

FINAL

WASTEWATER COLLECTION SYSTEM MASTER PLAN

Prepared for
City of Burlingame, California
October 15, 2010

BC Project No. 136414



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BROWN AND CALDWELL

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LIST OF ACRONYMS

AA	Anza Area
ADWF	average dry weather flow
APNs	Tax Assessor's parcel numbers
APS	Anza Point South
Assessor	Tax Assessor
BHSMD	Burlingame Hills Sewer Maintenance District
BSF	base sanitary flow
Burlingame Hills	San Mateo County Burlingame Hills Sewer Maintenance District
City	City of Burlingame
County	San Mateo County
CR	Commercial Residential
DWF	dry weather flow
FM	Flow Monitoring
fps	feet per second
GIS	Geographical Information System
GWI	ground water infiltration
HGL	hydraulic grade line
Hillsborough	Town of Hillsborough
I/I	inflow and infiltration
IB	Inner Bayshore
IDF	Intensity Duration Frequency
MG	million gallons
mgd	million gallons per day
NBSU	North Bayside System Unit
NOAA	National Oceanic and Atmospheric Administration
PDWF	peak dry weather flow
PWWF	peak wet weather flow
R1	Single Family
R2	Medium Density
R3	Medium-High Density
R4	High Density
RD/I	rainfall dependent infiltration and inflow
RR	Rollins Road
SFR	Single-family residential
SL	Shoreline
SMD	Burlingame Hills Sewer Maintenance District
SSO	sanitary sewer overflow
SWMM	Storm Water Management Model
TM	technical memorandum
TW	Trousdale West
WWTP	wastewater treatment plant

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WASTEWATER COLLECTION SYSTEM MASTER PLAN

EXECUTIVE SUMMARY

This Executive Summary summarizes the findings and recommendations of the Wastewater Collection System Master Plan (Master Plan) for the City of Burlingame (City). The Master Plan is based on an assessment of the collection system hydraulics. The Master Plan includes recommended improvements to provide adequate hydraulic capacity and reduce rainfall dependent inflow and infiltration (RDI/I).

Supporting information for this Executive Summary can be found in the Master Plan Introduction and the following Technical Memoranda:

- TM 1 – Flow Monitoring Plan
- TM 2 – Flow Monitoring Report
- TM 3 – Land Use Evaluation
- TM 4 – Dry Weather Flow Projections
- TM 5 – Hydraulic Model Development and System Performance Evaluation
- TM 6 – Capital Improvement Plan

Background

The City collects and treats wastewater from businesses and residents within the City of Burlingame. The City also transports and treats wastewater from two satellite collection systems: the Burlingame Hills Sewer Maintenance District (SMD) and a portion of the Town of Hillsborough. The entire service area encompasses approximately six square miles and 10,000 customers. The City's collection system includes seven pumping station facilities, approximately 84 miles of gravity sewers that range in size from 6-inches to 51-inches in diameter, and approximately 3.6 miles of force mains that range in size from 8 inches to 30 inches in diameter.

Service area flows are conveyed to the City's Wastewater Treatment Plant (WWTP), which has a secondary treatment capacity of 13 million gallons per day (mgd). The City's WWTP effluent is discharged up to a maximum rate of 16 mgd to the San Francisco Bay via the North Bayside System Unit (NBSU) outfall, a jointly-owned outfall pipe shared by the cities of Burlingame, San Bruno, South San Francisco, Millbrae, Colma, and the San Francisco Airport. During dry weather, the WWTP treats an average flow of approximately 3.6 mgd. This flow rate has remained relatively constant for at least the past eight years. Peak hour average daily flows are approximately 6.5 mgd during dry weather. Ten-year design peak hourly wet weather flows are approximately 32 mgd.

Project Approach

The approach for this project included monitoring collection system flows, developing a hydraulic model to identify capacity deficiencies and ultimately, developing capital improvement projects to eliminate capacity constraints and reduce RDI/I within the City's collection system. The approach

was framed by the following parameters, which were identified in the City's National Pollutant Discharge Elimination System (NPDES) permit and Consent Decree:

1. Eliminate capacity-related sanitary sewer overflows (SSOs) during rain events of less than the Consent Decree design storm.
2. Eliminate discharges to the City's unpermitted near shore outfall during rain events less than the Consent Decree design storm.
3. Minimize blending events at the WWTP.

Further discussion of these three parameters is included in the following sections.

Eliminate Capacity-Related SSOs

The City's consent decree requires reducing the occurrence of SSOs in the collection system. Projects were developed to eliminate pipe and pump station hydraulic restrictions, improve areas of the system with historic maintenance issues, and help the City reduce RDI/I in the system.

Additionally, California State Water Resources Control Board (SWRCB) Order No. 2006-003 provides statewide general Waste Discharge Requirements (WDR) for all publicly owned sanitary sewer collection systems in California with more than one mile of sewer pipe. Agencies meeting these criteria must develop a Sewer System Management Plan (SSMP). The SSMP will establish goals and present objectives to minimize the number and impact of sanitary sewer overflows (SSO), provide sewer capacity to accommodate design storm flows, and maintain the condition of the collection system such that the City can continue to provide reliable service.

Eliminate Discharges to the Nearshore Outfall

The City's NPDES permit allows WWTP effluent to be discharged up to a maximum rate of 16 mgd to the San Francisco Bay via the NBSU outfall. Under Design Storm conditions, peak (hourly) wet weather flows (PWWFs) reach approximately 32 mgd at the WWTP. Since the NBSU outfall is contractually limited to 16 mgd, wet weather flows over 16 mgd must be reduced either through RDI/I reduction, storage and discharge of wet weather flows over a longer period of time, or by increasing the NBSU outfall capacity to prevent the use of the City's unpermitted Nearshore outfall.

Minimize Blending Events at the WWTP

Blending events occur at the WWTP when wet weather flows exceed the 13 mgd capacity of the secondary treatment process. Wet weather flows above 13 mgd receive primary treatment, but bypass secondary treatment, and are blended with secondary effluent before discharge.

The City's proposed 1.5 MG wet weather storage facility at the WWTP reduces the volume of blended effluent since stored wastewater will be returned to the headworks of the WWTP for secondary treatment before discharge. RDI/I reduction methods such as collection system rehabilitation also minimize blending by lowering wet weather flows to the WWTP.

Hydraulic Assessment

The collection system hydraulic assessment was based on modeling of six pump stations and 84 miles of trunk sewers and force mains under design flow conditions. The City's Geographic Information System (GIS) data provided the base for the hydraulic model. Flow projections were

based on flow monitoring performed during this project. Flow projections did not include any allowances for growth or densification within the service area, which is essentially built-out. Design peak wet weather flows were developed using two 10-year, 24-hour design storms.

The design storm is a 10-year 24-hour storm with a distribution typically used for collection system master plans. The City's Consent Decree requires that collection system improvements resolve capacity-related SSOs during storm events less than a 10-year 24-hour storm using an SCS Type IA 24-hour rainfall distribution curve. This storm is less conservative than the design storm and was used for prioritizing improvement projects.

Figure ES-1 and ES-2 show the performance of the existing collection system under the Design and Consent Decree Scenarios. Gravity sewers with inadequate capacity are shown as having "throttled surcharge". These include gravity sewers with flat or adverse slopes. Sewers with adequate capacity that are surcharged due to a throttled pipe downstream (or a geometry condition such as a submerged outlet) are shown as having "backwater surcharge".

For the Design Scenario, there are 19 potential SSO locations in the existing system, ten of which are in manholes located outside of the City limits (although flows from the City may contribute upstream). For the Consent Decree Scenario, there are 14 potential SSO locations, nine of which are in manholes located outside of the City limits (although flows from the City may contribute upstream). 1740 Rollins Road and Airport Road pump stations have potential capacity deficiencies for the Design and Consent Decree Scenarios. These findings led to hydraulic capacity enhancement projects for the Capital Improvement Plan.

RDI/I Assessment

Analysis of the flow monitoring data collected for this project identified a number of basins with high levels of RDI/I that are potential candidates for RDI/I reduction through collection system and service lateral rehabilitation. Basins were selected for rehabilitation based on the following criteria:

- High potential for RDI/I reduction based on modeled R-factor (percent of rainfall volume that enters the collection system).
- Effectiveness of RDI/I reduction (gallons of RDI/I per lineal foot of pipe) with a focus on basins with small diameter pipe primarily in residential areas where RDI/I is expected to be prevalent.
- Basins where RDI/I reduction projects have not been previously implemented.

Table ES-1 summarizes the properties of each of the 18 flow monitoring basins, including the primary agency that contributes the flow, and indicates which basins were selected for the RDI/I reduction model scenario. Note that average dry weather flow (ADWF) and PWWF values include flows from upstream basins. These basins are shown in Figure ES-3.

Table ES-1. RDI/I Reduction Scenarios

Flow Monitor Basin	Primary Contributing Agency	ADWF ¹ (mgd)	Consent Decree Scenario ²		Contributing Area (ac)	Wet Weather GWI (mgd)	R-factor (% of Rainfall Volume)	Consent Decree Scenario ²	Total Length of Pipe (LF)	Gallons RDI/I per Total LF	Candidate for Collection System Rehabilitation
			PWWF ¹ (mgd)	Peaking Factor				Volume RDI/I (MG)			
Unmetered	City				159	0.0	1.0	0.04	32,083	1	
1	City	0.24	2.24	9.3	240	0.1	3.9	0.94	48,675	19	
2	City	0.11	2.07	18.8	114	0.0	7.8	0.89	19,329	46	✓
3	City and BHSMD	0.10	0.79	7.9	79	0.1	7.1	0.56	19,222	29	✓
4	BHSMD	0.01	0.32	32.0	24	0.0	9.5	0.23	5,069	45	
5	City	0.21	1.52	7.2	50	0.0	3.4	0.17	20,365	8	
6	City	0.21	3.17	15.1	74	0.0	9.2	0.69	20,518	34	✓
7	City and BHSMD	0.20	1.88	9.4	208	0.2	5.7	1.18	42,881	28	✓
8	Hillsborough	0.07	1.38	19.7	140	0.0	5.7	0.81	28,977	28	✓
9	Hillsborough	0.05	0.67	13.4	52	0.0	7.0	0.37	9,035	41	✓
10	Hillsborough	0.17	1.08	6.4	638	0.0	2.6	1.66	90,913	18	
11	City	0.65	2.19	3.4	155	0.5	4.2	0.65	42,957	15	
13	City	0.17	1.10	6.5	103	0.2	3.0	0.31	29,180	11	
14	City	1.00	7.84	7.8	265	0.0	2.0	0.53	85,181	6	
15	City	1.76	17.20	9.8	333	0.0	7.8	2.72	82,253	33	✓
16	City	0.13	2.98	22.9	6	0.0	5.0	0.03	2,812	11	
17	City and Hillsborough	0.26	1.86	7.2	125	0.1	6.3	0.79	29,686	27	✓
Floribunda	Hillsborough	0.17	3.65	21.5	759	0.1	2.6	1.94	105,448	18	✓

¹ Flow rates include all flows upstream of the meter, including flows from tributary basins.

² SSOs occur under both wet weather scenarios, therefore, PWWFs and peaking factors do not include system losses.

Capital Improvement Plan

Capital improvement projects were developed to mitigate hydraulic and structural deficiencies, reduce maintenance, and improve overall system reliability and operation. Information from the hydraulic assessment was used to prioritize the capital projects into the three categories listed in Table ES-2. City-identified maintenance projects are expected to be completed first, within the next three years; hydraulic projects that are necessary to meet the requirements of the Consent Decree must be completed in the next ten years; and hydraulic projects triggered by the Design Storm are expected to be completed more than ten years from now, and should be reevaluated after the conditions of the Consent Decree are met.



Wastewater Collection System Master Plan

Project No. 136414

Legend

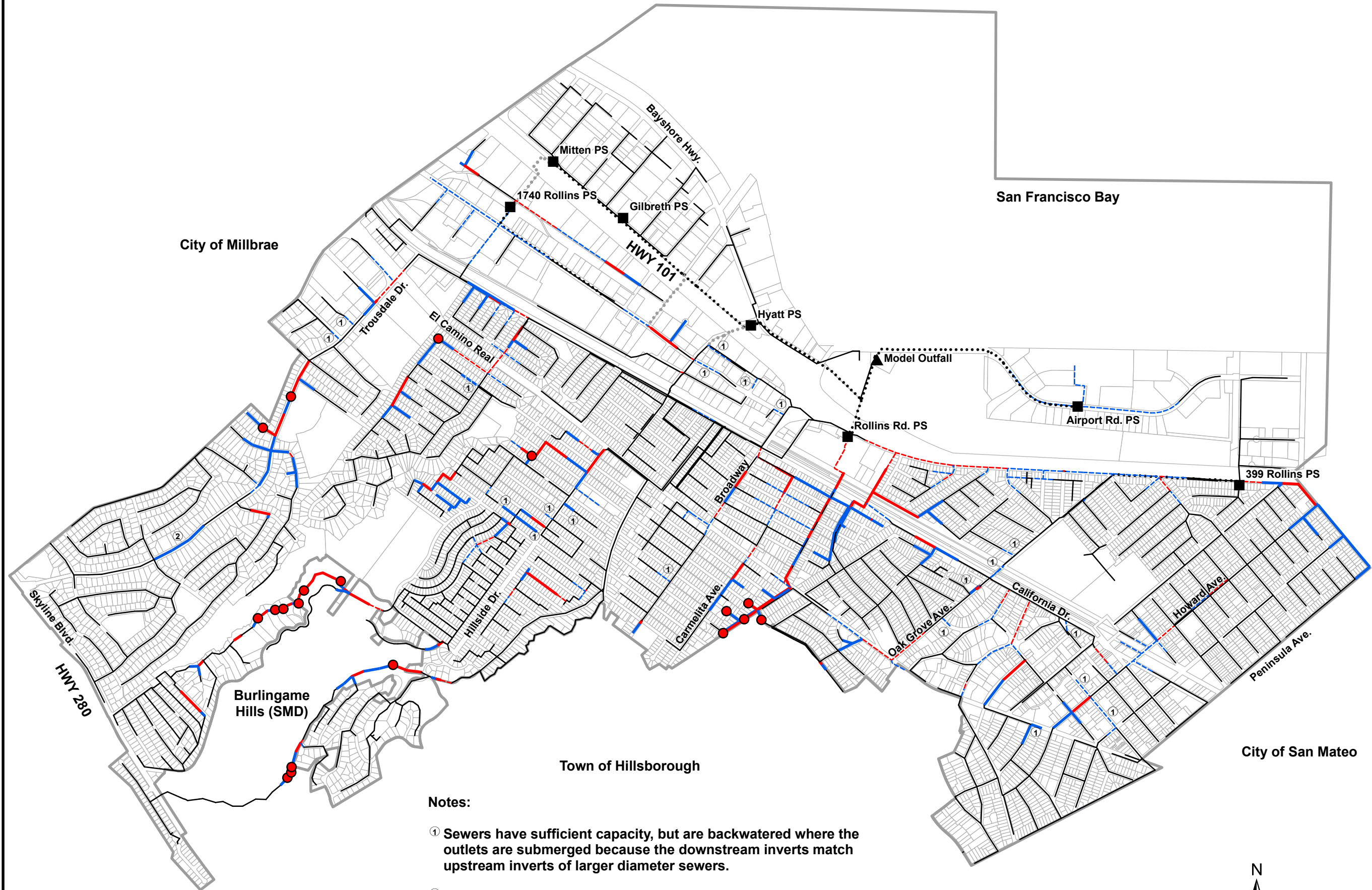
- Potential SSO Location
- ▲ WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer
- Modeled Forcemain
- Inactive Forcemain
- Throttle Surge, Freeboard < 5 ft
- Backwater Surge, Freeboard < 5 ft
- Throttle Surge w/ Sufficient Freeboard
- Backwater Surge w/ Sufficient Freeboard
- Burlingame City Limits
- Burlingame Parcels

Figure ES-1

Existing System
Performance:
Design Scenario



Last Revision: 1/13/2010



Notes:

- ① Sewers have sufficient capacity, but are backwatered where the outlets are submerged because the downstream inverts match upstream inverts of larger diameter sewers.
- ② High flow velocity due to steep slopes creates localized backwatering at manhole inlets. Sewers have sufficient capacity.

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**Wastewater Collection
System Master Plan**
Project No. 136414

Legend

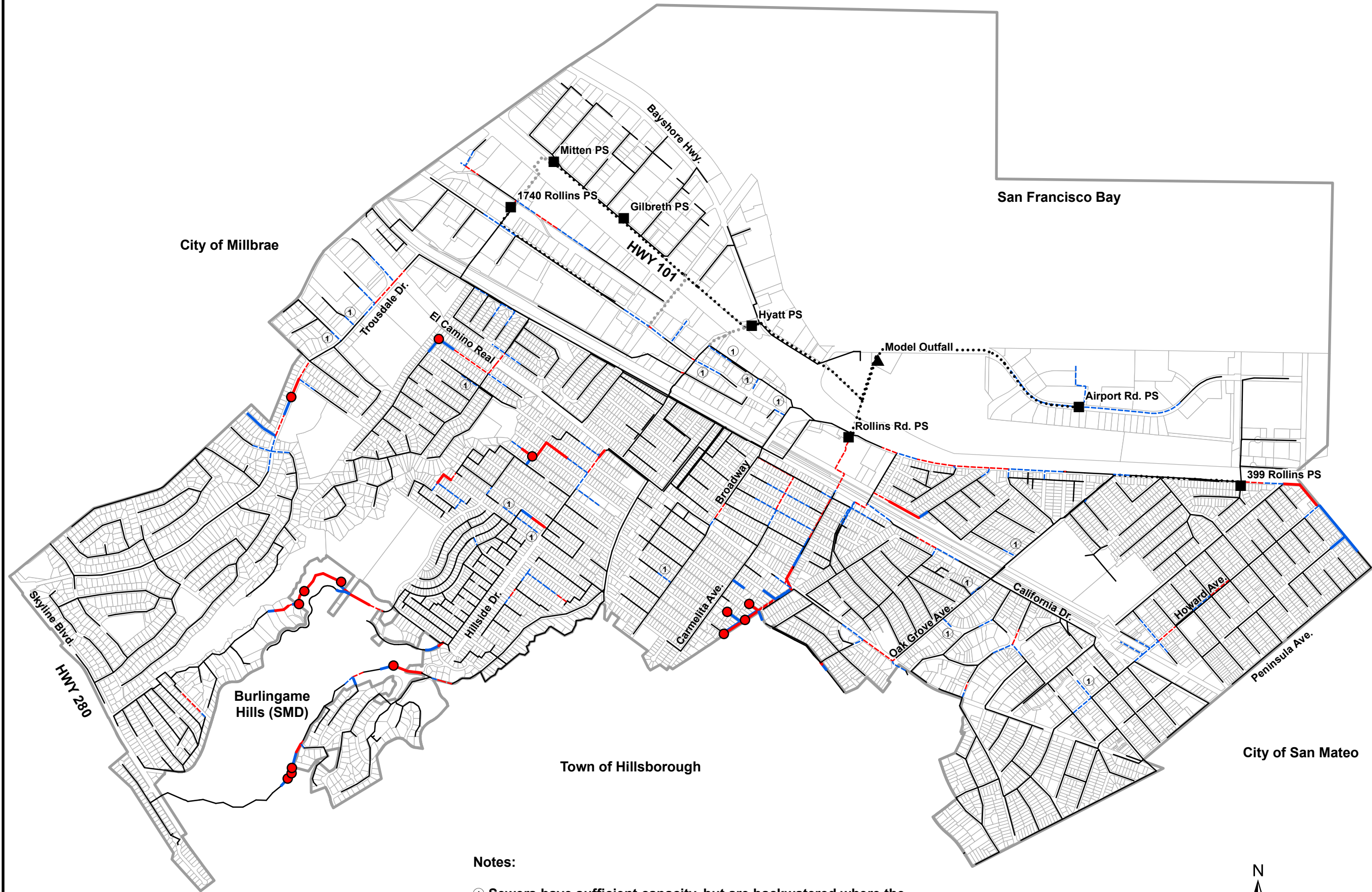
- Potential SSO Location
- ▲ WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer
- Modeled Forcemain
- Inactive Forcemain
- Throttle Surge, Freeboard < 3 ft
- Backwater Surge, Freeboard < 3 ft
- Throttle Surge w/ Sufficient Freeboard
- Backwater Surge w/ Sufficient Freeboard
- Burlingame City Limits
- Burlingame Parcels

Figure ES-2

**Existing System
Performance:
Consent Decree
Scenario**



Last Revision: 1/13/2010



Notes:

- ① Sewers have sufficient capacity, but are backwatered where the outlets are submerged because the downstream inverts match upstream inverts of larger diameter sewers.

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**Wastewater Collection
System Master Plan**
Project No. 136414

Legend

- ▲ WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer Collection System
- ▭ Burlingame City Limits
- ▭ Parcels

Basins to be Rehabilitated

- Basin 2
- Basin 3
- Basin 4
- Basin 6
- Basin 7
- Basin 8
- Basin 9
- Basin 17
- Basin Floribunda
- Basin 15 (Residential)

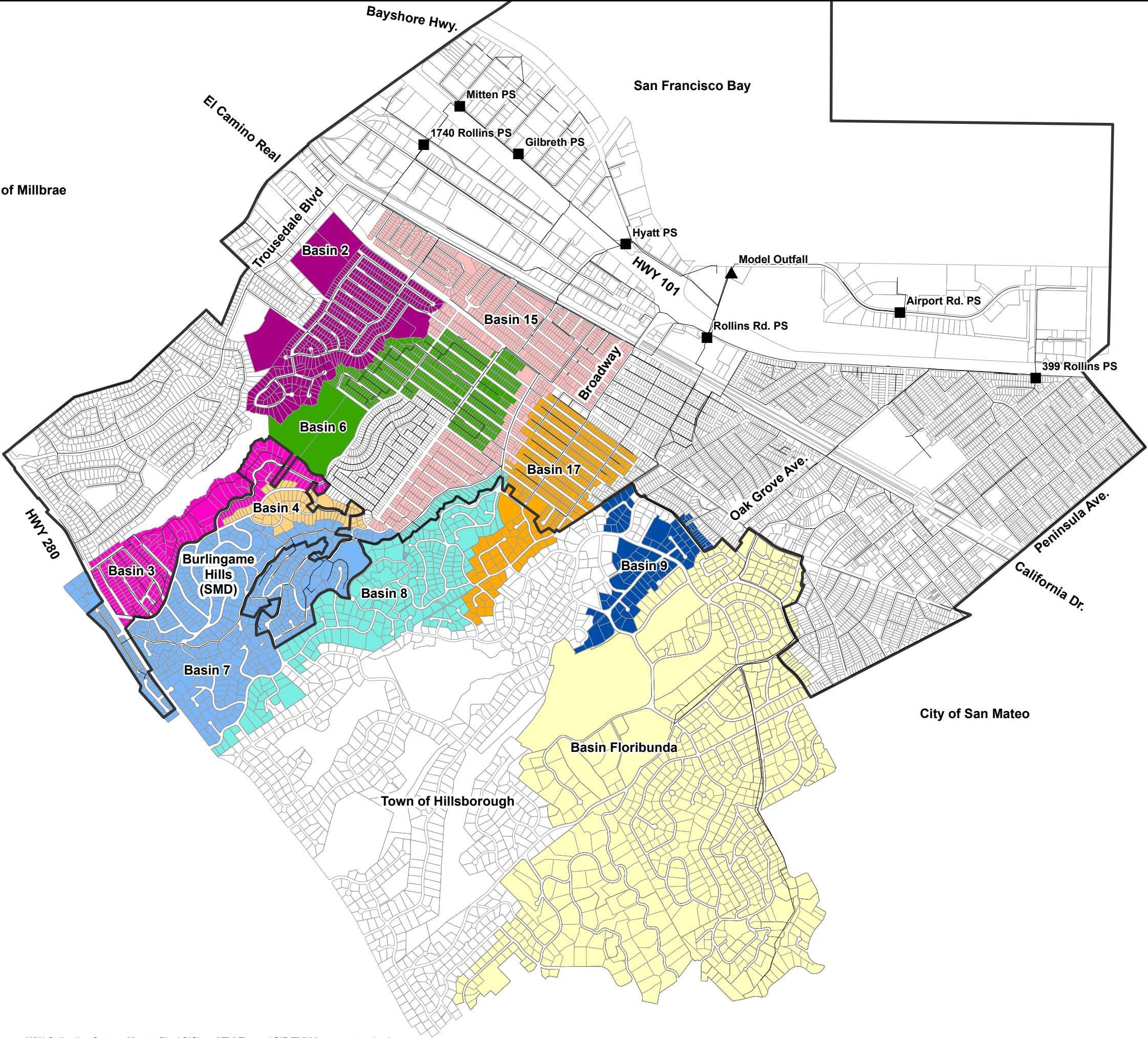


Figure ES-3

**Candidate Basins
for Rehabilitation**



Last Revision:3/12/2010



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Table ES-2. Project Prioritization		
Priority		Projects
5-Years	High	High Priority Projects
10-Years	Medium	Capacity Improvement Projects
10-Years	Medium	Basin-Wide Collection System Rehabilitation Projects
Beyond 10-Years	Low	Capacity Improvement Projects

Hydraulic Projects. Hydraulic projects are based on the results of the hydraulic assessment and are intended to provide hydraulic capacity in the system for the two 10-year design storm conditions.

Maintenance Projects. Maintenance improvements were identified by the City during the development of this Master Plan. Preliminary design plans for the proposed maintenance projects were provided by the City and were incorporated as a maintenance project in this Master Plan. Maintenance projects were reviewed to verify that the solutions were hydraulically acceptable.

Collection System Rehabilitation. RDI/I reduction is needed in the collection system to eliminate use of the near shore outfall and minimize blending at the WWTP. For this project, two RDI/I reduction approaches were tested in a selection of the most promising basins:

- **30 percent reduction.** Rehabilitation of mains, manholes, and lower laterals (within the public right-of-way or easement).
- **50 percent reduction.** Rehabilitation of mains, manholes, lower laterals, and upper (privately-owned) laterals.

The implementation of the 30 to 50 percent RDI/I reduction in the candidate basins results in a lower volume and PWWF at the WWTP and no model Nearshore outfall discharges for the Design Storm.

The comprehensive Capital Improvement Plan (CIP) is listed in Table ES-3 and shown on Figures ES-4.

Table ES-3. Capital Improvement Project Summary

Project No.	Contributing Agency	Location	Project Description	Existing Size	Future Size	Quantity	Construction Cost	Engineering, Admin, Etc.	Total Project Cost
5-Years: High Priority Projects									
11	City	Upper Carmelita Ave.	Upsize by pipe bursting.	6-in	8-in	1,800 LF	\$451,980	\$158,190	\$610,170
14	City	Grove Ave.	Open cut replacement.	6-in	8-in	3,510 LF	\$850,000 ²	\$297,500 ²	\$1,147,500 ²
15	City	Easement: California Dr./ Edgehill Dr.	Re-route collection system by open cut installation.	N/A	8-in to 12-in	3,190 LF	\$1,254,180	\$438,960	\$1,693,140
23	City	Majilla Ave. Easements	Sewer rehabilitation.	6-in	8-in	1,140 LF	\$150,000 ²	\$52,500 ²	\$202,500 ²
24	City	Downtown Burlingame	Sewer rehabilitation.	6-in, 10-in	8-in, 10-in	6,809 LF	\$1,400,000 ²	\$300,000 ²	\$1,700,000 ²
Subtotal - High Priority Projects							\$4,106,160	\$1,247,150	\$5,353,310
10-Years: Medium Priority Capacity Improvement Projects									
2	City	Upper Trousdale Dr.	Upsize by pipe bursting. (Recently paved.)	8-in	10-in	1,280 LF	\$383,620	\$134,270	\$517,890
3	City & BHSMD	Adeline Dr. Easement	Upsize and re-grade by open cut replacement.	8-in	10-in, 12-in	3,212 LF	\$1,349,810	\$472,430	\$1,822,240
5	City & BHSMD	Canyon Rd.	Upsize and re-grade by open cut replacement.	6-in, 8-in, 12-in	8-in to 18-in	4,010 LF	\$1,706,600	\$597,310	\$2,303,910
7	City	Adeline Dr. - Cabrillo & Cortez	Upsize by pipe bursting and open cut replacement.	6-in, 8-in, 15-in	8-in to 21-in	2,215 LF	\$838,200	\$293,370	\$1,131,570
8	City	Columbus Ave. to Bernal Ave.	Upsize by pipe bursting.	6-in	8-in	892 LF	\$223,980	\$78,390	\$302,370
9	City	Hale Dr. to Bernal Ave.	Install new pipe and 3 new manholes by open cut.	-	10-in	1,400 LF	\$532,980	\$186,540	\$719,520
12'	City & Hillsborough	Lower Sanchez Ave. (DS of California Dr.)	Upsize and re-grade by open cut replacement.	15-in	21-in	1,110 LF	\$695,300	\$243,360	\$938,660
13'	Hillsborough	Sanchez Ave. (Hillsborough)	Upsize and re-grade by open cut replacement.	6-in, 8-in, 10-in	10-in, 15-in	2,880 LF	\$1,517,890	\$531,260	\$2,049,150
17	City	Carolan Ave.	Upsize by pipe bursting. Not enough fall to re-grade.	6-in	8-in	800 LF	\$200,880	\$70,310	\$271,190
18	City	Rollins Rd. & Humboldt Rd.	Upsize by pipe bursting and open cut replacement.	8-in	10-in, 12-in	1,330 LF	\$452,600	\$158,410	\$611,010
19	City & Hillsborough	Upper Oak Grove Ave. & El Camino R.	Upsize by open cut replacement.	15-in	21-in	85 LF	\$53,240	\$18,630	\$71,870

Table ES-3. Capital Improvement Project Summary

Project No.	Contributing Agency	Location	Project Description	Existing Size	Future Size	Quantity	Construction Cost	Engineering, Admin, Etc.	Total Project Cost
20	City	1740 Rollins PS	Pump station upgrade. Confirm capacity with hydraulic analysis.	1.0 mgd	2.0 mgd	-	\$132,500	\$46,000	\$178,500
21	City	Airport Road PS	Pump station upgrade. Confirm capacity with hydraulic analysis.	0.3 mgd	0.4 mgd	-	\$50,000	\$18,000	\$68,000
Subtotal - Medium Priority Capacity Improvement Projects							\$8,137,600	\$2,848,280	\$10,985,880
10-Years: Medium Priority Basin-Wide Collection System Rehabilitation Projects									
22A	City	Basins 2, 3, 6, 7, 8, 9, 15, 17, Floribunda	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 12-in	8-in to 12-in	50,450 LF to 100,800 LF	\$12,700,000 to \$25,400,000	\$4,400,000 to \$8,900,000	\$17,100,000 to \$34,300,000
22B	BHSMD	Basin 3, 4, 7	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 8-in	8-in to 12-in	10,400 LF to 20,800 LF	\$2,600,000 to \$5,300,000	\$900,000 to \$1,900,000	\$3,500,000 to \$7,200,000
22C	Hillsborough	Basin 7, 8, 9, 17, Floribunda	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 12-in	8-in to 12-in	46,450 LF to 92,800 LF	\$11,700,000 to \$23,400,000	\$4,100,000 to \$8,200,000	\$15,800,000 to \$31,600,000
Subtotal - Medium Priority Basin-Wide Collection System Rehabilitation Projects – Minimum							\$27,000,000	\$9,400,000	\$36,400,000
Subtotal - Medium Priority Basin-Wide Collection System Rehabilitation Projects – Maximum							\$54,100,000	\$19,000,000	\$73,100,000
Beyond 10-Years: Low Priority Capacity Improvement Projects									
1	City	Lower Trousdale Dr.	Upsize and re-grade by open cut replacement and pipe bursting.	12-in, 18-in	15-in, 24-in	2,700 LF	\$1,662,930	\$582,030	\$2,244,960
4	City	La Mesa Dr.	Upsize by pipe bursting.	6-in	8-in	610 LF	\$153,170	\$53,610	\$206,780
6	City	Davis Dr.	Upsize by pipe bursting, and install relief sewer by open cut.	6-in	8-in, 10-in	1,773 LF	\$511,690	\$179,090	\$690,780
10	City	Columbus Ave. Hillside/Easton	Upsize by pipe bursting.	6-in	8-in	1,250 LF	\$313,880	\$109,860	\$423,740
16	City	California Dr. & Palm Dr.	Upsize by pipe bursting.	6-in	8-in	840 LF	\$210,920	\$73,820	\$284,740
Subtotal - Low Priority Capacity Improvement Projects							\$2,852,590	\$998,410	\$3,851,000
Grand Total – Minimum							\$42,096,350	\$14,493,840	\$56,590,190
Grand Total – Maximum							\$69,196,350	\$24,093,840	\$93,290,190

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Wastewater Collection System Master Plan

Project No. 136414

Legend

- CIP Project Number
- WWTP
- Pump Station (PS)
- Existing Sanitary Sewer
- 10-Years - Capacity / Rehab
- 5-Years - High Priority
- >10-Years - Capacity
- Burlingame City Limits
- Burlingame Parcels

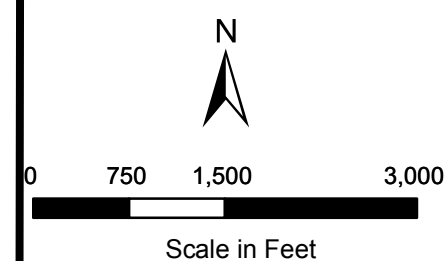
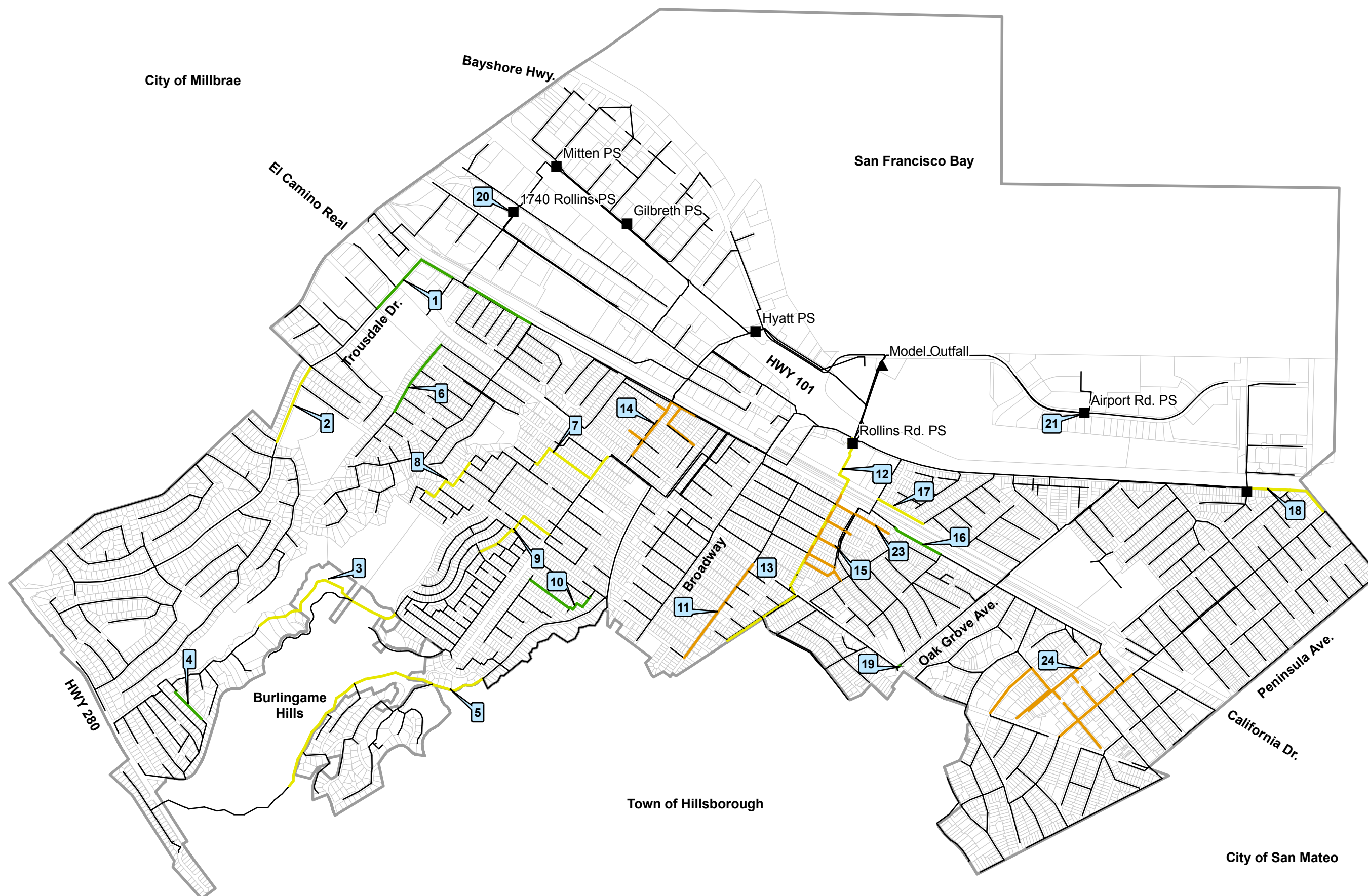


Figure ES-4

Capital Improvement Projects

BROWN AND
CALDWELL

Last Revision: 10/12/2010



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Other Recommendations

Although not included in the Capital Improvement Plan, the following activities are also recommended to meet the stated NPDES permit and Consent Decree requirements.

NBSU Outfall Hydraulic Investigation. The City is contractually limited to a peak discharge of 16 mgd through the NBSU outfall. An investigation should be performed to determine the limits of the outfall, and whether additional capacity is available. The capacity of the NBSU outfall could be limited by the pipeline pressure rating, the capacity of an in-line pump station, bay dilution requirements that are tide-dependant, or by over-conservative modeling assumptions made at the time of the original design. It is in the City's best interest to investigate whether additional capacity is available since it could potentially provide a much quicker and less-costly method for eliminating the use of the Nearshore outfall.

Wet Weather Flow Monitoring and RDI/I Investigations. Further intensive wet weather flow monitoring should be completed to isolate smaller basins and to identify where RDI/I reduction will be most effective. The City should also conduct detailed field investigations, including smoke and dye testing, to characterize how RDI/I is distributed with each smaller basin and to identify portions of the basins that do not need rehabilitation.

Private Lateral Rehabilitation Programs. The City's satellite collection systems should expand their efforts to control and reduce RDI/I by implementing rigorous private lateral inspection and rehabilitation programs. RDI/I from private laterals has been found to account for approximately 50 percent of the total RDI/I in several Bay Area cities. A program to inspect and rehabilitate private service laterals at the sale of property can provide on-going RDI/I control at low cost.

Satellite Collection Systems Agreements. The City should review the agreements with its satellite collection systems to ensure that appropriate limits on PWWFs are included. PWWFs are the primary criteria for sizing collection system facilities including pipes and pump stations. Wet weather flows are also a significant cause of overflows in the City's collection system. Responsibilities for limiting, conveying, and paying for PWWFs should be clearly delineated. Satellite collection systems should have active programs to control and reduce RDI/I that include identifying and disconnecting inflow sources, private lateral inspection and rehabilitation programs, and regular monitoring and evaluation of wet weather flows.

Master Plan Update. This Master Plan should be updated in 5 years as the City completes improvements and RDI/I reduction projects, and as updated flow monitoring information becomes available. The existing hydraulic model should be updated periodically to reflect changes in the collection system, including collection system rehabilitation and sewer upsizing projects. Future flow monitoring should include long-term flow monitoring of the Town of Hillsborough and Burlingame Hills SMD flows to recalibrate the model and for continuous simulation modeling of the storage basin at the WWTP.

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WASTEWATER COLLECTION SYSTEM MASTER PLAN

1. INTRODUCTION

The City of Burlingame (City) owns and maintains a wastewater collection system that serves approximately 8,000 sewer customers within the City and over 2,000 customers from satellite collection systems in the Burlingame Hills Sewer Maintenance District (SMD) and the Town of Hillsborough. These three entities make up the service area that is tributary to the City's Wastewater Treatment Plant (WWTP). The City last prepared a wastewater collection system master plan in 1999. In October 2008, the District retained Brown and Caldwell (BC) to prepare a new Master Plan.

This Master Plan provides a comprehensive plan for improving the collection system over the next 10 to 20 years, and includes a hydraulic evaluation, RDI/I assessment, and develops a detailed capital improvement plan. This Master Plan will help the City meet the requirements of its Consent Decree and facilitate the City's development of its Sewer System Management Plan (SSMP) as required by the State Water Resources Control Board (SWRCB).

This section summarizes the process undertaken to develop this Master Plan and provides background information on the study area, collection system, and regulatory and legal drivers.

1.1 Scope of Work

The Master Plan scope of work includes the tasks outlined below. Completed work tasks were documented in technical memoranda. These technical memoranda are included as chapters of this Master Plan report.

Review Existing Data. Review available information on the existing collection system.

Flow Monitoring and Analysis. Develop a flow monitoring plan and perform wet weather flow and rainfall monitoring to project wastewater flows and develop rainfall dependent inflow and infiltration (RDI/I) projections.

Hydraulic Model Development. Develop and calibrate a hydraulic model of the collection system to identify hydraulic deficiencies and test RDI/I reduction scenarios.

System Performance Evaluation and Capacity Assurance Plan. Identify hydraulic deficiencies in the collection system and develop improvement alternatives.

Capital Improvement Plan Development. Develop capital projects to address deficiencies and prioritize the projects in a Capital Improvement Plan (CIP) using established deficiency criteria.

Master Plan Report. Document the Master Plan in a readily useable report.

1.2 Study Area

The Master Plan study area encompasses approximately six square miles and 10,000 customers including the City of Burlingame and two satellite collection systems: Burlingame Hills SMD and a portion of the Town of Hillsborough. The service area is bordered by Highway 280 on the west, San Francisco Bay on the east, the City of San Mateo on the south and the City of Millbrae on the north. The hydraulic analysis for this Master Plan includes collection system pipes within the City of Burlingame, and some pipes within the Burlingame Hills Sewer Maintenance District that transport flows from the City.

1.3 Existing Collection System

The City collects and treats wastewater from businesses and residents within the City of Burlingame, and transports and treats wastewater from two satellite collection systems. The collection system owned and maintained by the City includes seven pumping station facilities, approximately 84 miles of gravity sewers that range in size from 6-inches to 51-inches in diameter, and approximately 3.6 miles of force mains that range in size from 8 inches to 30 inches in diameter. Flows from the City and the two satellites are conveyed to the City's wastewater treatment plant (WWTP).

1.4 Wastewater Treatment

Service area flows are conveyed to the City's WWTP, which has a secondary treatment capacity of 13 mgd. The City's WWTP effluent is discharged up to a maximum rate of 16 million gallons per day (mgd) to the San Francisco Bay via the North Bayside System Unit (NBSU) outfall, a jointly-owned outfall pipe shared by the cities of Burlingame, San Bruno, South San Francisco, Millbrae, Colma, and the San Francisco Airport. During dry weather, the WWTP treats an average flow of approximately 3.6 mgd. This flow rate has remained relatively constant for at least the past eight years. Peak hour average daily flows are approximately 6.5 mgd during dry weather, and ten-year design peak hourly wet weather flows are approximately 32 mgd.

1.5 Previous Planning Reports and Information

In 1999, the City completed a previous evaluation of the wastewater collection system. Additional reports, planning documents and information used in the development of this Master Plan are as follows:

- San Mateo County Parcel GIS
- City of Burlingame General Plan: Land Use Element (1969) and Housing Element (2002)
- Burlingame Bayfront Specific Plan (Adopted 2004/Amended 2006)
- North Burlingame/Rollins Road Specific Plan (Adopted 2005/Amended 2007)
- City of Burlingame Title 25 Zoning Code
- City of Burlingame Water and Sewer Billing Information (July 2007 to June 2008)
- Various Sewer Record and Construction Drawings

1.6 Regulatory and Legal

This section summarizes current regulatory requirements and legal decisions that have influenced the development of this Master Plan, and is intended to provide a general discussion of the subject matter covered. To the extent it addresses laws, regulations or court decisions of any jurisdiction; it is not intended as a precise, detailed or thorough summary of the pertinent legal authorities.

Regulatory. The United States Environmental Protection Agency (USEPA) began drafting Capacity, Management, Operations and Maintenance (CMOM) regulations in the mid-1990s to require owners and operators of publicly owned wastewater collection systems to eliminate sanitary sewer overflows (SSOs). SSOs occur when wastewater escapes the collection system as a result of blockages or capacity restrictions in the system. The State of California, through its State Water Resources Control Board (SWRCB), has issued Sewer System Management Plan (SSMP) requirements to achieve the SSO reduction goals of CMOM.

SWRCB Order No. 2006-003 provides statewide general Waste Discharge Requirements (WDR) for all publicly owned sanitary sewer collection systems in California with more than one mile of sewer pipe. Agencies meeting these criteria must develop an SSMP that includes at least 11 mandatory elements, which are identified in Table 1. The agency's SSMP must be approved by the collection system's governing body. The WDR also requires uniform reporting of all SSOs to a statewide electronic database maintained by the SWRCB. All elements of the SSMP were required to be in place by specified dates prior to August 1, 2009 for sewer agencies serving populations between 10,000 and 100,000.

Table 1. SSMP Components	
Components	Major Goals
1. Goals	Properly manage, operate and maintain all parts of the sanitary sewer system.
2. Organization	Clearly identify the parties responsible for the plan; management, administration and maintenance; and the chain of communication for SSO reporting.
3. Legal Authority	Demonstrate through ordinances, agreements or other legally binding procedures that the agency has the legal authority to: prevent illicit discharges into the sewer system; require that sewers and connections be properly designed and constructed; ensure access for maintenance, inspection and repairs; limit the discharge of fats, oils and grease (FOG); and enforce violation of sewer ordinances.
4. O&M Program	a) Maintain an up-to-date map; b) Regular preventive maintenance activities; c) Develop a prioritized rehabilitation and replacement plan; d) Provide training; e) Provide equipment and replacement part inventories.
5. Design and Performance Provisions	a) Design and construction standards and specifications; b) Procedures and standards for inspecting and testing new sewers.
6. Overflow Emergency Response Plan	a) Proper notification procedures; b) Overflow response program; c) Overflow notification procedures; d) Emergency Response Plan procedures; e) Traffic and crowd control procedures; f) Program to ensure reasonable steps are taken to contain SSO.

Table 1. SSMP Components

Components	Major Goals
7. Fog Control Program	a) Public education and outreach plan; b) FOG disposal plan; c) Legal authority to prevent discharges; d) Grease removal device requirements; e) Authority to inspect grease producing facilities; f) Identification of areas prone to FOG blockages; g) Development and Implementation of FOG source control measures.
8. System Evaluation and Capacity Assurance Plan	a) Evaluation of areas experiencing SSO discharge; b) Develop design criteria; c) Develop a CIP to address identified hydraulic deficiencies; d) Develop a schedule of completion dates.
9. Monitoring, Measurement and Program Modifications	a) Maintain information to establish and prioritize SSMP activities; b) Monitor the implementation and effectiveness of each element; c) Assess the success of the preventive maintenance program; d) Update program elements as necessary; e) Identify and illustrate SSO trends.
10. SSMP Audits	Conduct a program audit at least every two years to evaluate the effectiveness of the SSMP.
11. Communication Program	Communicate on a regular basis with the public on the development, implementation and performance of the SSMP.

The City of Burlingame WWTP is authorized through its NPDES permit No. CA0037788 to discharge to the lower San Francisco Bay via the North Bayside System Unit (NBSU) outfall. The WWTP's NPDES permit includes several requirements that directly influence the approach and recommendations of this Master Plan. The applicable requirements are as follows:

1. The discharger shall comply with the development of an SSMP as specified in the WDR.
2. The discharger must undertake multiple corrective measures to eliminate future discharges to the Near Shore Outfall.
3. The discharger must undertake multiple corrective measures, including system rehabilitation, to minimize blending. Blending is permitted when the discharger's PWWF exceeds the capacity of the secondary treatment units as long as other conditions are met in the NPDES permit.

Legal. In October, 2008, the City entered into a Consent Decree with San Francisco Baykeeper. The objectives of the Consent Decree are as follows:

1. To ensure that the City uses, implements, and improves ways, means, and methods to prevent sanitary sewer overflows;
2. To ensure that the City continues to use, implement and improve ways, means and methods to prevent or reduce WWTP violations; and
3. To further the goals and objectives of the Clean Water Act.

The Consent Decree includes several requirements that directly influence the approach and recommendations of this Master Plan. The applicable requirements are as follows:

1. The City shall minimize the use of the Near Shore Outfall and eliminate its use for rainfall events less than the Consent Decree design storm through construction of the retention basin at the WWTP, capital improvements in the system, and reduction of peak wet weather flows.
2. Develop a Capacity Assurance Report for identification of all necessary capacity improvements to convey PWWFs to the WWTP without SSOs caused by insufficient capacity.
3. Identify RDI/I within the City's collection system and identify improvements designed to eliminate discharges from the Near Shore Outfall for rainfall events less than the Consent Decree design storm.

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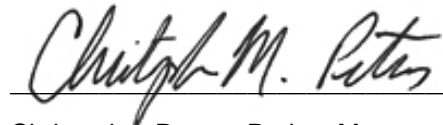
Prepared for: City of Burlingame, California
Project Title: Wastewater Collection System Master Plan
Project No: 136414-2.1

Technical Memorandum No. 1

Subject: Flow Monitoring Plan
Date: October 15, 2010
To: Donald Chang, PE, Project Manager
From: Christopher Peters, PE, Project Manager
Copy to: Art Morimoto, PE, Assistant Public Works Director

Prepared by: Lani Good, PE, Senior Engineer, California, License No. C 73677

Reviewed by:



Christopher Peters, Project Manager
Engineer-in-Responsible Charge, California, License No. C 69669



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1. FLOW MONITORING PLAN

This Technical Memorandum (TM) recommends temporary flow monitor and rain gage locations for data gathering during the 2008/2009 wet weather season in support of the Wastewater Collection System Master Plan for the City of Burlingame (City).

1.1 Site Selection Criteria

Brown and Caldwell has reviewed the City's previous flow monitoring activities, the available sewer block maps, and the City's graphic information system (GIS) information to determine appropriate temporary flow monitor and rain gage locations.

The temporary flow monitors will be area-velocity meters and will record wastewater flow data throughout the 2008/2009 wet weather season. Temporary flow monitor sites are located to:

- a) capture satellite collection system flows,
- b) isolate basins with high rainfall dependant inflow and infiltration (I/I) or previous sewer rehabilitation,
- c) meet minimum drainage basin size and flow requirements, and
- d) avoid interruption from pumping station cycles.

Rainfall on the peninsula typically moves from north to south, with higher elevations generally receiving more rainfall than lower elevations. Therefore, temporary rain gages are located in both high and low elevations, and in both north and south basins of the service area.

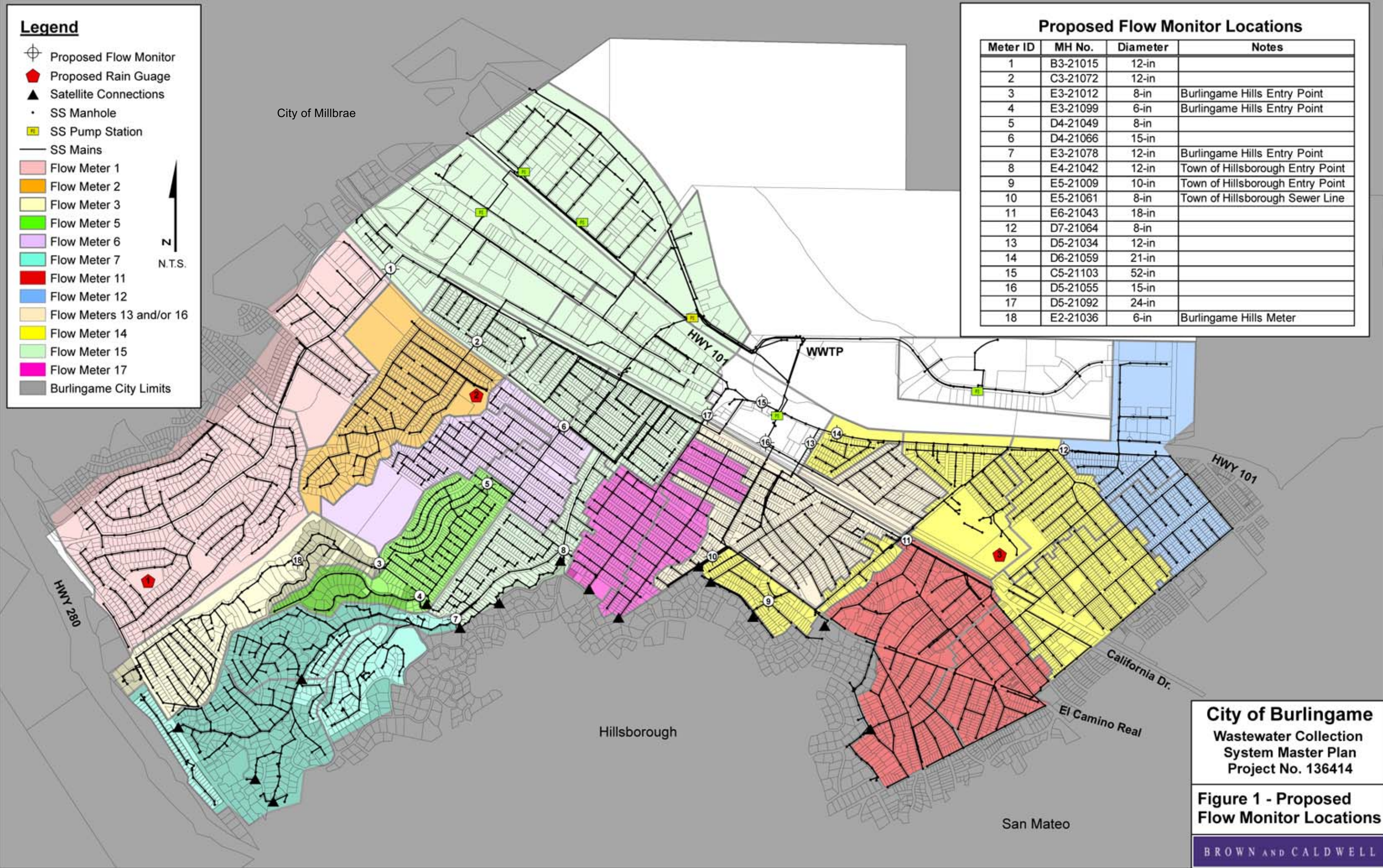
1.2 Recommended Flow Monitoring Plan

This section presents the recommended temporary flow monitoring plan for the 2008/2009 wet weather season. The recommended locations of the flow monitors and rain gages and the tributary drainage basin boundaries are shown on Figure 1-1. Field investigations of each proposed flow and precipitation monitoring site will be performed and field adjustments made as necessary, in consultation with the City. The City will provide all permits for conducting the flow monitoring program, locate manholes, provide access to public facilities for rain gauges, and will assist in traffic control if necessary.

The flow monitors and rain gages will be installed in mid-December, 2008, and will remain in service for a period of 60 days. Flow monitors will be capable of monitoring in surcharge and reverse-flow conditions. The flow and precipitation data will be collected at a maximum of 15 minute intervals. Flow monitoring data will be collected at 5 minute intervals for monitors collecting data directly downstream from satellite collection systems.

The rainfall and flow monitoring data will be used to confirm base sanitary flow rates, quantify I/I, and develop design storm hydrographs. This information will be used with the hydraulic model of the collection system to identify capacity constraints in the collection system.

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1.2.1 Flow Monitors

Table 1-1 identifies the location of the 18 recommended flow monitors. Flow monitors will be installed in the designated manhole, and will monitor flows in the pipe immediately upstream of the manhole. The additional flow monitoring Site No. 18 was requested by the County of San Mateo to monitor flows entering the Burlingame Hills Sewer Maintenance District and is funded under a separate contract with the County.

Site No.	Location	Manhole No.	Diameter	Recording Interval	Notes
1	Trousdale Dr., North of El Camino Real	B3-21015	12-inch	15-minute	
2	Rosedale Ave. & Westmoor Rd.	C3-21072	12-inch	15-minute	
3	Adeline Dr. & Alvarado Ave.	E3-21012	8-inch	5-minute	Burlingame Hills Entry Point
4	Easement (Hillside Dr.) & Alvarado Ave.	E3-21099	6-inch	5-minute	Burlingame Hills Entry Point
5	Bernal Ave.	D4-21049	8-inch	15-minute	
6	Hillside Dr., South of El Camino Real	D4-21066	15-inch	15-minute	
7	Easton Dr.	E3-21078	12-inch	5-minute	Burlingame Hills Entry Point
8	Jackling Dr. & Vancouver Ave.	E4-21042	12-inch	5-minute	Town of Hillsborough Entry Point
9	Willow Ave. South of Newhall Rd.	E5-21009	10-inch	15-minute	Town of Hillsborough Entry Point
10	Sanchez Ave. South of Newhall Rd.	E5-21061	8-inch	5-minute	Town of Hillsborough Sewer Line
11	Oak Grove Ave. & Linden Ave.	E6-21043	18-inch	15-minute	
12	Howard Ave. & Humboldt Rd.	D7-21064	8-inch	15-minute	
13	Easement (Toyon Dr.)	D5-21034	12-inch	15-minute	
14	Rollins Rd., East of Toyon Dr.	D6-21059	21-inch	15-minute	
15	Rollins Rd., East of Cadillac Way	C5-21103	52-inch	15-minute	
16	Carolan Ave.	D5-21055	15-inch	15-minute	
17	Broadway, North of California	D5-21092	24-inch	15-minute	
18	Easement (Adeline Dr.)	E2-21036	6-inch	5-minute	County-Funded Meter: Burlingame Hills Sewer Maintenance District

1.2.2 Rainfall Gages

Three temporary rain gages will be installed in the service area to accurately quantify rainfall during the 2008/2009 wet weather season. Rain gages will be tipping buckets with dedicated data loggers. The data loggers will record the time when each 0.01 inch of rainfall occurs at the location of the tipping bucket, and will be checked periodically by field crews during the flow monitoring program. The rain gages will be installed at three publicly-owned locations on flat roofs with no tree cover at 1) Cuernavaca Park, 2) Ray Park, and 3) Washington Park.

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ATTACHMENT A: DETAILED FLOW MONITOR LOCATION MAPS

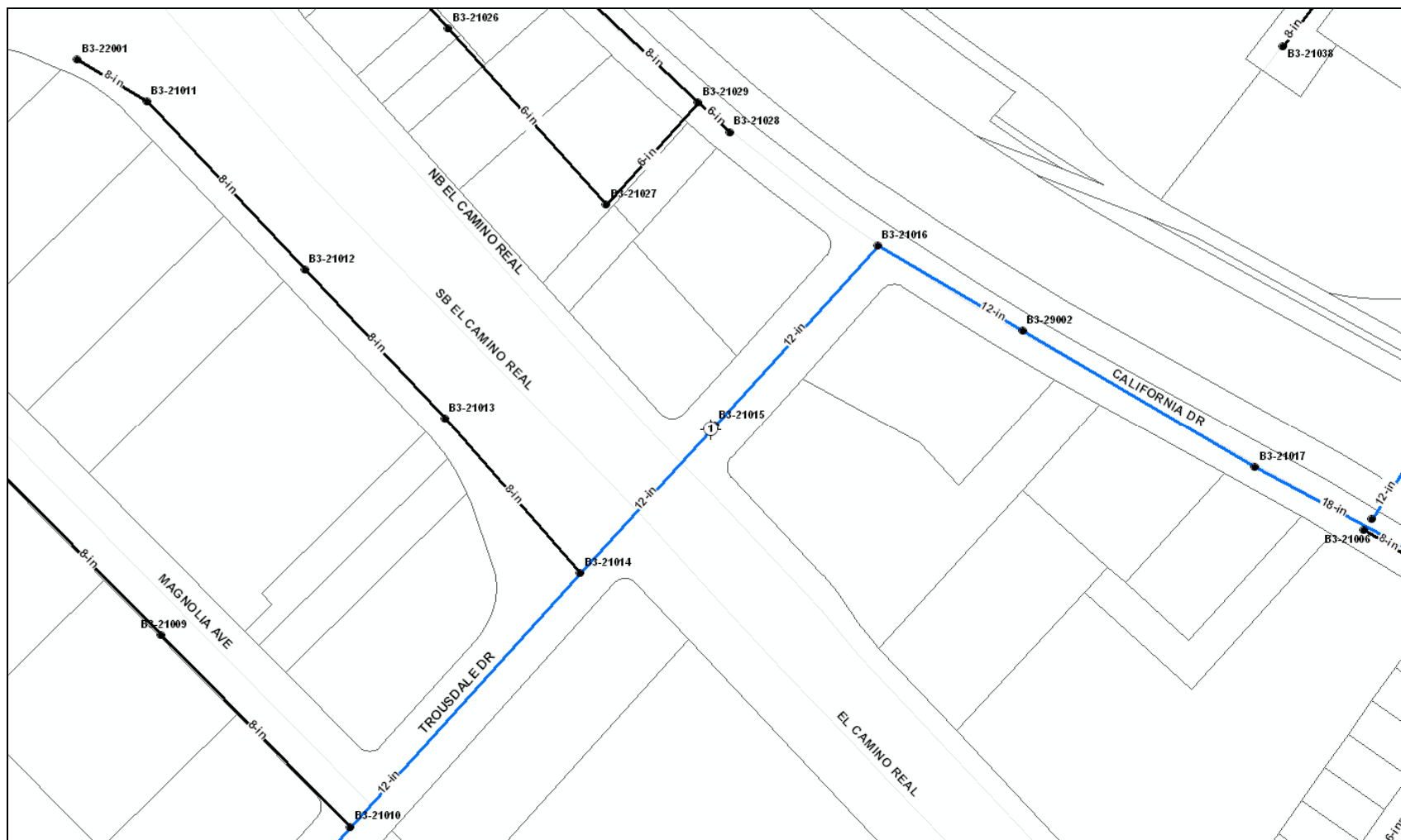


Figure A-1. Flow Monitor Site No. 1

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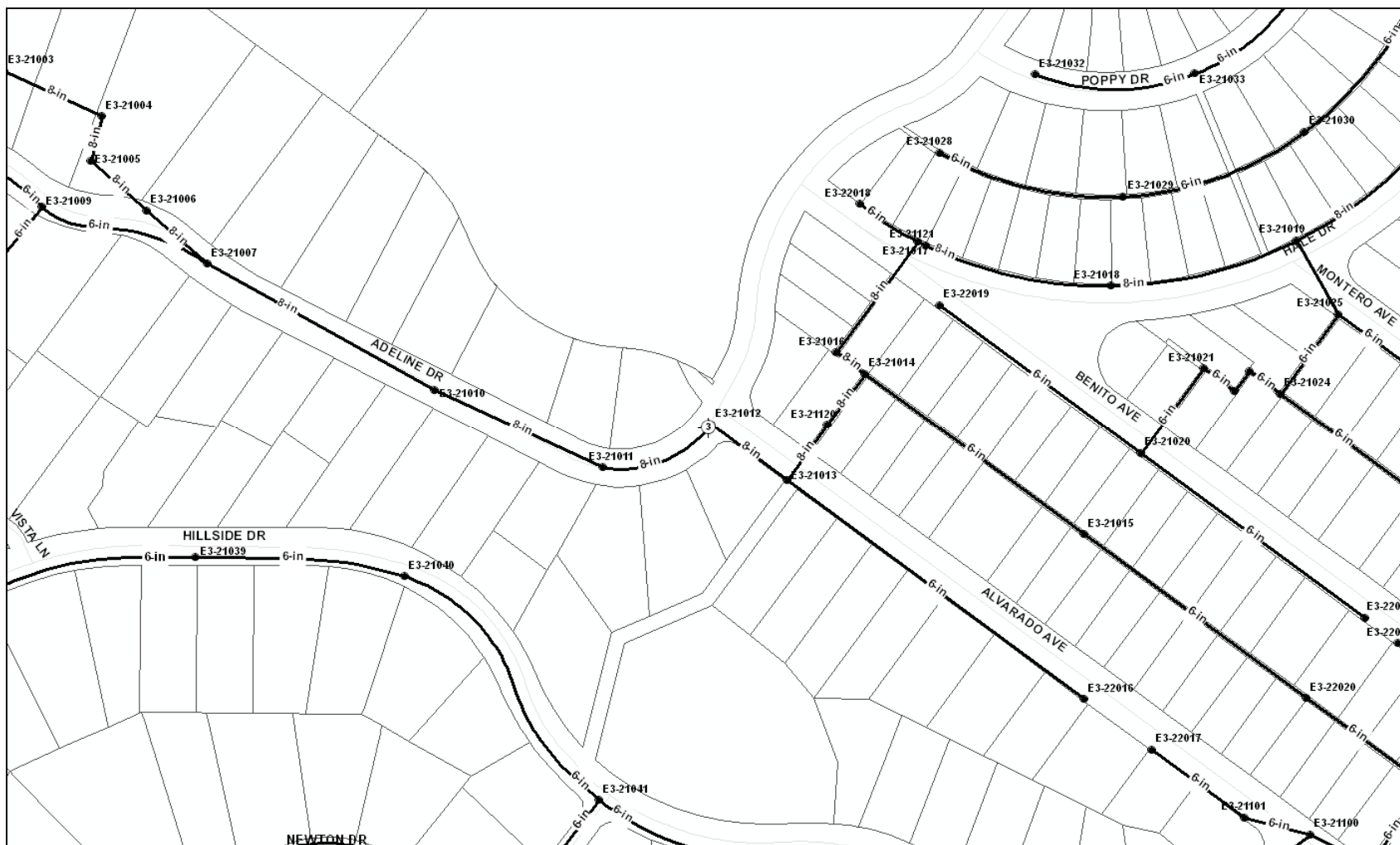


Figure A-3. Flow Monitor Site No. 3

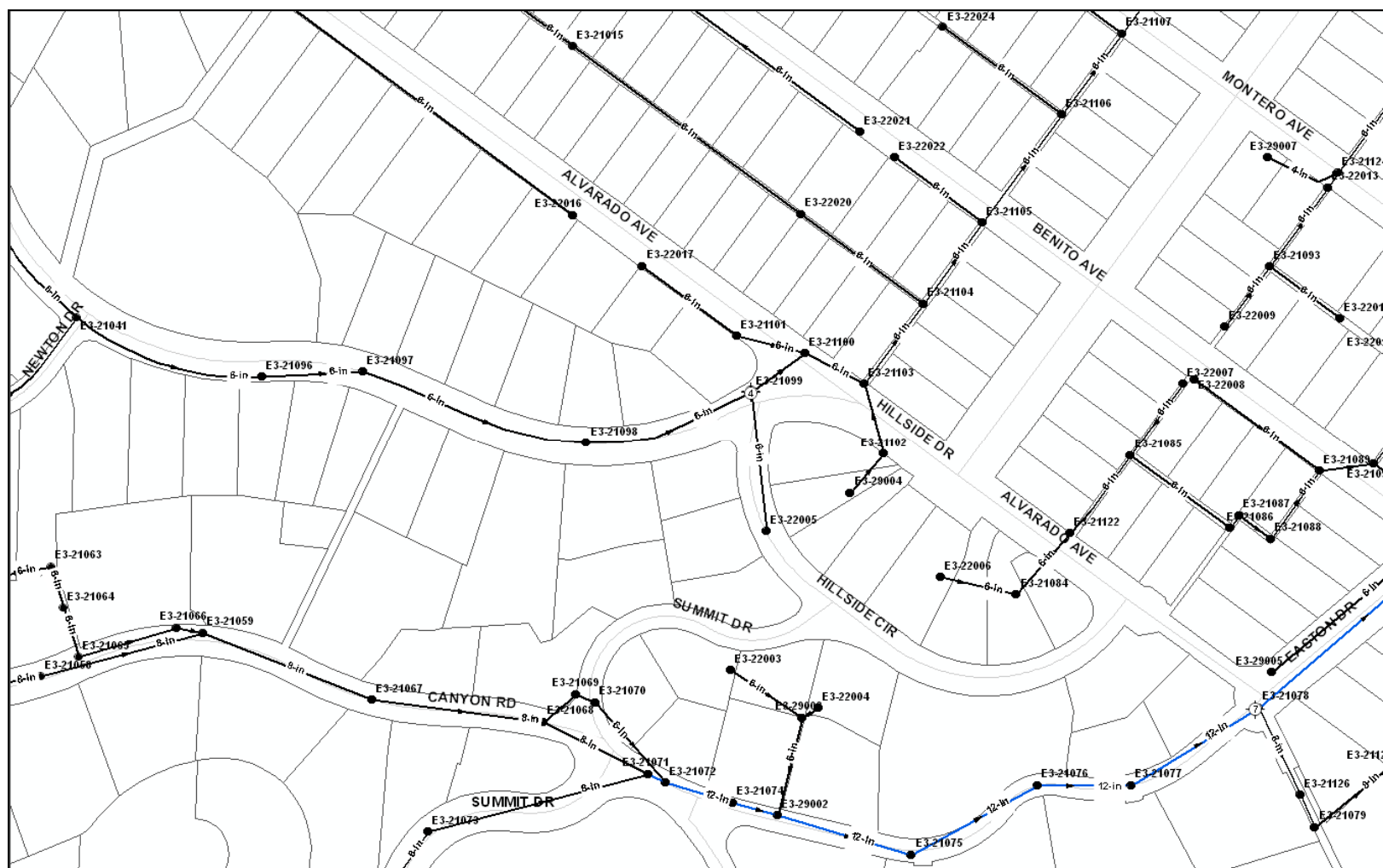


Figure A-4. Flow Monitor Site No. 4

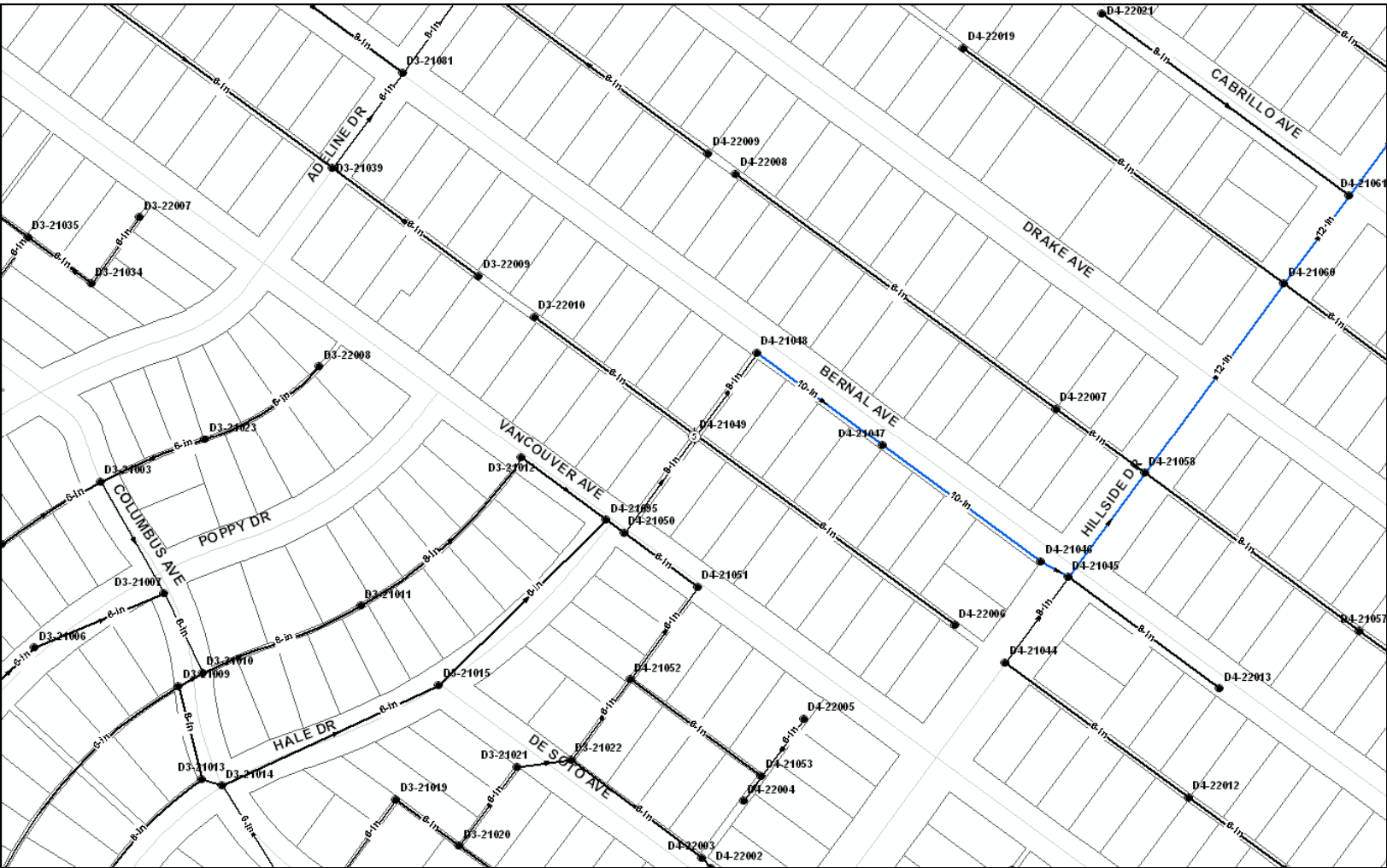
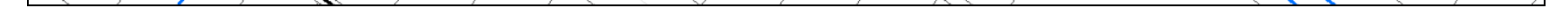


Figure A-5. Flow Monitor Site No. 5



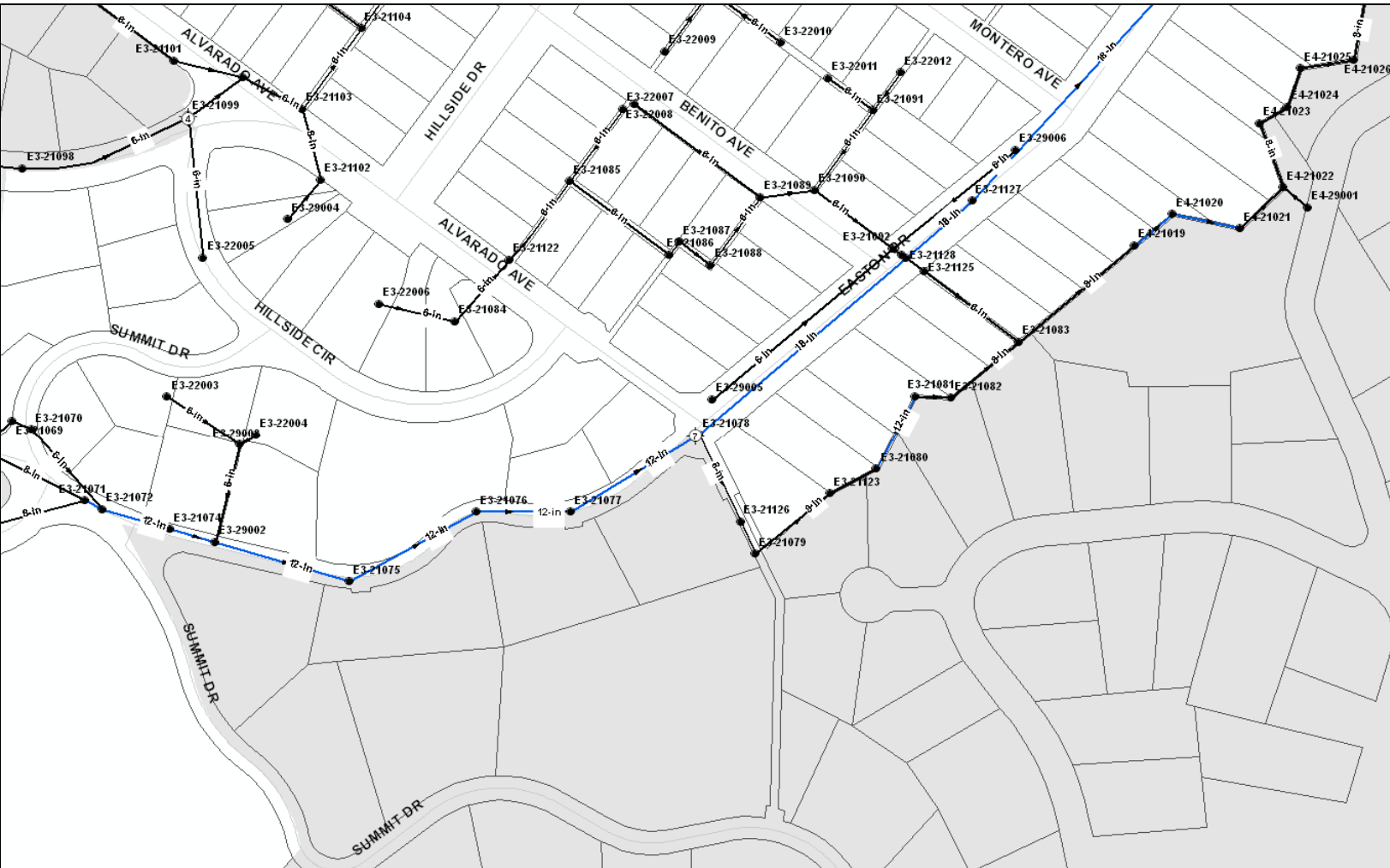


Figure A-7. Flow Monitor Site No. 7

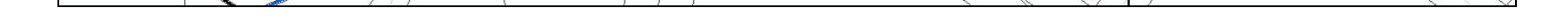




Figure A-9. Flow Monitor Site No. 9

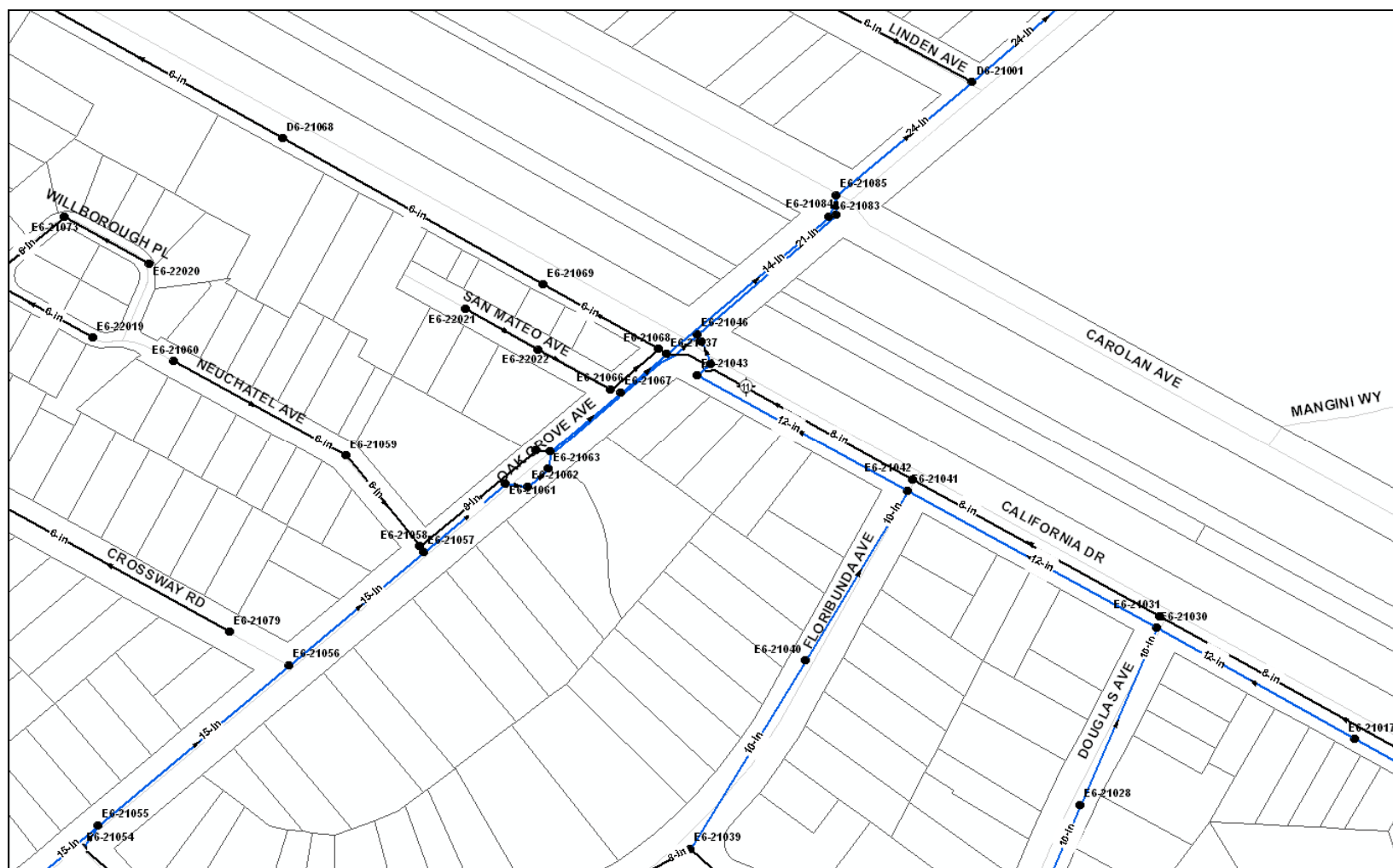


Figure A-11. Flow Monitor Site No. 11

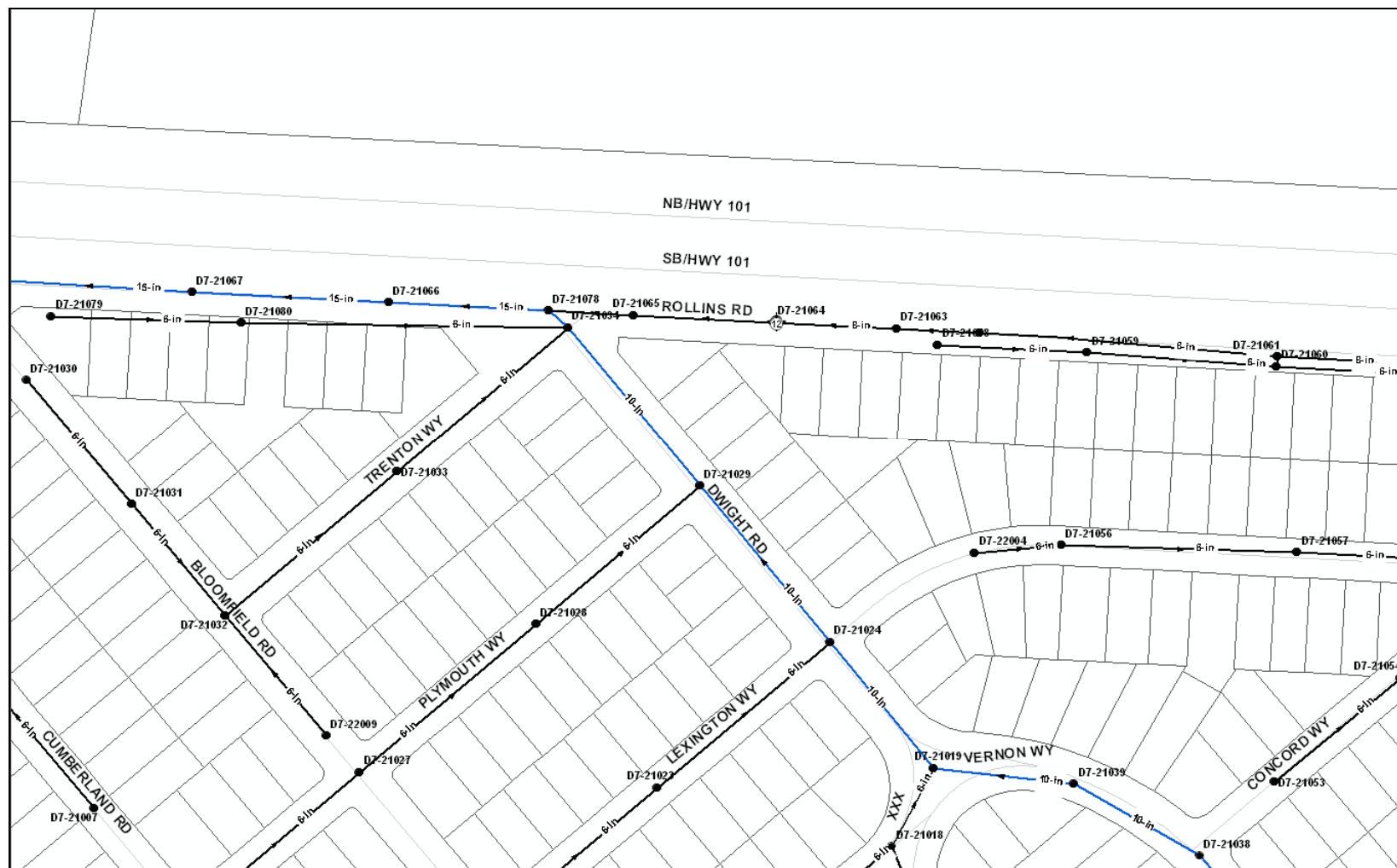


Figure A-12. Flow Monitor Site No. 12

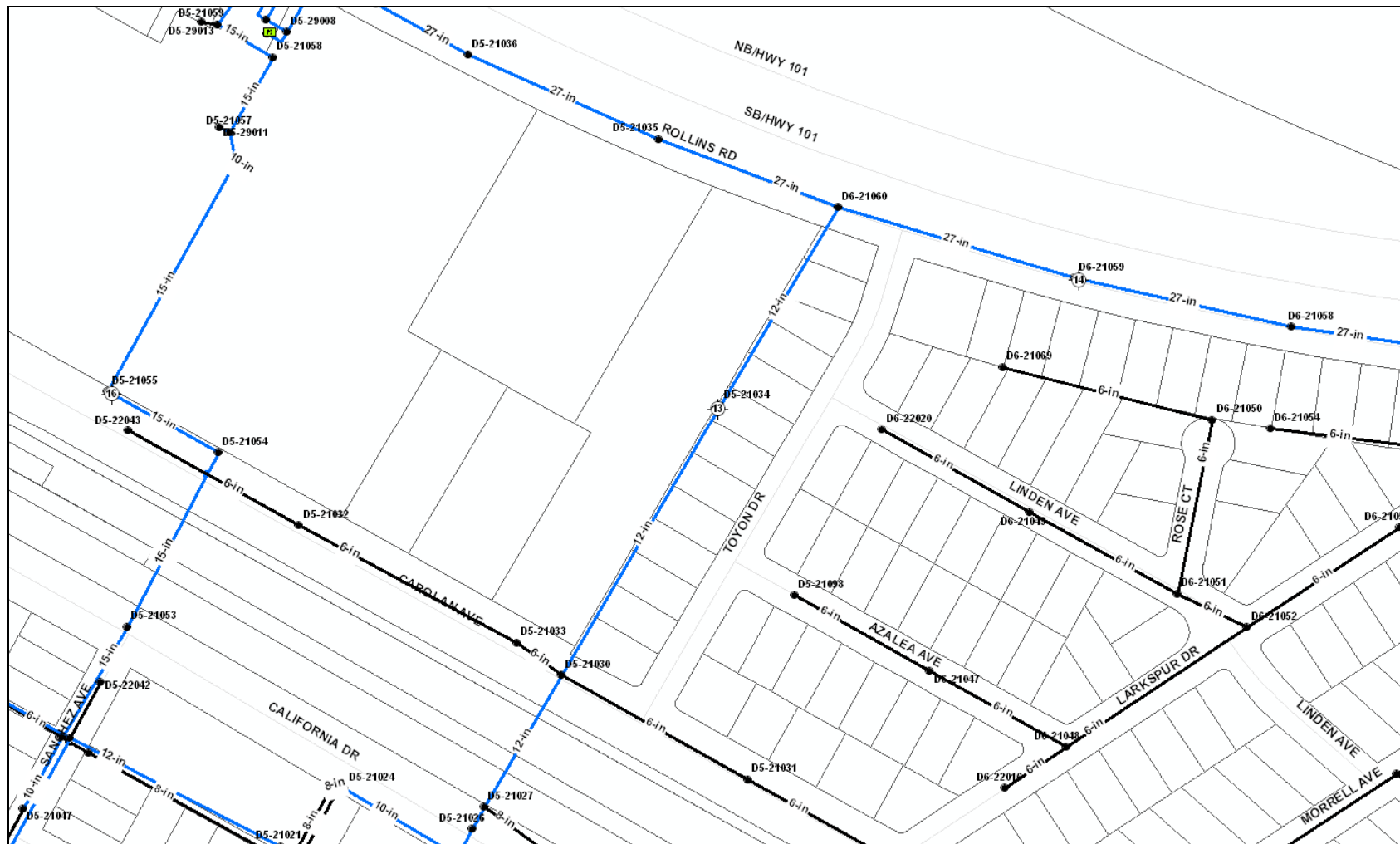


Figure A-13. Flow Monitor Site No. 13

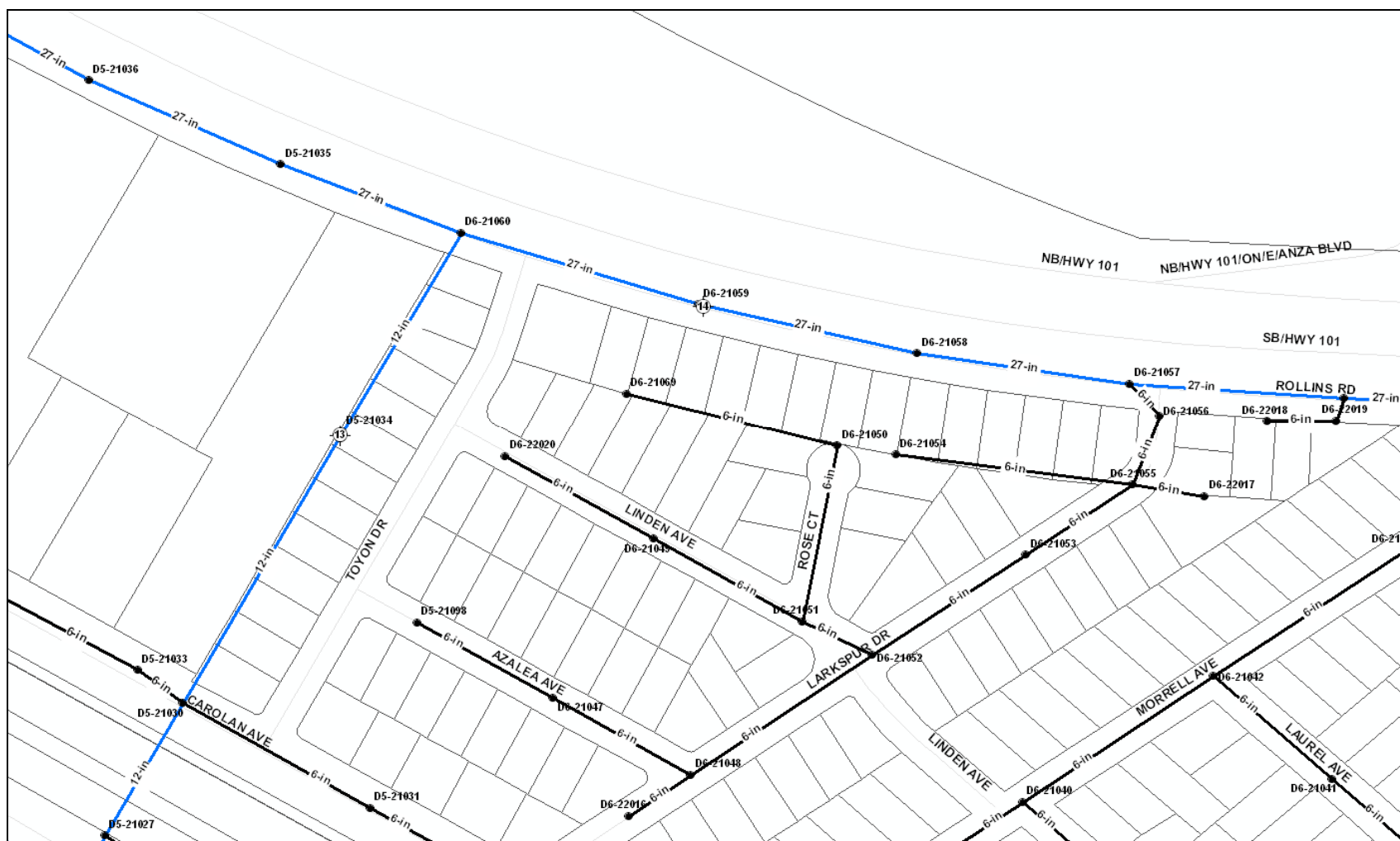


Figure A-14. Flow Monitor Site No. 14

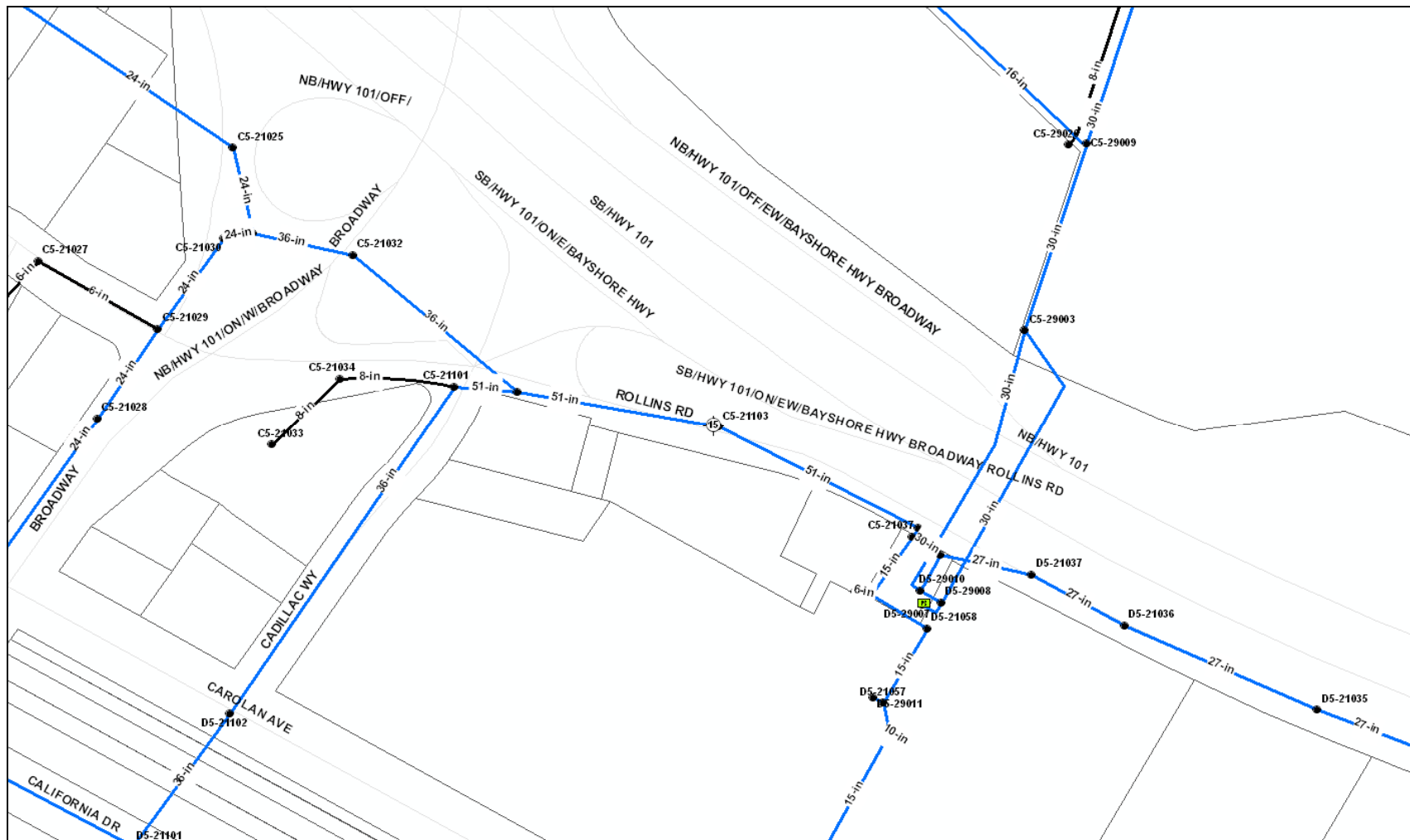


Figure A-15. Flow Monitor Site No. 15

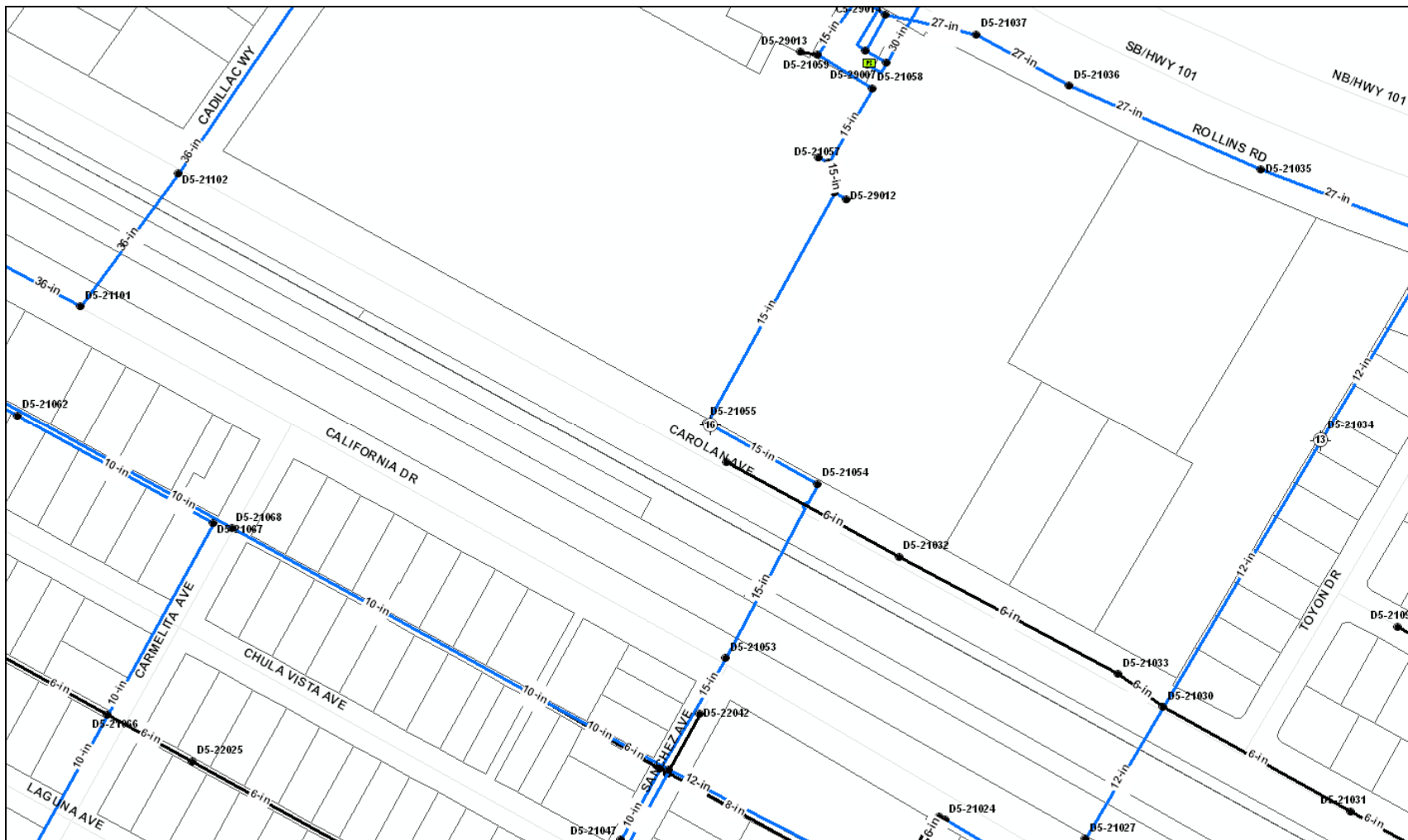


Figure A-16. Flow Monitor Site No. 16

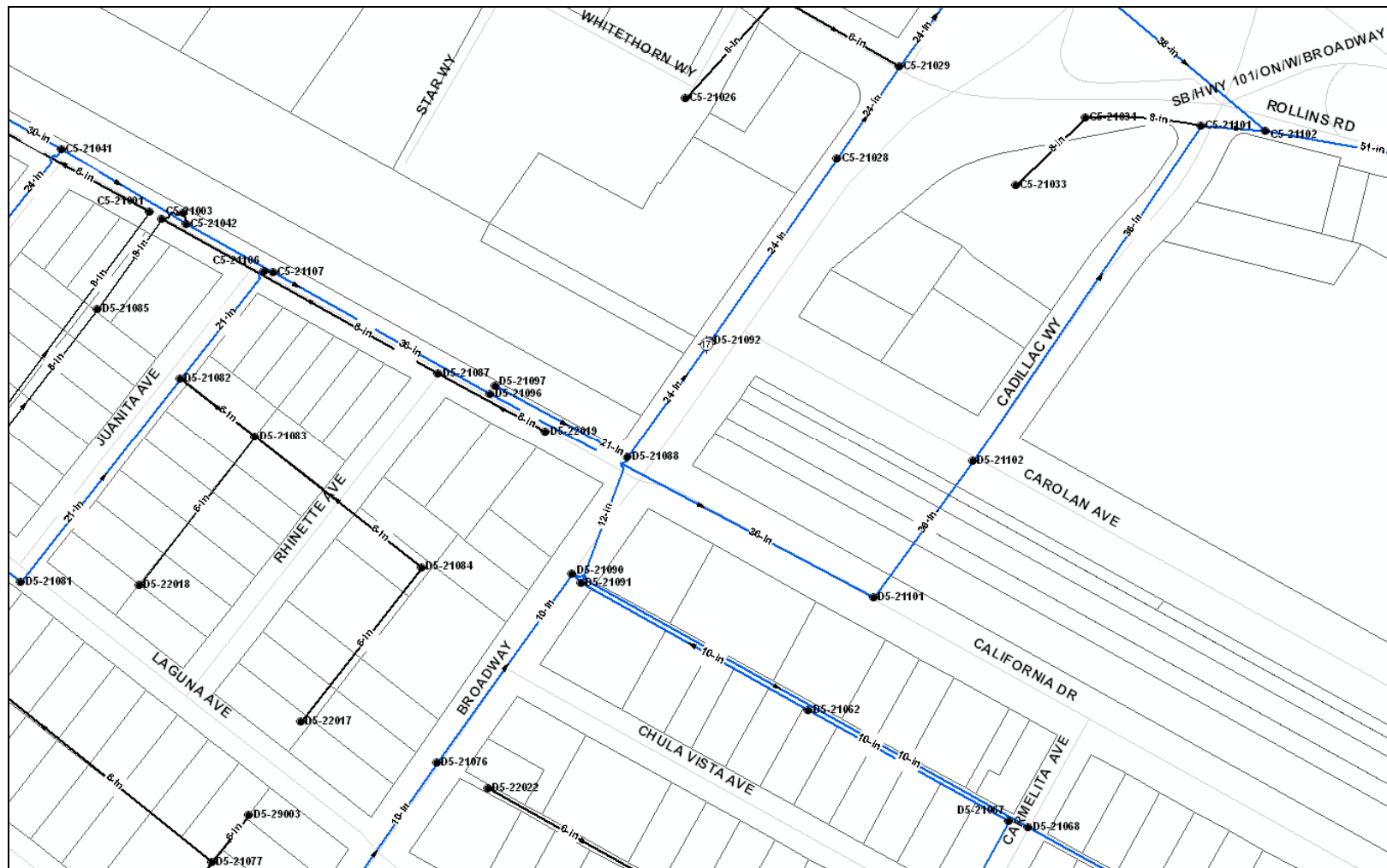


Figure A-17. Flow Monitor Site No. 17



Figure A-18. Flow Monitor Site No. 18

WASTEWATER COLLECTION SYSTEM MASTER PLAN

2. WASTEWATER COLLECTION SYSTEM FLOW MONITORING SERVICES WET WEATHER SEASON OF FEBRUARY 2009

Bound and submitted separately by E2 Consulting Engineers, Inc.

May 2009

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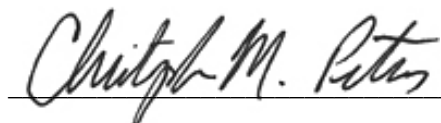
Prepared for: City of Burlingame, California
Project Title: Wastewater Collection System Master Plan
Project No: 136414-3.1

Technical Memorandum No. 3

Subject: Land Use Evaluation
Date: October 15, 2010
To: Donald Chang, PE, Project Manager
From: Christopher Peters, PE, Project Manager
Copy to: Art Morimoto, PE, Assistant Public Works Director

Prepared by: Colin Dudley, PE, Project Engineer, California, License No. C 72777
Alexandra Park, PE, Project Engineer, California, License No. C 64117

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3. LAND USE EVALUATION

This technical memorandum (TM) describes existing land uses within the City of Burlingame (City). Land use provides the basis for developing unit wastewater flows and wastewater flow projections for this Wastewater Collection System Master Plan. Since the City is almost fully developed, this Master Plan evaluates current land use conditions and does not evaluate a future build-out land use scenario.

3.1 Information Sources

Land use information was assigned to each parcel within the City limits. San Mateo County (County) and Town of Hillsborough parcels outside of the City limits that are served by the City's collection system will be accounted for with flow monitor data, and are not included in the land use analysis. Information that was used to develop the parcel land use information is summarized below.

- **Geographical Information System (GIS) Data** – The City provided a shapefile containing the County Tax Assessor's (Assessor's) parcel numbers (APNs), parcel boundary, parcel centroids, and area information. Other GIS information provided by the City includes shapefiles of the City's zoning district information, which is polygon-based and is not associated with individual parcels.
- **San Mateo County Parcel Information** – Parcel information was received from the City in a Microsoft® Office Access database including APNs and Assessor's land use codes for parcels within the City limits. This was the primary source of information used to assign land use to non-residential parcels.
- **City of Burlingame General Plan** – The City's General Plan consists of 10 elements, two of which were used for the land use analysis: the Land Use Element and the Housing Element, adopted in 1969 and 2002, respectively.
- **Burlingame Bayfront Specific Plan** – The Burlingame Bayfront Specific Plan, adopted in 2004 and amended in 2006, guides the development and re-development of the City east of US 101.
- **North Burlingame/Rollins Road Specific Plan** – The North Burlingame/Rollins Road Specific Plan, adopted in 2005 and amended in 2007, clarifies the City land use policy in this area and contains proposed land use and zoning changes.
- **City of Burlingame Title 25 Zoning Code** – The Title 25 Zoning Code provides details of the permitted, conditional, and prohibited land uses for each of the City's zoning districts. The zoning code was used to assign master plan land use categories to the City's various zoning districts.
- **Aerial Photography** – Aerial photography from Google Earth software was used to categorize the land use of some parcels, originally of unknown land use.
- **City of Burlingame Water and Sewer Billing Information** – The City provided water and sewer billing information from July 2007 to June 2008. This usage information by sewer billing category was used to determine the master plan land use categories.

3.2 Land Use Consolidation

The various information sources had a variety of land use categories. This section describes how these source land uses were consolidated into master plan land use categories.

3.2.1 Consolidation Methodology

The land use designations from the sources described in Section 3.1 were consolidated according to the following methodology:

- After reviewing land use categories provided in the Assessor's parcel database, the City's General and Specific Plans, and the City's water and sewer billing data, the land use categories were grouped by wastewater generation characteristics and consolidated into master plan land use categories.
- For residential parcels the primary source of information on the parcel land use was the City zoning ordinance.
- The Assessor's land use codes were the primary source for the land use of non-residential parcels. The Assessor's land use codes generally correspond with the City zoning districts for non-residential parcels, but provide more detail on individual parcels.
- For non-residential parcels without Assessor's land use codes, the City zoning district was relied upon for parcel land use.
- For parcels missing both Assessor's land use codes and City zoning district information, aerial photography was used to categorize the parcel's land use.
- Hotels and motels were assigned a separate category because of their high room density and larger wastewater generation rates.
- Condominium parcels were included in the medium-high density and high density residential categories due to their similarity to other high density residential land uses.
- Non-contributing land uses generate little or no wastewater and include storage facilities, parking lots, roads, vacant residential parcels, drainage channels, open water and tidal zones, parks, and sports fields.
- Several large parcels associated with San Francisco International Airport and located completely within San Francisco Bay were removed from the evaluation.

3.2.2 City Zoning Ordinance

The City GIS zoning district information is not parcel-based, but rather polygon-based where large zoning districts cover numerous parcels. Therefore, the large zoning districts were joined with the individual parcels contained within each zone, and each zoning district was assigned to a master plan land use category (listed in Table 3-1) based on its description in the City's General or Specific Plan. Approximately 89 percent of the parcels within the City are zoned residential, and the City zoning district information was used to classify the majority of the parcels into the four residential master plan land use categories.

Parcels of non-residential land use were included within the residential zoning districts in the City's GIS shapefiles. These parcels included schools, parks, city buildings, and other non-residential uses, and were reclassified using Assessor's land use codes and aerial photography.

Table 3-1. Master Plan Land Use Category Assignment to City Zoning District

Master Plan Land Use Category	City Zoning District	Zoning District Description	Description Source
Commercial	Anza Area (AA)	Misc commercial including restaurants, hotels, offices, retail and personal services	Title 25 Zoning Code - 25.47
	Anza Point North (APN)	Misc commercial including restaurants, hotels, offices, recreation facilities, retail and personal services	Title 25 Zoning Code - 25.48
	C1	Shopping and Service	General Plan - Housing Element
	C2	Service and Special Sales	General Plan - Housing Element
	C3	Office use	General Plan - Housing Element
	Shoreline (SL)	Misc commercial including, recreation facilities, restaurants, hotels, offices, restricted retail sales and personal services	Title 25 Zoning Code - 25.45
	Trousdale West (TW)	Multi-family residential, offices, financial institutions, convents and parish houses, extended stay hotels	Title 25 Zoning Code - 25.47
Industrial	Anza Point South (APS)	Recreation facilities, light industrial or manufacturing, warehouse , outdoor storage, service businesses excluding personal services, offices	Title 25 Zoning Code - 25.49
	Inner Bayshore (IB)	Light industrial or manufacturing, freight services, office/ light industrial park	Title 25 Zoning Code - 25.43
	Rollins Road (RR)	Industrial, freight services, auto repair and service, parking for fleet vehicles	Title 25 Zoning Code - 25.44
Single Family Residential	Single Family (R1)	< 8 Dwelling units per acre	General Plan - Housing Element
Medium Density Residential	Medium Density (R2)	9 to 20 Dwelling units per acre	General Plan - Housing Element
Medium-High Density Residential	Medium-High Density (R3)	21-50 Dwelling units per acre	General Plan - Housing Element
High Density Residential	High Density (R4)	> 51 Dwelling units per acre	General Plan - Housing Element
Mixed Use	Commercial Residential (CR)	Multi-family residential or mixed commercial /residential	General Plan - Housing Element

3.2.3 County Tax Assessor's Land Use Codes

The non-residential land uses within the City were determined primarily from the Assessor's land use codes for each parcel. The Assessor's land use codes provide more detail about the specific non-residential land uses than the City zoning district information. There are 52 Assessor's land use codes within the City limits, 40 of which are non-residential. The 40 non-residential Assessor's land use codes were consolidated into six of the 10 master plan land use categories based on similar wastewater generation characteristics. The master plan land use categories and associated Assessor's land use codes are listed in Table 3-2. After the Assessor's land use codes were consolidated into the master plan land use categories, they were joined with individual APNs in the City's GIS.

Within the City limits, 81 non-residential parcels were unclassified in the Assessor's land use code. These parcels were assigned a land use based on their respective zoning district, as described in the City's General and Specific Plans and Zoning Ordinance as discussed in Section 3.2.2.

Table 3-2. Master Plan Land Use Categories Assignment to Assessor's Land Use Codes

Master Plan Land Use Category	Assessor's Land Use Code	Assessor's Land Use Code Description
Commercial	11	Commercial, stores, one story
	12	Commercial, store and office combination
	13	Commercial, store, office, residential combination
	14	Commercial, supermarkets
	16	Commercial, shopping centers
	17	Commercial, office building, one story
	18	Commercial, office building, two+ stories
	19	Commercial, professional building
	21	Commercial, restaurants, lounges, nightclubs
	22	Commercial, recreation, sports, health
	23	Commercial, financial institutions
	24	Commercial, service shops
	25	Commercial, service stations, bulk plants
	26	Commercial, auto sales, repair, storage
	28	Commercial, wholesale outlets
	29	Commercial, nursery, private, trade schools
	77	Mortuaries, Cemeteries
	79	Commercial, industrial, miscellaneous
Industrial	31	Industrial, light manufacturing
	32	Industrial, heavy industrial
	34	Industrial, packing plants, cotton gins
	36	Industrial, food processing
Warehouse	38	Industrial, storage, warehouse
Institutional	64	Recreational, clubs, lodges, dance halls
	71	Institutional, churches
	72	Institutional, schools
	73	Institutional, colleges
	74	Institutional, hospitals
	75	Institutional, nursing homes, rest homes
	76	Institutional, post offices
Hotels and Motels	6	Residential, hotels, motels

Table 3-2. Master Plan Land Use Categories Assignment to Assessor's Land Use Codes

Master Plan Land Use Category	Assessor's Land Use Code	Assessor's Land Use Code Description
Non-Contributing	0	Vacant, residential
	27	Commercial, parking lots
	39	Industrial, storage, open
	62	Recreational, airports
	69	Recreational, parks
	79	Commercial, industrial, miscellaneous (WWTP)
	81	Miscellaneous, water companies, radio stations
	88	Miscellaneous, highways and streets

3.2.4 Other Methods of Determining Land Use

There were 48 parcels identified as residential by the Assessor's land use codes (see Table 3-3) that were not identified as such by the City zoning district information. These parcels were assigned a master plan land use category after reviewing aerial photography and comparing this to their zoning district, 34 of which were indeed residential parcels.

Table 3-3. Assessor's Residential Land Use Codes

Assessor's Land Use Code	Assessor's Land Use Code Description
1	Residential, single family residence
2	Residential, 2 units
3	Residential, 3 units
4	Residential, 4 units
5	Residential, 5 or more units
89	Residential, miscellaneous
91	Residential, more than one detached residence
92	Residential, single family residence converted to 2 units
93	Residential, single family residence with duplex or triplex
94	Residential, two duplexes
95	Residential, Other
96	Residential, fourplex plus other units

There were 22 unclassified parcels that had neither an Assessor's land use code nor a zoning district, and were therefore assigned a master plan land use category after reviewing aerial photography of the City. The majority of these parcels were determined to be of a non-contributing land use such as parks, drainage ways, parking lots, roads, and railroad right-of-way. Vacant and other non-contributing land uses identified otherwise by the zoning information and the Assessor's land use codes were reclassified after reviewing aerial photography.

3.3 Master Plan Land Use

The results of the land use consolidation are shown in Figure 3-1, the land use map for this Master Plan. The Master Plan land use map was compared to the City of Burlingame General Plan land use map to confirm the general distribution of land uses.

The City is nearly built out, and any re-development is not expected to significantly change the land use distribution and wastewater flow projection. Therefore, only the current land use scenario was developed for this Master Plan. Table 3-4 summarizes the acreage in each of the master plan land use categories. The majority of the City is single family residential with open space/non-contributing parcels and commercial land the second and third highest percentage of area, respectively.

Table 3-4. Master Plan Land Use Category Summary

Master Plan Land Use Category	Parcel Count	Area (Acres)	Percent of Total Area (%)
Commercial	400	240	11
Industrial	65	86	4
Warehouse	130	134	6
Institutional	55	151	7
Hotels and Motels	13	64	3
Single Family Residential	5805	978	44
Medium Density Residential	390	59	3
Medium-High Density Residential	631	123	6
High Density Residential	114	36	2
Mixed Use	14	2	<1
Non-Contributing	209	356	16
Total	7,826	2,229	100



Wastewater Collection System Master Plan

Project No. 136414

Legend

City Limits

Land Use Categories

- Commercial
- Industrial
- Warehouse
- Institutional
- Mixed Use
- Single Family Residential
- Medium Density Residential
- Med-High Density Residential
- High Density Residential
- Hotels and Motels
- Non-Contributing



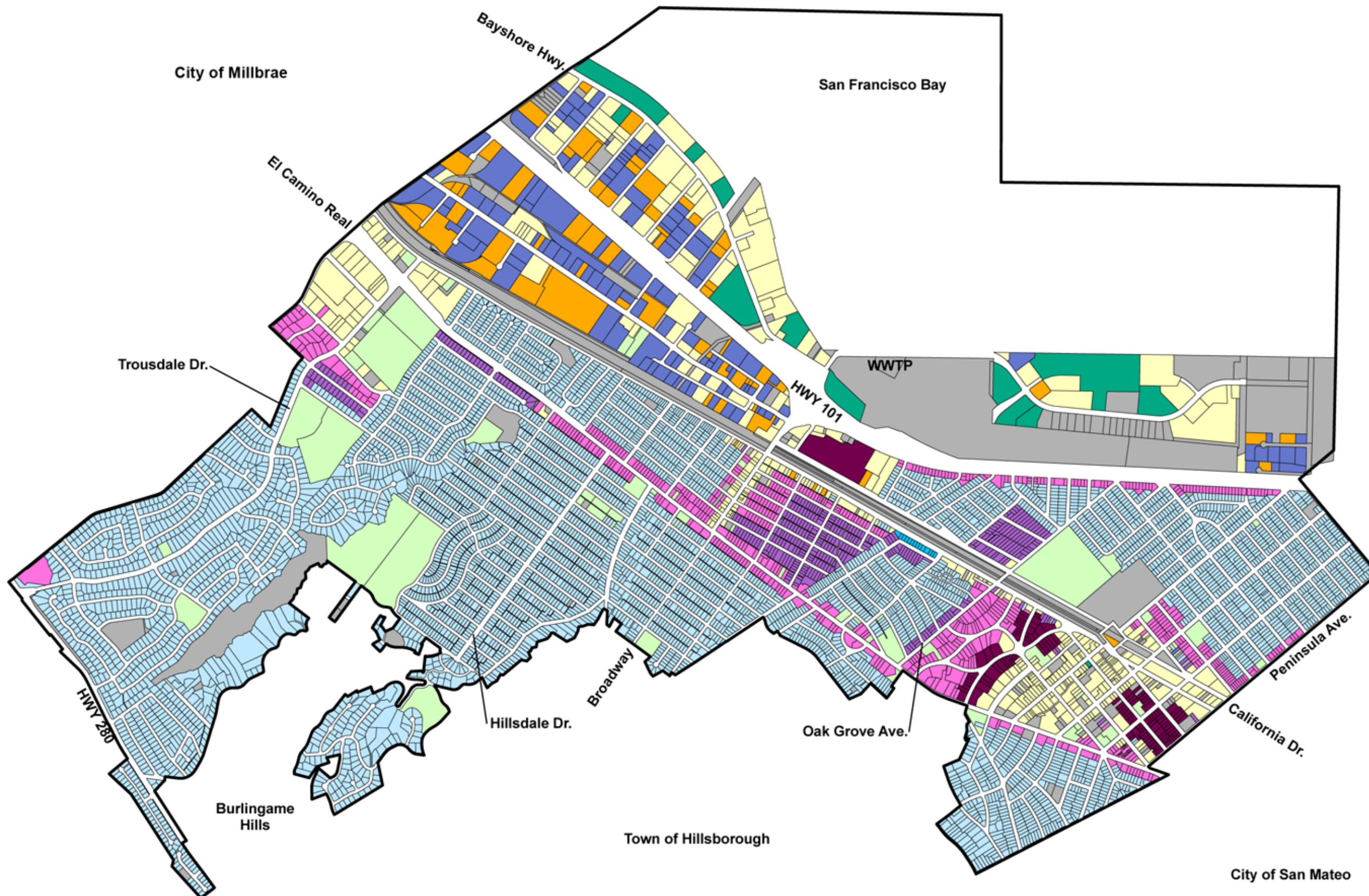
0 0.25 0.5
Scale in Miles

Figure 3-1

Land Use Map

BROWN AND
CALDWELL

Last Revision: 4/3/2009



City of Millbrae

San Francisco Bay

Bayshore Hwy.

El Camino Real

Trousdale Dr.

WWTP

HWY 101

HWY 280

Burlingame Hills

Hillsdale Dr.

Broadway

Oak Grove Ave.

Town of Hillsborough

City of San Mateo

Peninsula Ave.
California Dr.

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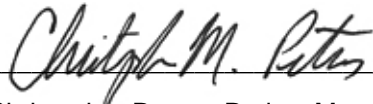
Prepared for: City of Burlingame, California
Project Title: Burlingame Wastewater Collection System Master Plan
Project No: 136414-3.2

Technical Memorandum No. 4

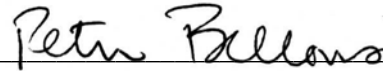
Subject: Dry Weather Flow Projections
Date: October 15, 2010
To: Donald Chang, PE, Project Manager
From: Christopher Peters, PE, Project Manager
Copy to: Art Morimoto, P.E., Assistant Public Works Director

Prepared by: Alexandra Park, PE, Project Engineer, California, License No. C 64117

Reviewed by:



Christopher Peters, Project Manager
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4. DRY WEATHER FLOW PROJECTIONS

This technical memorandum (TM) summarizes the development of the dry weather flow (DWF) projections for parcels located within the City of Burlingame (City). Flow projections were based on the master plan land use categories developed in TM 3 – Land Use Evaluation, and will form the foundation for the development and calibration of the hydraulic model of the City’s collection system.

This TM is organized into the following sections:

1. Methodology
2. Wastewater Flow Components
3. Water Billing and Flow Data
4. Point Sources
5. Unit Flow Factors

4.1 Methodology

The City’s collection system has two satellite collection systems, the Town of Hillsborough (Hillsborough) and the San Mateo County Burlingame Hills Sewer Maintenance District (Burlingame Hills), which contribute flows to the City’s collection system at multiple connection points. The City’s collection system conveys these flows from the City boundary to the Burlingame Wastewater Treatment Plant (WWTP). In order to determine the flows generated within the City boundary, a mass balance is performed using satellite collection system flows and the WWTP influent flows.

Dry weather unit flow factors are then developed for each land use category using winter water consumption data. The unit flow factor for the single family residential land use is derived by dwelling unit (flow per parcel). For medium to high density residential and non-residential land uses, unit flows are derived on a flow per acre basis. Point sources of wastewater flows have atypical wastewater flows for their land use category, and are removed from the unit flow calculations to avoid over-inflation of the unit flow factors.

The unit flow factors are then applied to each land use unit (parcel or acre) within the City boundary, and the point sources are added to develop predicted flows. The difference between the predicted flows (based on water use) and the measured flows at the WWTP is attributed to dry weather ground water infiltration (GWI).

The unit flow factors and GWI rate form the initial basis for the calibration of the hydraulic model, which will be addressed in a separate TM.

4.2 Wastewater Flow Components

Wastewater flow generally consists of three components (see Figure 4-1): base sanitary flow (BSF), GWI, and rainfall dependent infiltration and inflow (RDI/I). DWF is comprised of only BSF and dry weather GWI.

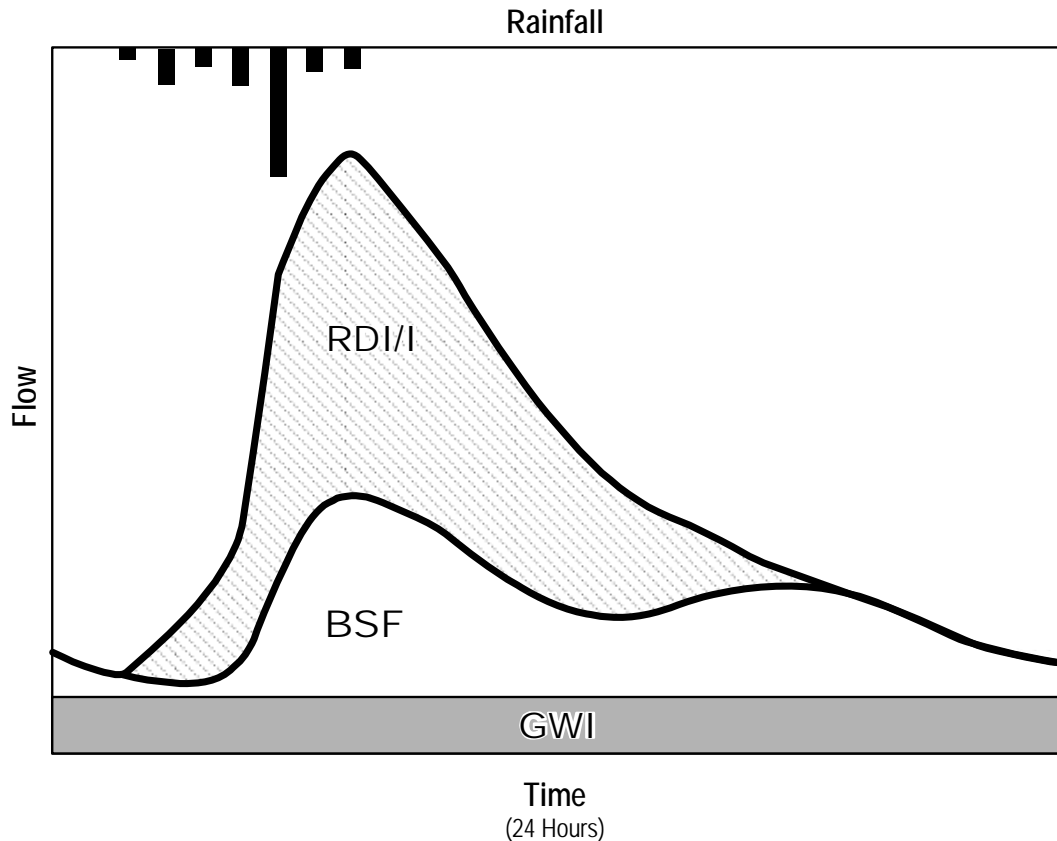


Figure 4-1. Wastewater Hydrograph Components

4.2.1 Base Sanitary Flow

BSF is generated from residential, commercial, industrial, and public sources that discharge wastewater into the collection system. During dry weather, it is the major source of the DWF in the collection system. BSF is determined from the land use type, and may be impacted by water uses practices such as water conservation.

BSF is typically calculated by applying a distinct unit flow factor to each type of land use. The BSF for this project was based on the amount of potable water billed to water service customers of each land use category during the winter months of 2008 by determining the portion of potable water discharged to the collection system as wastewater.

4.2.1.1 Diurnal Patterns

BSF varies throughout the day, and the pattern of variation depends on land use category. Residential areas, for example, typically exhibit a diurnal pattern with the lowest flows occurring during early morning hours, and the highest peak flows occurring mid-morning, with a second peak in the evening. Commercial and industrial land uses tend to generate a relatively constant flow during working hours, dropping off steeply between late evening and early morning. Diurnal patterns do not affect the generation of average daily BSF and DWF, but will play an important role later in calibrating the hydraulic model.

4.2.1.2 Seasonal Variation

Attachment A shows WWTP influent flow meter data in the form of average daily flows for January 2001 through November 2008. There is a consistent variation between dry season and rainy season flows with higher flows received by the WWTP during the rainy season. Seasonal variations in wastewater flows are attributed to inflow and infiltration caused by seasonal rainfall patterns in regions like Burlingame where the population is relatively constant year-round.

4.2.2 Groundwater Infiltration

GWI occurs when groundwater levels are above the collection system pipe inverts, allowing water to enter the system through faulty joints or other defects. During any given day, GWI comprises a relatively constant proportion of the total flow entering the system. It can vary significantly from dry season to wet season, and is higher in the spring after the rainy season than at the end of a dry summer. The amount that dry weather GWI contributes to the total average daily DWF can be approximated by taking the difference between the projected and measured DWF in a mass balance.

4.2.3 Rainfall Dependent Infiltration and Inflow

RDI/I occurs during wet weather. *Infiltration* enters the collection system by the same mechanism as GWI, and is attributable to a seasonal rise in the groundwater table. The *inflow* component of RDI/I comes from surface water and stormwater runoff that enters the collection system largely through manholes, cross connections with the storm drain system, downspouts, or direct connections to the collection system. The amount of RDI/I can be characterized for different rainfall events using flow monitoring data from collection system sub-basins, flow meter data from the WWTP, and precipitation data. RDI/I does not contribute to dry weather flows, but RDI/I projections will be made later in the Model Development and Calibration TM.

4.3 Water Billing and Flow Data

Unit flow factors for each land use category were developed using the following data sources:

- City water billing records (July 2007 through June 2008).
- Burlingame WWTP influent flow data (January 2001 through November 2008).
- Temporary flow monitor data for Hillsborough and Burlingame Hills from flow monitors 4, 7, 8, 9, and 10 (January 2009).
- Permanent flow monitor data for the Town of Hillsborough from the Floribunda flow monitor (January 2009).

4.3.1 City Water Billing Records

In a non-arid, urban setting such as Burlingame, landscape irrigation and other non-household water uses are typically at a minimum during wet season winter months, and the amount of municipal water “consumed” can be consistently correlated with the amount of water returned to the wastewater collection system and is used to estimate BSF. Although water use is variable throughout the year and summer water use is higher than winter use, BSF generation is consistent throughout the year. The potable water returned to the collection system as BSF is typically 80 to 90 percent of winter water use.

The City supplied a monthly water billing summary by land use for the July 2007 through June 2008, and the water use data covering the 2007-08 winter was correlated to the 11 master plan land use categories described in TM 3 – Land Use Evaluation.

4.3.2 Wastewater Treatment Plant Flow Data

Flow data from the Burlingame WWTP influent flow meter and the corresponding rain data were provided for January 2001 through November 2008. No rain occurred during the period of July 1 through September 30 for all years of data provided. The average WWTP daily flow during this dry period is summarized by year in Table 4-1.

Table 4-1. Daily Average Dry Weather ¹ WWTP Flow	
Year	WWTP Average DWF (mgd)
2001	3.59
2002	3.45
2003	3.69
2004	3.58
2005	3.78
2006	3.69
2007	3.45
2008	3.17

¹No rain occurred from July 1 - Sept 30 for all years of data provided.

Note that the average DWF at the WWTP was significantly lower in 2008 than in previous years, which averaged 3.61 mgd. The WWTP's contract operator, Veolia Water, attributes the drop in flow to voluntary water conservation. This reduction of flow is not expected to continue in the future, therefore, the 2006/2008 average daily flow of 3.44 mgd was used for the mass balance.

4.3.3 Temporary and Permanent Flow Monitor Data

The City's collection system receives flows from Hillsborough and Burlingame Hills. To estimate the BSF generated within the City boundary, the flows from Hillsborough and Burlingame Hills are subtracted from the combined flow at the WWTP. Ideally, WWTP data and flow monitor data from the same dry period is used for this calculation. However, long term dry weather flow monitoring data is only available at two Hillsborough connection points, where the Newhall and Floribunda permanent meters are installed. Therefore, data from the temporary wet weather flow monitors (described in TM 1 – Flow Monitoring Plan) are also used to estimate the flow entering the City from the satellite collection systems. The permanent and temporary flow monitor locations are shown on Figure 4-2. There is a small Burlingame Hills area between flow monitors 3 and 18, but the flow contributed by this area was negligible.

The temporary flow monitors were installed during the 2008/2009 winter to capture wet weather data. To use this data to estimate BSF, data from a dry period was chosen to represent satellite system flows. No rain occurred during the temporary flow monitoring period from January 6, 2009 to January 21, 2009. Therefore, the flow data from the two week period of January 7, 2009 to January 21, 2009 was averaged to represent the average daily Hillsborough and Burlingame Hills flows. This data is summarized in Table 4-2. Note that the temporary flow monitor 10 is redundant to the permanent Newhall meter, and was installed to verify flows measured by the permanent meter.

Table 4-2. Average Daily Hillsborough and Burlingame Hills Flows during Dry Period¹

Flow Monitor	Flows Measured	Average DWF (gpd)
FM4	Burlingame Hills	7,000
FM7	Burlingame Hills	188,000
FM8	Town of Hillsborough	73,000
FM9	Town of Hillsborough	44,000
FM10 (redundant)	Town of Hillsborough	161,000
Newhall	Town of Hillsborough	168,000
Floribunda	Town of Hillsborough	159,000

¹Flow data from the two week period of 1/7/09 to 1/21/09.

4.4 Point Sources

Point sources are large contributors of wastewater flows, and have atypical flows for their land use category. Point sources are identified and removed from the BSF to avoid over-inflation of the unit flow factors for each land use category.

The City provided water billing data for the top 50 water users from 2007/2008. The data included customer account, name, address, annual consumption, and consumption per billing period. The data from the 2007/2008 winter was used to identify the top water users. For water customers with multiple billing accounts, water consumption was summed. After sorting the top customers high to low by water use, it was apparent that there was a large gap between the seven highest water customers, who used more than 40,000 gallons per day (gpd), and the next highest water consumer. Therefore, point sources were defined as customers using more than 40,000 gpd. Point sources and their corresponding DWF rates are shown in Table 4-3.

Table 4-3. Point Source Summary

Customer Name	Service Address	APN	Average Daily Water Use (gpd)	Estimated Average Daily BSF ¹ (gpd)
Hyatt Regency Burlingame	1333 Bayshore Hwy	026 112 140	76,338	73,000
Northpark	1050-90 Carolan Avenue	026 231 280	57,807	55,000
Felcor-Hilton site #69520	150 Anza Blvd	026 342 350	49,738	48,000
Marriott Full Sev. #33337C9	1800 Bayshore Hwy	026 282 130	41,892	40,000
Sheraton Gateway Hotel SFO	600 Airport Blvd	026 363 490	41,566	39,000
Doubletree Hotel	835 Airport Blvd	026 343 430	41,532	39,000
Burlingame Healthcare Ctr.	1100 Trousdale Drive	025 150 080	40,262	38,000
Total Estimated Point Source BSF (gpd)				332,000

¹This flow is equivalent to 90 percent of water use, rounded to the nearest 1,000 gallons.

The estimated average daily water use shown in Table 4-3 is derived from the maximum of the average day for the two winter water bills for the months of November/December 2007 and January/February 2008. Typically wastewater flow is 80 to 90 percent of the total water use. Each customer's contribution to BSF is based on 95 percent of water consumption resulting in wastewater flow.

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Wastewater Collection System Master Plan

Project No. 136414

Legend

- ▲ Permanent Flow Monitors
- Temporary Satellite Flow Monitors

City Limits

Land Use Categories

- Large Discharger
- Commercial
- Industrial
- Warehouse
- Institutional
- Mixed Use
- Single Family Residential
- Medium Density Residential
- Med-High Density Residential
- High Density Residential
- Hotels and Motels
- Non-Contributing
- Satellite Sewers

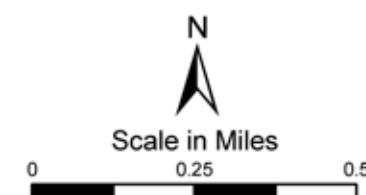
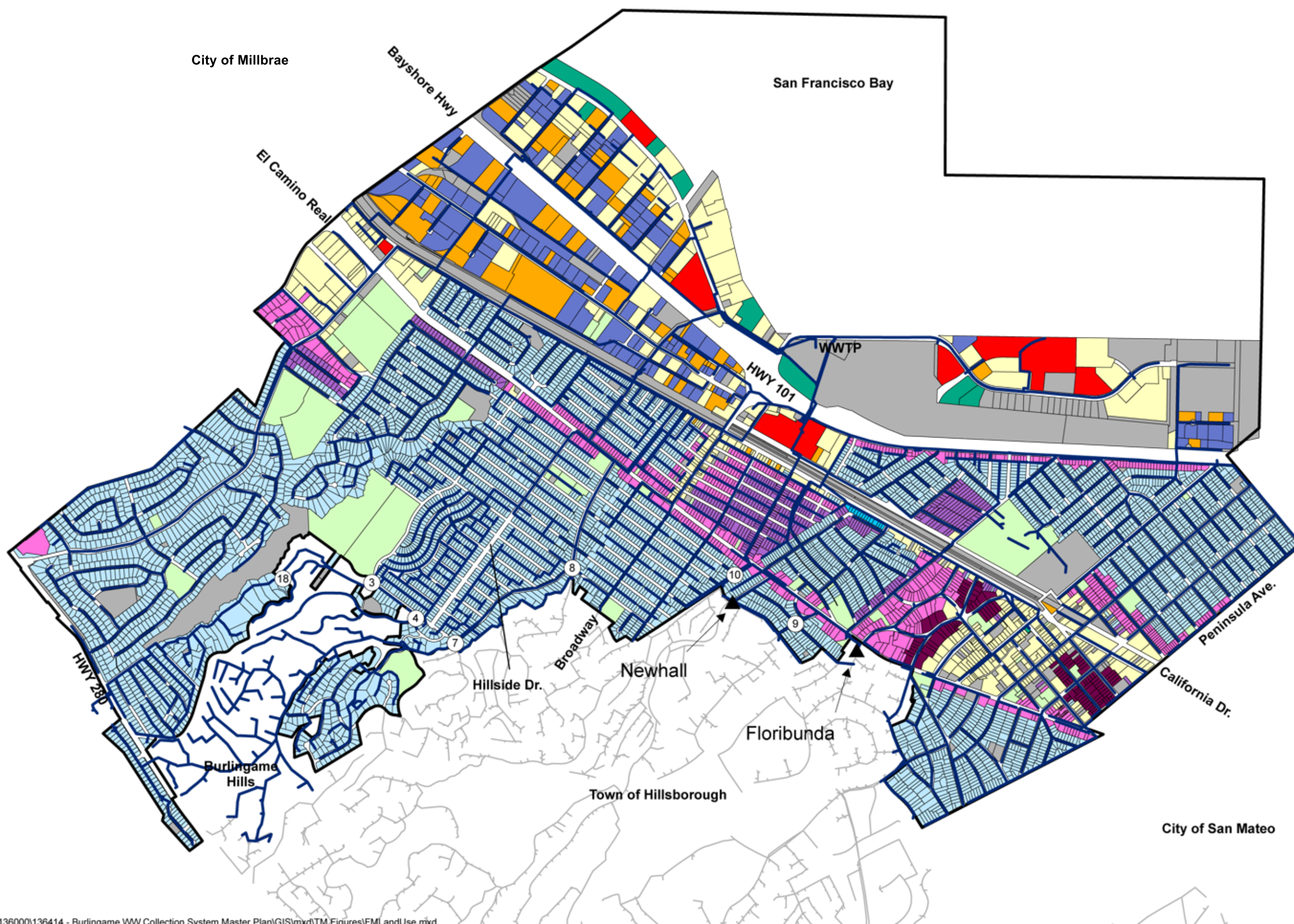


Figure 4-2
Burlingame Permanent
and Temporary Satellite
Flow Monitors

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Last Revision: 6/2/09



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4.5 Unit Flow Factors

Unit flow factors and the rate of GWI were developed based on water billing and wastewater flow data, and form the initial basis for the calibration of the hydraulic model.

4.5.1 Mass Balance

This section presents the results of the mass balance between BSF and WWTP flow monitoring data. To estimate the BSF generated within the City boundary, the flows from Hillsborough and Burlingame Hills were subtracted from the combined flow at the WWTP. Although not all of the incoming flows from Hillsborough and Burlingame Hills are accounted for by the flow monitoring data, the unmonitored flows are considered to be negligible. Flow monitor 10 was positioned as a back-up for the Newhall flow monitor because the Newhall flow monitor is a depth-only monitor. The Newhall flow monitor and flow monitor 10 flows were similar (within 5 percent), so the temporary flow monitor 10 was used instead of the permanent Newhall meter to avoid double counting flow. Table 4-4 summarizes the BSF estimate within the City boundary.

Table 4-4. BSF Generated by the City	
	Average Daily Flows (gpd)
WWTP	3,440,000
(subtract:)	
Flow Monitor 4	(7,000)
Flow Monitor 7	(188,000)
Flow Monitor 8	(73,000)
Flow Monitor 9	(44,000)
Flow Monitor 10 (used instead of Newhall)	(161,000)
Floribunda	(159,000)
Approximate City Flows (Target)	2,808,000

4.5.2 Unit Flow Factors

Table 4-5 lists the average water use and the wastewater unit flow factors developed for each master plan land use category. The factors are applied on a per parcel or per acre basis as indicated in Table 4-5. The water billing land use categories are similar to the master plan land use categories, and Table 4-5 shows the correlation between the two. A more detailed table showing this correlation is also included in Attachment B.

Table 4-5. Average Water Use and Corresponding Wastewater Unit Flow Factors by Land Use					
Master Plan Land Use Category	Water Billing Land Uses	Average Water Use		Wastewater Unit Flow Factor ¹	
Single Family Residential	Single Family	170	gpd per parcel	170	gpd per parcel
Mixed Use	Not a Water Billing category	n/a	gpd per acre	-	gpd per acre
Medium Density Residential	Duplex	1,270	gpd per acre	1,200	gpd per acre
Med-High Density Residential	Not a Water Billing category	n/a	gpd per acre	-	gpd per acre
High Density Residential	Multifamily	5,410	gpd per acre	5,140	gpd per acre
Institutional	Hospitals & Institutional	450	gpd per acre	430	gpd per acre
Commercial	Commercial and Food Related	1,140	gpd per acre	1,090	gpd per acre
Industrial	Industrial	440	gpd per acre	420	gpd per acre
Hotels, Motels	Hotel with and without restaurant	5,580	gpd per acre	5,300	gpd per acre
Warehouse	Corp. Yard	470	gpd per acre	450	gpd per acre

¹Typically calculated as 95 percent of the winter water consumption.

There were two master plan land use categories that were difficult to extract from the water billing land use: “Mixed Use” and “Medium-High Density Residential.” As described in TM 3 – Land Use Evaluation, the medium-high density land use is 21 to 50 dwelling units per acre and the high density is 50 dwelling units per acre and above. Assuming an average of 35 dwelling units per acre for medium-high density parcels, the unit flow factor was estimated to be approximately 70 percent (35/50) of the high-density parcel unit flow factor.

The preliminary unit flow factors¹ are presented below in Table 4-6, and form the initial basis for calibration of the hydraulic model. As shown in Table 4-6, a BSF for the City of 2.49 mgd was predicted by applying the unit flow factors to the land use units and adding the point source flows. Predicted flows are approximately 11.4 percent less than measured flows at the WWTP (2.81 mgd), a quantity contributed to dry weather GWI. Should it become necessary to modify the factors shown in Table 4-6 in order to facilitate hydraulic model calibration, such changes will be documented in the Model Development and Calibration TM.

¹ These flow factors should be considered preliminary; the ability to calibrate the model may require that they be revised, along with the estimated point source flows.

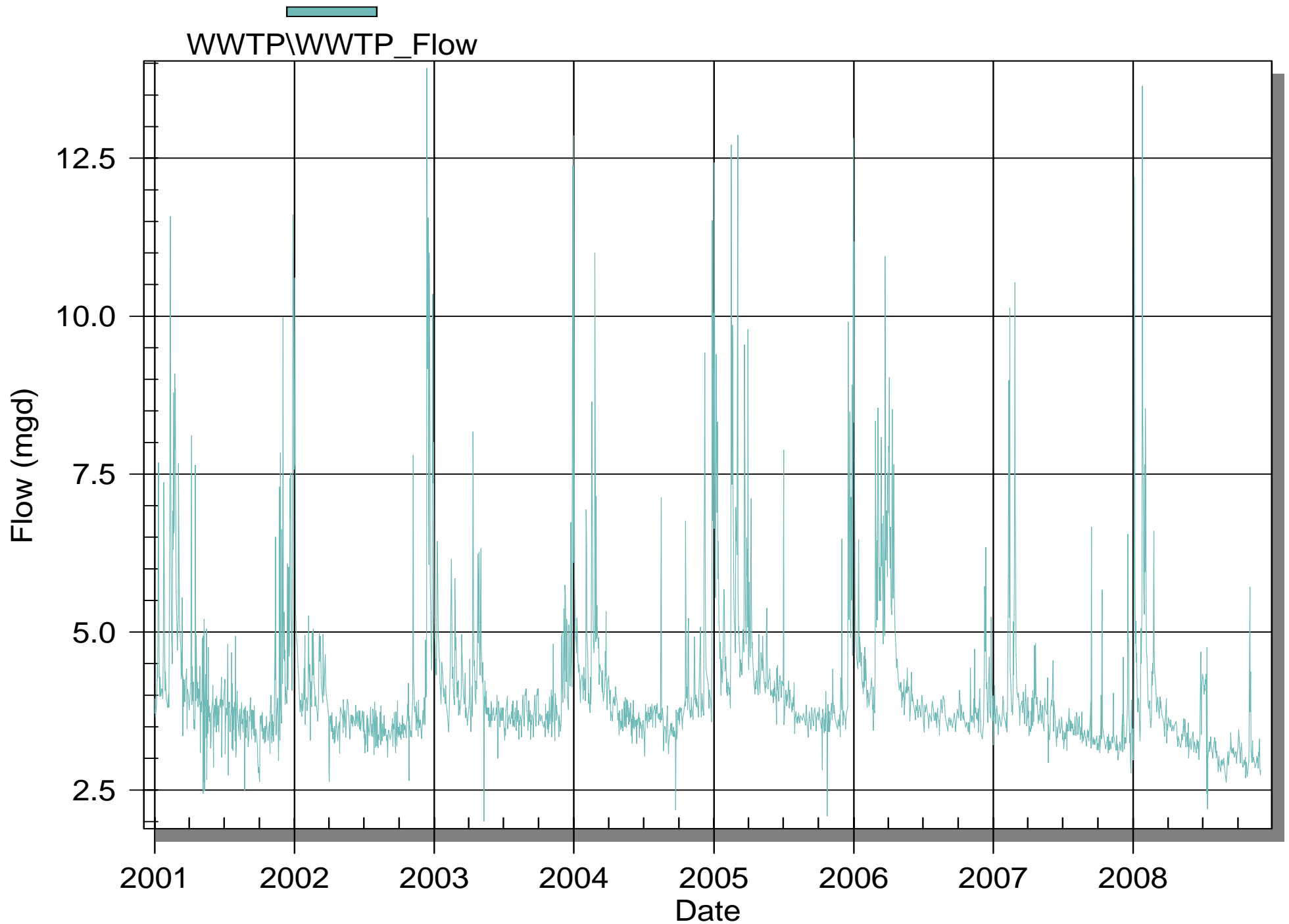
Table 4-6. Preliminary Unit Flow Factors and Estimated Dry Weather GWI				
Land Use Category	Unit Flow Factor	Unit	Acres or Parcels	Total BSF (gpd)
Single Family Residential	170	gpd per parcel	5,805	987,000
Mixed Use	1,500	gpd per acre	1.5	2,000
Multi-Family Residential (med density)	1,200	gpd per acre	59	71,000
Multi-Family Residential (med-high density)	3,300	gpd per acre	123	406,000
Multi-Family Residential (high density)	5,140	gpd per acre	25	126,000
Institutional	430	gpd per acre	150	65,000
Commercial	1,090	gpd per acre	237	258,000
Industrial	420	gpd per acre	86	36,000
Hotels, Motels	5,300	gpd per acre	28	146,000
Warehouse	450	gpd per acre	134	60,000
Point Sources	(See Table 4-3)	gpd	7 sources	332,000
TOTAL Predicted				2,489,000
Target at WWTP (from Section 4.5.1)				2,808,000
Percent Difference (GWI)			11.4%	319,000

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ATTACHMENT A: BURLINGAME WWTP FLOW, SEASONAL VARIATION

Attachment A

Burlingame WWTP Flow, Seasonal Variation



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ATTACHMENT B: BURLINGAME WATER BILLING SUMMARY

Attachment B
Burlingame Water Billing Summary

BC Category	Water Billing Category	As of 6-08	Code	Description	Jul 2007	Aug 2007	Sep 2007	Oct 2007	Nov 2007	Dec 2007	Jan 2008	Feb 2008	Mar 2008	Apr 2008	May 2008	Jun 2008	Total
Water Consumption By Sewer Code in Hundreds of Gallons																	
COMMERCIAL	COMMERCIAL	402	E1	LIGHT COMMERCIAL	70,422	91,723	74,723	82,756	69,025	43,980	59,112	40,787	57,521	54,967	64,684	68,393	778,093
COMMERCIAL	COMMERCIAL	8	E3	BARS	1,826	216	2,374	174	2,203	0	2,404	0	1,831	0	1,619	0	12,647
COMMERCIAL	COMMERCIAL	61	E5	AUTO RELATED	10,768	3,406	12,858	2,752	10,656	1,831	8,728	1,204	8,362	2,345	9,380	3,364	75,654
COMMERCIAL	COMMERCIAL	6	E6	LAUNDROMATS	7,791	202	7,895	0	7,258	36	7,909	0	7,656	0	8,603	0	47,350
COMMERCIAL	COMMERCIAL	7	E7	CAR WASH	10,956	186	10,638	191	8,603	187	5,968	262	9,658	188	9,501	158	56,496
COMMERCIAL	FOOD RELATED	30	D1	LARGE RESTAURANT	20,252	22,159	20,535	21,289	19,194	20,441	18,815	20,589	18,316	21,103	19,088	25,062	246,843
COMMERCIAL	FOOD RELATED	44	D2	SMALL RESTAURANT	16,240	1,872	17,116	1,800	18,372	1,630	17,899	2,445	16,429	1,902	17,004	1,761	114,470
COMMERCIAL	FOOD RELATED	6	D3	CATERING	48	6,883	28	5,619	44	4,910	41	4,377	26	4,366	26	5,014	31,382
COMMERCIAL	FOOD RELATED	7	D4	BAKERIES	2,671	7,559	2,753	7,339	2,736	6,076	2,956	5,687	2,663	5,781	2,705	7,631	56,557
COMMERCIAL	FOOD RELATED	4	D7	LARGE MARKETS	2,772	1,864	2,855	1,902	3,494	1,672	3,269	1,901	3,274	1,840	3,359	1,835	30,037
		575									127,101	77,252	125,736				
Hotel	COMMERCIAL	4	E9	HOTEL W/O RESTAURANT	1,548	7,014	1,785	6,391	1,952	5,026	2,009	4,763	1,971	5,788	2,071	6,646	46,964
Hotel	INDUSTRIAL	20	C1	HOTEL W/ RESTAURANT	8,400	237,223	0	215,784	3	174,960	0	192,115	0	190,690	0	202,992	1,222,167
		24									2,009	196,878	1,971				
INDUSTRIAL	INDUSTRIAL	5	C2	COMM./IND. LAUNDRIES	806	3,617	798	3,441	779	24,971	526	25,815	710	27,980	609	27,859	117,911
INDUSTRIAL	INDUSTRIAL	241	C4	INDUSTRIAL	1,897	144,262	1,976	138,924	1,269	100,918	1,041	101,270	1,234	104,152	1,411	136,563	734,917
INDUSTRIAL	INDUSTRIAL	3	E2	MORTUARY	654	0	1,327	0	1,081	0	1,225	0	1,098	0	1,194	0	6,579
INDUSTRIAL	INDUSTRIAL	4	D6	CHOCOLATE MANUFACT.	0	20,012	0	23,322	0	19,913	0	20,488	0	20,257	0	16,145	120,137
		253									2,792	147,573	3,042				
INSTITUTIONAL	COMMERCIAL	4	E8	COMM CONVALESCENT	20,165	3,854	22,930	3,841	22,645	2,329	24,560	59	20,339	9	18,733	59	139,523
INSTITUTIONAL	COMMERCIAL	4	P	PENINSULA HOSPITAL	0	5,394	0	4,500	0	3,300	0	6,735	0	4,020	0	4,946	28,895
INSTITUTIONAL	INSTITUTIONAL	22	F2	SCHOOLS	13,885	10,432	16,855	11,800	14,109	9,352	7,239	8,921	3,626	8,367	5,284	12,685	122,555
INSTITUTIONAL	INSTITUTIONAL	25	F4	CHURCHES	5,324	6,191	4,810	7,678	6,043	6,429	3,044	4,083	2,565	3,373	3,501	6,172	59,213
INSTITUTIONAL	INSTITUTIONAL	1	N1	CITY HALL	1,545	0	1,768	0	723	0	279	0	271	0	1,176	0	5,762
INSTITUTIONAL	INSTITUTIONAL	1	N2	POLICE	688	0	753	0	370	0	359	0	504	0	466	0	3,140
INSTITUTIONAL	INSTITUTIONAL	6	N5	RECREATION	9,706	451	10,949	423	8,051	348	6,859	280	5,807	425	8,519	365	52,183
INSTITUTIONAL	INSTITUTIONAL	3	N7	LIBRARY	1,098	88	1,143	91	777	54	456	17	495	43	672	86	5,020
INSTITUTIONAL	INSTITUTIONAL	3	N8	FIRE	773	748	779	667	681	564	711	590	638	572	707	652	8,082
		69									43,507	20,685	34,245				
High Density	MULTIFAMILY	8	M8	CONVALESCENT HOSP	3,109	269	3,290	772	2,866	333	2,671	293	2,340	312	3,210	350	19,815
High Density	MULTIFAMILY	737	M1	MULTIFAMILY	374,231	105,176	392,338	107,555	361,440	97,934	332,014	99,106	316,626	104,320	356,832	108,711	2,756,283
Medium Density	RESIDENTIAL	431	B5	DUPLEX	42,628	22,564	45,118	21,475	35,976	16,170	29,553	14,569	27,240	16,474	37,172	22,106	331,045
Single Family	RESIDENTIAL	5,994	B1	SINGLE FAMILY	659,983	720,933	665,076	676,695	477,398	422,460	332,150	304,013	280,684	394,968	499,490	645,045	6,078,895
Warehouse	INSTITUTIONAL	17	N4	CORP. YARD	966	5,157	1,045	3,885	1,364	3,473	1,771	2,927	1,857	3,077	2,441	4,361	32,324

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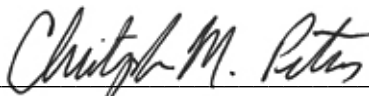
Prepared for: City of Burlingame, California
Project Title: Burlingame Wastewater Collection System Master Plan
Project No: 136414-4.5

Technical Memorandum No. 5

Subject: Hydraulic Model Development and System Performance Evaluation
Date: October 15, 2010
To: Donald Chang, PE, Project Manager
Copy to: Art Morimoto, PE, Assistant Public Works Director

Prepared by: Colin Dudley, PE, Project Engineer, California, License No. C 72777
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Reviewed by:



Christopher Peters, Project Manager
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5. HYDRAULIC MODEL DEVELOPMENT AND SYSTEM PERFORMANCE EVALUATION

This technical memorandum (TM) summarizes the development of the hydraulic model and system performance evaluation for the City of Burlingame (City) wastewater collection system. The development of the hydraulic model was based on flow projections developed in TM 4 – Dry Weather Flow Projections. The system performance evaluation forms the foundation of the capital improvement plan for the collection system.

This TM is organized into the following sections:

1. Hydraulic Model Selection
2. Data Sources
3. Methodology
4. Model Network Development
5. Model Flow Development
6. Dry Weather Model Calibration
7. Wet Weather Model Calibration
8. Existing System Performance Evaluation

5.1 Hydraulic Model Selection

A dynamic hydraulic model is essential for evaluating the hydraulics of the City's collection system, which has surcharged pipes, many pump stations, and numerous flow splits. InfoWorksTM CS was selected as the modeling software package because it is a fully dynamic hydraulic modeling program able to model complicated collection systems with multiple flow splits and in-line storage. It has a robust user interface, accurate and stable hydraulic engine, and the ability to model inflow and infiltration (I/I) via R-factor analysis. InfoWorksTM CS imports sewer data directly from an existing database, and is currently used by a number of Bay Area municipalities including San Jose, San Francisco, and San Mateo.

5.2 Data Sources

The City's collection system Graphic Information System (GIS) was the main data source for the model network components and parcels. Additional data sources included record drawings, sewer block maps, and City responses to specific requests for flow split and pump station information.

Graphic Information System (GIS) shapefiles with a date stamp of February 10, 2009 were provided by the City and imported directly into the hydraulic model to form the basis of the network's mains and manholes. GIS information for a total of 2,492 sewer mains included: asset ID, upstream and downstream manhole IDs, invert elevations, length, and diameter. GIS information for a total of 2,441 manholes included: asset ID, rim elevation, location coordinates, and diameter. GIS 2-foot topography contours were used for the interpolation of incomplete rim elevations.

Sewer Block Maps dated March 1987 were provided by the City. The block maps include pipe and manhole information; however, they do not reflect recent system improvements, including the record and construction drawings listed below.

Record and Construction Drawings of recent improvement projects were provided by the City. Updated information was incorporated into the model upon cursory review of the following record and construction drawings:

- Burlingame Subdivision Sewer Rehabilitation Project Phase I and II, August 2008. (As-Built Drawings).
- California Drive and Oak Grove Avenue Area Sewer Improvement and Rehabilitation Project Phase 1, November 2008. (Record Drawings).
- California Drive and Oak Grove Avenue Area Sewer Improvement and Rehabilitation Project Phase 2, May 2008 (Bid Set).
- City of Burlingame Rollins Road Sewer Upgrade Project, Pipeline and Pump Station, City Projects 9853 and 9947, July 2000. (Construction Drawings).
- El Camino Real Sewer Rehabilitation, Hillside Drive to Easton Drive, December 1995. (Record Drawings).

Pump Station Information was supplied by the City in response to specific data requests. Information included wet well dimensions, on/off level controls, pump speed (fixed vs. variable), horsepower, approximate flow rates (based on City draw-down tests), and normal operation modes.

Flow Monitoring (FM) Data was collected between December 30, 2008 and March 10, 2009 at 19 FM sites throughout the collection system, as presented in TM 2.

5.3 Methodology

The hydraulic model was developed by importing and validating the collection system network, allocating unit base sanitary flow (BSF) and ground water infiltration (GWI) (developed in TM 4) to the network, applying wastewater diurnal patterns based on land use, and then calibrating the model to both dry and wet weather precipitation and flow monitoring data collected during the winter of 2009.

5.4 Model Network Development

The hydraulic model consists of conduits (pipes), nodes (manholes), pump stations, and subcatchments. This section defines these components and their attributes, explains how attribute values were determined, and summarizes the process used to identify and correct missing and suspect data.

5.4.1 Conduits and Nodes

The network pipes and manholes were imported directly from the City GIS files listed above. All pipes having valid (non-zero) upstream and downstream invert information in GIS were automatically included in the model regardless of diameter or location. All gravity mains were assigned Manning's friction factor $n = 0.013$.

Figure 5-1 shows the location and diameter of modeled gravity mains. Approximately 86 percent of the total length of pipe in the collection system was included in the model.

5.4.1.1 Incomplete or Inconsistent Data

A number of GIS elements had either incomplete or inconsistent data (see Table 5-1) and were either excluded from the hydraulic model or corrected during the model development.

Table 5-1. GIS Incomplete or Inconsistent Data

GIS Element	Number of Incomplete or Inconsistent Elements	Percent of Total
Sewer Up/Downstream Manhole IDs	32	1
Invert Elevation	739	30
Sewer Diameter	23	1
Manhole Rim Elevation	637	26
Manhole Diameter	1,907	78

When GIS information was unavailable, pipes and manholes were excluded from the model network if they were terminal pipes (the most upstream) *and* their absence had a negligible effect on the system flow loading. Initial continuity checks also corrected pipes where upstream and downstream manhole IDs were incorrect or reversed.

For the remaining pipes, missing or inconsistent invert elevations and pipe diameters were either interpolated from upstream and downstream pipes, provided by the other data source documents discussed previously, or provided by the City in response to specific requests for information. For example, a single 6-inch diameter pipe reach within a 15-inch trunk sewer was adjusted to 15-inch diameter.

Missing manhole rim elevations were interpolated from 2-foot GIS topographic contours. Generally, the interpolated elevations were found to be within ± 0.5 feet of known rim elevations. Missing manhole diameters were interpolated as three to seven feet in diameter, depending on the sewer diameter.

During early model simulations, approximately 140 pipes were found to have irregular invert data, resulting in adverse grades and creating a discontinuous hydraulic model. In these cases, invert elevations were adjusted to City-supplied information or to interpolated elevations.

5.4.2 Flow Splits

Flow splits are manholes with two or more outlet pipes. Flow splits occurring within a basin have little effect on system flows; however, two flow splits in Sanchez Avenue were identified that are expected to have a significant effect on flow routing:

- Manhole E5-21058 in the 6-inch sewer in Sanchez Avenue at the intersection of Newhall Road has a 6-inch bypass connection from the 8-inch parallel sewer owned by the Town of Hillsborough. This bypass connection appears to only be active during wet weather.
- Manhole D5-21043 in the 10-inch sewer located in Sanchez Avenue between Paloma and Laguna Avenues splits flow between the 10-inch sewer in Sanchez Avenue and a 10-inch easement sewer to the north.

5.4.3 Pump Stations and Forcemains

Pump stations were included in the model with the exception of the Rollins Road Pump Station which pumps directly to the wastewater treatment plant (WWTP). Pump station characteristics and operating parameters were supplied by the City, and are summarized in Table 5-2.

Table 5-2. Pump Station Information

Pump Station	Location	Wet Well Dimensions (Diameter x Depth) (ft)	No. of Pumps (incl. standby)	Operating Level (ft)		Motor Speed	Estimated Firm Capacity* (mgd)
				On	Off		
399 Rollins	399 Rollins Road	6 x 17	2	6.2	2.6	Fixed	0.88
1740 Rollins	1740 Rollins Road	21** x 19	3	3.2	1.8	Fixed	1.44
Mitten	1775 Gilbreth Road	10 x 16	2	4.5, 5 Lag	2.5	Fixed	0.48
Gilbreth	1628 Gilbreth Road	9 x 17.5	2	5.4	2.7	Fixed	0.59
Hyatt	1301 Bayshore Highway	6 x 25	2	5.0	2.5	Fixed	0.28
Airport Rd.	710 Airport Boulevard	7.5 x 17.5	2	5.0	3.2	Variable	0.27

* Firm capacity was estimated by the City based on totalizing flow meters and field draw-down tests with one pump out of service.

** 1740 Rollins Pump Station has both wet and dry wells within the circular well. The wet well volume is half the dimensions shown above.

Pump station modeling parameters (fixed speed or variable speed motors, on/off levels, wet well dimensions, forcemain configuration, etc.) were set to reflect normal operating conditions as closely as possible. During both dry weather and wet weather simulations, all pumping stations were modeled at their firm pumping capacity with one pump out of service.

Fixed speed pumps were set to operate on the level controls listed in Table 5-2. The variable speed pumps at the Airport Road Pump Station were modeled as fixed speed pumps operating at their maximum variable speed capacity (with one pump out of service) to represent the pump station's firm pumping capacity.

The pump stations and forcemain configurations that were included in the hydraulic model are shown on Figure 5-1. For forcemains, InfoWorks™ CS calculates equivalent Hazen-Williams friction factors based on the assigned Manning's friction factor ($n = 0.013$) using a relationship from the EPA's Storm Water Management Model (SWMM) Version 5.

5.5 Model Flow Development

Typically, wastewater consists of three components: BSF, GWI, and rainfall dependent infiltration and inflow (RDI/I). BSF and GWI during dry weather are discussed in TM 4. GWI can vary seasonally as rainfall causes localized groundwater levels to rise during the winter. This phenomenon occurs within the City, and results in increased GWI in some areas during wet weather. RDI/I also occurs during wet weather conditions and generally causes the wastewater flow to substantially increase. Together, BSF, wet weather GWI, and RDI/I constitute wet weather flow.

5.5.1 Flow Allocation

Wastewater flows were allocated to the collection system by loading the flows generated by each parcel to a manhole based on GIS sewer lateral locations where available, or the proximity of the parcel to the nearest manhole.

After manhole assignment, the wastewater flow load from each parcel was calculated using the unit flow factors and point source loads presented in TM 4. Parcels sharing common land uses and input nodes were grouped into subcatchments and input into the model as a single element. The summation of subcatchment loads is the total load at each manhole.

Land uses within the City limits are described in TM 4. For parcels located within the Town of Hillsborough and the Burlingame Hills Sewer Maintenance District (SMD) San Mateo County Tax Assessor's land use

codes were used to define single family residential, medium density residential, institutional, and non-contributing parcels, and wastewater unit flow factors were applied as described above.

5.6 Dry Weather Model Calibration

Once the network and subcatchments were developed, the hydraulic model was calibrated to metered flows collected during the winter of 2009 and at the WWTP. The starting point for calibration was based on the BSF, as presented in TM 4, and diurnal curves. The calibration process sought to match modeled peak flows and volumes to observed data at the 19 FM sites and by projecting BSF, distributing GWI, and matching the shape of FM hydrographs.

5.6.1 Flow Data

FM data was collected between December 30, 2008 and March 10, 2009 at 19 FM sites throughout the collection system, with beginning and ending dates varying slightly. No significant precipitation was recorded during the period from January 3 to January 20; therefore, Thursday, January 15, 2009 was selected as the dry weather calibration day. Detailed FM site information is presented in TM 2, and FM locations are shown on Figure 5-1.

5.6.2 BSF Calibration

The objective of BSF calibration was to correlate the modeled hydrographs with the shape and magnitude of the observed hydrographs at each FM location by manipulating the unit flow factors and diurnal patterns until modeled flows match observed flows reasonably well.

Diurnal patterns are used to account for the typical variation in flow during a day. Initially, weekday and weekend diurnal flow patterns were developed from flow monitor (FM) data or typical patterns for three categories of land use: residential, commercial, and hotels. FM basin 1 is almost exclusively residential and was, therefore, used to develop the initial residential diurnal pattern by averaging BSF hourly peaking factors from multiple days. Typical commercial and hotel diurnal patterns were applied to the model since FM data was not available exclusively for these land uses.

Single-family residential (SFR) parcels account for the largest proportion of flow in the City's collection system. Once the model was run with the initial loads and diurnal patterns, FM basin 1 was analyzed for SFR flow factors. As a result of this analysis, the residential diurnal pattern and the SFR flow factor of 170 gpd per parcel were confirmed. However, the predicted flows varied significantly from observed flows for several FM basins in the portion of City in the hills with lower SFR densities, in the Burlingame Hills SMD, and the Town of Hillsborough. Therefore, the unit flow factors were calibrated and additional diurnal patterns were developed for FM basins 3, 4, 7, 8, and portions of the Town of Hillsborough.

The weekday diurnal patterns were applied to the model subcatchments by land use, and are shown on Figure 5-2. Table 5-3 lists the calibrated BSF factors for each land use category and the diurnal pattern applied for each area.

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**Wastewater Collection
System Master Plan**

Project No. 136414

Legend

- Flow Monitor Location
- ▲ Satellite System Connections
- Pump Station (PS)
- Pump Station-Not Modeled
- ▲ WWTP
- Burlingame Parcels
- Burlingame City Limits

Sanitary Sewers

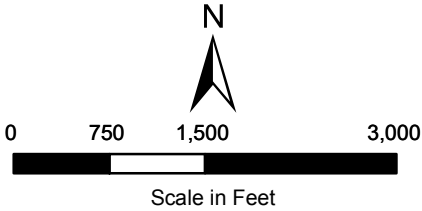
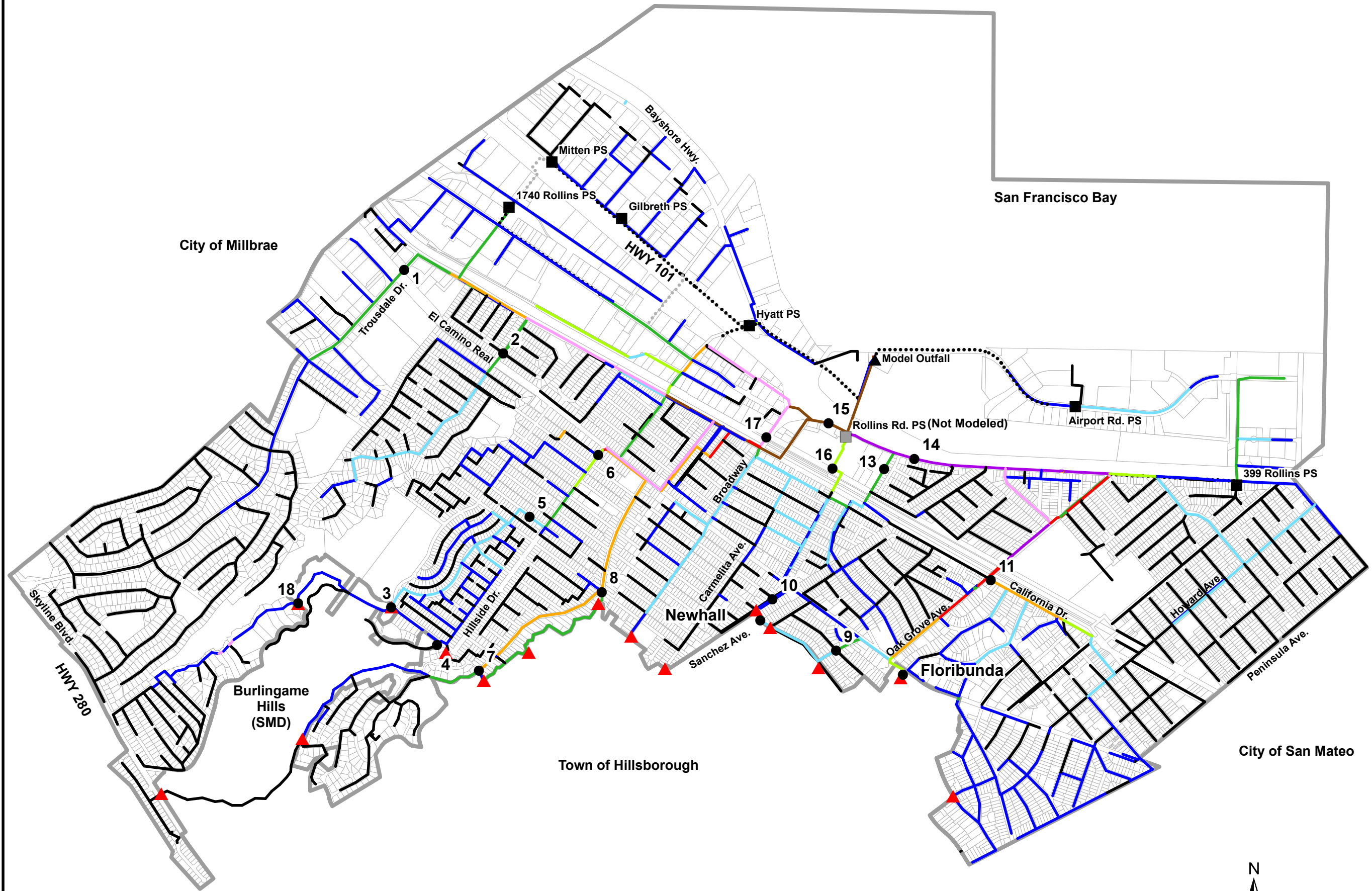
- Forcemains
- Inactive Forcemains
- 6-inch
- 8-inch
- 10-inch
- 12 to 14-inch
- 15-inch
- 18-inch
- 21-inch
- 24-inch
- 27-inch
- 30-inch or Larger

Figure 5-1

Model Network



Last Revision: 12/17/2009



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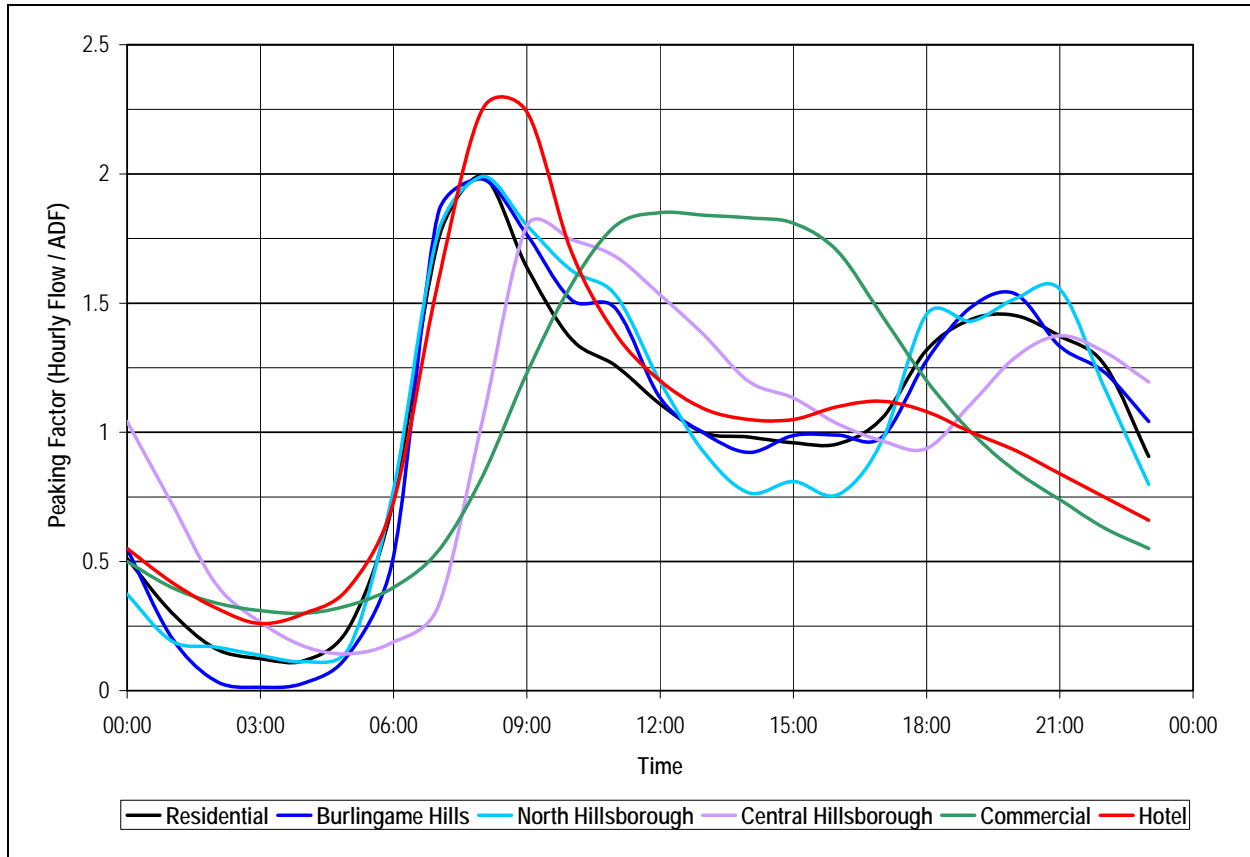


Figure 5-2. Weekday Diurnal Patterns

Land Use Category	Unit Flow Factor	Calibrated Flow Factor	Unit	Diurnal Pattern
Single Family Residential	170	170	gpd per parcel	Residential
Single Family Residential – City of Burlingame (FM 3 and FM 4*)	170	170	gpd per parcel	Burlingame Hills
Single Family Residential – Burlingame Hills SMD (FM 7 and FM 4*)	170	420	gpd per parcel	Burlingame Hills
Single Family Residential – Town of Hillsborough (FM 8)	170	275	gpd per parcel	North Hillsborough
Single Family Residential – Town of Hillsborough (Newhall Meter)	170	210	gpd per parcel	Central Hillsborough
Mixed Use	1,500	1,500	gpd per acre	Commercial
Multi-Family Residential (Med Density)	1,200	1,200	gpd per acre	Residential
Multi-Family Residential (Med-high Density)	3,300	3,300	gpd per acre	Residential
Multi-Family Residential (High Density)	5,140	5,140	gpd per acre	Residential
Institutional	430	430	gpd per acre	Commercial
Commercial	1,090	1,090	gpd per acre	Commercial
Industrial	420	420	gpd per acre	Commercial
Hotels, Motels	5,300	5,300	gpd per acre	Hotel
Warehouse	450	450	gpd per acre	Commercial

* FM basin 4 is a very small basin with flow characteristics similar to both FM basins 3 and 7, and is modeled as a mix of both.

The area east of Highway 101 flows directly to the WWTP via multiple pump stations and was not metered. The BSF from this area was estimated by the unit flow factors and point source loads developed in TM 4.

5.6.3 Dry Weather GWI Calibration

The flow attributed to GWI was roughly equivalent to the difference between the low (early morning) metered flow and model BSF. For basins where there was a difference, a constant flow of GWI was added to the subcatchments in the corresponding FM basin. The location of each FM basin and the dry weather GWI flows for each basin are shown in Figure 5-4. The total, system-wide dry weather GWI was determined to be 0.62 mgd.

5.6.4 Observed vs. Modeled Results

The dry weather calibration was carried out by comparing modeled results with metered data from the flow monitoring period described above. An example of the metered vs. calibration hydrographs is shown in Figure 5-3 (reported at a one hour time step). The dry weather calibration hydrograph for each meter is located in Attachment A.

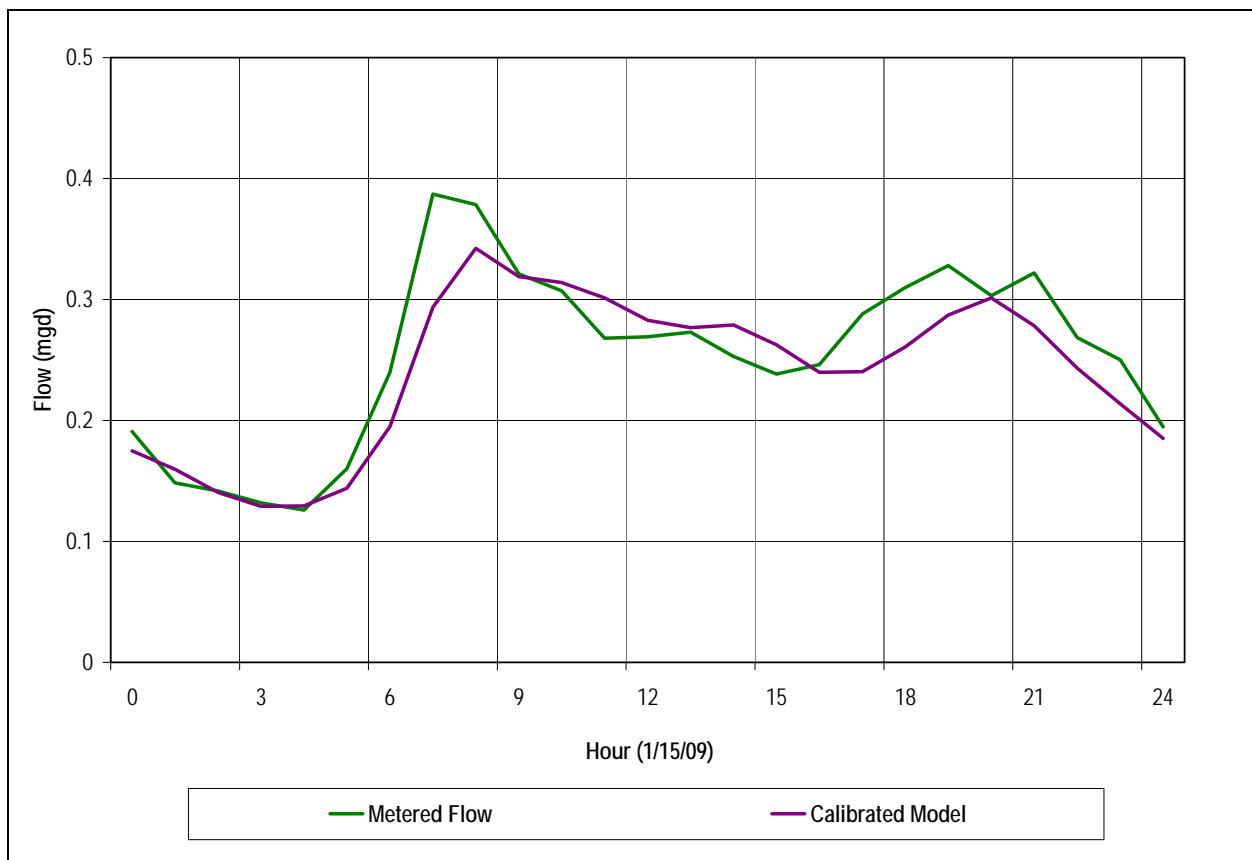


Figure 5-3. Dry Weather Calibration at FM 17

Comparisons of metered vs. modeled average dry weather flow (ADWF) and peak dry weather flow (PDWF) are presented in Table 5-4. The target accuracy range for peak flow calibration is typically ± 15 percent. The total model BSF load was 3.06 mgd, the GWI load was 0.62 mgd, and the overall total system loading was 3.68 mgd.

Table 5-4. Dry Weather Calibration Results

Flow Monitor	ADWF (mgd)			PDWF (mgd)			Observations
	Observed	Modeled	Percent Difference	Observed	Modeled	Percent Difference	
1	0.24	0.24	0	0.43	0.42	-2	
2	0.11	0.10	-9	0.18	0.17	-6	
3	0.10	0.10	0	0.15	0.13	-13	Used only for dry weather calibration for the FM Basin 3.
4	0.006	0.007	17	0.019	0.014	-26	DWF too low to be accurately recorded.
5	0.21	0.17	-19	0.45	0.27	-40	Highly variable DWF. Calibrates well on other days.
6	0.21	0.27	29	0.40	0.45	13	
7	0.20	0.16	-20	0.32	0.26	-19	Institutional parcel may be contributing higher flows.
8	0.07	0.07	0	0.14	0.14	0	
9	0.045	0.042	-7	0.061	0.056	-8	
10	0.17	0.18	6	0.28	0.28	0	
11	0.65	0.58	-11	0.78	0.77	-1	
13	0.17	0.18	6	0.22	0.29	32	Variable DWF. Calibrates well on other days.
14	1.00	1.23	23	1.88	1.83	-3	
15	1.76	1.47	-16	3.21	2.32	-28	Flows are influenced by the Mitten PS.
16	0.13	0.19	46	0.21	0.29	38	Possible unidentified flow split.
17	0.26	0.25	-4	0.39	0.36	-8	
18	-	-	-	-	-	-	Used only for wet weather calibration for FM Basin 3.
Floribunda	0.17	0.14	-18	0.26	0.24	-8	
WWTP	3.03	3.68	21	5.60	6.53	17	Inaccuracies with permanent WWTP FM.

During the dry weather flow monitoring period, there was an unaccounted for loss in flows from FM 10 (observed ADWF = 0.17 mgd) to FM 16 (observed ADWF = 0.13), which could not be replicated in the model. The flow monitoring data for FM 16 appears to be reasonable, and standard meter deviations cannot account for the approximately 25 percent discrepancy in flows between FM 10 and FM 16. Record drawing research and City field investigations could not identify an alternate sewer routing to account for the flow loss, and a mass balance of metered flows did not reveal additional unaccounted-for flows in another meter. Additional field investigations such as smoke testing and/or dye testing are required to determine the reason for the loss in flow in Sanchez Avenue.

Calibration of modeled flows to WWTP permanent meter data revealed possible inaccuracies in the permanent meter at the WWTP. As discussed in TM 4, the ADWF at the WWTP was significantly lower in 2008 and 2009 than in previous years, which averaged 3.64 mgd (for 2005 through 2007). Additionally, the temporary flow monitors recorded higher volumes than the WWTP flow meter for the same time period, indicating that the permanent meter at the WWTP may not be properly calibrated or may have other inaccuracies.

5.7 Wet Weather Model Calibration

Wet weather model calibration involves estimating the amount of I/I that enters the collection system during a storm event, spatially distributing the total I/I amount throughout the collection system area, and then adjusting modeling parameters until modeled flows match observed flows at specified points within an acceptable margin of error.

5.7.1 Flow Data

The three-day period of February 14, 15, and 16, 2009 was selected as the wet weather calibration period, with significant rainfall (a total of 2.9 inches, with a peak hourly rainfall of 0.25 inches/hour) occurring between 3:00 am on February 15 and 10:00 am on February 16. This period was selected because data from the FMs showed that rainfall during that period caused the highest peak at most of the FM sites. The storm event on March 2, 2009 was used to verify the wet weather calibration.

5.7.2 Wet Weather GWI Calibration

Significant rainfall events during the FM period began around February 5, 2009 and continued to March 5, 2009, and caused a slight rise in the minimum flows observed afterwards. During the days between those early rains and the calibration storm, the shape and magnitude of the diurnal patterns returned to normal, but were transposed slightly higher up the Y-axis, indicating an increase in wet weather GWI. For that reason, wet weather GWI factors were developed and applied to the network for the wet weather calibration.

5.7.3 R-factor Calibration

Subcatchment RDI/I factors were input into the model in the form of an R-factor, which is the percentage of rainfall volume that reaches the collection system. RDI/I varies between sewer basins depending on many different localized conditions such as pipe condition, ground surface (permeable vs. impermeable), number of connections, etc.

R-factors are divided between fast, medium, and slow runoff surfaces (see Figure 5-5) that determine how fast RDI/I enters the system. During calibration, the percentage of rainfall assigned to each surface was manipulated to change the shape of each FM basin hydrograph. The process of manipulating the runoff surfaces was iterative, and was repeated until the modeled hydrograph corresponded reasonably well with the observed hydrograph.



Wastewater Collection
System Master Plan
Project No. 136414

Legend

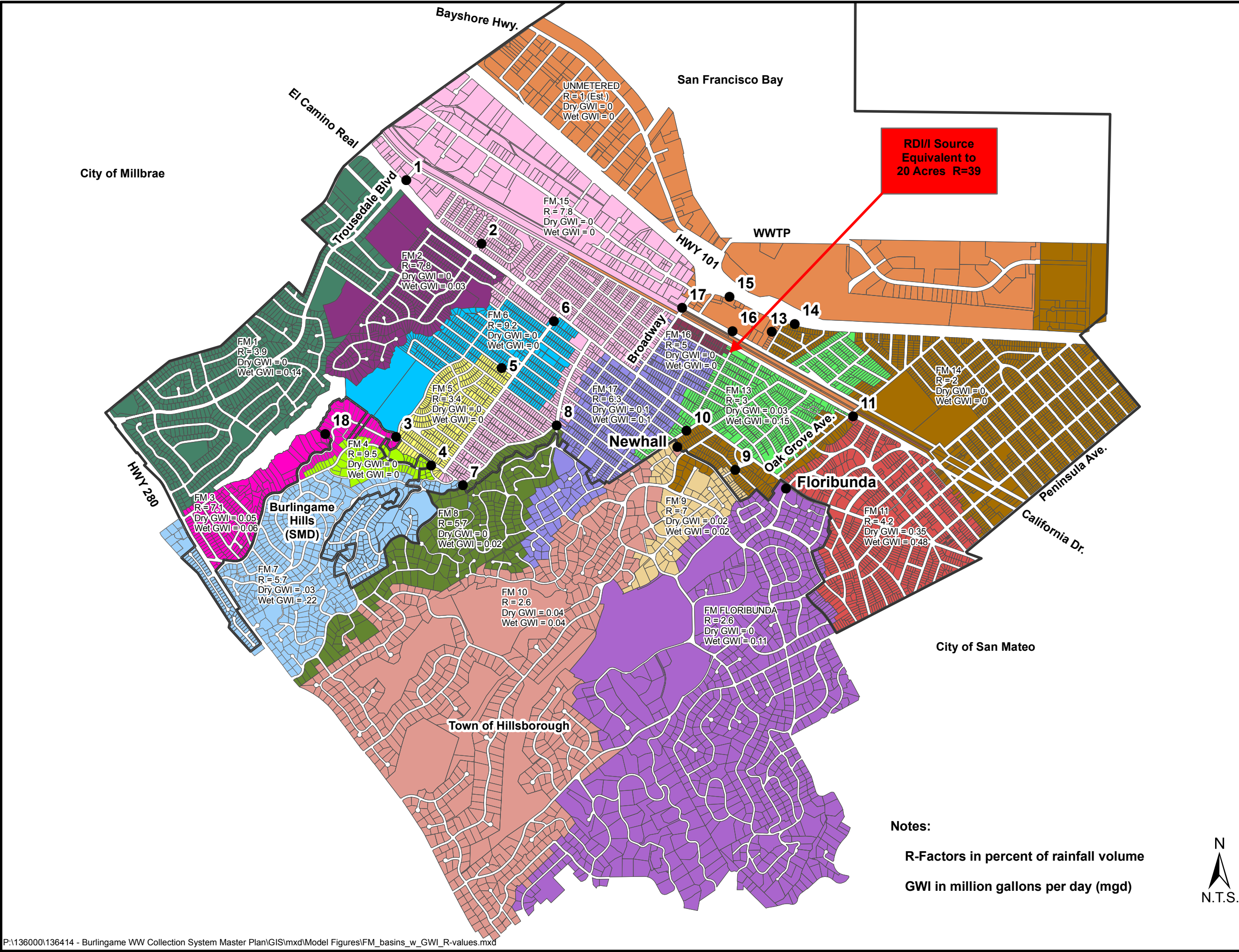
- Flow Monitor Location
- ▭ Parcels
- ▭ Burlingame City Limits
- Flow Monitor Basin
 - Unmonitored
 - 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10
 - 11
 - 13
 - 14
 - 15
 - 16
 - 17
 - Floribunda

Figure 5-4

Calibration Factors



Last Revision: 1/10/2010



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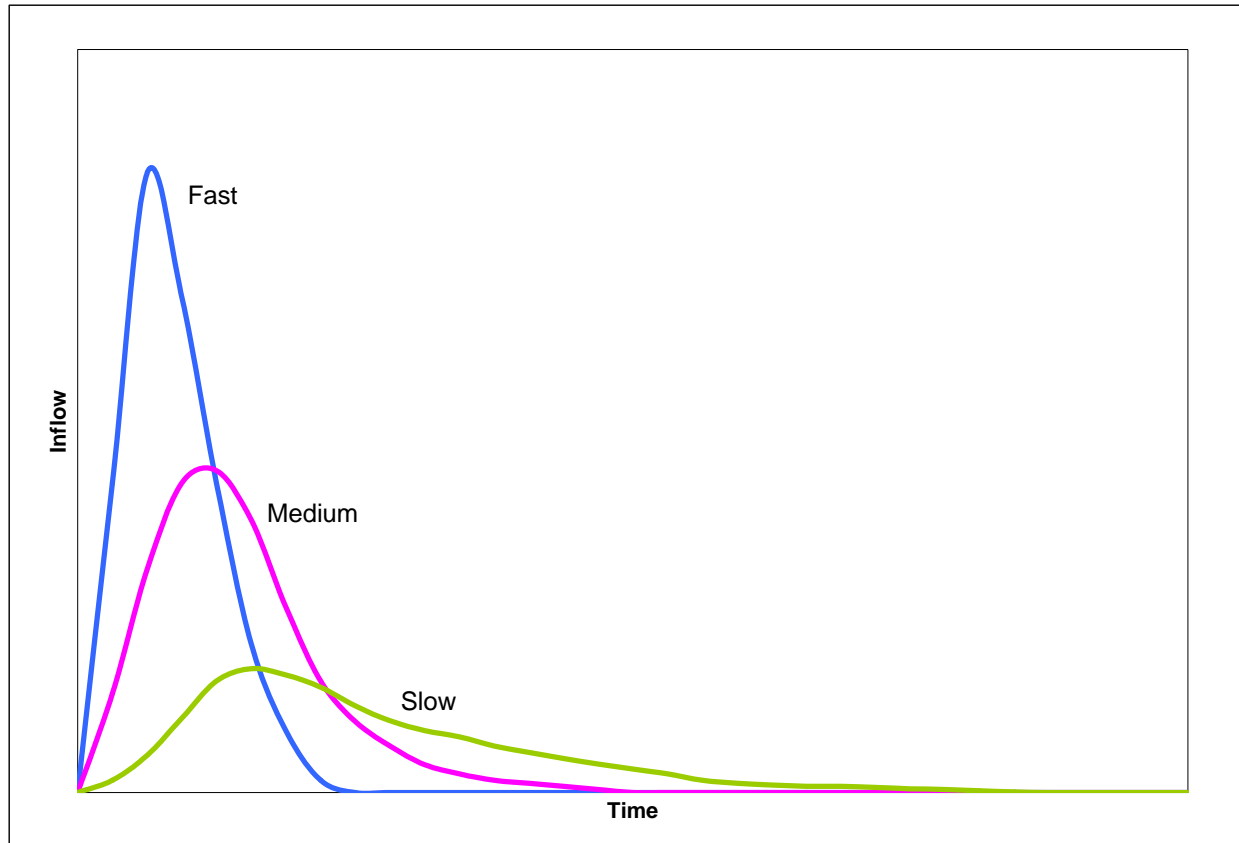


Figure 5-5. Typical RDI/I Hydrograph Components: Runoff Surfaces

FMs 3, 5, and 8 showed anomalies in data during wet weather flows. Both FM 3 and FM 18 monitored the FM basin 3, with FM 18 located immediately upstream of FM 3. Flow velocities were high at FM 3, particularly during wet weather events, due to the steep grade just upstream of its location. High velocity can affect the accuracy of flow meters; therefore, FM 18 was used for wet weather calibration of the FM 3 basin when velocities peaked.

FM 8 also had data anomalies that occurred during wet weather events. Data from FM 8 showed low velocities and high water level, which indicates that the meter experienced backwater from a potential downstream obstruction such as roots, grease, pipe collapse, etc. The FM 8 basin was located adjacent to the FM 7 basin and was comprised of parcels of similar size and land use. Therefore, the calibrated R-factor for the FM 7 basin was applied to the FM 8 basin.

FM 5 lacked data for the wet weather calibration period (February 14-16, 2009), but had data for the March 2, 2009 storm. Therefore, the FM 5 basin was calibrated to the March 2, 2009 storm instead.

The final R-factors resulting from the calibration process are listed in Table 5-5. Generally, R-factors above three are considered high.

Table 5-5. Wet Weather Parameters			
FM Basin	Contributing Area (ac)	Wet Weather GWI (mgd)	R-factor (Percent of Rainfall Volume)
Unmetered	159	0.00	1.0
1	240	0.14	3.9
2	114	0.03	7.8
3	79	0.06	7.1
4	24	0.00	9.5
5	50	0.00	3.4
6	74	0.00	9.2
7	208	0.22	5.7
8	140	0.02	5.7
9	52	0.02	7.0
10	638	0.04	2.6
11	155	0.48	4.2
13	103	0.15	3.0
14	265	0.00	2.0
15	333	0.00	7.8
16	6	0.00	5.0
17	125	0.10	6.3
Floribunda	759	0.11	2.6

5.7.4 Observed vs. Modeled Results

The model was calibrated to wet weather flows by iteratively comparing modeled results with observed data for the calibration period, and overall, the model calibrated well. An example of the metered vs. modeled calibration hydrographs is shown in Figure 5-6 (reported at a one hour time step). The wet weather calibration hydrograph for each meter is located in Attachment B.

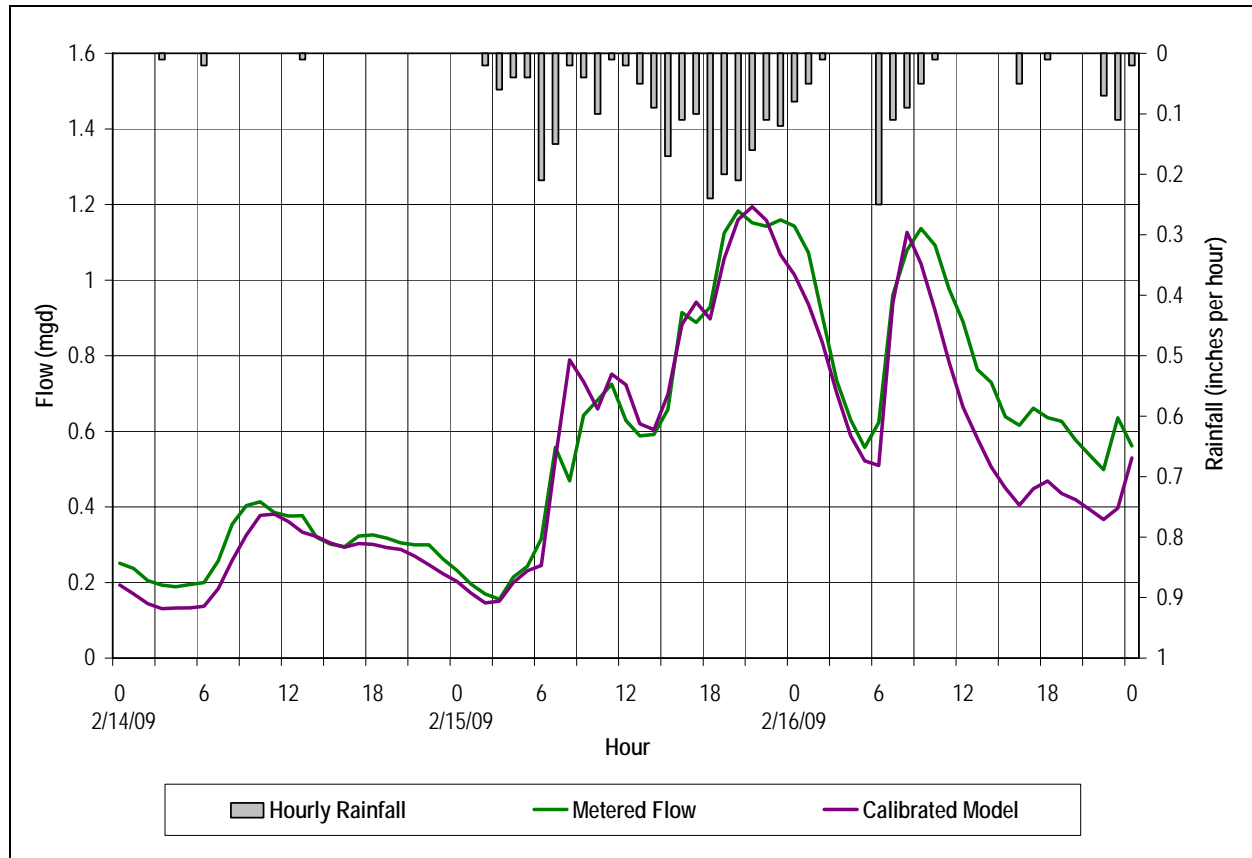


Figure 5-6. Wet Weather Calibration at FM 17

The wet weather parameters listed in Table 5-5 were calibrated to the three-day period of February 14, 15, and 16, 2009. The hydraulic model flow projections were verified by applying these wet weather parameters to a simulation of the rainfall from March 2, 2009, and comparing the modeled flows with the metered flow data. Wet weather parameters vary with each storm because of varied rainfall patterns and characteristics of the collection system; but generally, the model responded well to the March 2, 2009 rainfall and projected wet weather flows that correlated well with metered flows.

Table 5-6 presents the numerical results of the final wet weather calibration. Wet weather results are presented as peak flow occurring during the three-day wet weather calibration simulation.

Table 5-6. Wet Weather Model Calibration Results

Flow Meter	ADWF (mgd)	Peak Wet Weather Flow (mgd)			Observations
		Observed	Modeled	Percent Difference	
1	0.24	1.44	1.45	1	
2	0.11	1.10	1.10	0	
3	0.10	-	-	-	Used only for dry weather calibration for the FM Basin 3.
4	0.01	0.21	0.21	0	
5	0.21	-	1.18	-	Missing data on February 15, 2009. The storm on March 2, 2009 was used for FM 5 calibration.
6	0.21	2.16	2.10	-3	
7	0.20	1.58	1.57	-1	
8*	0.07	-	0.90	-	Flow monitor data anomalies. R-factor from FM Basin 7 was used for FM Basin 8 calibration.
9	0.05	0.41	0.41	0	
10	0.17	1.10	1.06	-4	
11	0.65	1.40	1.40	0	
13	0.17	0.82	0.82	0	
14	1.00	4.22	4.92	17	Flow monitor inaccuracies. Re-monitored only during dry weather.
15	1.76	11.27	11.10	-2	
16**	0.13	1.91	2.00	5	Includes a simulated wet weather RDI/I source.
17	0.26	1.18	1.19	1	
18	-	0.72	0.71	-1	Used only for wet weather calibration for the FM Basin 3.
Floribunda	0.17	2.14	2.17	1	
WWTP	3.03	16.40	18.28	11	Potential inaccuracies with permanent WWTP FM.

* Data from FM 8 showed low velocities and high water level, which indicates that the meter experienced backwater from a potential downstream obstruction such as roots, grease, pipe collapse, etc.

** FM Basin 16 includes a simulated wet weather inflow source equivalent to a 20-acre subcatchment with an R-factor of 39, with a total added RDI/I volume of 0.65 million gallons during the three-day calibration period.

In initial wet weather calibration runs, the FM 16 modeled peak flow (1.1 mgd) was approximately 42 percent lower than the metered peak flow (1.9 mgd) indicating an additional flow which cannot be replicated in the model. FM 16 experienced an unaccounted-for loss in flows during dry weather (discussed in Section 5.6.4) and an increase in flows during wet weather.

The majority of the flow through FM 16 is routed through FM 10 to the 8-inch Town of Hillsborough sewer in Sanchez Avenue (see Figure 5-7). FM 16 data appears reasonable and accurate, and FM 10 calibrates well to its metered PWWF of 1.1 mgd. The 8-inch sewer in Sanchez Avenue just downstream of FM 10 has a limited gravity capacity of 1.0 mgd, which suggests that additional flow is entering the pipe downstream of the 8-inch portion. Therefore, two likely explanations for the high observed wet weather flows at FM 16 were investigated: 1) flow diversions from FM basins 13 and/or 17 to FM 16, and 2) significant RDI/I between FM 10 and FM 16.

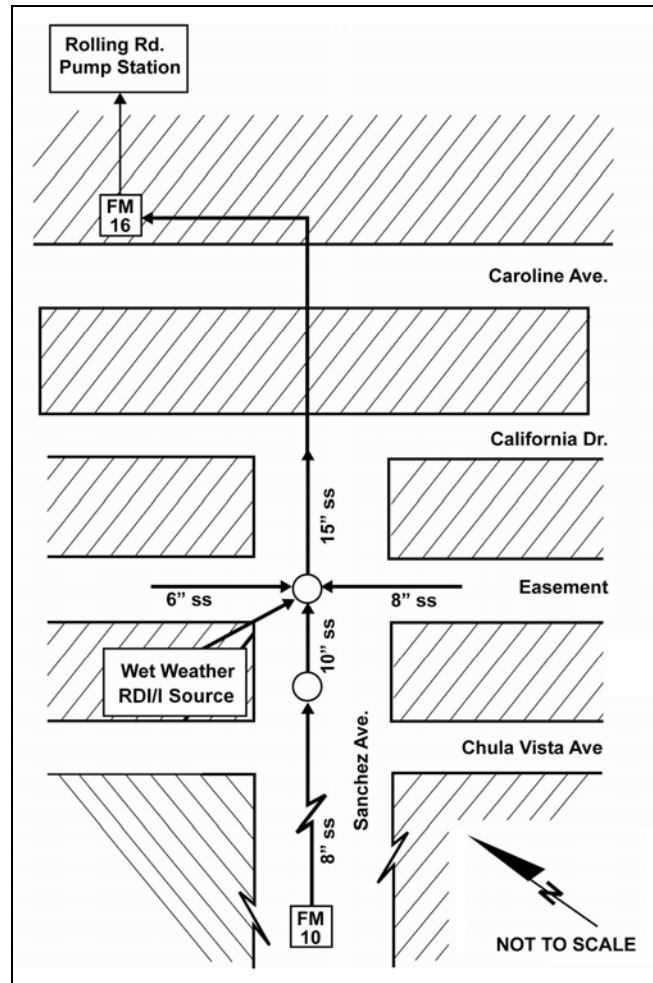


Figure 5-7. FM 16 Wet Weather RDI/I Source

First, model simulations were conducted to re-route upstream flows from FM basins 13 and 17 to FM 16 through two easement sewers connected to the 15-inch Town of Hillsborough sewer (see Figure 5-7). However, these simulations were unsuccessful and indicate that these diversions cannot account for the high flows monitored at FM 16.

The second explanation is that RDI/I is entering the system during wet weather from an unknown source that is not represented in the hydraulic model. A review of sewer maps and aerial photography show a number of storm drain and open channel crossings in the area that may contribute to the wet weather RDI/I. Additional field investigation such as smoke testing, dye testing, and/or wet weather observation is required to determine the source of the additional RDI/I.

To simulate the unknown wet weather RDI/I source, a virtual subcatchment was modeled to contribute a volume of approximately 0.65 million gallons of RDI/I during the three-day wet weather calibration period to match the metered peak flow at FM 16.

5.8 Existing System Performance Evaluation

The performance of the existing collection system was analyzed by the hydraulic model under two scenarios: 1) the Design Scenario and 2) the Consent Decree Scenario. This section describes the criteria that were used and the analysis performed to determine potential hydraulic deficiencies for the collection system.

5.8.1 Design Storms

The collection system was evaluated using the two 10-year, 24-hour design storms shown on Figure 5-8. The same volume of precipitation was applied for both storms but was distributed differently. The amount of precipitation was determined using the National Oceanic and Atmospheric Administration (NOAA) Intensity Duration Frequency (IDF) curves for San Mateo County. The resulting rainfall depths are listed in Table 5-7.

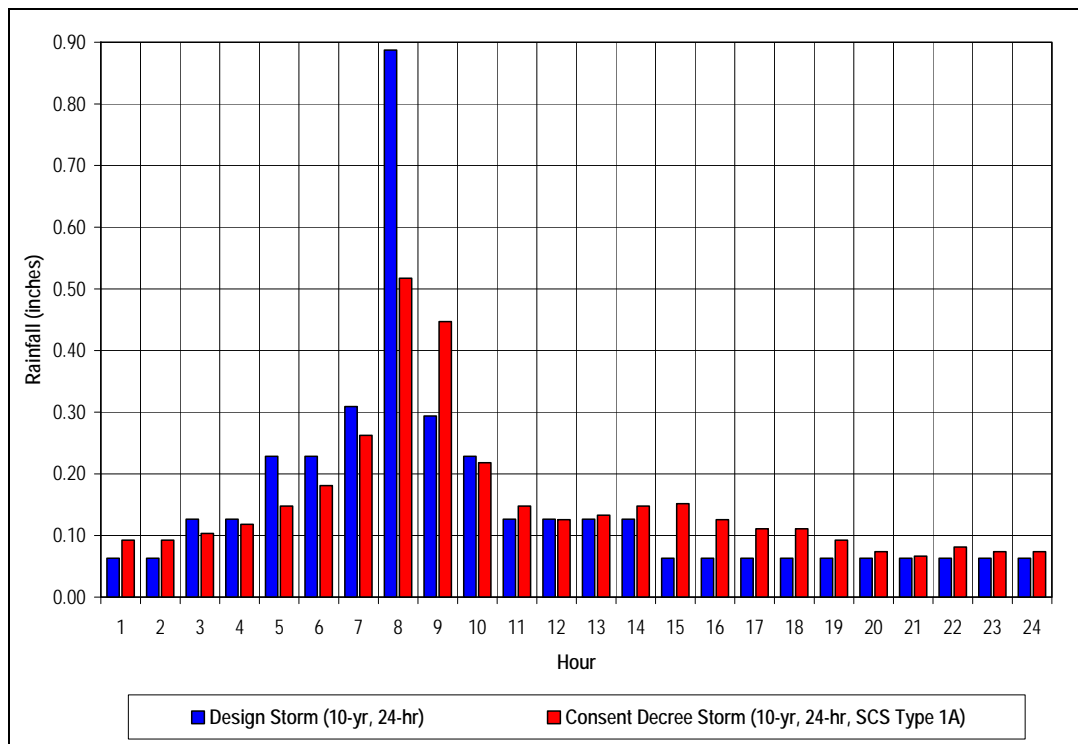


Figure 5-8. Design Storm Distributions

10-yr Storm Duration (Hours)	Total Rainfall Depth (in)
1	0.89
2	1.20
3	1.49
6	2.18
12	2.94
24	3.69

The design storm is a 10-year 24-hour storm with a distribution typically used for collection system master plans. The City's consent decree requires that collection system improvements resolve capacity-related SSOs during storm events less than a 10-year 24-hour storm using an SCS Type IA 24-hour rainfall distribution curve (shown on Figure 5-8), as referenced on Figure B-1 of Attachment B of the USDA Urban Hydrology for Small Watersheds guidance TR-55.

5.8.2 Evaluation Criteria

The performance of the collection system was evaluated using the following criteria.

5.8.2.1 Pipes

The two criteria used to evaluate the capacity of the modeled gravity pipes under peak flows were: surcharge condition (throttle vs. backwater) and surcharge elevation (as a function of freeboard). A pipe was considered surcharged when the hydraulic grade line (HGL) rose above the crown of the pipe.

When a surcharged pipe's HGL slope is steeper than the slope of the pipe itself, the sewer is experiencing "throttle surcharge" and does not have adequate hydraulic capacity to convey peak flows. Otherwise, surcharged pipes are experiencing "backwater surcharge" from throttle surcharge or grade breaks downstream. It is possible that a single throttle-surcharged pipe can cause flooding and overflows in multiple upstream manholes.

Surcharging was evaluated using "surcharge freeboard" which is the vertical freeboard from the HGL elevation to the manhole rim elevation. For example, one foot of surcharge in a sewer with six feet of cover has a surcharge freeboard of five feet. Possible locations for sanitary sewer overflows (SSOs) are predicted in the model when surcharging causes the HGL elevation to reach the ground surface elevation at a manhole (thus, the surcharge freeboard is equal to or less than zero). The Design and Consent Decree Scenarios were evaluated for minimum surcharge freeboard levels of five and three feet, respectively. These surcharge freeboard levels provide a margin of safety before SSOs occur to compensate for inherent inaccuracies that are present in collection system models.

5.8.2.2 Pump Stations

The pump station evaluation considers firm hydraulic capacity (with the largest pump out of service) compared to the predicted peak model flows. If the firm capacity was less than the PWWF predicted in the model, the pump station capacity may be deficient.

5.8.2.3 Forcemains

The forcemain evaluation was based on a maximum allowable velocity of eight feet per second (fps). According to Pumping Station Design, Second Edition by Robert Sanks, when velocities exceed this amount, there is a risk of excessive water hammer. The evaluated velocities in the forcemains are based on the peak modeled flow through the forcemains.

5.8.3 Existing Collection System Performance Results

Table 5-8 summarizes the results of the hydraulic modeling of the existing collection system under the two design scenarios. Detailed model output is included as Attachments C and D.

Table 5-8. Existing System Results

Flow Monitor	ADWF (mgd)	Design Scenario*		Consent Decree Scenario*	
		PWWF (mgd)	Peaking Factor	PWWF (mgd)	Peaking Factor
1	0.24	2.39	10.0	2.24	9.3
2	0.11	2.55	23.2	2.07	18.8
3	0.10	0.83	8.3	0.79	7.9
4	0.01	0.45	45.0	0.32	32.0
5	0.21	1.74	8.3	1.52	7.2
6	0.21	3.66	17.4	3.17	15.1
7	0.2	1.97	9.9	1.88	9.4
8	0.07	1.68	24.0	1.38	19.7
9	0.05	0.92	18.4	0.67	13.4
10	0.17	1.07	6.3	1.08	6.4
11	0.65	2.62	4.0	2.19	3.4
13	0.17	1.30	7.6	1.10	6.5
14	1.00	9.40	9.4	7.84	7.8
15	1.76	19.16	10.9	17.20	9.8
16	0.13	3.56	27.4	2.98	22.9
17	0.26	2.03	7.8	1.86	7.2
18	0.10**	1.29	12.9	1.21	12.1
Floribunda	0.17	4.25	25.0	3.65	21.5
WWTP	3.03	34.47	11.4	29.77	9.8

* SSOs occur under both wet weather scenarios, therefore, PWWFs and peaking factors do not include system losses.

** ADWF for FM 18 was derived from FM 3, which is just downstream.

5.8.3.1 Pipes

Figure 5-9 and Figure 5-10 shows the locations of sanitary sewer surcharge and potential overflow locations. Sewers with inadequate surcharge freeboard (less than three feet) are noted. There are 14 potential SSO locations in the existing system under this scenario, nine of which are in manholes located outside of the City limits (although flows from the City may contribute upstream).

5.8.3.2 Pump Stations

Table 5-9 summarizes the evaluation of the pump stations. The pump station capacities provided by the City were based on City flow meters at the 399 Rollins, Mitten, and Hyatt pump stations, and City draw-down tests at the remaining pump stations. Because of inaccuracies in these types of capacity ratings, a full hydraulic analysis should be performed to confirm potential pump station deficiencies.



Wastewater Collection
System Master Plan
Project No. 136414

Legend

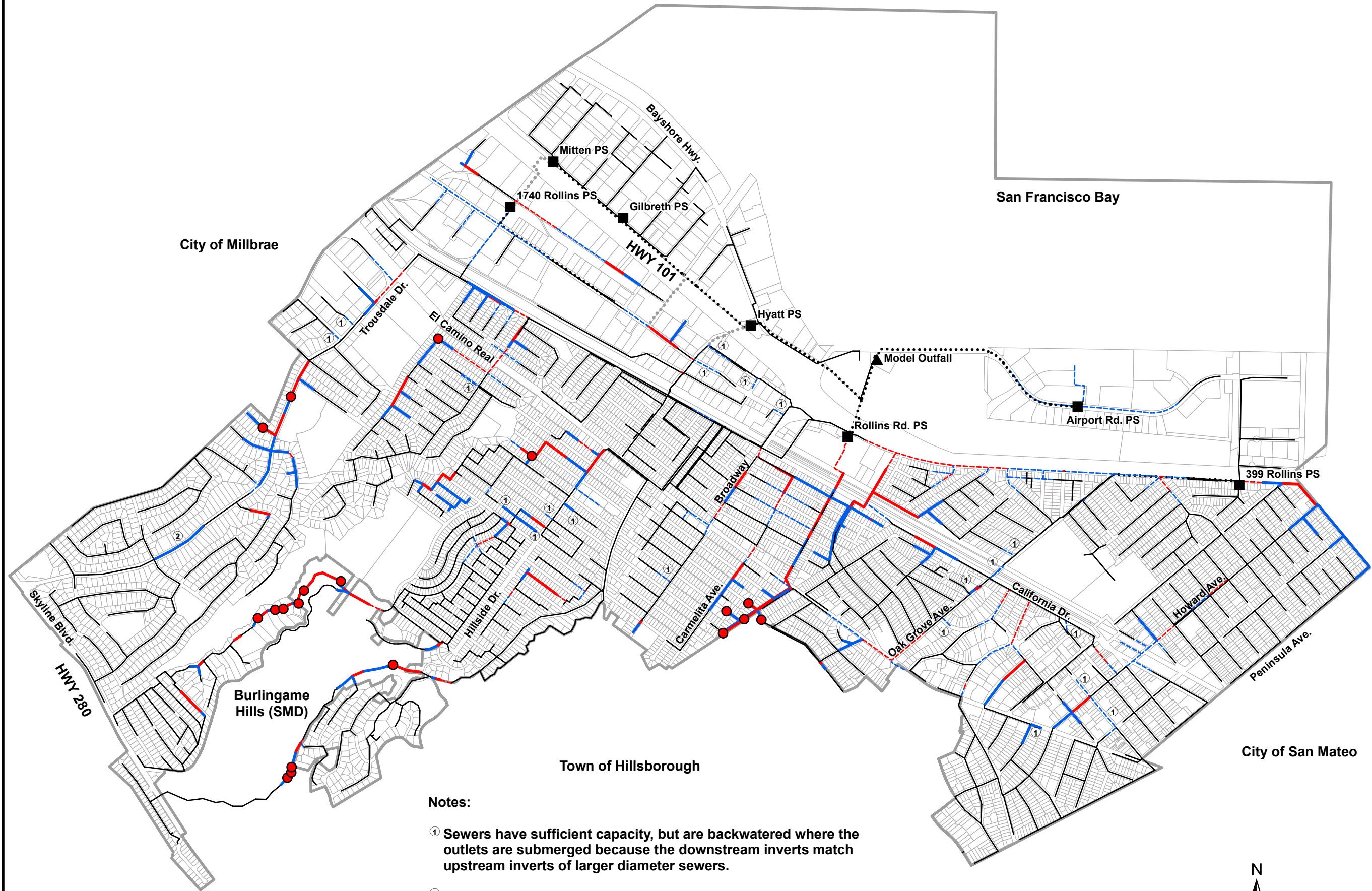
- Potential SSO Location
- WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer
- Modeled Forcemain
- Inactive Forcemain
- Throttle Surge, Freeboard < 5 ft
- Backwater Surge, Freeboard < 5 ft
- Throttle Surge w/ Sufficient Freeboard
- Backwater Surge w/ Sufficient Freeboard
- Burlingame City Limits
- Burlingame Parcels

Figure 5-9

Existing System
Performance:
Design Scenario



Last Revision: 1/13/2010



- Notes:
- ① Sewers have sufficient capacity, but are backwatered where the outlets are submerged because the downstream inverts match upstream inverts of larger diameter sewers.
 - ② High flow velocity due to steep slopes creates localized backwatering at manhole inlets. Sewers have sufficient capacity.

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Wastewater Collection
System Master Plan
Project No. 136414

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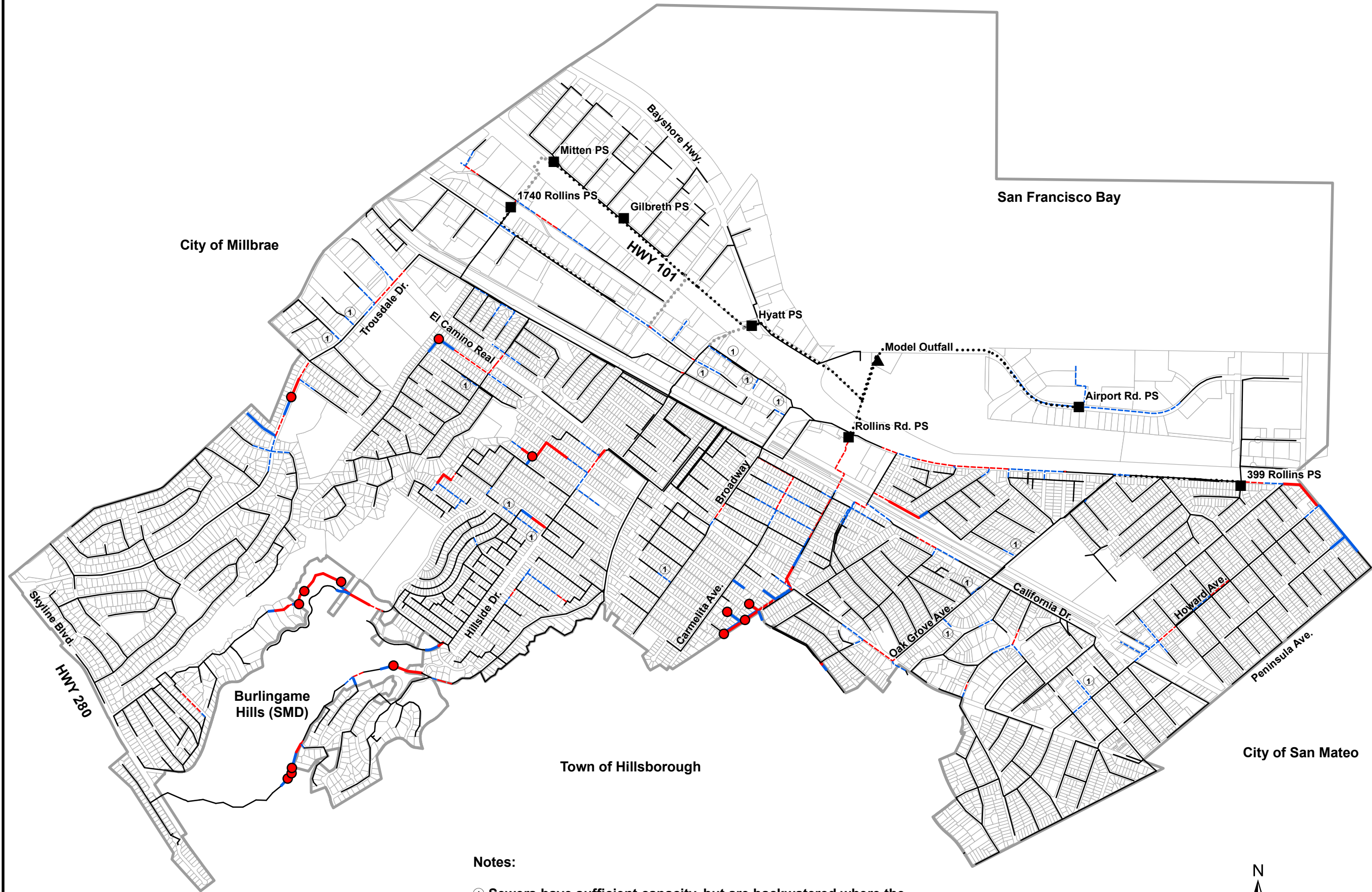
- Potential SSO Location
- WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer
- Modeled Forcemain
- Inactive Forcemain
- Throttle Surge, Freeboard < 3 ft
- Backwater Surge, Freeboard < 3 ft
- Throttle Surge w/ Sufficient Freeboard
- Backwater Surge w/ Sufficient Freeboard
- Burlingame City Limits
- Burlingame Parcels

Figure 5-10

Existing System
Performance:
Consent Decree
Scenario



Last Revision: 1/13/2010



Notes:

① Sewers have sufficient capacity, but are backwatered where the outlets are submerged because the downstream inverts match upstream inverts of larger diameter sewers.

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Table 5-9. Pump Station Capacity Evaluation

Pump Station	Estimated Firm Capacity* (mgd)	Design Scenario		Consent Decree Scenario	
		PWWF (mgd)	Potential Capacity Deficiency (mgd)	PWWF (mgd)	Potential Capacity Deficiency (mgd)
399 Rollins	0.88	0.82	-	0.81	-
1740 Rollins	1.44	1.96	0.52	1.56	0.12
Mitten	0.48	0.15	-	0.15	-
Gilbreth	0.59	0.33	-	0.35	-
Hyatt	0.28	0.29	-	0.29	-
Airport Rd.	0.27	0.38	0.11	0.38	0.11

* Firm capacity was estimated by the City based on totalizing flow meters and field draw-down tests with one pump out of service.

5.8.3.3 Forcemains

Table 5-10 summarizes the PWWFs and peak velocities experienced in the forcemains in the existing collection system. All of the forcemains have peak velocities under eight fps and adequate hydraulic capacity. The lowest velocity required to keep grit moving is 2.0 fps and the velocity desirable to re-suspend settled solids is 3.5 fps, therefore, low peak velocities in the Airport Road and Hyatt forcemains may cause maintenance issues.

Table 5-10. Forcemain Peak Velocities

Forcemain		Diameter (in)	PWWF (mgd)	Peak Velocity (fps)
From	To			
Mitten PS	Gilbreth PS	8	0.48	2.13
Gilbreth PS	Hyatt PS	12	1.07	2.11
Hyatt PS	WWTP	16	1.35	1.49
1740 Rollins PS	MH B4-21043	10	1.44	4.09
399 Rollins Rd PS	MH D7-21012	10	0.88	2.50
Airport Rd. PS	WWTP	8	0.27	1.20

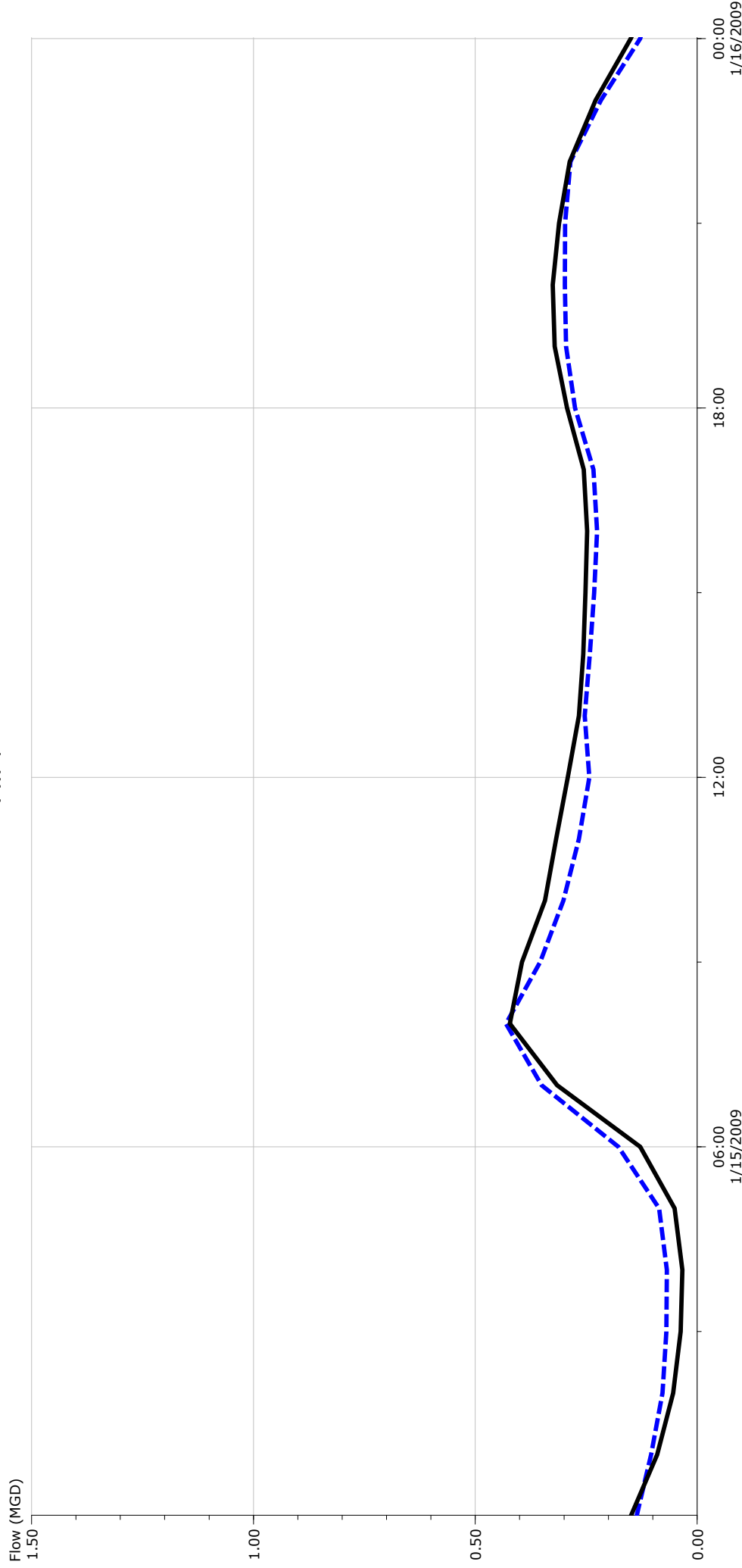
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ATTACHMENT A: DRY WEATHER CALIBRATION HYDROGRAPHS

Dry Weather Calibration Results

From: 1/15/2009 00:00

To: 1/16/2009 00:00



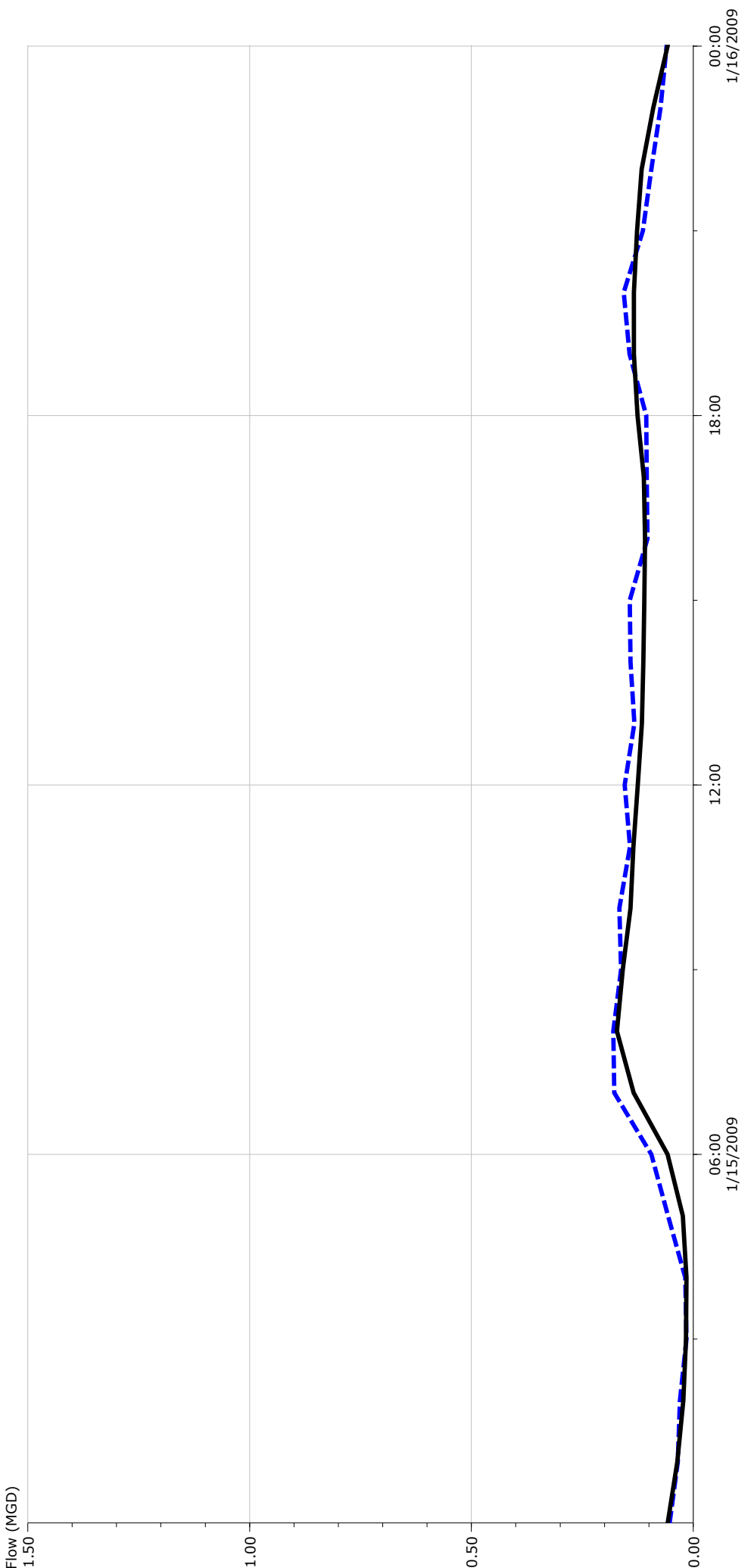
	Flow (MGD)		Volume (US Mgal)
	Min	Max	
Obs.	0.068	0.431	0.235
>Burlingame CS>Run Group>V103 DWF-Calibration>DWF	0.033	0.422	0.243

Results Report

Powered by

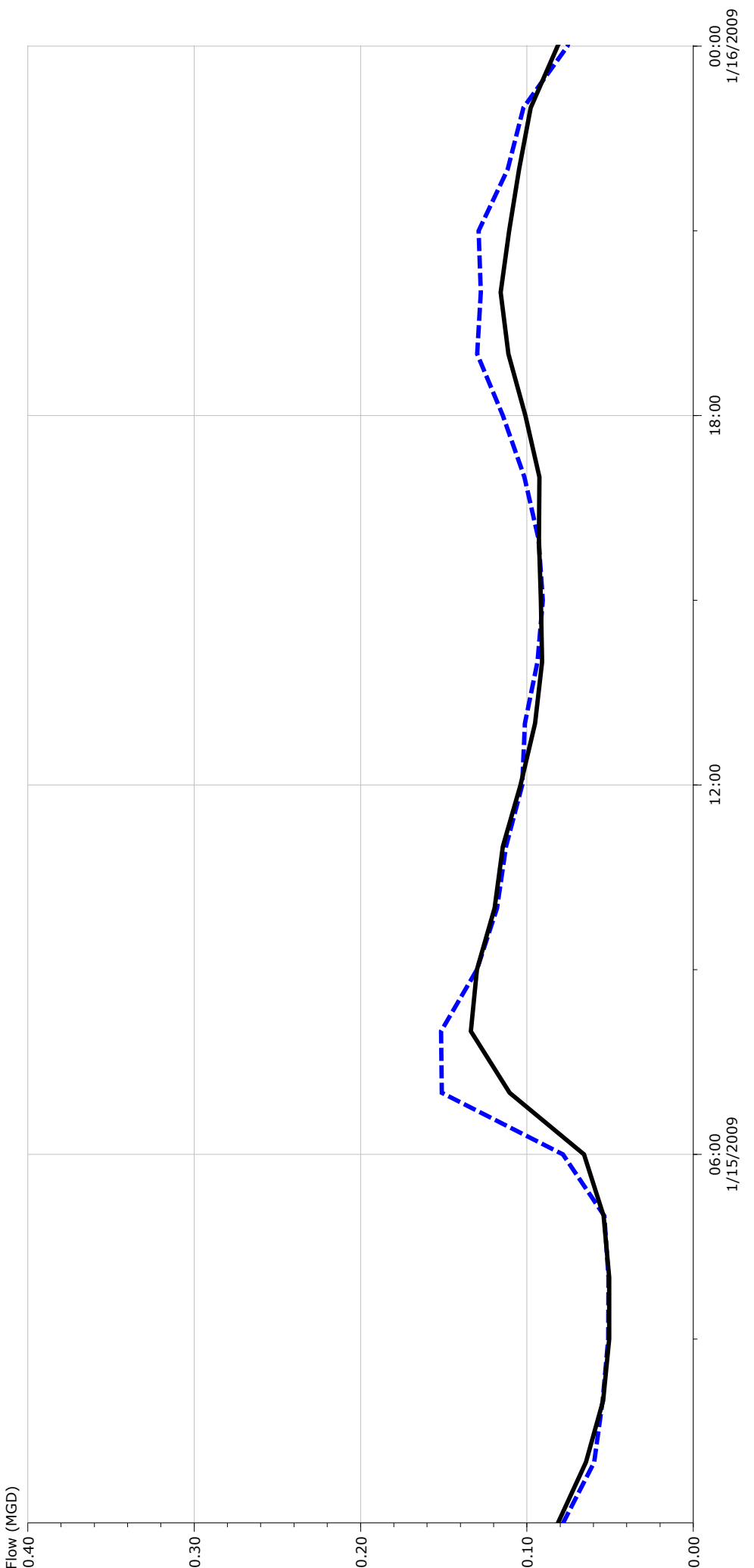


FM 2



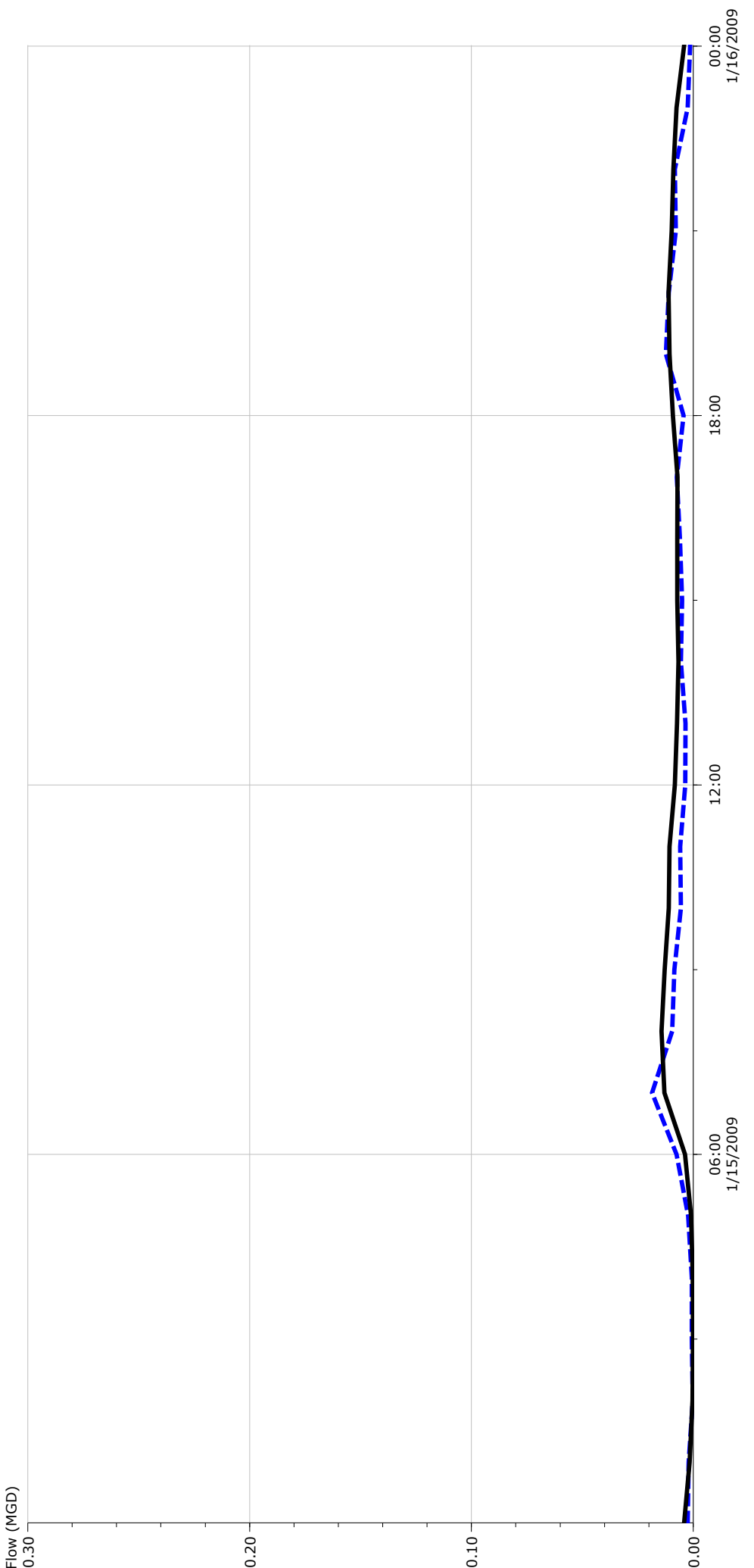
	Flow (MGD)		Volume (US Mgal)	
	Min	Max		
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	0.015	0.180	0.111	
	0.015	0.172	0.102	

FM 3



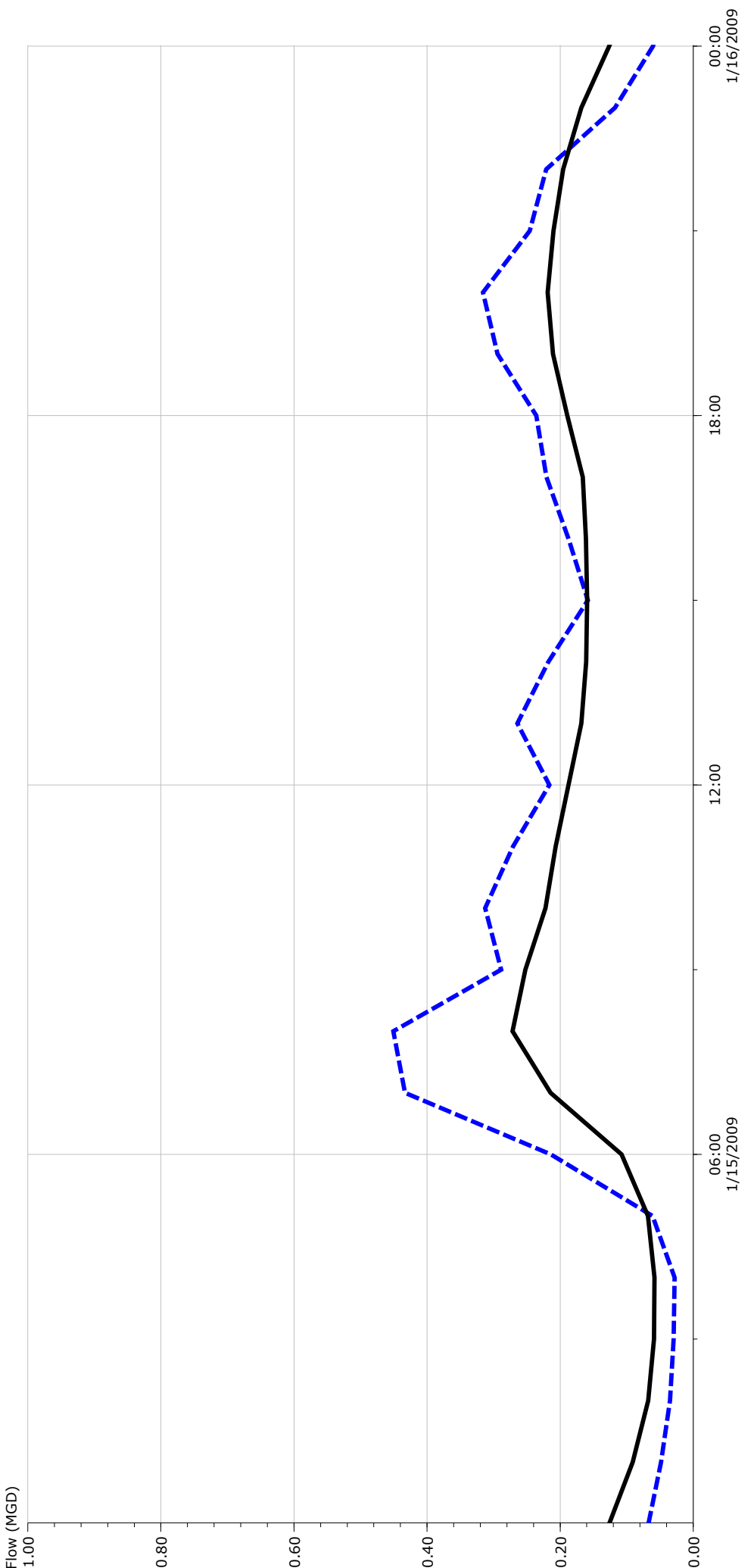
	Flow (MGD)		Volume (US Mgal)
	Min	Max	
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	0.051	0.152	0.103
	0.051	0.134	0.097

FM 4



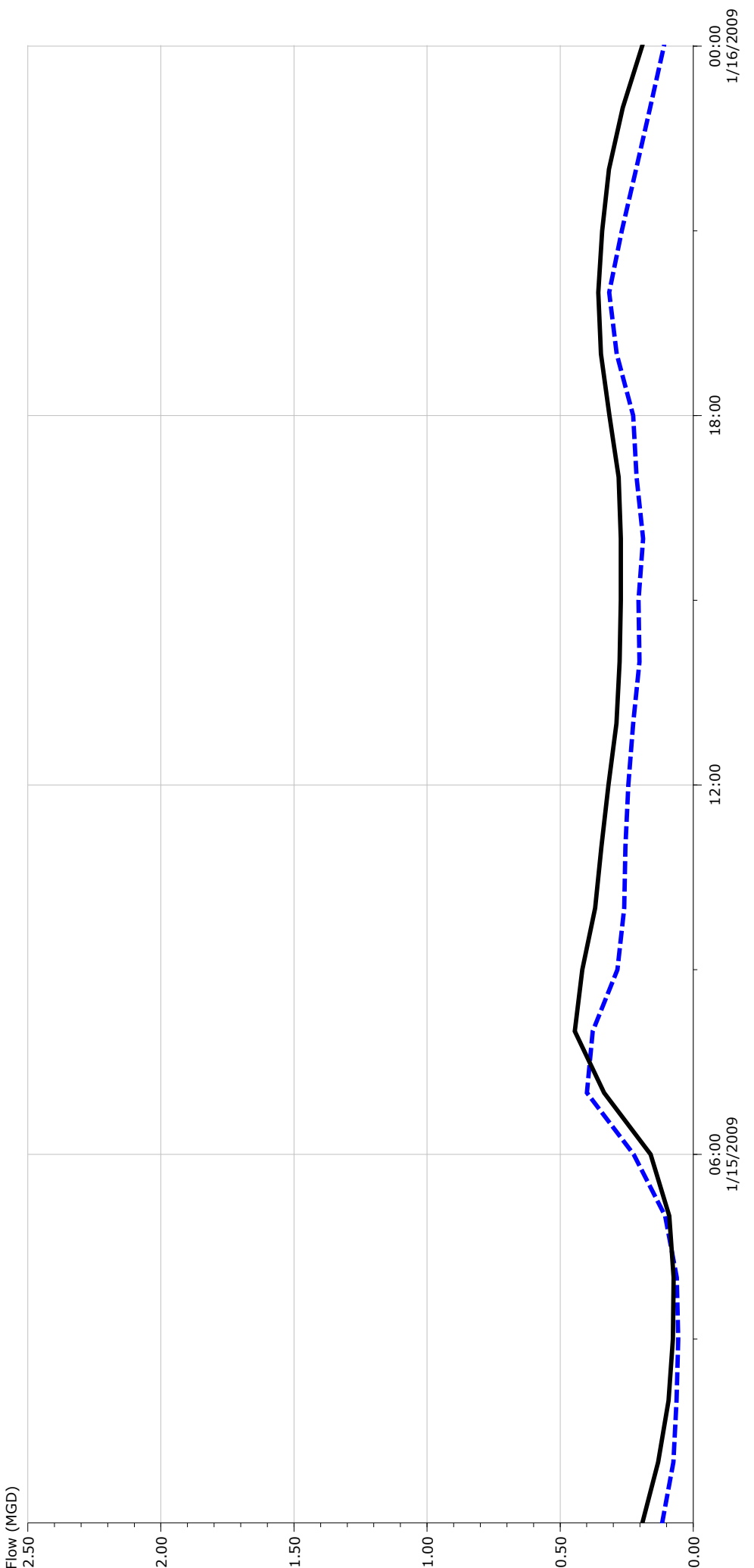
	Flow (MGD)		Volume (US Mgal)
	Min	Max	
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	0.000	0.019	0.006
	0.000	0.014	0.007

FM 5



	Obs.	Flow (MGD)		Volume (US Mgal)	
		Min	Max		
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF		0.028	0.451	0.208	
		0.058	0.272	0.169	

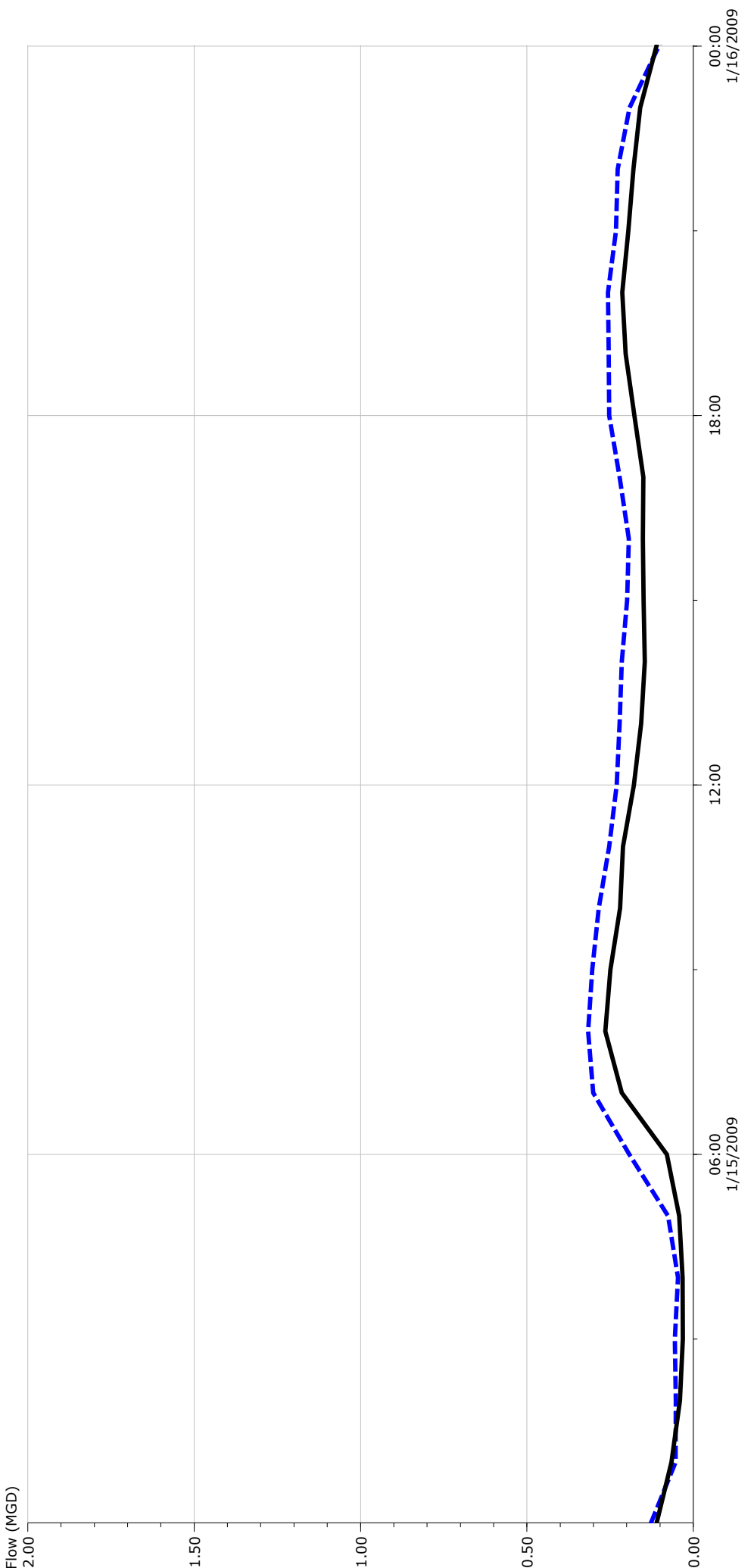
FM 6



>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	Obs.				
		Min	Max		Volume (US Mgal)
		0.056	0.400		0.214
		0.073	0.445		0.274

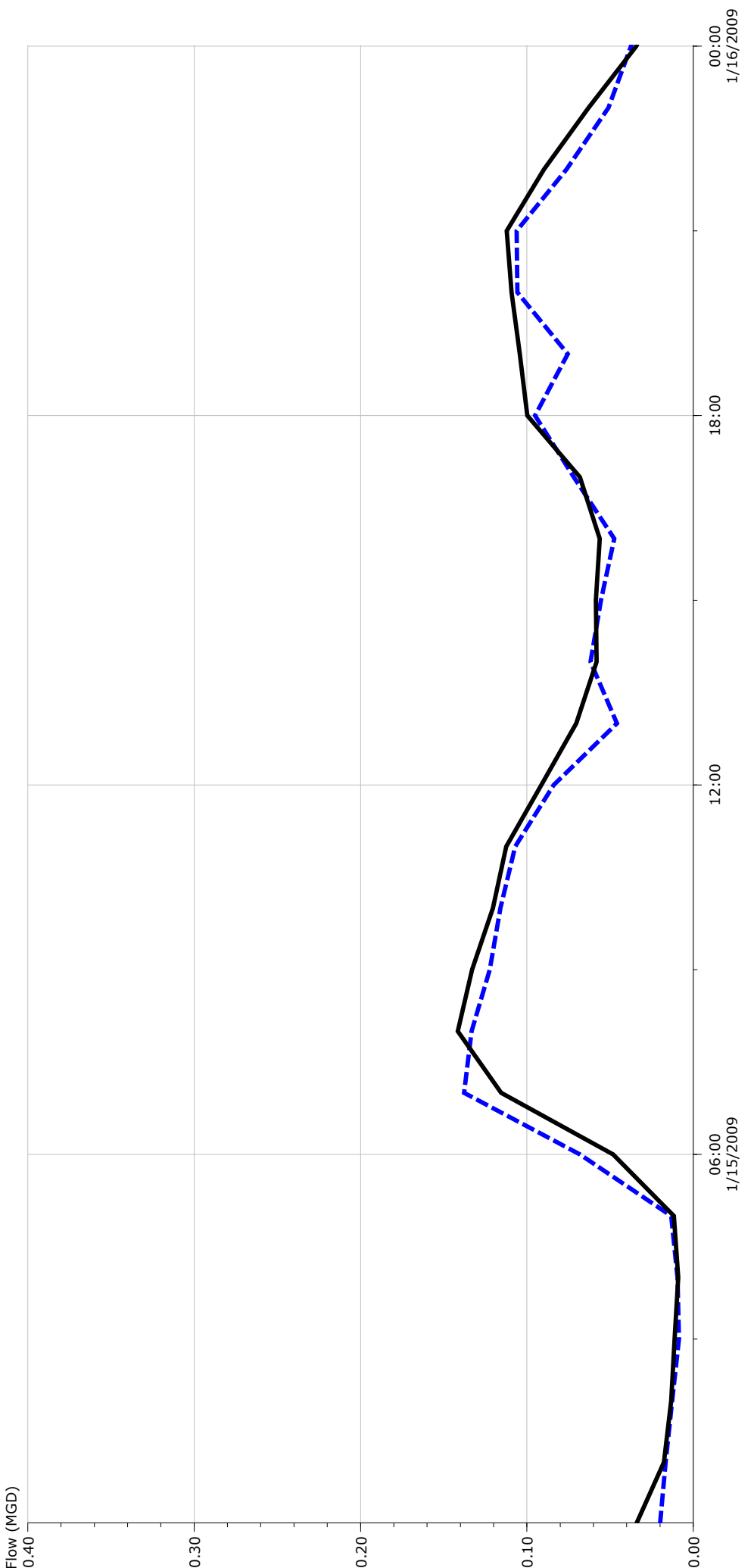
Results Report

FM 7



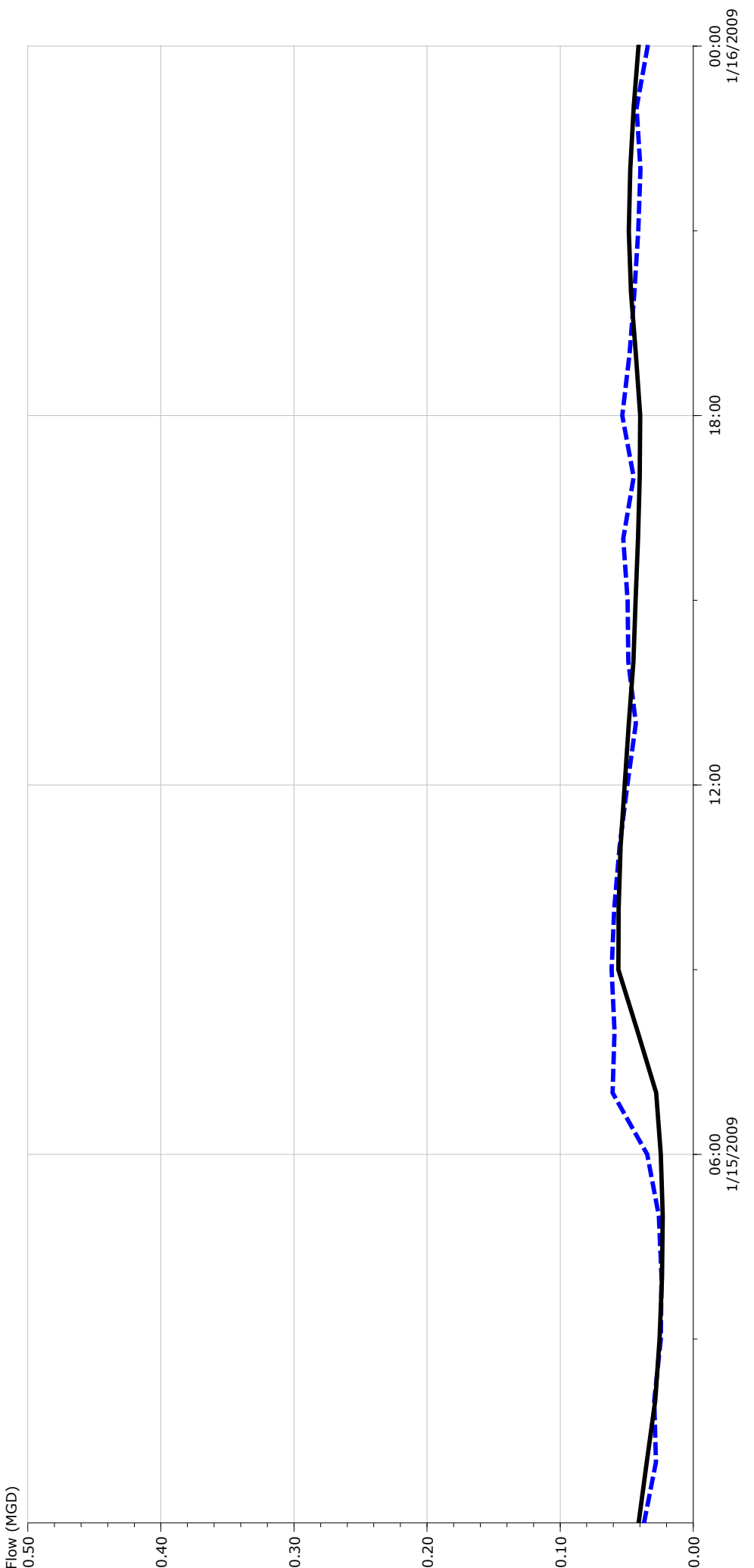
	Flow (MGD)		Volume (US Mgal)	
	Min	Max	Min	Max
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	0.046	0.316	0.202	
	0.031	0.264	0.155	

FM 8



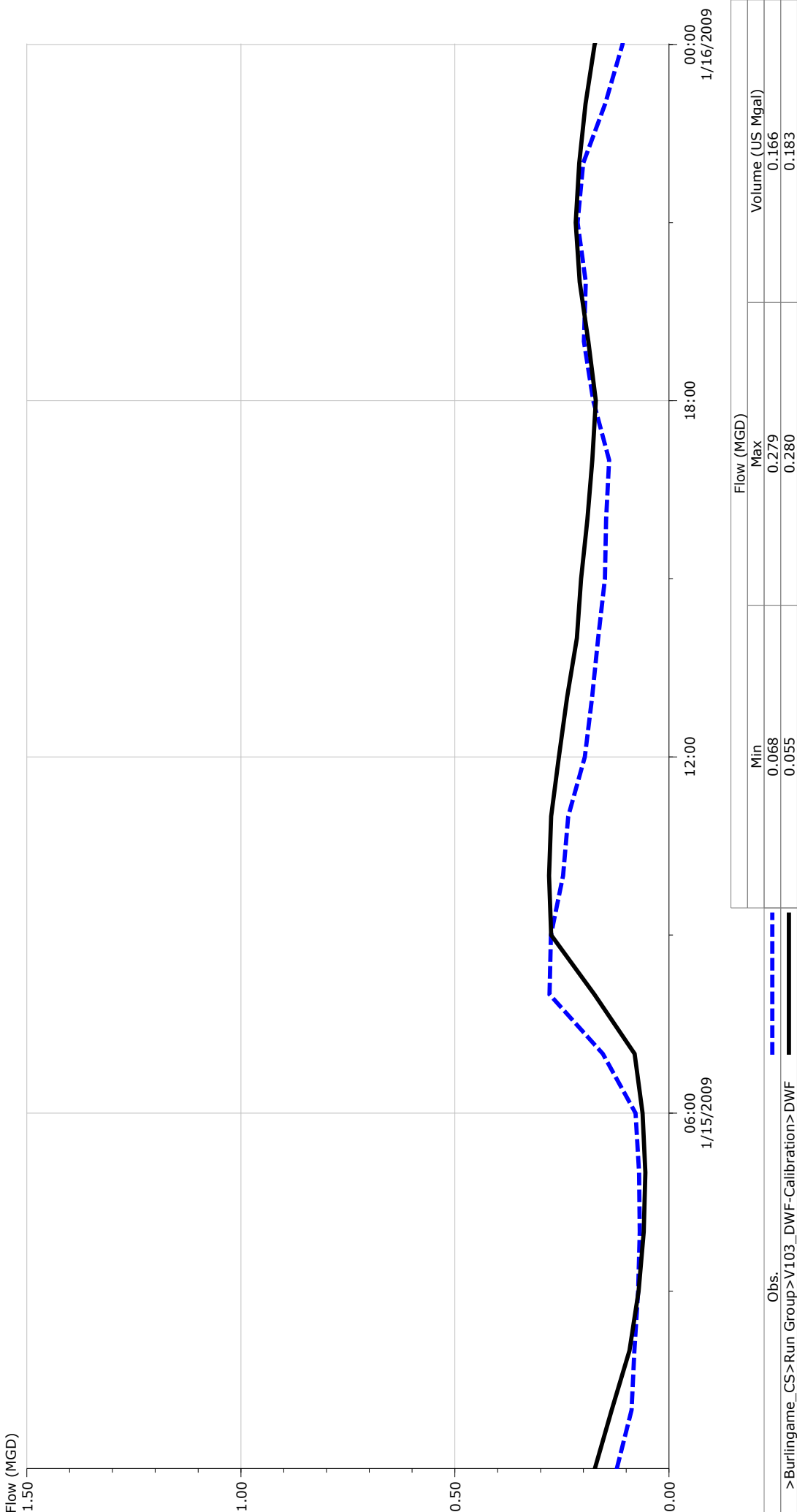
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	Flow (MGD)		Volume (US Mgal)
	Min	Max	
Obs.	0.009	0.138	0.070
Predicted	0.009	0.142	0.074

FM 9



	Flow (MGD)		Volume (US Mgal)	
	Min	Max		
>Burlingame_CS>Run Group>V103_DWF-Calibration>DWF	0.024	0.061	0.045	
	0.023	0.056	0.042	

FM 10

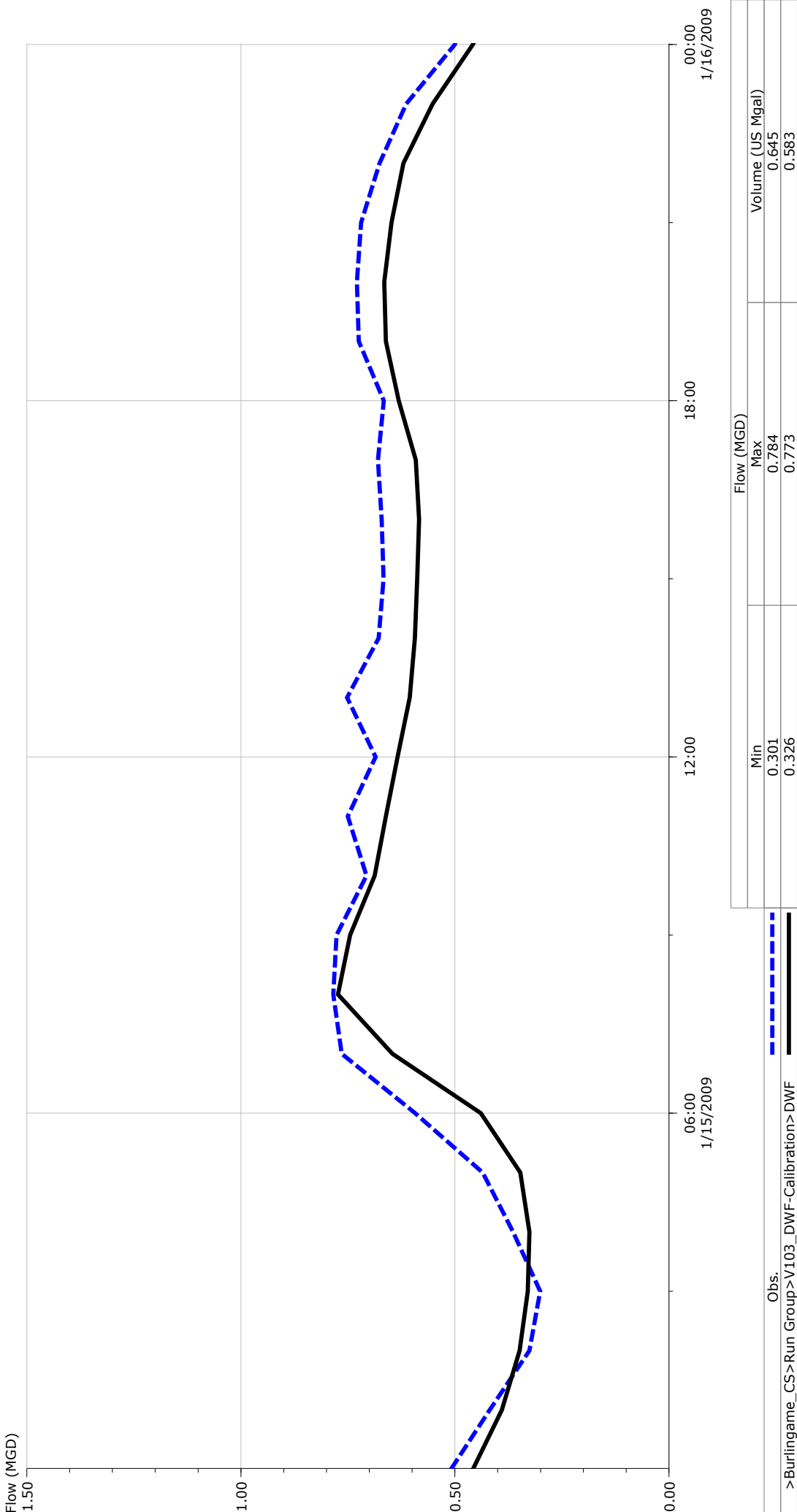


Results Report

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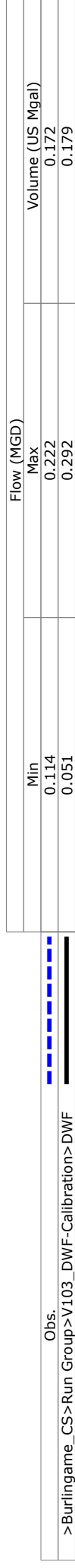
FM 11



Results Report

Powered by

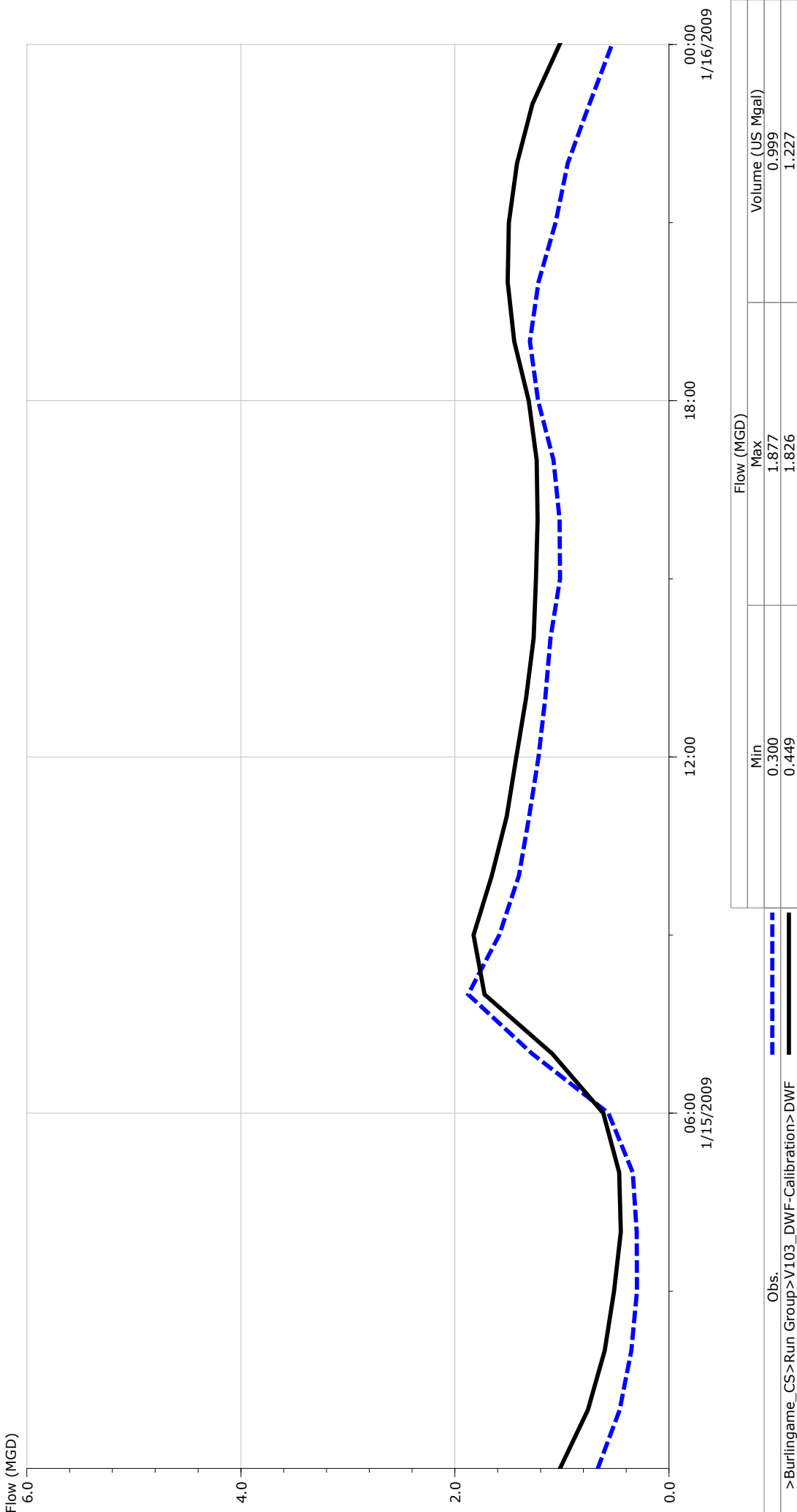




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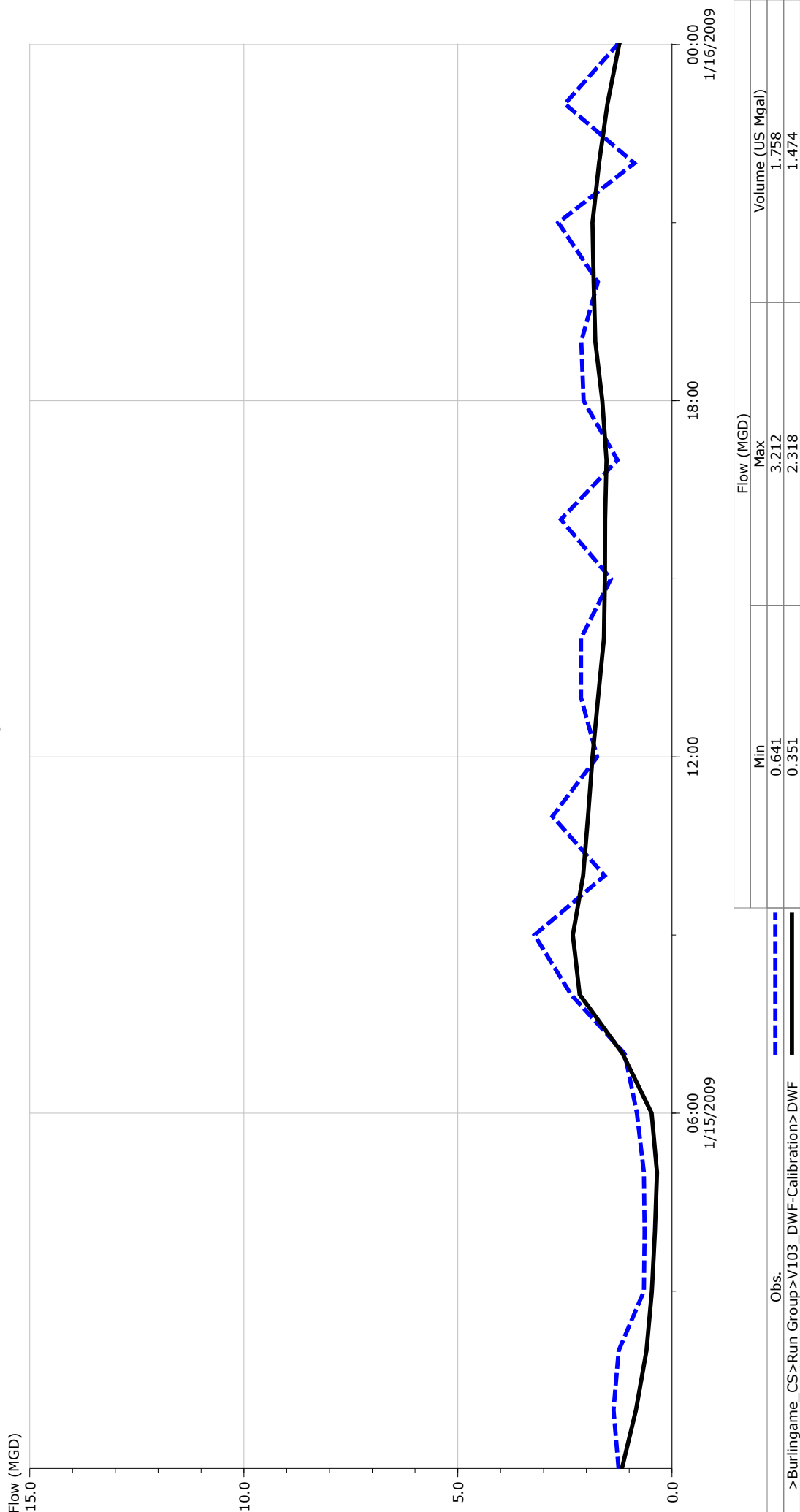


FM 14



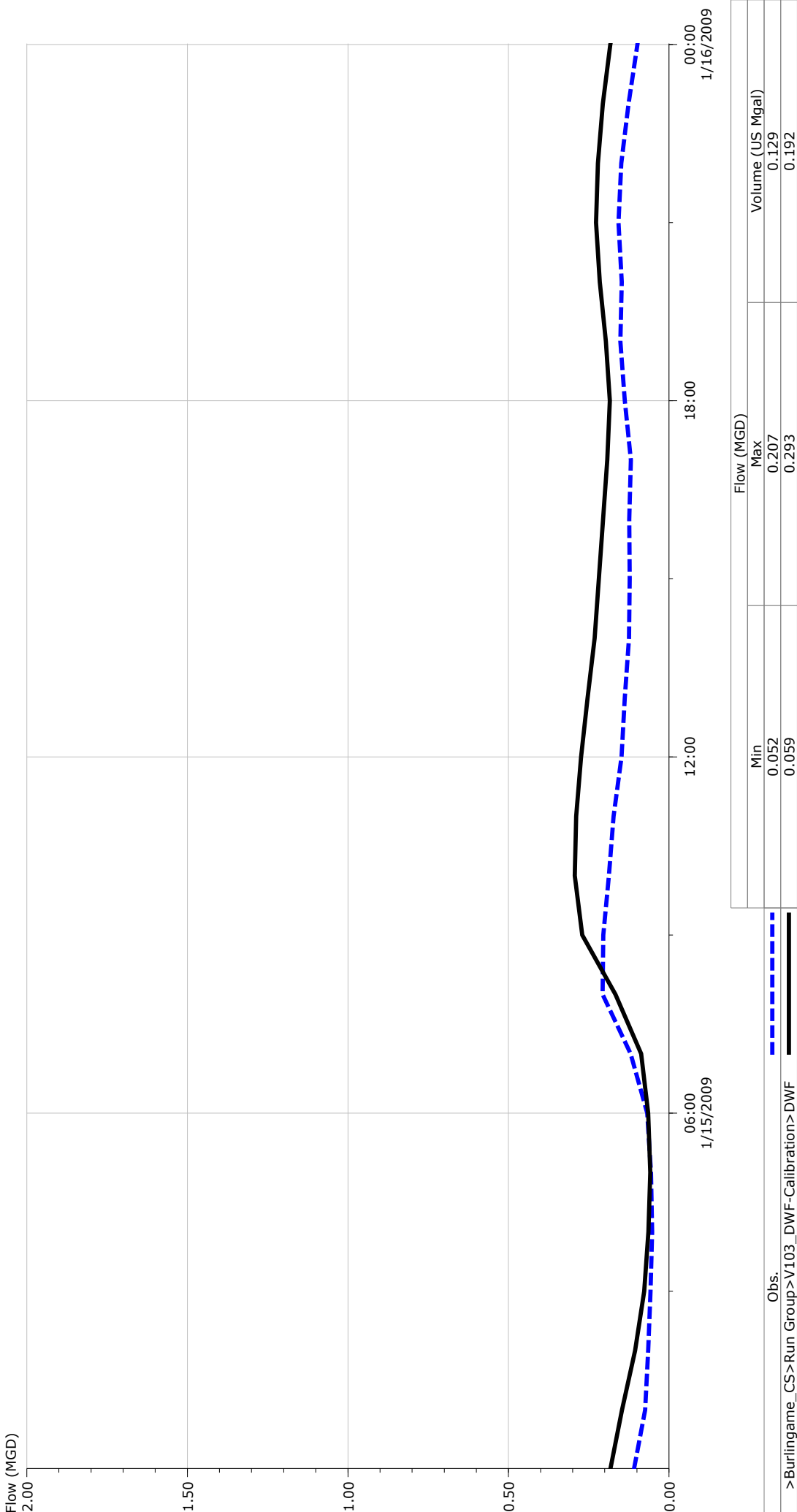
Results Report

FM 15



Results Report

FM 16

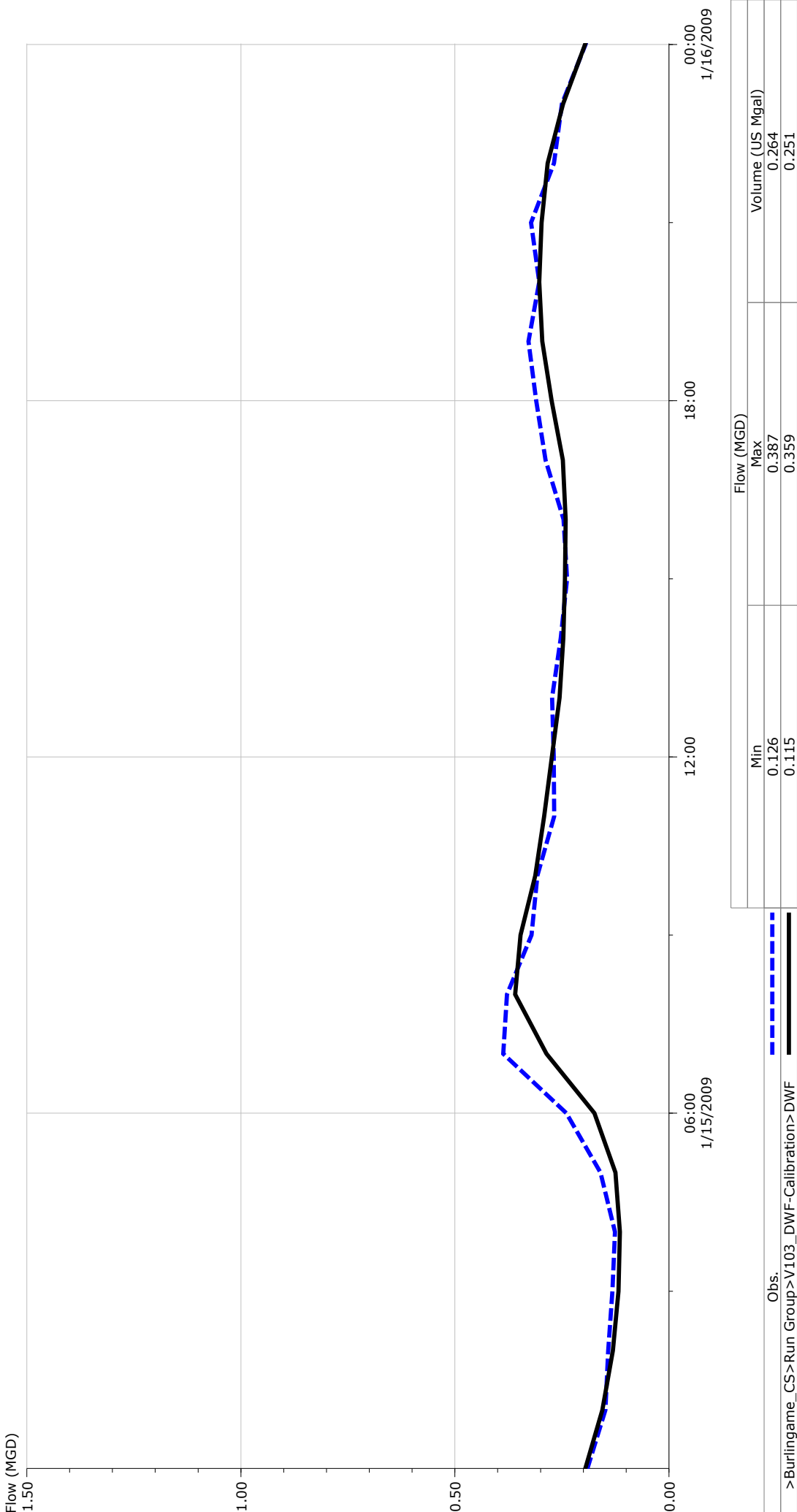


Results Report

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FM 17

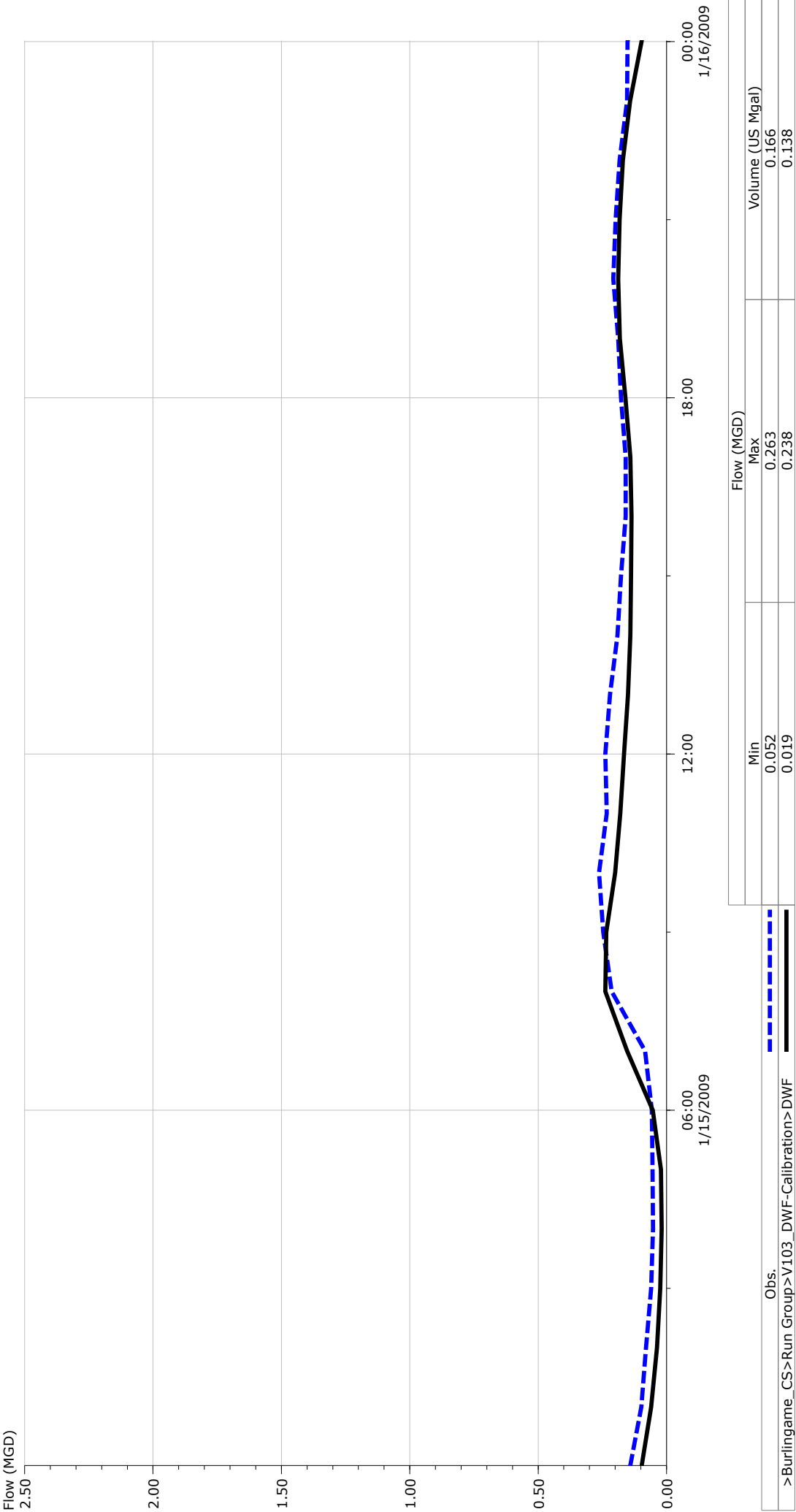


Results Report

Powered by



FM Floribunda



Results Report

Powered by



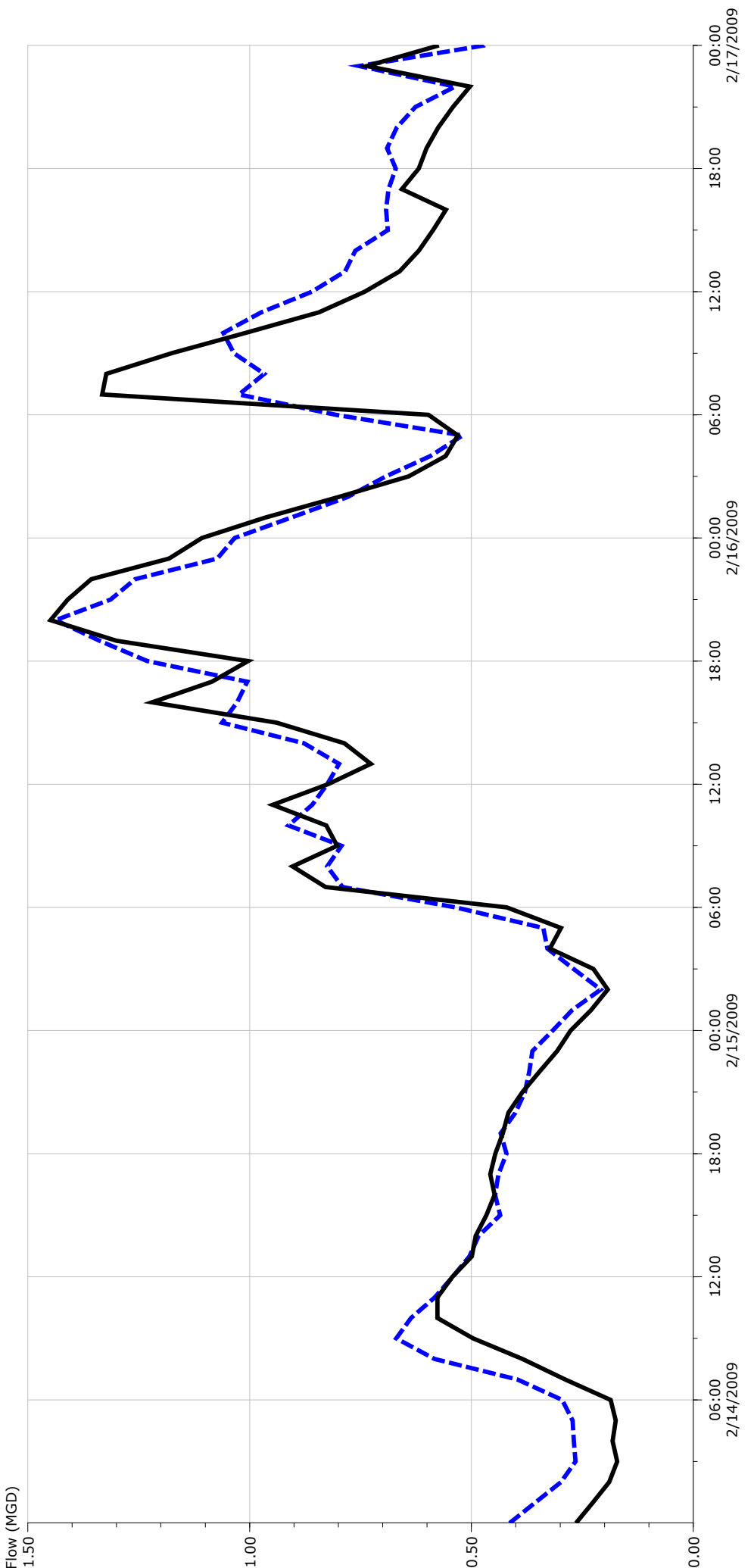
ATTACHMENT B: WET WEATHER CALIBRATION HYDROGRAPHS

Wet Weather Calibration Results

From: 2/14/2009 00:00

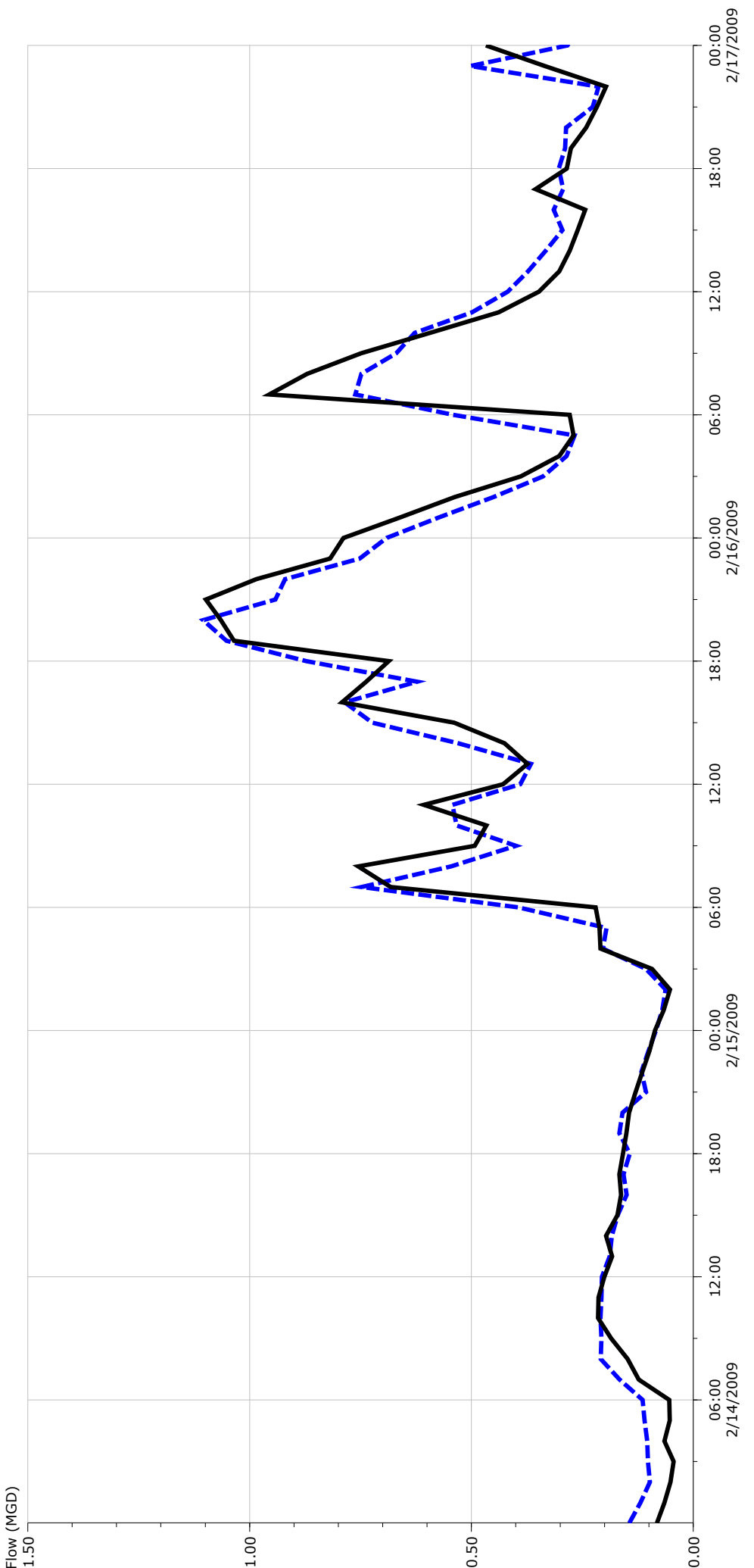
To: 2/17/2009 00:00

FM 1



Obs.	Flow (MGD)		Volume (US Mgal)
	Min	Max	
	0.208	1.437	2.053
Modeled	0.171	1.449	1.956

FM 2



Obs.	Flow (MGD)		Volume (US Mgal)
	Min	Max	
	0.062	1.104	1.135
Modeled	0.044	1.099	1.103

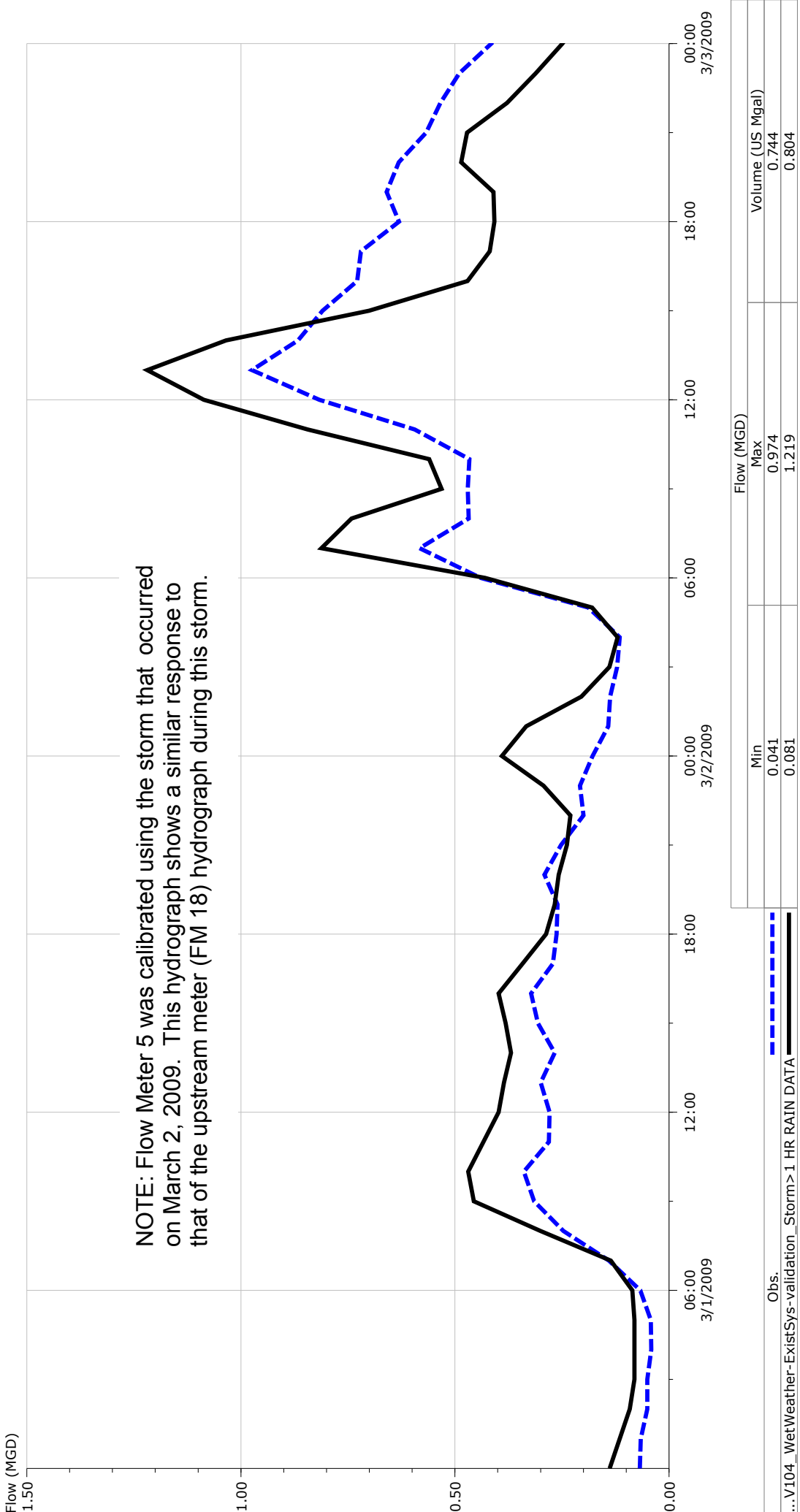


Results Report

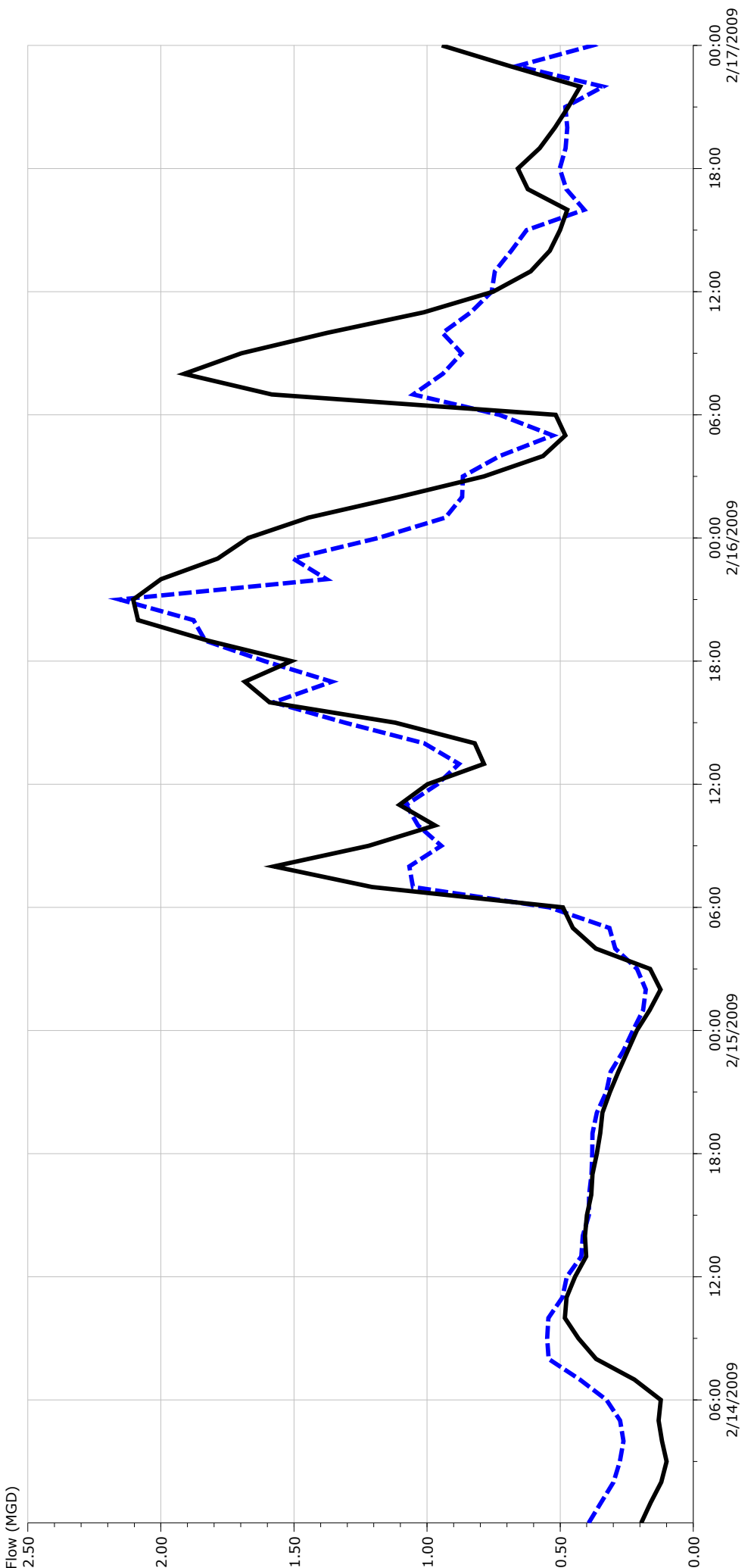
Powered by



FM 5

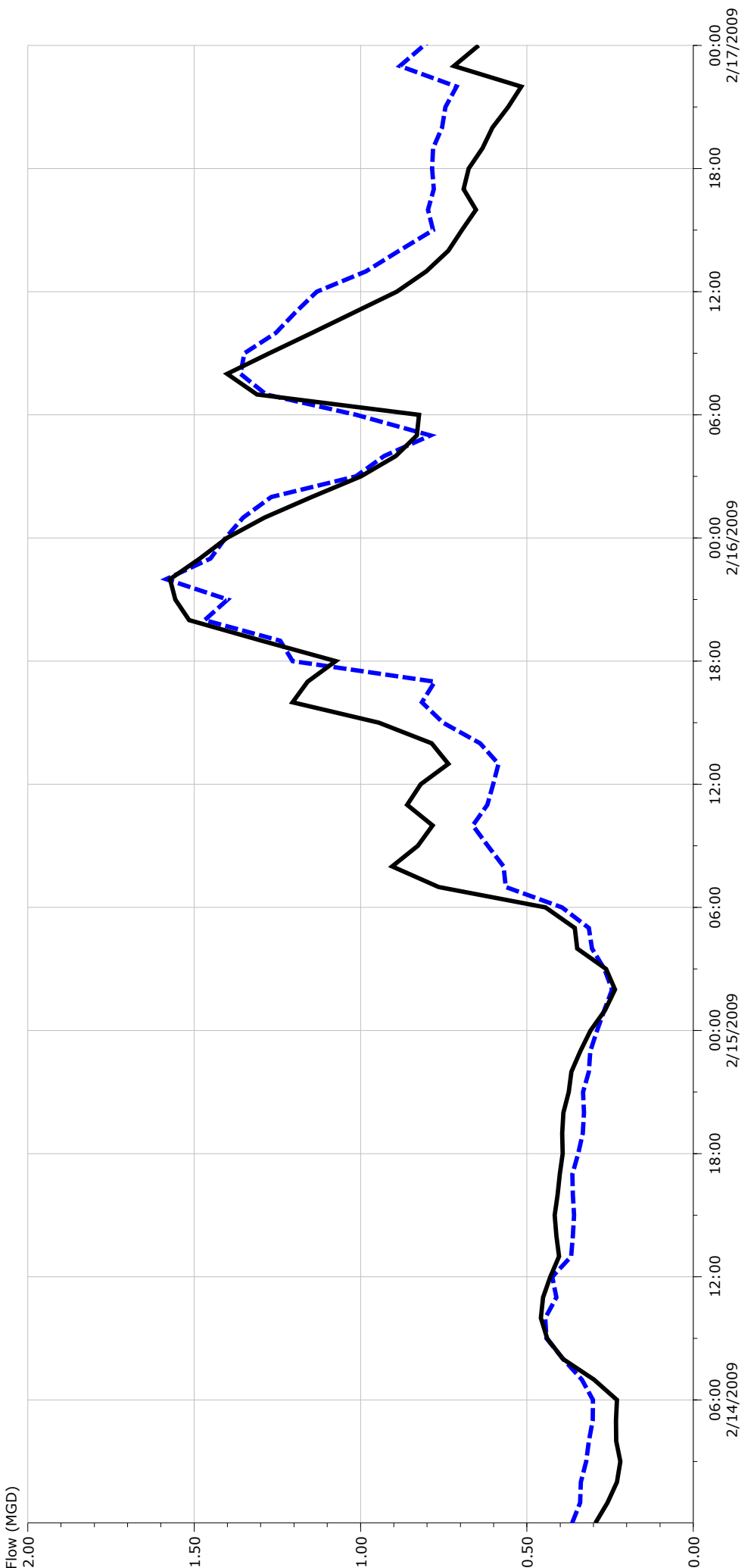


FM 6



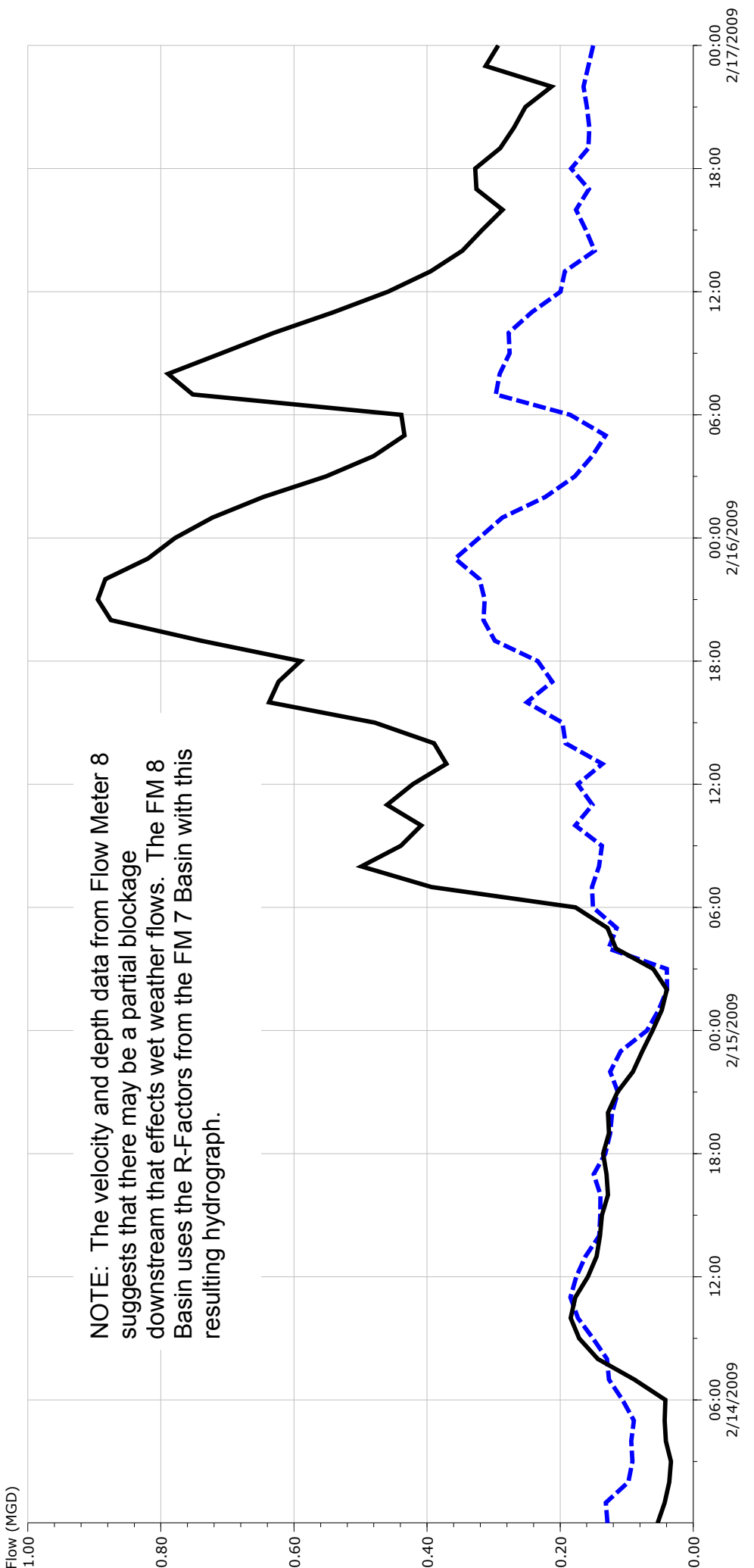
Obs.		Flow (MGD)		Volume (US Mgal)	
Modeled		Min	Max		
		0.178	2.155	2.137	
		0.100	2.104	2.290	

FM 7



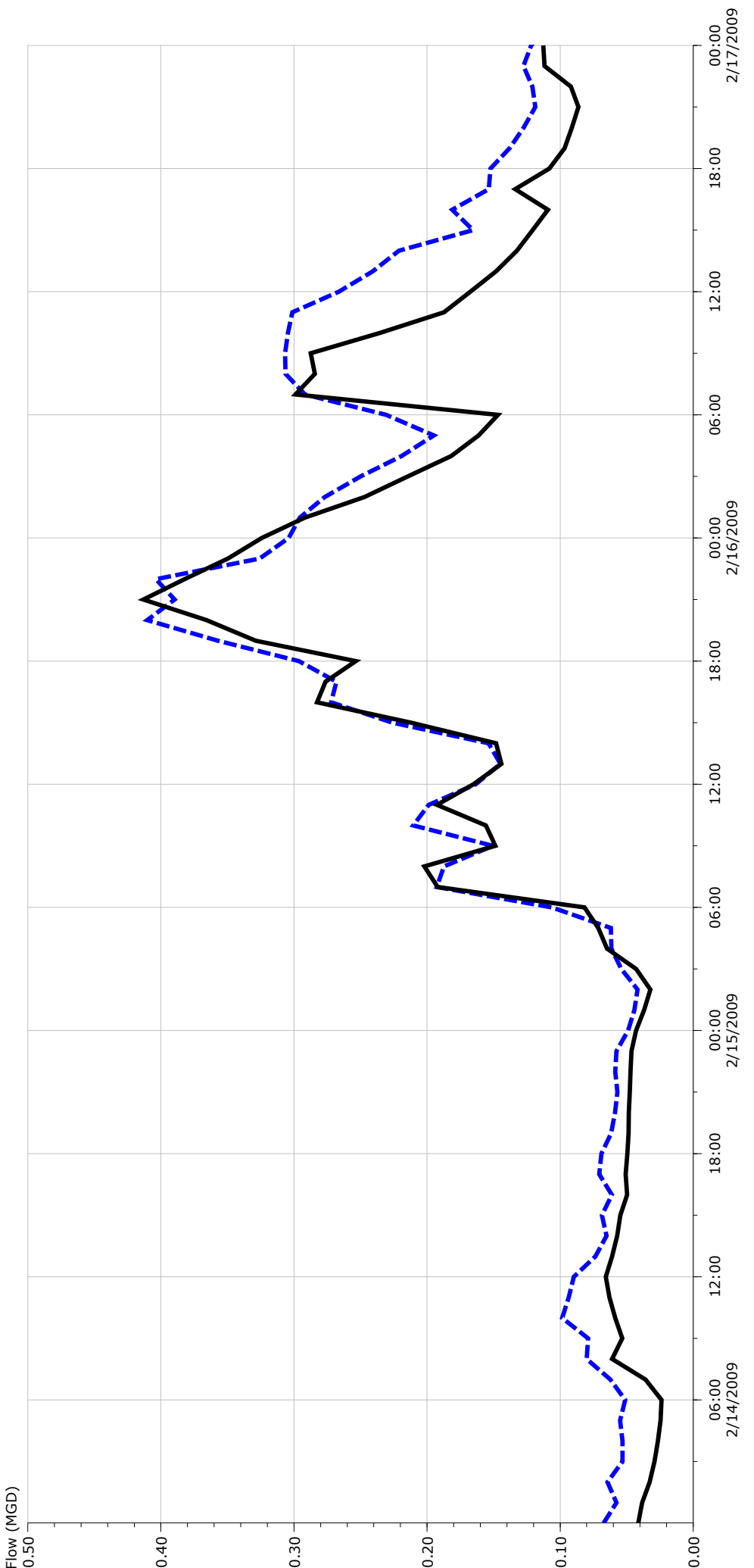
Obs.	Flow (MGD)		Volume (US Mgal)	
	Min	Max	Min	Max
	0.244	1.584	2.142	2.119
Modeled	0.219	1.573		

FM 8



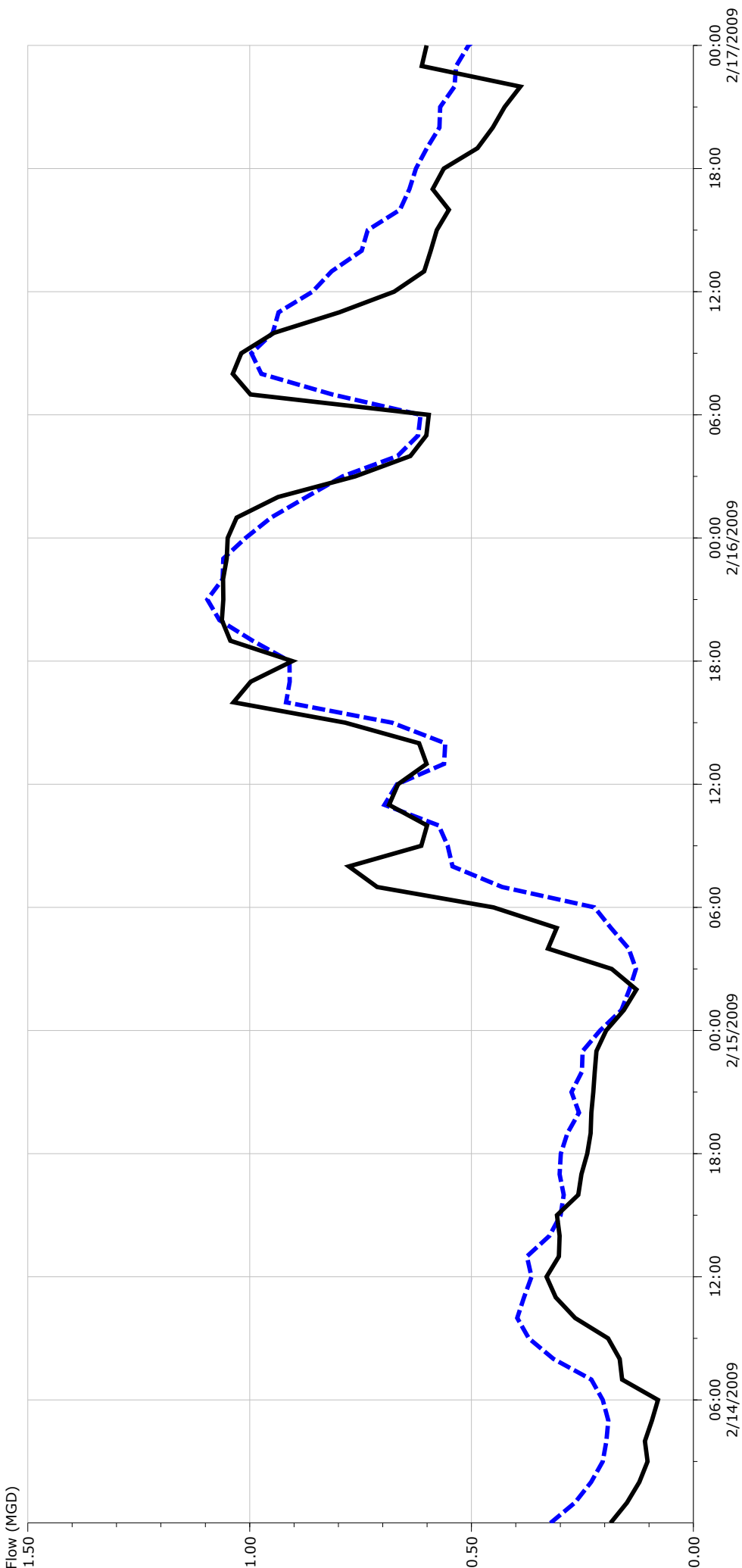
Obs. Modeled	<div><div></div><div></div></div>	Flow (MGD)		Volume (US Mgal)		
		Min	Max			
				0.039	0.358	0.522
				0.033	0.895	1.021

FM 9



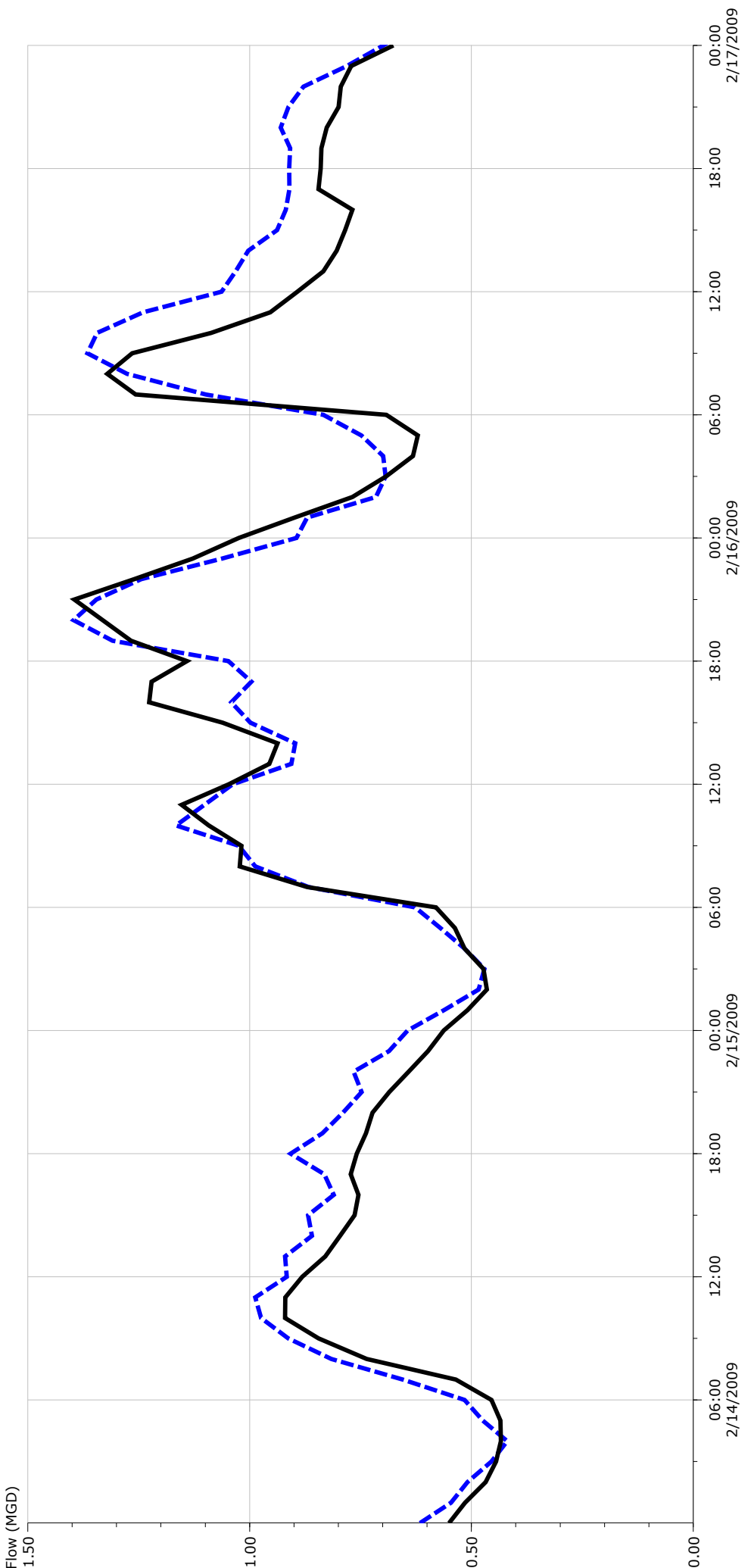
	Flow (MGD)		Volume (US Mgal)
	Min	Max	
Obs.	0.042	0.410	0.493
Modeled	0.024	0.413	0.416

FM 10



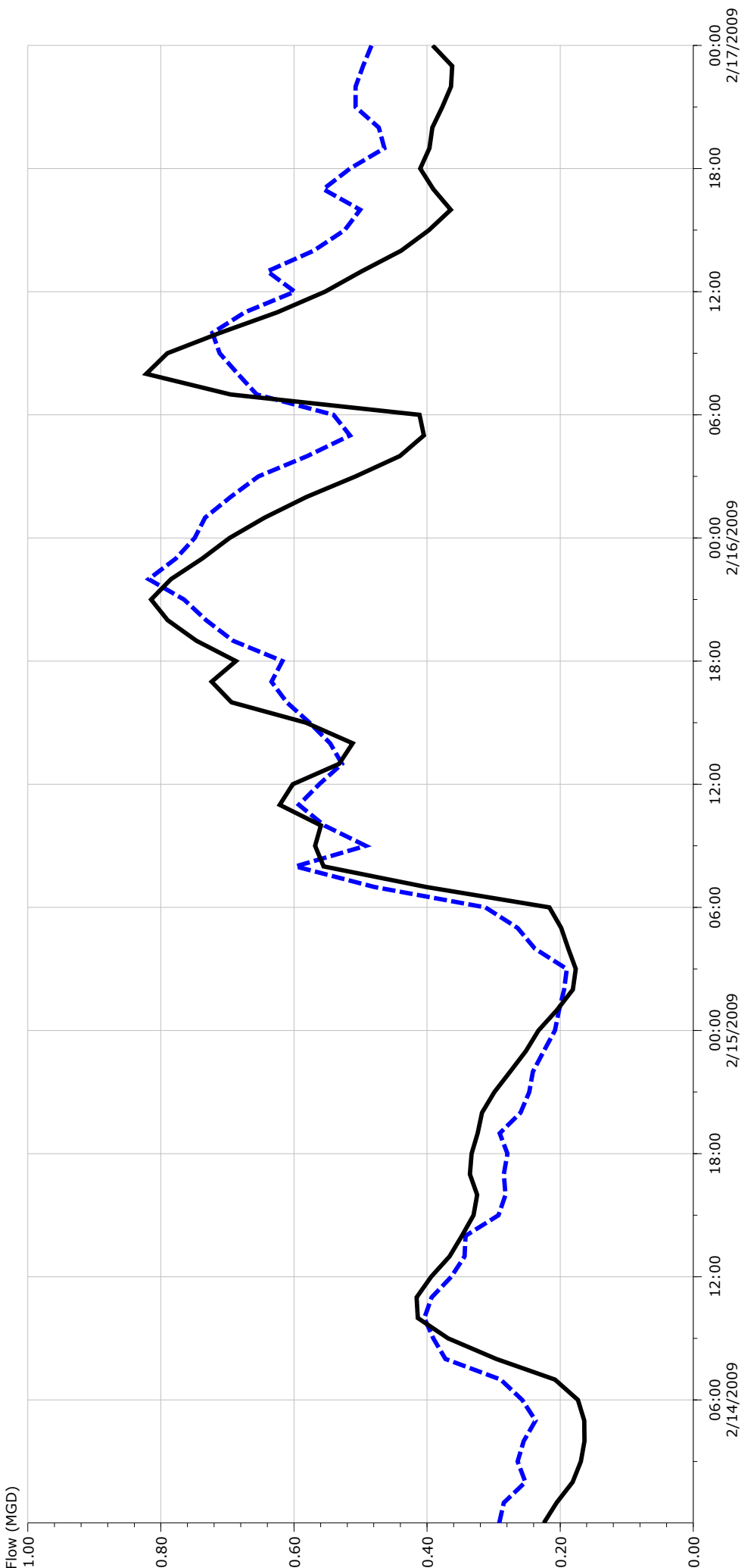
Flow (MGD)		Volume (US Mgal)	
Obs.	Modeled	Min	Max
		0.129	1.095
		0.079	1.063
			1.669
			1.592

FM 11



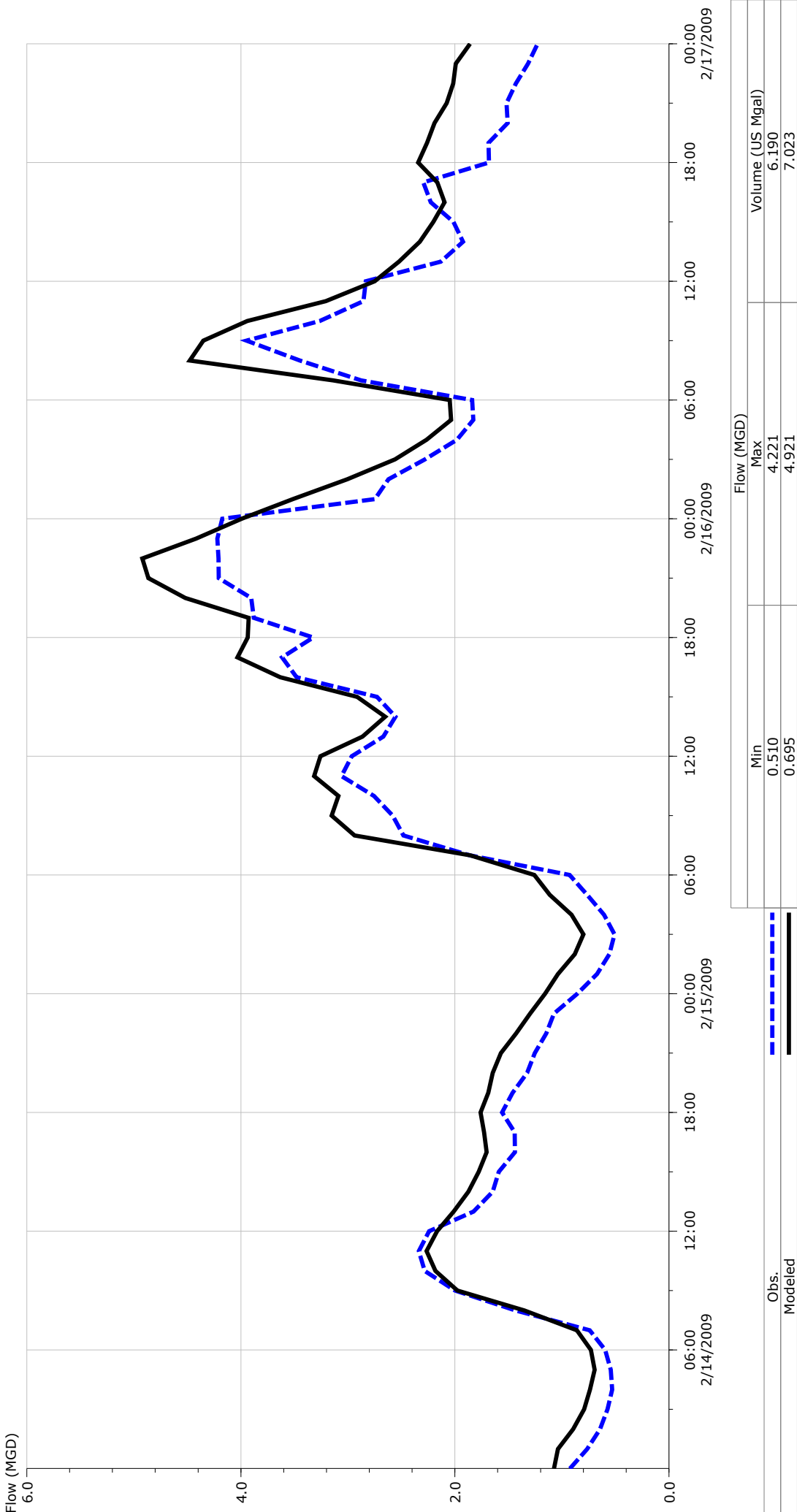
	Flow (MGD)		Volume (US Mgal)
	Min	Max	
Obs.	0.420	1.397	2.659
Modeled	0.433	1.395	2.501

FM 13

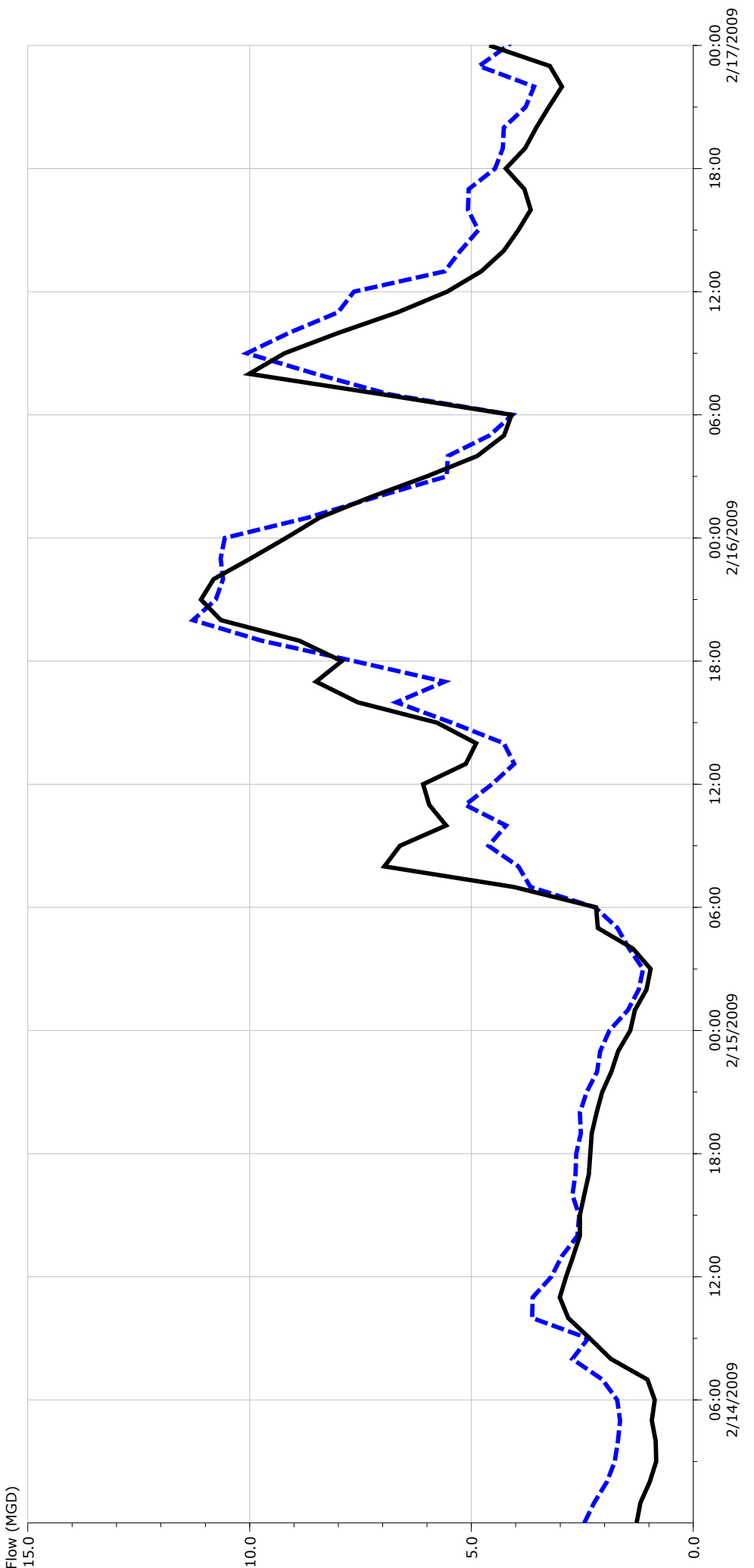


Obs.		Modeled	
Flow (MGD)		Volume (US Mgal)	
Min		Max	
0.190		0.818	
0.164		0.822	
		1.424	
		1.315	

FM 14



FM 15



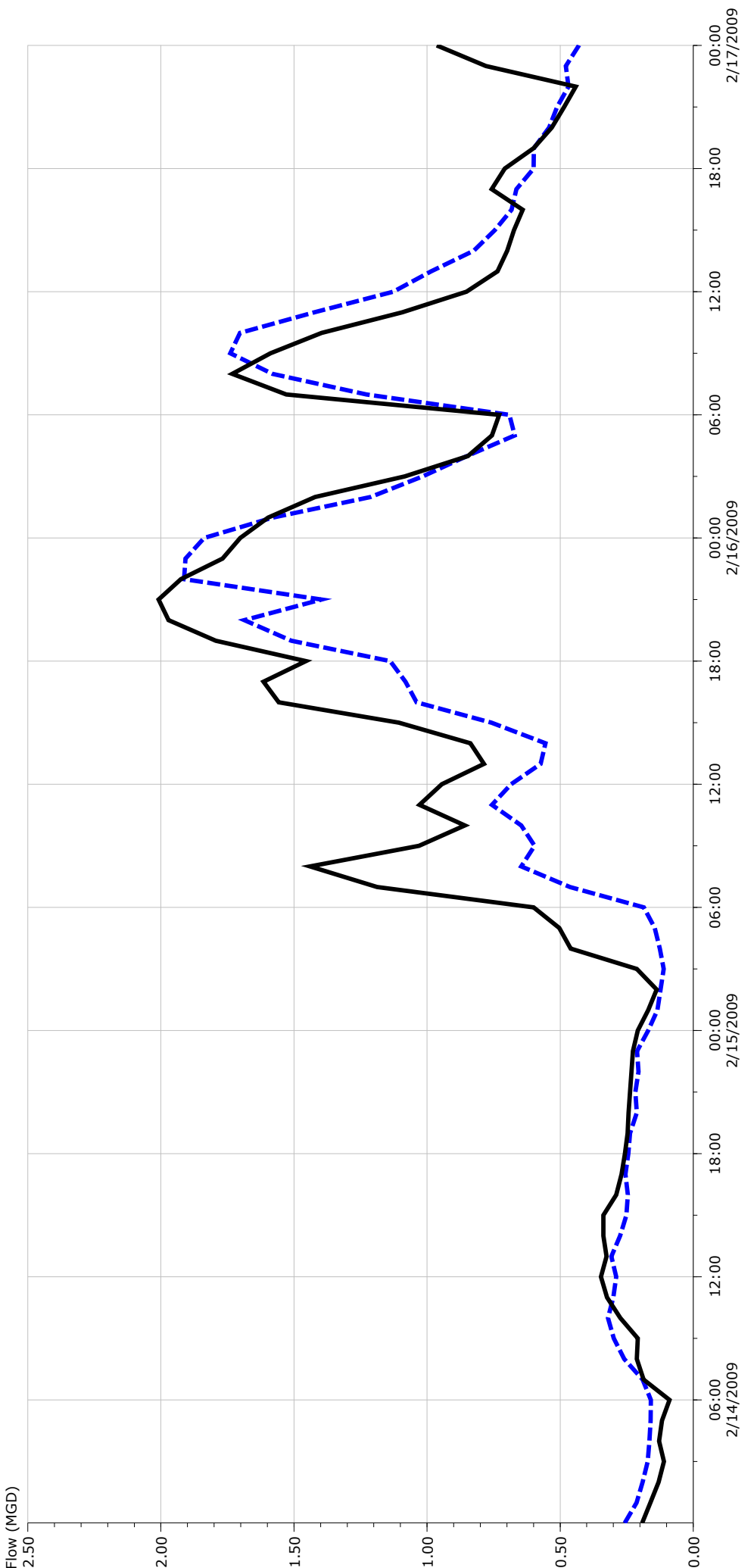
Obs.	Flow (MGD)		Volume (US Mgal)
	Min	Max	
	1.128	11.273	13.972
	0.838	11.095	13.182

Results Report

Powered by

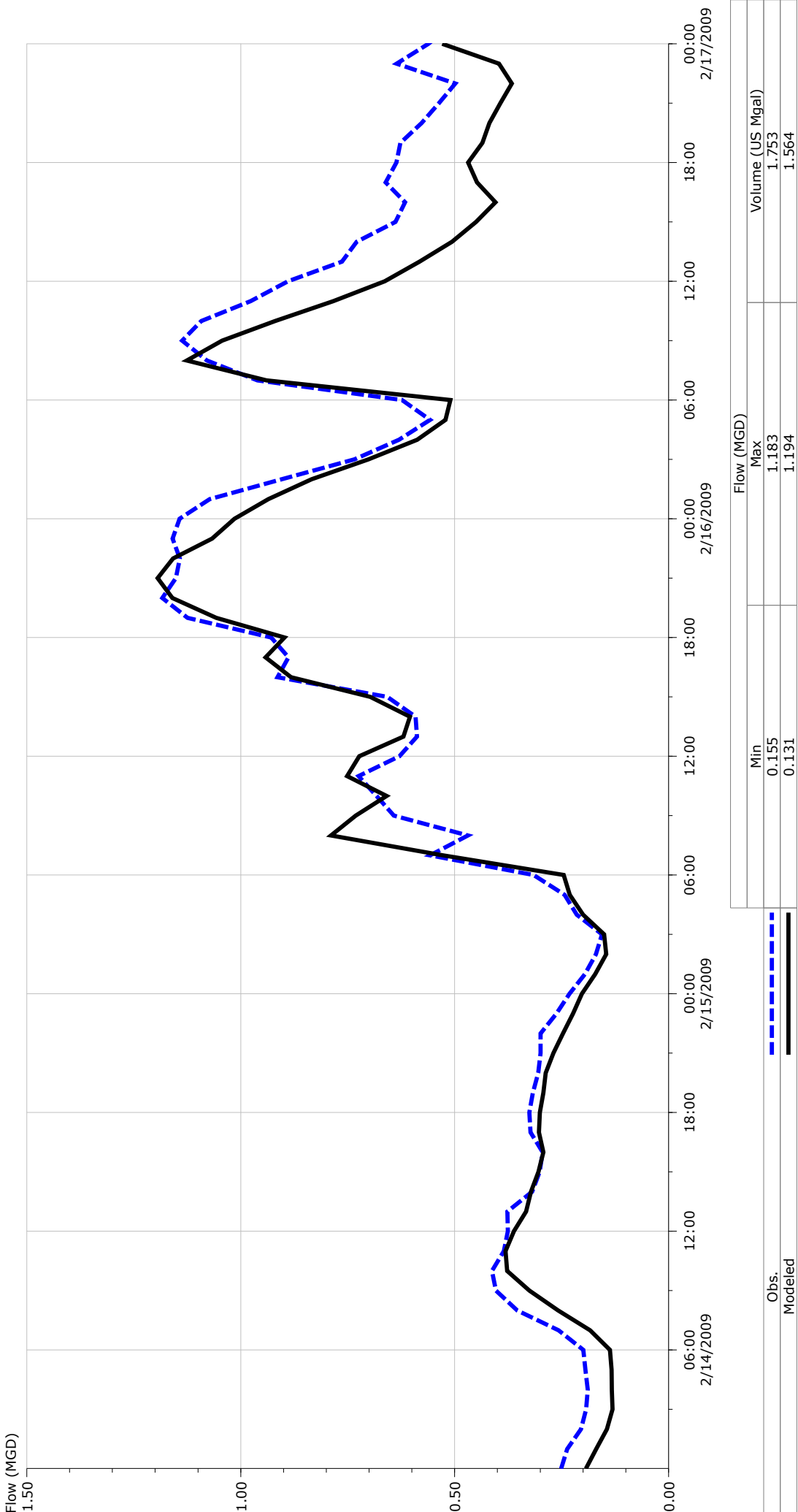


FM 16

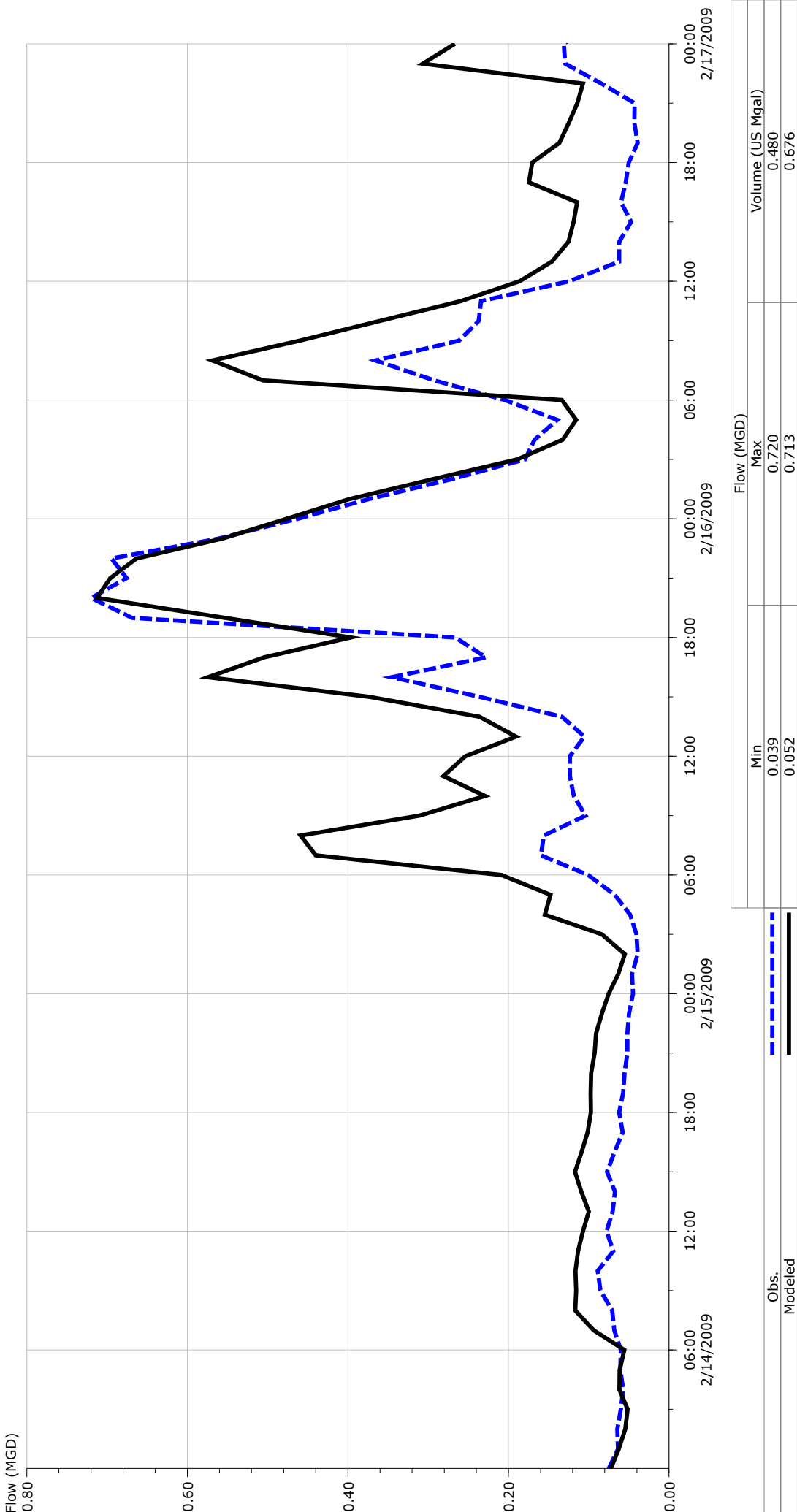


	Flow (MGD)		Volume (US Mgal)
	Min	Max	
Obs.	0.111	1.913	2.011
Modeled	0.090	2.008	2.285

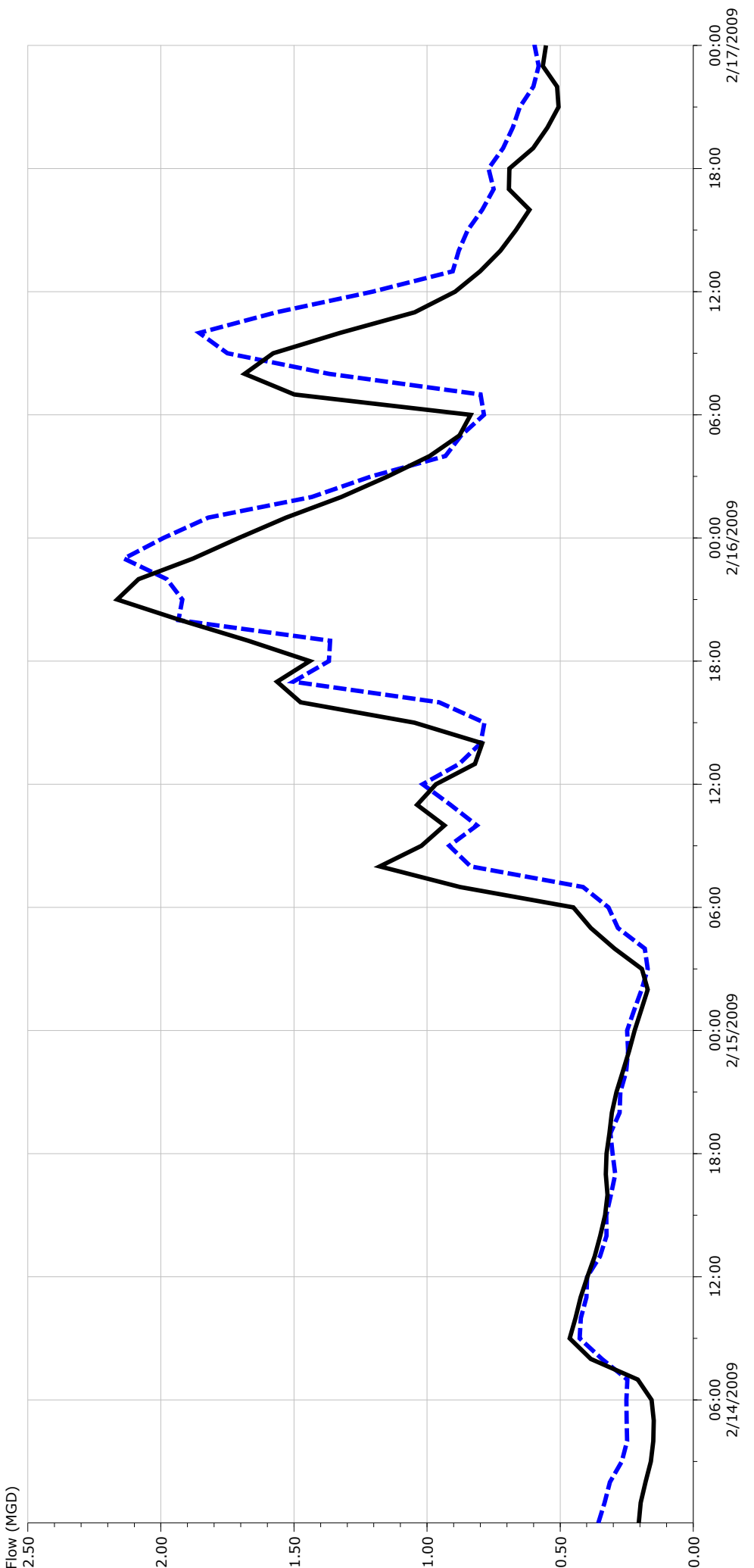
FM 17



FM 18



FM FLORIBUNDA



Obs.	Flow (MGD)		Volume (US Mgal)
	Min	Max	
	0.171	2.139	2.340
	0.149	2.165	2.304

ATTACHMENT C: MODEL OUTPUT – DESIGN SCENARIO

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
399RollinsPS	D7-21012	10	2035.0	-0.2211	8.84	5.50	14.77	10.00	-	0.880	2.51	Pressure	Pressure	Foremain
A3-21001	A3-21002	8	256.3	0.4682	8.30	3.57	7.00	2.37	0.535	0.029	0.6	0.12	0.18	Gravity
A3-21002	A3-21004	8	262.7	0.4454	7.00	2.62	7.00	0.067	0.521	0.029	0.3	0.18	1.20	Surcharged
A3-21004	A3-21004	6	89.4	1.1186	6.00	2.20	7.00	1.20	0.384	0.052	0.4	0.25	1.20	Surcharged
A3-21004	A3-21005	8	255.0	-0.3451	7.00	1.20	6.31	2.08	-0.459	0.117	1.7	1.20	0.23	Surcharged
A3-21005	B3-21042	8	350.0	0.4714	6.31	2.08	6.82	0.536	0.117	1.0	0.22	0.34	0.34	Gravity
A4-21001	A4-21002	6	61.0	0.4098	4.70	0.51	4.40	0.26	0.232	0.006	0.3	0.08	0.10	Gravity
A4-21002	A4-21003	6	240.0	0.4042	4.40	0.26	4.50	-0.71	0.231	0.011	0.6	0.10	0.10	Gravity
A4-21003	A4-21004	6	228.0	0.4254	4.50	0.26	4.80	-0.71	0.237	0.013	0.6	0.10	0.11	Gravity
A4-21004	A4-21005	6	230.0	0.4217	4.80	-1.68	4.30	-2.65	0.236	0.016	0.7	0.11	0.12	Gravity
A4-21005	A4-21006	6	235.0	0.4553	4.30	-2.65	4.40	-3.72	0.245	0.022	0.8	0.12	0.13	Gravity
A4-21006	A4-21007	6	228.0	0.4474	4.40	-3.72	5.00	-4.74	0.243	0.027	0.9	0.13	0.14	Gravity
A4-21007	A4-21014	6	236.0	0.4280	5.00	-4.74	4.50	-5.75	0.237	0.034	0.5	0.14	0.30	Gravity
A4-21008	A4-21009	6	205.0	0.5951	5.00	2.29	4.50	1.07	0.28	0.025	1.0	0.12	0.15	Gravity
A4-21009	A4-21010	6	71.9	0.3477	4.50	0.97	4.70	0.72	0.214	0.099	1.2	0.25	0.32	Gravity
A4-21010	A4-21011	6	246.1	0.1666	4.70	0.72	4.70	0.31	0.148	0.100	2.1	0.31	0.20	Gravity
A4-21011	A4-21012	6	245.0	0.4204	4.70	-0.31	4.70	-1.34	0.235	0.107	1.6	0.25	0.26	Gravity
A4-21012	A4-21013	6	245.0	0.4204	4.70	-1.34	4.20	-2.37	0.235	0.117	1.9	0.26	0.24	Gravity
A4-21013	A4-21014	6	245.0	0.5837	4.20	-2.37	4.50	-3.80	0.277	0.119	2.2	0.24	0.22	Gravity
A4-21014	A4-21015	6	88.9	0.4274	4.50	-5.75	4.40	-6.13	0.237	0.148	2.4	0.29	0.25	Gravity
A4-21015	A4-29003	8	44.9	0.4900	4.40	-6.13	4.00	-6.35	0.547	0.151	2.2	0.25	0.23	Gravity
A4-21016	A4-21015	8	173.3	1.1541	5.50	0.49	4.40	-1.51	0.839	0.003	0.2	0.07	0.07	Gravity
A4-21017	A4-21023	8	336.5	0.4458	6.10	0.50	4.70	-1.00	0.522	0.107	1.2	0.22	0.29	Gravity
A4-21018	A4-21019	8	212.0	0.4245	4.70	0.60	4.40	-0.30	0.509	0.050	1.2	0.15	0.16	Gravity
A4-21019	A4-21020	8	212.0	0.4717	4.40	-0.30	4.20	-1.30	0.537	0.054	1.3	0.16	0.16	Gravity
A4-21020	A4-21021	8	231.8	0.4314	4.20	-1.30	4.90	-2.30	0.513	0.055	1.0	0.16	0.19	Gravity
A4-21021	A4-21025	8	232.2	0.2153	4.90	-2.30	4.00	-2.80	0.363	0.056	0.7	0.19	0.26	Gravity
A4-21022	A4-21023	8	205.0	0.6341	5.30	0.30	4.70	-1.00	0.622	0.014	0.2	0.09	0.29	Gravity
A4-21023	A4-21024	8	213.7	0.3276	4.70	-1.00	4.50	-1.70	0.208	0.124	2.2	0.29	0.23	Gravity
A4-21024	A4-21025	8	212.0	0.5189	4.50	-1.70	4.00	-2.80	0.563	0.125	1.6	0.23	0.26	Gravity
A4-21025	B4-21021	8	231.0	0.6494	4.00	-2.80	4.90	-4.30	0.63	0.188	2.0	0.26	0.29	Gravity
A4-21026	A4-21027	8	287.8	0.4170	4.80	-0.20	4.20	-1.40	0.504	0.006	0.3	0.08	0.09	Gravity
A4-21027	B4-21019	8	280.9	0.4628	4.20	-1.40	4.20	-2.70	0.531	0.009	0.4	0.09	0.10	Gravity
A4-21030	B4-21008	8	323.8	0.5713	7.20	1.35	4.90	-0.50	0.591	0.031	1.0	0.12	0.14	Gravity
A4-22001	A4-21002	6	145.0	0.4069	5.00	0.85	4.40	0.28	0.231	0.005	0.3	0.08	0.10	Gravity
A4-22002	A4-21001	6	210.6	0.4653	5.30	1.49	4.70	0.51	0.247	0.006	0.4	0.08	0.08	Gravity
A4-22003	A4-21010	6	155.0	0.6710	5.40	1.76	4.70	0.72	0.297	0.002	0.0	0.07	0.32	Gravity
A4-22005	A4-21008	6	120.0	0.5833	6.00	2.99	5.40	2.29	0.277	0.016	0.7	0.11	0.12	Gravity
A4-22006	A4-21018	6	154.5	0.6602	5.10	1.62	4.70	0.60	0.295	0.007	0.3	0.08	0.15	Gravity
A4-22008	A4-21018	6	150.0	0.6667	5.10	1.60	4.70	0.60	0.296	0.005	0.2	0.08	0.15	Gravity
A4-22009	A4-21023	6	145.1	0.5649	5.20	0.40	4.70	-1.00	0.356	0.006	0.1	0.08	0.29	Gravity
A4-22010	A4-21022	8	180.6	0.6091	5.90	1.40	5.30	0.30	0.61	0.000	0.0	0.07	0.09	Gravity
A4-29003PS	B4-23001	8	469.3	-0.1396	4.00	-6.35	4.00	-5.70	-	0.480	2.1	Pressure	Pressure	Foremain
A4-29003SG	B4-21035	6	1146.3	-0.8157	4.00	-6.35	6.44	3.00	-0.328	0.000	0.0	0.07	0.07	Unused Foremain
B2-21001	C2-21011	8	220.0	1.9227	64.23	58.35	59.66	54.12	1.083	0.048	1.6	0.12	0.13	Gravity
B3-21001	B3-21004	6	298.5	0.3752	6.97	2.97	6.28	1.85	0.222	0.073	0.8	0.22	0.75	Surcharged
B3-21002	C4-21018	8	241.2	0.3151	7.73	0.98	8.53	0.22	0.439	0.246	1.3	1.00	1.52	Surcharged
B3-21003	B3-21002	8	239.2	0.0460	6.80	1.09	7.73	0.98	0.188	0.201	1.4	1.05	1.01	Throttled
B3-21004	B3-21003	6	251.7	0.3019	6.28	1.85	6.80	1.99	0.199	0.152	1.1	0.75	1.05	Surcharged
B3-21005	B3-21004	12	126.7	0.3867	6.16	2.57	6.28	2.08	1.432	0.077	1.8	0.17	0.52	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B3-21006	B3-21005	8	134.0	0.3507	6.70	6.70	3.04	6.16	2.57	0.483	0.075	1.7	0.19	0.17 Gravity
B3-21007	C3-21017	6	332.3	0.5026	47.47	47.47	43.31	46.32	41.64	0.257	0.060	1.3	0.18	0.20 Gravity
B3-21008	B3-21009	8	330.0	0.3697	36.26	36.26	27.69	26.04	26.47	0.475	0.067	1.9	0.18	0.16 Gravity
B3-21009	B3-21010	8	351.2	1.6714	36.04	36.04	26.47	26.41	20.60	1.01	0.080	2.4	0.14	1.64 Surcharged
B3-21010	B3-21051	12	52.1	0.2246	26.41	26.41	16.52	34.00	16.40	1.091	2.318	4.0	5.68	5.26 Throttled
B3-21011	B3-21012	8	300.0	0.4700	23.36	23.36	17.35	21.01	17.35	0.536	0.037	0.7	0.14	0.30 Gravity
B3-21012	B3-21013	8	266.4	0.4054	21.01	21.01	17.35	23.81	16.27	0.497	0.076	1.0	0.30	1.34 Surcharged
B3-21013	B3-21014	8	267.6	0.2803	23.81	23.81	16.27	26.41	15.52	0.414	0.095	0.4	1.34	2.05 Surcharged
B3-21014	B3-21015	12	260.5	0.6603	26.41	26.41	15.52	15.52	13.80	1.871	2.406	5.4	1.99	0.82 Throttled
B3-21015	B3-21016	12	316.5	1.4660	21.52	21.52	13.80	13.63	9.16	2.789	2.438	6.1	0.73	0.73 Gravity
B3-21016	B3-21017	12	218.6	2.1638	13.63	13.63	9.16	8.30	4.43	3.388	2.438	7.1	0.64	0.64 Gravity
B3-21017	B3-21046	18	295.1	0.3626	8.30	8.30	3.90	5.83	2.83	4.089	2.498	4.3	0.85	0.76 Gravity
B3-21018	B3-21019	12	398.8	1.9308	8.60	8.60	1.00	7.70	-6.70	3.2	0.050	0.7	0.13	4.71 Surcharged
B3-21019	B3-21020	12	380.0	0.6184	7.70	7.70	-6.70	7.87	-9.05	1.811	0.133	0.2	4.71	7.06 Surcharged
B3-21020	B4-21036	14	300.7	-0.0166	7.87	7.87	-9.05	6.00	-0.448	1.121	1.121	3.5	7.06	6.84 Surcharged
B3-21021	B3-21022	8	260.2	0.5726	5.92	5.92	0.98	7.53	-0.51	0.591	0.051	1.1	0.15	0.18 Gravity
B3-21022	B4-21042	8	265.6	0.4480	7.53	7.53	-0.51	6.64	-1.70	0.523	0.070	1.7	0.18	0.16 Gravity
B3-21023	B3-21024	6	163.1	0.8216	15.00	15.00	11.00	13.54	9.66	0.329	0.014	0.9	0.10	0.09 Gravity
B3-21024	B3-21049	8	247.6	1.0178	13.54	13.54	9.66	12.59	7.14	0.788	0.014	0.3	0.09	0.18 Gravity
B3-21025	B3-21049	8	31.7	0.5994	11.48	11.48	7.33	12.59	7.14	0.605	0.114	2.0	0.21	0.20 Gravity
B3-21026	B3-21027	6	308.2	0.7203	16.46	16.46	12.88	15.27	10.46	0.308	0.046	1.3	0.15	0.16 Gravity
B3-21027	B3-21029	6	178.9	0.9335	15.27	15.27	9.33	12.49	8.79	0.35	0.067	1.4	0.16	0.22 Gravity
B3-21028	B3-21029	6	56.0	0.9107	12.66	12.66	9.30	12.49	8.79	0.346	0.078	1.7	0.18	0.22 Gravity
B3-21029	B3-21025	8	282.2	0.5174	12.49	12.49	8.79	11.48	7.33	0.562	0.114	1.9	0.22	0.21 Gravity
B3-21031	B3-21032	8	238.8	0.5025	12.00	12.00	3.80	12.00	2.60	0.564	0.154	1.6	0.25	0.29 Gravity
B3-21032	B3-21033	8	296.3	0.2666	12.00	12.00	2.60	6.89	1.81	0.403	0.154	1.2	0.29	0.41 Gravity
B3-21033	B3-21034	8	275.6	0.4499	6.89	6.89	1.87	7.49	0.63	0.524	0.272	1.8	0.35	0.61 Gravity
B3-21034	B3-21036	8	275.4	0.3304	7.49	7.49	0.63	7.08	-0.28	0.449	0.324	2.1	0.61	1.23 Surcharged
B3-21035	B3-21036	8	326.7	0.2632	7.49	7.49	0.58	7.08	-0.28	0.401	0.084	0.5	0.39	1.23 Surcharged
B3-21036	B3-21037	8	264.8	0.6005	7.08	7.08	-0.28	7.96	-1.87	0.605	0.430	2.1	1.22	2.34 Surcharged
B3-21037	B3-21040	8	257.8	0.3918	7.96	7.96	-1.87	6.83	-2.88	0.489	0.491	2.8	2.33	2.77 Surcharged
B3-21038	B3-21039	8	145.0	0.9917	6.90	6.90	1.22	6.48	0.762	0.059	1.2	0.14	0.18	0.18 Gravity
B3-21039	B3-21040	8	425.8	0.7750	6.48	6.48	1.22	6.83	-2.08	0.688	0.096	2.0	0.18	1.96 Surcharged
B3-21040	B3-21041	8	141.5	0.8339	6.83	6.83	-2.88	7.24	-4.06	0.713	0.616	3.6	2.76	3.45 Surcharged
B3-21041	B3-21020	8	307.8	1.6212	7.24	7.24	-4.06	7.87	-9.05	0.995	0.693	2.9	3.44	7.06 Surcharged
B3-21042	B4-21035	8	344.2	0.5230	6.82	6.82	0.43	6.44	-1.37	0.565	0.288	2.7	0.34	0.32 Gravity
B3-21046	B3-21047	18	425.6	0.2303	5.83	5.83	1.51	7.20	0.53	3.258	2.459	2.4	1.33	1.75 Surcharged
B3-21047	C4-21080	18	425.2	0.1505	7.20	7.20	0.53	8.70	-0.11	2.634	2.457	2.1	1.74	1.82 Surcharged
B3-21048	B3-21031	8	30.0	2.0667	10.50	10.50	4.42	12.00	3.80	1.123	2.0	0.18	0.25	0.18 Gravity
B3-21049	B3-21050	8	187.3	1.2333	12.59	12.59	7.14	10.00	4.83	0.868	0.122	2.6	0.18	0.18 Gravity
B3-21050	B3-21048	8	28.3	1.4488	10.00	10.00	4.83	10.50	4.42	0.941	0.122	2.6	0.18	0.18 Gravity
B3-21051	B3-21014	12	393.4	0.2245	34.00	34.00	16.40	26.41	15.52	1.091	2.317	4.3	5.22	2.06 Throttled
B3-22001	B3-21011	8	106.3	1.1665	25.44	25.44	20.00	23.96	18.76	0.844	0.025	0.8	0.10	0.14 Gravity
B3-22002	B3-21026	6	144.5	0.7820	17.30	17.30	13.81	16.46	12.68	0.321	0.028	0.9	0.12	0.15 Gravity
B3-22003	B3-21023	6	118.3	1.6484	17.50	17.50	12.95	15.00	11.00	0.466	0.015	0.8	0.09	0.10 Gravity
B3-22004	B3-21018	12	237.9	0.8701	7.01	7.01	3.07	8.60	1.00	2.149	0.000	0.0	0.07	0.13 Gravity
B3-29001	B3-22003	6	50.8	1.6535	18.37	18.37	13.79	17.50	12.95	0.466	0.015	1.0	0.09	0.09 Gravity
B3-29002	B3-21017	12	351.8	1.3445	11.11	11.11	9.16	8.30	4.43	2.67	0.039	0.9	0.13	0.33 Gravity
B4-21001	B4-21002	8	265.0	0.4151	5.10	5.10	0.40	5.10	-0.70	0.503	0.017	0.6	0.10	0.12 Gravity
B4-21002	B4-21003	8	255.0	0.3922	5.10	5.10	-0.70	6.40	-1.70	0.489	0.026	0.9	0.12	0.13 Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B4-21003	B4-21004	8	250.0	0.4800	6.40	-1.70	6.60	-2.90	0.541	0.030	1.0	0.13	0.13	Gravity
B4-21004	B4-21005	8	51.8	0.5792	6.60	-3.20	6.40	-3.20	0.595	0.036	1.1	0.13	0.14	Gravity
B4-21005	B4-21006	8	240.4	0.4160	6.40	-2.40	5.20	-4.20	0.504	0.036	1.0	0.14	0.14	Gravity
B4-21006	B4-21007	8	242.3	0.4127	5.20	-4.20	4.30	-5.20	0.502	0.039	0.7	0.14	0.20	Gravity
B4-21007	B4-21013	8	196.8	0.4573	4.30	-5.20	5.00	-5.20	0.528	0.097	1.7	0.20	0.20	Gravity
B4-21008	B4-21009	8	58.9	0.5093	4.90	-0.50	4.50	-0.80	0.557	0.038	1.0	0.14	0.15	Gravity
B4-21009	B4-21010	8	250.7	0.3989	4.50	-0.80	4.70	-1.80	0.493	0.043	1.1	0.15	0.15	Gravity
B4-21010	B4-21011	8	251.0	0.3984	4.70	-1.80	5.30	-2.80	0.493	0.048	1.1	0.15	0.16	Gravity
B4-21011	B4-21012	8	238.8	0.4188	5.30	-3.80	5.00	-3.80	0.505	1.2	0.16	0.16	0.17	Gravity
B4-21012	B4-21017	8	242.7	0.4120	5.00	-3.80	4.30	-4.80	0.501	0.063	1.6	0.17	0.15	Gravity
B4-21013	B4-21014	8	180.7	0.4981	5.00	-6.10	4.00	-7.00	0.551	0.097	1.9	0.20	0.19	Gravity
B4-21014	B4-29009	8	36.7	6.2670	4.00	-7.70	4.00	-10.00	-	0.335	6.4	Pressure	Pressure	Forcemain
B4-21015	B4-23006	8	16.4	-0.2500	4.00	-6.83	4.00	-6.79	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-21017PS	B4-21043	10	2235.3	-0.3923	4.00	-5.20	8.45	3.57	-	1.440	4.1	Pressure	Pressure	Forcemain
B4-21018	B4-21016	8	173.6	0.0058	5.30	0.50	5.90	0.49	0.059	0.000	0.0	0.07	0.07	Gravity
B4-21018	B4-28001	8	94.0	1.3191	5.30	0.50	4.00	-0.74	0.897	0.003	0.2	0.07	0.08	Gravity
B4-21019	B4-21020	8	230.7	0.4335	4.20	-2.70	4.90	-3.70	0.514	0.015	0.7	0.10	0.10	Gravity
B4-21020	B4-21023	8	233.5	0.4283	4.90	-3.70	4.50	-4.70	0.511	0.015	0.8	0.10	0.10	Gravity
B4-21021	B4-21022	8	225.0	0.4444	4.90	-4.30	4.60	-5.30	0.521	0.196	2.0	0.29	0.30	Gravity
B4-21022	B4-21023	8	220.0	0.4091	4.60	-5.30	4.50	-6.20	0.5	0.202	2.4	0.30	0.27	Gravity
B4-21023	B4-21014	8	322.0	0.4348	4.50	-6.30	4.00	-7.70	0.515	0.215	2.5	0.31	0.27	Gravity
B4-21024	B5-21006	8	375.1	0.6772	7.71	4.30	8.16	1.76	0.643	0.004	0.2	0.08	0.10	Gravity
B4-21027	B4-21028	8	414.1	0.623	6.38	2.80	6.23	0.74	0.551	0.086	1.3	0.19	0.43	Gravity
B4-21028	B4-21029	8	329.8	0.7004	6.23	0.74	5.98	-1.57	0.654	0.145	0.8	0.43	2.67	Surcharged
B4-21029	B4-21030	8	329.0	0.0000	5.98	-1.57	6.13	-1.57	0	0.143	1.9	2.67	2.62	Throttled
B4-21030	B4-21031	8	329.8	0.9369	6.13	-1.57	6.00	-4.66	0.756	0.175	1.6	2.62	5.59	Surcharged
B4-21031	B4-21032	8	329.2	0.4222	6.00	-4.66	6.16	-6.05	0.508	0.228	1.1	5.58	6.77	Surcharged
B4-21032	B4-21033	8	259.5	0.2197	6.16	-6.05	6.23	-6.62	0.366	0.341	1.4	6.77	7.02	Surcharged
B4-21033	B4-21034	8	415.7	0.0794	6.23	-6.62	5.96	-6.95	0.22	0.331	1.6	7.01	6.83	Throttled
B4-21034	B4-21035	8	359.3	0.3980	5.96	-6.95	6.44	-8.38	0.493	0.509	2.1	6.83	7.28	Throttled
B4-21035	B4-21036	8	155.7	0.3982	6.44	-8.38	6.00	-9.00	0.493	0.852	4.3	7.27	6.84	Throttled
B4-21036	B4-21017	14	39.3	6.3613	6.00	-9.00	4.00	-11.50	8.762	1.930	9.6	6.83	9.25	Surcharged
B4-21037	B4-21038	8	354.7	0.4595	7.81	2.47	6.64	0.84	0.53	0.082	1.1	0.19	0.24	Gravity
B4-21038	B4-21039	8	459.6	0.3285	6.64	0.84	7.87	-0.67	0.448	0.118	1.3	0.24	0.29	Gravity
B4-21039	B4-21040	8	340.4	0.5112	7.87	-0.67	6.36	-2.41	0.559	0.209	2.4	0.29	0.92	Surcharged
B4-21040	B4-21041	8	248.3	1.1236	6.36	-2.41	6.47	-5.20	0.828	0.232	1.6	0.92	3.58	Surcharged
B4-21041	B4-21042	8	61.3	0.2284	6.47	-5.20	6.64	-5.34	0.373	0.277	2.7	3.58	3.68	Surcharged
B4-21042	B3-21020	8	299.1	1.2404	6.64	-5.34	7.87	-9.05	0.87	0.353	1.5	3.68	7.06	Surcharged
B4-21043	C4-21076	14	390.7	0.2252	8.45	3.57	6.97	2.69	1.649	3.5	0.95	1.14	Gravity	
B4-21044	B4-29006	8	40.6	-4.5690	4.27	-3.81	4.72	-1.95	-	1.072	4.7	Pressure	Pressure	Forcemain
B4-22001	B4-21008	6	150.0	1.0000	5.30	1.00	4.90	-0.50	0.363	0.006	0.3	0.08	0.14	Gravity
B4-22002	B4-21009	6	138.9	0.7919	5.30	0.30	4.50	-0.80	0.323	0.005	0.2	0.08	0.15	Gravity
B4-22003	B5-21002	6	217.2	0.6354	5.80	0.90	5.70	0.289	0.289	0.007	0.5	0.08	0.09	Gravity
B4-22014	B4-21037	8	384.1	0.1770	8.00	3.15	7.81	2.47	0.329	0.042	0.8	0.18	0.19	Gravity
B4-22015	C5-23004	12	482.1	0.0000	8.13	-1.94	6.00	-1.94	-	1.072	2.1	Pressure	Pressure	Forcemain
B4-22016	B4-22015	12	169.0	0.0000	6.00	-1.94	6.00	-1.94	-	1.072	2.1	Pressure	Pressure	Forcemain
B4-23001	B4-23002	8	13.5	0.1185	4.00	-5.70	4.00	-5.71	-	0.480	2.1	Pressure	Pressure	Forcemain
B4-23002	B4-23003	8	475.9	0.1221	4.00	-5.71	4.00	-6.29	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-23003	B4-23004	8	13.8	0.1232	4.00	-6.29	4.00	-6.31	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-23004	B4-23005	6	408.9	0.1220	4.00	-6.31	4.00	-6.81	-	0.481	3.8	Pressure	Pressure	Forcemain

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B4-23005	B4-29007	8	9.5	0.1263	4.00	-6.81	4.00	-6.82	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-23006	B4-29008	8	11.9	-0.2437	4.00	-6.79	4.00	-6.76	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-23007	B4-23008	8	17.2	-0.2500	4.00	-5.80	4.00	-5.75	-	1.071	4.7	Pressure	Pressure	Forcemain
B4-23008	B4-23009	8	311.9	-0.2501	4.00	-5.75	4.00	-4.97	-	1.071	4.7	Pressure	Pressure	Forcemain
B4-23009	B4-23010	8	50.1	-0.2495	4.00	-4.97	4.00	-4.85	-	1.071	4.7	Pressure	Pressure	Forcemain
B4-23010	B4-21044	8	417.1	-0.2501	4.05	-4.85	4.05	-3.81	-	1.071	4.7	Pressure	Pressure	Forcemain
B4-28001	B4-21019	8	177.1	1.1067	4.00	-0.74	4.20	-2.70	0.822	0.006	0.3	0.08	0.10	Gravity
B4-29005	B4-22016	12	258.9	0.0000	6.00	-1.94	6.00	-1.94	-	1.072	2.1	Pressure	Pressure	Forcemain
B4-29006	B4-29005	12	12.0	0.0000	6.00	-1.94	4.72	-1.94	-	1.072	2.1	Pressure	Pressure	Forcemain
B4-29006SG	C4-21067	10	1001.5	-0.3235	4.72	-1.95	8.30	1.29	-0.806	0.000	0.0	4.93	1.69	Unused Forcemain
B4-29007	B4-21015	8	8.8	-0.2386	4.00	-6.85	4.00	-6.83	-	0.481	2.1	Pressure	Pressure	Forcemain
B4-29008	B4-23007	8	420.5	-0.2499	4.00	-6.85	4.00	-5.80	-	1.071	4.7	Pressure	Pressure	Forcemain
B4-29009PS	B4-29008	8	61.3	-0.2496	4.00	-7.00	4.00	-6.85	-	0.590	2.6	Pressure	Pressure	Forcemain
B4-29009SG	B4-29007	8	60.0	-0.8767	4.00	-7.38	4.00	-6.85	-	0.000	0.0	Pressure	Pressure	Unused Forcemain
B5-21001	A4-21030	8	277.2	0.4257	7.90	2.53	7.20	1.35	0.51	0.026	0.9	0.12	0.12	Gravity
B5-21002	B4-21001	8	117.7	0.4248	5.70	0.90	5.10	0.40	0.509	0.007	0.3	0.09	0.10	Gravity
B5-21003	B5-21005	8	158.9	0.5664	8.20	1.00	8.20	0.10	0.588	0.000	0.0	0.07	0.13	Gravity
B5-21004	B5-21005	8	314.1	0.7004	8.50	2.30	8.20	0.10	0.654	0.026	0.9	0.11	0.13	Gravity
B5-21005	B5-21008	8	151.2	0.4034	8.20	0.10	7.40	0.9	0.496	0.028	0.9	0.13	0.14	Gravity
B5-21006	B5-21007	8	309.3	0.6208	8.16	1.76	6.60	-0.16	0.615	0.015	0.6	0.10	0.11	Gravity
B5-21007	B5-21008	8	108.9	0.3214	6.60	-0.16	7.40	-0.51	0.443	0.018	0.6	0.11	0.14	Gravity
B5-21008	B5-21009	8	326.2	0.7020	7.40	-0.51	8.20	-2.80	0.655	0.046	1.3	0.14	0.14	Gravity
B5-21009	B5-21010	8	322.3	0.5895	8.20	-2.80	8.00	-4.70	0.6	0.046	1.2	0.14	0.15	Gravity
B5-21010	B5-21011	8	317.6	0.5982	8.00	-4.70	8.20	-6.60	0.604	0.056	1.4	0.15	0.16	Gravity
B5-21011	B5-21012	8	56.9	0.7030	8.20	-6.60	8.20	-7.00	0.655	0.067	1.0	0.16	0.28	Gravity
B5-21012	C5-21043	8	298.0	0.7550	8.20	-7.00	8.00	-9.25	0.679	0.229	2.6	0.28	0.28	Gravity
B5-22002	B4-21001	6	172.0	0.6395	5.70	1.50	5.10	0.40	0.29	0.009	0.5	0.09	0.10	Gravity
C2-21001	D2-21071	6	258.0	4.8062	162.82	158.10	151.21	145.70	0.795	0.020	0.9	0.08	0.12	Gravity
C2-21002	C2-21003	6	348.5	0.6255	121.88	117.73	121.36	115.55	0.287	-0.087	-0.6	3.79	FULL	Surcharged
C2-21003	D2-21073	6	223.2	0.3674	121.36	115.55	124.56	114.73	0.22	-0.391	-2.1	FULL	FULL	Throttled
C2-21004	C2-21005	8	300.5	6.2230	108.02	102.39	89.28	83.69	1.949	1.776	6.4	3.18	FULL	Surcharged
C2-21005	C2-21007	8	303.5	3.2191	89.28	83.69	80.17	73.92	1.402	1.652	7.1	FULL	FULL	Throttled
C2-21006	C2-21007	6	306.0	2.8595	87.20	82.67	80.17	73.92	0.613	0.028	0.2	0.10	1.47	Surcharged
C2-21008	C2-21008	8	323.3	4.5623	80.17	73.92	68.65	59.17	1.689	1.675	7.8	1.34	0.63	Throttled
C2-21008	C3-21011	12	295.4	1.4286	68.65	59.17	60.02	54.95	2.753	1.812	5.7	0.60	0.60	Gravity
C2-21009	C2-21012	6	182.9	2.5970	69.19	64.18	65.21	59.43	0.585	0.018	0.9	0.09	0.11	Gravity
C2-21010	B2-21001	8	299.8	1.2975	67.47	62.24	64.23	58.35	0.89	0.022	0.9	0.10	0.12	Gravity
C2-21011	C3-21013	8	200.8	2.3904	59.66	54.12	55.51	49.32	1.208	0.068	1.2	0.13	0.21	Gravity
C2-21012	C3-21013	6	277.5	3.6432	65.21	277.5	49.32	49.32	0.692	0.048	1.0	0.11	0.21	Gravity
C2-22001	C2-21008	8	259.0	0.3514	70.70	60.08	68.65	59.17	0.463	0.061	0.3	0.18	0.62	Gravity
C3-21001	C3-21002	6	301.1	2.3746	102.67	97.88	95.43	90.73	0.559	0.007	0.5	0.08	0.09	Gravity
C3-21002	C2-21006	6	300.0	2.6867	95.43	90.73	87.20	82.67	0.595	0.017	1.0	0.09	0.10	Gravity
C3-21003	C3-21004	8	294.2	1.0401	77.52	72.86	74.60	69.80	0.797	0.020	0.7	0.10	0.13	Gravity
C3-21004	C3-21005	8	310.0	1.0032	74.60	69.80	71.36	66.69	0.782	0.044	1.5	0.13	0.13	Gravity
C3-21005	C2-21008	8	335.6	2.2408	71.36	66.69	68.65	59.17	1.169	0.068	0.3	0.13	0.62	Gravity
C3-21007	C3-21008	8	132.1	7.5852	76.42	71.92	67.38	61.90	2.151	0.032	1.0	0.09	0.13	Gravity
C3-21009	C3-21009	8	289.3	1.0439	67.38	61.90	63.29	58.88	0.798	0.048	1.4	0.13	0.14	Gravity
C3-21008	C3-21010	8	350.7	1.0237	63.29	58.88	59.80	55.29	0.79	0.063	1.3	0.14	0.18	Gravity
C3-21010	C3-21012	8	363.6	1.1359	59.80	55.29	56.58	51.16	0.833	0.112	0.8	0.18	0.41	Gravity
C3-21011	C3-21012	12	139.8	2.6896	60.02	54.92	56.58	51.16	3.777	1.839	7.2	0.50	0.50	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C3-21012	C3-21015	12	147.4	7.1031	56.58	51.16	52.89	40.89	6.138	1.960	4.7	0.41	0.79	Gravity
C3-21013	C3-21014	8	270.0	0.7222	55.51	49.32	54.15	47.37	0.684	0.124	2.1	0.21	0.21	Gravity
C3-21014	C3-21015	8	231.7	2.8830	54.15	47.37	1.326	40.69	1.326	0.133	0.6	0.16	0.79	Surcharged
C3-21015	C3-21016	12	257.1	1.0191	52.89	40.69	45.54	38.07	2.325	2.100	5.1	0.77	0.77	Gravity
C3-21016	C3-21019	12	55.5	1.9279	45.54	38.07	44.01	37.00	3.199	2.115	6.1	0.61	0.66	Gravity
C3-21017	C3-21018	6	135.5	0.8044	46.32	41.64	44.04	40.55	0.325	0.093	2.0	0.20	0.20	Gravity
C3-21018	C3-21019	6	211.5	1.6785	44.04	40.55	44.01	37.00	0.47	0.099	0.8	0.17	0.66	Surcharged
C3-21019	C3-21020	12	219.5	1.8679	44.01	37.00	38.78	32.90	3.148	2.214	6.5	0.64	0.64	Gravity
C3-21020	B3-21010	12	250.1	6.5494	38.78	32.90	16.52	5.894	2.229	3.8	0.44	5.72	5.72	Surcharged
C3-21021	C3-21023	6	251.7	5.5463	84.89	80.07	72.23	66.11	0.864	0.260	4.1	0.20	0.25	Gravity
C3-21022	C3-21023	6	338.0	3.4911	83.41	77.93	72.23	66.13	0.678	0.028	0.5	0.10	0.23	Gravity
C3-21023	C3-21025	6	250.6	3.5555	72.23	66.11	62.70	57.20	0.684	0.319	4.9	0.25	0.97	Surcharged
C3-21024	C3-21025	6	346.7	4.3957	76.70	70.48	62.70	55.24	0.761	0.040	1.0	0.10	2.93	Surcharged
C3-21025	C3-21028	6	251.0	0.8167	62.70	55.10	57.93	53.05	0.328	0.381	2.7	3.06	2.17	Throttled
C3-21026	C3-21027	6	218.2	1.4482	71.76	67.08	68.57	63.92	0.437	0.023	1.2	0.10	0.11	Gravity
C3-21027	C3-21028	6	199.7	5.4432	68.57	63.92	57.93	53.05	0.846	0.053	0.4	0.11	2.17	Surcharged
C3-21028	C3-21030	6	251.8	0.9531	57.93	53.05	55.90	50.65	0.354	0.451	3.9	2.14	0.43	Throttled
C3-21029	C3-21030	6	172.4	5.2668	66.42	59.88	55.90	50.80	0.832	0.022	0.9	0.09	0.23	Gravity
C3-21030	C3-21032	6	248.9	2.6396	55.90	50.65	50.02	44.08	0.589	0.496	5.1	0.36	0.36	Gravity
C3-21031	C3-21032	6	273.7	7.3986	68.52	64.44	50.02	44.19	0.987	0.030	1.0	0.09	0.23	Gravity
C3-21032	C3-21034	6	251.0	5.1355	50.02	44.08	37.29	31.19	0.822	0.555	5.3	0.32	2.86	Surcharged
C3-21034	C3-21037	8	256.6	4.3609	37.29	31.19	28.50	20.00	0.758	0.589	3.5	2.82	FULL	Surcharged
C3-21037	C3-21038	6	292.4	1.6142	26.50	20.00	15.28	0.932	0.932	2.8	FULL		8.89	Surcharged
C3-21038	C3-21039	8	299.7	0.2736	29.33	15.28	28.03	14.46	0.409	0.827	3.0	8.88	6.96	Throttled
C3-21039	C3-21054	8	344.9	0.2580	28.03	14.46	28.45	13.57	0.397	0.857	3.5	6.94	4.31	Throttled
C3-21040	D3-21072	6	302.6	2.3298	79.00	74.06	71.90	67.01	0.554	0.033	2.3	0.11	0.16	Gravity
C3-21041	C3-21042	6	279.3	1.4142	73.03	67.73	69.32	63.78	0.431	0.027	0.4	0.11	0.29	Gravity
C3-21042	C3-21045	10	278.4	3.6889	69.32	63.70	59.39	53.43	2.72	1.029	6.7	0.36	0.38	Gravity
C3-21043	C3-21044	6	306.6	0.5512	69.13	64.07	67.86	62.38	0.269	0.030	1.1	0.13	0.14	Gravity
C3-21044	C3-21045	6	344.2	2.5334	67.86	62.38	59.39	53.66	0.577	0.075	3.0	0.14	0.15	Gravity
C3-21045	C3-21048	10	250.0	4.0720	59.39	53.43	48.25	43.25	2.858	1.137	7.4	0.37	0.37	Gravity
C3-21046	C3-21047	6	285.0	6.2947	69.16	63.94	56.07	46.00	0.91	0.031	1.0	0.09	0.15	Gravity
C3-21047	C3-21048	6	240.0	1.0083	56.07	46.00	48.25	43.58	0.364	0.062	1.9	0.15	0.15	Gravity
C3-21048	C3-21050	10	250.2	7.1367	48.25	43.25	30.87	25.39	3.784	1.228	7.6	0.34	0.39	Gravity
C3-21049	C3-21050	6	328.0	3.2744	42.70	35.74	30.87	25.00	0.656	0.053	0.4	0.11	0.78	Surcharged
C3-21050	C3-21053	10	17.3	7.1329	30.87	25.39	30.36	24.16	3.784	1.575	5.9	0.39	0.60	Gravity
C3-21052	C3-21053	6	340.8	3.3979	42.82	35.74	30.36	24.16	0.669	0.038	0.3	0.10	0.60	Surcharged
C3-21053	C3-21054	10	237.5	2.2358	30.36	24.16	28.45	18.85	2.118	1.656	6.5	0.57	0.57	Gravity
C3-21054	C3-21075	12	180.8	0.5166	26.45	24.29	12.64	1.656	2.551	4.6	4.26	2.94	2.94	Throttled
C3-21055	C3-21056	6	282.9	5.0831	55.20	51.02	43.46	36.64	0.818	0.171	2.4	0.17	0.28	Gravity
C3-21056	C3-21057	6	340.2	1.8895	43.46	36.64	33.54	30.21	0.499	0.270	3.6	0.28	0.29	Gravity
C3-21057	C3-21058	6	255.0	1.8894	33.54	30.21	30.87	25.39	0.499	0.281	2.6	0.18	0.39	Gravity
C3-21060	C3-21053	6	426.3	0.1384	33.09	25.59	30.36	0.135	0.135	0.031	1.3	0.18	0.12	Gravity
C3-21061	C3-21054	6	355.0	1.4000	27.95	18.54	26.45	13.57	0.429	0.098	0.6	0.17	4.31	Surcharged
C3-21062	C3-21063	6	322.8	0.7187	15.55	10.92	13.02	8.60	0.308	0.016	0.7	0.10	0.12	Gravity
C3-21063	C3-21064	6	251.7	2.21064	13.02	8.60	12.04	6.28	0.348	0.029	1.0	0.12	0.14	Gravity
C3-21064	B3-21001	6	269.4	1.2287	12.04	6.28	6.97	2.97	0.402	0.050	0.9	0.14	0.22	Gravity
C3-21065	C3-21066	6	244.1	0.7907	9.48	4.98	7.55	3.05	0.323	0.021	0.7	0.11	0.14	Gravity
C3-21066	B3-21003	6	251.7	0.7509	7.55	3.05	6.80	1.16	0.314	0.038	0.3	0.14	0.98	Surcharged
C3-21067	C3-21068	6	263.7	1.4676	12.30	8.28	8.60	4.41	0.439	0.018	0.8	0.10	0.12	Gravity

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C3-21068	B3-21002	6	247.7	1.3847	8.60	4.41	7.73	0.98	0.427	0.036	0.3	0.12	1.01	Surcharged
C3-21069	C3-21070	6	285.8	1.9601	16.10	11.95	10.77	6.74	0.508	0.020	0.9	0.09	0.12	Gravity
C3-21070	C4-21018	6	270.0	2.4148	10.77	17.76	8.53	0.22	0.564	0.045	0.5	0.12	1.52	Surcharged
C3-21071	C3-21072	6	242.4	0.5198	17.56	12.61	19.06	11.35	0.262	0.019	0.1	0.10	1.29	Surcharged
C4-21006	C3-21072	12	101.8	1.0511	19.06	11.39	16.72	10.32	2.361	2.629	5.7	1.17	0.86	Throttled
C3-21075	C3-21072	12	229.5	0.5168	24.29	22.5	19.06	11.45	1.656	2.560	5.1	2.89	1.20	Throttled
C3-22001	C3-21007	8	336.5	4.1842	90.70	86.00	76.42	71.92	1.598	0.017	1.0	0.08	0.09	Gravity
C3-22003	C3-21052	6	381.3	2.3420	50.75	44.67	42.82	35.74	0.555	0.019	1.0	0.09	0.10	Gravity
C4-21003	C3-21061	6	278.4	0.5532	27.57	27.57	27.95	18.54	0.27	0.046	1.2	0.15	0.17	Gravity
C4-21004	C4-21005	6	305.0	1.2885	25.27	21.27	21.46	17.34	0.412	0.024	1.0	0.10	0.13	Gravity
C4-21005	C3-21072	6	300.0	1.9967	21.46	17.34	19.06	11.35	0.513	0.051	0.4	0.13	1.29	Surcharged
C4-21006	C4-21015	12	251.4	0.4256	16.72	10.32	12.25	9.25	1.503	1.023	3.7	0.61	0.54	Gravity
C4-21006	C4-21009	12	144.1	1.1797	16.72	10.32	12.80	8.62	2.502	1.624	3.3	0.61	1.07	Surcharged
C4-21007	C4-21008	6	225.0	1.2667	21.30	17.30	18.37	14.45	0.408	0.022	1.0	0.10	0.12	Gravity
C4-21008	C4-21009	6	256.2	2.1351	18.37	14.45	12.80	8.98	0.53	0.047	1.9	0.12	0.71	Surcharged
C4-21009	C4-21016	12	248.1	0.4434	12.80	8.62	11.02	7.52	1.534	1.674	4.5	1.05	0.69	Throttled
C4-21010	C4-21011	6	172.9	2.1978	23.44	19.76	19.98	15.96	0.538	0.018	0.7	0.09	0.13	Gravity
C4-21011	C4-21012	6	198.0	1.8838	19.98	15.98	16.25	12.25	0.498	0.039	1.1	0.11	0.16	Gravity
C4-21012	C4-21013	6	150.3	0.5988	16.25	12.25	15.73	11.35	0.281	0.052	1.4	0.16	0.17	Gravity
C4-21013	C4-21014	6	298.3	0.6470	15.73	11.35	14.57	9.42	0.292	0.061	1.2	0.17	0.22	Gravity
C4-21014	C4-21016	6	302.0	0.5828	14.57	9.42	11.02	7.66	0.277	0.097	1.5	0.22	0.34	Gravity
C4-21015	C4-29007	12	252.6	2.0744	12.25	9.25	10.33	4.01	3.317	1.035	2.7	0.40	0.72	Gravity
C4-21016	C4-21017	12	110.8	3.1679	11.02	7.52	10.18	4.01	4.099	1.774	4.9	0.48	0.64	Gravity
C4-21017	C4-21081	12	75.3	2.9615	10.18	4.01	10.70	1.78	3.964	2.819	8.2	0.64	0.64	Gravity
C4-21018	C4-21080	8	16.5	1.3333	8.53	0.11	8.70	-0.11	0.902	0.297	1.2	1.63	1.82	Surcharged
C4-21021	C4-21022	15	331.4	0.2505	8.90	5.68	8.62	4.85	2.09	0.078	0.4	0.17	0.39	Gravity
C4-21022	C4-21023	15	331.2	0.1540	8.62	4.85	8.86	4.34	1.639	0.337	1.7	0.39	0.38	Gravity
C4-21023	C4-21024	15	332.7	0.1485	8.86	4.32	9.26	3.83	1.609	0.334	1.6	0.39	0.39	Gravity
C4-21024	C4-21025	15	332.4	0.2016	9.26	3.83	7.80	3.16	1.875	0.393	1.6	0.39	0.43	Gravity
C4-21025	C4-21026	15	330.7	0.1966	7.80	3.16	6.03	2.51	1.851	0.452	1.5	0.43	0.52	Gravity
C4-21026	C4-21027	10	254.8	0.2159	6.03	2.51	5.63	1.96	0.658	0.451	1.9	0.52	0.53	Gravity
C4-21027	C4-21028	15	327.3	0.1204	5.63	1.96	4.41	1.57	1.449	0.537	1.5	0.53	0.58	Gravity
C4-21028	C4-21029	15	262.3	0.1205	4.41	1.57	8.47	1.25	1.449	0.580	1.3	0.58	0.69	Gravity
C4-21029	C4-21030	15	64.5	-4.2326	8.47	-1.23	8.00	1.50	-8.591	0.599	2.4	3.17	0.44	Surcharged
C4-21030	C4-21074	18	255.1	0.3865	8.00	0.98	7.57	-0.01	4.221	0.751	0.9	0.44	1.00	Gravity
C4-21035	C4-21036	6	416.4	0.9246	21.75	16.63	17.60	12.78	0.349	0.015	0.7	0.10	0.11	Gravity
C4-21036	C4-21037	6	364.2	1.1505	17.60	12.78	13.56	8.59	0.389	0.029	1.3	0.11	0.12	Gravity
C4-21037	C4-21038	6	117.1	1.6225	13.56	8.59	12.16	6.69	0.462	0.041	0.6	0.12	0.27	Gravity
C4-21038	C4-21039	6	145.0	0.3241	12.16	6.69	10.77	6.22	0.207	0.110	1.5	0.27	0.28	Gravity
C4-21039	C4-21040	6	150.0	0.3467	10.77	6.22	10.10	5.70	0.214	0.121	1.4	0.28	0.33	Gravity
C4-21040	C4-21041	8	285.0	0.2421	10.10	5.70	8.95	5.01	0.384	0.178	1.0	0.33	0.49	Gravity
C4-21041	C4-21042	8	238.0	0.1134	8.95	5.01	7.54	4.74	0.263	0.243	1.7	0.49	0.40	Gravity
C4-21042	C4-21091	8	519.1	0.0000	7.54	4.74	6.49	4.74	0	0.067	1.2	0.40	0.20	Gravity
C4-21042	C4-21051	8	75.0	0.0400	7.54	4.74	7.83	4.71	0.156	0.186	2.4	0.40	0.25	Gravity
C4-21043	C4-21044	6	376.0	0.0665	17.50	13.55	17.34	13.30	0.094	0.033	1.0	0.22	0.16	Gravity
C4-21044	C4-21045	6	309.7	1.2367	17.34	13.30	13.92	9.47	0.403	0.074	1.8	0.16	0.18	Gravity
C4-21045	C4-21048	6	295.5	1.1878	13.92	9.47	10.16	5.96	0.395	0.100	2.4	0.18	0.18	Gravity
C4-21046	C4-21047	6	436.0	0.8807	15.15	11.00	11.71	7.16	0.34	0.035	0.7	0.13	0.21	Gravity
C4-21047	C4-21048	6	296.4	0.4049	11.71	7.16	10.16	5.96	0.231	0.073	1.8	0.21	0.18	Gravity
C4-21048	C4-21085	8	17.4	36.2069	10.16	5.96	10.50	-0.34	4.696	0.189	7.6	0.11	0.11	Gravity

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C4-21049	C4-21050	8	18.2	0.8890	7.83	7.55	5.55	5.37	0.776	0.030	1.3	0.11	0.11	Gravity
C4-21050	C4-21051	10	27.8	2.3741	7.55	7.83	5.37	4.71	2.181	0.030	0.8	0.11	0.13	Gravity
C4-21051	C4-21052	10	248.0	0.1210	7.83	7.83	4.71	0.493	0.022	0.4	0.13	0.17	0.17	Gravity
C4-21051	C4-21056	12	23.1	23.6364	7.83	8.00	4.71	-0.75	11.195	0.194	4.8	0.13	0.13	Gravity
C4-21052	C4-21053	10	279.4	0.1503	6.23	5.63	3.99	0.549	0.043	0.8	0.17	0.17	0.17	Gravity
C4-21053	C4-21057	10	265.9	0.1655	6.23	5.90	3.55	0.043	0.576	0.043	0.3	0.17	0.34	Gravity
C4-21054	C4-21055	6	22.0	2.8636	6.31	6.55	4.68	4.05	0.614	0.032	0.3	0.10	0.40	Gravity
C4-21055	C4-21056	12	297.4	0.1210	6.55	6.01	4.05	3.69	0.801	0.256	1.1	0.40	0.46	Gravity
C4-21056	C4-21057	12	141.8	0.0987	6.01	5.90	3.55	0.724	0.353	2.3	0.46	0.34	0.34	Gravity
C4-21057	C4-21058	15	12.0	0.1667	5.90	6.08	3.55	3.53	1.703	0.396	2.6	0.34	0.31	Gravity
C4-21058	C4-21059	15	12.2	0.2459	6.08	6.08	3.51	3.48	2.073	0.000	0.0	0.07	0.07	Gravity
C4-21058	C4-21059	18	16.4	9.4512	6.08	6.40	-1.45	-3.00	20.892	0.604	7.1	0.23	0.80	Gravity
C4-21059	C4-21065	10	109.3	0.4300	7.05	10.48	3.48	10.48	0.929	0.000	0.0	0.07	0.07	Gravity
C4-21059	C4-21064	15	57.7	0.2946	7.05	10.80	3.48	10.80	2.267	0.000	0.0	0.07	0.07	Gravity
C4-21060	C4-21061	6	15.8	10.3797	8.16	8.32	6.96	5.32	1.168	0.006	0.1	0.07	0.29	Gravity
C4-21061	C4-21063	6	329.1	0.3342	8.32	6.77	4.22	4.22	0.121	0.121	1.5	0.28	0.30	Gravity
C4-21062	C4-21063	8	270.1	0.2777	7.59	4.97	4.97	4.22	0.412	0.075	0.8	0.20	0.30	Gravity
C4-21063	C4-21068	8	163.1	0.4353	6.77	6.08	4.22	3.51	0.515	0.209	2.4	0.30	0.27	Gravity
C4-21064	C4-21065	15	46.9	0.6397	10.80	10.48	3.01	3.341	0.000	0.0	0.07	0.07	0.07	Gravity
C4-21065	C4-21066	15	93.8	0.5437	10.48	9.50	3.01	2.50	3.079	0.000	0.0	0.07	0.07	Gravity
C4-21066	C4-21030	12	242.2	0.5822	9.50	8.00	2.50	1.09	1.757	-0.001	0.0	0.07	0.33	Gravity
C4-21067	C4-21068	14	55.0	0.0000	8.30	-1.20	-1.20	0	1.505	2.0	4.17	4.07	4.07	Throttled
C4-21068	C4-21069	14	259.7	0.1887	8.38	5.77	1.57	1.08	1.509	1.525	2.5	1.29	1.27	Throttled
C4-21069	C4-21071	14	110.0	0.1818	5.77	6.25	1.08	0.88	1.481	1.545	2.5	1.26	1.24	Throttled
C4-21070	C4-21071	8	427.6	0.5636	7.65	6.25	2.50	0.09	0.586	0.103	0.4	0.20	2.03	Surcharged
C4-21071	C4-21072	14	142.0	0.1831	6.25	5.93	0.88	0.62	1.487	1.637	2.5	1.23	1.17	Throttled
C4-21072	C4-21073	14	265.0	0.1849	5.93	0.62	0.82	0.13	1.494	1.659	3.1	1.16	1.02	Gravity
C4-21073	C4-21074	14	60.0	0.0000	7.69	-1.80	-1.80	-1.80	0	1.667	2.3	2.93	2.80	Throttled
C4-21074	C4-21075	18	98.5	0.1421	7.57	-0.06	-0.06	-0.20	2.56	2.469	3.2	1.05	0.97	Gravity
C4-21075	C5-21013	18	222.5	0.2652	5.90	5.16	-0.20	-0.79	3.496	2.478	2.8	0.96	1.10	Gravity
C4-21076	C4-21067	14	465.2	0.3009	6.97	2.89	2.89	1.29	1.906	1.474	2.0	1.13	1.69	Surcharged
C4-21078	D4-21086	6	28.2	0.2128	9.35	6.59	6.59	6.53	0.167	0.035	0.7	0.19	0.21	Gravity
C4-21080	C4-21081	18	246.9	0.1580	8.70	-0.11	-0.11	-0.50	2.699	2.746	2.3	1.80	1.79	Throttled
C4-21081	C4-21082	24	429.8	0.1419	10.70	12.70	-0.50	-1.11	5.509	5.437	3.2	1.78	1.80	Gravity
C4-21082	C4-21083	24	427.4	0.1497	12.70	13.60	-1.75	-1.75	5.659	5.359	3.2	1.79	1.86	Gravity
C4-21083	C4-21084	24	422.7	0.1514	13.60	-2.39	-1.75	5.69	5.268	3.1	1.85	1.95	1.95	Gravity
C4-21084	C4-21085	24	132.0	0.1515	11.50	10.50	-2.39	-2.59	5.692	5.248	3.0	1.94	1.97	Gravity
C4-21085	C4-21086	24	278.9	0.1470	10.50	8.00	-2.59	-3.00	5.607	5.398	3.1	1.96	1.99	Gravity
C4-21086	C4-21087	24	392.1	0.1505	8.00	7.81	-3.59	-3.59	5.577	5.546	3.2	1.98	2.00	Gravity
C4-21087	C4-21089	24	410.9	0.1485	7.81	6.40	-3.59	-4.20	5.634	5.546	3.1	1.98	2.00	Gravity
C4-21089	C4-21090	30	423.5	0.1511	6.40	7.90	-4.20	-4.84	10.307	6.112	2.1	1.99	2.41	Gravity
C4-21090	C5-21041	30	405.1	0.1037	7.90	9.30	-5.26	-5.26	8.537	6.126	1.9	2.41	2.61	Surcharged
C4-21091	C4-22014	8	35.0	0.3600	6.49	6.11	4.61	0.469	0.079	1.4	0.20	0.20	0.20	Gravity
C4-21092	D4-21076	6	246.6	0.1906	19.11	22.54	16.01	15.54	0.158	0.149	1.1	0.97	1.01	Surcharged
C4-22006	C4-21078	6	235.9	0.4409	10.63	9.35	7.63	6.59	0.241	0.018	0.4	0.11	0.19	Gravity
C4-22009	C4-21054	6	210.0	0.5238	8.17	5.78	4.68	0.263	0.005	0.3	0.08	0.10	0.10	Gravity
C4-22010	C4-21054	6	94.2	-0.0955	6.02	6.31	4.59	4.68	-0.112	0.005	0.3	0.19	0.10	Gravity
C4-22014	C4-22015	8	85.0	0.3612	6.11	6.00	4.61	4.31	0.469	0.081	1.3	0.20	0.21	Gravity
C4-22015	C4-21056	8	170.9	0.3610	6.00	3.69	6.01	3.69	0.091	0.5	0.21	0.46	0.46	Gravity
C4-22021	C4-21092	18	5.2	1.4808	19.19	19.11	16.09	16.01	8.247	-0.016	0.0	0.90	0.98	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C4-22022	C3-21060	6	233.1	0.4934	31.08	27.40	33.09	26.25	0.255	0.004	0.3	0.08	0.08	Gravity
C4-29007	C4-21017	12	9.5	0.0000	10.33	4.00	10.18	4.00	0	1.043	2.8	0.72	0.69	Gravity
C4-21048	C4-29012	8	128.3	0.3196	10.00	5.96	10.16	5.55	0.442	0.005	0.0	0.12	0.52	Gravity
C5-21001	C5-21002	8	270.1	0.3813	11.25	7.14	8.57	6.11	0.482	0.001	0.0	0.07	0.14	Gravity
C5-21002	C4-21062	8	269.8	0.4225	8.57	6.11	7.59	4.97	0.508	0.041	0.7	0.14	0.20	Gravity
C5-21003	C5-21004	8	32.6	0.3374	11.31	10.97	10.97	6.60	0.454	0.056	1.6	0.17	0.14	Gravity
C5-21004	C5-21042	8	14.5	22.0000	10.97	1.00	10.90	-2.19	3.664	0.056	3.2	0.09	0.09	Gravity
C5-21006	C5-21007	6	267.9	0.4927	6.97	4.69	6.91	3.37	0.255	0.042	0.9	0.15	0.20	Gravity
C5-21007	C5-21008	8	376.6	0.2841	6.91	3.37	3.37	2.30	0.416	0.076	0.8	0.20	0.28	Gravity
C5-21008	C4-21030	8	360.0	0.3361	5.05	2.30	8.00	1.09	0.453	0.160	1.6	0.28	0.33	Gravity
C5-21009	C5-21010	8	321.4	0.4387	7.04	3.21	5.70	1.80	0.517	0.026	0.7	0.12	0.15	Gravity
C5-21010	C4-21074	8	446.6	0.4165	5.70	1.80	7.57	-0.06	0.504	0.047	0.2	0.15	1.06	Surcharged
C5-21011	C5-21012	6	271.5	0.4641	5.31	3.26	3.85	2.00	0.247	0.004	0.2	0.08	0.10	Gravity
C5-21012	C5-29008	6	419.8	0.6346	3.85	2.00	5.74	-0.66	0.289	0.013	0.1	0.10	0.98	Surcharged
C5-21013	C5-21040	24	58.9	0.0730	5.16	-0.79	3.73	-0.83	3.932	2.514	2.2	1.10	1.09	Gravity
C5-21014	C5-21015	8	253.0	0.5534	7.40	3.70	7.60	2.30	0.581	0.003	0.2	0.07	0.07	Gravity
C5-21015	C5-21016	8	300.0	0.6000	7.60	2.20	7.80	0.40	0.605	0.008	0.3	0.08	0.15	Gravity
C5-21016	C5-21017	8	297.7	0.6046	7.80	0.40	7.80	-1.40	0.607	0.054	1.5	0.15	0.15	Gravity
C5-21017	C5-21043	8	258.9	2.9355	7.80	-1.40	8.00	-9.00	1.339	0.058	2.3	0.12	0.12	Gravity
C5-21019	C5-21020	8	148.3	0.8294	8.20	3.40	8.09	2.17	0.711	0.000	0.0	0.00	0.67	Gravity
C5-21020	C5-21013	8	134.0	0.0000	8.09	2.17	5.16	2.17	0	0.000	0.0	0.67	0.67	Throttled
C5-21021	C5-21022	24	230.0	0.1870	3.90	-1.10	4.92	-1.53	6.323	2.564	2.6	0.91	0.98	Gravity
C5-21022	C5-21023	24	261.7	0.1299	4.92	-1.53	6.13	-1.87	5.271	2.612	3.0	0.98	0.88	Gravity
C5-21023	C5-21024	24	45.2	0.2876	6.13	-1.87	6.85	-2.00	7.841	2.638	2.8	0.88	0.94	Gravity
C5-21024	C5-21025	24	558.2	0.1791	6.85	-2.00	11.16	-3.00	6.189	2.668	2.0	0.94	1.26	Gravity
C5-21025	C5-21031	24	113.9	0.0878	11.16	-3.00	11.33	-3.10	4.332	2.669	1.9	1.26	1.29	Gravity
C5-21026	C5-21027	6	173.8	0.8055	8.72	5.31	7.77	3.91	0.326	0.050	1.2	0.15	0.18	Gravity
C5-21027	C5-21029	6	178.5	0.6387	7.77	3.91	10.27	2.77	0.29	0.070	0.5	0.18	0.76	Surcharged
C5-21028	C5-21029	24	141.0	0.8014	11.30	3.90	10.27	2.77	13.091	2.142	3.0	0.56	0.76	Gravity
C5-21029	C5-21030	24	146.0	0.2123	10.27	2.77	11.40	2.46	6.738	2.204	3.9	0.76	0.65	Gravity
C5-21030	C5-21031	24	39.3	14.1476	11.40	2.46	11.33	-3.10	54.972	2.204	1.6	0.33	1.29	Gravity
C5-21031	C5-21032	36	132.8	0.0753	11.33	-3.10	9.15	-3.20	11.829	4.872	2.7	1.29	1.26	Gravity
C5-21032	C5-21102	36	277.9	0.0288	9.15	-3.20	9.10	-3.28	7.315	4.871	4.4	1.26	0.87	Gravity
C5-21037	C5-29014	51	43.5	0.3862	8.80	-8.08	10.00	-8.24	67.898	23.263	5.2	2.04	2.12	Gravity
C5-21040	C5-21021	24	369.8	0.0722	3.73	-0.83	3.90	-1.10	3.932	2.526	2.8	1.09	0.91	Gravity
C5-21041	C5-21042	36	185.0	0.1027	9.30	-5.26	10.90	-5.45	13.818	14.365	3.7	2.60	2.57	Gravity
C5-21042	C5-21107	36	127.3	0.1728	10.90	-5.45	12.30	-5.67	17.92	14.406	3.6	2.55	2.63	Gravity
C5-21043	C5-21044	16	11.4	0.8596	8.00	-9.25	8.00	-9.35	4.599	0.289	2.7	0.24	0.24	Gravity
C5-21044	C5-29026	16	116.2	0.8623	8.00	-9.35	8.00	-10.35	4.605	0.289	2.7	0.24	0.24	Gravity
C5-21045	C5-21014	6	593.7	0.4969	9.23	6.65	7.40	3.70	0.256	0.000	0.0	0.07	0.07	Gravity
C5-21101	C5-21102	51	82.5	0.0727	10.00	-7.39	9.10	-7.45	29.429	14.745	3.1	2.19	2.19	Gravity
C5-21102	C5-21103	51	266.0	0.1053	9.10	-7.45	9.00	-7.73	35.41	19.589	4.2	2.19	2.15	Gravity
C5-21103	C5-21104	51	291.2	0.0996	9.00	-7.73	9.80	-8.02	34.442	19.583	4.6	2.15	2.01	Gravity
C5-21104	C5-21037	51	14.1	0.3901	9.80	-8.02	8.80	-8.08	67.898	19.582	4.5	2.01	2.04	Gravity
C5-21106	C5-21107	24	11.2	69.6429	12.00	-5.13	12.30	-2.67	121.799	0.389	3.3	0.22	0.22	Gravity
C5-21107	D5-21096	36	316.6	0.1327	12.30	-6.67	13.61	-6.09	15.702	14.758	3.5	2.62	2.65	Gravity
C5-21108	C5-29032	6	140.5	0.5480	10.00	7.97	9.81	0.269	0.000	0.000	0.0	0.07	0.07	Gravity
C5-22006	C5-21019	10	108.1	0.1832	6.75	3.60	8.20	3.40	0.606	0.000	0.0	0.00	0.00	Gravity
C5-22008	C5-21023	6	180.0	2.7000	7.16	2.99	6.13	-1.87	0.596	0.005	0.0	0.07	0.88	Surcharged
C5-22009	C5-21006	6	139.1	0.0144	7.26	4.71	6.97	4.69	0.043	0.009	0.3	0.16	0.15	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C5-23001	C5-27005	12	215.3	0.0000	7.43	-1.94	8.00	-1.94	-	1.072	2.1	Pressure	Pressure	Foremain
C5-23004	C5-23005	12	20.0	0.0000	8.10	-1.94	8.13	-1.94	-	1.072	2.1	Pressure	Pressure	Foremain
C5-23005	C5-23006	12	421.6	0.0000	8.08	-1.94	8.10	-1.94	-	1.072	2.1	Pressure	Pressure	Foremain
C5-23006	C5-23001	12	80.8	0.0000	8.08	-1.94	7.43	-1.94	-	1.072	2.1	Pressure	Pressure	Foremain
C5-24001	C5-29029	10	13.2	0.1818	8.00	4.19	8.00	4.17	0.606	0.000	0.0	0.00	0.00	Gravity
C5-27005	C5-29010	8	2321.8	0.0000	8.00	-1.94	8.09	-1.94	-	1.073	4.8	Pressure	Pressure	Foremain
C5-27006	C5-29031	8	174.8	0.0000	8.00	4.23	8.00	4.23	-	0.280	1.2	Pressure	Pressure	Foremain
C5-27010	C5-29028	6	16.1	0.0000	8.00	4.23	8.00	4.23	-	0.280	2.2	Pressure	Pressure	Foremain
C5-27011	C5-29027	6	16.2	0.0000	8.00	4.23	8.00	4.23	-	0.000	0.0	Pressure	Pressure	Foremain
C5-29003	C5-29009SG	30	256.1	-2.6279	7.81	-2.50	11.48	4.23	-	0.000	0.0	Pressure	Pressure	Foremain
C5-29008	C5-21013	6	19.9	0.6332	5.74	-0.66	5.16	-0.79	0.289	0.016	-0.1	0.98	1.10	Surcharged
C5-29009	C5-29013	30	691.7	0.0000	11.48	4.23	8.14	4.23	-	0.280	0.1	Pressure	Pressure	Foremain
C5-29014	D5-29010	51	53.5	0.3869	10.00	-8.24	10.00	-8.45	67.898	33.508	7.3	2.12	2.12	Gravity
C5-29020	C5-29021	8	597.6	3.3384	8.24	7.50	10.05	-12.45	1.427	0.069	1.9	0.12	0.15	Gravity
C5-29027	C5-29028	6	3.3	0.0000	8.00	4.23	8.00	4.23	-	0.000	0.0	Pressure	Pressure	Foremain
C5-29028	C5-27006	8	3.3	0.0000	8.00	4.23	8.00	4.23	-	0.280	1.2	Pressure	Pressure	Foremain
C5-29029	C5-22006	10	312.0	0.1830	8.00	4.17	6.75	3.60	0.606	0.000	0.0	0.00	0.00	Gravity
C5-29031	C5-29009	16	1977.8	0.0000	8.00	4.23	11.48	4.23	-	0.280	0.3	Pressure	Pressure	Foremain
C5-29032	C5-21045	6	100.5	0.5473	9.81	7.20	9.23	6.65	0.268	0.000	0.0	0.07	0.07	Gravity
C6-21001	C6-21002	6	300.1	0.6465	8.60	1.70	8.60	-0.24	0.292	0.110	1.8	0.79	2.61	Surcharged
C6-21002	C6-21003	6	157.6	0.5393	8.60	-0.24	8.60	-1.09	0.266	0.114	2.0	2.61	3.39	Surcharged
C6-21003	C6-21004	6	272.1	0.6156	8.60	-1.09	8.09	-2.77	0.285	0.105	1.9	3.39	4.94	Surcharged
C6-21004	C6-21005	6	70.7	0.6153	9.09	-2.77	8.50	-3.20	0.285	0.102	1.8	4.94	5.34	Surcharged
C6-21005	C6-21011	6	58.4	0.5137	8.50	-3.20	9.60	-3.50	0.26	0.099	2.1	5.34	5.62	Surcharged
C6-21006	C6-21007	8	282.0	0.4504	8.50	2.27	8.60	1.00	0.524	0.094	1.3	0.20	1.29	Surcharged
C6-21007	C6-21008	8	251.6	0.4491	8.60	1.00	9.10	-0.13	0.524	0.132	1.6	1.29	2.38	Surcharged
C6-21008	C6-21009	8	259.1	0.4400	9.10	-0.13	8.60	-1.27	0.518	0.158	2.0	2.38	3.48	Surcharged
C6-21009	C6-21010	8	242.4	0.4579	8.60	-1.27	9.30	-2.38	0.529	0.151	1.9	3.48	4.55	Surcharged
C6-21010	C6-21011	8	246.6	0.4542	9.30	-2.38	9.60	-3.50	0.527	0.137	2.2	4.55	5.62	Surcharged
C6-21011PS	C6-22001	8	428.9	0.2616	9.60	4.75	8.00	3.63	0.4	0.270	1.2	3.78	4.39	Surcharged
C6-22001	C6-22003	8	1004.6	0.0000	8.00	3.63	8.00	3.63	-	0.270	1.2	Pressure	Pressure	Foremain
C6-22003	C6-22005	8	292.8	0.0000	8.00	3.63	9.03	3.63	-	0.270	1.2	Pressure	Pressure	Foremain
C6-22004	C5-29012	8	1111.4	0.0000	8.00	3.63	8.05	3.63	-	0.270	1.2	Pressure	Pressure	Foremain
C6-22005	C6-22004	8	708.9	0.0000	9.03	3.63	8.00	3.63	-	0.270	1.2	Pressure	Pressure	Foremain
C7-21001	C7-21002	12	293.9	0.2552	8.68	5.05	10.80	4.30	1.163	0.000	0.0	0.07	0.07	Gravity
C7-21002	C7-21003	12	180.0	0.2500	10.80	4.30	10.17	3.85	1.152	0.000	0.0	0.07	0.07	Gravity
C7-21003	C7-21004	12	311.0	0.2572	10.17	3.85	5.30	3.05	1.168	0.000	0.0	0.07	0.07	Gravity
C7-21004	C7-21005	12	295.0	0.2576	5.30	3.05	8.50	2.29	1.169	0.000	0.0	0.07	0.07	Gravity
C7-21005	D7-21071	12	320.6	0.2464	8.50	2.29	1.143	8.38	1.50	0.000	0.1	0.07	0.16	Gravity
C7-21006	C7-21007	8	233.1	0.4848	10.00	4.52	9.00	3.39	0.544	0.001	0.1	0.07	0.08	Gravity
C7-21007	C7-21008	8	261.8	0.4469	9.00	3.39	8.30	2.22	0.522	0.006	0.2	0.08	0.15	Gravity
C7-21008	C7-21009	10	278.2	0.2983	8.30	2.22	8.90	1.39	0.774	0.048	0.9	0.15	0.81	Gravity
C7-21009	C7-21010	10	229.8	0.3046	8.90	1.39	8.30	0.69	0.782	0.063	1.1	0.81	1.50	Surcharged
C7-21010	C7-21011	10	227.1	0.3056	8.30	0.69	9.40	0.00	0.783	0.064	0.7	1.50	2.19	Surcharged
C7-21011	C7-21012	10	247.5	0.3055	9.40	0.00	8.70	-0.76	0.783	0.121	1.5	2.19	2.93	Surcharged
C7-21012	C7-21013	10	301.6	0.2984	8.70	-0.76	9.00	-1.66	0.774	0.118	1.5	2.93	3.81	Surcharged
C7-21013	C7-21014	10	298.4	0.3016	9.00	-1.66	8.60	-2.56	0.778	0.109	1.4	3.81	4.70	Surcharged
C7-21014	C6-21011	10	321.7	0.2922	8.60	-2.56	9.60	-3.50	0.766	0.117	2.0	4.70	5.62	Surcharged
C8-21001	C7-21001	12	242.4	0.2517	9.07	5.66	8.68	1.156	0.000	0.000	0.0	0.07	0.07	Gravity
D1-21002	D1-21003	6	125.9	4.7657	553.30	547.30	547.80	541.30	0.792	0.068	3.3	0.12	0.11	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D1-21003	D1-21004	6	225.5	9.7118	547.30	541.30	526.00	519.40	1.13	0.081	3.4	0.11	0.12	Gravity
D1-21004	E1-21025	6	262.4	9.4512	526.00	519.40	504.20	494.60	1.115	0.105	3.4	0.12	0.15	Gravity
D1-21005	D1-21006	6	299.5	7.1786	542.60	536.70	522.00	515.20	0.972	0.010	0.8	0.07	0.08	Gravity
D1-21006	D1-21007	6	148.5	13.4680	522.00	515.20	503.20	495.20	1.331	0.017	1.2	0.08	0.08	Gravity
D1-21007	D1-21008	6	293.0	13.1741	503.20	495.20	465.20	456.60	1.317	0.034	1.8	0.08	0.10	Gravity
D1-21008	D1-21010	6	189.7	9.5941	465.20	456.60	445.00	438.40	1.124	0.059	3.1	0.10	0.10	Gravity
D1-21009	D1-21008	6	156.0	9.5513	477.40	471.50	465.20	456.60	1.121	0.015	0.8	0.08	0.10	Gravity
D1-21010	D2-21002	6	177.6	11.4865	445.00	438.40	428.40	418.00	1.229	0.071	1.8	0.10	0.18	Gravity
D1-21012	D1-21013	6	249.6	10.9776	516.40	510.40	489.20	483.00	1.202	0.027	1.6	0.08	0.10	Gravity
D1-21013	D1-21014	6	287.6	9.4228	489.20	483.00	463.60	455.90	1.114	0.048	2.5	0.10	0.11	Gravity
D1-21014	D2-21001	6	298.2	8.9531	463.60	455.90	436.60	429.50	1.079	0.066	2.9	0.11	0.12	Gravity
D1-21016	D1-21017	6	290.1	9.4105	538.50	535.00	513.50	507.70	1.113	0.012	0.9	0.07	0.08	Gravity
D1-21017	D1-21018	6	269.3	10.9915	513.50	507.70	483.80	478.10	1.203	0.020	1.4	0.08	0.08	Gravity
D1-21018	D2-21038	6	266.0	11.1278	483.80	478.10	454.60	448.50	1.21	0.027	1.5	0.08	0.10	Gravity
D1-22011	D1-21012	6	187.3	5.2322	525.20	520.20	516.40	510.40	0.83	0.011	0.8	0.08	0.08	Gravity
D1-22015	D1-21016	6	151.8	2.8327	544.80	539.30	538.50	535.00	0.611	0.005	0.4	0.07	0.07	Gravity
D2-21001	D2-21002	6	163.9	7.0165	436.60	429.50	426.40	418.00	0.961	0.081	2.0	0.12	0.18	Gravity
D2-21002	D2-21003	6	202.8	3.7475	426.40	418.00	415.40	410.40	0.702	0.162	4.1	0.18	0.17	Gravity
D2-21003	D2-21004	6	64.7	4.4822	415.40	410.40	415.10	407.50	0.768	0.169	4.3	0.17	0.17	Gravity
D2-21004	D2-21006	6	250.0	10.6800	415.10	407.50	386.50	380.80	1.186	0.184	4.4	0.15	0.18	Gravity
D2-21005	D2-21004	6	212.9	11.2729	437.60	431.50	415.10	407.50	1.218	0.013	0.4	0.07	0.15	Gravity
D2-21006	D2-21007	6	115.9	4.8318	386.50	380.80	382.60	375.20	0.797	0.201	1.8	0.18	0.49	Gravity
D2-21007	D2-21008	6	316.3	8.6595	382.60	375.20	353.21	347.81	1.068	0.914	8.0	0.37	0.75	Surcharged
D2-21008	D2-21009	6	314.0	10.0360	353.21	347.81	321.77	316.30	1.149	0.952	8.0	0.36	0.78	Surcharged
D2-21009	D2-21010	6	321.6	9.8072	321.77	316.30	290.18	284.76	1.136	0.984	7.8	0.37	0.78	Surcharged
D2-21010	D2-21011	6	328.2	9.5643	290.18	284.76	258.76	253.37	1.122	1.024	9.7	0.39	0.39	Gravity
D2-21011	D2-21012	8	282.7	11.3230	258.76	253.37	229.76	221.36	2.629	1.057	6.7	0.30	0.49	Gravity
D2-21012	D2-21024	8	260.0	8.7038	229.76	221.36	206.27	198.73	2.305	1.536	9.9	0.41	0.49	Gravity
D2-21013	D2-21014	6	213.1	10.6335	349.64	344.73	327.87	322.07	1.183	0.055	1.2	0.10	0.20	Gravity
D2-21014	D2-21015	6	244.1	0.4195	327.87	322.07	324.50	321.05	0.235	0.067	1.3	0.20	0.22	Gravity
D2-21015	D2-21018	6	251.8	0.4194	324.50	321.05	327.36	319.99	0.235	0.083	1.8	0.22	0.20	Gravity
D2-21016	D2-21017	6	97.9	7.3749	347.57	341.27	339.18	334.05	0.985	0.279	6.4	0.19	0.19	Gravity
D2-21017	D2-21018	6	163.3	8.6099	339.18	334.05	327.36	319.99	1.064	0.285	6.1	0.19	0.20	Gravity
D2-21018	D2-21019	6	295.5	13.0051	327.36	319.99	287.03	281.56	1.308	0.379	8.1	0.20	0.20	Gravity
D2-21019	D2-21020	6	298.7	14.6903	287.03	281.56	243.73	237.68	1.39	0.404	5.1	0.20	0.31	Gravity
D2-21020	D2-21021	6	69.0	3.7536	243.73	237.68	241.58	235.09	0.703	0.410	3.0	0.30	1.64	Surcharged
D2-21021	D2-21022	6	296.3	1.0192	241.58	235.09	237.87	232.07	0.366	0.420	3.7	1.62	0.41	Throttled
D2-21022	D2-21023	6	158.2	3.8053	237.87	232.07	231.41	226.05	0.708	0.436	5.5	0.29	0.30	Gravity
D2-21023	D2-21012	6	103.4	4.5358	231.41	226.05	229.76	221.36	0.773	0.452	3.6	0.29	0.49	Gravity
D2-21024	D2-21025	8	177.6	9.2568	206.27	198.73	188.86	182.29	2.377	1.552	7.5	0.40	0.88	Surcharged
D2-21025	D2-21051	8	267.1	7.8825	188.86	182.29	168.89	161.77	2.165	1.894	9.4	0.49	1.26	Surcharged
D2-21026	D2-21027	6	298.4	10.3150	401.28	396.10	370.12	365.32	1.165	0.014	0.9	0.07	0.09	Gravity
D2-21027	D2-21028	6	285.8	10.9027	370.12	365.32	341.61	334.16	1.198	0.039	1.8	0.09	0.11	Gravity
D2-21028	D2-21029	6	262.9	4.1347	341.61	334.16	331.15	323.29	0.738	0.057	2.4	0.11	0.12	Gravity
D2-21029	D2-21035	6	177.4	4.6223	331.15	323.29	324.61	315.09	0.78	0.073	1.9	0.12	0.17	Gravity
D2-21030	D2-21031	6	125.0	6.6880	449.56	442.98	440.18	434.62	0.938	0.014	1.1	0.08	0.08	Gravity
D2-21031	D2-21032	6	299.7	15.0317	440.18	434.52	393.00	389.47	1.406	0.027	1.7	0.08	0.09	Gravity
D2-21032	D2-21033	6	305.1	15.4179	393.00	389.47	351.34	342.43	1.424	0.046	2.4	0.09	0.11	Gravity
D2-21033	D2-21034	6	150.6	8.0943	351.34	342.43	336.59	330.24	1.032	0.061	3.1	0.11	0.11	Gravity
D2-21034	D2-21035	6	196.0	7.7296	336.59	330.24	324.61	315.09	1.009	0.067	1.7	0.11	0.17	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D2-21035	D2-21078	6	97.6	3.2295	324.61	324.61	319.30	311.94	0.652	0.145	3.4	0.17	0.18	Gravity
D2-21036	D2-21037	6	289.7	5.2330	311.34	311.34	297.17	291.05	0.83	0.190	4.1	0.18	0.20	Gravity
D2-21037	D2-21043	6	115.6	3.7803	297.17	297.17	292.17	291.05	0.868	0.190	4.4	0.20	0.20	Gravity
D2-21038	D2-21039	6	176.0	3.3523	454.60	454.60	447.90	442.60	0.664	0.033	2.3	0.10	0.09	Gravity
D2-21039	D2-21040	6	300.9	14.9551	447.90	447.90	403.40	397.60	1.403	0.039	2.6	0.09	0.09	Gravity
D2-21040	D2-21041	6	114.3	14.9493	403.40	403.40	385.60	380.51	1.403	0.046	2.8	0.09	0.09	Gravity
D2-21041	D2-21042	6	234.8	14.9502	385.60	385.60	350.79	345.41	1.403	0.053	3.1	0.09	0.10	Gravity
D2-21042	D2-21043	6	302.2	14.9504	350.79	350.79	305.62	300.23	1.403	0.062	3.3	0.10	0.10	Gravity
D2-21043	D2-21044	6	124.0	10.9274	300.23	300.23	292.17	286.68	1.199	0.067	1.7	0.10	0.17	Gravity
D2-21044	D2-21045	6	226.0	12.1637	292.17	292.17	266.13	259.19	1.265	0.268	5.7	0.17	0.20	Gravity
D2-21045	D2-21046	6	123.2	6.5341	266.13	266.13	255.79	251.14	0.927	0.270	5.8	0.20	0.20	Gravity
D2-21046	D2-21047	6	288.0	15.5448	255.79	255.79	217.90	209.48	1.43	0.285	5.1	0.17	0.23	Gravity
D2-21047	D2-21049	6	315.8	4.7910	217.90	217.90	199.63	194.35	0.794	0.304	5.0	0.23	0.24	Gravity
D2-21048	D2-21049	6	117.9	1.6031	200.64	200.64	196.24	194.35	0.459	0.013	0.2	0.09	0.24	Gravity
D2-21049	D2-21050	6	188.8	4.3273	199.63	199.63	191.33	186.18	0.755	0.329	4.5	0.24	0.28	Gravity
D2-21050	D2-21025	6	131.1	2.9672	191.33	191.33	188.86	182.29	0.625	0.338	2.6	0.28	0.87	Surcharged
D2-21051	D2-21052	8	317.0	8.3407	166.89	166.89	143.71	135.33	2.256	1.890	6.8	1.03	8.22	Surcharged
D2-21052	D2-21073	8	247.5	8.4040	143.71	143.71	124.56	114.73	2.285	2.143	7.0	7.89	9.25	Surcharged
D2-21053	D2-21054	6	95.0	3.2000	324.79	324.79	320.03	313.75	0.649	0.012	0.9	0.08	0.08	Gravity
D2-21054	D2-21055	6	160.0	12.6063	320.03	320.03	298.68	293.58	1.288	0.023	1.8	0.08	0.08	Gravity
D2-21055	D2-21056	6	175.4	14.4698	298.68	298.68	275.40	268.20	1.38	0.029	1.4	0.08	0.11	Gravity
D2-21056	D2-21059	6	102.5	14.1951	275.40	275.40	258.96	253.65	1.367	0.092	4.4	0.11	0.11	Gravity
D2-21057	D2-21058	6	146.9	2.5868	298.50	298.50	283.60	279.80	0.583	0.051	2.7	0.12	0.10	Gravity
D2-21058	D2-21056	6	169.5	6.8437	282.50	282.50	275.40	268.20	0.949	0.054	2.7	0.10	0.11	Gravity
D2-21059	D2-21061	6	193.9	15.1882	258.96	258.96	238.55	224.20	1.414	0.101	2.9	0.11	0.16	Gravity
D2-21060	D2-21061	6	273.4	0.3182	225.07	225.07	238.55	224.20	0.205	0.023	0.7	0.13	0.16	Gravity
D2-21061	D2-21062	6	122.0	3.7869	238.55	238.55	225.81	219.58	0.706	0.129	3.7	0.16	0.16	Gravity
D2-21062	D2-21063	6	147.0	12.8844	225.81	225.81	205.97	200.64	1.302	0.139	5.4	0.13	0.13	Gravity
D2-21063	D2-21064	6	168.5	15.8635	205.97	205.97	180.38	173.91	1.445	0.150	5.0	0.13	0.14	Gravity
D2-21064	D2-21066	6	201.5	13.3002	180.38	180.38	154.67	147.11	1.323	0.187	3.0	0.14	0.25	Gravity
D2-21065	D2-21064	6	232.0	7.1379	195.08	195.08	180.38	173.91	0.989	0.024	0.8	0.08	0.14	Gravity
D2-21066	D2-21068	6	239.2	1.6597	154.67	154.67	148.34	143.14	0.467	0.207	2.1	0.25	2.86	Surcharged
D2-21067	D2-21068	6	149.7	2.7054	153.52	153.52	148.34	143.14	0.597	0.033	0.2	0.09	2.86	Surcharged
D2-21068	D2-21069	6	239.4	0.6266	148.34	148.34	151.37	141.64	0.287	0.260	2.1	2.86	3.50	Surcharged
D2-21069	D2-21070	6	94.9	0.4953	151.37	151.37	150.87	141.17	0.255	0.293	3.1	3.49	3.61	Throttled
D2-21070	D2-21052	6	285.4	1.9762	150.87	150.87	143.71	135.53	0.51	0.328	2.2	3.60	8.02	Surcharged
D2-21071	D2-21072	6	178.1	2.2235	151.21	151.21	147.27	141.74	0.541	0.056	1.5	0.12	1.94	Surcharged
D2-21072	D2-21052	6	300.7	2.1317	147.27	147.27	143.71	135.53	0.53	0.103	0.6	1.94	8.21	Surcharged
D2-21073	D2-21004	8	348.4	3.5419	124.56	124.56	108.02	102.39	1.47	1.755	7.8	9.16	3.31	Throttled
D2-21078	D2-21036	6	177.3	3.2307	319.30	319.30	311.34	306.21	0.652	0.166	4.1	0.18	0.18	Gravity
D3-21003	D3-21007	8	132.1	1.0371	77.36	77.36	76.90	73.59	0.795	0.057	1.2	0.14	0.17	Gravity
D3-21004	D3-21085	8	391.8	4.4844	102.39	102.39	83.48	77.48	1.654	0.022	1.2	0.09	0.09	Gravity
D3-21007	D3-21086	8	198.2	0.7669	76.90	76.90	73.59	72.07	0.684	0.085	1.9	0.17	0.17	Gravity
D3-21008	D3-21084	6	184.0	4.9402	97.64	97.64	88.80	85.00	0.806	0.033	2.0	0.10	0.09	Gravity
D3-21009	D3-21014	8	138.6	1.9625	80.01	80.01	81.29	73.60	1.094	0.045	0.2	0.11	1.63	Surcharged
D3-21010	D3-21011	6	219.3	0.7661	79.22	79.22	80.13	71.67	0.318	0.004	0.3	0.08	0.09	Gravity
D3-21011	D3-21012	6	281.3	1.4433	80.13	80.13	74.17	67.61	0.436	0.017	0.5	0.09	0.16	Gravity
D3-21012	D4-21095	10	133.8	1.7265	74.17	74.17	66.80	65.30	1.861	0.108	0.3	0.16	1.01	Surcharged
D3-21014	D3-21015	10	305.0	1.0164	81.29	81.29	77.80	70.50	1.428	1.585	5.0	1.57	0.70	Throttled
D4-21015	D4-21095	10	299.6	1.7356	77.80	77.80	66.80	65.30	1.866	1.615	4.4	0.61	1.02	Surcharged

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D3-21017	D3-21014	10	149.7	1.2091	81.41	75.41	81.29	73.60	1.588	0.580	1.6	0.38	1.63	Surcharged
D3-21018	D3-21019	6	125.0	0.3280	82.45	76.87	81.32	76.46	0.208	0.004	0.3	0.08	0.08	Gravity
D3-21019	D3-21020	6	100.0	0.7700	81.32	76.46	81.32	75.69	0.318	0.008	0.5	0.08	0.10	Gravity
D3-21020	D3-21021	6	166.5	1.8739	81.19	75.69	78.57	72.57	0.497	0.022	1.2	0.10	0.10	Gravity
D3-21021	D3-21015	8	143.1	1.4465	78.57	72.57	77.80	70.50	0.94	0.028	0.1	0.10	0.63	Gravity
D3-21022	D3-21021	8	50.4	0.9921	78.57	73.07	72.57	72.57	0.778	0.005	0.2	0.08	0.10	Gravity
D3-21022	D4-21052	6	127.0	2.3071	78.79	73.07	74.64	70.14	0.551	0.007	0.3	0.08	0.12	Gravity
D3-21023	D3-21003	6	144.1	0.5968	78.62	75.82	77.36	74.96	0.28	0.013	0.5	0.10	0.14	Gravity
D3-21024	D3-21026	6	456.0	0.4561	79.82	77.74	77.74	77.43	0.245	0.038	0.5	0.15	0.30	Gravity
D3-21026	D3-21024	6	50.1	0.6188	82.49	77.74	83.13	77.43	0.286	0.180	2.5	0.30	0.27	Gravity
D3-21027	D3-21030	6	149.2	2.0845	83.13	77.45	80.04	74.34	0.524	0.193	1.4	0.22	1.48	Surcharged
D3-21028	D3-21029	6	259.2	1.8634	85.48	81.89	81.96	77.06	0.495	0.069	1.8	0.14	0.17	Gravity
D3-21029	D3-21030	6	158.2	1.7193	81.96	77.06	80.04	74.34	0.476	0.102	0.8	0.17	1.48	Surcharged
D3-21030	D3-21031	6	153.0	0.4706	80.04	74.34	78.72	73.62	0.249	0.317	3.2	1.47	1.18	Throttled
D3-21031	D3-21038	6	149.5	3.2910	78.72	73.62	75.70	68.70	0.658	0.319	2.1	1.17	4.97	Surcharged
D3-21032	D3-21033	6	53.0	1.1887	75.20	72.00	71.37	71.37	0.396	0.048	1.0	2.17	2.79	Surcharged
D3-21033	D3-21035	6	162.0	0.2901	75.33	71.37	74.90	70.90	0.195	0.058	0.9	2.79	3.23	Surcharged
D3-21034	D3-21035	6	100.0	0.3500	76.60	71.25	74.90	70.90	0.215	0.031	0.4	2.88	3.23	Surcharged
D3-21035	D3-22006	6	193.1	0.4827	74.90	70.90	75.19	69.97	0.252	0.100	1.3	3.23	4.03	Surcharged
D3-21036	D3-21037	6	157.2	0.5725	75.70	68.70	72.49	67.80	0.275	0.443	3.0	4.95	3.39	Throttled
D3-21037	D3-21038	6	139.3	0.4379	72.49	67.80	72.94	67.19	0.24	0.448	3.2	3.37	1.75	Throttled
D3-21038	D3-21041	6	142.6	0.6942	72.94	67.19	70.25	66.20	0.302	0.471	4.1	1.72	0.42	Throttled
D3-21039	D3-21081	6	151.7	7.3237	72.73	68.48	66.36	57.37	0.982	0.084	0.6	0.12	1.52	Surcharged
D3-21040	D3-21041	6	102.5	1.2976	72.88	67.53	70.25	66.20	0.413	0.015	0.1	0.09	0.41	Gravity
D3-21041	D3-21080	6	150.3	2.1224	70.25	66.20	65.01	63.01	0.529	0.479	4.6	0.39	0.39	Gravity
D3-21042	D3-21043	6	205.0	0.2780	62.89	58.53	69.41	57.96	0.191	0.079	1.9	0.24	0.19	Gravity
D3-21042	D3-21045	8	149.0	2.1745	62.89	58.53	57.53	55.29	1.152	0.285	1.8	0.24	0.44	Gravity
D3-21043	D3-21046	6	150.0	2.1467	69.41	57.96	58.12	54.74	0.532	0.141	2.2	0.19	0.25	Gravity
D3-21044	D4-21069	8	298.1	3.5928	61.94	57.37	50.01	46.66	1.481	0.368	5.1	0.24	0.24	Gravity
D3-21045	D3-21046	8	205.1	0.2682	57.53	55.29	58.12	54.74	0.405	0.305	2.8	0.44	0.33	Gravity
D3-21046	D3-21047	8	150.0	3.8267	58.12	54.74	52.16	49.00	1.528	0.442	3.8	0.25	0.34	Gravity
D3-21047	D3-21048	8	102.6	1.4620	52.16	49.00	51.90	47.50	0.944	0.471	4.1	0.34	0.34	Gravity
D3-21048	D3-21049	6	140.1	4.2755	51.90	47.50	44.71	41.51	0.75	0.499	5.3	0.31	0.35	Gravity
D3-21049	D4-21070	8	277.1	1.8658	44.71	39.59	39.59	36.34	1.067	0.548	2.8	0.35	0.61	Gravity
D3-21050	D3-21032	6	304.1	0.8057	77.75	74.45	75.20	72.00	0.326	0.032	1.0	0.12	2.17	Surcharged
D3-21051	D3-21052	6	198.4	11.3458	177.72	171.50	155.48	148.99	1.222	0.035	1.8	0.09	0.11	Gravity
D3-21052	D3-21053	6	218.8	3.6335	155.48	148.95	147.33	141.00	0.691	0.108	3.0	0.15	0.16	Gravity
D3-21053	D3-21055	6	343.7	6.0227	147.33	141.00	125.89	120.30	0.89	0.169	4.7	0.16	0.16	Gravity
D3-21054	D3-21055	8	255.8	10.9109	151.54	147.42	125.89	119.51	1.993	0.340	2.6	0.20	0.20	Gravity
D3-21055	D3-21056	8	368.2	6.5100	125.89	119.51	101.32	95.54	2.581	0.340	2.6	0.20	0.38	Gravity
D3-21056	D3-21058	10	324.4	0.4316	101.32	95.54	97.83	94.14	0.93	0.382	2.8	0.38	0.34	Gravity
D3-21057	D3-21058	6	110.0	0.9091	99.20	95.08	97.83	94.08	0.346	0.033	0.5	0.12	0.25	Gravity
D3-21058	D3-21059	10	140.7	3.1841	97.83	94.08	94.90	89.60	2.527	0.430	4.2	0.25	0.28	Gravity
D3-21059	D3-21061	10	258.2	2.2967	94.90	89.60	89.25	83.67	2.147	0.453	4.1	0.28	0.29	Gravity
D3-21060	D3-21061	6	132.0	1.0985	90.43	85.25	83.80	83.80	0.38	0.023	1.1	0.11	0.16	Gravity
D3-21061	D3-21066	10	140.3	2.2452	89.25	85.96	80.52	80.52	2.122	0.507	3.5	0.29	0.36	Gravity
D3-21062	D3-21064	6	310.5	2.8406	100.02	95.09	93.75	86.27	0.611	0.073	2.7	0.14	0.14	Gravity
D3-21063	D3-21063	6	173.0	-3.9306	93.75	86.13	101.99	92.93	-0.719	-0.049	-2.4	0.19	0.11	Gravity
D3-21064	D3-21063	8	115.0	1.5261	93.75	86.13	88.00	84.38	0.965	0.153	2.7	0.19	0.20	Gravity
D3-21065	D3-21066	6	344.5	0.4296	85.42	82.16	85.96	80.68	0.238	0.221	2.8	0.40	0.30	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D3-21066	D3-21068	10	146.4	2.1926	85.96	80.52	83.15	77.31	2.097	0.751	4.1	0.36	0.43	Gravity
D3-21067	D3-21068	6	260.3	2.6585	90.65	84.23	83.15	77.31	0.592	0.028	0.2	0.10	0.43	Gravity
D3-21068	D3-21070	10	220.4	1.2568	83.15	77.31	78.94	74.54	1.588	0.807	4.4	0.43	0.43	Gravity
D3-21069	D3-21070	6	272.9	2.1693	85.96	80.48	78.94	74.56	0.534	0.028	0.3	0.10	0.34	Gravity
D3-21070	D3-21071	10	165.6	2.6449	78.94	74.54	75.85	70.16	2.304	0.870	3.9	0.36	0.50	Gravity
D3-21071	D3-21072	10	370.9	0.9383	75.85	71.90	71.90	66.68	1.372	0.901	4.2	0.50	0.49	Gravity
D3-21072	D3-21042	10	248.6	1.1987	71.90	66.68	69.32	63.70	1.551	0.970	4.6	0.48	0.48	Gravity
D3-21073	D3-21074	6	196.7	1.9115	73.79	68.91	70.30	65.15	0.502	0.050	1.5	0.13	0.16	Gravity
D3-21074	D3-21075	6	378.3	2.0169	70.30	65.15	63.04	57.52	0.304	0.092	2.1	0.16	0.19	Gravity
D3-21075	D3-21055	6	256.0	2.5391	63.04	57.52	55.20	51.02	0.578	0.156	3.6	0.19	0.19	Gravity
D3-21076	D3-21077	6	278.0	1.4496	97.33	92.10	92.48	88.07	0.437	0.017	0.9	0.09	0.10	Gravity
D3-21077	D3-21021	6	135.3	5.9128	92.48	88.07	84.89	80.07	0.882	0.051	1.1	0.10	0.20	Gravity
D3-21078	D3-21021	6	132.0	3.7424	91.17	85.28	84.89	80.34	0.702	0.019	1.3	0.09	0.09	Gravity
D3-21079	D3-21017	6	127.7	7.6586	89.68	85.19	81.41	75.41	1.004	0.017	0.2	0.08	0.38	Gravity
D3-21080	D3-21082	8	288.0	0.8056	66.01	63.01	69.19	60.69	0.701	0.175	2.3	0.24	0.25	Gravity
D3-21080	D3-21042	8	150.2	2.9827	66.01	63.01	62.89	58.53	1.349	0.335	4.7	0.24	0.24	Gravity
D3-21081	D3-21044	8	148.1	0.4321	66.36	58.53	61.94	57.89	0.514	0.276	2.7	0.36	0.31	Gravity
D3-21082	D3-21081	8	289.5	0.7461	69.19	60.69	66.36	58.53	0.675	0.188	1.6	0.25	0.36	Gravity
D3-21083	D3-21065	8	145.2	1.5255	88.00	84.38	82.16	85.42	0.965	0.169	1.2	0.20	0.41	Gravity
D3-21084	D3-21009	8	157.5	5.5111	88.00	85.00	80.01	76.32	1.834	0.039	1.6	0.09	0.11	Gravity
D3-21085	D3-21007	8	159.6	2.4373	83.48	77.48	76.90	73.59	1.22	0.026	0.6	0.09	0.17	Gravity
D3-21086	D3-21087	8	228.4	0.9063	79.15	72.07	80.89	70.00	0.744	0.087	2.1	0.17	0.17	Gravity
D3-21087	D3-21012	10	146.9	1.6270	80.89	70.00	74.17	67.61	1.807	0.087	1.8	0.15	0.16	Gravity
D3-21088	D3-21003	9	254.5	6.8134	96.12	92.30	77.36	74.96	2.791	0.040	1.1	0.10	0.14	Gravity
D3-21089	D3-21088	6	240.7	7.8106	117.60	111.40	96.12	92.60	1.014	0.028	2.0	0.09	0.09	Gravity
D3-22001	D3-21024	6	96.0	8.1025	85.40	79.82	80.95	79.82	0.875	0.005	0.2	0.07	0.15	Gravity
D3-22002	D3-21032	6	93.0	12.0108	85.67	83.17	75.20	72.00	1.257	0.013	0.5	0.07	2.17	Surcharged
D3-22003	D3-21036	6	108.7	0.4821	75.31	69.22	75.70	68.70	0.252	0.154	1.0	4.61	4.97	Surcharged
D3-22004	D3-22003	6	17.9	0.4860	75.27	69.31	69.22	69.22	0.252	0.144	1.5	4.55	4.61	Surcharged
D3-22005	D3-22004	6	115.9	0.4823	75.23	69.87	75.27	69.31	0.252	0.127	1.4	4.11	4.55	Surcharged
D3-22006	D3-22005	6	20.5	0.4780	75.19	69.97	75.23	69.87	0.252	0.117	1.5	4.03	4.11	Surcharged
D3-22007	D3-21034	6	105.0	3.8857	76.27	69.33	76.60	71.25	0.715	0.011	0.4	0.08	2.88	Surcharged
D3-22008	D3-21023	6	174.9	1.8239	81.65	79.01	78.62	75.82	0.49	0.006	0.3	0.07	0.10	Gravity
D3-22009	D3-21039	6	231.4	4.6111	81.97	79.15	72.73	68.48	0.779	0.030	1.3	0.09	0.12	Gravity
D3-22010	D4-21049	6	256.0	7.5391	80.27	79.47	64.32	60.17	0.996	0.010	0.1	0.07	0.59	Surcharged
D4-21001	D5-21069	10	300.0	2.5740	44.50	33.30	40.30	25.58	2.272	0.734	5.2	0.34	0.35	Gravity
D4-21002	D4-21003	6	160.3	0.6176	41.76	35.95	39.81	34.96	0.285	0.012	0.2	0.10	0.28	Gravity
D4-21003	D4-21005	8	300.0	1.1500	39.81	34.96	34.20	31.51	0.838	0.280	3.2	0.28	0.28	Gravity
D4-21004	D4-21003	8	316.0	0.2785	40.65	35.84	39.81	34.96	0.412	0.234	2.5	0.37	0.28	Gravity
D4-21005	D4-21007	8	300.0	2.4900	34.20	31.51	29.35	24.04	1.233	0.341	2.3	0.25	0.42	Gravity
D4-21006	D4-21001	6	184.7	0.1895	37.83	33.65	44.50	33.30	0.158	0.013	0.1	0.12	0.34	Gravity
D4-21006	D4-21005	6	465.1	0.4601	37.83	33.65	34.20	31.51	0.246	0.020	0.3	0.12	0.25	Gravity
D4-21007	D4-21010	8	138.8	0.4899	29.35	24.04	27.75	23.36	0.547	0.373	2.3	0.42	0.46	Gravity
D4-21008	D4-21007	6	225.0	0.3422	27.81	24.81	29.35	24.04	0.212	0.011	0.1	0.10	0.42	Gravity
D4-21008	D4-29005	6	151.1	1.6228	27.81	24.81	28.36	22.36	0.462	0.024	0.2	0.10	0.80	Surcharged
D4-21009	D4-21008	6	200.0	3.7550	38.86	32.32	27.81	24.81	0.703	0.010	0.8	0.08	0.10	Gravity
D4-21010	D4-21011	8	18.3	0.0546	27.75	23.36	28.04	23.35	0.183	0.373	2.9	0.45	0.37	Gravity
D4-21011	D4-29005	10	223.8	0.4433	28.04	23.35	28.36	22.36	0.943	0.365	2.3	0.37	0.80	Gravity
D4-21014	D4-21016	18	194.9	2.0267	47.74	41.60	44.70	37.65	9.668	4.396	7.6	0.73	0.76	Gravity
D4-21016	D4-21018	18	115.2	1.7361	44.70	37.65	42.70	35.65	8.947	4.409	7.2	0.76	0.80	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-21018	D4-21020	18	144.1	1.5267	42.70	35.65	40.20	33.45	8.39	4.429	6.9	0.79	0.83	Gravity
D4-21020	D4-21021	18	221.5	1.3995	40.20	33.45	36.60	30.35	8.033	4.453	6.9	0.82	0.82	Gravity
D4-21021	D4-21022	18	242.6	1.9786	36.60	25.55	32.70	25.52	4.482	4.546	7.9	0.74	0.74	Gravity
D4-21022	D4-21023	18	306.9	4.1251	32.70	25.55	27.63	12.89	13.791	4.546	9.1	0.62	0.95	Gravity
D4-21023	D4-21025	24	24.6	1.6260	27.63	12.66	27.42	12.26	18.641	5.827	3.6	1.17	1.48	Gravity
D4-21025	D4-21091	24	250.7	0.4108	27.42	12.27	28.30	11.24	9.373	8.411	6.0	1.45	1.30	Gravity
D4-21027	D4-21028	18	13.6	0.5882	28.14	11.23	28.18	11.15	5.209	0.022	0.1	0.50	0.58	Gravity
D4-21028	D4-21097	18	174.9	-0.2230	28.18	11.15	24.29	11.54	-3.206	0.022	0.3	0.58	0.18	Gravity
D4-21029	D4-21030	18	290.0	-0.3586	21.40	7.75	18.92	8.79	-4.066	0.082	1.2	1.23	0.17	Gravity
D4-21030	D4-21031	18	273.3	0.4354	18.92	8.79	13.05	7.60	4.481	0.082	1.3	0.16	0.15	Gravity
D4-21031	D5-21078	18	120.0	0.4833	13.05	7.60	13.92	7.02	4.721	0.082	0.5	0.15	0.29	Gravity
D4-21032	D4-21033	6	146.0	-0.6712	24.85	14.82	18.36	15.80	-0.297	0.012	0.6	1.09	0.11	Surcharged
D4-21033	D4-21034	6	134.0	0.8187	18.36	15.80	20.36	14.70	0.328	0.020	0.9	0.11	0.12	Gravity
D4-21034	D4-21035	6	156.0	0.8186	20.36	14.70	18.36	13.43	0.328	0.028	1.1	0.12	0.13	Gravity
D4-21035	D4-21036	6	151.0	0.6530	18.36	13.43	16.44	12.44	0.293	0.034	1.5	0.13	0.13	Gravity
D4-21036	D4-21041	6	16.7	-1.4970	16.44	12.44	16.90	12.44	-0.444	0.008	0.5	0.35	0.10	Gravity
D4-21036	D5-21078	6	122.9	4.4101	16.44	12.44	13.92	7.02	0.762	0.034	0.4	0.10	0.29	Gravity
D4-21037	D4-21038	8	145.0	1.1379	24.27	17.38	20.73	15.73	0.833	0.032	1.2	0.11	0.12	Gravity
D4-21038	D4-21039	6	135.0	1.0963	20.73	13.50	21.21	14.25	0.38	0.032	0.6	0.12	0.22	Gravity
D4-21039	D4-21040	6	155.2	0.6714	21.21	15.73	18.33	13.21	0.297	0.109	2.0	0.22	0.22	Gravity
D4-21040	D4-21041	6	151.5	0.6719	18.33	13.21	18.90	12.19	0.297	0.108	1.4	0.22	0.29	Gravity
D4-21041	D5-21078	6	143.1	0.7827	16.90	12.19	13.92	11.07	0.321	0.193	2.6	0.29	0.27	Gravity
D4-21042	D4-21043	6	300.0	3.2733	59.53	52.83	46.67	43.01	0.656	0.131	1.9	0.17	0.27	Gravity
D4-21043	D4-21057	8	250.0	0.7840	46.67	43.01	49.53	41.05	0.692	0.217	2.1	0.27	0.32	Gravity
D4-21044	D4-21045	8	135.0	10.1407	70.17	61.51	53.87	47.82	2.488	0.009	0.1	0.07	0.42	Gravity
D4-21045	D4-21058	12	165.0	5.3455	53.87	47.82	45.96	39.00	5.325	1.816	6.4	0.42	0.55	Gravity
D4-21046	D4-21045	12	40.2	1.8159	53.23	48.55	53.87	47.82	3.104	1.785	6.1	0.56	0.56	Gravity
D4-21047	D4-21046	10	250.0	1.1280	54.85	51.37	53.23	48.55	1.504	1.784	5.4	2.02	0.74	Throttled
D4-21047	D4-21047	10	200.0	2.8450	56.66	51.37	62.40	51.37	2.304	1.779	4.7	0.57	2.08	Surcharged
D4-21049	D4-21048	10	131.0	2.6794	64.32	60.17	62.40	56.66	2.319	1.781	6.6	0.56	0.60	Gravity
D4-21050	D4-21049	10	155.0	3.1806	66.90	65.10	64.32	60.17	2.526	1.748	6.6	0.53	0.59	Gravity
D4-21051	D4-21050	8	116.5	3.5365	74.12	69.22	66.90	65.10	1.469	0.026	0.1	0.09	0.55	Gravity
D4-21052	D4-21051	6	145.6	0.6319	74.64	70.14	74.12	69.22	0.288	0.026	1.5	0.12	0.12	Gravity
D4-21053	D4-21052	6	208.3	7.6140	91.85	86.00	74.64	70.14	1.001	0.012	0.5	0.07	0.12	Gravity
D4-21054	D4-22003	6	170.7	0.2402	83.02	76.99	82.58	76.58	0.178	0.005	0.4	0.09	0.08	Gravity
D4-21054	D3-21020	6	258.2	0.5035	83.02	76.99	81.19	75.69	0.257	0.008	0.4	0.09	0.10	Gravity
D4-21055	E4-22025	6	209.8	1.6969	96.05	91.15	91.97	87.59	0.473	0.027	0.7	0.10	0.17	Gravity
D4-21056	E4-21016	6	358.4	0.7785	47.00	41.74	41.40	38.95	0.32	0.022	0.6	0.11	0.17	Gravity
D4-21057	D4-21058	8	340.0	0.6029	49.53	41.05	45.96	39.00	0.607	0.259	1.3	0.32	0.55	Gravity
D4-21058	D4-21060	12	300.0	3.1133	45.96	39.00	34.00	29.66	4.064	2.204	8.0	0.54	0.54	Gravity
D4-21059	D4-22026	6	243.0	0.1852	35.99	32.55	35.63	32.10	0.166	0.102	2.0	0.31	0.21	Gravity
D4-21060	D4-21061	12	140.0	3.5714	34.00	29.64	30.00	26.64	4.353	2.402	7.6	0.55	0.60	Gravity
D4-21061	D4-21062	12	160.0	2.9625	30.00	24.64	26.00	19.90	3.964	2.429	6.9	0.58	0.65	Gravity
D4-21062	D4-21064	15	300.0	1.5533	26.00	19.90	20.50	15.24	5.204	2.610	3.1	0.65	3.25	Surcharged
D4-21063	D4-21062	6	456.1	2.6595	36.66	32.03	28.00	19.90	0.592	0.097	0.7	0.15	0.65	Surcharged
D4-21064	D4-21065	15	300.0	0.2967	20.50	15.24	18.79	14.35	2.274	3.573	4.3	3.21	1.87	Throttled
D4-21065	D4-21079	15	38.0	0.3500	18.79	14.35	18.20	14.22	2.472	3.683	4.5	1.79	1.62	Throttled
D4-21066	D4-21067	20	49.0	0.4082	18.23	13.68	17.97	13.68	5.745	3.888	4.9	0.96	0.92	Gravity
D4-21067	D4-21068	18	397.4	0.0906	17.97	13.68	22.23	13.32	2.044	1.293	2.0	0.86	0.85	Gravity
D4-21067	D4-21060	20	16.0	0.8125	17.97	13.68	18.00	13.55	8.106	2.593	3.1	0.86	0.95	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-21068	D4-21069	18	196.9	0.1067	22.23	13.32	24.99	13.11	2.218	1.295	2.0	0.85	0.87	Gravity
D4-21069	D4-21070	8	143.4	7.1967	50.01	46.66	39.59	36.34	2.096	0.430	2.1	0.22	0.61	Gravity
D4-21070	D4-21071	8	225.2	1.7052	39.59	36.34	35.80	32.50	1.02	0.973	5.0	0.58	0.58	Gravity
D4-21071	D4-21072	8	160.0	4.5813	35.80	32.50	29.26	25.17	1.672	1.018	3.9	0.39	FULL	Surcharged
D4-21072	D4-21073	8	50.0	0.4600	29.26	25.17	30.12	24.94	0.53	0.718	3.0	FULL	4.15	Throttled
D4-21073	D4-21102	8	150.8	0.7029	30.12	24.94	28.00	23.88	0.655	0.754	3.1	4.13	4.05	Throttled
D4-21074	D4-21075	8	400.0	0.5525	27.08	22.83	28.27	20.62	0.581	0.794	4.0	3.95	2.36	Throttled
D4-21075	D4-21084	8	390.0	1.3795	28.27	20.62	20.50	15.24	0.918	0.833	3.4	2.33	3.25	Surcharged
D4-21076	D4-21077	8	250.0	0.1880	22.54	15.54	23.83	15.07	0.157	0.177	1.8	1.01	0.87	Throttled
D4-21077	D4-21078	8	112.4	0.4893	23.83	15.07	19.19	14.52	0.547	0.205	0.9	0.87	1.34	Surcharged
D4-21078	D4-21079	8	30.8	0.1299	19.19	14.52	18.20	14.48	0.282	0.210	1.5	1.33	1.35	Surcharged
D4-21079	D4-21086	15	96.1	0.3507	18.20	14.22	18.23	13.88	2.472	3.888	5.8	1.54	0.99	Throttled
D4-21080	D4-21101	24	391.0	0.1637	18.00	391.0	23.00	12.91	5.916	2.592	2.5	0.95	1.07	Gravity
D4-21083	D4-21084	6	294.3	3.3979	23.25	18.70	15.70	8.70	0.669	0.085	2.1	0.14	0.18	Gravity
D4-21084	D4-21088	12	290.0	0.7483	15.70	8.70	9.99	6.53	1.992	0.123	1.6	0.18	0.21	Gravity
D4-21085	D4-21105	6	159.9	1.7573	15.70	18.48	19.07	15.67	0.481	0.000	0.0	0.07	0.14	Gravity
D4-21086	C4-21055	12	290.0	0.8552	9.99	6.53	6.55	4.05	2.13	0.190	1.0	0.21	0.40	Gravity
D4-21087	D4-21088	6	146.5	1.7884	17.02	13.42	13.21	10.80	0.485	0.099	2.2	0.17	0.19	Gravity
D4-21088	C4-21061	6	517.6	1.0587	13.21	10.80	5.32	0.373	0.101	1.4	0.19	0.29	0.94	Gravity
D4-21089	D4-21023	18	185.0	0.1189	24.99	13.11	27.63	12.89	2.342	1.296	2.7	0.87	0.94	Gravity
D4-21091	D4-21092	24	446.6	0.4344	28.30	10.88	20.60	8.94	9.638	8.411	6.0	1.44	1.30	Gravity
D4-21092	D4-21093	24	438.9	0.6243	20.60	8.94	13.70	6.20	11.554	8.410	6.1	1.28	1.28	Gravity
D4-21093	C5-21041	8	467.4	1.8314	13.70	6.20	9.30	-2.36	19.79	8.410	9.0	0.94	0.94	Gravity
D4-21094	D5-21070	10	311.9	0.2725	29.07	22.02	34.92	21.17	0.739	0.392	1.2	1.07	1.68	Surcharged
D4-21095	D4-21090	10	28.0	0.7143	66.80	65.30	66.90	65.10	1.197	1.722	5.3	0.95	0.72	Throttled
D4-21097	D4-21029	18	129.4	1.3910	24.29	11.54	21.40	9.74	8.008	0.083	1.0	0.18	0.18	Gravity
D4-21098	D4-21097	8	16.9	2.7219	24.60	12.00	24.29	11.54	1.287	0.062	1.2	0.12	0.18	Gravity
D4-21099	D4-21098	8	443.7	1.6520	23.60	19.43	24.60	12.10	1.004	0.062	2.0	0.13	0.13	Gravity
D4-21101	D4-21025	24	386.0	0.1658	23.00	12.91	27.42	12.27	5.954	2.599	1.6	1.07	1.47	Gravity
D4-21102	D4-21074	8	149.2	0.7038	28.00	23.88	27.08	22.83	0.655	0.747	2.9	4.03	3.98	Throttled
D4-21104	C4-22021	18	148.7	1.4748	22.22	18.28	19.19	16.09	8.247	-0.015	0.0	0.15	0.90	Gravity
D4-21105	D4-21087	6	128.0	1.7578	19.07	15.67	17.02	13.42	0.481	0.060	1.6	0.14	0.17	Gravity
D3-21022	D4-22003	8	208.2	1.6859	82.58	76.58	78.79	73.07	1.014	0.008	0.5	0.08	0.08	Gravity
D4-21053	D4-22004	6	39.3	4.2494	90.71	87.67	91.85	86.00	0.748	0.004	0.4	0.07	0.07	Gravity
D4-22005	D4-21053	6	90.7	2.4256	91.70	88.20	91.85	86.00	0.565	0.006	0.5	0.07	0.07	Gravity
D4-22006	D4-21049	6	410.0	1.4390	69.65	66.07	64.32	60.17	0.435	0.014	0.1	0.09	0.59	Surcharged
D4-22007	D4-21058	6	140.0	1.9214	48.65	41.69	45.96	39.00	0.503	0.113	0.9	0.18	0.55	Surcharged
D4-22010	D4-21055	6	75.0	0.7200	94.74	91.69	96.05	91.15	0.308	0.012	0.6	0.09	0.10	Gravity
D4-22012	D4-21044	6	290.0	-2.9931	76.60	52.83	70.17	61.51	-0.628	-0.006	-0.5	0.37	0.07	Gravity
D4-22013	D4-21045	8	240.0	5.3250	62.95	53.87	53.87	52.83	0	0.055	1.5	0.37	0.17	Gravity
D4-22014	E4-22013	6	206.7	2.7092	63.96	56.61	47.82	1.803	0.020	0.020	0.1	0.08	0.42	Gravity
D4-22020	D4-21071	6	350.0	6.0343	56.32	350.0	51.01	0.597	0.008	0.008	0.6	0.08	0.09	Gravity
D4-22021	D4-21061	8	390.0	7.0513	52.14	30.00	30.00	24.64	2.075	0.025	0.1	0.08	0.60	Gravity
D4-22022	D4-22052	8	194.8	6.0370	41.42	36.93	38.88	25.17	1.919	0.029	0.1	0.09	4.25	Surcharged
D4-22026	D4-21066	6	189.5	1.2876	35.63	32.10	34.00	29.66	0.412	0.141	1.1	0.21	0.54	Surcharged
D4-22027	D4-21059	6	107.3	2.7679	39.74	35.52	35.99	32.55	0.604	0.064	0.8	0.13	0.31	Gravity
D4-22028	D4-22027	6	89.2	6.6031	44.57	41.41	39.74	35.52	0.932	0.044	1.7	0.10	0.13	Gravity
D4-22036	D4-21003	6	182.1	1.1367	39.06	37.03	39.81	34.96	0.387	0.017	0.2	0.10	0.28	Gravity
D4-22037	D4-21005	6	175.0	0.6629	35.17	32.67	34.20	31.51	0.295	0.019	0.3	0.11	0.25	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-22038	D4-22039	6	255.0	1.1725	31.25	29.05	32.94	26.06	0.393	0.017	0.6	0.10	0.15	Gravity
D4-22039	D4-21022	6	20.0	0.8000	32.94	26.06	32.70	25.90	0.324	0.029	1.1	0.15	0.27	Gravity
D4-22040	D4-21007	6	136.0	0.4118	27.90	24.04	29.35	0.015	0.1	0.11	0.1	0.11	0.42	Gravity
D4-22046	C4-21060	6	416.0	0.5529	13.54	9.26	8.16	6.96	0.27	0.006	0.6	0.08	0.07	Gravity
D4-22050	C4-21078	6	101.0	1.7525	11.08	8.36	9.35	6.59	0.48	0.013	0.3	0.09	0.19	Gravity
D4-22051	D4-21086	6	27.0	3.2963	9.60	7.42	9.99	6.53	0.658	0.033	0.6	0.10	0.21	Gravity
D4-22052	D4-22053	8	9.5	0.0000	36.88	25.17	36.65	25.17	0	0.043	0.2	4.25	4.25	Throttled
D4-22053	D4-21072	8	195.2	0.0000	36.65	25.17	29.28	25.17	0	0.066	0.2	4.25	FULL	Throttled
D4-22054	D4-21083	6	253.6	0.7453	23.85	20.59	18.70	0.313	0.054	1.9	0.15	0.15	0.15	Gravity
D4-22055	D4-21037	8	112.7	2.7507	23.93	20.35	24.27	17.25	1.296	0.025	0.3	0.09	0.24	Gravity
D4-22056	D4-21084	12	136.8	2.3173	18.87	11.87	15.70	8.70	3.506	0.008	0.1	0.11	0.18	Gravity
D4-22057	D4-22058	6	108.8	1.1029	23.38	20.38	22.05	19.18	0.381	0.000	0.0	0.07	0.07	Gravity
D4-22058	D4-290	6	8.6	2.1163	22.05	19.18	22.00	19.00	0.528	0.000	0.0	0.07	0.07	Gravity
D4-22061	D4-22051	6	281.0	3.9359	21.03	18.48	9.60	7.42	0.72	0.018	1.0	0.08	0.10	Gravity
D4-290	D4-21104	6	33.9	2.1180	22.00	19.00	22.22	18.28	0.528	0.000	0.0	0.07	0.07	Gravity
D4-29005	D4-21094	10	76.4	0.4424	28.36	22.36	29.07	22.02	0.943	0.390	2.0	0.80	1.08	Surcharged
D5-21002	D5-21003	6	192.1	0.5466	39.94	36.80	40.68	35.75	0.268	0.003	0.3	0.07	0.08	Gravity
D5-21003	D5-21004	6	310.8	5.2220	40.68	35.75	23.25	19.52	0.829	0.013	0.7	0.08	0.10	Gravity
D5-21004	E5-21073	8	159.5	7.1536	23.25	19.52	12.13	8.11	2.089	0.053	1.3	0.10	0.15	Gravity
D5-21005	D5-21006	10	153.5	0.2182	10.36	5.55	10.00	5.22	0.662	0.326	1.8	0.81	1.07	Surcharged
D5-21006	D5-21010	10	153.5	0.2182	10.00	5.22	10.03	4.88	0.682	0.329	1.6	1.07	1.33	Surcharged
D5-21007	E5-21048	6	171.7	0.2737	10.60	7.90	11.03	7.43	0.719	0.001	0.1	0.07	0.15	Gravity
D5-21008	D5-21008	6	154.7	0.8403	10.60	7.90	10.30	6.60	0.716	0.002	0.1	0.07	0.07	Gravity
D5-21008	D5-22029	8	125.2	0.3123	10.30	6.60	10.00	6.21	0.436	0.002	0.1	0.07	0.08	Gravity
D5-21009	D5-21011	6	120.7	0.4805	9.41	5.23	9.46	4.65	0.251	0.018	0.6	0.38	0.96	Surcharged
D5-21010	D5-21010	10	151.9	0.1580	10.03	4.88	10.00	4.64	0.563	0.334	1.6	1.33	1.50	Surcharged
D5-21011	D5-21014	6	174.5	0.2235	9.46	4.65	8.62	4.26	0.172	0.020	0.4	0.96	1.34	Surcharged
D5-21012	D5-21016	8	290.0	0.2414	8.20	5.70	9.00	5.00	0.384	0.003	0.2	0.08	0.09	Gravity
D5-21013	D5-21015	10	145.3	0.1583	10.00	4.41	9.50	4.41	0.563	0.326	2.1	1.49	1.65	Surcharged
D5-21014	D5-21018	6	288.8	0.2458	8.62	4.26	8.55	3.55	0.18	0.040	0.3	1.34	2.02	Surcharged
D5-21015	D5-21017	10	145.1	0.3901	9.50	4.41	10.00	3.84	0.885	0.336	1.2	1.65	2.14	Surcharged
D5-21016	D5-21022	8	259.7	0.7701	9.00	5.00	8.40	3.00	0.686	0.009	0.0	0.09	2.06	Surcharged
D5-21017	D5-21019	10	142.1	0.0732	10.00	3.84	8.85	3.74	0.383	0.338	2.2	2.14	2.17	Surcharged
D5-21018	D5-21020	10	15.9	1.3522	8.55	3.55	8.50	3.34	1.647	0.864	2.3	2.01	2.16	Surcharged
D5-21019	D5-21018	8	29.2	-0.8904	8.85	3.29	8.55	3.55	-0.737	0.831	3.4	2.59	2.02	Surcharged
D5-21020	D5-21023	10	105.7	0.3690	8.50	3.35	8.40	2.96	0.861	0.886	2.4	2.13	2.10	Throttled
D5-21021	D5-21019	12	14.4	1.1806	9.76	3.91	8.85	3.74	2.506	0.552	2.7	2.01	2.17	Surcharged
D5-21022	D5-21023	8	12.4	0.3226	8.40	3.00	8.40	2.96	0.444	-0.011	0.0	2.06	2.10	Surcharged
D5-21023	D5-21024	2	8.3	2.4096	8.40	2.76	2.202	0.888	2.3	2.08	2.25	2.08	2.25	Surcharged
D5-21024	D5-21025	10	172.3	0.1219	8.09	2.76	8.00	2.55	0.494	0.889	2.4	2.23	1.75	Throttled
D5-21025	D5-21026	10	39.8	0.0000	8.00	2.55	8.00	2.55	0	0.891	2.4	1.74	1.58	Throttled
D5-21026	D5-21027	10	32.3	0.0000	8.00	2.55	8.00	2.55	0	0.892	2.4	1.56	1.43	Throttled
D5-21027	D5-21030	12	199.4	0.0752	9.02	2.55	8.43	2.40	0.632	1.095	3.6	1.41	1.11	Throttled
D5-21028	D5-21029	6	69.8	0.4441	9.15	4.99	8.63	4.68	0.242	0.215	2.7	0.37	0.30	Gravity
D5-21029	D5-21027	8	446.2	0.4774	8.63	4.68	9.02	2.55	0.54	0.211	0.9	0.30	1.43	Surcharged
D5-21030	D5-21034	12	410.1	0.2634	8.43	2.11	10.55	1.03	1.182	1.301	2.5	1.37	1.12	Throttled
D5-21031	D5-21030	6	280.1	0.2535	9.06	3.11	8.43	2.40	0.183	0.206	2.1	1.32	1.11	Throttled
D5-21034	D6-21060	12	301.9	0.2120	10.55	1.03	8.36	0.39	1.081	1.310	4.0	1.11	0.61	Throttled
D5-21035	D5-21036	27	273.3	0.1537	7.85	-3.21	8.22	-3.63	7.848	10.732	4.9	2.27	1.80	Throttled
D5-21036	D5-21037	27	138.0	0.3116	8.22	-3.63	9.44	-4.06	11.175	10.729	4.9	1.78	1.77	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D5-21037	C5-29014	27	121.9	0.1559	9.44	-4.06	10.00	-4.25	7.903	10.728	6.3	1.75	1.42	Gravity
D5-21038	D5-21046	6	183.2	0.8024	16.19	10.31	14.96	8.84	0.325	0.122	1.2	0.22	0.37	Gravity
D5-21039	D5-21041	8	290.1	2.1475	25.60	17.97	21.20	11.74	1.145	1.084	4.5	7.45	8.40	Surcharged
D5-21040	D5-21043	10	290.0	1.1345	23.66	17.16	19.89	13.87	1.509	0.833	4.2	0.46	0.46	Gravity
D5-21041	D5-21044	8	301.3	1.4537	21.20	11.74	17.50	7.36	0.942	1.088	4.5	8.37	7.34	Throttled
D5-21042	D5-21065	10	465.0	0.3183	18.04	46.50	10.14	8.66	0.799	0.447	1.7	2.66	3.65	Surcharged
D5-21043	D5-21046	10	290.0	1.7345	19.89	13.87	14.96	8.84	1.865	0.419	3.2	0.28	0.37	Gravity
D5-21043	D5-21042	10	210.0	1.7762	19.89	13.87	18.04	10.14	1.888	0.421	2.1	0.28	2.66	Surcharged
D5-21044	D5-21047	8	305.1	1.4356	17.50	7.36	11.40	2.98	0.936	1.091	4.8	7.31	6.23	Throttled
D5-21045	D5-22025	6	322.2	0.6030	15.63	10.31	17.87	8.37	0.282	-0.104	-0.7	0.34	2.51	Surcharged
D5-21045	D5-21038	6	424	0.0000	15.63	10.31	16.19	10.31	0	0.118	2.2	0.34	0.22	Gravity
D5-21046	D5-21049	10	291.0	1.0241	14.96	8.84	10.60	5.86	1.433	0.547	3.7	0.37	0.37	Gravity
D5-21047	D5-21048	10	106.1	0.2639	11.40	2.64	10.40	2.36	0.728	1.101	4.2	6.56	6.27	Throttled
D5-21048	D5-21050	8	45.4	-0.2863	10.40	2.36	10.49	2.49	-0.418	-0.014	-0.2	6.27	6.14	Surcharged
D5-21048	D5-21053	15	167.7	1.5444	10.40	1.94	9.20	-0.65	5.19	3.615	3.9	6.65	7.91	Surcharged
D5-21049	D5-21021	12	310.5	0.1739	10.60	4.45	9.76	3.91	0.961	0.548	2.6	1.62	2.01	Surcharged
D5-21051	D5-21052	10	26.6	2.7820	11.68	5.84	11.85	5.10	2.36	0.136	0.9	2.86	3.60	Surcharged
D5-21052	D5-21048	6	176.1	0.3805	11.85	5.10	10.40	4.43	0.224	0.148	1.8	3.60	4.20	Surcharged
D5-21053	D5-21054	15	261.8	0.1719	9.20	-0.65	10.50	-1.10	1.731	3.614	4.0	7.87	6.34	Throttled
D5-21054	D5-21055	15	166.3	0.1864	10.50	-1.10	10.50	-1.41	1.803	3.613	4.1	6.30	5.35	Throttled
D5-21055	D5-21056	15	344.4	0.1539	10.50	-1.41	9.30	-1.94	1.638	3.613	4.2	5.31	3.23	Throttled
D5-21056	D5-21057	15	395.0	0.1772	9.30	-1.94	9.30	-2.01	1.758	3.613	4.3	3.18	2.95	Throttled
D5-21057	D5-21058	15	112.8	0.2128	9.30	-2.01	9.40	-2.25	1.926	3.734	4.5	2.90	2.23	Throttled
D5-21058	D5-21059	15	84.4	0.2133	9.40	-2.25	9.50	-2.43	1.929	3.734	4.5	2.15	1.65	Throttled
D5-21059	C5-21037	15	92.5	0.2054	9.50	-2.43	8.80	-2.62	1.893	3.734	5.6	1.57	0.97	Throttled
D5-21060	D5-21061	8	223.8	0.3083	36.01	24.65	31.38	23.96	0.434	0.497	3.3	0.77	0.43	Throttled
D5-21061	D5-21063	8	338.5	1.1581	31.38	23.96	26.00	20.04	0.841	0.583	3.9	0.42	0.42	Gravity
D5-21062	D5-21091	10	331.6	0.1448	15.80	6.05	15.71	5.57	0.539	0.954	3.4	2.25	1.20	Throttled
D5-21063	D5-21105	10	388.4	0.4300	26.00	20.04	24.72	18.37	0.929	0.213	1.9	0.28	0.30	Gravity
D5-21063	D5-21064	6	15.1	3.8146	26.00	20.04	26.00	19.46	0.708	0.384	4.7	0.28	0.31	Gravity
D5-21064	D5-21065	6	284.9	3.8133	26.00	19.46	21.64	8.60	0.708	0.443	2.9	0.30	3.71	Surcharged
D5-21065	D5-21066	10	290.0	0.3448	21.64	8.60	16.68	7.60	0.832	0.962	2.5	3.70	3.33	Throttled
D5-21066	D5-21067	10	285.0	0.2526	16.68	7.60	12.30	6.88	0.712	0.934	2.4	3.32	2.77	Throttled
D5-21067	D5-21062	10	291.4	0.2848	12.30	6.88	15.80	6.05	0.756	0.941	2.5	2.75	2.27	Throttled
D5-21068	D5-21051	10	437.0	0.4073	12.05	8.79	11.68	7.01	0.904	0.114	1.7	0.15	1.69	Surcharged
D5-21069	D4-21009	6	224.9	-2.9978	40.30	25.58	38.86	32.32	-0.628	-0.013	-1.0	0.35	0.08	Gravity
D5-21069	D5-21070	10	171.3	2.5733	40.30	25.58	34.92	21.17	2.272	0.770	2.5	0.35	1.68	Surcharged
D5-21070	D5-21071	10	138.9	0.7559	34.92	21.17	31.75	20.12	1.232	1.128	3.0	1.65	1.80	Surcharged
D5-21071	D5-21073	10	282.3	0.2976	31.75	20.12	25.92	19.28	0.773	1.154	4.0	1.77	0.65	Throttled
D5-21072	D5-21104	8	11.0	0.0000	32.39	27.99	32.39	27.99	0	0.015	0.7	0.12	0.10	Gravity
D5-21073	D5-21093	10	291.6	0.8505	25.92	19.28	21.67	16.80	1.306	1.158	3.4	0.64	1.02	Surcharged
D5-21075	D4-21039	6	379.4	0.8197	20.07	17.36	21.21	14.25	0.328	0.053	1.0	0.15	0.22	Gravity
D5-21076	D5-21090	10	295.6	0.8694	18.21	15.09	15.58	12.52	1.321	1.167	4.2	0.61	0.61	Gravity
D5-21077	D4-21041	6	544.4	1.1940	22.43	18.69	16.90	12.19	0.396	0.076	1.0	0.16	0.29	Gravity
D5-21078	D5-21081	18	150.0	0.3733	13.92	7.02	14.44	6.46	4.149	0.315	1.9	0.29	0.31	Gravity
D5-21079	C5-21001	8	456.6	0.8585	13.74	11.06	11.25	7.14	0.724	0.001	0.1	0.07	0.07	Gravity
D5-21079	D5-21078	6	16.1	25.0932	13.74	11.06	13.92	7.02	1.816	0.007	0.1	0.07	0.29	Gravity
D5-21080	D5-21085	8	319.3	0.9615	13.87	11.07	12.15	8.00	0.766	0.009	0.3	0.08	0.12	Gravity
D5-21081	D5-21082	21	329.0	0.2432	14.44	5.66	12.15	5.66	5.051	0.314	1.6	0.31	0.33	Gravity
D5-21082	C5-21106	21	177.8	0.2981	12.15	5.66	12.00	5.13	5.591	0.389	2.4	0.33	0.28	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D5-21083	D5-21082	6	121.0	4.1653	15.50	10.70	12.15	5.66	0.74	0.079	0.9	0.13	0.33	Gravity
D5-21084	D5-21083	6	289.0	0.5985	15.79	12.31	15.80	10.70	0.281	0.043	1.7	0.15	0.13	Gravity
D5-21085	C5-21003	8	140.9	0.9155	12.15	8.00	11.31	6.71	0.747	0.035	0.8	0.12	0.17	Gravity
D5-21087	C5-21003	8	403.7	0.5945	13.02	9.11	11.31	6.71	0.602	0.021	0.5	0.11	0.17	Gravity
D5-21088	D5-21082	24	182.0	0.1099	13.60	4.24	12.34	4.848	2.122	2.2	0.96	0.98	0.98	Gravity
D5-21090	D5-21091	10	16.7	41.0180	15.58	12.52	15.71	5.67	9.063	1.168	10.7	0.22	1.10	Surcharged
D5-21091	D5-21088	12	175.8	0.6712	15.71	5.42	13.60	4.24	1.887	2.122	4.2	1.29	0.96	Throttled
D5-21092	C5-21088	24	283.0	0.0495	12.34	4.04	11.30	3.90	3.252	2.142	3.8	0.98	0.64	Gravity
D5-21093	D5-21076	10	289.0	0.5917	21.67	15.09	18.21	1.09	1.167	4.1	0.98	0.63	0.63	Throttled
D5-21096	D5-21076	36	552.6	0.1013	13.61	-6.09	12.60	-6.65	13.724	14.745	3.6	2.63	2.49	Gravity
D5-21097	D5-21101	21	192.1	0.0000	13.50	4.60	13.60	4.60	0	-0.023	-0.1	0.60	0.60	Gravity
D5-21098	D6-21047	6	203.0	0.4778	8.28	7.76	7.76	0.006	0.3	0.08	0.3	0.08	0.10	Gravity
D5-21101	D5-21102	36	214.7	0.1025	12.60	-6.65	11.00	-6.87	13.801	14.742	3.7	2.47	2.42	Gravity
D5-21102	C5-21101	36	517.0	0.1006	11.00	-6.87	10.00	-7.39	13.673	14.741	4.1	2.40	2.19	Gravity
D5-21104	D4-21099	8	273.2	3.1332	32.39	27.99	23.60	19.43	1.383	0.044	1.4	0.10	0.13	Gravity
D5-21105	D5-21040	10	261.6	0.4320	24.72	18.37	23.66	17.24	0.931	0.247	1.6	0.30	0.38	Gravity
D5-22004	D5-22005	6	352.7	-1.5566	32.58	22.91	30.75	28.40	-0.453	-0.010	-0.7	0.10	0.08	Gravity
D5-22004	D5-21071	8	66.0	1.1818	32.58	22.91	31.75	22.13	0.849	0.025	1.2	0.10	0.10	Gravity
D5-22005	D5-22006	6	12.1	1.9008	30.54	28.40	30.54	28.17	0.501	0.033	0.5	0.08	0.12	Gravity
D5-22006	D5-21061	6	358.5	1.1743	30.54	28.17	31.38	23.96	0.393	0.033	0.3	0.12	0.43	Gravity
D5-22009	D5-21064	6	224.5	0.2940	28.50	20.70	26.00	20.04	0.197	0.052	1.6	0.19	0.15	Gravity
D5-22010	D5-22009	6	31.1	0.0000	28.42	20.70	28.50	20.70	0	0.042	1.0	0.22	0.19	Gravity
D5-22011	D5-22010	6	229.3	0.5669	25.11	22.93	20.70	0.273	0.273	0.026	0.5	0.12	0.22	Gravity
D5-22012	D5-22045	6	145.8	0.4527	25.22	22.85	25.88	22.19	0.244	0.000	0.0	0.07	0.10	Gravity
D5-22012	D5-21073	8	75.5	1.0464	25.22	20.42	25.92	19.63	0.799	0.007	0.4	0.08	0.30	Gravity
D5-22020	D5-22021	6	288.6	0.8697	22.43	20.42	23.58	17.91	0.338	0.006	0.3	0.08	0.11	Gravity
D5-22020	D5-21093	8	50.3	2.4254	22.43	20.42	21.67	19.20	1.217	0.010	0.6	0.08	0.08	Gravity
D5-22021	D5-21085	6	364.0	2.5412	22.58	17.91	21.64	8.66	0.578	0.038	0.3	0.11	3.65	Surcharged
D5-22022	D5-22023	6	267.3	0.3068	18.21	14.73	18.08	13.91	0.201	0.012	0.6	0.10	0.10	Gravity
D5-22023	D5-22024	6	18.1	1.4917	18.08	13.91	18.21	13.64	0.443	0.025	1.1	0.10	0.12	Gravity
D5-22024	D5-21066	6	314.8	1.9187	18.21	13.64	16.68	7.60	0.503	0.039	0.3	0.12	3.33	Surcharged
D5-22025	D5-21066	6	127.1	0.6035	17.87	8.37	16.68	7.60	0.282	-0.083	-0.6	2.51	3.33	Surcharged
D5-22026	E5-21052	6	248.7	4.5718	21.52	18.99	12.05	7.62	0.776	0.006	0.3	0.07	0.11	Gravity
D5-22027	D5-21005	6	285.8	4.6921	19.50	18.96	10.36	5.55	0.786	0.009	0.1	0.07	0.81	Surcharged
D5-22029	D5-21012	8	163.2	0.3119	10.00	6.21	8.20	5.70	0.436	0.003	0.2	0.08	0.08	Gravity
D5-22033	D5-21014	6	80.0	23.8125	28.10	23.31	8.62	4.26	1.77	0.020	0.5	0.07	1.34	Surcharged
D5-22039	D5-22040	6	220.0	2.1045	15.57	8.97	8.70	4.34	0.526	0.015	0.4	0.09	1.17	Surcharged
D5-22040	D5-22041	6	9.0	0.0000	8.70	4.34	8.31	4.34	0	0.022	0.6	1.17	1.17	Throttled
D5-22041	D5-21029	6	357.4	0.1175	8.31	3.92	8.50	3.124	0.124	0.028	1.1	1.17	1.57	Surcharged
D5-22042	D5-21049	6	84.0	2.2024	9.71	7.71	10.60	5.86	0.538	0.002	0.2	0.07	0.21	Gravity
D5-22044	E5-21074	6	260.0	2.5462	39.57	35.48	33.35	28.86	0.579	0.009	0.6	0.08	0.09	Gravity
D5-22045	D5-22011	6	42.1	0.4513	25.88	22.19	25.11	22.00	0.244	0.013	0.6	0.10	0.12	Gravity
D5-29008	C5-29003	30	413.7	0.0000	10.00	-2.50	7.81	-2.50	-	0.000	0.0	Pressure	Pressure	Force main
D5-29010SG1	C5-29003	30	381.9	0.0000	10.00	-2.50	7.81	-2.50	-	0.000	0.0	Pressure	Pressure	Force main
D5-29010SG2	D5-29008	30	25.6	0.0000	10.00	-2.50	10.00	-2.50	0	0.000	0.0	0.13	0.13	Gravity
D5-EL001	D5-21068	10	627.8	0.5941	15.31	12.52	12.05	1.092	0.033	0.8	0.12	0.15	0.15	Gravity
D6-21001	D6-21002	27	239.4	0.1420	18.89	9.90	18.01	9.56	7.545	8.093	3.3	2.14	2.07	Gravity
D6-21002	D6-21003	27	252.2	-0.0555	18.01	9.56	17.86	9.70	-4.717	8.096	5.4	2.05	1.27	Gravity
D6-21003	D6-21004	27	200.0	0.4650	17.86	9.70	16.20	13.651	8.138	5.6	1.26	1.25	1.25	Gravity
D6-21004	D6-21026A	27	74.5	0.4966	16.20	8.77	13.80	8.40	14.11	8.139	5.6	1.24	1.24	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D6-21005	D6-29008	21	64.8	0.3549	13.90	8.40	14.00	8.17	6.102	2.322	2.4	0.90	1.05	Gravity
D6-21006	D6-21009	14	345.3	0.0434	14.00	8.34	16.23	8.19	0.724	0.765	3.2	0.79	0.44	Gravity
D6-21006	D6-21009	21	343.1	0.1341	14.00	8.34	16.23	7.88	3.75	1.594	2.8	0.79	0.68	Gravity
D6-21007	D6-21006	6	291.4	0.5148	16.24	10.44	14.00	8.94	0.26	0.041	1.7	0.15	0.19	Gravity
D6-21008	D6-21009	6	59.9	3.8731	15.43	10.20	16.23	7.88	0.714	0.022	0.4	0.09	0.68	Surcharged
D6-21009	D7-21009	14	231.4	0.2247	16.23	7.36	16.17	7.36	1.647	1.066	2.7	0.68	0.64	Gravity
D6-21009	D7-21009	21	229.2	0.1483	16.23	7.88	16.17	7.54	3.945	1.315	3.4	0.68	0.52	Gravity
D6-21010	D6-21011	27	280.4	0.1961	13.14	0.84	11.96	0.29	8.866	3.724	2.1	3.67	4.12	Surcharged
D6-21011	D6-21014	18	52.8	0.4924	11.96	7.10	11.84	4.765	0.000	0.0	0.0	0.08	0.08	Gravity
D6-21011	D6-21012	27	9.9	0.5051	11.96	0.34	12.05	0.29	14.227	3.721	2.1	4.07	4.11	Surcharged
D6-21012	D6-21013	27	37.4	0.0000	12.05	-5.30	12.01	-5.30	0	3.718	1.3	9.70	9.69	Throttled
D6-21013	D6-21014	27	10.5	0.4762	12.01	0.34	11.84	0.29	13.815	3.716	2.2	4.04	4.08	Surcharged
D6-21014	D6-21015	27	286.6	0.0907	11.84	0.29	11.13	0.03	6.03	3.712	1.8	4.08	4.24	Surcharged
D6-21015	D6-21016	27	252.2	0.0833	11.13	0.03	10.47	-0.18	5.777	3.752	1.6	4.23	4.35	Surcharged
D6-21016	D6-21017	27	306.5	0.1533	10.47	-0.18	9.40	-0.65	7.839	3.752	1.4	4.34	4.71	Surcharged
D6-21017	D6-21045	27	303.9	0.1185	9.40	-0.65	8.89	-1.01	6.89	9.353	3.4	4.67	4.36	Throttled
D6-21018	D6-21019	8	309.8	0.4906	14.67	9.25	13.72	7.73	0.547	0.010	0.4	0.09	0.11	Gravity
D6-21019	D6-21074	8	156.6	0.5409	13.72	7.73	12.00	6.88	0.575	0.021	0.9	0.11	0.11	Gravity
D6-21021	D6-21022	8	161.1	2.0453	11.08	6.07	10.07	2.78	1.117	0.107	1.8	0.12	1.50	Surcharged
D6-21022	D6-21024	8	175.2	-1.7837	10.07	2.78	11.38	-1.043	-0.005	-0.4	1.50	0.12	0.08	Surcharged
D6-21022	D6-21015	8	134.2	1.8443	10.07	2.78	11.13	0.30	1.081	0.133	1.2	1.50	3.97	Surcharged
D6-21024	D6-21025	8	76.2	2.1916	11.38	5.90	11.05	4.23	1.156	0.006	0.3	0.08	0.10	Gravity
D6-21025	D6-21029	8	307.8	0.5296	11.05	4.23	10.67	2.60	0.569	0.083	1.2	0.10	1.68	Surcharged
D6-21026	D6-21027	24	225.6	1.0505	14.22	8.09	13.19	5.72	14.988	5.819	6.1	0.89	0.95	Gravity
D6-21026A	D6-21028	24	67.0	0.8060	13.80	8.63	14.22	8.09	13.128	5.817	6.2	0.94	0.94	Gravity
D6-21026W	D6-21005	21	140.2	0.1284	13.80	8.40	13.80	8.40	3.67	2.322	2.9	0.96	0.90	Gravity
D6-21027	D6-21027A	24	280.0	0.7929	13.19	5.72	12.00	3.50	13.021	5.825	6.1	0.95	1.43	Gravity
D6-21027A	D6-21028	24	280.0	0.7964	12.00	3.50	12.01	1.27	13.05	5.849	5.7	1.42	3.21	Surcharged
D6-21028	D6-21029	24	108.4	0.7934	12.01	1.27	10.67	0.41	13.025	5.869	4.9	3.18	3.87	Surcharged
D6-21029	D6-21017	24	134.1	0.7905	10.67	0.41	9.40	-0.65	13.001	5.943	2.7	3.85	4.71	Surcharged
D6-21030	D6-21031	6	352.0	0.6392	15.68	11.08	12.45	8.83	0.29	0.040	0.7	0.14	0.23	Gravity
D6-21031	D6-21032	6	244.7	0.1921	12.45	8.83	13.37	7.86	0.159	0.064	1.0	0.23	0.25	Gravity
D6-21032	D6-21034	6	253.3	0.2053	13.37	8.36	13.93	7.84	0.164	0.075	1.0	0.25	0.28	Gravity
D6-21033	D6-21034	6	301.0	0.4817	16.04	9.49	13.93	8.04	0.252	0.027	1.2	0.13	0.12	Gravity
D6-21034	D6-21035	6	198.0	0.2980	13.93	7.84	11.62	7.25	0.198	0.107	1.5	0.28	0.28	Gravity
D6-21035	D6-21036	6	360.3	0.3081	11.62	7.25	9.34	6.14	0.201	0.112	1.5	0.28	0.39	Gravity
D6-21036	D6-21037	6	308.5	0.3501	9.34	6.14	7.50	5.06	0.215	0.111	1.3	0.39	1.17	Surcharged
D6-21037	D6-21038	8	175.8	0.3925	7.50	5.06	7.11	4.37	0.489	0.200	1.2	1.16	1.73	Surcharged
D6-21038	D6-21031	6	519.8	0.2424	7.11	4.37	9.06	3.11	0.202	1.5	1.73	1.32	1.32	Throttled
D6-21039	D6-21040	6	230.0	0.3913	10.10	6.93	8.08	6.03	0.227	0.021	0.3	0.12	0.37	Gravity
D6-21040	D6-21037	6	298.4	0.3251	8.08	6.03	7.50	5.06	0.207	0.087	1.0	0.37	1.17	Surcharged
D6-21041	D6-21042	6	204.0	0.2696	10.32	7.11	10.31	6.03	0.188	0.020	0.5	0.13	0.19	Gravity
D6-21042	D6-21043	6	298.4	0.3619	10.31	7.11	8.08	6.03	0.218	0.060	1.0	0.19	0.37	Gravity
D6-21043	D6-21044	6	185.0	0.2757	11.64	8.60	11.04	8.09	0.19	0.017	0.6	0.12	0.14	Gravity
D6-21044	D6-21042	6	298.4	0.3284	11.04	8.09	10.31	7.11	0.208	0.028	0.6	0.14	0.19	Gravity
D6-21045	D6-21046	27	278.7	0.1292	8.89	-1.01	9.27	-1.37	7.195	9.360	3.5	4.32	4.07	Throttled
D6-21046	D6-21057	27	280.8	0.1531	9.27	-1.37	8.91	-1.80	7.833	9.360	3.5	4.02	3.84	Throttled
D6-21047	D6-21048	6	205.3	0.5114	7.76	5.26	7.44	4.21	0.259	0.014	0.7	0.10	0.10	Gravity
D6-21048	D6-21051	6	283.5	0.4868	7.44	4.19	8.11	2.81	0.253	0.024	0.7	0.12	0.16	Gravity
D6-21049	D6-21051	6	221.0	0.5158	8.85	4.50	8.40	3.36	0.261	0.012	0.4	0.10	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D6-21050	D6-21051	6	233.1	0.4547	9.98	4.43	8.40	3.37	0.245	0.015	0.6	0.11	0.12	Gravity
D6-21051	D6-21052	6	101.5	0.6320	8.40	3.36	8.11	2.82	0.265	0.030	0.7	0.13	0.15	Gravity
D6-21052	D6-21053	6	239.0	0.8159	8.11	2.81	7.61	0.328	0.328	0.059	0.7	0.16	1.28	Surcharged
D6-21053	D6-21055	6	166.0	0.0301	7.61	0.86	8.91	0.81	0.063	0.066	1.3	1.28	1.29	Throttled
D6-21054	D6-21055	6	310.6	1.8094	9.99	6.43	8.91	0.81	0.488	0.012	0.2	0.08	1.29	Surcharged
D6-21055	D6-21056	6	96.2	0.4782	8.91	0.81	8.91	0.35	0.251	0.087	2.1	1.29	1.71	Surcharged
D6-21056	D6-21057	6	57.2	1.1014	8.91	0.35	8.91	-0.28	0.381	0.091	2.2	1.71	2.31	Surcharged
D6-21057	D6-21058	27	280.2	0.0964	8.91	-1.80	8.38	-2.07	6.214	9.422	3.5	3.79	3.43	Throttled
D6-21058	D6-21059	27	292.1	0.1267	8.38	-2.07	7.88	-2.44	7.125	9.421	3.5	3.38	3.09	Throttled
D6-21059	D6-21060	27	324.4	0.1726	7.88	-2.44	8.36	-3.00	8.318	9.422	3.5	3.05	2.88	Throttled
D6-21060	D6-21061	27	251.4	0.0835	8.36	-3.00	7.85	-3.21	5.785	10.733	4.1	2.83	2.30	Throttled
D6-21062	D7-21001	6	124.0	0.8629	19.88	16.07	17.88	15.00	0.337	0.000	0.0	0.07	0.07	Gravity
D6-21064	D6-21065	6	310.0	0.3065	13.37	8.45	11.74	7.50	0.201	0.029	0.2	0.17	1.10	Surcharged
D6-21065	D6-21067	6	134.5	0.4461	11.74	7.50	11.36	6.90	0.242	0.164	1.2	1.09	1.44	Surcharged
D6-21066	D5-21028	6	416.7	0.4104	12.19	6.70	9.15	4.99	0.232	0.215	2.1	0.39	0.37	Gravity
D6-21067	D6-21066	6	345.0	0.0580	11.36	6.90	12.19	6.70	0.087	0.212	2.0	1.44	0.40	Throttled
D6-21068	D6-21067	6	410.0	0.4341	13.49	8.68	11.36	6.90	0.239	0.070	0.5	0.21	1.44	Surcharged
D6-21069	D6-21060	6	283.6	0.2292	9.90	5.08	9.98	4.43	0.174	0.009	0.5	0.10	0.11	Gravity
D6-21070	D6-21019	8	141.0	1.0496	12.00	9.21	13.72	7.73	0.8	0.001	0.1	0.07	0.11	Gravity
D6-21074	D6-21021	8	150.2	0.6413	12.00	6.88	11.08	6.07	0.575	0.024	0.9	0.11	0.12	Gravity
D6-22005	D6-21025	6	90.0	4.0556	10.21	7.88	11.05	4.23	0.731	0.002	0.1	0.07	0.10	Gravity
D6-22006	D6-21025	6	80.0	3.1875	11.47	6.78	11.05	4.23	0.648	0.001	0.0	0.07	0.10	Gravity
D6-21030	D6-21030	6	341.6	1.0919	17.60	14.81	15.68	11.08	0.379	0.014	0.5	0.09	0.14	Gravity
D6-22009	D6-21001	6	226.0	1.3850	18.17	13.03	18.89	9.90	0.427	0.006	0.0	0.08	2.15	Surcharged
D6-22009	D6-21033	6	273.9	1.2924	18.17	13.03	16.04	9.49	0.412	0.006	0.3	0.08	0.13	Gravity
D6-22010	D6-21031	6	278.0	0.0784	13.80	10.16	12.45	8.83	0.251	0.008	0.1	0.09	0.23	Gravity
D6-22011	D6-21043	6	194.4	0.4270	12.29	9.43	11.64	8.60	0.237	0.008	0.3	0.09	0.12	Gravity
D6-21041	D6-21041	6	197.8	0.4702	11.25	8.59	10.32	7.66	0.249	0.010	0.4	0.09	0.13	Gravity
D6-22013	D6-21039	6	240.0	0.3333	12.70	7.73	10.10	6.93	0.209	0.009	0.4	0.10	0.12	Gravity
D6-22014	D6-21064	6	254.8	9.3524	34.87	32.28	13.37	8.45	1.109	0.010	0.4	0.07	0.17	Gravity
D6-22015	D6-21044	6	86.5	0.6358	10.23	8.64	11.04	8.09	0.289	0.004	0.1	0.07	0.14	Gravity
D6-22015	D6-21045	6	198.4	4.8639	10.23	8.64	8.89	-1.01	0.8	0.015	0.1	0.07	4.36	Surcharged
D6-22016	D6-21048	6	97.0	0.6495	7.73	4.82	7.44	4.19	0.292	0.004	0.2	0.08	0.12	Gravity
D6-22022	D6-21024	8	149.6	2.0722	12.00	9.00	11.38	5.90	1.125	0.006	0.4	0.08	0.08	Gravity
D6-29008	D6-21006	14	101.5	-0.1675	14.00	8.17	14.00	8.34	-1.422	0.877	1.8	1.05	0.79	Gravity
D6-29008	D6-21006	21	100.4	-0.1693	14.00	8.17	14.00	8.34	-4.215	1.447	2.1	1.05	0.79	Gravity
D7-21001	D7-21002	6	151.2	0.8201	17.88	15.00	18.70	13.76	0.328	0.002	0.1	0.07	0.12	Gravity
D7-21002	D7-21004	6	195.0	0.3333	18.70	13.76	17.97	13.11	0.209	0.021	1.0	0.12	0.11	Gravity
D7-21003	D7-21002	6	111.0	0.8468	19.57	14.70	18.70	13.76	0.334	0.008	0.3	0.08	0.12	Gravity
D7-21004	D6-21007	6	238.0	1.1218	17.97	13.11	16.24	10.44	0.384	0.028	0.9	0.11	0.15	Gravity
D7-21005	D7-21006	6	303.0	0.8350	19.96	16.38	17.69	13.85	0.331	0.009	0.6	0.08	0.08	Gravity
D7-21006	D6-21008	6	253.0	0.9447	17.69	13.83	15.43	11.44	0.353	0.020	1.1	0.10	0.10	Gravity
D7-21009	D7-21010	14	166.2	0.3309	16.17	7.36	15.24	6.81	1.998	1.099	2.2	0.64	0.80	Gravity
D7-21009	D7-21010	21	164.1	0.1889	16.17	7.36	15.24	7.05	4.452	1.302	3.0	0.64	0.56	Gravity
D7-21010	D7-21011	14	149.3	0.2612	15.24	7.05	14.44	6.66	1.776	0.837	3.3	0.56	0.46	Gravity
D7-21010	D7-21011	21	147.1	0.4963	15.24	7.05	14.44	6.32	1.575	1.447	3.6	0.56	0.56	Gravity
D7-21011	D7-21012	24	352.9	9.5739	14.44	5.99	14.77	2.62	45.245	2.661	11.6	0.37	2.06	Surcharged
D7-21012	D6-21010	27	443.5	0.0744	14.77	1.17	13.14	0.84	5.461	3.728	2.9	3.51	3.68	Surcharged
D7-21013	E7-21024	6	270.9	0.0923	19.63	16.99	21.16	16.74	0.11	0.004	0.3	0.09	0.08	Gravity
D7-21013	D7-21014	6	375.3	1.3696	19.63	16.99	16.59	11.85	0.425	0.016	0.6	0.09	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D7-21014	D7-21018	6	264.1	0.8778	16.59	11.85	14.76	10.06	0.299	0.032	1.3	0.13	0.13	Gravity
D7-21015	D7-21016	6	216.0	0.8889	17.09	15.17	19.74	12.60	0.342	0.015	0.8	0.10	0.10	Gravity
D7-21016	D7-21017	6	240.0	1.0708	19.74	15.17	16.53	12.60	0.375	0.022	1.0	0.10	0.11	Gravity
D7-21017	D7-21018	6	220.0	1.1864	16.53	12.60	14.76	9.99	0.395	0.031	1.2	0.11	0.13	Gravity
D7-21018	D7-21019	6	113.0	3.0796	14.76	9.99	13.91	6.51	0.637	0.069	2.6	0.13	0.13	Gravity
D7-21019	D7-21024	10	207.2	0.4247	13.91	5.23	13.08	4.247	0.923	0.462	2.7	0.42	0.42	Gravity
D7-21020	D7-21021	6	201.0	0.5522	23.52	18.91	22.19	17.80	0.27	0.014	0.6	0.10	0.12	Gravity
D7-21021	D7-21022	6	278.9	0.6167	22.19	17.80	20.04	16.08	0.285	0.023	1.1	0.12	0.11	Gravity
D7-21022	D7-21023	6	279.6	1.3233	20.04	16.08	12.38	12.38	0.417	0.030	1.5	0.11	0.11	Gravity
D7-21023	D7-21024	6	287.3	2.4887	16.23	12.38	13.08	5.23	0.572	0.042	0.4	0.11	0.42	Gravity
D7-21024	D7-21029	10	258.2	0.8274	13.08	5.23	12.09	3.61	1.122	0.524	1.7	0.42	1.60	Surcharged
D7-21025	D7-21026	6	206.0	0.6990	21.15	17.99	21.34	16.55	0.303	0.006	0.3	0.08	0.10	Gravity
D7-21026	D7-21027	6	284.0	0.5317	21.34	16.55	18.91	15.04	0.265	0.015	0.8	0.10	0.11	Gravity
D7-21027	D7-21028	6	292.9	1.2564	18.91	15.04	15.02	11.36	0.407	0.024	1.2	0.11	0.11	Gravity
D7-21028	D7-21029	6	272.8	2.1994	15.02	11.36	12.09	5.36	0.538	0.036	1.8	0.11	0.11	Gravity
D7-21029	D7-21034	10	263.0	0.1521	12.09	3.61	11.12	3.21	0.552	0.571	3.0	1.59	1.65	Throttled
D7-21030	D7-21031	6	208.0	0.5144	14.93	11.88	16.07	10.81	0.26	0.003	0.2	0.07	0.09	Gravity
D7-21031	D7-21032	6	184.2	0.8740	16.07	10.81	17.44	9.20	0.339	0.010	0.4	0.09	0.12	Gravity
D7-21032	D7-21033	6	285.3	0.2559	17.44	13.30	13.30	8.47	0.184	0.017	0.9	0.12	0.10	Gravity
D7-21033	D7-21034	6	284.8	1.6292	13.30	8.47	11.12	3.83	0.463	0.044	1.8	0.10	1.03	Surcharged
D7-21034	D7-21078	10	32.7	0.8422	11.12	3.21	11.79	3.00	1.135	0.616	3.1	1.64	1.81	Surcharged
D7-21035	D7-21037	6	376.1	1.2284	18.80	13.04	14.99	8.42	0.402	0.063	1.9	0.15	0.21	Gravity
D7-21036	D7-21037	10	355.0	0.3718	16.24	9.52	14.99	8.20	0.864	0.333	1.8	0.36	0.43	Gravity
D7-21037	D7-21038	10	260.0	0.2692	14.99	8.20	16.59	7.50	0.735	0.384	2.4	0.43	0.39	Gravity
D7-21038	D7-21039	10	183.3	0.4146	16.59	7.50	14.00	6.74	0.912	0.389	2.2	0.39	0.41	Gravity
D7-21039	D7-21019	10	180.5	0.3490	16.59	6.74	13.91	6.11	0.837	0.396	2.2	0.41	0.42	Gravity
D7-21040	D7-21042	10	280.8	0.5662	16.25	8.99	14.00	7.40	1.066	0.396	2.3	0.36	0.40	Gravity
D7-21041	D7-21040	6	261.7	0.1681	14.00	9.72	16.25	9.28	0.149	0.014	0.8	0.12	0.10	Gravity
D7-21042	D8-21016	10	136.9	0.4456	14.00	7.40	12.93	6.79	0.945	0.428	2.5	0.40	0.41	Gravity
D7-21043	D7-21042	6	256.8	0.1363	13.00	8.16	14.00	7.81	0.134	0.014	0.8	0.13	0.10	Gravity
D7-21045	D7-21046	6	224.6	0.4942	14.12	9.74	12.02	8.63	0.255	0.007	0.4	0.08	0.10	Gravity
D7-21046	D7-21047	6	279.6	0.5794	12.02	8.63	11.79	7.01	0.276	0.015	0.8	0.10	0.10	Gravity
D7-21047	D7-21049	6	281.5	1.1297	11.79	7.01	9.68	3.83	0.386	0.019	0.6	0.10	0.14	Gravity
D7-21048	D7-21049	6	221.3	0.3163	9.93	4.53	9.68	3.83	0.204	0.014	0.5	0.11	0.14	Gravity
D7-21049	D7-21050	6	288.3	0.6694	9.68	3.83	6.05	1.90	0.297	0.042	1.0	0.14	0.30	Gravity
D7-21050	D8-21015	6	88.9	0.3262	6.05	1.90	5.82	1.61	0.207	0.059	1.8	0.30	0.57	Surcharged
D7-21051	D7-21052	8	342.0	0.2105	6.57	-1.43	8.31	-2.15	0.358	0.601	3.6	1.76	0.50	Throttled
D7-21052	399-Rollins-PS	12	48.0	0.9792	8.31	-2.15	8.84	-2.62	2.279	0.781	3.9	0.50	0.94	Gravity
D7-21053	D7-21054	6	207.4	1.0174	14.24	4.59	10.29	3.01	0.366	0.005	0.3	0.08	0.09	Gravity
D7-21054	D7-21055	6	220.4	0.7169	10.29	4.59	8.63	3.01	0.307	0.011	0.4	0.09	0.14	Gravity
D7-21055	399-Rollins-PS	6	194.0	0.8299	8.63	3.01	8.84	1.40	0.33	0.047	1.6	0.14	0.14	Gravity
D7-21056	D7-21057	6	300.0	0.6333	9.82	4.29	9.16	0.13	0.289	0.013	0.6	0.10	0.13	Gravity
D7-21057	D7-21055	6	297.9	0.4297	9.16	4.29	8.63	3.01	0.238	0.023	0.8	0.13	0.14	Gravity
D7-21058	D7-21059	6	190.0	0.3158	9.36	4.46	8.31	3.86	0.204	0.005	0.3	0.08	0.10	Gravity
D7-21059	D7-21060	6	242.0	0.3264	8.31	3.86	9.45	3.07	0.207	0.011	0.6	0.10	0.10	Gravity
D7-21060	D7-21061	8	28.7	0.2787	9.45	3.05	9.09	0.412	0.019	0.09	0.9	0.12	0.10	Gravity
D7-21061	D7-21062	8	345.5	0.4978	9.09	2.35	8.31	0.63	0.551	0.024	1.0	0.12	0.11	Gravity
D7-21062	D7-21063	8	105.5	0.4076	9.71	5.44	10.18	5.01	0.499	0.000	0.0	0.07	0.07	Gravity
D7-21063	D7-21064	8	156.5	0.7284	10.18	5.01	10.95	3.87	0.667	0.088	0.4	0.07	0.94	Surcharged
D7-21064	D7-21065	8	178.5	0.4594	10.95	3.87	11.79	3.05	0.53	-0.134	-0.6	0.94	1.76	Surcharged

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D7-21065	D7-21078	8	108.2	0.0462	11.79	3.05	11.79	3.00	0.188	-0.168	-0.7	1.76	1.81	Throttled
D7-21066	D7-21067	15	250.0	0.1560	12.87	2.36	14.02	1.97	1.649	0.853	2.1	2.41	2.76	Surcharged
D7-21067	D7-21012	15	254.8	0.3140	14.02	1.17	14.77	1.77	2.34	0.864	1.2	2.76	3.51	Surcharged
D7-21068	D7-21069	10	292.1	0.4108	8.38	3.80	8.70	2.60	0.908	0.029	0.8	0.12	0.13	Gravity
D7-21069	D7-21070	10	245.2	0.4364	8.70	2.60	8.40	1.53	0.936	0.037	0.8	0.13	0.16	Gravity
D7-21070	D7-21071	10	11.7	0.2564	8.40	1.53	8.38	1.50	0.718	0.044	0.9	0.16	0.16	Gravity
D7-21071	D7-21072	12	13.1	0.0000	8.38	1.50	8.25	1.50	0	0.044	1.1	0.16	0.13	Gravity
D7-21072	D7-21073	12	237.9	0.5464	8.25	1.50	9.00	0.20	1.702	0.049	0.6	0.13	0.23	Gravity
D7-21073	D7-21076	12	154.7	0.0259	9.00	0.20	9.00	0.16	0.37	0.054	1.3	0.23	0.14	Gravity
D7-21074	D7-21075	8	300.0	0.6000	8.32	2.87	9.38	1.07	0.605	0.009	0.5	0.09	0.10	Gravity
D7-21075	D7-21076	8	203.6	0.4470	9.38	1.07	9.00	0.16	0.522	0.012	0.4	0.10	0.14	Gravity
D7-21076	D7-21052	12	245.2	0.9421	9.00	0.16	8.31	-2.15	2.236	0.096	0.5	0.14	0.50	Gravity
D7-21077	D7-21035	6	240.0	0.7583	20.07	16.00	18.80	0.316	0.016	0.016	0.9	0.10	0.10	Gravity
D7-21078	D7-21066	15	203.6	0.3143	11.79	3.00	12.87	2.36	2.341	0.827	1.9	1.80	2.41	Surcharged
D7-22002	D7-21014	6	133.0	1.5865	17.64	13.96	16.89	11.85	0.457	0.010	0.4	0.08	0.13	Gravity
D7-22003	D7-21043	6	195.6	0.3681	12.26	8.88	13.00	8.16	0.22	0.006	0.2	0.09	0.13	Gravity
D7-22004	D7-21056	6	111.0	0.1081	10.34	6.31	9.82	6.19	0.119	0.005	0.3	0.10	0.10	Gravity
D7-22005	D7-21055	6	133.6	1.7216	9.55	5.31	8.63	3.01	0.476	0.008	0.3	0.08	0.14	Gravity
D7-22006	D7-21015	6	214.0	0.6542	22.31	18.49	17.09	0.293	0.006	0.3	0.08	0.10	0.10	Gravity
D7-22007	D7-21020	6	204.0	0.5000	22.65	19.93	23.52	18.91	0.257	0.007	0.4	0.09	0.10	Gravity
D8-21001	D8-21002	6	311.9	0.1122	7.43	4.70	6.49	4.35	0.122	0.059	0.7	1.06	1.35	Surcharged
D8-21002	D8-21005	8	312.0	0.1250	6.49	4.35	7.17	3.96	0.276	0.117	0.7	1.35	1.69	Surcharged
D8-21003	D8-21004	6	288.3	0.4960	13.17	7.44	10.51	6.01	0.255	0.053	1.4	0.17	0.17	Gravity
D8-21004	D8-21002	6	298.2	0.5567	10.51	6.01	6.49	4.35	0.271	0.055	0.7	0.17	1.35	Surcharged
D8-21005	D8-21006	8	313.0	0.0511	7.17	3.96	8.40	3.80	0.177	0.131	0.7	1.69	1.80	Surcharged
D8-21006	D8-21012	8	43.7	0.8924	8.40	3.83	7.99	3.44	0.738	0.529	2.4	1.76	1.93	Surcharged
D8-21007	D7-21042	6	314.8	1.0515	14.13	11.12	14.00	7.81	0.372	0.013	0.8	0.09	0.09	Gravity
D8-21008	D8-21009	6	239.8	0.8632	12.12	8.25	11.59	6.18	0.337	0.018	0.2	0.10	0.42	Gravity
D8-21009	D8-21011	10	288.3	0.4509	11.59	6.18	8.61	4.88	0.951	0.458	2.3	0.42	1.01	Surcharged
D8-21010	D8-21011	6	362.1	0.4833	9.57	6.63	8.61	4.88	0.252	0.017	0.1	0.11	1.01	Surcharged
D8-21011	D8-21006	10	301.3	0.3584	8.61	4.88	8.40	3.80	0.848	0.446	2.0	1.01	1.80	Surcharged
D8-21012	D8-21013	8	410.8	0.3797	7.99	3.44	5.82	1.88	0.481	0.530	2.4	1.92	1.52	Throttled
D8-21013	D8-21015	8	249.6	0.3966	5.82	1.88	5.82	0.89	0.492	0.534	2.8	1.51	1.29	Throttled
D8-21014	D7-21050	6	222.2	0.3780	7.05	2.74	6.05	0.90	0.223	0.012	0.3	0.10	0.30	Gravity
D8-21015	D7-21051	8	315.4	0.7356	5.82	0.89	6.57	-1.43	0.67	0.579	2.4	1.27	1.78	Surcharged
D8-21016	D8-21009	10	144.1	0.4233	12.93	6.79	11.59	6.18	0.922	0.434	2.5	0.41	0.42	Gravity
D8-21017	D7-21074	8	235.0	0.5149	9.08	4.08	8.32	2.87	0.561	0.007	0.4	0.08	0.09	Gravity
D8-21018	D7-21068	8	300.0	0.5000	8.30	5.30	8.38	3.80	0.552	0.010	0.4	0.09	0.12	Gravity
D8-22001	D8-21007	6	224.1	0.3570	9.98	7.19	9.64	6.39	0.217	0.008	0.4	0.09	0.11	Gravity
D8-22002	D8-21010	6	96.7	1.0238	9.82	7.62	9.57	6.63	0.367	0.010	0.5	0.09	0.11	Gravity
D8-22003	D8-21008	6	216.5	0.5173	12.76	9.37	12.12	8.25	0.261	0.011	0.6	0.10	0.10	Gravity
D8-22004	D8-21014	6	198.5	0.6650	7.87	4.06	7.05	2.74	0.296	0.004	0.2	0.08	0.10	Gravity
D8-22005	D8-21048	6	216.0	0.9630	10.61	6.61	9.93	4.53	0.356	0.006	0.3	0.08	0.11	Gravity
E1-21001	E1-21002	6	292.8	5.7377	552.70	546.30	536.60	529.50	0.889	0.007	0.6	0.07	0.08	Gravity
E1-21002	E1-21003	6	231.2	7.2664	536.60	529.50	523.40	512.70	0.978	0.017	0.9	0.08	0.11	Gravity
E1-21003	E1-21004	6	336.5	3.7741	523.40	512.70	508.50	500.00	0.705	0.041	1.6	0.10	0.13	Gravity
E1-21004	E2-21002	6	173.2	6.2933	508.50	500.00	498.00	489.10	0.91	0.098	1.9	0.13	0.22	Gravity
E1-21006	E1-21007	6	271.7	6.2569	558.70	552.00	541.50	535.00	0.907	0.021	1.4	0.08	0.09	Gravity
E1-21007	E1-21008	6	198.9	11.5636	541.50	535.00	520.00	512.00	1.234	0.037	2.0	0.09	0.10	Gravity
E1-21008	E1-21004	6	161.3	7.4396	520.00	512.00	508.50	500.00	0.989	0.050	1.9	0.10	0.13	Gravity

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E2-21010	E2-21073	6	170.2	13.3960	520.90	514.80	500.20	492.00	1.328	0.015	1.0	0.07	0.09	Gravity
E1-21011	E1-21012	6	156.7	9.1257	557.60	551.20	543.80	536.90	1.096	0.020	1.1	0.08	0.10	Gravity
E1-21012	E1-21013	6	186.5	3.2708	543.80	536.90	539.00	530.80	0.656	0.031	1.7	0.10	0.10	Gravity
E1-21013	E1-21017	6	328.6	3.0128	539.00	528.00	526.40	518.10	0.63	0.079	2.5	0.14	0.15	Gravity
E1-21014	E1-21013	6	221.9	2.2983	542.60	535.90	539.00	530.80	0.955	0.037	1.8	0.11	0.11	Gravity
E1-21015	E1-21014	6	115.0	0.9565	543.20	537.00	542.60	535.90	0.355	0.017	0.8	0.10	0.11	Gravity
E1-21017	E1-21018	6	119.4	4.2714	526.40	518.10	519.50	513.00	0.75	0.116	4.0	0.15	0.15	Gravity
E1-21018	E1-21019	6	199.2	11.5462	519.50	513.00	495.80	490.00	1.233	0.129	4.7	0.13	0.14	Gravity
E1-21019	E1-21020	6	277.4	11.4636	490.00	486.40	458.20	453.00	1.228	0.146	2.8	0.13	0.22	Gravity
E2-21084	E1-21020	6	286.7	1.8137	464.60	458.20	459.60	453.00	0.489	0.171	2.7	0.22	0.25	Gravity
E1-21022	E1-21017	6	268.0	2.8493	531.40	525.20	526.40	518.10	0.591	0.033	1.0	0.10	0.15	Gravity
E1-21025	E1-21027	6	222.6	5.4807	504.20	494.60	488.00	482.40	0.849	0.131	4.7	0.15	0.14	Gravity
E1-21027	E1-21028	6	210.4	11.1692	488.00	482.40	464.50	458.90	1.212	0.151	5.0	0.14	0.14	Gravity
E1-21028	E1-21029	6	303.0	10.3960	464.50	458.90	434.60	427.40	1.17	0.170	5.0	0.14	0.16	Gravity
E1-21029	E2-21089	6	308.7	9.2323	434.60	427.40	404.70	398.90	1.102	0.194	5.4	0.16	0.16	Gravity
E1-21030	E2-21080	6	305.0	5.6066	522.20	515.90	505.40	498.80	0.859	0.013	1.1	0.08	0.08	Gravity
E1-21056	E2-21057	6	174.9	5.0886	491.50	485.00	482.80	476.10	0.818	0.020	1.3	0.08	0.09	Gravity
E1-22005	E1-21006	6	98.1	10.1937	569.20	562.00	558.70	552.00	1.158	0.011	0.8	0.07	0.08	Gravity
E1-22009	E1-21010	6	234.6	12.0205	549.40	543.00	520.90	514.80	1.258	0.008	0.7	0.07	0.07	Gravity
E1-21021	E1-21022	6	291.1	6.2521	550.30	543.40	531.40	525.20	0.907	0.011	0.6	0.07	0.10	Gravity
E1-22023	E1-21030	6	110.0	9.0000	532.40	525.80	522.20	515.90	1.088	0.006	0.5	0.07	0.08	Gravity
E1-22026	E1-21025	6	206.0	7.4757	516.00	510.00	504.20	494.60	0.992	0.012	0.4	0.07	0.15	Gravity
E1-22031	E1-21011	6	138.6	9.9567	571.40	565.00	551.20	551.20	1.145	0.009	0.7	0.07	0.08	Gravity
E2-21001	E2-21002	8	36.6	5.0820	475.76	470.16	475.40	468.30	1.76	0.390	5.8	0.23	0.23	Gravity
E2-21002	E2-21003	8	132.1	20.6662	475.40	468.30	444.20	441.00	3.551	0.389	3.2	0.16	0.35	Gravity
E2-21003	E1-21005	8	102.3	1.1730	444.20	441.00	443.50	439.80	0.846	0.041	0.4	0.10	0.35	Gravity
E2-21004	E2-21003	6	170.3	5.3905	457.16	450.18	444.20	441.00	0.842	0.041	0.4	0.10	0.35	Gravity
E2-21005	E2-21006	8	170.2	12.4559	443.50	439.80	422.00	418.60	2.757	0.460	2.8	0.20	0.47	Gravity
E2-21006	E2-21007	8	129.0	0.5426	422.00	418.60	423.00	417.90	0.575	0.460	3.2	0.46	0.40	Gravity
E2-21007	E2-21011	8	128.0	6.1719	423.00	417.90	414.50	410.00	1.941	0.905	8.1	0.33	0.33	Gravity
E2-21008	E2-21009	6	150.0	11.0133	470.93	461.29	450.77	444.77	1.204	0.427	6.3	0.22	0.26	Gravity
E2-21009	E2-21010	6	30.1	5.5482	450.77	444.77	449.77	443.10	0.854	0.427	6.4	0.26	0.26	Gravity
E2-21010	E2-21007	8	113.3	22.2418	449.77	443.10	423.00	417.90	3.685	0.442	4.0	0.17	0.33	Gravity
E2-21011	E2-21012	8	55.0	49.8182	414.50	410.00	385.50	382.60	5.514	0.913	9.3	0.19	0.30	Gravity
E2-21012	E2-21013	8	85.0	8.6235	385.50	382.60	381.00	375.10	2.321	0.913	9.7	0.30	0.29	Gravity
E2-21013	E2-29004	8	39.3	9.9924	381.00	375.10	373.81	371.17	2.469	0.913	9.5	0.29	0.30	Gravity
E2-21014	E2-22003	6	96.1	33.2986	397.00	394.00	367.50	362.00	2.094	0.101	5.0	0.10	0.11	Gravity
E2-21016	E2-21019	8	117.0	1.4530	343.50	338.00	343.17	336.30	0.942	1.067	5.0	1.16	0.60	Throttled
E2-21017	E2-21018	6	216.0	9.0185	455.10	449.81	435.98	430.33	1.089	0.034	2.0	0.09	0.10	Gravity
E2-21018	E2-21019	6	331.8	27.8059	435.98	430.33	343.17	338.07	1.913	0.085	4.9	0.10	0.10	Gravity
E2-21019	E2-21020	8	179.6	2.4722	343.17	336.30	337.56	331.86	1.228	1.166	6.1	0.55	0.55	Gravity
E2-21020	E2-21021	8	114.9	6.4056	337.56	331.86	329.50	324.50	1.977	1.184	8.9	0.28	0.38	Gravity
E2-21021	E2-21022	24	85.4	13.4660	329.50	324.50	318.10	313.00	53.665	1.203	6.2	0.38	0.30	Gravity
E2-21022	E2-21025	8	130.4	14.5706	318.10	313.00	300.60	294.00	2.983	1.203	8.1	0.30	0.42	Gravity
E2-21023	E2-21024	6	209.7	21.4115	416.00	411.80	371.00	366.90	1.679	0.085	4.7	0.10	0.10	Gravity
E2-21024	E2-21025	6	132.7	54.9359	371.00	366.90	300.60	294.00	2.689	0.131	1.2	0.10	0.42	Gravity
E2-21025	E2-21026	24	109.6	1.7336	300.60	294.00	296.50	292.10	19.25	1.322	2.6	0.42	1.55	Gravity
E2-21026	E2-21027	8	127.5	2.2745	296.50	292.10	293.30	289.20	1.178	1.322	6.2	1.48	0.60	Throttled
E2-21027	E2-21028	8	225.0	18.3111	293.30	289.20	253.40	248.00	3.343	1.430	10.4	0.32	0.44	Gravity
E2-21028	E2-21029	8	92.4	10.4978	253.40	248.00	242.20	238.30	2.532	1.461	7.7	0.37	2.94	Surcharged

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E2-21029	E2-21030	8	62.6	5.2716	242.20	238.80	238.30	235.00	1.794	1.461	5.6	2.85	FULL	Surcharged
E2-21030	E2-21031	8	188.4	2.6639	238.80	236.00	235.00	230.00	1.273	1.425	6.4	3.77	2.27	Throttled
E2-21031	E2-21032	8	121.1	5.3675	236.00	230.00	227.90	223.50	1.81	1.425	5.4	2.19	FULL	Surcharged
E2-21032	E2-21033	8	127.4	1.9623	227.90	223.50	223.50	221.00	1.094	1.381	5.5	4.38	FULL	Throttled
E2-21033	E2-21034	8	90.0	1.3333	223.50	223.50	221.00	219.80	0.902	1.258	5.2	FULL	1.52	Throttled
E2-21034	E2-21035	8	62.3	1.4446	223.50	225.90	224.50	218.90	0.939	1.287	6.0	1.44	0.60	Throttled
E2-21035	E2-21036	8	111.2	8.4173	224.50	218.90	218.90	209.54	2.267	1.292	4.8	0.37	FULL	Surcharged
E2-21036	E2-21037	8	78.3	1.2299	214.44	209.54	209.54	208.58	0.867	0.918	3.8	FULL	4.88	Throttled
E2-21037	E2-21038	8	55.0	1.2309	238.12	208.58	207.90	207.90	0.867	0.867	3.4	4.85	4.73	Throttled
E2-21038	E2-21039	8	96.0	0.5208	212.70	207.90	211.08	207.40	0.564	0.924	3.5	4.70	FULL	Throttled
E2-21039	E2-21040	8	205.0	0.5366	211.08	207.40	211.09	206.30	0.572	0.602	2.6	FULL	3.77	Throttled
E2-21040	E3-21001	8	100.0	0.4700	211.09	206.30	212.15	205.83	0.536	0.602	2.7	3.76	3.67	Throttled
E2-21041	E2-21042	6	242.6	13.1080	403.10	400.93	370.91	369.13	1.313	0.030	1.8	0.08	0.09	Gravity
E2-21042	E2-21043	6	179.2	9.1842	370.91	369.13	362.69	352.67	1.099	0.042	2.2	0.09	0.11	Gravity
E2-21043	E2-21044	6	233.1	9.1828	362.69	352.67	338.56	331.27	1.099	0.067	2.6	0.11	0.13	Gravity
E2-21044	E2-21045	6	377.6	9.1811	338.56	331.27	307.01	296.60	1.099	0.117	4.0	0.13	0.14	Gravity
E2-21045	E2-21046	6	287.3	9.1803	307.01	296.60	272.18	270.22	1.099	0.152	4.8	0.14	0.15	Gravity
E2-21046	E3-21008	6	260.2	9.1826	272.18	270.22	255.20	246.33	1.099	0.175	5.5	0.15	0.15	Gravity
E2-21057	E2-21058	6	190.7	8.3901	482.80	476.10	469.40	460.10	1.051	0.035	1.9	0.09	0.10	Gravity
E2-21058	E2-21059	6	192.0	5.7292	469.40	460.10	455.80	449.10	0.868	0.049	2.5	0.10	0.11	Gravity
E2-21059	E2-21060	6	200.0	8.0500	455.80	449.10	441.80	433.00	1.029	0.068	2.0	0.11	0.16	Gravity
E2-21060	E2-21061	6	288.7	1.6973	441.80	433.00	433.80	428.10	0.473	0.082	1.8	0.16	0.20	Gravity
E2-21061	E2-21062	6	300.2	0.9993	433.80	428.10	425.10	420.90	0.363	0.106	2.1	0.20	0.21	Gravity
E2-21062	E2-21063	6	297.4	1.0087	430.90	425.10	427.80	422.10	0.364	0.124	2.4	0.21	0.21	Gravity
E2-21063	E2-21064	6	286.6	1.2212	427.80	422.10	423.00	418.60	0.401	0.133	2.6	0.21	0.21	Gravity
E2-21064	E2-21065	6	249.1	10.0281	423.00	418.60	398.42	393.62	1.149	0.147	5.1	0.14	0.14	Gravity
E2-21065	E2-21066	6	210.2	12.2217	398.42	393.62	373.11	367.93	1.268	0.162	5.2	0.14	0.15	Gravity
E2-21066	E2-21067	6	103.5	9.3527	373.11	367.93	363.57	358.25	1.111	0.169	5.2	0.15	0.15	Gravity
E2-21067	D2-21016	6	188.0	9.0319	363.57	358.25	347.57	341.27	1.09	0.182	4.0	0.15	0.20	Gravity
E2-21068	E2-21069	6	260.4	13.6943	435.97	430.99	400.45	395.33	1.343	0.060	3.0	0.10	0.11	Gravity
E2-21069	E2-21070	6	251.2	10.3519	400.45	395.33	374.47	369.33	1.167	0.075	3.6	0.11	0.11	Gravity
E2-21070	D2-21016	6	120.9	16.2366	366.05	360.90	347.57	341.27	1.462	0.091	2.0	0.11	0.20	Gravity
E2-21071	E2-21072	6	218.1	3.9413	367.94	362.23	368.73	353.63	0.72	0.020	1.1	0.09	0.10	Gravity
E2-21072	E2-21073	6	141.4	0.7072	498.00	489.10	494.50	488.10	0.305	0.106	2.1	0.22	0.21	Gravity
E2-21073	E2-21074	6	96.8	4.0289	500.20	492.00	494.50	488.10	0.728	0.022	0.5	0.09	0.20	Gravity
E2-21074	E2-21075	6	216.9	1.4753	494.50	488.10	490.80	484.90	0.441	0.133	2.8	0.20	0.20	Gravity
E2-21075	E2-21076	6	298.6	6.0281	490.80	484.90	472.90	466.90	0.891	0.152	3.8	0.15	0.18	Gravity
E2-21076	E2-21077	6	209.0	4.3062	472.90	466.90	464.80	457.90	0.753	0.175	3.7	0.18	0.20	Gravity
E2-21077	E2-21078	6	300.4	3.1625	464.80	457.90	454.50	448.40	0.645	0.192	3.8	0.20	0.21	Gravity
E2-21078	E2-21079	6	217.2	2.9006	454.50	448.40	448.80	442.10	0.618	0.203	2.9	0.21	0.28	Gravity
E2-21079	E2-21086	6	266.3	5.8205	448.80	442.10	429.20	426.60	0.875	0.459	6.6	0.27	0.27	Gravity
E2-21080	E2-21081	6	183.0	10.4918	505.40	498.80	485.60	479.60	1.175	0.020	1.5	0.08	0.08	Gravity
E2-21081	E2-21082	6	137.0	13.0657	485.60	479.60	470.20	461.70	1.311	0.030	1.8	0.08	0.09	Gravity
E2-21082	E2-21083	6	180.0	8.0556	470.20	461.70	453.80	447.20	1.03	0.039	0.7	0.09	0.24	Gravity
E2-21083	E2-21079	6	188.9	2.6998	453.80	447.20	448.80	442.10	0.596	0.250	3.5	0.24	0.28	Gravity
E2-21084	E2-21085	6	179.0	1.2849	459.60	453.00	457.20	450.70	0.411	0.189	3.0	0.25	0.25	Gravity
E2-21085	E2-21083	6	239.0	1.4644	457.20	450.70	453.80	447.20	0.439	0.202	3.3	0.25	0.25	Gravity
E2-21086	E2-21087	6	256.7	9.7390	429.20	426.60	408.40	401.60	1.132	0.462	7.9	0.24	0.24	Gravity
E2-21087	E2-21088	6	174.0	10.6897	406.40	401.60	383.00	383.00	1.186	0.483	6.2	0.23	0.30	Gravity
E2-21088	D2-21007	6	135.6	5.7522	388.00	383.00	382.60	375.20	0.87	0.498	4.2	0.28	0.50	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E2-21089	D2-21007	6	235.4	10.0680	404.70	398.90	382.60	375.20	1.151	0.218	1.9	0.16	0.49	Gravity
E2-21090	E2-21091	6	153.1	8.8178	335.00	325.00	315.00	311.50	1.077	0.016	0.8	0.08	0.11	Gravity
E2-21091	E2-21092	6	173.8	0.9781	335.00	315.00	315.00	309.80	1.350	0.025	1.8	0.11	0.11	Gravity
E2-21092	E2-21093	6	144.6	14.7303	317.00	309.80	296.00	288.50	1.392	0.028	1.6	0.08	0.10	Gravity
E2-21093	E2-21094	6	96.5	2.9534	296.00	288.50	288.50	285.65	0.623	0.031	1.2	0.10	0.13	Gravity
E2-21094	E2-21095	6	125.3	0.7582	288.50	285.65	285.65	284.70	0.316	0.035	1.3	0.10	0.14	Gravity
E2-21095	D2-21057	6	146.1	0.7529	295.50	284.70	298.50	283.60	0.315	0.038	1.6	0.14	0.12	Gravity
E2-21099	D2-21013	6	225.9	3.9416	368.73	353.63	349.64	344.73	0.72	0.038	2.2	0.10	0.10	Gravity
E2-21070	E2-21070	6	81.4	10.3514	374.47	369.33	366.05	360.90	1.167	0.085	4.3	0.11	0.11	Gravity
E2-22002	E2-21023	6	94.7	1.1616	420.00	412.90	416.00	411.80	0.391	0.052	2.0	0.14	0.14	Gravity
E2-22003	E2-21016	6	143.8	16.8898	367.50	362.00	343.50	338.00	1.482	0.101	0.7	0.11	1.23	Surcharged
E2-22004	E2-21016	8	141.2	20.9674	374.00	367.61	343.50	338.00	3.578	0.950	4.0	0.24	1.24	Surcharged
E2-22007	E2-21071	6	115.0	27.6696	399.25	394.05	367.94	367.94	1.908	0.009	0.6	0.07	0.09	Gravity
E2-29004	E2-22004	8	35.7	9.9916	373.81	371.17	374.00	367.61	2.469	0.950	9.9	0.29	0.29	Gravity
E3-21001	E3-21002	8	120.5	0.5145	212.15	205.83	210.31	205.21	0.56	0.612	2.6	3.65	3.54	Throttled
E3-21002	E3-21003	8	171.7	0.4892	210.31	205.21	208.37	204.37	0.546	0.646	2.6	3.52	3.15	Throttled
E3-21003	E3-21004	8	140.0	0.4929	208.37	204.37	206.20	203.68	0.548	0.712	2.8	3.13	FULL	Throttled
E3-21004	E3-21005	8	60.0	0.2500	206.20	203.68	212.46	203.53	0.391	0.608	3.0	FULL	2.57	Throttled
E3-21005	E3-21006	8	97.3	0.6578	212.46	203.53	206.73	202.89	0.633	0.608	2.5	2.56	2.85	Surcharged
E3-21006	E3-21007	8	105.7	0.4541	206.73	202.89	207.82	202.41	0.527	0.613	2.5	2.84	2.95	Throttled
E3-21007	E3-21010	8	340.3	0.5907	207.82	202.41	210.20	200.40	0.6	0.751	3.1	2.93	1.69	Throttled
E3-21008	E3-21009	8	195.3	9.1813	255.20	246.33	232.00	228.40	1.099	0.175	5.2	0.15	0.16	Gravity
E3-21009	E3-21007	6	232.4	11.1833	232.00	228.40	207.82	202.41	1.213	0.210	1.4	0.16	2.95	Surcharged
E3-21010	E3-21011	8	242.6	0.5853	210.20	200.40	203.18	198.98	0.598	0.785	4.1	1.66	0.53	Throttled
E3-21011	E3-21012	8	159.3	13.3082	203.18	198.98	181.54	177.78	2.85	0.825	9.1	0.25	0.28	Gravity
E3-21012	E3-21129	8	29.5	9.4237	181.54	177.78	180.00	175.00	2.397	0.825	9.2	0.28	0.28	Gravity
E3-21013	E3-21129	8	129.4	1.1592	182.50	176.50	180.00	175.00	0.841	0.017	0.2	0.09	0.25	Gravity
E3-21014	E3-21016	6	47.5	0.7368	161.59	156.44	162.11	156.09	0.311	0.022	1.6	0.11	0.11	Gravity
E3-21015	E3-21014	6	355.0	0.1268	163.80	156.89	161.59	156.44	0.129	0.013	0.6	0.12	0.11	Gravity
E3-21016	E3-21017	6	180.1	9.2671	162.11	156.09	145.40	139.40	1.104	0.026	0.3	0.08	0.31	Gravity
E3-21017	E3-21018	10	262.8	5.2131	145.40	139.40	131.70	125.70	3.234	0.875	7.4	0.31	0.31	Gravity
E3-21018	E3-21019	10	251.1	7.9849	131.70	125.70	112.90	105.65	4.003	0.885	5.7	0.28	0.38	Gravity
E3-21019	E3-21026	10	311.9	2.6771	112.90	105.65	103.30	97.30	2.317	0.930	6.0	0.38	0.38	Gravity
E3-21020	E3-21021	6	138.4	6.8425	140.60	135.00	131.97	125.53	0.949	0.020	1.1	0.08	0.10	Gravity
E3-21021	E3-21022	6	50.0	1.4400	131.97	125.53	132.01	124.81	0.435	0.023	1.5	0.10	0.09	Gravity
E3-21022	E3-21023	6	32.0	4.0938	132.01	124.81	128.75	123.50	0.734	0.025	1.3	0.09	0.11	Gravity
E3-21023	E3-21024	6	50.0	1.5600	128.75	123.50	129.23	122.72	0.453	0.027	1.8	0.11	0.09	Gravity
E3-21024	E3-21025	6	129.2	9.8994	129.23	122.72	117.83	109.93	1.142	0.037	2.1	0.09	0.10	Gravity
E3-21025	E3-21026	8	110.7	3.8663	117.83	109.93	105.65	105.65	1.536	0.042	0.3	0.10	0.38	Gravity
E3-21026	E3-21027	10	256.0	4.0078	103.30	97.30	93.04	87.04	2.836	0.934	6.5	0.34	0.36	Gravity
E3-21027	D3-21014	10	357.6	3.7584	93.04	87.04	81.29	73.60	2.746	0.966	3.3	0.35	1.63	Surcharged
E3-21028	E3-21029	6	250.0	8.6120	158.91	155.60	137.85	134.07	1.065	0.002	0.2	0.07	0.07	Gravity
E3-21029	E3-21030	6	255.2	4.3299	137.85	134.07	126.03	123.02	0.755	0.009	0.7	0.07	0.08	Gravity
E3-21030	E3-21031	6	248.4	3.7520	126.03	123.02	116.80	113.70	0.703	0.016	1.1	0.08	0.08	Gravity
E3-21031	D3-21008	6	289.4	6.7761	116.80	113.70	97.64	94.09	0.944	0.024	1.4	0.08	0.10	Gravity
E3-21032	E3-21033	8	214.5	7.6830	163.37	158.97	147.19	142.49	2.165	0.007	0.5	0.07	0.08	Gravity
E3-21033	D3-21034	8	226.2	8.5853	147.19	142.49	127.60	123.07	2.289	0.014	1.0	0.08	0.08	Gravity
E3-21034	E3-21004	8	228.3	12.2733	127.60	123.07	102.39	95.05	2.737	0.015	0.9	0.08	0.09	Gravity
E3-21036	D3-21089	6	359.8	7.8933	144.00	139.80	117.60	111.40	1.019	0.015	1.0	0.08	0.09	Gravity
E3-21040	E3-21041	6	398.0	6.5503	288.59	275.75	252.46	249.68	0.928	0.197	3.8	0.17	0.21	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-21041	E3-21096	6	254.1	8.8371	252.46	249.68	232.91	227.23	1.078	0.364	7.0	0.21	0.21	Gravity
E3-21051	E3-21053	8	174.2	4.8220	203.40	198.30	195.99	189.90	1.715	1.453	5.8	0.84	2.93	Surcharged
E3-21051	E3-29001	8	38.2	8.5000	218.42	213.60	213.36	210.36	2.277	1.309	9.5	0.37	0.42	Gravity
E3-21053	E3-21057	8	189.1	2.7023	195.99	189.90	188.57	184.79	1.284	1.513	7.1	2.83	0.60	Throttled
E3-21054	E3-21053	6	20.0	2.7000	194.00	190.44	195.99	189.90	0.596	0.065	0.4	2.39	2.92	Surcharged
E3-21055	E3-21054	6	115.5	20.3680	232.92	213.97	190.44	190.44	1.637	0.056	1.5	0.09	2.39	Surcharged
E3-21057	E3-21058	8	257.6	5.4115	188.57	184.78	175.72	170.84	1.817	1.535	8.4	0.48	1.18	Surcharged
E3-21058	E3-21059	8	214.7	6.9492	175.72	170.84	163.03	155.92	2.059	1.534	5.6	1.01	FULL	Surcharged
E3-21059	E3-21067	8	232.0	2.8103	165.03	155.92	156.80	149.40	1.31	1.407	5.1	FULL		Throttled
E3-21067	E3-21068	8	220.0	1.0500	156.80	149.40	151.18	147.09	0.801	1.429	6.7	5.83	0.60	Throttled
E3-21068	E3-21071	8	149.9	4.0427	151.18	147.09	145.18	141.03	1.571	1.440	7.8	0.52	0.52	Gravity
E3-21071	E3-21072	12	25.0	30.2800	145.18	141.03	140.18	133.46	12.674	1.939	9.6	0.28	0.42	Gravity
E3-21072	E3-21074	12	90.0	6.1778	140.18	133.46	133.57	127.90	5.725	1.938	3.6	0.42	2.32	Surcharged
E3-21073	E3-21071	6	290.1	11.6236	179.75	174.75	145.18	141.03	1.237	0.499	6.6	0.23	0.29	Gravity
E3-21074	E3-29002	12	59.1	0.0000	133.57	127.90	137.88	127.90	0	1.938	3.6	2.29	1.86	Throttled
E3-21075	E3-21076	12	183.4	1.8539	131.69	127.62	124.22	124.22	3.136	1.958	5.6	0.58	0.66	Gravity
E3-21076	E3-21077	12	120.0	1.4583	128.35	124.22	127.83	122.47	2.781	1.969	5.8	0.64	0.64	Gravity
E3-21077	E3-21078	12	190.4	1.2605	127.83	122.00	126.72	119.60	2.586	1.975	5.5	0.66	0.66	Gravity
E3-21078	E3-21126	8	123.7	13.2482	126.72	120.30	103.91	2.844	0.000	0.000	0.0	0.07	0.07	Gravity
E3-21078	E3-21128	18	345.9	2.0526	126.72	119.60	117.41	112.50	9.728	1.978	6.2	0.48	0.48	Gravity
E3-21079	E3-21123	12	121.8	1.8962	104.13	98.13	111.05	96.06	3	0.264	3.5	0.22	0.21	Gravity
E3-21080	E3-21081	12	105.3	0.6743	100.23	105.3	101.81	94.22	1.891	0.272	2.5	0.27	0.27	Gravity
E3-21081	E3-21082	12	45.6	4.0570	101.81	94.22	99.39	92.37	4.64	0.278	2.6	0.19	0.27	Gravity
E3-21082	E3-21083	12	111.8	0.7603	99.39	100.26	100.26	91.52	2.008	0.288	2.7	0.27	0.27	Gravity
E3-21083	E4-21019	12	191.2	0.8787	100.26	90.91	91.93	89.23	2.159	0.294	2.8	0.26	0.26	Gravity
E3-21084	E3-21122	6	104.2	0.0000	171.99	167.73	169.35	167.73	0	0.017	0.9	0.18	0.10	Gravity
E3-21085	E3-21086	6	157.0	5.0637	159.51	153.06	149.50	145.11	0.816	0.038	2.4	0.10	0.09	Gravity
E3-21086	E3-21087	6	20.0	10.9000	149.50	145.11	146.80	142.93	1.198	0.043	2.1	0.09	0.11	Gravity
E3-21087	E3-21088	6	50.0	4.0200	146.80	142.93	144.91	140.92	0.727	0.051	3.1	0.11	0.09	Gravity
E3-21088	E3-21089	6	107.0	12.7664	144.91	131.77	131.77	127.26	1.296	0.051	2.7	0.09	0.10	Gravity
E3-21089	E3-21090	6	69.3	6.1472	131.77	127.26	126.69	123.00	0.899	0.051	2.5	0.10	0.11	Gravity
E3-21090	E3-21092	6	124.1	9.9380	126.69	123.00	118.60	110.67	1.144	0.082	0.6	0.11	2.06	Surcharged
E3-21091	E3-21090	6	125.0	4.4080	136.06	128.51	126.69	123.00	0.762	0.028	1.3	0.09	0.11	Gravity
E3-21091	E3-29014	6	13.2	9.9697	118.60	110.67	117.69	109.35	1.144	0.082	0.5	2.06	3.36	Surcharged
E3-21092	E3-22013	6	124.7	5.5894	146.03	139.77	133.60	132.80	0.858	0.031	0.8	0.09	0.17	Gravity
E3-21093	E3-21095	6	300.0	1.3533	111.71	106.50	107.64	102.44	0.422	0.097	2.5	0.18	0.18	Gravity
E3-21095	E4-21066	6	148.5	6.5926	107.64	102.44	100.00	92.65	0.932	0.164	1.2	0.16	0.67	Surcharged
E3-21096	E3-21097	6	128.9	8.8386	232.91	227.23	217.03	215.83	1.078	0.363	6.8	0.21	0.22	Gravity
E3-21097	E3-21098	6	302.1	10.5369	217.03	215.83	184.00	184.00	1.178	0.451	3.2	0.26	2.10	Surcharged
E3-21098	E3-21099	6	224.5	6.5479	187.30	184.00	172.18	169.30	0.928	0.451	3.2	0.26	2.10	Surcharged
E3-21099	E3-21100	6	84.3	-0.2966	172.18	169.30	172.05	169.55	-0.198	0.464	3.9	2.07	0.45	Surcharged
E3-21100	E3-21103	8	85.6	4.4626	172.05	169.55	165.73	165.73	1.651	0.479	6.1	0.25	0.25	Gravity
E3-21101	E3-21100	8	49.3	0.3245	172.93	169.71	172.05	169.55	0.445	0.013	0.2	0.12	0.26	Gravity
E3-21102	E3-21103	6	93.1	0.0000	169.15	165.73	169.15	165.73	0	0.009	0.2	0.22	0.22	Gravity
E3-21103	E3-21104	8	127.0	8.5197	169.15	165.73	158.89	154.91	2.28	0.488	7.0	0.22	0.23	Gravity
E3-21104	E3-21105	8	128.9	7.4476	158.89	154.91	145.31	143.41	2.132	0.494	6.7	0.23	0.24	Gravity
E3-21105	E3-21106	8	171.1	6.1309	149.41	145.31	140.82	134.82	1.934	0.497	6.7	0.24	0.24	Gravity
E3-21106	E3-21107	8	128.7	6.0917	140.82	134.82	134.55	126.98	1.928	0.509	5.6	0.24	0.28	Gravity
E3-21107	E3-21108	8	171.3	3.4793	134.55	126.98	121.02	121.02	1.457	0.514	5.6	0.28	0.28	Gravity
E3-21108	E3-21109	8	128.0	10.3750	127.00	121.02	114.79	107.74	2.516	0.528	6.2	0.22	0.27	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-21109	E3-21110	8	172.0	4.5349	114.79	107.74	105.08	99.94	1.864	0.530	5.7	0.27	0.29 Gravity
E3-21110	E3-21111	8	128.0	3.6641	105.08	99.94	99.17	95.25	1.495	0.544	5.8	0.29	0.29 Gravity
E3-21111	E3-21112	8	172.0	3.5698	99.17	95.25	92.51	89.11	1.476	0.547	5.8	0.29	0.29 Gravity
E3-21112	E3-21113	8	127.0	6.8031	92.51	89.11	86.47	80.47	2.038	0.560	4.6	0.25	0.36 Gravity
E3-21113	D3-21017	10	408.1	1.2399	86.47	80.47	81.41	75.41	1.577	0.563	3.7	0.36	0.38 Gravity
E3-21114	E3-21115	6	128.0	4.5156	113.64	108.46	106.08	102.68	0.771	0.015	1.1	0.08	0.08 Gravity
E3-21115	E3-21116	8	172.0	4.5291	106.08	102.68	100.43	94.89	1.663	0.018	1.0	0.08	0.09 Gravity
E3-21116	E3-21117	8	127.9	3.7295	100.43	94.89	96.12	90.12	1.508	0.028	1.3	0.09	0.11 Gravity
E3-21117	E3-21027	8	209.8	1.4681	96.12	90.12	87.04	0.947	0.3	0.11	0.36	0.11	0.36 Gravity
E3-21118	D3-21079	8	125.0	3.5920	94.06	89.68	89.68	85.19	0.688	0.006	0.5	0.07	0.08 Gravity
E3-21119	E3-21055	6	99.1	20.3653	268.33	234.15	232.92	213.97	1.637	0.057	3.6	0.09	0.09 Gravity
E3-21120	E3-21014	6	83.0	19.1928	177.37	172.37	161.59	156.44	1.59	0.007	0.3	0.07	0.11 Gravity
E3-21122	E3-21085	6	126.1	11.6336	169.35	167.73	159.51	153.06	1.237	0.023	1.3	0.08	0.10 Gravity
E3-21123	E3-21080	12	66.9	2.7414	111.05	96.06	100.23	94.23	3.815	0.266	0.5	0.21	0.97 Gravity
E3-21124	E3-21094	6	151.6	16.0290	133.60	132.80	111.71	108.50	1.452	0.034	2.5	0.08	0.08 Gravity
E3-21125	E3-21083	6	149.7	11.7502	116.34	109.11	100.26	91.52	1.243	0.002	0.2	0.07	0.07 Gravity
E3-21126	E3-21079	8	45.0	12.8489	119.87	103.91	104.13	98.13	2.8	0.003	0.0	0.07	0.22 Gravity
E3-21127	E3-21128	18	111.0	0.5315	121.65	110.42	117.41	109.83	4.951	-2.073	-1.8	0.70	1.44 Gravity
E3-21127	E4-21074	18	390.0	0.7385	121.65	109.83	120.35	106.95	5.835	2.073	4.1	0.63	0.68 Gravity
E3-21128	E3-21125	6	28.9	11.7301	117.41	112.50	116.34	109.11	1.243	0.000	0.0	0.07	0.07 Gravity
E3-21129	E3-21130	10	148.8	11.1492	180.00	175.00	164.37	158.41	4.73	0.842	7.6	0.25	0.29 Gravity
E3-21130	E3-22018	10	170.9	5.9743	164.37	158.41	154.28	148.20	3.463	0.842	7.6	0.29	0.29 Gravity
E3-21131	E3-21018	8	153.8	4.4213	139.52	132.50	131.70	125.70	1.643	0.006	0.1	0.07	0.28 Gravity
E3-21132	E3-21025	8	110.1	10.3996	128.38	121.38	117.83	109.93	2.519	0.002	0.1	0.07	0.10 Gravity
E3-21132	E3-21114	6	170.8	7.5644	128.38	121.38	113.64	108.46	0.998	0.003	0.2	0.07	0.08 Gravity
E3-21133	E3-21015	6	146.0	0.6233	166.20	157.80	163.80	156.89	0.286	0.006	0.3	0.08	0.12 Gravity
E3-21134	E3-21020	8	146.6	0.7298	141.07	135.07	140.60	134.00	0.667	0.016	0.1	0.11	1.08 Surcharged
E3-22006	E3-21084	6	100.0	2.7800	173.63	170.51	171.99	167.73	0.605	0.010	0.2	0.08	0.18 Gravity
E3-22013	E3-21124	6	23.7	0.0000	133.60	132.80	133.60	132.80	0	0.031	1.3	0.17	0.12 Gravity
E3-22016	E3-21013	8	482.7	1.4585	188.54	183.54	182.50	176.50	0.943	0.007	0.4	0.08	0.09 Gravity
E3-22017	E3-21101	8	196.7	3.1978	185.80	176.00	172.93	169.71	1.397	0.013	0.5	0.08	0.12 Gravity
E3-22018	E3-21017	10	89.2	9.8655	154.28	148.20	145.40	139.40	4.448	0.844	7.2	0.26	0.31 Gravity
E3-22019	E3-21020	8	163.3	2.3637	142.36	136.36	140.60	132.50	1.201	0.000	0.0	0.07	2.58 Surcharged
E3-22019	E3-21020	8	164.1	0.9141	142.36	134.00	140.60	132.50	0.747	0.002	0.0	1.08	2.58 Surcharged
E3-22020	E3-21133	6	215.0	2.7907	167.20	163.80	166.20	157.80	0.606	0.002	0.1	0.07	0.08 Gravity
E3-22020	E3-21104	6	194.2	4.5778	167.20	163.80	158.89	154.91	0.776	0.002	0.0	0.07	0.23 Gravity
E3-22021	E3-21105	8	194.7	1.3816	151.50	148.00	149.41	145.31	0.918	0.000	0.0	0.07	0.24 Gravity
E3-22021	E3-21134	8	216.4	4.7274	151.50	145.30	141.07	135.07	1.699	0.008	0.4	0.07	0.11 Gravity
E3-22023	E3-21024	6	218.4	14.9176	157.40	155.30	129.23	122.72	1.401	0.006	0.4	0.07	0.09 Gravity
E3-22024	E3-21106	6	188.5	8.8488	157.50	151.50	140.82	134.82	1.079	0.004	0.1	0.07	0.24 Gravity
E3-22025	E3-21132	8	51.5	24.0194	139.75	133.75	128.38	121.38	3.829	0.002	0.1	0.07	0.07 Gravity
E3-22026	E3-21107	8	154.8	6.6214	143.23	137.23	134.55	126.98	2.01	0.003	0.0	0.07	0.28 Gravity
E3-22028	E3-21114	6	120.0	16.3333	131.56	128.06	113.64	108.46	1.466	0.006	0.5	0.07	0.08 Gravity
E3-22029	E3-21108	6	155.0	7.1419	135.59	132.09	127.00	121.02	0.969	0.008	0.2	0.07	0.22 Gravity
E3-22030	E3-21115	8	157.9	4.8702	116.37	110.37	106.08	102.68	1.724	0.000	0.0	0.07	0.08 Gravity
E3-22030	E3-21109	8	190.0	1.3842	116.37	110.37	114.79	107.74	0.919	0.000	0.0	0.07	0.27 Gravity
E3-22032	E3-21116	6	100.0	12.8200	112.79	107.71	100.43	94.89	1.299	0.006	0.4	0.07	0.09 Gravity
E3-22033	E3-21110	6	160.0	7.4813	115.41	111.91	105.08	99.94	0.992	0.004	0.1	0.07	0.29 Gravity
E3-22035	E3-21111	8	189.8	1.0011	102.54	97.15	99.17	95.25	0.782	0.001	0.0	0.07	0.29 Gravity
E3-22035	E3-21117	8	158.2	4.4437	102.54	97.15	96.12	90.12	1.647	0.001	0.0	0.07	0.11 Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-22036	D3-21079	6	153.0	3.7778	94.47	90.97	89.68	85.19	0.705	0.009	0.7	0.07	0.08	Gravity
E3-22037	E3-21112	6	155.0	6.986	96.96	93.36	92.51	89.11	0.601	0.009	0.1	0.08	0.25	Gravity
E3-22038	D4-21054	6	89.3	2.0806	85.92	82.42	83.02	80.95	0.895	0.007	0.5	0.07	0.09	Gravity
E3-29001	E3-21051	8	141.9	8.4954	213.36	210.36	203.40	198.30	2.277	1.317	6.8	0.38	1.00	Surcharged
E3-29002	E3-21075	12	178.3	0.1570	137.88	127.90	131.69	127.62	0.913	1.959	4.8	1.81	0.75	Throttled
E3-29014	E3-21128	8	7.0	-44.9857	117.69	109.35	117.41	112.50	-5.24	0.099	1.6	3.36	0.21	Surcharged
E4-21002	E4-21003	6	267.2	0.5576	64.41	61.02	66.21	59.53	0.271	0.044	1.3	0.15	0.16	Gravity
E4-21003	E4-21004	6	167.2	3.5586	66.21	59.53	58.00	53.58	0.684	0.127	2.4	0.16	0.22	Gravity
E4-21004	E4-21005	6	300.0	1.7800	58.00	53.58	52.07	48.24	0.484	0.171	2.5	0.22	0.27	Gravity
E4-21005	E5-21069	6	300.0	1.4467	52.07	48.24	47.62	43.90	0.436	0.223	2.9	0.26	0.29	Gravity
E4-21006	E4-21007	8	196.6	6.5768	73.75	69.07	61.35	56.14	2.004	0.553	2.4	0.25	0.69	Surcharged
E4-21007	E4-21009	8	40.0	0.0000	61.35	56.14	61.35	56.14	0	0.553	3.5	0.68	0.44	Throttled
E4-21009	E4-21012	8	150.0	3.4800	61.35	56.14	56.01	50.92	1.457	0.587	5.8	0.30	0.31	Gravity
E4-21010	E4-21011	6	252.7	1.1634	59.01	56.30	58.00	53.36	0.391	0.022	0.7	0.10	0.14	Gravity
E4-21011	E4-21012	6	286.6	0.9152	58.00	53.36	56.01	50.92	0.347	0.049	0.6	0.14	0.31	Gravity
E4-21012	E4-21015	10	300.0	3.2133	56.01	50.92	50.50	41.28	2.539	0.686	3.7	0.31	0.44	Gravity
E4-21013	E4-21014	6	260.4	1.0753	51.73	47.25	48.60	44.45	0.376	0.024	0.8	0.11	0.14	Gravity
E4-21014	E4-21015	6	308.7	1.0269	48.60	44.45	50.85	41.28	0.388	0.050	0.4	0.14	0.44	Gravity
E4-21015	E4-21017	10	300.0	1.1367	50.85	41.28	49.23	37.87	1.51	0.781	2.6	0.43	0.68	Gravity
E4-21016	E4-21017	6	257.1	0.4201	41.40	38.95	49.23	37.87	0.235	0.055	0.4	0.17	0.68	Surcharged
E4-21017	E4-21018	10	300.0	0.4000	49.23	37.87	45.65	36.67	0.896	0.863	3.7	0.68	0.52	Gravity
E4-21018	D4-21004	8	333.9	0.2725	45.65	36.75	40.65	35.84	0.408	0.192	1.5	0.33	0.37	Gravity
E4-21018	E4-21001	10	300.0	1.1233	45.65	36.67	44.50	33.30	1.501	0.695	4.0	0.41	0.41	Gravity
E4-21019	E4-21020	12	62.6	11.0703	91.93	89.23	89.03	82.30	7.666	0.299	4.4	0.17	0.19	Gravity
E4-21020	E4-21021	12	87.6	5.1826	89.03	82.30	85.45	82.30	7.243	0.305	1.6	0.19	0.40	Gravity
E4-21021	E4-21022	12	75.4	0.1061	85.45	77.76	82.54	77.68	0.75	0.305	2.5	0.40	0.29	Gravity
E4-21022	E4-21023	12	87.0	1.2529	82.54	76.97	81.98	75.88	2.578	1.463	5.0	0.56	0.56	Gravity
E4-21023	E4-21024	12	41.1	1.4112	81.98	75.88	86.42	75.30	2.737	1.469	5.3	0.53	0.53	Gravity
E4-21024	E4-21025	12	51.1	2.3288	86.42	75.30	80.13	74.11	3.513	1.468	6.6	0.46	0.45	Gravity
E4-21025	E4-21026	12	69.2	2.5578	80.13	74.11	78.84	72.34	3.683	1.476	5.5	0.45	0.53	Gravity
E4-21026	E4-21027	12	82.1	1.5104	78.84	72.34	92.25	71.10	2.83	1.475	5.7	0.52	0.51	Gravity
E4-21027	E4-21028	12	160.1	1.6615	92.25	71.10	74.96	68.44	2.969	1.482	5.8	0.51	0.50	Gravity
E4-21028	E4-21029	12	108.6	1.7864	74.96	68.44	71.80	66.50	3.079	1.485	5.0	0.50	0.57	Gravity
E4-21029	E4-21030	12	21.8	1.2661	71.80	66.50	93.78	66.22	2.592	1.497	5.0	0.56	0.57	Gravity
E4-21030	E4-21031	12	249.7	1.6740	71.52	66.13	67.25	61.95	2.98	1.503	4.6	0.51	0.62	Gravity
E4-21031	E4-21032	12	127.6	0.9326	67.25	61.95	65.76	60.76	2.224	1.510	4.3	0.61	0.65	Gravity
E4-21032	E4-21033	12	118.1	0.8383	65.76	60.76	64.08	59.77	2.109	1.508	3.5	0.64	0.79	Gravity
E4-21033	E4-21034	12	69.5	0.4604	64.08	59.77	64.39	59.45	1.582	1.506	3.8	0.78	0.72	Gravity
E4-21034	E4-21035	12	66.7	0.5697	64.39	59.45	63.20	59.07	1.739	1.514	4.3	0.71	0.66	Gravity
E4-21035	E4-21036	12	92.8	1.0345	63.20	59.07	62.27	58.11	2.342	1.522	3.8	0.61	0.73	Gravity
E4-21036	E4-21037	12	82.6	0.5690	62.27	58.11	62.06	57.64	1.738	1.526	4.3	0.72	0.67	Gravity
E4-21037	E4-21038	12	109.5	0.7763	62.06	57.64	60.87	56.79	2.029	1.529	4.0	0.65	0.71	Gravity
E4-21038	E4-21039	12	151.6	0.6662	60.87	56.79	64.89	55.78	1.88	1.535	3.9	0.70	0.73	Gravity
E4-21039	E4-21040	12	79.8	0.6516	64.89	55.78	64.51	55.26	1.86	1.537	3.7	0.71	0.77	Gravity
E4-21040	E4-21042	12	132.0	0.6591	64.51	55.26	61.37	54.39	1.87	1.712	4.5	0.75	0.70	Gravity
E4-21042	E4-21045	18	49.8	1.4257	61.37	53.21	60.22	52.50	8.108	2.217	4.3	0.56	0.69	Gravity
E4-21043	E4-21042	8	227.4	2.0053	65.37	58.95	61.37	54.39	1.106	0.504	4.6	0.33	0.33	Gravity
E4-21045	D4-21014	18	325.4	1.2846	53.53	45.78	47.74	41.60	7.686	4.368	6.7	0.84	0.83	Gravity
E4-21047	E3-21094	6	307.0	4.4691	127.92	120.22	111.71	106.50	0.767	0.033	0.8	0.10	0.18	Gravity
E4-21048	E3-21095	6	307.0	0.7720	114.29	104.81	107.64	102.44	0.319	0.038	1.1	0.14	0.16	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E4-21049	E4-21048	6	20.0	2.3500	113.30	105.28	114.29	104.81	0.566	0.038	1.4	0.11	0.14	Gravity
E4-21051	E4-21052	6	150.0	0.9533	103.22	97.04	103.77	96.21	0.27	0.013	0.5	0.10	0.12	Gravity
E4-21052	E4-21053	6	20.0	1.3000	103.77	96.21	104.99	95.95	0.416	0.038	1.6	0.12	0.12	Gravity
E4-21053	E4-22020	6	194.2	1.3182	104.99	95.95	97.17	93.39	0.416	0.038	0.6	0.12	0.24	Gravity
E4-21054	E4-21055	6	143.4	2.2566	104.81	92.65	91.40	89.41	0.545	0.256	3.9	0.25	0.32	Gravity
E4-21055	E4-21061	6	156.6	2.2567	104.81	89.41	91.58	85.88	0.545	0.256	1.9	0.31	2.92	Surcharged
E4-21056	E4-21065	6	100.2	2.0559	80.85	77.56	77.63	75.50	0.52	0.360	4.2	0.32	0.32	Gravity
E4-21057	E4-21056	6	111.0	3.6216	91.99	81.58	80.85	77.56	0.89	0.357	4.0	0.27	0.33	Gravity
E4-21058	E4-21057	6	50.0	1.7600	93.07	82.46	91.99	81.58	0.481	0.348	4.0	0.32	0.32	Gravity
E4-21059	E4-21058	6	20.0	1.6500	94.19	82.79	93.07	82.46	0.466	0.342	3.8	0.33	0.33	Gravity
E4-21060	E4-22031	6	223.0	0.8457	88.28	84.23	91.37	82.79	0.291	0.312	2.2	2.28	1.96	Throttled
E4-21061	E4-21060	6	353.5	0.4668	91.58	85.88	88.28	84.23	0.248	0.281	2.1	2.91	2.29	Throttled
E4-21062	E4-22027	6	239.1	3.1221	84.26	78.64	81.33	71.18	0.641	0.074	2.5	0.13	0.14	Gravity
E4-21063	E4-21064	6	44.0	1.1591	69.85	62.93	66.92	62.42	0.391	0.475	4.1	0.73	0.44	Throttled
E4-21064	E4-21043	8	115.2	3.0122	66.92	62.42	65.37	58.95	1.356	0.491	4.5	0.29	0.33	Gravity
E4-21065	E4-21063	6	162.0	7.7593	77.63	75.50	69.85	62.93	1.011	0.366	2.8	0.22	0.78	Surcharged
E4-21066	E4-21054	6	151.5	0.0000	100.00	92.65	104.81	92.65	0	0.169	2.6	0.66	0.26	Throttled
E4-21067	E4-21030	12	7.4	1.2703	93.78	66.22	71.52	66.13	2.592	1.497	5.1	0.56	0.56	Gravity
E4-21068	E4-21075	18	102.8	1.8482	62.69	54.40	60.22	52.50	9.234	-15.968	-8.6	0.41	0.40	Gravity
E4-21071	E4-21071	18	320.2	-5.5300	74.77	68.24	92.00	86.50	-15.968	-2.079	-8.6	0.41	0.40	Gravity
E4-21069	E4-21068	18	274.1	5.0493	74.77	68.24	62.69	54.40	15.259	2.079	6.0	0.41	0.51	Gravity
E4-21072	E4-21071	18	397.1	3.3996	105.93	100.00	92.00	86.50	12.519	2.072	7.5	0.44	0.44	Gravity
E4-21073	E4-21072	18	319.7	2.0050	116.37	106.41	105.93	100.00	9.615	2.072	6.2	0.50	0.50	Gravity
E4-21074	E4-21073	18	100.6	0.5368	120.35	106.95	116.37	106.41	4.976	2.073	4.1	0.68	0.68	Gravity
E4-21075	E4-21045	18	279.2	2.4069	60.22	52.50	53.53	45.78	10.535	4.309	6.5	0.69	0.85	Gravity
E4-22013	E4-21045	6	105.5	1.7156	54.10	51.01	53.53	49.20	0.475	0.014	1.0	0.09	0.09	Gravity
E4-22020	E4-22021	6	19.5	0.0000	97.17	93.39	96.99	93.39	0	0.050	1.0	0.24	0.21	Gravity
E4-22021	E4-21054	6	243.3	0.2959	96.99	93.39	104.81	92.67	0.197	0.067	1.2	0.21	0.23	Gravity
E4-22023	E4-21059	6	59.3	0.0000	94.83	82.79	94.19	82.79	0	0.007	0.1	0.34	0.34	Gravity
E4-22024	E4-21061	6	75.0	7.7467	94.74	91.69	91.58	85.88	1.01	0.017	0.1	0.08	2.92	Surcharged
E4-22025	E4-22026	6	15.7	0.0000	91.97	87.59	91.97	87.59	0	0.039	1.6	0.17	0.13	Gravity
E4-22026	E4-21062	6	178.2	5.0224	91.97	87.59	84.26	81.33	0.813	0.052	1.9	0.11	0.13	Gravity
E4-22027	E4-22028	6	20.7	3.1256	81.33	71.18	80.65	70.53	0.641	0.092	2.9	0.14	0.15	Gravity
E4-22028	E4-21063	6	243.4	3.1216	80.65	70.53	69.85	62.93	0.641	0.103	0.8	0.15	0.78	Surcharged
E4-22029	E4-21043	8	231.3	2.7756	75.12	65.37	65.37	58.95	1.302	0.006	0.1	0.07	0.33	Gravity
E4-22031	E4-21059	6	180.5	0.1828	91.37	82.79	94.19	82.46	0.155	0.335	2.5	1.94	0.67	Throttled
E5-21003	E5-21004	6	260.9	0.7742	53.63	48.15	49.61	46.13	0.319	0.039	1.7	0.14	0.14	Gravity
E5-21004	E5-21005	6	120.0	4.3667	49.61	46.13	44.58	40.89	0.758	0.052	2.2	0.11	0.12	Gravity
E5-21005	E5-21006	6	120.0	2.7500	44.58	40.89	41.20	37.59	0.602	0.065	0.5	0.12	1.68	Surcharged
E5-21006	E5-21007	6	34.5	1.4203	41.20	37.59	41.28	37.10	0.432	0.774	6.4	1.60	0.46	Throttled
E5-21007	E5-21008	10	94.4	1.1335	41.28	37.07	39.20	36.00	1.508	0.907	4.4	0.48	0.48	Gravity
E5-21008	E5-21009	10	238.9	1.7539	39.20	34.38	34.78	30.19	1.876	0.926	5.0	0.42	0.43	Gravity
E5-21009	E5-21031	12	230.0	1.2696	34.78	30.19	31.65	27.27	2.595	0.937	4.2	0.43	1.54	Surcharged
E5-21010	E5-21009	6	250.0	3.2600	41.85	38.40	34.78	30.25	0.655	0.025	0.5	0.09	0.37	Gravity
E5-21011	E5-21031	8	154.0	0.6494	32.27	28.07	31.65	27.27	0.63	0.033	0.2	0.54	1.54	Surcharged
E5-21012	E5-21013	6	185.0	-7.3297	41.17	37.07	53.27	50.63	-0.982	-0.005	-0.4	0.48	0.07	Gravity
E5-21012	E5-21007	6	159.7	0.0000	41.17	37.07	41.28	37.07	0	0.010	0.1	0.48	0.48	Gravity
E5-21013	E5-21014	6	205.0	0.5463	53.27	50.63	53.69	49.51	0.288	0.001	0.1	0.07	0.08	Gravity
E5-21014	E5-21014	6	188.4	0.5573	53.69	49.51	52.84	48.46	0.271	0.006	0.4	0.08	0.09	Gravity
E5-21015	E5-21016	6	190.0	0.3579	52.84	48.46	52.13	47.78	0.217	0.008	0.4	0.09	0.12	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E5-21016	E5-21026	6	383.5	2.8988	52.13	47.78	40.69	37.43	0.596	0.048	1.6	0.12	0.14	Gravity
E5-21017	E5-21007	10	790.2	0.7466	52.51	43.06	41.28	37.16	1.224	0.131	1.1	0.19	0.39	Gravity
E5-21018	E5-21017	10	275.0	1.0909	51.67	46.06	52.51	43.06	1.479	0.128	2.1	0.18	0.19	Gravity
E5-21021	E5-21022	8	266.4	2.2973	43.05	38.20	36.09	32.08	1.184	0.000	0.0	0.07	0.07	Gravity
E5-21022	E5-21023	8	350.0	0.5143	36.09	32.09	35.91	31.91	0.56	0.000	0.0	0.07	0.07	Gravity
E5-21023	E5-21024	8	160.3	0.8796	35.91	31.91	34.93	30.50	0.733	0.000	0.0	0.07	0.07	Gravity
E5-21024	E5-21025	8	172.7	0.3764	34.93	30.30	36.13	29.65	0.479	0.035	0.4	0.14	0.26	Gravity
E5-21025	E5-21029	8	285.3	0.2173	36.13	29.65	36.66	29.03	0.364	0.108	1.9	0.26	0.20	Gravity
E5-21026	E5-21025	6	356.0	1.9607	40.69	37.43	30.45	0.508	0.069	2.3	0.14	0.14	0.14	Gravity
E5-21027	E5-21026	6	264.1	1.0451	44.09	40.33	40.69	37.57	0.371	0.016	0.9	0.10	0.10	Gravity
E5-21028	E5-21027	6	283.8	0.4475	45.19	41.60	44.09	40.33	0.243	0.003	0.2	0.07	0.10	Gravity
E5-21028	E5-21009	6	358.6	3.0006	45.19	41.60	34.78	30.84	0.628	0.007	0.6	0.07	0.07	Gravity
E5-21029	E5-21030	8	270.8	0.6647	36.66	27.23	35.51	27.23	0.637	0.108	1.9	0.20	1.36	Surcharged
E5-21030	E5-21032	8	385.8	0.6143	35.51	27.23	34.86	24.86	0.612	0.118	1.3	1.36	3.65	Surcharged
E5-21031	E5-21033	12	193.0	1.2642	31.65	27.27	34.89	24.83	2.59	0.903	3.6	1.53	3.68	Surcharged
E5-21032	E5-21033	10	21.7	0.9677	34.86	24.86	34.69	23.76	1.392	0.123	0.5	3.65	3.86	Surcharged
E5-21033	E5-21034	10	290.0	0.3069	34.69	24.65	33.58	23.76	0.785	0.967	2.5	3.85	3.46	Throttled
E5-21034	E5-21035	10	288.7	0.3312	33.58	23.76	33.01	22.87	0.815	0.973	2.6	3.44	3.12	Throttled
E5-21035	E5-21035A	15	83.0	0.5060	33.01	22.55	31.66	22.13	2.971	5.448	6.5	3.35	2.34	Throttled
E5-21035A	E6-21050	18	213.0	0.5211	31.66	22.55	30.40	21.02	4.902	5.448	4.9	2.24	1.97	Throttled
E5-21036	E5-21035	15	44.1	1.3152	33.78	23.24	33.01	22.66	4.787	4.497	5.3	3.29	3.34	Surcharged
E5-21038	E5-21039	8	210.0	3.6048	24.29	20.32	20.32	13.54	1.483	0.010	0.3	0.08	0.15	Gravity
E5-21041	E5-21041	8	320.5	0.4243	20.32	18.06	18.06	12.18	0.509	0.046	1.4	0.15	0.13	Gravity
E5-21040	E5-21039	6	243.1	1.0366	24.91	20.32	20.32	13.54	0.369	0.020	0.6	0.10	0.15	Gravity
E5-21041	E5-21046	8	244.9	0.8983	18.06	12.03	12.82	9.83	0.74	0.142	2.0	0.21	0.23	Gravity
E5-21042	E5-21041	8	239.1	1.7900	16.31	16.31	18.06	12.03	1.045	0.041	0.7	0.11	0.21	Gravity
E5-21043	E5-21041	6	181.0	1.1160	21.30	14.20	18.06	12.18	0.383	0.046	1.7	0.14	0.14	Gravity
E5-21044	E5-21045	6	447.1	0.3668	27.49	22.29	23.57	20.65	0.22	0.008	0.3	0.09	0.13	Gravity
E5-21044	E5-21043	6	128.3	6.3055	27.49	22.29	21.30	14.20	0.911	0.034	1.2	0.09	0.14	Gravity
E5-21045	E5-21044	6	265.1	0.3998	23.57	20.65	23.25	19.59	0.229	0.027	1.2	0.13	0.12	Gravity
E5-21046	E5-21047	8	276.2	0.7133	12.82	9.83	11.43	7.86	0.86	0.156	1.4	0.23	0.34	Gravity
E5-21047	E5-21048	8	255.4	0.1919	11.43	7.86	11.03	7.37	0.342	0.170	2.3	0.34	0.24	Gravity
E5-21048	E5-21049	8	150.4	0.6250	11.03	7.29	11.64	6.35	0.618	0.229	1.5	0.29	0.44	Gravity
E5-21049	E5-21050	8	188.0	0.2340	11.64	6.35	10.72	5.91	0.378	0.285	2.7	0.44	0.48	Gravity
E5-21050	D5-21005	10	46.6	0.7725	10.72	5.91	10.36	5.55	1.245	0.315	1.8	0.48	0.81	Gravity
E5-21051	E5-21050	10	259.0	3.1274	10.72	6.72	10.72	5.91	2.505	0.030	0.3	0.11	0.48	Gravity
E5-21052	E5-21051	6	96.6	0.9317	12.05	7.62	10.72	6.72	0.35	0.024	1.2	0.11	0.11	Gravity
E5-21053	E5-21049	6	171.6	6.8200	25.57	18.57	11.64	7.21	0.933	0.048	2.6	0.10	0.10	Gravity
E5-21054	E5-21053	6	335.4	3.0501	31.47	28.91	18.68	0.634	0.91	0.09	0.08	0.08	0.08	Gravity
E5-21055	E5-21053	6	395.3	3.3747	38.05	31.91	25.57	18.57	0.666	0.026	1.4	0.09	0.10	Gravity
E5-21056	E5-21057	6	319.9	1.5286	49.39	45.57	46.28	40.68	0.449	0.017	0.4	0.10	4.87	Surcharged
E5-21057	E5-21058	6	319.9	0.4939	46.28	40.68	50.54	39.10	0.255	-0.168	-1.0	4.87	7.06	Surcharged
E5-21058	E5-21059	6	13.9	0.0000	50.54	39.60	50.80	39.60	0	-1.150	-6.4	6.57	8.04	Throttled
E5-21058	E5-21060	6	319.9	0.1876	50.54	39.10	44.39	38.50	0.157	0.510	4.1	7.04	1.12	Throttled
E5-21059	E5-21061	8	304.5	0.4039	50.80	38.73	44.39	37.50	0.497	1.099	5.0	8.98	4.75	Throttled
E5-21060	E5-21063	6	301.8	1.9980	44.39	38.50	36.69	32.47	0.513	0.521	4.4	1.08	0.45	Throttled
E5-21061	E5-21062	8	302.1	4.3793	44.60	37.50	37.30	24.27	1.635	1.088	3.7	4.71	12.33	Surcharged
E5-21062	E5-21066	8	175.1	0.3883	37.30	24.27	35.80	23.59	0.487	1.078	4.0	12.31	9.86	Throttled
E5-21063	E5-21064	6	125.2	4.5048	36.69	32.47	36.36	26.83	0.77	0.32	3.9	0.32	0.73	Surcharged
E5-21064	E5-21067	8	262.5	0.4267	36.36	26.83	31.22	25.71	0.51	0.536	3.4	0.72	0.44	Throttled

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E5-21065	E5-21064	8	195.0	3.6103	36.42	33.87	36.36	26.83	1.484	0.008	0.2	0.08	0.73	Surcharged
E5-21066	E5-21068	8	224.7	0.3961	35.80	23.59	30.20	22.70	0.492	1.079	4.9	9.83	6.70	Throttled
E5-21067	D5-21040	10	377.0	2.2679	31.22	25.71	23.66	17.16	2.133	0.580	3.1	0.31	0.46	Gravity
E5-21068	D5-21039	8	215.4	2.1959	30.20	22.70	25.60	17.97	1.158	1.081	5.3	6.67	7.48	Surcharged
E5-21069	E5-21070	6	300.0	1.5067	47.62	43.90	43.33	39.38	0.445	0.268	2.5	0.29	0.54	Surcharged
E5-21070	E5-21071	6	300.0	1.0900	43.33	39.38	36.11	32.81	0.379	0.327	2.6	0.52	1.16	Surcharged
E5-21071	E5-21072	6	300.0	1.1000	39.94	36.11	36.94	32.81	0.38	0.406	3.7	1.13	0.41	Throttled
E5-21072	D5-21060	8	125.0	6.5280	36.94	32.81	36.01	24.65	1.996	0.488	2.1	0.24	0.78	Surcharged
E5-21073	E5-21048	8	148.6	0.5518	12.13	8.11	7.29	0.58	0.057	0.6	0.15	0.29	0.29	Gravity
E5-21074	E5-21076	6	310.0	4.3129	33.35	28.86	23.48	15.49	0.753	0.029	1.8	0.09	0.09	Gravity
E5-21075	E5-21059	6	252.8	1.4517	46.90	42.40	50.80	38.73	0.437	0.446	2.9	FULL	9.00	Throttled
E5-21076	E5-21075	6	391.2	0.8691	59.40	45.80	46.90	42.40	0.338	0.639	4.0	FULL	FULL	Throttled
E5-22002	E5-21056	6	230.0	0.8739	48.85	47.58	49.39	45.57	0.339	0.010	0.6	0.09	0.10	Gravity
E5-22003	E5-21057	6	252.7	0.3364	44.84	41.53	46.28	40.68	0.21	-0.189	0.7	0.10	0.54	Gravity
E5-22005	E5-21058	6	163.1	0.7664	43.36	40.35	50.54	39.10	0.318	-0.477	-2.7	FULL	7.05	Throttled
E5-22007	E5-21071	6	225.0	-0.0489	38.91	36.00	39.94	36.11	-0.08	0.029	0.3	1.28	1.16	Surcharged
E5-22008	E5-21060	6	235.0	0.1447	40.32	38.84	44.39	38.50	-0.138	-0.010	0.2	0.78	1.12	Surcharged
E5-22009	E5-21072	6	318.7	0.3263	37.39	33.85	36.94	32.81	0.207	0.024	0.4	0.13	0.24	Gravity
E5-22010	E5-21065	6	55.0	0.1445	36.20	34.45	33.87	33.87	0.373	0.003	0.2	0.07	0.08	Gravity
E5-22011	E5-21003	6	50.0	6.2600	53.56	51.28	53.63	48.15	0.908	0.005	0.2	0.07	0.14	Gravity
E5-22012	E5-21010	6	300.0	0.8967	43.19	40.49	41.85	38.40	0.303	0.013	0.3	0.10	0.09	Gravity
E5-22013	E5-22013A	8	105.0	0.6667	34.90	29.50	33.65	28.80	0.638	0.014	0.7	0.09	0.10	Gravity
E5-22013A	E5-21011	8	81.0	0.6543	33.65	28.80	32.27	28.27	0.632	0.017	0.7	0.10	0.54	Gravity
E5-22014	E5-21055	6	432.6	1.1442	37.97	36.86	38.05	31.91	0.388	0.008	0.5	0.08	0.09	Gravity
E5-22015	E5-21040	6	183.7	5.9118	33.72	27.12	24.91	16.26	0.882	0.007	0.6	0.07	0.07	Gravity
E5-22016	E5-21040	6	159.5	8.0564	31.13	28.91	24.91	16.06	1.03	0.005	0.3	0.07	0.10	Gravity
E5-22019	E5-21021	8	304.3	1.2751	49.72	42.08	43.05	38.20	0.882	0.000	0.0	0.07	0.07	Gravity
E5-22039	E5-21070	8	146.7	0.8885	44.69	40.39	43.33	39.38	0.648	0.029	0.2	0.11	0.54	Gravity
E6-21001	E6-21002	6	376.5	0.3772	34.56	30.65	32.64	29.23	0.223	0.054	0.7	0.18	0.28	Gravity
E6-21002	E6-21003	6	337.6	0.2695	32.64	29.23	30.98	28.32	0.188	0.105	2.1	0.28	0.21	Gravity
E6-21003	E7-21057	6	223.0	1.3049	30.98	28.32	30.96	25.41	0.414	0.105	2.5	0.18	0.18	Gravity
E6-21006	E6-21294	8	259.0	1.4479	29.35	23.06	28.00	19.31	0.94	-0.001	0.0	0.07	0.14	Gravity
E6-21007	E6-21008	6	276.0	0.9457	30.93	25.49	28.56	22.88	0.353	0.017	0.6	0.10	0.15	Gravity
E6-21008	E6-21009	6	60.9	2.1232	28.56	22.88	28.69	21.59	0.529	0.080	2.4	0.15	0.15	Gravity
E6-21009	E6-21010	6	163.3	2.1231	28.69	21.59	27.34	18.12	0.529	0.090	0.7	0.15	0.55	Surcharged
E6-21010	E6-21925	18	130.0	0.3077	27.34	18.12	17.72	17.72	3.767	1.072	3.2	0.55	0.50	Gravity
E6-21013	E6-21294	8	273.0	1.0293	27.17	22.12	28.00	19.31	0.793	0.079	2.2	0.16	0.16	Gravity
E6-21017	E6-21030	18	289.6	0.4489	25.48	16.53	23.78	15.23	4.549	1.164	1.7	0.53	0.87	Gravity
E6-21018	E6-21019	6	218.0	1.3028	34.71	29.61	31.97	26.77	0.414	0.048	1.5	0.13	0.15	Gravity
E6-21019	E6-21021	6	230.1	1.1604	31.97	26.77	29.02	24.10	0.391	0.063	0.7	0.15	0.37	Gravity
E6-21020	E6-21021	6	454.4	0.8737	33.28	28.07	29.02	24.10	0.399	0.356	3.4	1.12	0.38	Throttled
E6-21021	E6-21022	8	107.8	2.1521	29.02	24.10	27.08	21.78	0.532	0.427	1.7	0.35	0.39	Gravity
E6-21022	E6-21026	8	224.8	1.3746	27.08	21.78	26.90	18.69	0.916	0.429	4.7	0.38	2.64	Surcharged
E6-21023	E6-21024	8	305.0	1.1607	34.53	26.09	30.20	22.55	0.842	0.585	3.9	0.42	0.42	Gravity
E6-21024	E6-21025	10	299.0	0.6020	30.20	22.15	28.91	20.35	1.099	0.664	2.7	0.75	1.87	Surcharged
E6-21025	E6-21026	10	331.6	0.21026	28.91	20.35	26.90	18.69	1.002	0.715	1.9	1.86	2.64	Surcharged
E6-21026	E6-21027	10	260.9	0.3756	26.90	18.69	25.51	17.71	0.868	1.155	3.4	2.62	1.83	Throttled
E6-21027	E6-21028	10	218.1	0.6006	25.51	17.71	24.65	16.40	1.088	1.176	3.2	1.80	1.57	Throttled
E6-21028	E6-21030	10	246.0	0.4756	24.65	16.40	23.78	15.23	0.977	1.207	3.3	1.53	0.87	Throttled
E6-21030	E6-21041	18	363.0	0.3085	23.78	15.23	21.39	14.11	3.772	2.381	3.6	0.86	0.84	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E6-21032	E6-21033	8	255.0	0.6118	35.73	30.53	34.00	28.97	0.611	0.023	0.4	0.11	0.20	Gravity
E6-21033	E6-21034	6	328.3	0.5178	34.00	28.97	32.16	27.27	0.261	0.080	1.9	0.20	0.19	Gravity
E6-21034	E6-21035	8	228.5	1.7155	32.16	27.27	27.27	1.023	0.115	0.22	2.2	0.17	0.19	Gravity
E6-21035	E6-21036	8	227.1	1.4839	27.67	23.35	25.31	19.98	0.952	0.149	1.9	0.19	0.26	Gravity
E6-21036	E6-21038	8	250.0	0.6520	25.31	19.98	23.60	18.35	0.631	0.188	2.3	0.26	0.26	Gravity
E6-21037	E6-21046	21	45.8	1.4410	18.99	11.49	10.83	12.95	3.911	2.8	1.45	2.03	2.03	Surcharged
E6-21037	E6-21063	21	140.0	0.3857	18.99	11.49	18.56	10.95	6.361	4.174	2.9	1.45	1.76	Surcharged
E6-21038	E6-21039	8	243.6	0.7471	23.60	16.18	22.38	14.36	0.675	0.228	1.0	0.28	0.87	Surcharged
E6-21039	E6-21040	10	281.9	0.0674	22.38	14.36	14.17	0.368	0.300	0.8	0.87	0.93	0.93	Surcharged
E6-21040	E6-21041	10	253.3	0.0237	21.62	14.17	21.39	14.11	0.218	0.346	1.0	0.93	0.84	Throttled
E6-21041	E6-21043	18	307.0	0.4625	21.39	14.11	18.71	12.69	4.618	2.723	4.5	0.84	0.79	Gravity
E6-21043	E6-21037	14	43.0	0.6744	18.71	12.69	18.99	12.40	2.853	1.365	4.0	0.58	0.58	Gravity
E6-21043	E6-21037	14	43.0	0.6744	18.71	12.69	18.99	12.40	2.853	1.365	4.0	0.58	0.58	Gravity
E6-21046	E6-21084	21	234.3	0.1921	19.41	10.83	18.43	10.38	4.489	3.911	2.4	2.01	2.12	Surcharged
E6-21050	E6-21052	18	379.0	0.5435	30.40	21.02	32.22	18.96	5.006	5.456	5.1	1.90	1.49	Throttled
E6-21052	E6-21055	18	327.0	0.5872	32.22	18.96	5.203	5.469	5.9	1.45	1.13	1.13	Gravity	
E6-21053	E6-21055	8	182.0	0.5000	24.01	17.97	23.29	17.06	0.552	0.009	0.1	0.17	1.08	Surcharged
E6-21055	E6-21056	21	348.0	0.5977	23.29	17.04	20.04	14.96	7.919	5.487	5.4	1.09	1.10	Gravity
E6-21056	E6-21057	21	225.0	0.6044	20.04	13.60	19.21	12.75	7.963	5.498	5.4	1.09	1.12	Gravity
E6-21057	E6-21061	21	135.0	0.6296	19.21	13.60	18.75	12.75	8.127	5.509	5.4	1.10	1.27	Gravity
E6-21058	E6-21064	8	192.8	0.4046	18.53	13.27	18.34	12.49	0.497	0.026	0.1	0.38	1.16	Surcharged
E6-21059	E6-21059	8	149.3	0.0536	17.51	13.35	13.27	0.181	0.021	0.021	0.6	0.31	0.38	Gravity
E6-21060	E6-21061	8	250.9	0.2631	15.88	14.01	17.51	13.35	0.401	0.007	0.1	0.09	0.31	Gravity
E6-21061	E6-21065	14	50.0	0.6000	18.75	12.60	18.74	12.30	2.691	2.758	3.8	1.37	1.36	Throttled
E6-21061	E6-21065	14	50.0	0.6000	18.75	12.60	18.74	12.30	2.691	2.758	3.8	1.37	1.36	Throttled
E6-21064	E6-21065	8	17.9	-0.9497	18.34	12.49	18.74	12.66	-0.762	0.026	0.4	1.16	0.99	Surcharged
E6-21065	E6-21066	21	137.0	0.3796	18.74	12.30	18.67	11.78	6.31	5.543	4.7	1.34	1.41	Gravity
E6-21066	E6-21037	21	77.0	0.3766	18.67	11.78	18.99	11.49	6.286	5.552	5.2	1.40	1.46	Gravity
E6-21068	E6-21037	6	12.8	0.4688	18.84	12.73	18.99	12.67	0.248	-0.065	-0.9	0.19	0.28	Gravity
E6-21068	E6-21069	6	168.5	1.4896	18.84	12.73	16.32	10.22	0.443	0.065	1.4	0.14	0.20	Gravity
E6-21069	E6-21068	6	380.4	0.4311	16.32	10.22	13.49	8.58	0.238	0.070	0.8	0.20	0.31	Gravity
E6-21070	E6-21071	6	255.0	0.2275	21.13	14.98	23.40	14.40	0.173	0.032	0.8	0.16	0.17	Gravity
E6-21071	E6-21074	6	260.9	1.9471	23.40	14.40	15.12	9.32	0.506	0.108	1.8	0.17	0.24	Gravity
E6-21072	E6-21074	6	245.6	0.5415	14.80	10.65	15.12	9.32	0.267	0.019	0.3	0.11	0.24	Gravity
E6-21073	E6-21072	6	126.0	0.4444	14.12	11.21	14.80	10.65	0.242	0.008	0.4	0.09	0.11	Gravity
E6-21074	E6-21065	6	221.5	0.8217	15.12	9.32	11.74	7.50	0.329	0.137	1.5	0.24	1.10	Surcharged
E6-21075	E6-21076	6	330.0	0.7000	24.23	17.59	23.48	15.28	0.304	0.032	1.3	0.13	0.13	Gravity
E6-21076	E6-21071	6	27.0	2.8889	23.48	15.18	23.40	14.40	0.617	0.071	1.9	0.13	0.17	Gravity
E6-21077	E6-21078	6	354.0	0.7599	30.00	26.25	28.34	23.56	0.316	0.021	0.7	0.11	0.14	Gravity
E6-21078	E5-21044	6	214.4	0.5924	28.34	23.56	27.49	22.29	0.279	0.036	1.4	0.14	0.13	Gravity
E6-21079	E6-21080	6	346.7	0.0750	20.09	15.41	20.58	15.15	0.099	0.009	0.2	0.12	0.18	Gravity
E6-21080	E6-21070	6	220.0	0.0773	20.58	15.15	21.13	14.98	0.101	0.023	0.7	0.18	0.16	Gravity
E6-21083	E6-21085	21	156.0	0.3782	18.56	10.95	18.06	10.36	6.299	4.173	2.6	1.75	2.08	Surcharged
E6-21084	E6-21085	21	24.9	0.1606	18.43	10.38	18.06	10.34	4.108	3.911	2.4	2.10	2.10	Surcharged
E6-21085	D6-21001	27	225.9	0.1948	18.06	10.34	18.89	9.90	8.835	8.085	3.2	2.09	2.15	Gravity
E6-21086	E6-21097	8	249.1	-0.9635	32.00	24.91	31.94	31.06	-0.767	-0.013	-0.7	0.10	0.09	Gravity
E6-21086	E6-21096	8	55.3	2.7306	32.00	28.66	31.02	27.15	1.291	0.040	1.7	0.10	0.11	Gravity
E6-21088	E6-21010	15	249.0	0.4538	28.68	19.25	27.34	18.12	2.813	0.992	3.0	0.52	0.55	Gravity
E6-21092	F6-21027	8	184.0	2.5272	40.53	38.75	39.09	34.10	1.242	0.034	1.6	0.10	0.10	Gravity
E6-21093	E6-21039	8	293.4	1.5644	24.64	22.20	22.38	17.61	0.977	0.033	1.5	0.11	0.11	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E6-21096	E6-21024	8	163.6	2.8117	31.02	27.15	30.20	22.55	1.31	0.055	2.9	0.11	0.35	Gravity
E6-21097	E6-21034	8	114.8	3.3014	31.94	31.06	32.16	27.27	1.419	0.024	0.5	0.09	0.17	Gravity
E6-21098	E6-21032	8	295.0	2.1932	39.92	37.00	35.73	30.53	1.157	0.024	0.5	0.09	0.11	Gravity
E6-21098	E6-21032	8	295.0	2.1932	39.92	37.00	35.73	30.53	1.157	0.024	0.5	0.09	0.11	Gravity
E6-21294	E6-21925	8	74.0	2.1486	28.00	19.31	27.73	17.72	1.145	0.083	0.5	0.14	0.50	Gravity
E6-21923	E6-21023	8	120.9	0.0000	36.00	26.09	34.53	26.09	0	0.561	3.5	1.11	0.44	Throttled
E6-21925	E6-21017	18	217.0	0.5484	27.73	17.72	25.48	16.53	5.028	1.154	3.2	0.50	0.53	Gravity
E6-21926	E6-21013	8	325.0	0.4985	26.92	23.74	27.17	22.12	0.552	0.028	0.7	0.12	0.16	Gravity
E6-22001	E6-21001	6	170.0	0.0647	33.30	31.05	34.56	30.94	0.092	0.005	0.3	0.10	0.08	Gravity
E6-22002	E6-21002	6	160.0	0.6187	33.17	30.22	32.64	29.23	0.285	0.018	0.2	0.11	0.28	Gravity
E6-22003	E7-21020	6	350.0	0.2171	33.30	29.17	34.10	28.41	0.169	0.015	0.1	0.11	0.69	Surcharged
E6-22008	E5-21042	8	443.9	2.3384	27.62	26.75	21.29	16.37	1.195	0.028	1.4	0.10	0.10	Gravity
E6-22015	E6-21077	6	141.0	0.8156	31.05	27.40	30.00	26.25	0.328	0.005	0.3	0.08	0.11	Gravity
E6-22016	E6-22017	6	125.0	1.3840	24.99	20.72	24.91	18.99	0.427	0.007	0.3	0.08	0.11	Gravity
E6-22017	E6-21075	6	307.8	0.4548	24.91	18.99	24.23	17.59	0.245	0.019	0.7	0.11	0.13	Gravity
E6-22018	E6-21076	6	192.6	4.2575	27.35	23.38	23.48	15.18	0.749	0.007	0.3	0.07	0.13	Gravity
E6-22019	E6-21072	6	153.7	0.7807	15.39	12.83	14.80	10.65	0.321	0.004	0.2	0.07	0.11	Gravity
E6-22020	E6-21073	6	124.1	0.8219	14.86	12.23	14.12	11.21	0.329	0.005	0.3	0.08	0.09	Gravity
E7-21001	E7-21002	6	190.0	1.4579	34.47	27.87	30.18	25.10	0.438	0.006	0.1	0.08	0.23	Gravity
E7-21002	E7-21003	6	325.0	0.1785	30.18	25.14	30.76	24.56	0.153	0.041	0.8	0.19	0.22	Gravity
E7-21003	E7-21004	6	343.3	0.2039	30.76	25.14	31.55	23.86	0.164	0.053	1.6	0.22	0.68	Surcharged
E7-21004	E7-21013	6	172.9	0.9717	31.55	23.70	29.94	22.02	0.358	0.277	2.8	0.82	1.41	Surcharged
E7-21005	E7-21006	10	180.0	0.9500	33.61	26.81	33.00	25.10	1.381	0.167	4.2	0.54	0.54	Gravity
E7-21006	E7-21012	6	183.7	0.2123	33.00	25.10	32.26	24.71	0.167	0.172	1.9	0.46	0.42	Gravity
E7-21006	E7-21007	10	231.0	1.1688	33.00	25.10	33.30	22.40	1.531	0.851	2.3	0.46	1.17	Surcharged
E7-21007	E7-21085	10	311.8	0.2213	33.30	22.40	30.68	21.71	0.666	0.867	3.5	1.14	0.95	Throttled
E7-21012	E7-21004	6	141.1	0.7158	32.26	24.71	31.55	23.70	0.307	0.230	2.4	0.41	0.84	Surcharged
E7-21013	E7-21016	6	148.4	0.9299	29.94	22.02	28.55	20.64	0.35	0.279	2.5	1.40	1.82	Surcharged
E7-21014	E7-21013	6	402.6	0.7079	29.57	24.87	29.94	22.02	0.305	0.008	0.1	0.08	1.41	Surcharged
E7-21015	E7-21016	6	270.0	0.5704	27.78	22.52	28.55	20.98	0.274	-0.010	0.3	0.08	1.48	Surcharged
E7-21016	E7-21017	6	164.1	0.7861	28.55	20.64	26.67	19.35	0.322	0.284	2.0	1.81	2.01	Surcharged
E7-21017	E7-21025	6	359.8	0.1890	26.67	19.35	22.82	18.67	0.158	0.284	3.1	2.00	0.34	Throttled
E7-21018	E7-21017	6	231.8	0.9232	26.39	21.49	26.67	19.35	0.349	0.006	0.0	0.08	2.01	Surcharged
E7-21019	E7-21017	6	340.0	0.3000	24.96	20.37	26.67	19.35	0.199	0.013	0.1	0.99	2.01	Surcharged
E7-21020	E7-21021	6	341.8	1.0035	27.32	23.29	23.65	19.86	0.363	0.005	0.3	0.08	0.14	Gravity
E7-21021	E7-21022	6	360.0	0.4361	23.65	19.86	25.57	18.29	0.24	0.033	1.0	0.14	0.15	Gravity
E7-21022	E7-21023	6	360.0	0.3333	25.57	18.29	22.87	17.09	0.209	0.033	1.0	0.15	0.15	Gravity
E7-21023	E7-21024	6	360.0	0.3750	22.87	17.09	21.16	15.74	0.222	0.038	1.2	0.15	0.15	Gravity
E7-21024	D7-21035	6	375.0	0.7200	21.16	15.74	18.80	13.04	0.308	0.046	1.5	0.15	0.15	Gravity
E7-21025	E7-21028	8	362.1	0.2044	22.82	18.67	26.49	17.93	0.353	0.175	1.7	0.34	0.31	Gravity
E7-21025	E7-21028	10	360.2	0.2054	22.82	18.67	26.49	17.93	0.642	0.211	1.8	0.34	0.31	Gravity
E7-21026	E7-21025	6	287.7	0.3650	25.58	20.04	22.82	18.99	0.219	0.033	1.3	0.15	0.13	Gravity
E7-21027	E7-21028	6	315.0	0.3556	24.32	19.05	26.49	17.93	0.216	0.023	0.3	0.13	0.31	Gravity
E7-21028	E7-21030	6	362.4	0.8195	26.49	17.93	25.17	14.96	0.328	0.216	1.6	0.31	1.05	Surcharged
E7-21028	E7-21030	10	360.0	0.3806	26.49	17.93	25.17	16.56	0.874	0.251	2.4	0.31	0.28	Gravity
E7-21029	E7-21030	6	270.0	0.2000	22.38	17.73	25.17	17.19	0.162	0.024	1.1	0.14	0.11	Gravity
E7-21030	E7-21031	10	375.0	0.21031	25.17	16.56	22.50	13.77	1.222	-0.001	0.0	0.07	0.31	Gravity
E7-21030	E7-21031	8	377.0	0.3156	25.17	14.96	22.50	13.77	0.439	0.517	3.4	1.03	0.43	Throttled
E7-21031	E7-21032	10	374.8	0.8324	22.50	13.69	17.34	10.57	1.292	0.547	1.8	0.39	0.67	Gravity
E7-21032	D7-21036	10	260.0	0.5346	17.34	10.91	16.24	9.52	1.036	0.320	2.2	0.33	0.36	Gravity
E7-21032	D7-21040	10	285.1	0.6734	17.34	10.91	16.25	8.99	1.162	0.360	2.5	0.33	0.36	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E7-21033	E7-21034	6	262.0	0.3053	27.73	22.88	27.29	22.08	0.2	0.021	0.7	0.13	0.15	Gravity
E7-21034	E7-21035	6	305.0	0.5443	27.29	22.08	27.27	20.42	0.268	0.043	1.1	0.15	0.18	Gravity
E7-21035	E7-21025	6	320.7	0.5457	27.27	20.42	27.22	18.67	0.268	0.062	0.7	0.18	0.34	Gravity
E7-21036	E7-21037	6	285.0	0.3088	28.19	24.71	26.93	23.83	0.202	0.024	0.8	0.13	0.14	Gravity
E7-21037	E7-21034	6	360.0	0.6139	26.93	24.29	27.29	22.08	0.264	0.000	0.0	0.07	0.15	Gravity
E7-21037	E7-21038	6	365.0	0.4219	26.93	23.83	26.34	22.29	0.236	0.031	1.1	0.14	0.14	Gravity
E7-21038	E7-21028	6	260.0	1.3692	26.34	22.29	26.49	18.73	0.424	0.053	1.9	0.14	0.14	Gravity
E7-21039	E7-21040	6	245.0	0.5714	26.91	21.28	24.30	19.88	0.274	0.024	0.9	0.12	0.13	Gravity
E7-21040	E7-21043	6	375.0	1.1840	24.30	19.88	20.08	15.44	0.395	0.044	0.8	0.13	0.23	Gravity
E7-21041	E7-21030	6	245.0	0.2816	24.49	17.88	25.17	17.19	0.193	0.018	0.9	0.12	0.11	Gravity
E7-21042	E7-21031	6	250.0	0.4040	21.15	14.79	22.50	13.78	0.231	0.018	0.3	0.11	0.30	Gravity
E7-21043	E7-21045	6	373.5	0.3668	20.08	15.44	18.89	14.07	0.22	0.084	1.3	0.23	0.25	Gravity
E7-21044	E7-21043	6	311.4	0.3757	21.47	17.11	20.08	15.94	0.222	0.029	1.2	0.14	0.12	Gravity
E7-21045	E7-21046	6	310.0	0.4065	18.89	14.07	17.91	12.81	0.231	0.110	1.8	0.25	0.25	Gravity
E7-21046	E7-21032	6	315.0	0.6032	17.91	12.81	17.34	10.91	0.282	0.126	1.5	0.25	0.33	Gravity
E7-21047	D7-21040	6	244.9	0.4328	17.25	10.34	16.25	9.28	0.239	0.016	0.9	0.11	0.10	Gravity
E7-21048	E7-21049	6	269.0	0.5167	28.26	25.33	29.87	23.94	0.261	0.004	0.3	0.08	0.08	Gravity
E7-21049	E7-21050	6	360.2	0.5997	29.87	23.94	26.02	21.78	0.281	0.004	0.3	0.08	0.07	Gravity
E7-21050	E7-21051	6	375.0	0.8107	23.09	17.78	23.09	18.74	0.327	0.004	0.2	0.07	0.10	Gravity
E7-21051	E7-21044	6	312.4	0.5218	23.09	18.74	21.47	17.11	0.262	0.013	0.5	0.10	0.14	Gravity
E7-21052	E7-21053	6	216.4	0.3420	18.51	17.55	17.72	16.81	0.212	0.000	0.0	0.07	0.07	Gravity
E7-21053	D7-21001	6	322.1	0.5619	17.72	16.81	17.88	15.00	0.272	0.000	0.0	0.07	0.07	Gravity
E7-21055	E7-21057	10	66.9	0.7623	30.68	21.71	30.96	21.20	1.236	0.880	3.0	0.54	0.65	Gravity
E7-21057	E7-21058	10	113.6	0.5634	30.96	21.20	30.38	20.56	1.063	0.986	3.9	0.64	0.56	Gravity
E7-21058	E6-21088	15	257.8	0.5081	30.38	20.56	28.98	19.25	2.977	0.987	3.2	0.50	0.52	Gravity
E7-22001	E7-21033	6	244.5	0.6094	28.22	24.47	27.73	22.98	0.283	0.012	0.7	0.10	0.09	Gravity
E7-22002	E7-21036	6	276.2	0.2824	29.48	25.49	28.19	24.71	0.193	0.010	0.4	0.10	0.13	Gravity
E7-21039	E7-21039	6	287.5	0.5809	26.36	22.95	26.91	21.28	0.276	0.011	0.5	0.10	0.12	Gravity
E7-22005	E7-21040	6	260.0	0.7077	26.67	21.72	24.30	19.88	0.305	0.010	0.4	0.09	0.13	Gravity
E7-22007	E7-21018	6	218.0	0.7844	26.70	23.20	26.39	21.49	0.321	0.002	0.2	0.07	0.08	Gravity
E7-22008	E7-21041	6	200.0	0.4000	24.13	18.68	24.49	17.88	0.229	0.008	0.3	0.09	0.12	Gravity
E7-22009	E7-21042	6	200.0	0.5050	20.49	15.80	21.15	14.79	0.258	0.007	0.3	0.08	0.11	Gravity
E7-22010	E7-21005	6	345.0	0.1681	30.31	27.74	33.61	27.16	0.149	0.022	1.1	0.15	0.20	Gravity
E7-22011	E7-21015	6	254.6	1.1233	28.44	25.38	27.78	22.52	0.385	0.000	0.0	0.07	0.08	Gravity
E7-22012	E7-21019	6	110.0	0.7636	24.62	21.21	24.86	20.37	0.317	-0.021	0.2	0.15	0.99	Surcharged
E7-22012	E7-22013	6	150.0	0.0000	24.62	21.21	24.63	21.21	0	0.026	1.2	0.15	0.12	Gravity
E7-22013	E7-21021	6	150.0	0.9000	24.63	21.21	23.65	19.86	0.344	0.028	1.0	0.12	0.14	Gravity
E7-22014	E7-21026	6	251.7	0.4450	25.72	21.16	25.88	20.04	0.242	0.014	0.4	0.10	0.15	Gravity
E7-22015	E6-2085	6	235.0	0.6085	23.09	20.48	24.32	19.05	0.283	0.008	0.3	0.09	0.13	Gravity
E7-22016	E7-21029	6	250.0	0.1840	27.03	18.19	22.38	17.73	0.156	0.011	0.4	0.11	0.14	Gravity
E7-22017	E7-21047	6	210.0	0.2190	17.35	10.80	17.25	10.34	0.17	0.008	0.4	0.10	0.11	Gravity
E7-22018	D7-21013	6	430.0	0.5395	23.69	19.31	19.63	16.99	0.266	0.008	0.5	0.09	0.09	Gravity
E7-22019	D7-21077	6	251.4	0.2387	21.16	16.60	20.07	16.00	0.177	0.003	0.2	0.08	0.10	Gravity
E7-22019	E7-21031	6	123.6	2.2816	21.16	16.60	22.50	13.78	0.548	0.009	0.1	0.08	0.30	Gravity
E8-21001	E8-22002	6	125.0	0.3360	23.76	18.79	22.36	18.37	0.21	0.002	0.2	0.07	0.07	Gravity
E8-21002	E8-21003	6	281.0	0.8470	18.53	14.72	16.01	12.34	0.334	0.007	0.5	0.08	0.09	Gravity
E8-21004	E8-21004	6	281.6	1.3672	16.01	12.34	12.87	8.49	0.424	0.012	0.5	0.09	0.12	Gravity
E8-21004	E8-21006	6	288.3	0.9712	12.87	8.49	9.51	5.69	0.368	0.031	0.6	0.12	0.23	Gravity
E8-21005	E8-21004	6	233.2	0.2058	12.83	8.97	12.87	8.49	0.165	0.014	0.6	0.12	0.12	Gravity
E8-21006	E8-21008	6	295.6	0.1319	9.51	5.69	8.56	5.30	0.132	0.051	1.0	0.23	0.51	Surcharged

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E8-21007	E8-21006	6	220.0	0.3182	9.84	6.39	9.51	5.89	0.205	0.016	0.3	0.11	0.23	Gravity
E8-21008	E8-21001	6	318.5	0.1884	8.56	5.30	7.43	4.70	0.157	0.022	0.8	0.51	1.06	Surcharged
E8-21009	D7-21045	6	315.2	0.7773	22.44	18.89	18.89	14.07	0.32	0.052	0.3	0.11	0.25	Gravity
E8-21010	E8-21011	6	233.3	0.5915	17.45	13.13	17.21	11.75	0.279	0.014	0.8	0.10	0.10	Gravity
E8-21011	E8-21013	6	281.0	1.2349	17.21	11.65	14.00	8.18	0.403	0.025	0.6	0.11	0.19	Gravity
E8-21012	E8-21013	6	241.7	0.5544	14.11	9.64	14.00	8.30	0.27	0.014	0.8	0.10	0.10	Gravity
E8-21013	D8-21003	6	281.0	0.2633	14.00	8.18	13.17	7.44	0.186	0.049	1.3	0.19	0.17	Gravity
E8-21001	E8-21001	6	262.3	0.6100	23.00	20.34	23.76	18.74	0.283	0.002	0.1	0.07	0.12	Gravity
E8-21002	E8-21002	6	161.8	2.2559	22.36	18.37	18.53	14.72	0.545	0.004	0.3	0.07	0.08	Gravity
E8-21004	E8-21010	6	221.7	0.8435	17.97	15.00	17.45	13.13	0.333	0.006	0.3	0.08	0.10	Gravity
E8-22005	E8-21012	6	212.6	0.7056	14.91	11.14	14.11	9.84	0.305	0.006	0.3	0.08	0.10	Gravity
E8-22006	E8-21005	6	208.9	1.1202	13.04	11.31	12.83	8.97	0.384	0.006	0.3	0.08	0.12	Gravity
E8-22007	D8-21007	6	136.5	0.2198	14.20	11.42	14.13	11.12	0.17	0.004	0.3	0.08	0.09	Gravity
F1-21001	E1-21003	6	355.0	0.6197	522.90	514.90	523.40	512.70	0.286	0.013	0.7	0.10	0.11	Gravity
F1-21002	F2-21106	6	167.2	3.7620	523.21	517.52	517.09	511.23	0.704	0.124	2.4	0.16	0.21	Gravity
F1-21006	F1-21002	6	170.0	3.8118	530.13	524.00	523.21	517.52	0.708	0.055	1.6	0.11	0.16	Gravity
F2-21001	F2-21002	6	357.5	0.4783	558.12	553.39	562.29	551.68	0.251	0.048	1.0	0.16	0.20	Gravity
F2-21002	F2-21003	6	377.8	0.5956	562.29	551.68	553.93	549.43	0.28	0.084	1.3	0.20	0.25	Gravity
F2-21003	F2-21004	6	216.2	1.7068	553.93	549.43	555.00	545.74	0.474	0.222	3.5	0.25	0.25	Gravity
F2-21004	F2-21005	6	99.5	6.3317	555.00	545.74	549.29	539.44	0.913	0.222	5.5	0.18	0.18	Gravity
F2-21005	F2-21006	6	213.3	10.0985	549.29	539.44	523.40	517.90	1.153	0.222	5.6	0.16	0.18	Gravity
F2-21006	F2-21009	6	128.8	10.6056	523.40	508.66	504.24	485.10	1.182	0.266	6.7	0.18	0.18	Gravity
F2-21009	F2-21010	6	179.3	10.6748	508.66	485.10	485.04	488.81	1.185	0.266	6.1	0.18	0.19	Gravity
F2-21010	F2-21017	6	59.0	10.8814	488.81	485.10	481.79	478.68	1.197	0.319	7.5	0.19	0.19	Gravity
F2-21017	F2-21018	6	206.5	11.7579	481.79	478.68	458.87	454.40	1.244	0.318	6.1	0.18	0.22	Gravity
F2-21018	F2-21019	6	117.2	10.6741	458.87	454.40	441.89	441.85	1.185	0.417	8.4	0.22	0.22	Gravity
F2-21019	F2-21020	6	166.8	11.1643	445.03	441.88	425.20	423.26	1.212	0.416	7.4	0.21	0.23	Gravity
F2-21020	F2-21021	6	154.1	11.1688	425.20	423.26	410.04	406.05	1.212	0.468	8.5	0.23	0.22	Gravity
F2-21021	F2-21025	6	230.6	11.7303	410.04	383.45	383.45	379.00	1.242	0.467	6.6	0.22	0.28	Gravity
F2-21025	F2-21032	6	161.1	9.3917	383.45	379.00	368.75	363.87	1.112	0.579	7.2	0.27	0.31	Gravity
F2-21032	F2-21033	6	150.8	7.3077	368.75	363.87	356.75	352.85	0.981	0.578	7.2	0.29	0.31	Gravity
F2-21033	F2-21034	6	160.9	8.5581	356.75	352.85	343.62	339.08	1.061	0.618	7.7	0.29	0.32	Gravity
F2-21034	F2-21035	6	160.6	8.4496	343.62	339.08	331.43	325.51	1.055	0.617	3.7	0.29	FULL	Surcharged
F2-21035	F2-21044	6	101.8	7.1513	331.43	325.51	323.51	318.23	0.97	0.976	7.0	FULL	FULL	Throttled
F2-21044	F2-21052	6	83.1	6.8833	323.51	318.23	317.25	312.51	0.952	0.952	6.1	5.25	FULL	Throttled
F2-21052	F2-21053	6	256.0	5.4648	317.25	312.51	303.52	298.52	0.848	0.827	5.5	FULL	4.88	Surcharged
F2-21053	F2-21055	6	145.5	4.8385	303.52	298.56	300.11	291.52	0.798	0.850	5.8	4.77	3.28	Throttled
F2-21055	F2-21055	6	83.8	7.2554	299.83	297.60	300.11	291.52	0.977	0.052	0.3	0.10	3.27	Surcharged
F2-21055	F2-21056	6	69.1	3.0680	300.11	291.52	296.02	289.40	0.635	0.938	7.8	3.18	0.45	Throttled
F2-21056	F2-21081	8	255.0	11.5608	296.02	289.40	265.52	259.92	2.656	1.237	8.4	0.33	0.43	Gravity
F2-21081	F3-21045	8	160.3	6.3631	265.52	259.92	254.04	249.72	1.971	1.237	7.3	0.39	0.48	Gravity
F2-21082	F3-21042	6	171.1	1.1981	294.21	290.19	290.77	288.14	0.397	0.015	1.1	0.09	0.09	Gravity
F2-21084	F2-29008	6	200.0	9.0235	567.99	563.04	556.31	544.99	1.09	0.029	1.6	0.09	0.10	Gravity
F2-21085	F2-21086	6	282.3	8.9656	553.54	547.50	527.99	522.19	1.086	0.082	2.4	0.11	0.16	Gravity
F2-21086	F2-21087	6	175.2	5.6507	527.99	522.19	527.57	512.29	0.862	0.149	3.5	0.16	0.18	Gravity
F2-21087	F2-21090	6	103.4	2.6209	522.57	519.06	519.06	509.58	0.587	0.149	1.9	0.18	0.30	Gravity
F2-21088	F2-21089	6	287.5	4.5739	555.90	551.80	543.68	538.65	0.776	0.013	1.0	0.08	0.08	Gravity
F2-21089	F2-21090	6	211.1	13.7707	543.68	538.65	519.06	509.58	1.346	0.024	0.3	0.08	0.30	Gravity
F2-21090	F2-21091	6	189.3	0.6815	519.06	515.24	509.58	509.58	0.299	0.185	2.6	0.29	0.28	Gravity
F2-21091	F2-21092	6	198.8	6.5040	515.24	508.29	505.52	495.36	0.925	0.226	4.4	0.18	0.21	Gravity

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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F2-21092	F2-21100	6	244.6	7.8332	505.52	495.36	484.35	476.20	1.015	0.344	3.8	0.21	0.33	Gravity
F2-21093	F2-21109	6	261.4	14.1890	544.88	537.18	507.19	500.09	1.366	0.055	2.3	0.09	0.12	Gravity
F2-21094	F2-21093	6	275.0	1.3273	545.24	540.83	544.88	537.18	0.418	0.014	0.9	0.09	0.10	Gravity
F2-21094	F2-21095	6	201.1	3.4411	545.24	540.83	538.49	533.91	0.673	0.023	1.4	0.09	0.10	Gravity
F2-21095	F2-21096	6	242.6	12.6092	538.49	533.91	508.52	503.32	1.288	0.053	3.2	0.10	0.10	Gravity
F2-21096	F2-21097	6	125.0	2.2560	508.52	503.24	505.42	505.42	0.545	0.087	2.7	0.15	0.15	Gravity
F2-21097	F2-21092	6	198.4	2.5504	505.44	500.42	505.52	495.36	0.579	0.095	1.8	0.15	0.21	Gravity
F2-21098	F2-21099	6	435.0	3.7609	497.12	493.37	480.69	477.01	0.704	0.007	0.3	0.07	0.12	Gravity
F2-21098	F2-21004	6	255.0	16.9373	497.12	493.37	457.16	450.18	1.493	0.015	0.8	0.07	0.10	Gravity
F2-21099	F2-21100	6	107.2	0.7556	480.69	477.01	484.35	476.20	0.315	0.027	0.3	0.12	0.33	Gravity
F2-21100	F2-21101	6	207.5	2.2554	484.35	476.20	481.86	471.52	0.545	0.390	4.5	0.32	0.32	Gravity
F2-21101	F2-21102	6	112.9	6.6076	481.86	471.52	470.04	464.06	0.933	0.402	2.7	0.24	3.54	Surcharged
F2-21102	F2-21103	6	203.3	0.5952	470.04	464.06	469.29	462.85	0.28	0.407	2.9	3.52	2.04	Throttled
F2-21103	F2-21008	6	221.7	0.7037	469.29	462.85	470.83	461.29	0.304	0.422	3.8	2.02	0.41	Throttled
F2-21105	F2-21106	6	245.0	13.6816	550.92	544.83	517.09	511.31	1.342	0.033	1.5	0.08	0.13	Gravity
F2-21106	F2-21107	6	263.7	2.2943	517.09	511.23	510.96	505.18	0.549	0.186	3.6	0.21	0.21	Gravity
F2-21107	F2-21108	6	327.5	14.4244	558.08	552.50	510.96	505.26	1.378	0.040	2.6	0.09	0.10	Gravity
F2-21108	F2-21110	6	151.3	9.0218	510.96	505.18	498.69	491.53	1.09	0.256	6.1	0.18	0.18	Gravity
F2-21109	F2-21110	6	177.3	4.8280	507.19	500.09	498.69	491.53	0.797	0.073	1.7	0.12	0.18	Gravity
F2-21110	F2-21001	6	141.6	15.0918	496.69	491.53	475.76	470.16	1.409	0.346	6.2	0.18	0.23	Gravity
F2-21111	F2-21112	6	174.0	14.1839	510.30	504.80	485.54	480.12	1.366	0.017	1.1	0.08	0.09	Gravity
F2-21112	F2-21001	6	227.5	4.3780	485.54	480.12	475.76	470.16	0.759	0.030	0.5	0.09	0.23	Gravity
F2-21113	F2-21017	6	250.0	4.9120	466.59	462.09	455.10	449.81	0.804	0.019	1.2	0.08	0.09	Gravity
F2-21115	F2-21116	6	60.0	5.2333	421.00	414.77	411.63	411.63	0.83	0.010	0.6	0.07	0.09	Gravity
F2-21116	F3-21039	6	211.4	1.0123	417.00	411.63	414.00	409.49	0.365	0.014	1.1	0.09	0.08	Gravity
F2-22002	F2-21084	6	206.0	2.9903	573.28	569.20	567.99	563.04	0.627	0.029	2.1	0.10	0.09	Gravity
F2-22004	F2-21105	6	227.7	16.1704	584.25	581.65	550.92	544.83	1.459	0.017	1.2	0.07	0.08	Gravity
F2-22006	F2-21088	6	190.0	6.4737	656.40	563.90	555.90	551.60	0.923	0.007	0.1	0.07	0.28	Gravity
F2-22007	F2-21111	6	126.9	6.4381	518.30	512.97	510.30	504.80	0.92	0.013	1.1	0.08	0.08	Gravity
F2-22008	F2-21096	6	195.0	0.8205	512.09	504.84	508.52	503.24	0.329	0.018	0.6	0.10	0.15	Gravity
F2-22009	F2-21095	6	90.5	5.2376	541.30	538.65	538.49	533.91	0.83	0.015	0.9	0.08	0.10	Gravity
F2-22010	F2-21091	6	139.5	0.0358	534.36	508.34	515.24	508.29	0.069	0.018	0.4	0.18	0.18	Gravity
F2-22020	F2-21107	6	160.0	5.3250	562.72	561.02	558.08	552.50	0.837	0.012	0.8	0.08	0.09	Gravity
F2-23008	F2-21086	6	252.7	9.0237	556.31	544.99	527.99	522.19	1.09	0.059	1.8	0.10	0.16	Gravity
F3-21002	F3-21003	6	271.3	10.9362	485.05	479.11	450.75	449.44	1.2	0.026	1.7	0.08	0.09	Gravity
F3-21003	F3-21004	6	226.9	17.9330	450.75	449.44	412.63	408.75	1.536	0.052	2.6	0.09	0.11	Gravity
F3-21004	F3-21005	6	177.8	15.7255	412.63	408.75	386.04	380.79	1.439	0.097	4.6	0.11	0.11	Gravity
F3-21005	F3-21007	6	50.0	14.8540	386.04	380.79	383.04	373.36	1.398	0.105	4.8	0.11	0.11	Gravity
F3-21007	F3-21008	6	205.4	14.8549	383.04	373.36	355.16	342.85	1.398	0.115	4.9	0.11	0.12	Gravity
F3-21008	F3-21009	6	137.3	14.8514	355.16	342.85	335.29	322.46	1.398	0.115	5.2	0.12	0.12	Gravity
F3-21009	F3-21010	6	83.9	14.8510	335.29	322.46	314.00	310.00	1.398	0.115	4.6	0.12	0.13	Gravity
F3-21010	F3-21012	6	90.1	19.2120	314.00	310.00	296.95	292.69	1.59	0.161	5.3	0.13	0.15	Gravity
F3-21011	F3-21059	6	53.3	-10.5816	337.16	323.26	334.40	328.90	-1.18	0.015	0.7	5.71	0.12	Surcharged
F3-21012	F3-21013	6	125.0	8.9440	296.95	292.69	283.37	281.51	1.085	0.161	5.9	0.15	0.14	Gravity
F3-21013	F3-21014	6	136.8	14.0241	283.37	281.51	271.33	262.33	1.359	0.161	5.9	0.13	0.14	Gravity
F3-21014	F3-21015	6	149.9	14.0327	271.33	262.33	245.19	241.29	1.359	0.161	5.9	0.13	0.14	Gravity
F3-21015	F3-21016	6	98.9	18.5187	245.19	241.29	226.85	222.98	1.561	0.185	4.6	0.13	0.18	Gravity
F3-21016	F3-21037	6	40.0	18.5125	226.85	222.98	219.04	215.57	1.561	0.347	2.4	0.17	2.78	Surcharged
F3-21017	F3-21022	6	120.0	5.6167	381.10	376.74	379.14	370.00	0.86	0.027	1.3	0.09	0.11	Gravity
F3-21019	F3-21020	6	288.4	9.0361	424.50	420.24	398.37	394.18	1.091	0.016	1.1	0.08	0.09	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F3-21020	F3-21021	6	268.6	8.9166	398.37	394.18	375.95	370.23	1.083	0.030	0.7	0.09	0.19	Gravity
F3-21021	F3-21022	6	125.2	0.1837	375.95	370.23	379.14	370.00	0.155	0.041	1.5	0.19	0.13	Gravity
F3-21022	F3-21023	6	235.0	8.7830	379.14	370.00	355.00	349.36	1.075	0.071	3.3	0.11	0.11	Gravity
F3-21023	F3-21024	6	298.5	11.9196	355.00	349.36	318.58	313.78	1.253	0.099	4.1	0.11	0.12	Gravity
F3-21024	F3-21025	6	210.0	11.1667	318.58	313.78	295.48	290.33	1.212	0.118	5.5	0.12	0.11	Gravity
F3-21025	F3-21026	6	141.2	27.3612	295.48	290.33	276.49	251.70	1.897	0.144	6.3	0.11	0.12	Gravity
F3-21026	F3-21016	6	105.0	27.3533	276.49	251.70	226.85	222.98	1.897	0.163	4.1	0.12	0.18	Gravity
F3-21027	F3-21028	6	86.2	46.8910	382.99	381.99	342.57	341.57	2.484	0.003	0.3	0.07	0.08	Gravity
F3-21028	F3-21034	6	223.4	28.7198	342.57	341.57	284.58	277.41	1.944	0.039	2.0	0.08	0.11	Gravity
F3-21029	F3-21030	6	114.1	1.0868	332.44	310.80	313.30	309.56	0.378	0.015	1.0	0.09	0.08	Gravity
F3-21030	F3-21031	6	227.4	6.3149	313.30	309.56	300.20	295.20	0.912	0.023	1.6	0.08	0.09	Gravity
F3-21031	F3-21032	6	78.3	6.7433	300.20	295.20	294.92	289.92	0.942	0.027	0.6	0.09	0.20	Gravity
F3-21032	F3-21055	6	99.6	1.1044	294.92	289.92	293.82	288.82	0.381	0.110	1.1	0.20	0.35	Gravity
F3-21033	F3-21034	6	123.9	9.2090	293.82	288.82	284.58	277.41	1.101	0.109	5.4	0.13	0.13	Gravity
F3-21034	F3-21035	6	105.8	53.4594	284.58	277.41	229.37	220.85	2.652	0.153	5.1	0.10	0.14	Gravity
F3-21035	F3-21054	6	38.1	8.6168	229.37	220.85	217.57	218.33	2.1757	0.153	2.4	0.14	0.25	Gravity
F3-21037	F3-21054	6	48.4	4.2934	219.04	215.57	218.33	213.49	0.752	0.347	2.2	2.77	4.33	Surcharged
F3-21038	E3-21073	6	304.6	11.3854	214.71	209.43	179.75	174.75	1.224	0.500	8.6	0.24	0.23	Gravity
F3-21039	F3-21040	6	232.1	17.4451	414.00	409.49	373.20	369.00	1.515	0.032	2.5	0.08	0.08	Gravity
F3-21040	F3-21041	6	151.3	28.1560	373.20	369.00	332.33	326.40	1.925	0.036	2.2	0.08	0.10	Gravity
F3-21041	F2-21054	6	305.0	9.4426	332.33	326.40	299.83	297.80	1.115	0.045	2.4	0.10	0.10	Gravity
F3-21042	F3-21043	8	253.7	5.9992	290.77	288.14	286.63	272.92	1.913	0.025	1.7	0.09	0.08	Gravity
F3-21043	F3-21044	6	72.0	43.8750	286.63	272.92	246.37	241.33	2.402	0.039	2.2	0.08	0.10	Gravity
F3-21044	F3-21047	6	26.0	5.6154	246.37	241.33	243.33	239.87	0.859	0.039	0.3	0.10	0.41	Gravity
F3-21045	F3-21047	8	208.1	4.7333	254.04	249.72	243.33	239.87	1.7	1.237	8.1	0.43	0.43	Gravity
F3-21047	F3-21048	8	145.2	8.7397	243.33	239.87	230.93	227.18	2.31	1.309	9.6	0.37	0.41	Gravity
F3-21048	F3-21049	8	100.0	8.4970	230.93	227.18	223.16	218.68	2.277	1.309	9.6	0.37	0.41	Gravity
F3-21049	E3-21052	8	59.8	8.4967	223.16	218.68	218.42	213.60	2.277	1.309	9.6	0.37	0.41	Gravity
F3-21050	F3-21051	6	340.9	4.7668	318.56	314.89	303.42	298.64	0.792	0.019	1.3	0.08	0.09	Gravity
F3-21051	F3-21052	6	150.4	12.5997	303.42	298.64	285.29	279.69	1.288	0.035	2.6	0.09	0.08	Gravity
F3-21052	F3-21119	6	223.5	20.3772	285.29	279.69	268.33	234.15	1.637	0.040	2.5	0.08	0.09	Gravity
F3-21054	F3-21038	6	94.5	8.6106	218.33	217.57	214.71	209.43	1.064	0.500	7.8	0.25	0.25	Gravity
F3-21055	F3-21033	6	59.6	0.0000	293.82	288.82	293.82	288.82	0	0.109	2.2	0.35	0.21	Gravity
F3-21058	F3-21010	6	37.1	5.3908	318.00	312.00	314.00	310.00	0.843	0.035	1.4	0.10	0.13	Gravity
F3-21059	F3-21058	6	41.5	40.7229	334.40	328.90	318.00	312.00	2.315	0.015	0.9	0.07	0.10	Gravity
F3-22001	F2-21115	6	69.5	1.0360	418.40	415.49	421.00	414.77	0.369	0.005	0.5	0.08	0.07	Gravity
F3-22012	F3-21011	6	80.1	3.7453	342.00	338.00	337.16	335.00	0.702	0.009	0.8	0.08	0.08	Gravity
F3-22013	F3-21027	6	33.7	4.8368	385.62	383.62	382.99	381.99	0.798	0.003	0.3	0.07	0.07	Gravity
F3-22014	F3-21029	6	68.8	0.8576	345.13	311.39	332.44	310.80	0.336	0.009	0.6	0.09	0.09	Gravity
F3-22020	F3-21058	6	34.4	2.3837	313.43	312.82	318.00	312.00	0.56	0.020	1.2	0.09	0.10	Gravity
F6-21010	F6-21011	8	220.9	1.0457	58.46	54.95	55.12	52.64	0.799	0.099	2.5	0.17	0.17	Gravity
F6-21011	F6-21012	8	35.5	1.7183	55.12	52.64	54.80	52.03	1.024	0.101	1.2	0.16	0.27	Gravity
F6-21012	F6-21013	8	171.9	0.2036	54.80	52.03	55.04	51.68	0.352	0.111	1.2	0.27	0.29	Gravity
F6-21013	F6-21014	8	199.3	0.1957	55.04	51.68	55.70	51.29	0.346	0.129	1.6	0.29	0.26	Gravity
F6-21014	F6-21021	8	354.7	0.2143	55.70	51.29	54.22	50.53	0.362	0.106	2.0	0.26	0.19	Gravity
F6-21014	F6-21016	8	275.0	0.8000	55.70	51.34	52.27	49.14	0.699	0.132	2.2	0.21	0.21	Gravity
F6-21015	F6-21014	8	285.1	1.1294	58.27	54.56	55.70	51.34	0.83	0.090	1.5	0.16	0.21	Gravity
F6-21016	F6-21017	8	204.9	2.0595	52.27	49.14	49.51	44.92	1.121	0.164	2.4	0.19	0.23	Gravity
F6-21017	F6-21018	8	401.0	1.2120	49.51	44.92	40.86	40.06	0.199	0.199	1.4	0.23	0.39	Gravity
F6-21018	F6-21069	8	324.0	0.6451	43.79	40.06	41.68	37.97	0.627	0.398	3.0	0.39	0.38	Gravity

Burlingame Wastewater Collection System Master Plan
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Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F6-21020	F6-21021	8	282.0	0.9149	56.53	53.01	54.22	50.43	0.747	0.022	0.4	0.10	0.19	Gravity
F6-21021	F6-21022	8	197.6	1.5789	54.22	50.43	50.05	47.31	0.982	0.144	2.4	0.19	0.21	Gravity
F6-21022	F6-21023	8	240.0	1.1458	50.05	47.31	47.73	44.56	0.836	0.157	2.6	0.21	0.31	Gravity
F6-21023	F6-21018	8	313.2	1.4368	47.73	44.56	43.79	40.06	0.937	0.175	1.3	0.21	0.39	Gravity
F6-21024	F6-21025	8	84.1	5.7669	39.57	35.88	38.37	31.03	1.876	0.480	5.1	0.24	0.29	Gravity
F6-21025	F6-21026	12	52.0	1.6538	38.37	31.03	37.32	30.17	2.961	0.480	3.9	0.29	0.29	Gravity
F6-21026	F6-21023	8	133.3	3.0608	37.32	30.17	36.00	26.09	1.367	0.524	2.2	0.29	1.13	Surcharged
F6-21027	F6-21026	8	200.0	1.3750	39.09	32.92	37.32	30.17	0.916	0.045	0.5	0.12	0.29	Gravity
F6-21029	F6-21030	8	351.2	0.9282	58.59	56.06	56.30	52.80	0.753	0.022	0.6	0.10	0.15	Gravity
F6-21030	F6-21031	8	222.6	0.8580	56.30	52.80	54.51	50.89	0.724	0.070	1.2	0.15	0.20	Gravity
F6-21031	F6-21035	8	282.4	1.3739	54.51	50.89	50.72	47.01	0.916	0.160	2.8	0.20	0.20	Gravity
F6-21032	F6-21031	8	361.7	0.5834	56.49	53.00	54.51	50.89	0.597	0.062	1.1	0.16	0.20	Gravity
F6-21033	F6-21034	8	403.7	1.4887	59.00	54.80	52.12	48.79	0.953	0.014	0.4	0.09	0.14	Gravity
F6-21033	F6-21059	8	360.7	4.0144	59.00	54.80	46.04	40.32	1.565	0.023	0.6	0.09	0.16	Gravity
F6-21034	F6-21035	8	428.9	0.4150	52.12	48.79	50.72	47.01	0.503	0.039	0.8	0.14	0.18	Gravity
F6-21035	F6-21037	8	383.1	0.3054	50.72	47.01	49.48	45.84	0.432	0.057	1.5	0.18	0.16	Gravity
F6-21035	F6-29016	8	8.0	2.3250	50.72	47.01	50.83	46.82	1.193	0.157	3.1	0.18	0.18	Gravity
F6-21036	F6-21037	8	232.4	1.1618	51.82	48.54	49.48	45.84	0.842	0.007	0.2	0.08	0.16	Gravity
F6-21037	F6-29015	8	8.0	1.2500	49.48	45.84	49.53	45.74	0.873	0.077	1.5	0.16	0.19	Gravity
F6-21038	F6-21039	6	338.6	1.8252	45.75	42.14	40.96	35.96	0.49	0.147	1.1	0.20	0.56	Surcharged
F6-21039	F6-21041	8	384.3	0.0390	40.96	35.96	40.34	35.81	0.154	0.186	1.3	0.56	0.41	Gravity
F6-21040	F6-21041	6	342.2	1.3267	44.00	40.45	40.34	35.91	0.418	0.056	1.0	0.14	0.31	Gravity
F6-21041	F6-29012	8	240.0	0.2475	40.34	35.81	38.90	35.22	0.389	0.260	1.6	0.41	0.42	Gravity
F6-21042	F6-21043	8	44.4	0.1351	37.73	34.85	37.81	34.79	0.287	0.285	2.6	0.43	0.33	Gravity
F6-21043	F6-21020	6	490.6	1.3698	37.81	34.79	33.28	28.07	0.425	0.302	2.4	0.32	1.13	Surcharged
F6-21044	F6-21045	8	221.2	1.0714	45.79	41.38	43.44	39.01	0.809	0.206	2.1	0.24	0.30	Gravity
F6-21045	F6-21071	6	271.5	1.1083	43.44	39.01	40.00	36.00	0.382	0.239	3.1	0.30	0.30	Gravity
F6-21046	F6-29013	8	10.6	0.0000	40.28	35.74	40.00	35.74	0	0.261	2.7	0.35	0.30	Gravity
F6-21047	F6-21048	6	382.2	0.9916	40.12	35.12	36.63	31.33	0.361	0.270	2.1	0.34	1.02	Surcharged
F6-21048	F7-21020	6	376.5	0.7756	36.63	31.33	34.10	28.41	0.319	0.325	2.4	1.00	0.69	Throttled
F6-21049	F6-21050	6	90.0	0.4444	37.57	33.37	36.75	32.97	0.242	0.025	1.0	0.13	0.12	Gravity
F6-21050	F6-21048	6	220.0	0.7000	36.75	32.97	36.63	31.43	0.304	0.031	0.6	0.12	0.92	Surcharged
F6-21051	F6-21048	6	215.0	0.3349	35.73	32.10	31.38	0.21	0.040	0.3	0.27	0.97	0.97	Surcharged
F6-21052	F6-29011	8	190.7	1.1536	51.35	47.63	48.44	45.43	0.839	0.013	0.6	0.09	0.10	Gravity
F6-21054	F6-21058	8	359.7	0.7729	46.49	43.44	44.83	40.66	0.687	0.000	0.0	0.07	0.13	Gravity
F6-21054	F6-29017	8	8.0	1.0875	46.49	43.33	43.24	43.24	0.815	0.036	1.0	0.12	0.14	Gravity
F6-21055	F6-21056	6	275.2	1.0538	43.25	40.35	39.93	37.45	0.372	0.087	1.4	0.18	0.25	Gravity
F6-21056	F7-21009	8	361.0	0.2410	39.93	37.45	39.45	36.58	0.384	0.111	1.9	0.25	0.21	Gravity
F6-21057	F6-21058	8	428.3	0.7565	47.08	43.90	44.83	40.66	0.679	0.019	0.6	0.10	0.13	Gravity
F6-21058	F6-29018	8	8.0	0.7625	44.83	40.66	45.49	40.60	0.68	0.040	1.1	0.13	0.14	Gravity
F6-21059	F6-29014	8	8.0	22.2500	46.04	40.32	46.71	38.54	3.685	0.026	0.1	0.16	1.92	Surcharged
F6-21060	F6-21061	6	335.0	0.8179	39.53	34.73	36.95	31.99	0.328	0.017	0.6	0.10	0.14	Gravity
F6-21061	F6-21018	6	339.2	0.7017	36.95	31.99	34.71	29.61	0.304	0.035	1.4	0.14	0.13	Gravity
F6-21062	E6-21001	6	305.0	0.6754	36.57	32.71	34.56	30.65	0.298	0.035	0.9	0.13	0.18	Gravity
F6-21063	F6-21039	6	177.6	1.1543	41.00	38.01	40.96	35.96	0.39	0.042	0.3	0.13	0.56	Surcharged
F6-21069	F6-21024	8	206.7	0.9821	41.68	37.91	39.57	37.74	0.430	0.374	3.4	0.37	0.37	Gravity
F6-21071	F6-21046	8	23.5	1.1106	40.00	36.00	40.28	35.74	0.823	0.261	2.2	0.28	0.35	Gravity
F6-21073	F6-21040	6	257.2	1.4697	47.03	44.23	44.00	40.45	0.44	0.016	0.6	0.09	0.14	Gravity
F6-21074	F6-21017	8	165.0	0.4061	46.95	45.75	45.08	45.08	0.498	0.019	0.9	0.11	0.10	Gravity
F6-22010	F6-21062	6	183.0	0.7486	38.08	34.08	36.57	32.71	0.314	0.011	0.4	0.09	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F6-22011	F6-21051	6	135.0	0.1481	35.05	32.30	35.73	32.10	0.14	0.014	0.4	0.12	0.27	Gravity
F6-29011	F6-21054	8	190.0	1.1053	48.44	45.43	46.49	43.33	0.821	0.026	0.9	0.10	0.12	Gravity
F6-29012	F6-21042	8	147.8	0.2476	38.90	35.22	37.73	34.85	0.389	0.263	1.7	0.41	0.43	Gravity
F6-29013	F6-21047	8	57.5	1.0435	40.00	35.74	40.12	35.14	0.798	0.261	2.4	0.27	0.32	Gravity
F6-29014	F7-21001	8	489.3	0.3793	46.71	40.32	44.59	38.54	0.481	0.035	1.0	0.14	0.14	Gravity
F6-29015	F6-21038	6	288.0	1.2500	49.53	45.74	42.14	40.06	0.475	0.107	2.3	0.19	0.20	Gravity
F6-29016	F6-21044	8	233.5	2.3315	50.83	46.82	45.79	41.38	1.193	0.171	2.4	0.18	0.24	Gravity
F6-29017	F6-21055	6	265.9	1.0880	46.41	43.24	43.25	40.35	0.378	0.053	1.3	0.14	0.18	Gravity
F6-29018	F7-21010	8	250.5	0.7581	45.49	40.60	43.37	38.70	0.68	0.054	1.2	0.14	0.17	Gravity
F7-21001	F7-21002	6	405.0	0.4222	44.59	38.54	43.70	36.83	0.236	0.034	1.5	0.14	0.12	Gravity
F7-21002	F7-21003	8	395.0	0.7873	43.70	36.83	41.88	33.72	0.693	0.034	1.2	0.12	0.13	Gravity
F7-21003	F7-21004	8	288.7	0.6066	41.88	33.72	40.33	32.09	0.608	0.035	0.4	0.13	0.29	Gravity
F7-21004	F7-21018	8	626.2	0.2092	40.33	32.09	37.10	30.78	0.357	0.134	0.8	0.29	0.51	Gravity
F7-21006	F7-21007	8	398.0	0.4221	42.83	39.22	41.79	37.54	0.508	0.016	0.2	0.10	0.23	Gravity
F7-21007	F7-21008	8	377.3	0.2306	41.79	37.54	39.58	36.67	0.375	0.089	1.8	0.23	0.21	Gravity
F7-21008	F7-21009	8	32.6	0.0000	39.58	36.51	39.45	36.51	0	0.182	2.0	0.37	0.28	Gravity
F7-21009	F7-21011	8	79.3	0.8575	39.45	36.49	39.11	35.81	0.723	0.293	2.7	0.30	0.32	Gravity
F7-21010	F7-21033	8	247.1	0.8863	43.37	38.70	39.60	36.51	0.735	0.083	0.6	0.17	0.41	Gravity
F7-21011	F7-21017	8	172.3	1.4510	39.11	35.81	37.76	33.31	0.437	0.298	3.2	0.32	0.35	Gravity
F7-21012	F7-21013	8	135.6	1.0619	39.73	36.23	39.65	34.79	0.805	0.012	0.5	0.09	0.11	Gravity
F7-21013	F7-21014	8	280.0	0.4429	39.95	34.79	40.20	33.55	0.52	0.021	0.5	0.11	0.16	Gravity
F7-21014	F7-21015	6	55.5	0.3784	40.20	33.55	40.17	33.34	0.223	0.044	1.5	0.16	0.14	Gravity
F7-21015	F7-21004	8	37.5	2.7200	40.17	33.34	40.33	32.32	1.288	0.061	2.3	0.12	0.12	Gravity
F7-21016	F7-21015	8	246.2	0.5890	39.53	34.79	40.17	33.34	0.6	0.018	0.7	0.10	0.12	Gravity
F7-21017	F7-21018	6	191.9	1.3184	37.76	33.31	37.10	30.78	0.417	0.317	2.5	0.34	0.51	Surcharged
F7-21018	F7-21019	8	308.8	0.4210	37.10	30.78	35.59	29.48	0.507	0.443	2.2	0.51	0.71	Surcharged
F7-21019	F7-21020	8	315.0	0.3397	35.59	29.48	34.10	28.41	0.455	0.448	1.9	0.70	0.69	Surcharged
F7-21020	F7-21005	10	365.0	0.3425	34.10	28.41	33.61	27.16	0.829	0.801	3.6	0.68	0.50	Gravity
F7-21021	F7-21023	6	295.0	0.6339	38.00	34.13	36.62	32.10	0.232	0.071	0.9	0.18	0.31	Gravity
F7-21022	F7-21023	6	230.0	0.4087	36.73	33.04	36.62	32.10	0.232	0.032	0.3	0.14	0.47	Gravity
F7-21023	F7-21024	6	310.0	0.2710	36.62	32.26	34.83	31.42	0.189	0.125	2.1	0.31	0.24	Gravity
F7-21024	F7-21005	6	315.0	1.3624	34.83	31.42	33.61	27.16	0.422	0.181	3.0	0.24	0.24	Gravity
F7-21025	F7-21026	6	228.3	1.1389	38.65	33.45	35.02	30.85	0.387	0.007	0.5	0.08	0.08	Gravity
F7-21026	F7-21027	6	278.1	1.1758	35.02	30.85	30.77	27.58	0.393	0.007	0.3	0.08	0.12	Gravity
F7-21027	F7-21028	6	330.0	0.2727	30.77	27.58	29.52	26.68	0.189	0.016	0.7	0.12	0.12	Gravity
F7-21028	F7-21029	6	323.7	0.2780	29.52	26.67	29.50	25.77	0.191	0.020	0.6	0.13	0.17	Gravity
F7-21029	F7-21002	6	330.0	0.1909	29.50	25.77	30.18	25.14	0.159	0.031	0.7	0.17	0.19	Gravity
F7-21030	F7-21032	6	300.0	0.2833	35.20	30.96	35.40	30.11	0.193	0.039	1.1	0.17	0.16	Gravity
F7-21031	F7-21032	6	192.0	0.3032	35.60	31.38	35.40	30.11	0.295	0.022	0.6	0.11	0.16	Gravity
F7-21032	F7-21012	6	625.0	0.7760	35.40	30.11	32.26	25.26	0.32	0.061	1.7	0.16	0.16	Gravity
F7-21033	F7-21008	8	38.7	-0.4134	39.60	36.51	39.58	36.87	-0.502	0.093	1.6	0.41	0.21	Gravity
F7-22003	F6-21049	6	231.9	0.6813	38.65	34.95	37.57	37.07	0.299	0.017	0.7	0.10	0.13	Gravity
F7-22005	F7-21021	6	295.0	0.1356	39.59	34.53	38.00	34.13	0.134	0.023	0.6	0.15	0.18	Gravity
F7-22006	F7-21031	6	141.7	3.5286	37.00	36.38	35.60	31.38	0.681	0.002	0.1	0.07	0.11	Gravity
F7-22007	F7-21001	6	153.7	1.6396	35.24	30.39	34.47	27.87	0.465	0.000	0.0	0.07	0.08	Gravity
F7-22008	F7-21030	6	235.2	0.3656	34.75	31.82	35.20	30.96	0.219	0.005	0.1	0.08	0.17	Gravity
G2-21004	G2-21005	6	60.0	41.2333	610.37	586.20	580.08	561.46	2.329	0.072	1.4	0.09	0.21	Gravity
G2-21005	G2-21006	6	155.9	0.4362	580.08	561.46	566.26	560.78	0.24	0.078	1.9	0.21	0.18	Gravity
G2-21006	G2-21007	6	240.5	2.3992	566.26	560.78	555.54	555.01	0.562	0.090	2.2	0.15	0.18	Gravity
G2-21007	F2-21003	6	354.4	1.5745	555.54	555.01	553.93	549.43	0.455	0.115	1.8	0.18	0.25	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Design Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
G2-22006	G2-21004	6	32.4	0.0000	610.37	586.20	610.37	586.20	0	0.070	1.9	0.25	0.16	Gravity
G2-23006	G2-21006	6	38.3	3.1854	566.26	562.00	566.26	560.78	0.647	0.005	0.2	0.07	0.15	Gravity
G6-21001	G6-21002	6	16.3	43.6196	89.97	86.46	89.45	79.35	2.393	0.022	1.2	0.07	0.10	Gravity
G6-21002	G6-21003	8	194.4	1.2191	89.45	79.35	87.64	76.98	0.863	0.026	1.4	0.10	0.09	Gravity
G6-21003	G6-21004	8	123.3	4.4688	87.64	76.98	74.64	71.47	1.652	0.033	1.8	0.09	0.09	Gravity
G6-21004	G6-21005	8	119.2	6.2584	74.64	71.47	71.08	64.01	1.954	0.038	1.5	0.09	3.84	Surcharged
G6-21005	G6-21006	8	133.8	2.2347	71.08	64.01	64.35	61.02	1.168	0.061	1.7	3.84	FULL	Surcharged
G6-21006	F6-21001	8	200.0	3.2500	64.35	61.02	59.93	54.52	1.408	0.079	0.3	6.82	13.31	Surcharged
G6-21007	G6-21008	8	252.7	0.9120	67.46	62.34	64.61	60.31	0.7	0.032	0.8	0.12	0.15	Gravity
G6-21008	G6-21009	8	250.0	0.9120	64.61	60.31	61.92	58.03	0.746	0.070	2.0	0.15	0.14	Gravity
G6-21009	F6-21010	8	298.9	1.1643	61.92	58.04	58.27	54.56	0.843	0.054	1.3	0.13	0.16	Gravity
G6-21010	G6-22004	8	329.1	0.9359	61.92	58.03	58.46	54.95	0.756	0.061	1.4	0.14	0.17	Gravity
G6-21010	F6-21032	8	117.5	0.0426	61.44	57.68	60.78	57.63	0.161	0.004	0.2	0.09	0.10	Gravity
G6-21010	G6-21032	8	381.1	1.2280	61.44	57.68	56.49	53.00	0.866	0.018	0.5	0.09	0.16	Gravity
G6-21012	G6-21007	8	410.8	4.6665	85.48	81.51	67.46	62.34	1.688	0.020	0.8	0.08	0.12	Gravity
G6-21013	F6-21029	8	278.4	1.1925	62.04	59.38	58.59	56.06	0.853	0.007	0.3	0.08	0.10	Gravity
G6-22003	G6-21010	8	322.0	0.3820	62.76	58.91	61.44	57.68	0.483	0.009	0.5	0.09	0.09	Gravity
G6-22004	F6-21033	8	282.0	1.0035	60.78	57.63	59.00	54.80	0.783	0.022	1.3	0.10	0.09	Gravity
NEWHALL	E5-21059	10	100.0	7.6700	50.80	46.40	50.80	38.73	3.923	2.415	5.3	FULL	9.01	Surcharged
RR Cleanout	D7-21062	8	380.0	0.4132	9.09	7.01	9.71	5.44	0.502	0.000	0.0	0.07	0.07	Gravity
SSMH5H21	E5-21036	15	222.4	1.9627	36.18	27.61	33.78	23.24	5.85	4.482	5.4	1.70	3.36	Surcharged

ATTACHMENT D: MODEL OUTPUT – CONSENT DECREE SCENARIO

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
399RollinsPS	D7-21012	10	2035.0	-0.2211	8.84	5.50	14.77	10.00	-	0.880	2.496	PRESSURE	PRESSURE	Foremain
A3-21001	A3-21002	8	256.3	0.4682	8.30	3.57	7.00	2.37	0.535	0.021	0.535	0.11	0.15	Gravity
A3-21002	A3-21004	8	262.7	0.4454	7.00	2.37	7.00	1.20	0.521	0.049	0.207	0.15	1.14	Surcharged
A3-21003	A3-21004	6	89.4	1.1186	6.00	8.94	2.00	0.384	0.038	0.028	0.19	1.14	0.20	Surcharged
A3-21004	A3-21005	8	255.0	-0.3451	7.00	1.20	6.31	2.08	-0.459	0.087	1.529	1.14	0.20	Surcharged
A3-21005	A3-21004	8	350.0	0.4714	6.31	2.08	6.82	0.43	0.536	0.087	0.925	0.19	0.29	Gravity
A4-21001	A4-21002	8	61.0	0.4098	4.70	0.51	4.40	0.26	0.232	0.005	0.288	0.08	0.10	Gravity
A4-21002	A4-21003	6	240.0	0.4042	4.40	0.26	4.50	-0.71	0.231	0.010	0.563	0.10	0.10	Gravity
A4-21003	A4-21004	6	228.0	0.4254	4.50	-0.71	4.80	-1.68	0.237	0.011	0.586	0.10	0.11	Gravity
A4-21004	A4-21005	6	230.0	0.4217	4.80	-1.68	4.30	-2.65	0.236	0.014	0.667	0.11	0.11	Gravity
A4-21005	A4-21006	6	235.0	0.4553	4.30	-2.65	4.40	-3.72	0.245	0.019	0.786	0.11	0.12	Gravity
A4-21006	A4-21007	6	228.0	0.4474	4.40	-3.72	5.00	-4.74	0.243	0.023	0.81	0.12	0.14	Gravity
A4-21007	A4-21014	6	236.0	0.4280	5.00	-4.74	4.50	-5.75	0.237	0.030	0.471	0.14	0.29	Gravity
A4-21008	A4-21009	6	205.0	0.5951	5.40	2.29	4.50	0.280	0.024	1	0.12	0.15	0.15	Gravity
A4-21009	A4-21010	6	71.9	0.3477	4.50	0.97	4.70	0.72	0.214	0.099	1.181	0.25	0.31	Gravity
A4-21010	A4-21011	6	246.1	0.1666	4.70	0.72	4.70	0.31	0.148	0.100	2.092	0.31	0.20	Gravity
A4-21011	A4-21012	6	245.0	0.4204	4.70	-0.31	4.70	-1.34	0.235	0.106	1.613	0.25	0.26	Gravity
A4-21012	A4-21013	6	245.0	0.4204	4.70	-1.34	4.20	-2.37	0.235	0.116	1.932	0.26	0.24	Gravity
A4-21013	A4-21014	6	245.0	0.5837	4.20	-2.37	4.50	-3.80	0.277	0.117	2.153	0.24	0.22	Gravity
A4-21014	A4-21015	6	88.9	0.4274	4.50	-5.75	4.40	-6.13	0.237	0.146	2.361	0.29	0.24	Gravity
A4-21015	A4-29003	8	44.9	0.4900	4.40	-6.13	4.00	-6.35	0.547	0.149	2.165	0.24	0.23	Gravity
A4-21016	A4-21015	8	173.3	1.1541	5.50	0.49	4.40	-1.51	0.839	0.002	0.161	0.07	0.07	Gravity
A4-21017	A4-21023	8	336.5	0.4458	6.10	0.50	4.70	-1.00	0.522	0.107	1.229	0.22	0.29	Gravity
A4-21018	A4-21019	8	212.0	0.6341	4.70	0.60	4.40	0.245	0.30	0.049	1.243	0.15	0.15	Gravity
A4-21019	A4-21020	8	212.0	0.4717	4.40	-0.30	4.20	-1.30	0.537	0.053	1.286	0.15	0.16	Gravity
A4-21020	A4-21021	8	231.8	0.4314	4.20	-1.30	4.90	-2.30	0.513	0.054	1.034	0.16	0.19	Gravity
A4-21021	A4-21025	8	232.2	0.2153	4.90	-2.30	4.00	-2.80	0.363	0.055	0.692	0.19	0.26	Gravity
A4-21022	A4-21023	8	205.0	0.6341	5.30	0.30	4.70	-1.00	0.622	0.014	0.228	0.09	0.29	Gravity
A4-21023	A4-21024	6	213.7	0.3276	4.70	-1.00	4.50	-1.70	0.208	0.123	2.224	0.29	0.23	Gravity
A4-21024	A4-21025	8	212.0	0.5189	4.50	-1.70	4.00	-2.80	0.563	0.124	1.56	0.23	0.26	Gravity
A4-21025	B4-21021	8	231.0	0.6494	4.00	-2.80	4.90	-4.30	0.630	0.186	1.987	0.26	0.29	Gravity
A4-21026	A4-21027	8	287.8	0.4170	4.80	-0.20	4.20	-1.40	0.504	0.004	0.259	0.08	0.09	Gravity
A4-21027	B4-21019	8	280.9	0.4628	4.20	-1.40	4.20	-2.70	0.531	0.007	0.368	0.09	0.10	Gravity
A4-21030	B4-21008	8	323.8	0.5713	7.20	1.35	4.90	-0.50	0.591	0.030	0.959	0.12	0.14	Gravity
A4-22001	A4-21002	6	145.0	0.4069	5.00	0.85	4.40	0.26	0.231	0.005	0.3	0.08	0.10	Gravity
A4-22002	A4-21001	6	210.6	0.4653	5.30	1.49	4.70	0.51	0.247	0.005	0.37	0.08	0.08	Gravity
A4-22003	A4-21010	6	155.0	0.6710	5.40	1.76	4.70	0.72	0.297	0.001	0.023	0.07	0.31	Gravity
A4-22005	A4-21008	6	120.0	0.5833	6.00	2.99	5.40	2.29	0.016	0.016	0.731	0.10	0.12	Gravity
A4-22006	A4-21018	6	154.5	0.6602	5.10	1.62	4.70	0.60	0.295	0.006	0.287	0.08	0.15	Gravity
A4-22008	A4-21018	6	150.0	0.6667	5.10	1.60	4.70	0.60	0.296	0.005	0.22	0.08	0.15	Gravity
A4-22009	A4-21023	6	145.1	0.9649	5.20	0.40	4.70	-1.00	0.356	0.005	0.094	0.08	0.29	Gravity
A4-22010	A4-21022	8	180.6	0.6091	5.90	1.40	5.30	0.30	0.610	0.000	-0.001	0.07	0.09	Gravity
A4-29003PS	B4-23001	8	469.3	-0.1396	4.00	-6.35	4.00	-5.70	-	0.480	2.129	PRESSURE	PRESSURE	Foremain
A4-29003SG	B4-21035	6	1146.3	-0.8157	4.00	-6.35	6.44	3.00	-0.328	0.000	0	0.07	0.07	Unused Foremain
B2-21001	C2-21011	8	220.0	1.9227	64.23	58.35	59.66	54.12	1.083	0.041	1.497	0.11	0.12	Gravity
B3-21001	B3-21004	6	298.5	0.3752	6.97	2.97	6.28	1.85	0.222	0.062	0.782	0.19	0.30	Gravity
B3-21002	C4-21018	8	241.2	0.3151	0.98	0.98	8.53	0.22	0.439	0.201	1.345	0.52	1.12	Surcharged
B3-21003	B3-21002	8	239.2	0.0460	6.80	1.09	7.73	0.98	0.164	0.164	1.377	0.53	0.53	Gravity
B3-21004	B3-21003	6	251.7	0.3019	6.28	1.85	6.80	1.09	0.199	0.125	0.957	0.30	0.54	Surcharged
B3-21005	B3-21004	12	126.7	0.3867	6.16	2.57	6.28	2.08	1.432	0.056	1.406	0.15	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B3-21006	B3-21005	8	134.0	0.3507	6.70	3.04	6.16	2.57	0.463	0.056	1.506	0.17	0.15	Gravity
B3-21007	C3-21017	6	332.3	0.5026	47.47	43.31	46.32	41.64	0.257	0.047	1.15	0.16	0.18	Gravity
B3-21008	B3-21009	8	330.0	0.3697	36.26	27.69	36.04	26.47	0.475	0.046	1.518	0.15	0.13	Gravity
B3-21009	B3-21010	8	351.2	1.6714	36.04	26.47	26.41	20.60	0.058	2.324	0.13	0.72	0.72	Surcharged
B3-21010	B3-21051	12	52.1	0.2246	26.41	16.52	34.00	16.40	1.091	2.179	3.826	4.77	4.41	Throttled
B3-21011	B3-21012	8	300.0	0.4700	23.96	18.76	21.01	17.35	0.536	0.028	0.65	0.12	0.16	Gravity
B3-21012	B3-21013	8	266.4	0.4054	21.01	17.35	23.81	16.27	0.497	0.067	0.889	0.16	0.95	Surcharged
B3-21013	B3-21014	8	267.6	0.2803	23.81	16.27	26.41	15.52	0.414	0.089	0.372	0.95	1.67	Surcharged
B3-21014	B3-21015	12	260.5	0.8603	26.41	15.52	21.52	13.80	1.871	2.247	5.164	1.61	0.80	Throttled
B3-21015	B3-21016	12	316.5	1.4660	21.52	13.80	13.63	9.16	2.789	2.272	5.97	0.71	0.71	Gravity
B3-21016	B3-21017	12	218.6	2.1638	13.63	9.16	8.30	4.43	3.388	2.272	6.966	0.62	0.62	Gravity
B3-21017	B3-21046	18	295.1	0.3626	8.30	3.90	5.83	2.83	4.089	2.317	4.232	0.82	0.73	Gravity
B3-21018	B3-21019	12	398.8	1.9308	8.60	1.00	7.70	-6.70	3.200	0.032	0.661	0.12	0.15	Gravity
B3-21019	B3-21020	12	380.0	0.6184	7.70	-6.70	7.87	0.077	1.811	0.077	0.155	0.15	0.96	Gravity
B3-21020	B4-21036	14	300.7	-0.0166	7.87	-9.05	6.00	-9.00	-0.448	0.884	3.184	0.96	0.49	Gravity
B3-21021	B3-21022	8	280.2	0.5726	5.92	0.98	7.53	-0.51	0.591	0.037	0.954	0.13	0.15	Gravity
B3-21022	B4-21042	8	265.6	0.4480	7.53	-0.51	6.64	-1.70	0.523	0.051	1.479	0.15	0.14	Gravity
B3-21023	B3-21024	6	163.1	0.8216	15.00	11.00	13.54	9.66	0.329	0.011	0.74	0.09	0.09	Gravity
B3-21024	B3-21049	8	247.6	1.0178	13.54	9.66	12.59	7.14	0.788	0.011	0.239	0.09	0.18	Gravity
B3-21025	B3-21049	8	31.7	0.5994	11.48	7.33	12.59	7.14	0.605	0.112	1.952	0.20	0.20	Gravity
B3-21026	B3-21027	6	308.2	0.7203	16.46	12.68	15.27	10.46	0.308	0.034	1.141	0.13	0.14	Gravity
B3-21027	B3-21029	6	178.9	0.9335	15.27	10.46	12.49	8.79	0.350	0.050	1.105	0.14	0.21	Gravity
B3-21028	B3-21029	6	56.0	0.9107	12.66	9.30	12.49	8.79	0.346	0.077	1.704	0.18	0.21	Gravity
B3-21029	B3-21025	8	282.2	0.5174	12.49	8.79	11.48	7.33	0.562	0.112	1.918	0.21	0.20	Gravity
B3-21031	B3-21032	8	238.8	0.5025	12.00	3.80	12.00	2.60	0.554	0.138	1.539	0.24	0.28	Gravity
B3-21032	B3-21033	8	296.3	0.2666	12.00	2.60	6.89	1.81	0.403	0.138	1.153	0.28	0.37	Gravity
B3-21033	B3-21034	8	275.6	0.21034	6.89	1.87	7.49	0.63	0.524	0.218	1.709	0.31	0.37	Gravity
B3-21034	B3-21036	8	275.4	0.3304	7.49	0.63	7.08	-0.28	0.449	0.257	2.039	0.37	0.37	Gravity
B3-21035	B3-21036	8	326.7	0.2632	7.49	0.58	7.08	-0.28	0.401	0.062	0.49	0.19	0.37	Gravity
B3-21036	B3-21037	8	264.8	0.6005	7.08	-0.28	7.96	-1.87	0.605	0.338	2.055	0.37	0.46	Gravity
B3-21037	B3-21040	8	257.8	0.3918	7.96	-1.87	6.83	-2.88	0.489	0.385	2.641	0.46	0.42	Gravity
B3-21038	B3-21039	8	145.0	0.9517	6.90	2.60	6.48	1.22	0.762	0.043	1.059	0.13	0.16	Gravity
B3-21039	B3-21040	8	425.8	0.7750	6.48	1.22	6.83	-2.08	0.688	0.070	1.736	0.16	0.16	Gravity
B3-21040	B3-21041	8	141.5	0.8339	6.83	-2.88	7.24	-4.06	0.713	0.479	3.304	0.41	0.41	Gravity
B3-21041	B3-21020	8	307.8	1.6212	7.24	-4.06	7.87	-9.05	0.995	0.541	2.294	0.36	0.96	Surcharged
B3-21042	B4-21035	8	344.2	0.5230	6.82	0.43	6.44	-1.37	0.565	0.213	2.442	0.29	0.27	Gravity
B3-21046	B3-21047	18	425.6	0.2303	5.83	1.51	7.20	3.258	2.314	2.428	0.97	1.30	1.30	Gravity
B3-21047	C4-21060	18	425.2	0.1505	7.20	0.53	8.70	-0.11	2.634	2.318	2.13	1.29	1.42	Gravity
B3-21048	B3-21031	8	30.0	2.0667	10.50	4.42	12.00	3.80	1.123	0.138	1.921	0.17	0.24	Gravity
B3-21049	B3-21050	8	187.3	1.2333	12.59	7.14	10.00	4.83	0.868	0.120	2.536	0.18	0.18	Gravity
B3-21050	B3-21048	8	28.3	1.4488	10.00	4.83	10.50	4.42	0.941	0.120	2.589	0.18	0.17	Gravity
B3-21051	B3-21014	12	393.4	0.2245	34.00	16.40	26.41	15.52	1.091	2.178	4.078	4.38	1.68	Throttled
B3-22001	B3-21011	8	106.3	1.1665	25.44	20.00	23.96	18.76	0.844	0.018	0.641	0.09	0.12	Gravity
B3-22002	B3-21026	6	144.5	0.7820	17.30	13.81	16.46	12.68	0.321	0.021	0.783	0.11	0.13	Gravity
B3-22003	B3-21023	6	118.3	1.6484	17.50	12.95	15.00	11.00	0.466	0.011	0.699	0.08	0.09	Gravity
B3-22004	B3-21018	12	237.9	0.8701	7.01	3.07	8.60	1.00	2.149	0.000	0.001	0.07	0.12	Gravity
B3-29001	B3-22003	6	50.8	1.6535	18.37	13.79	17.50	12.95	0.466	0.011	0.789	0.08	0.08	Gravity
B3-29002	B3-21017	12	351.8	1.3445	11.11	9.16	8.30	4.43	2.670	0.029	0.752	0.12	0.29	Gravity
B4-21001	B4-21002	8	265.0	0.4151	5.10	0.40	5.10	-0.70	0.503	0.016	0.608	0.10	0.12	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B4-21002	B4-21003	8	255.0	0.3922	5.10	-0.70	6.40	-1.70	0.489	0.023	0.837	0.12	0.12	Gravity
B4-21003	B4-21004	8	250.0	0.4800	6.40	-1.70	6.60	-2.90	0.541	0.027	0.93	0.12	0.13	Gravity
B4-21004	B4-21005	8	51.8	0.5792	6.60	-2.90	6.40	-3.20	0.595	0.033	1.031	0.13	0.13	Gravity
B4-21005	B4-21006	8	240.4	0.4160	6.40	-3.20	5.20	-4.20	0.504	0.033	0.989	0.13	0.14	Gravity
B4-21006	B4-21007	8	242.3	0.4127	5.20	-4.20	4.30	-5.20	0.502	0.036	0.654	0.14	0.20	Gravity
B4-21007	B4-21013	8	196.8	0.4573	4.30	-5.20	5.00	-6.10	0.528	0.095	1.7	0.20	0.20	Gravity
B4-21008	B4-21009	8	58.9	0.5093	4.90	-0.50	4.50	-0.80	0.557	0.038	1.045	0.14	0.15	Gravity
B4-21009	B4-21010	8	250.7	0.3989	4.50	-0.80	4.70	-1.80	0.493	0.042	1.083	0.15	0.15	Gravity
B4-21010	B4-21011	8	251.0	0.3984	4.70	-1.80	5.30	-2.80	0.493	0.047	1.126	0.15	0.16	Gravity
B4-21011	B4-21012	8	238.8	0.4186	5.30	-2.80	5.00	-3.80	0.506	0.054	1.187	0.16	0.17	Gravity
B4-21012	B4-21007	8	242.7	0.4120	5.00	-3.80	4.30	-4.80	0.501	0.061	1.594	0.17	0.15	Gravity
B4-21013	B4-21014	8	180.7	0.4981	5.00	-6.10	4.00	-7.00	0.551	0.095	1.849	0.20	0.19	Gravity
B4-21014	B4-29009	8	36.7	6.2670	4.00	-7.70	4.00	-10.00	-	0.348	6.04	PRESSURE	PRESSURE	Foremain
B4-21015	B4-23006	8	16.4	-0.2500	4.00	-6.83	4.00	-6.79	-	0.481	2.131	PRESSURE	PRESSURE	Foremain
B4-21017PS	B4-21043	10	2235.3	-0.3923	4.00	-5.20	8.45	3.57	-	1.440	4.086	PRESSURE	PRESSURE	Foremain
B4-21018	B4-28001	8	94.0	1.3191	5.30	0.50	4.00	-0.74	0.897	0.002	0.165	0.07	0.08	Gravity
B4-21018	A4-21016	8	173.6	0.0058	5.30	0.50	5.50	0.49	0.059	0.000	0.018	0.07	0.07	Gravity
B4-21019	B4-21020	8	230.7	0.4335	4.20	-2.70	4.90	-3.70	0.514	0.013	0.647	0.10	0.10	Gravity
B4-21020	B4-21023	8	233.5	0.4283	4.90	-3.70	4.50	-4.70	0.511	0.013	0.691	0.10	0.09	Gravity
B4-21021	B4-21022	8	225.0	0.4444	4.90	-4.30	4.60	-5.30	0.521	0.194	1.974	0.29	0.30	Gravity
B4-21022	B4-21023	8	220.0	0.4091	4.60	-5.30	4.50	-6.20	0.500	0.200	2.4	0.30	0.26	Gravity
B4-21023	B4-21014	8	322.0	0.4348	4.50	-6.30	4.00	-7.70	0.515	0.212	2.447	0.31	0.27	Gravity
B4-21024	B5-21006	8	375.1	0.6772	7.71	4.30	8.16	0.76	0.843	0.003	0.18	0.07	0.09	Gravity
B4-21027	B4-21028	8	414.1	0.4975	6.38	2.80	6.23	0.74	0.551	0.062	1.162	0.17	0.19	Gravity
B4-21028	B4-21029	8	329.8	0.7004	6.23	0.74	5.98	-1.57	0.654	0.106	0.665	0.19	0.45	Gravity
B4-21029	B4-21030	8	329.0	0.0000	5.98	-1.57	6.13	-1.57	0.000	0.106	1.747	0.45	0.21	Gravity
B4-21030	B4-21031	8	329.8	0.9369	6.13	-1.57	6.00	-4.66	0.756	0.148	1.538	0.21	0.30	Gravity
B4-21031	B4-21032	8	329.2	0.4222	6.00	-4.66	6.16	-6.05	0.508	0.196	1.126	0.30	0.84	Surcharged
B4-21032	B4-21033	8	259.5	0.2197	6.16	-6.05	6.23	-6.82	0.366	0.286	1.207	0.84	1.04	Surcharged
B4-21033	B4-21034	8	415.7	0.0794	6.23	-6.62	5.96	-6.95	0.220	0.286	1.6	1.04	0.80	Throttled
B4-21034	B4-21035	8	359.3	0.3980	5.96	-6.95	6.44	-8.38	0.493	0.420	1.77	0.79	1.14	Surcharged
B4-21035	B4-21036	8	155.7	0.3982	6.44	-8.38	6.00	-9.00	0.493	0.677	3.815	1.11	0.49	Throttled
B4-21036	B4-21017	14	39.3	6.3613	6.00	-9.00	4.00	-11.50	8.762	1.554	9.098	0.35	1.87	Surcharged
B4-21037	B4-21038	8	354.7	0.4595	7.81	2.47	6.64	0.84	0.530	0.060	0.997	0.17	0.21	Gravity
B4-21038	B4-21039	8	459.6	0.3285	6.64	0.84	7.87	-0.67	0.448	0.087	1.145	0.21	0.25	Gravity
B4-21039	B4-21040	8	340.4	0.5112	7.87	-0.67	6.36	-2.41	0.559	0.155	2.195	0.25	0.23	Gravity
B4-21040	B4-21041	8	248.3	1.1236	6.36	-2.41	6.47	-5.20	0.828	0.173	1.476	0.22	0.34	Gravity
B4-21041	B4-21042	8	61.3	0.2284	6.47	-5.20	6.64	-5.34	0.373	0.207	2.491	0.34	0.26	Gravity
B4-21042	B3-21020	8	299.1	1.2404	6.64	-5.34	7.87	-9.05	0.870	0.267	1.129	0.26	0.96	Surcharged
B4-21043	C4-21076	14	390.7	0.2252	8.45	3.57	6.97	2.69	1.849	1.442	3.503	0.87	1.00	Gravity
B4-21044	B4-29006	8	40.6	-4.5690	4.27	-3.81	4.72	-1.95	-	1.072	4.75	PRESSURE	PRESSURE	Foremain
B4-22001	B4-21008	6	150.0	1.0000	5.30	1.00	4.90	-0.50	0.363	0.006	0.264	0.08	0.14	Gravity
B4-22002	B4-21009	6	138.9	0.7919	5.30	0.30	4.50	-0.80	0.323	0.004	0.165	0.08	0.15	Gravity
B4-22003	B5-21002	6	217.2	0.6354	5.80	2.28	5.70	0.90	0.289	0.007	0.476	0.08	0.09	Gravity
B4-22014	B4-21037	8	384.1	0.1770	8.00	3.15	7.81	2.47	0.329	0.031	0.718	0.15	0.17	Gravity
B4-22015	C5-23004	12	482.1	0.0000	8.13	-1.94	6.00	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
B4-22016	B4-22015	12	16.9	0.0000	6.00	-1.94	6.00	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
B4-23001	B4-23002	8	13.5	0.1185	4.00	-5.70	4.00	-5.71	-	0.480	2.129	PRESSURE	PRESSURE	Foremain
B4-23002	B4-23003	8	475.9	0.1221	4.00	-5.71	4.00	-6.29	-	0.481	2.13	PRESSURE	PRESSURE	Foremain

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
B4-23003	B4-23004	8	13.8	0.1232	4.00	-6.29	4.00	-6.31	-	0.481	2.13	PRESSURE	PRESSURE	Foremain
B4-23004	B4-23005	6	408.9	0.1220	4.00	-6.31	4.00	-6.81	-	0.481	3.789	PRESSURE	PRESSURE	Foremain
B4-23005	B4-29007	8	9.5	0.1263	4.00	-6.81	4.00	-6.82	-	0.481	2.131	PRESSURE	PRESSURE	Foremain
B4-23006	B4-23008	8	11.9	-0.2437	4.00	-6.79	4.00	-6.76	-	0.481	2.131	PRESSURE	PRESSURE	Foremain
B4-23007	B4-23008	8	17.2	-0.2500	4.00	-5.80	4.00	-5.75	-	1.071	4.748	PRESSURE	PRESSURE	Foremain
B4-23008	B4-23009	8	311.9	-0.2501	4.00	-5.75	4.00	-4.97	-	1.071	4.748	PRESSURE	PRESSURE	Foremain
B4-23009	B4-23010	8	50.1	-0.2495	4.00	-4.97	4.05	-4.85	-	1.071	4.749	PRESSURE	PRESSURE	Foremain
B4-23010	B4-21044	8	417.1	-0.2501	4.05	-4.85	4.27	-3.81	-	1.072	4.749	PRESSURE	PRESSURE	Foremain
B4-28001	B4-21019	8	177.1	1.1067	4.00	-0.74	4.20	-2.70	0.822	0.006	0.313	0.08	0.10	Gravity
B4-29005	B4-22016	12	258.9	0.0000	6.00	-1.94	6.00	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
B4-29006	B4-29005	12	12.0	0.0000	6.00	-1.94	4.72	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
B4-29006SG	C4-21067	10	1001.5	-0.3235	4.72	-1.95	8.30	1.29	-0.806	0.000	0	4.81	1.57	Unused Foremain
B4-29007	B4-21015	8	8.8	-0.2386	4.00	-6.85	4.00	-6.83	-	0.481	2.131	PRESSURE	PRESSURE	Foremain
B4-29008	B4-23007	8	420.5	-0.2499	4.00	-6.85	4.00	-5.80	-	1.071	4.748	PRESSURE	PRESSURE	Foremain
B4-29009PS	B4-29008	8	61.3	-0.2496	4.00	-7.00	4.00	-6.85	-	0.590	2.615	PRESSURE	PRESSURE	Foremain
B4-29009SG	B4-29007	8	60.0	-0.8767	4.00	-7.38	4.00	-6.85	-	0.000	0	PRESSURE	PRESSURE	Unused Foremain
B5-21001	A4-21030	8	277.2	0.4257	7.90	2.53	7.20	0.026	0.946	0.000	0.946	0.12	0.12	Gravity
B5-21002	B4-21030	8	117.7	0.4248	5.70	0.90	5.10	0.40	0.509	0.007	0.305	0.09	0.10	Gravity
B5-21003	B5-21005	8	158.9	0.5664	8.20	1.00	8.20	0.10	0.588	0.000	0	0.07	0.13	Gravity
B5-21004	B5-21005	8	314.1	0.7004	8.20	2.30	8.20	0.10	0.654	0.000	0.886	0.11	0.13	Gravity
B5-21005	B5-21008	8	151.2	0.4034	8.20	0.10	7.40	-0.51	0.496	0.028	0.861	0.13	0.14	Gravity
B5-21006	B5-21007	8	309.3	0.6208	8.16	1.76	6.60	-0.16	0.615	0.012	0.544	0.09	0.11	Gravity
B5-21007	B5-21008	8	108.9	0.3214	6.60	-0.16	7.40	-0.51	0.443	0.016	0.539	0.11	0.14	Gravity
B5-21008	B5-21009	8	326.2	0.7020	7.40	-0.51	8.20	-2.80	0.655	0.045	1.316	0.14	0.14	Gravity
B5-21009	B5-21010	8	322.3	0.5895	8.20	-2.80	8.00	-4.70	0.600	0.045	1.193	0.14	0.15	Gravity
B5-21010	B5-21011	8	317.6	0.5982	8.00	-4.70	8.20	-6.60	0.604	0.056	1.377	0.15	0.16	Gravity
B5-21011	B5-21030	8	56.9	0.7030	8.20	-6.60	8.20	-7.00	0.655	0.066	0.974	0.16	0.28	Gravity
B5-21012	C5-21043	8	298.0	0.7550	8.20	-7.00	8.00	-9.25	0.679	0.226	2.566	0.28	0.28	Gravity
B5-22002	B4-21001	6	172.0	0.6395	5.70	1.50	5.10	0.40	0.290	0.008	0.446	0.09	0.10	Gravity
C2-21001	D2-21071	6	258.0	4.8062	162.82	158.10	151.21	145.70	0.795	0.014	0.744	0.08	0.11	Gravity
C2-21002	C2-21003	6	348.5	0.6255	121.88	117.73	121.36	115.55	0.287	0.063	0.449	3.41	5.57	Surcharged
C2-21003	D2-21073	6	223.2	0.3674	121.36	115.55	124.56	114.73	0.220	0.091	0.623	5.57	6.37	Surcharged
C2-21005	C2-21005	8	300.5	6.2230	108.02	102.39	89.28	83.69	1.949	1.696	6.314	1.81	FULL	Surcharged
C2-21007	C2-21007	8	303.5	3.2191	89.28	83.69	80.17	73.92	1.402	1.646	7.069	5.57	1.41	Throttled
C2-21006	C2-21007	6	306.0	2.8595	87.20	82.67	80.17	73.92	0.613	0.024	0.179	0.09	1.39	Surcharged
C2-21007	C2-21008	8	323.3	4.5623	80.17	73.92	68.65	59.17	1.689	1.671	7.813	1.26	0.64	Throttled
C2-21008	C3-21011	12	295.4	1.4286	68.65	59.17	60.02	54.95	2.753	1.773	5.661	0.59	0.59	Gravity
C2-21009	C3-21012	6	182.9	2.5970	69.19	64.18	65.21	59.43	0.585	0.015	0.767	0.08	0.10	Gravity
C2-21010	B2-21001	8	299.8	1.2975	67.47	62.24	64.23	58.35	0.890	0.018	0.772	0.09	0.11	Gravity
C2-21011	C3-21013	8	200.8	2.3904	59.66	54.12	55.51	49.32	1.208	0.057	1.083	0.12	0.19	Gravity
C2-21012	C2-21013	6	277.5	3.6432	65.21	59.43	55.51	49.32	0.692	0.040	0.9	0.10	0.19	Gravity
C2-22001	C2-21008	8	259.0	0.3514	70.70	60.08	68.65	59.17	0.463	0.044	0.208	0.15	0.60	Gravity
C3-21001	C3-21002	6	301.1	2.3746	102.67	95.43	90.73	82.67	0.599	0.005	0.404	0.07	0.08	Gravity
C3-21002	C2-21006	6	300.0	2.6867	95.43	90.73	82.67	82.67	0.595	0.013	0.822	0.08	0.09	Gravity
C3-21003	C3-21004	8	294.2	1.0401	77.52	72.86	74.60	69.80	0.797	0.015	0.598	0.09	0.12	Gravity
C3-21004	C3-21005	8	310.0	1.0032	74.60	69.80	71.36	66.69	0.782	0.034	1.315	0.12	0.12	Gravity
C3-21005	C2-21008	8	335.6	2.2408	71.36	66.69	68.65	59.17	1.169	0.052	0.244	0.12	0.60	Gravity
C3-21007	C3-21008	8	132.1	7.5852	76.42	71.92	67.38	61.90	2.151	0.024	0.911	0.08	0.12	Gravity
C3-21008	C3-21009	8	289.3	1.0439	67.38	61.90	63.29	58.88	0.798	0.036	1.154	0.12	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C3-21009	C3-21010	8	350.7	1.0237	63.29	58.88	59.80	55.29	0.790	0.049	1.189	0.13	0.16	Gravity
C3-21010	C3-21012	8	363.6	1.1359	59.80	55.29	56.58	51.16	0.833	0.087	0.622	0.16	0.40	Gravity
C3-21011	C3-21012	12	139.8	2.6896	60.02	54.92	56.58	51.16	3.777	1.796	7.104	0.50	0.50	Gravity
C3-21012	C3-21015	12	147.4	7.1031	56.58	51.16	61.39	40.69	6.138	1.891	4.658	0.40	0.75	Gravity
C3-21013	C3-21014	8	270.0	0.7222	55.51	49.32	54.15	47.37	0.664	0.104	1.966	0.19	0.19	Gravity
C3-21014	C3-21015	8	231.7	2.8830	54.15	47.37	52.89	40.69	1.328	0.112	0.501	0.15	0.74	Surcharged
C3-21015	C3-21016	12	257.1	1.0191	52.89	40.69	45.54	38.07	2.325	2.009	5.101	0.73	0.73	Gravity
C3-21016	C3-21019	12	55.5	1.9279	45.54	38.07	44.01	37.00	3.199	2.020	6.058	0.59	0.63	Gravity
C3-21017	C3-21018	6	135.5	0.8044	46.32	41.64	44.04	40.55	0.325	0.077	1.888	0.18	0.18	Gravity
C3-21018	C3-21019	6	211.5	1.6785	44.04	40.55	44.01	37.00	0.470	0.081	0.612	0.15	0.63	Surcharged
C3-21019	C3-21020	12	219.5	1.8679	44.01	37.00	38.78	32.90	3.148	2.101	6.473	0.61	0.61	Gravity
C3-21020	B3-21010	12	250.1	6.5494	38.78	32.90	26.41	16.52	5.894	2.113	3.679	0.43	4.81	Surcharged
C3-21021	C3-21023	6	251.7	5.5463	84.89	80.07	72.23	66.11	0.854	0.172	3.488	0.17	0.21	Gravity
C3-21022	C3-21023	6	338.0	3.4911	83.41	77.93	72.23	66.13	0.678	0.019	0.444	0.09	0.19	Gravity
C3-21023	C3-21025	6	250.6	3.5555	72.23	66.11	62.70	57.20	0.684	0.214	4.357	0.21	0.21	Gravity
C3-21024	C3-21025	6	346.7	4.3957	76.70	70.48	62.70	55.24	0.761	0.026	1.018	0.09	0.22	Gravity
C3-21025	C3-21026	6	251.0	0.8167	62.70	55.10	57.93	53.05	0.328	0.262	2.511	0.35	0.39	Gravity
C3-21026	C3-21027	6	218.2	1.4482	71.76	67.08	68.57	63.92	0.437	0.016	0.928	0.09	0.10	Gravity
C3-21027	C3-21028	6	199.7	5.4432	68.57	63.92	57.93	53.05	0.846	0.036	0.348	0.10	0.39	Gravity
C3-21028	C3-21030	6	251.8	0.9531	57.93	53.05	55.90	50.65	0.354	0.313	3.179	0.38	0.36	Gravity
C3-21029	C3-21030	6	172.4	5.2668	66.42	59.88	55.90	50.80	0.832	0.015	0.984	0.08	0.14	Gravity
C3-21030	C3-21032	6	248.9	2.6396	55.90	50.65	50.02	44.08	0.589	0.344	4.602	0.29	0.29	Gravity
C3-21031	C3-21032	6	273.7	7.3986	68.52	64.44	50.02	44.19	0.987	0.020	0.999	0.08	0.14	Gravity
C3-21032	C3-21034	6	251.0	5.1355	50.02	44.08	37.29	31.19	0.822	0.386	5.27	0.25	0.28	Gravity
C3-21034	C3-21037	6	256.6	4.3609	37.29	31.19	26.50	20.00	0.768	0.413	2.727	0.28	FULL	Surcharged
C3-21037	C3-21038	8	292.4	1.6142	26.50	20.00	29.33	15.28	0.993	0.798	2.689	FULL		Surcharged
C3-21038	C3-21039	8	299.7	0.2736	29.33	29.33	28.03	14.46	0.409	0.828	3.02	8.11	5.51	Throttled
C3-21039	C3-21054	8	344.9	0.2580	28.03	14.46	26.45	13.57	0.397	0.857	3.499	5.49	2.14	Throttled
C3-21040	D3-21072	6	302.6	2.3298	79.00	74.06	71.90	67.01	0.554	0.023	1.351	0.10	0.10	Gravity
C3-21041	C3-21042	6	279.3	1.4142	73.03	67.73	69.32	63.78	0.431	0.018	0.354	0.10	0.22	Gravity
C3-21042	C3-21045	10	278.4	3.6889	69.32	63.70	59.39	53.43	2.720	0.694	5.913	0.30	0.31	Gravity
C3-21043	C3-21044	6	306.6	0.5512	69.13	64.07	67.86	62.38	0.269	0.021	0.896	0.11	0.12	Gravity
C3-21044	C3-21045	6	344.2	2.5334	67.86	62.38	59.39	53.66	0.577	0.051	2.221	0.12	0.12	Gravity
C3-21045	C3-21048	10	250.0	4.0720	59.39	53.43	48.25	43.25	2.858	0.769	6.569	0.31	0.31	Gravity
C3-21046	C3-21047	6	285.0	6.2947	69.16	63.94	56.07	46.00	0.910	0.021	0.788	0.08	0.13	Gravity
C3-21047	C3-21048	6	240.0	1.0083	56.07	46.00	48.25	43.58	0.364	0.042	1.56	0.13	0.13	Gravity
C3-21048	C3-21050	10	250.2	7.1367	43.25	25.39	37.84	25.39	3.784	0.831	6.845	0.28	0.31	Gravity
C3-21049	C3-21050	6	328.0	3.2744	42.70	35.74	30.87	25.00	0.656	0.036	0.269	0.10	0.71	Surcharged
C3-21050	C3-21053	10	17.3	7.1329	30.87	25.39	30.36	24.16	3.784	1.064	5.574	0.31	0.44	Gravity
C3-21052	C3-21053	6	340.8	3.3979	42.82	35.74	30.36	24.16	0.669	0.026	0.215	0.09	0.44	Gravity
C3-21053	C3-21053	10	237.5	2.2358	30.36	24.16	26.45	18.85	2.118	1.120	5.933	0.44	0.44	Gravity
C3-21054	C3-21075	12	180.8	0.5166	26.45	13.57	24.29	12.64	1.656	2.059	3.866	2.10	1.57	Throttled
C3-21055	C3-21056	6	282.9	5.0831	55.20	51.02	43.46	36.64	0.818	0.114	2.16	0.14	0.22	Gravity
C3-21056	C3-21057	6	340.2	1.8895	43.46	36.64	33.54	30.21	0.499	0.180	3.297	0.22	0.22	Gravity
C3-21057	C3-21050	6	255.0	1.8894	33.54	30.21	30.87	25.39	0.499	0.187	2.23	0.22	0.31	Gravity
C3-21060	C3-21053	6	426.3	0.1384	33.09	25.59	30.36	25.00	0.135	0.021	1.036	0.15	0.11	Gravity
C3-21061	C3-21054	6	355.0	1.4000	27.96	18.54	26.45	13.57	0.429	0.064	0.452	0.15	2.14	Surcharged
C3-21062	C3-21063	6	322.8	0.7187	15.55	10.92	13.02	8.60	0.308	0.012	0.612	0.09	0.11	Gravity
C3-21063	C3-21064	6	251.7	0.9217	13.02	8.60	12.04	6.28	0.348	0.022	0.925	0.11	0.12	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C3-21064	B3-21001	6	269.4	1.2287	12.04	6.28	6.97	2.97	0.402	0.038	0.86	0.12	0.19	Gravity
C3-21065	C3-21066	6	244.1	0.7907	9.48	4.98	7.55	3.05	0.323	0.016	0.64	0.10	0.13	Gravity
C3-21066	B3-21066	6	251.7	0.7509	7.55	3.05	6.80	1.16	0.314	0.031	0.343	0.13	0.46	Gravity
C3-21067	C3-21068	6	263.7	1.4676	12.30	263.7	8.28	8.439	0.014	0.439	0.671	0.09	0.11	Gravity
C3-21068	B3-21002	6	247.7	1.3847	8.60	4.41	7.73	0.98	0.427	0.029	0.309	0.11	0.53	Surcharged
C3-21069	C3-21070	6	265.8	1.9601	16.10	11.95	10.77	6.74	0.508	0.016	0.794	0.09	0.11	Gravity
C3-21070	C4-21018	6	270.0	2.4148	10.77	270.0	6.74	0.22	0.584	0.035	0.453	0.11	1.12	Surcharged
C3-21071	C3-21072	6	242.4	0.5198	17.56	12.61	19.06	11.35	0.262	0.010	0.076	0.09	0.83	Surcharged
C4-21006	C4-21006	12	101.8	1.0511	19.06	11.39	16.72	10.32	2.361	2.122	5.19	0.77	0.77	Gravity
C3-21075	C3-21072	12	229.5	0.5168	24.29	12.64	19.06	11.45	1.656	2.066	4.936	1.50	0.77	Throttled
C3-22001	C3-21007	8	336.5	4.1842	90.70	86.00	76.42	71.92	1.598	0.012	0.763	0.08	0.08	Gravity
C3-22003	C3-21052	6	381.3	2.3420	50.75	44.67	42.82	35.74	0.555	0.013	0.781	0.08	0.09	Gravity
C4-21003	C3-21061	6	278.4	0.5532	27.57	20.08	27.95	18.54	0.270	0.031	1.029	0.13	0.15	Gravity
C4-21004	C4-21005	6	305.0	1.2885	25.27	21.27	21.46	17.34	0.412	0.018	0.852	0.10	0.11	Gravity
C4-21005	C3-21072	6	300.0	1.9967	21.46	17.34	19.06	11.35	0.513	0.040	0.298	0.11	0.83	Surcharged
C4-21006	C4-21015	12	251.4	0.4256	16.72	10.32	12.25	9.25	1.503	0.817	3.405	0.53	0.48	Gravity
C4-21006	C4-21009	12	144.1	1.1797	16.72	14.1	12.80	8.62	2.502	1.320	3.28	0.53	0.74	Gravity
C4-21007	C4-21008	6	225.0	1.2667	21.30	17.30	18.37	14.45	0.408	0.017	0.838	0.10	0.11	Gravity
C4-21008	C4-21009	6	256.2	2.1351	18.37	14.45	12.80	8.98	0.530	0.037	1.902	0.11	0.38	Gravity
C4-21009	C4-21016	12	248.1	0.4434	12.80	8.62	11.02	7.52	1.534	1.360	4.093	0.73	0.62	Gravity
C4-21010	C4-21011	6	172.9	2.1978	23.44	19.76	19.98	15.96	0.538	0.013	0.54	0.08	0.13	Gravity
C4-21011	C4-21012	6	198.0	1.8838	19.98	15.98	16.25	12.25	0.498	0.030	0.996	0.11	0.14	Gravity
C4-21012	C4-21013	6	150.3	0.5988	16.25	12.25	15.73	11.35	0.281	0.040	1.239	0.14	0.15	Gravity
C4-21013	C4-21014	6	298.3	0.6470	15.73	11.35	14.57	9.42	0.292	0.047	1.08	0.15	0.19	Gravity
C4-21014	C4-21016	6	302.0	0.5828	14.57	9.42	11.02	7.66	0.277	0.075	1.484	0.19	0.29	Gravity
C4-21015	C4-29007	12	252.6	2.0744	12.25	9.25	10.33	4.01	3.317	0.827	2.539	0.36	0.61	Gravity
C4-21016	C4-21017	12	110.8	3.1679	11.02	7.52	10.18	4.01	4.099	1.438	4.817	0.42	0.58	Gravity
C4-21017	C4-21081	12	75.3	2.9615	10.18	4.01	10.70	1.78	3.964	2.273	7.781	0.56	0.56	Gravity
C4-21018	C4-21080	8	16.5	1.3333	8.53	0.11	8.70	-0.11	0.902	0.244	1.019	1.22	1.42	Surcharged
C4-21021	C4-21022	15	331.4	0.2505	5.68	8.90	8.62	4.85	2.090	0.055	0.319	0.15	0.34	Gravity
C4-21022	C4-21023	15	331.2	0.1540	8.62	4.85	8.66	4.34	1.639	0.248	1.52	0.34	0.32	Gravity
C4-21023	C4-21024	15	332.7	0.1485	8.66	4.32	9.26	3.83	1.609	0.248	1.407	0.34	0.34	Gravity
C4-21024	C4-21025	15	332.4	0.2016	9.26	3.83	7.80	3.16	1.875	0.293	1.518	0.34	0.37	Gravity
C4-21025	C4-21026	15	330.7	0.1966	7.80	3.16	6.03	2.51	1.851	0.338	1.411	0.37	0.43	Gravity
C4-21026	C4-21027	10	254.8	0.2159	6.03	2.51	5.63	1.96	0.658	0.338	1.715	0.43	0.46	Gravity
C4-21027	C4-21028	15	327.3	0.1204	5.63	1.96	4.41	1.57	1.449	0.404	1.351	0.46	0.50	Gravity
C4-21028	C4-21029	15	262.3	0.1205	4.41	262.3	8.47	1.25	1.449	0.437	1.067	0.50	0.64	Gravity
C4-21029	C4-21030	15	64.5	-4.2326	8.47	-1.23	8.00	1.50	-8.591	0.452	2.159	3.12	0.39	Surcharged
C4-21030	C4-21074	18	255.1	0.3865	8.00	0.98	7.57	-0.01	4.221	0.570	0.812	0.38	0.93	Gravity
C4-21035	C4-21036	6	416.4	0.9246	21.75	16.63	17.60	12.78	0.349	0.011	0.601	0.09	0.10	Gravity
C4-21036	C4-21037	6	364.2	1.1505	17.60	12.78	13.56	8.59	0.399	0.022	1.093	0.10	0.11	Gravity
C4-21037	C4-21038	6	117.1	1.6225	13.56	8.59	12.16	6.89	0.462	0.031	0.525	0.11	0.24	Gravity
C4-21038	C4-21039	6	145.0	0.3241	12.16	6.69	10.77	6.22	0.207	0.087	1.394	0.24	0.25	Gravity
C4-21039	C4-21040	6	150.0	0.3467	10.77	6.22	10.10	5.70	0.095	0.266	1.266	0.25	0.29	Gravity
C4-21040	C4-21041	8	285.0	0.2421	10.10	5.70	8.95	5.01	0.384	0.140	0.923	0.29	0.43	Gravity
C4-21041	C4-21042	8	238.0	0.1134	8.95	5.01	7.54	4.74	0.263	0.191	1.553	0.43	0.36	Gravity
C4-21042	C4-21043	8	519.1	0.0000	7.54	4.74	6.49	0.000	0.053	1.094	0.36	0.18	0.18	Gravity
C4-21042	C4-21051	8	75.0	0.0400	7.54	4.74	7.83	4.71	0.156	0.148	2.241	0.36	0.22	Gravity
C4-21043	C4-21044	6	376.0	0.0665	17.50	13.55	17.34	13.30	0.094	0.025	0.847	0.19	0.14	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C4-21044	C4-21045	6	309.7	1.2367	17.34	13.30	13.92	9.47	0.403	0.057	1.57	0.14	0.16	Gravity
C4-21045	C4-21048	6	295.5	1.1878	13.92	9.47	10.16	5.96	0.395	0.077	2.118	0.16	0.16	Gravity
C4-21046	C4-21047	6	436.0	0.8807	15.15	11.00	11.71	7.16	0.340	0.026	0.641	0.11	0.18	Gravity
C4-21047	C4-21048	6	296.4	0.4049	11.71	7.16	10.16	5.96	0.231	0.056	1.661	0.18	0.16	Gravity
C4-21048	C4-21085	8	17.4	36.2069	10.16	5.96	10.50	-0.34	4.696	0.146	6.661	0.10	0.10	Gravity
C4-21049	C4-21050	8	18.2	0.9890	7.83	5.55	7.55	5.37	0.776	0.023	1.029	0.10	0.10	Gravity
C4-21050	C4-21051	10	27.8	2.3741	7.55	5.37	7.83	4.71	2.181	0.023	0.654	0.10	0.13	Gravity
C4-21051	C4-21052	10	248.0	0.1210	7.83	4.71	6.23	4.41	0.493	0.019	0.413	0.13	0.16	Gravity
C4-21052	C4-21086	12	23.1	23.6364	7.83	4.71	8.00	-0.75	11.195	0.152	3.996	0.13	0.13	Gravity
C4-21053	C4-21053	10	279.4	0.1503	6.23	4.41	5.63	3.99	0.549	0.036	0.786	0.16	0.16	Gravity
C4-21057	C4-21057	10	265.9	0.1655	5.63	3.99	5.90	3.55	0.576	0.036	0.311	0.16	0.31	Gravity
C4-21054	C4-21055	6	22.0	2.8636	6.31	4.68	6.55	4.05	0.614	0.024	0.255	0.09	0.35	Gravity
C4-21055	C4-21056	12	297.4	0.1210	6.55	4.05	6.01	3.69	0.801	0.203	1.017	0.35	0.42	Gravity
C4-21056	C4-21057	12	141.8	0.0987	6.01	3.69	5.90	0.724	0.281	0.261	2.124	0.42	0.31	Gravity
C4-21057	C4-21058	15	12.0	0.1667	5.90	3.55	6.08	3.53	1.703	0.317	2.437	0.31	0.28	Gravity
C4-21058	C4-21059	15	12.2	0.2459	6.08	3.51	7.05	3.48	2.073	0.000	0	0.07	0.07	Gravity
C4-21059	C4-21059	18	16.4	0.94512	6.08	-1.45	6.40	-3.00	20.892	0.479	7.01	0.21	0.38	Gravity
C4-21059	C4-21065	10	109.3	0.4300	7.05	3.48	10.48	3.01	0.929	0.000	0	0.07	0.07	Gravity
C4-21059	C4-21064	15	57.7	0.2946	7.05	3.48	10.80	3.31	2.267	0.000	0	0.07	0.07	Gravity
C4-21061	C4-21061	6	15.8	10.3797	8.16	6.96	8.32	5.32	1.168	0.005	0.074	0.07	0.25	Gravity
C4-21061	C4-21063	6	329.1	0.3342	8.32	5.32	6.77	4.22	0.210	0.093	1.354	0.25	0.27	Gravity
C4-21062	C4-21063	8	270.1	0.2777	7.59	4.97	6.77	4.22	0.412	0.059	0.694	0.18	0.27	Gravity
C4-21063	C4-21058	8	163.1	0.4353	6.77	4.22	6.08	3.51	0.515	0.162	2.235	0.27	0.24	Gravity
C4-21064	C4-21065	15	46.9	0.6397	10.80	3.31	10.48	3.01	3.341	0.000	0	0.07	0.07	Gravity
C4-21065	C4-21066	15	93.8	0.5437	10.48	3.01	9.50	2.50	3.079	0.000	0	0.07	0.07	Gravity
C4-21066	C4-21030	12	242.2	0.5822	9.50	2.50	8.00	1.09	1.757	0.000	-0.004	0.07	0.27	Gravity
C4-21067	C4-21068	14	55.0	0.0000	8.30	-1.20	8.38	-1.20	0.000	1.491	1.97	4.05	3.95	Throttled
C4-21068	C4-21069	14	259.7	0.1887	8.38	1.57	5.77	1.08	1.509	1.507	2.497	1.17	1.17	Surcharged
C4-21069	C4-21071	14	110.0	0.1818	5.77	1.08	6.25	0.88	1.481	1.523	2.489	1.16	1.14	Gravity
C4-21070	C4-21071	8	427.6	0.5636	7.65	2.50	6.25	0.09	0.586	0.100	0.416	0.18	1.93	Surcharged
C4-21071	C4-21072	14	142.0	0.1831	6.25	0.88	5.93	0.62	1.487	1.597	2.534	1.13	1.08	Gravity
C4-21072	C4-21073	14	265.0	0.1849	5.93	0.82	7.69	0.13	1.494	1.614	3.152	1.07	0.94	Gravity
C4-21073	C4-21074	14	60.0	0.0000	7.69	-1.80	7.57	-1.80	0.000	1.620	2.194	2.86	2.73	Throttled
C4-21074	C4-21075	18	98.5	0.1421	7.57	-0.06	5.90	-0.20	2.560	2.233	3.107	0.98	0.90	Gravity
C4-21075	C5-21013	18	222.5	0.2652	5.90	-0.20	5.16	-0.79	3.496	2.240	2.663	0.90	1.04	Gravity
C4-21076	C4-21067	14	465.2	0.3009	6.97	2.69	8.30	1.29	1.906	1.466	2.033	1.00	1.57	Surcharged
C4-21078	D4-21086	6	28.2	0.2128	9.35	6.59	9.99	6.53	0.167	0.027	0.607	0.17	0.19	Gravity
C4-21080	C4-21081	18	246.9	0.1580	8.70	-0.11	10.70	-0.50	2.899	2.562	2.299	1.42	1.45	Gravity
C4-21081	C4-21082	24	429.8	0.1419	10.70	-0.50	12.70	-1.11	5.509	4.818	3.092	1.44	1.43	Gravity
C4-21082	C4-21083	24	427.4	0.1497	12.70	-1.11	13.60	-1.75	5.659	4.817	3.085	1.43	1.44	Gravity
C4-21083	C4-21084	24	422.7	0.1514	13.60	-1.75	11.50	-2.39	5.690	4.809	3.017	1.43	1.49	Gravity
C4-21084	C4-21085	24	132.0	0.1515	11.50	-2.39	10.50	-2.59	5.692	4.807	2.98	1.48	1.51	Gravity
C4-21085	C4-21086	24	278.9	0.1470	10.50	-2.59	8.00	-3.00	5.607	4.945	3.033	1.50	1.53	Gravity
C4-21086	C4-21087	24	392.1	0.1505	8.00	-3.00	7.81	-3.59	5.673	5.091	3.084	1.52	1.55	Gravity
C4-21087	C4-21089	24	410.9	0.1485	7.81	-3.59	6.40	-4.20	5.634	5.088	3.058	1.54	1.58	Gravity
C4-21089	C4-21090	30	423.5	0.1511	6.40	-4.20	7.90	-4.84	10.307	5.551	2.086	1.58	1.97	Gravity
C4-21090	C5-21041	30	405.1	0.1037	7.90	-4.84	9.30	-5.26	8.537	5.555	1.873	1.97	2.21	Gravity
C4-21091	C4-22014	8	35.0	0.3600	6.49	4.74	6.11	4.61	0.469	0.062	1.261	0.18	0.18	Gravity
C4-21092	D4-21076	6	246.6	0.1906	19.11	16.01	22.54	15.54	0.158	0.122	1.12	0.36	0.49	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C4-22006	C4-21078	6	235.9	0.4409	10.33	7.63	9.35	6.59	0.241	0.014	0.375	0.10	0.17	Gravity
C4-22009	C4-21054	6	210.0	0.5238	8.17	5.78	6.31	4.68	0.263	0.004	0.232	0.08	0.09	Gravity
C4-22010	C4-21054	6	94.2	-0.0955	6.02	4.59	6.31	4.68	-0.112	0.004	0.238	0.18	0.09	Gravity
C4-22014	C4-22015	8	85.0	0.3612	6.11	4.61	6.00	4.31	0.469	0.063	1.214	0.18	0.19	Gravity
C4-22015	C4-21056	8	170.9	0.3610	6.00	4.31	6.01	3.69	0.469	0.072	0.486	0.19	0.42	Gravity
C4-22021	C4-21092	18	5.2	1.4808	19.19	16.09	19.11	16.01	8.247	0.003	0.017	0.29	0.36	Gravity
C4-22022	C3-21060	6	233.1	0.4934	31.08	27.40	33.09	26.25	0.255	0.003	0.242	0.07	0.07	Gravity
C4-29007	C4-21017	12	9.5	0.0000	10.33	4.00	10.18	4.00	0.000	0.833	2.729	0.62	0.58	Gravity
C4-29012	C4-21048	8	128.3	0.3196	10.00	5.96	10.16	5.55	0.442	0.004	0.021	0.11	0.51	Gravity
C5-21001	C5-21002	8	270.1	0.3813	11.25	7.14	8.57	6.11	0.482	0.001	0.034	0.07	0.13	Gravity
C5-21002	C4-21062	8	269.8	0.4225	8.57	6.11	7.59	4.97	0.508	0.032	0.63	0.13	0.18	Gravity
C5-21003	C5-21004	8	32.6	0.3374	11.31	6.71	10.97	6.80	0.454	0.042	1.387	0.15	0.13	Gravity
C5-21004	C5-21042	8	14.5	22.0000	10.97	1.00	10.90	-2.19	3.664	0.042	2.807	0.08	0.08	Gravity
C5-21006	C5-21007	6	267.9	0.4927	6.97	4.69	6.91	3.37	0.255	0.031	0.755	0.14	0.18	Gravity
C5-21007	C5-21008	8	376.6	0.2841	6.91	3.37	5.05	2.30	0.416	0.056	0.766	0.18	0.24	Gravity
C5-21008	C4-21030	8	360.0	0.3361	5.05	2.30	8.00	1.09	0.453	0.119	1.561	0.24	0.27	Gravity
C5-21009	C5-21010	8	321.4	0.4387	7.04	3.21	1.80	0.019	0.517	0.019	0.592	0.11	0.13	Gravity
C5-21010	C4-21074	8	446.6	0.4165	5.70	1.80	7.57	-0.06	0.504	0.047	0.202	0.13	0.98	Surcharged
C5-21011	C5-21012	6	271.5	0.4641	5.31	3.26	3.85	2.00	0.247	0.003	0.203	0.08	0.09	Gravity
C5-21012	C5-29008	6	419.8	0.6346	3.85	2.00	2.09	0.012	0.289	0.012	0.089	0.09	0.91	Surcharged
C5-21013	C5-21040	24	58.9	0.0730	5.16	-0.79	3.73	-0.83	3.932	2.268	2.164	1.04	1.03	Gravity
C5-21014	C5-21015	8	253.0	0.5534	7.40	3.70	7.60	2.30	0.581	0.003	0.207	0.07	0.07	Gravity
C5-21015	C5-21016	8	300.0	0.6000	7.60	2.20	7.80	0.40	0.605	0.007	0.263	0.08	0.15	Gravity
C5-21016	C5-21017	8	297.7	0.6046	7.80	0.40	7.80	-1.40	0.607	0.054	1.547	0.15	0.15	Gravity
C5-21017	C5-21043	8	258.9	2.9355	7.80	-1.40	8.00	-9.00	1.339	0.057	2.24	0.11	0.11	Gravity
C5-21019	C5-21020	8	148.3	0.8294	8.20	3.40	8.09	2.17	0.711	0.000	0	0.00	0.67	Gravity
C5-21020	C5-21021	8	134.0	0.0000	8.09	2.17	5.16	0.000	0.000	0.000	0	0.67	0.67	Throttled
C5-21021	C5-21022	24	230.0	0.1870	3.90	-1.10	4.92	-1.53	6.323	2.308	2.549	0.85	0.92	Gravity
C5-21022	C5-21023	24	261.7	0.1299	4.92	-1.53	6.13	-1.87	5.271	2.345	2.977	0.92	0.82	Gravity
C5-21023	C5-21024	24	45.2	0.2876	6.13	-1.87	7.841	2.365	2.779	2.365	2.779	0.82	0.87	Gravity
C5-21024	C5-21025	24	558.2	0.1791	6.85	-2.00	11.16	-3.00	6.189	2.389	1.912	0.87	1.18	Gravity
C5-21025	C5-21031	24	113.9	0.0878	11.16	-3.00	11.33	-3.10	4.322	2.389	1.847	1.18	1.22	Gravity
C5-21026	C5-21027	6	173.8	0.8055	8.72	5.31	7.77	3.91	0.326	0.036	1.063	0.13	0.16	Gravity
C5-21027	C5-21029	6	178.5	0.6387	7.77	3.91	10.27	2.77	0.290	0.051	0.388	0.16	0.72	Surcharged
C5-21028	C5-21029	24	141.0	0.8014	11.30	3.90	10.27	2.77	13.091	1.899	2.882	0.53	0.72	Gravity
C5-21029	C5-21030	24	146.0	0.2123	10.27	2.77	11.40	2.46	6.738	1.947	3.711	0.72	0.61	Gravity
C5-21030	C5-21031	24	39.3	14.1476	11.40	3.93	11.33	-3.10	54.972	1.947	3.711	0.72	0.61	Gravity
C5-21031	C5-21032	36	132.8	0.0753	11.33	-3.10	9.15	-3.20	11.829	4.336	2.563	1.22	1.19	Gravity
C5-21032	C5-21032	36	277.9	0.0288	9.15	-3.20	9.10	-3.28	7.315	4.336	4.303	1.19	0.82	Gravity
C5-21037	C5-29014	51	43.5	0.3862	8.80	-8.08	10.00	-8.24	67.898	20.503	4.989	1.89	1.97	Gravity
C5-21040	C5-21021	24	369.8	0.0722	3.70	-0.83	3.90	-1.10	3.932	2.278	2.761	1.03	0.85	Gravity
C5-21041	C5-21042	36	185.0	0.1027	9.30	-5.26	10.90	-5.45	13.818	12.806	3.639	2.20	2.18	Gravity
C5-21042	C5-21107	36	127.3	0.1728	10.90	-5.45	12.30	-5.67	17.920	12.843	3.516	2.17	2.27	Gravity
C5-21043	C5-21044	16	11.4	0.8596	8.00	-9.35	8.00	-9.35	4.599	0.286	2.691	0.23	0.23	Gravity
C5-21044	C5-29026	16	116.2	0.8623	8.00	-9.35	8.00	-10.35	4.605	0.286	2.689	0.23	0.23	Gravity
C5-21045	C5-21014	6	593.7	0.4969	9.23	6.85	7.40	3.70	0.266	0.000	0	0.07	0.07	Gravity
C5-21101	C5-21102	51	82.5	0.0727	7.39	-7.45	29.429	13.132	2.973	2.973	2.973	2.06	2.06	Gravity
C5-21102	C5-21103	51	266.0	0.1053	9.10	-7.45	9.00	-7.73	35.410	17.463	4.104	2.06	2.01	Gravity
C5-21103	C5-21104	51	291.2	0.0996	9.00	-7.73	9.80	-8.02	34.442	17.460	4.543	2.01	1.86	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C5-21104	C5-21037	51	14.1	0.3901	9.30	-8.02	8.30	-8.03	67.898	17.459	4.445	1.86	1.89	Gravity
C5-21106	C5-21107	24	11.2	69.6429	12.00	5.13	12.30	-2.67	121.799	0.311	2.693	0.21	0.21	Gravity
C5-21107	D5-21096	36	316.6	0.1327	12.30	-5.67	13.61	-6.09	15.702	13.141	3.47	2.25	2.33	Gravity
C5-21108	C5-29032	6	140.5	0.5480	10.00	7.97	7.20	0.269	0.000	0	0	0.07	0.07	Gravity
C5-22006	C5-21019	10	108.1	0.1832	6.75	3.60	8.20	3.40	0.606	0.000	0	0.00	0.00	Gravity
C5-22008	C5-21023	6	180.0	2.7000	7.16	2.99	6.13	-1.87	0.596	0.004	0.03	0.07	0.82	Surcharged
C5-22009	C5-21006	6	139.1	0.0144	7.26	4.71	6.97	0.043	0.043	0.006	0.235	0.14	0.14	Gravity
C5-23001	C5-27005	12	215.3	0.0000	7.43	-1.94	8.00	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
C5-23004	C5-23005	12	20.0	0.0000	8.10	-1.94	8.13	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
C5-23005	C5-23006	12	421.6	0.0000	8.08	-1.94	8.10	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
C5-23006	C5-23001	12	80.8	0.0000	8.08	-1.94	7.43	-1.94	-	1.072	2.112	PRESSURE	PRESSURE	Foremain
C5-24001	C5-29029	10	13.2	0.1818	8.00	4.19	8.00	4.17	0.606	0.000	0	0.00	0.00	Gravity
C5-27005	C5-29010	8	2321.8	0.0000	8.00	-1.94	8.09	-1.94	-	1.073	4.754	PRESSURE	PRESSURE	Foremain
C5-27006	C5-29031	8	174.8	0.0000	8.00	4.23	8.00	4.23	-	0.280	1.241	PRESSURE	PRESSURE	Foremain
C5-27010	C5-29028	6	16.1	0.0000	8.00	4.23	8.00	4.23	-	0.280	2.206	PRESSURE	PRESSURE	Foremain
C5-27011	C5-29027	6	16.2	0.0000	8.00	4.23	8.00	4.23	-	0.000	0	PRESSURE	PRESSURE	Foremain
C5-29003	C5-29009SG	30	256.1	-2.6279	7.81	-2.50	11.48	4.23	-	0.000	0	PRESSURE	PRESSURE	Foremain
C5-29008	C5-21013	6	19.9	0.6332	5.74	-0.66	5.16	-0.79	0.289	0.015	-0.132	0.91	1.04	Surcharged
C5-29009	C5-29013	30	691.7	0.0000	11.48	4.23	8.14	4.23	-	0.280	0.088	PRESSURE	PRESSURE	Foremain
C5-29014	D5-29010	51	53.5	0.3869	10.00	-8.24	10.00	-8.45	67.898	29.400	7.069	1.97	1.97	Gravity
C5-29020	C5-29021	8	597.6	3.3384	8.24	7.50	10.05	-12.45	-	0.068	1.855	PRESSURE	PRESSURE	Foremain
C5-29027	C5-29028	6	3.3	0.0000	8.00	4.23	8.00	4.23	-	0.000	0	PRESSURE	PRESSURE	Foremain
C5-29028	C5-27006	8	3.3	0.0000	8.00	4.23	8.00	4.23	-	0.280	1.241	PRESSURE	PRESSURE	Foremain
C5-29029	C5-22006	10	312.0	0.1830	8.00	4.17	6.75	3.60	0.606	0.000	0	0.00	0.00	Gravity
C5-29031	C5-29009	16	1977.8	0.0000	8.00	4.23	11.48	4.23	-	0.280	0.31	PRESSURE	PRESSURE	Foremain
C5-29032	C5-21045	6	100.5	0.5473	9.81	7.20	9.23	6.65	0.288	0.000	0	0.07	0.07	Gravity
C6-21001	C6-21002	6	300.1	0.8465	8.60	-0.24	8.60	0.292	0.110	1.823	0.63	2.45	2.45	Surcharged
C6-21002	C6-21003	6	157.6	0.5393	8.60	-0.24	8.60	0.266	0.114	1.984	2.45	3.23	3.23	Surcharged
C6-21003	C6-21004	6	272.1	0.6156	8.60	-1.09	9.09	-2.77	0.285	0.105	1.915	3.23	4.78	Surcharged
C6-21004	C6-21005	6	70.7	0.6153	9.09	-2.77	8.50	-3.20	0.285	0.102	1.777	4.78	5.18	Surcharged
C6-21005	C6-21011	6	58.4	0.5137	8.50	-3.20	9.60	-3.50	0.260	0.099	2.277	5.18	5.46	Surcharged
C6-21006	C6-21007	8	282.0	0.4504	8.50	2.27	8.60	1.00	0.524	0.094	1.305	0.20	1.13	Surcharged
C6-21007	C6-21008	8	251.6	0.4491	8.60	1.00	9.10	-0.13	0.524	0.132	1.958	1.13	2.23	Surcharged
C6-21008	C6-21009	8	259.1	0.4400	9.10	-0.13	8.60	-1.27	0.518	0.158	1.951	2.23	3.32	Surcharged
C6-21009	C6-21010	8	242.4	0.4579	8.60	-1.27	9.30	-2.38	0.529	0.151	1.877	3.32	4.39	Surcharged
C6-21010	C6-21011	8	246.6	0.4542	9.30	-2.38	9.60	-3.50	0.527	0.137	2.079	4.39	5.46	Surcharged
C6-21011PS	C6-22001	8	428.9	0.2616	9.60	4.75	8.00	3.63	-	0.270	1.197	PRESSURE	PRESSURE	Foremain
C6-22001	C6-22003	8	1004.6	0.0000	8.00	3.63	8.00	3.63	-	0.270	1.197	PRESSURE	PRESSURE	Foremain
C6-22003	C6-22005	8	292.8	0.0000	8.00	3.63	9.03	3.63	-	0.270	1.197	PRESSURE	PRESSURE	Foremain
C6-22004	C5-29012	8	1111.4	0.0000	8.00	3.63	8.05	3.63	-	0.270	1.197	PRESSURE	PRESSURE	Foremain
C6-22005	C6-22004	8	708.9	0.0000	9.03	3.63	8.00	3.63	-	0.270	1.197	PRESSURE	PRESSURE	Foremain
C7-21001	C7-21002	12	293.9	0.2552	8.68	5.05	10.80	4.30	1.163	0.000	0	0.07	0.07	Gravity
C7-21002	C7-21003	12	180.0	0.2500	10.80	4.30	10.17	3.85	1.162	0.000	0	0.07	0.07	Gravity
C7-21003	C7-21004	12	311.0	0.2572	10.17	3.85	5.30	3.05	1.168	0.000	0	0.07	0.07	Gravity
C7-21004	C7-21005	12	295.0	0.2576	5.30	3.05	8.50	2.29	1.169	0.000	0	0.07	0.07	Gravity
C7-21005	D7-21071	12	320.6	0.2464	8.50	2.29	8.38	1.50	1.143	0.000	-0.004	0.07	0.14	Gravity
C7-21006	C7-21007	8	233.1	0.4848	10.00	4.52	9.00	3.39	0.544	0.001	0.087	0.08	0.08	Gravity
C7-21007	C7-21008	8	261.8	0.4469	9.00	3.39	8.30	2.22	0.522	0.006	0.167	0.08	0.15	Gravity
C7-21008	C7-21009	10	278.2	0.2983	8.30	2.22	8.90	1.39	0.774	0.046	0.867	0.15	0.65	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
C7-21009	C7-21010	10	229.8	0.3046	8.30	1.39	8.30	0.89	0.782	0.062	1.064	0.65	1.35	Surcharged
C7-21010	C7-21011	10	227.1	0.3056	8.30	0.89	9.40	0.00	0.783	0.063	0.739	1.35	2.03	Surcharged
C7-21011	C7-21012	10	247.5	0.3055	9.40	0.00	8.70	-0.76	0.783	0.121	1.498	2.03	2.78	Surcharged
C7-21012	C7-21013	10	301.6	0.2984	8.70	-0.76	9.00	-0.76	0.774	0.117	1.481	2.78	3.66	Surcharged
C7-21013	C7-21014	10	298.4	0.3016	9.00	-1.66	8.60	-2.56	0.778	0.109	1.4	3.66	4.54	Surcharged
C6-21014	C6-21011	10	321.7	0.2922	8.60	-2.56	9.60	-3.50	0.766	0.117	2.013	4.54	5.46	Surcharged
C8-21001	C7-21001	12	242.4	0.2517	9.07	5.66	8.68	5.05	1.156	0.000	0	0.07	0.07	Gravity
D1-21002	D1-21003	6	125.9	4.7657	553.30	547.30	547.80	541.30	0.792	0.055	2.875	0.11	0.10	Gravity
D1-21003	D1-21004	6	225.5	9.7118	547.80	541.30	526.00	519.40	1.130	0.084	3.058	0.10	0.11	Gravity
D1-21004	E1-21025	6	262.4	9.4512	526.00	519.40	504.20	494.60	1.115	0.082	2.989	0.11	0.14	Gravity
D1-21005	D1-21006	6	299.5	7.1786	542.60	536.70	522.00	515.20	0.972	0.007	0.643	0.07	0.07	Gravity
D1-21006	D1-21007	6	148.5	13.4680	522.00	515.20	503.20	495.20	1.331	0.013	0.995	0.07	0.08	Gravity
D1-21007	D1-21008	6	293.0	13.1741	503.20	495.20	465.20	456.60	1.317	0.024	1.5	0.08	0.09	Gravity
D1-21008	D1-21010	6	189.7	9.5941	465.20	456.60	445.00	438.40	1.124	0.043	2.532	0.09	0.10	Gravity
D1-21009	D1-21008	6	156.0	9.5513	477.40	471.50	465.20	456.60	1.121	0.011	0.652	0.07	0.09	Gravity
D1-21010	D2-21002	6	177.6	11.4865	445.00	438.40	428.40	418.00	1.229	0.051	1.564	0.10	0.15	Gravity
D1-21012	D1-21013	6	249.6	10.9776	516.40	510.40	483.00	489.20	1.202	0.019	1.28	0.08	0.09	Gravity
D1-21013	D1-21014	6	287.6	9.4228	489.20	483.00	463.60	455.90	1.114	0.035	2.017	0.09	0.10	Gravity
D1-21014	D2-21001	6	298.2	8.8531	463.60	455.90	436.60	429.50	1.079	0.048	2.439	0.10	0.11	Gravity
D1-21016	D1-21017	6	290.1	9.4105	538.50	535.00	513.50	507.70	1.113	0.009	0.73	0.07	0.07	Gravity
D1-21017	D1-21018	6	269.3	10.9915	513.50	507.70	483.80	478.10	1.203	0.014	1.147	0.07	0.08	Gravity
D1-21018	D2-21038	6	266.0	11.1278	483.80	478.10	454.60	448.50	1.210	0.020	1.259	0.08	0.09	Gravity
D1-22011	D1-21012	6	187.3	5.2322	525.20	520.20	516.40	510.40	0.830	0.008	0.623	0.07	0.08	Gravity
D1-22015	D1-21016	6	151.8	2.8327	544.80	539.30	538.50	535.00	0.611	0.003	0.315	0.07	0.07	Gravity
D2-21001	D2-21002	6	163.9	7.0165	436.60	429.50	426.40	418.00	0.961	0.058	1.783	0.11	0.15	Gravity
D2-21002	D2-21003	6	202.8	3.7475	426.40	418.00	415.40	410.40	0.702	0.118	3.707	0.15	0.15	Gravity
D2-21003	D2-21004	6	64.7	4.4822	415.40	410.40	415.70	407.50	0.768	0.122	4.206	0.15	0.15	Gravity
D2-21004	D2-21006	6	250.0	10.6800	415.70	407.50	386.50	380.80	1.186	0.133	3.835	0.13	0.16	Gravity
D2-21005	D2-21004	6	212.9	11.2729	437.60	431.50	415.70	407.50	1.218	0.009	0.345	0.07	0.13	Gravity
D2-21006	D2-21007	6	115.9	4.8318	386.50	380.80	382.60	375.20	0.797	0.145	1.718	0.16	0.34	Gravity
D2-21007	D2-21008	6	316.3	8.6595	382.60	375.20	353.21	347.81	1.068	0.673	8.003	0.30	0.34	Gravity
D2-21008	D2-21009	6	314.0	10.0350	353.21	347.81	321.77	316.30	1.149	0.700	7.978	0.29	0.36	Gravity
D2-21009	D2-21010	6	321.6	9.8072	321.77	316.30	290.18	284.76	1.136	0.724	7.838	0.30	0.38	Gravity
D2-21010	D2-21011	6	328.2	9.5643	290.18	284.76	258.76	253.37	1.122	0.753	9.009	0.31	0.31	Gravity
D2-21011	D2-21012	8	282.7	11.3230	258.76	253.37	229.76	221.36	2.629	0.778	6.692	0.26	0.34	Gravity
D2-21012	D2-21024	8	260.0	8.7038	229.76	221.36	206.27	198.73	2.305	1.130	9.87	0.34	0.34	Gravity
D2-21014	D2-21014	6	213.1	10.6335	349.64	344.73	327.87	322.07	1.183	0.040	1.038	0.09	0.17	Gravity
D2-21014	D2-21015	6	244.1	0.4195	327.87	322.07	324.50	321.05	0.235	0.049	1.151	0.17	0.19	Gravity
D2-21015	D2-21018	6	251.8	0.4194	324.50	321.05	327.36	319.99	0.235	0.061	1.591	0.19	0.17	Gravity
D2-21016	D2-21017	6	97.9	7.3749	347.57	341.27	339.18	334.05	0.985	0.202	5.564	0.17	0.17	Gravity
D2-21017	D2-21018	6	163.3	8.6099	339.18	334.05	327.36	319.99	1.064	0.206	5.369	0.16	0.17	Gravity
D2-21018	D2-21019	6	295.5	13.0051	327.36	319.99	287.03	281.56	1.308	0.275	7.125	0.17	0.17	Gravity
D2-21019	D2-21020	6	298.7	14.6903	287.03	281.56	243.73	237.68	1.390	0.294	4.848	0.17	0.24	Gravity
D2-21020	D2-21021	6	69.0	3.7536	243.73	237.68	241.58	235.09	0.703	0.299	2.987	0.24	0.37	Gravity
D2-21021	D2-21022	6	296.3	1.0192	241.58	235.09	237.87	232.07	0.366	0.308	3.154	0.36	0.36	Gravity
D2-21022	D2-21023	6	158.2	3.8053	237.87	232.07	231.41	226.05	0.708	0.320	5.251	0.25	0.24	Gravity
D2-21023	D2-21012	6	103.4	4.5358	231.41	226.05	229.76	221.36	0.773	0.332	3.589	0.24	0.34	Gravity
D2-21024	D2-21025	8	177.6	9.2568	206.27	198.73	188.86	182.29	2.377	1.142	7.491	0.33	0.45	Gravity
D2-21025	D2-21051	8	267.1	7.6825	188.86	182.29	166.89	161.77	2.165	1.398	9.408	0.40	0.45	Gravity

Burlingame Wastewater Collection System Master Plan

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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D2-21026	D2-21027	6	298.4	10.3150	401.28	396.10	370.12	365.32	1.165	0.010	0.71	0.07	0.08	Gravity
D2-21027	D2-21028	6	285.8	10.9027	370.12	365.32	341.61	334.16	1.198	0.028	1.5	0.08	0.10	Gravity
D2-21028	D2-21029	6	262.9	4.1347	341.61	334.16	331.15	323.29	0.738	0.041	2.017	0.10	0.11	Gravity
D2-21029	D2-21035	6	177.4	4.6223	331.15	323.29	324.61	315.09	0.780	0.053	1.655	0.11	0.15	Gravity
D2-21030	D2-21031	6	125.0	6.6880	449.56	442.96	440.18	434.62	0.938	0.010	0.874	0.07	0.07	Gravity
D2-21031	D2-21032	6	299.7	15.0317	440.18	434.52	393.00	389.47	1.406	0.019	1.41	0.08	0.08	Gravity
D2-21032	D2-21033	6	305.1	15.4179	393.00	389.47	351.34	342.43	1.424	0.034	1.96	0.08	0.10	Gravity
D2-21033	D2-21034	6	150.6	8.0943	351.34	342.43	336.59	330.24	1.032	0.045	2.504	0.10	0.10	Gravity
D2-21034	D2-21035	6	196.0	7.7296	336.59	330.24	324.61	315.09	1.009	0.049	1.523	0.10	0.15	Gravity
D2-21035	D2-21036	6	97.6	3.2295	324.61	315.09	319.30	311.94	0.652	0.105	3.002	0.15	0.16	Gravity
D2-21036	D2-21037	6	289.7	5.2330	311.94	306.21	297.17	291.05	0.830	0.138	3.637	0.15	0.17	Gravity
D2-21037	D2-21044	6	115.6	3.7803	297.17	291.05	292.17	286.68	0.705	0.146	3.966	0.17	0.17	Gravity
D2-21038	D2-21039	6	176.0	3.3523	454.60	448.50	447.90	442.60	0.664	0.024	1.81	0.09	0.08	Gravity
D2-21039	D2-21040	6	300.9	14.9551	447.90	442.60	403.40	403.40	1.403	0.029	2.09	0.08	0.08	Gravity
D2-21040	D2-21041	6	114.3	14.9493	403.40	397.60	385.80	380.51	1.403	0.034	2.337	0.08	0.09	Gravity
D2-21041	D2-21042	6	234.8	14.9502	385.80	380.51	350.79	345.41	1.403	0.039	2.53	0.09	0.09	Gravity
D2-21042	D2-21043	6	302.2	14.9504	345.41	305.62	300.23	305.62	1.403	0.046	2.714	0.09	0.10	Gravity
D2-21043	D2-21044	6	124.0	10.9274	305.62	300.23	292.17	286.68	1.199	0.049	1.581	0.10	0.15	Gravity
D2-21044	D2-21045	6	226.0	12.1637	292.17	286.68	266.13	259.19	1.285	0.195	5.065	0.15	0.17	Gravity
D2-21045	D2-21046	6	123.2	6.5341	266.13	259.19	255.79	251.14	0.927	0.197	5.123	0.17	0.17	Gravity
D2-21046	D2-21047	6	268.0	15.6448	255.79	251.14	217.90	209.48	1.430	0.208	4.598	0.14	0.19	Gravity
D2-21047	D2-21049	6	315.8	4.7910	217.90	209.48	199.63	194.35	0.794	0.222	4.465	0.19	0.21	Gravity
D2-21048	D2-21049	6	117.9	1.6031	200.64	196.24	199.63	194.35	0.459	0.010	0.194	0.08	0.21	Gravity
D2-21049	D2-21050	6	188.8	4.3273	199.63	194.35	186.18	181.33	0.755	0.240	4.21	0.21	0.23	Gravity
D2-21050	D2-21052	6	131.1	2.9672	191.33	186.18	188.86	182.29	0.625	0.248	2.07	0.23	0.45	Gravity
D2-21051	D2-21052	8	317.0	8.3407	166.89	161.77	143.71	135.33	2.266	1.413	6.03	0.39	0.76	Surcharged
D2-21052	D2-21073	8	247.5	8.4040	135.53	124.56	124.56	114.73	2.265	1.667	6.431	0.43	6.38	Surcharged
D2-21053	D2-21054	6	95.0	3.2000	324.79	316.79	320.03	313.75	0.649	0.008	0.696	0.08	0.08	Gravity
D2-21054	D2-21055	6	160.0	12.6063	320.03	313.75	298.68	293.58	1.288	0.017	1.37	0.08	0.08	Gravity
D2-21055	D2-21056	6	175.4	14.4698	298.68	293.58	275.40	268.20	1.380	0.021	1.183	0.08	0.10	Gravity
D2-21056	D2-21059	6	102.5	14.1951	275.40	268.20	258.96	253.65	1.367	0.065	3.568	0.10	0.10	Gravity
D2-21057	D2-21058	6	146.9	2.5868	298.50	283.60	282.50	279.80	0.583	0.036	2.161	0.11	0.09	Gravity
D2-21058	D2-21059	6	169.5	6.8437	282.50	279.80	275.40	268.20	0.949	0.038	2.155	0.09	0.10	Gravity
D2-21059	D2-21061	6	193.9	15.1882	258.96	253.65	238.55	224.20	1.414	0.072	2.501	0.10	0.14	Gravity
D2-21060	D2-21061	6	273.4	0.3182	228.24	225.07	238.55	224.20	0.205	0.016	0.569	0.11	0.14	Gravity
D2-21061	D2-21062	6	122.0	3.7869	238.55	224.20	225.81	219.58	0.706	0.092	3.452	0.14	0.14	Gravity
D2-21062	D2-21063	6	147.0	12.8844	225.81	219.58	205.97	200.64	1.302	0.099	4.688	0.11	0.11	Gravity
D2-21063	D2-21064	6	168.5	15.8635	205.97	200.64	180.38	173.91	1.445	0.108	4.292	0.11	0.13	Gravity
D2-21064	D2-21066	6	201.5	13.3002	180.38	173.91	154.67	147.11	1.323	0.134	2.647	0.13	0.21	Gravity
D2-21065	D2-21068	6	232.0	7.1379	195.08	190.47	180.38	173.91	0.969	0.017	0.678	0.08	0.13	Gravity
D2-21066	D2-21068	6	239.2	1.6597	154.67	147.11	148.34	143.14	0.467	0.154	1.983	0.21	0.29	Gravity
D2-21067	D2-21068	6	149.7	2.7054	153.52	147.19	148.34	143.14	0.597	0.014	0.18	0.08	0.29	Gravity
D2-21068	D2-21069	6	239.4	0.6266	148.34	143.14	151.37	141.64	0.287	0.177	2.014	0.29	0.33	Gravity
D2-21069	D2-21070	6	94.9	0.4953	151.37	141.64	150.87	141.17	0.255	0.185	2.56	0.32	0.28	Gravity
D2-21070	D2-21052	6	285.4	1.9762	150.87	141.17	143.71	135.53	0.510	0.198	1.504	0.23	0.55	Surcharged
D2-21071	D2-21072	6	178.1	2.2235	151.21	145.70	147.27	141.74	0.541	0.032	1.347	0.11	0.12	Gravity
D2-21072	D2-21073	6	300.7	2.1317	147.27	141.74	135.33	135.33	0.530	0.050	0.377	0.12	0.75	Surcharged
D2-21073	C2-21004	8	348.4	3.5419	124.56	114.73	108.02	102.39	1.470	1.680	7.627	6.29	1.93	Throttled
D2-21078	D2-21036	6	177.3	3.2307	319.30	311.94	311.34	306.21	0.652	0.120	3.698	0.16	0.15	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D3-21003	D3-21007	8	132.1	1.0371	77.36	74.96	76.90	73.59	0.795	0.046	1.159	0.13	0.15	Gravity
D3-21004	D3-21085	8	391.8	4.4844	102.39	95.05	83.48	77.48	1.654	0.018	0.985	0.08	0.09	Gravity
D3-21007	D3-21086	8	198.2	0.7669	76.90	73.59	79.15	72.07	0.684	0.068	1.768	0.15	0.15	Gravity
D3-21008	D3-21084	6	184.0	4.9402	97.64	94.09	88.80	85.00	0.806	0.026	1.701	0.09	0.09	Gravity
D3-21009	D3-21014	8	138.6	1.9625	80.01	76.32	81.29	73.60	1.094	0.035	0.149	0.10	0.73	Surcharged
D3-21010	D3-21011	6	219.3	0.7661	79.22	73.35	80.13	71.67	0.318	0.004	0.237	0.07	0.09	Gravity
D3-21011	D3-21012	6	281.3	1.4433	80.13	71.67	74.17	67.61	0.436	0.013	0.418	0.09	0.15	Gravity
D3-21012	D4-21095	10	133.8	1.7265	74.17	67.61	66.80	65.30	1.861	0.087	0.271	0.15	0.83	Gravity
D3-21014	D3-21015	10	305.0	1.0164	81.29	73.60	77.80	70.50	1.428	1.366	4.578	0.71	0.66	Gravity
D3-21015	D4-21095	10	299.6	1.7356	77.80	70.50	66.80	65.30	1.866	1.392	3.922	0.54	0.83	Gravity
D3-21017	D3-21014	10	149.7	1.2091	81.41	75.41	81.29	73.60	1.558	0.429	1.341	0.31	0.73	Gravity
D3-21018	D3-21019	6	125.0	0.3280	82.45	76.87	81.32	76.46	0.208	0.003	0.21	0.08	0.08	Gravity
D3-21019	D3-21020	6	100.0	0.7700	81.32	76.46	81.19	75.69	0.318	0.006	0.392	0.08	0.09	Gravity
D3-21020	D3-21021	6	166.5	1.8739	81.19	75.69	78.57	72.57	0.497	0.017	1.006	0.09	0.10	Gravity
D3-21021	D3-21015	8	143.1	1.4465	78.57	72.57	77.80	70.50	0.940	0.023	0.111	0.10	0.56	Gravity
D3-21022	D4-21082	6	127.0	2.3071	78.79	73.07	74.64	70.14	0.551	0.006	0.286	0.07	0.11	Gravity
D3-21022	D3-21021	8	50.4	0.9921	78.79	73.07	78.57	72.57	0.778	0.004	0.179	0.07	0.10	Gravity
D3-21023	D3-21003	6	144.1	0.5968	78.62	75.82	77.36	74.96	0.280	0.010	0.404	0.09	0.13	Gravity
D3-21024	D3-21026	6	456.0	0.4561	82.97	79.82	82.49	77.74	0.245	0.027	0.432	0.13	0.25	Gravity
D3-21026	D3-21027	6	50.1	0.6188	82.49	77.74	83.13	77.43	0.286	0.128	2.223	0.25	0.23	Gravity
D3-21027	D3-21030	6	149.2	2.0845	83.13	77.45	80.04	74.34	0.524	0.139	1.273	0.19	0.41	Gravity
D3-21028	D3-21029	6	259.2	1.8634	85.48	81.89	81.96	77.06	0.495	0.051	1.608	0.13	0.15	Gravity
D3-21029	D3-21030	6	158.2	1.7193	81.96	77.06	80.04	74.34	0.476	0.076	0.697	0.15	0.41	Gravity
D3-21030	D3-21031	6	153.0	0.4706	80.04	74.34	78.72	73.62	0.249	0.233	2.811	0.40	0.31	Gravity
D3-21031	D3-21036	6	149.5	3.2910	78.72	73.62	75.70	68.70	0.658	0.240	1.66	0.22	2.55	Surcharged
D3-21032	D3-21033	6	53.0	1.1887	75.20	72.00	75.33	71.37	0.396	0.034	0.895	0.12	0.23	Gravity
D3-21033	D3-21035	6	162.0	0.2901	75.33	71.37	70.90	70.90	0.195	0.042	0.843	0.23	0.66	Surcharged
D3-21034	D3-21035	6	100.0	0.3500	76.80	71.25	74.90	70.90	0.215	0.024	0.418	0.32	0.66	Surcharged
D3-21035	D3-22006	6	193.1	0.4827	74.90	70.90	75.19	69.97	0.252	0.080	1.302	0.66	1.51	Surcharged
D3-21036	D3-21037	6	157.2	0.5725	75.70	68.70	72.49	67.80	0.275	0.358	2.56	2.54	1.82	Throttled
D3-21037	D3-21038	6	139.3	0.4379	72.49	67.80	72.94	67.19	0.240	0.362	2.698	1.80	0.95	Throttled
D3-21038	D3-21041	6	142.6	0.6942	72.94	67.19	70.25	66.20	0.302	0.362	3.437	0.92	0.39	Throttled
D3-21039	D3-21081	6	151.7	7.3237	72.73	68.48	66.36	57.37	0.982	0.059	0.43	0.11	1.48	Surcharged
D3-21040	D3-21041	6	102.5	1.2976	72.88	67.53	70.25	66.20	0.413	0.010	0.117	0.08	0.34	Gravity
D3-21041	D3-21080	6	150.3	2.1224	70.25	66.20	66.01	63.01	0.529	0.388	4.416	0.33	0.33	Gravity
D3-21042	D3-21045	8	149.0	2.1745	62.89	58.53	57.53	55.29	1.152	0.230	1.713	0.21	0.38	Gravity
D3-21042	D3-21043	6	205.0	0.2780	62.89	58.53	58.61	57.96	0.191	0.065	1.74	0.21	0.17	Gravity
D3-21043	D3-21046	6	150.0	2.1467	69.41	57.96	58.12	54.74	0.532	0.110	1.923	0.17	0.23	Gravity
D3-21044	D4-21069	8	298.1	3.5928	61.94	57.37	50.01	46.66	1.481	0.287	4.728	0.21	0.21	Gravity
D3-21045	D3-21046	8	205.1	0.2682	57.53	55.29	54.74	49.05	0.245	0.356	2.588	0.38	0.29	Gravity
D3-21046	D3-21047	8	150.0	3.2627	58.12	54.74	52.16	49.00	1.528	0.362	3.603	0.23	0.30	Gravity
D3-21047	D3-21048	8	102.6	1.4620	52.16	49.00	51.90	47.50	0.944	0.378	3.831	0.30	0.30	Gravity
D3-21048	D3-21049	8	140.1	4.2755	51.90	47.50	44.71	41.51	0.750	0.400	4.908	0.27	0.31	Gravity
D3-21049	D4-21070	8	277.1	1.8658	44.71	41.51	39.59	36.34	1.067	0.407	2.687	0.31	0.45	Gravity
D3-21050	D3-21032	6	304.1	0.8057	77.75	74.45	75.20	72.00	0.326	0.021	0.947	0.11	0.12	Gravity
D3-21051	D3-21052	6	198.4	11.3458	177.72	171.50	155.48	148.99	1.222	0.023	1.618	0.08	0.09	Gravity
D3-21052	D3-21053	6	218.8	3.6335	155.48	148.95	147.33	141.00	0.691	0.070	2.513	0.13	0.14	Gravity
D3-21053	D3-21055	6	343.7	6.0227	147.33	141.00	125.89	120.30	0.890	0.110	3.935	0.14	0.14	Gravity
D3-21054	D3-21055	8	255.8	10.9109	151.54	147.42	125.89	119.51	2.581	0.072	1.65	0.10	0.17	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D3-21055	D3-21056	8	368.2	6.5100	125.89	119.51	101.32	95.54	1.993	0.224	2.247	0.17	0.30	Gravity
D3-21056	D3-21058	10	324.4	0.4316	101.32	95.54	97.83	94.14	0.930	0.253	2.443	0.30	0.28	Gravity
D3-21057	D3-21058	6	110.0	0.9091	99.20	95.08	97.83	94.08	0.346	0.022	0.445	0.11	0.21	Gravity
D3-21058	D3-21059	10	140.7	3.1841	97.83	94.08	99.60	95.27	2.527	0.285	3.646	0.21	0.23	Gravity
D3-21059	D3-21061	10	258.2	2.2967	94.90	89.60	89.25	83.67	2.147	0.301	3.6	0.23	0.24	Gravity
D3-21060	D3-21061	6	132.0	1.0985	90.43	85.25	89.25	83.80	0.380	0.016	1.106	0.10	0.11	Gravity
D3-21061	D3-21066	10	140.3	2.2452	89.25	83.67	85.96	80.52	2.122	0.338	3.076	0.24	0.29	Gravity
D3-21062	D3-21064	6	310.5	2.8406	100.02	95.09	93.75	86.27	0.611	0.048	2.221	0.11	0.11	Gravity
D3-21064	D3-21063	8	115.0	1.5261	93.75	86.13	88.00	84.38	0.965	0.100	2.282	0.16	0.17	Gravity
D3-21064	D3-21063	6	173.0	-3.9306	93.75	86.13	101.99	92.93	-0.032	-0.032	-1.85	0.16	0.10	Gravity
D3-21065	D3-21066	6	344.5	0.4296	85.42	82.16	85.96	80.68	0.238	0.147	2.355	0.29	0.25	Gravity
D3-21066	D3-21068	10	146.4	2.1926	85.96	80.52	83.15	77.31	2.097	0.500	3.583	0.29	0.35	Gravity
D3-21067	D3-21068	6	280.3	2.6585	90.65	84.23	83.15	77.31	0.592	0.019	0.2	0.09	0.35	Gravity
D3-21068	D3-21070	10	220.4	1.2568	83.15	77.31	78.94	74.54	1.588	0.539	3.862	0.35	0.35	Gravity
D3-21069	D3-21070	6	272.9	2.1693	85.86	80.48	78.94	74.56	0.534	0.019	0.26	0.09	0.28	Gravity
D3-21070	D3-21071	10	165.6	2.6449	78.94	74.54	75.85	70.16	2.304	0.582	3.522	0.30	0.40	Gravity
D3-21071	D3-21072	10	370.9	0.9383	75.85	70.16	71.90	66.68	1.372	0.604	3.741	0.40	0.39	Gravity
D3-21072	C3-21042	10	248.6	1.1987	71.90	66.68	69.32	63.70	1.551	0.652	4.044	0.39	0.39	Gravity
D3-21073	D3-21074	6	196.7	1.9115	73.79	68.91	70.30	65.15	0.502	0.033	1.211	0.11	0.13	Gravity
D3-21074	D3-21075	6	378.3	2.0169	70.30	65.15	63.04	57.52	0.515	0.061	1.777	0.13	0.16	Gravity
D3-21075	D3-21055	6	256.0	2.5391	63.04	57.52	55.20	51.02	0.578	0.104	3.311	0.16	0.16	Gravity
D3-21076	D3-21077	6	278.0	1.4496	97.33	92.10	92.48	88.07	0.437	0.012	0.717	0.09	0.09	Gravity
D3-21077	C3-21021	6	135.3	5.9128	92.48	88.07	84.89	80.07	0.882	0.034	0.928	0.09	0.17	Gravity
D3-21078	C3-21021	6	132.0	3.7424	91.17	85.28	80.34	70.02	0.702	0.013	1.016	0.08	0.08	Gravity
D3-21079	D3-21017	6	127.7	7.6586	89.68	85.19	81.41	75.41	1.004	0.014	0.178	0.08	0.31	Gravity
D3-21080	D3-21042	8	150.2	2.9827	66.01	63.01	62.89	58.53	1.349	0.271	4.369	0.21	0.21	Gravity
D3-21080	D3-21082	8	288.0	0.8056	66.01	63.01	60.69	60.19	0.701	0.141	2.092	0.21	0.23	Gravity
D3-21081	D3-21044	8	148.1	0.4321	66.36	58.53	61.94	57.89	0.514	0.221	2.482	0.32	0.28	Gravity
D3-21082	D3-21081	8	289.5	0.7461	69.19	60.69	66.36	58.53	0.675	0.152	1.487	0.23	0.32	Gravity
D3-21083	D3-21085	8	145.2	1.5255	88.00	84.38	85.42	82.16	0.965	0.111	1.159	0.17	0.29	Gravity
D3-21084	D3-21009	8	157.5	5.5111	88.80	85.00	80.01	76.32	1.834	0.031	1.41	0.09	0.10	Gravity
D3-21085	D3-21087	8	159.6	2.4373	83.48	77.48	76.90	73.59	1.220	0.021	0.524	0.09	0.15	Gravity
D3-21086	D3-21087	8	228.4	0.9063	79.15	72.07	80.89	70.00	0.744	0.070	2.006	0.15	0.15	Gravity
D3-21087	D3-21012	10	146.9	1.6270	80.89	70.00	67.61	1.807	0.744	0.070	1.652	0.14	0.15	Gravity
D3-21088	D3-21003	9	254.5	6.8134	96.12	92.30	77.36	74.96	2.791	0.032	0.986	0.09	0.13	Gravity
D3-21088	D3-21088	6	240.7	7.8106	117.60	111.40	96.12	92.60	1.014	0.023	1.678	0.08	0.08	Gravity
D3-22001	D3-21024	6	96.0	8.8125	89.05	85.40	82.97	79.82	0.875	0.004	0.148	0.07	0.13	Gravity
D3-22002	D3-21032	6	93.0	12.0108	85.67	83.17	75.20	72.00	1.257	0.009	0.408	0.07	0.12	Gravity
D3-22003	D3-21036	6	108.7	0.4821	75.31	69.22	75.70	68.70	0.252	0.120	0.845	2.14	2.55	Surcharged
D3-22004	D3-22003	6	117.9	0.4860	75.27	69.31	75.31	75.31	0.252	0.113	1.527	2.07	2.14	Surcharged
D3-22005	D3-22004	6	115.9	0.4823	75.23	69.87	75.27	69.31	0.252	0.100	1.381	1.59	2.07	Surcharged
D3-22006	D3-22005	6	20.5	0.4780	75.19	69.97	75.23	69.87	0.252	0.093	1.478	1.50	1.59	Surcharged
D3-22007	D3-21034	6	105.0	3.8857	76.27	75.33	76.60	71.25	0.715	0.009	0.399	0.08	0.32	Gravity
D3-22008	D3-21023	6	174.9	1.8239	81.65	79.01	78.62	75.82	0.490	0.005	0.287	0.07	0.09	Gravity
D3-22009	D3-21039	6	231.4	4.6111	81.97	79.15	72.73	68.48	0.779	0.021	1.086	0.09	0.11	Gravity
D3-22010	D4-21049	6	256.0	7.5391	80.27	79.47	64.32	60.17	0.986	0.008	0.062	0.07	0.52	Surcharged
D4-21001	D5-21069	10	300.0	2.5740	44.50	33.30	33.40	25.58	2.272	0.579	4.926	0.30	0.31	Gravity
D4-21002	D4-21003	6	160.3	0.6176	41.76	35.95	39.81	34.96	0.285	0.010	0.162	0.09	0.24	Gravity
D4-21003	D4-21005	8	300.0	1.1500	39.81	34.96	34.20	31.51	0.838	0.210	2.916	0.24	0.24	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-21004	D4-21003	8	316.0	0.2785	40.65	35.84	39.81	34.96	0.412	0.173	2.364	0.31	0.25	Gravity
D4-21005	D4-21007	8	300.0	2.4900	34.20	31.51	29.35	24.04	1.233	0.260	2.166	0.22	0.35	Gravity
D4-21006	D4-21005	6	485.1	0.4801	37.83	33.65	34.20	31.51	0.246	0.016	0.295	0.11	0.22	Gravity
D4-21006	D4-21001	6	184.7	0.1895	37.83	33.65	33.30	33.30	0.158	0.010	0.13	0.11	0.30	Gravity
D4-21007	D4-21010	8	138.8	0.4899	29.35	24.04	27.75	23.36	0.547	0.287	2.038	0.35	0.40	Gravity
D4-21008	D4-21007	6	225.0	0.3422	27.81	24.81	29.35	24.04	0.212	0.009	0.095	0.10	0.35	Gravity
D4-21008	D4-29005	6	151.1	1.6228	27.81	24.81	28.36	22.36	0.462	0.020	0.214	0.10	0.34	Gravity
D4-21009	D4-21008	6	200.0	3.7550	38.86	32.32	27.81	24.81	0.703	0.011	0.677	0.08	0.10	Gravity
D4-21010	D4-21011	8	18.3	0.0546	27.75	23.36	28.04	23.35	0.183	0.287	2.654	0.40	0.32	Gravity
D4-21011	D4-29005	10	223.8	0.4433	28.04	23.35	28.36	22.36	0.943	0.287	2.138	0.32	0.34	Gravity
D4-21014	D4-21016	18	194.9	2.0267	47.74	41.60	44.70	37.65	9.668	3.836	7.184	0.67	0.71	Gravity
D4-21016	D4-21018	18	115.2	1.7361	44.70	37.65	42.70	35.65	8.947	3.845	6.867	0.71	0.74	Gravity
D4-21018	D4-21020	18	144.1	1.5267	42.70	35.65	40.20	33.45	8.390	3.862	6.725	0.74	0.75	Gravity
D4-21020	D4-21021	18	221.5	1.3995	40.20	33.45	36.60	30.35	8.033	3.880	6.77	0.75	0.75	Gravity
D4-21021	D4-21022	18	242.6	1.9786	36.60	30.35	32.70	25.55	9.552	3.903	7.672	0.69	0.69	Gravity
D4-21022	D4-21023	18	306.9	4.1251	32.70	25.55	27.63	12.89	13.791	3.952	8.892	0.57	0.80	Gravity
D4-21023	D4-21025	24	24.6	1.6260	27.63	12.66	27.42	12.26	18.641	5.052	3.506	1.03	1.34	Gravity
D4-21025	D4-21081	24	250.7	0.4108	27.42	12.27	28.30	11.24	9.373	7.290	5.683	1.31	1.21	Gravity
D4-21027	D4-21028	18	13.6	0.5882	28.14	11.23	28.18	11.15	5.209	0.018	0.045	0.49	0.57	Gravity
D4-21028	D4-21097	18	174.9	-0.2230	28.18	11.15	24.29	11.54	-3.206	0.018	0.231	0.57	0.18	Gravity
D4-21029	D4-21030	18	290.0	-0.3586	21.40	7.75	18.92	8.79	-4.066	0.067	1.047	1.21	0.16	Gravity
D4-21030	D4-21031	18	273.3	0.4354	18.92	8.79	13.05	7.60	4.481	0.067	1.223	0.15	0.14	Gravity
D4-21031	D5-21078	18	120.0	0.4833	13.05	7.60	13.92	7.02	4.721	0.067	0.515	0.14	0.26	Gravity
D4-21032	D4-21033	6	146.0	-0.6712	24.85	14.82	18.36	15.80	-0.297	0.009	0.487	1.08	0.10	Surcharged
D4-21033	D4-21034	6	134.0	0.8187	18.36	15.80	20.36	14.70	0.328	0.016	0.782	0.10	0.11	Gravity
D4-21034	D4-21035	6	156.0	0.8186	20.36	14.70	18.36	13.43	0.328	0.022	0.947	0.11	0.12	Gravity
D4-21035	D4-21036	6	151.0	0.6530	18.36	13.43	16.44	12.44	0.293	0.027	1.501	0.12	0.12	Gravity
D4-21036	D4-21041	6	16.7	-1.4970	16.44	12.19	16.90	12.44	-0.444	0.007	0.4	0.34	0.10	Gravity
D4-21036	D5-21078	6	122.9	4.4101	16.44	12.44	13.92	7.02	0.762	0.026	0.395	0.09	0.26	Gravity
D4-21037	D4-21038	8	145.0	1.1379	24.27	17.38	20.73	15.73	0.833	0.027	1.099	0.10	0.11	Gravity
D4-21038	D4-21039	6	135.0	1.0963	20.73	15.73	21.21	14.25	0.380	0.027	0.572	0.11	0.20	Gravity
D4-21039	D4-21040	6	155.2	0.6714	21.21	14.25	18.33	13.21	0.297	0.086	1.855	0.20	0.20	Gravity
D4-21040	D4-21041	6	151.5	0.6719	18.33	13.21	16.90	12.19	0.297	0.086	1.348	0.20	0.25	Gravity
D4-21041	D5-21078	6	143.1	0.7827	16.90	12.19	13.92	11.07	0.321	0.151	2.368	0.25	0.25	Gravity
D4-21042	D4-21043	6	300.0	3.2733	59.53	52.83	46.67	43.01	0.656	0.094	1.685	0.14	0.23	Gravity
D4-21043	D4-21057	8	250.0	0.7840	46.67	43.01	49.53	41.05	0.692	0.155	1.874	0.23	0.26	Gravity
D4-21045	D4-21045	8	135.0	10.1407	70.17	61.51	53.87	47.82	2.488	0.006	0.045	0.07	0.38	Gravity
D4-21045	D4-21058	12	165.0	5.3455	53.87	47.82	45.96	39.00	5.325	1.554	6.338	0.38	0.49	Gravity
D4-21046	D4-21045	12	40.2	1.8159	53.23	48.55	53.87	47.82	3.104	1.531	5.944	0.51	0.51	Gravity
D4-21047	D4-21046	10	250.0	1.1280	54.85	51.37	53.23	48.55	1.504	1.530	4.891	0.94	0.69	Throttled
D4-21048	D4-21047	10	200.0	2.6450	62.40	56.66	54.85	51.37	2.304	1.526	4.6	0.51	1.00	Surcharged
D4-21049	D4-21048	10	131.0	2.6794	64.32	60.17	62.40	56.66	2.319	1.526	6.537	0.50	0.53	Gravity
D4-21050	D4-21049	10	155.0	3.1806	66.90	65.10	64.32	60.17	2.526	1.500	6.462	0.47	0.52	Gravity
D4-21051	D4-21050	8	116.5	3.5365	74.12	69.22	66.90	65.10	1.469	0.021	0.116	0.09	0.49	Gravity
D4-21052	D4-21051	6	145.6	0.6319	74.64	70.14	74.12	69.22	0.288	0.021	1.401	0.11	0.11	Gravity
D4-21053	D4-21052	6	208.3	7.6140	91.85	86.00	74.64	70.14	1.001	0.009	0.448	0.07	0.11	Gravity
D4-21054	D3-21020	6	258.2	0.5035	83.02	76.99	81.19	75.69	0.257	0.006	0.361	0.08	0.09	Gravity
D4-21054	D4-22003	6	170.7	0.2402	83.02	76.99	82.58	76.58	0.178	0.004	0.337	0.08	0.08	Gravity
D4-21055	E4-22025	6	209.8	1.6969	96.05	91.15	91.97	87.59	0.473	0.020	0.599	0.10	0.16	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-21056	E4-21016	6	358.4	0.7785	47.00	41.74	41.40	38.95	0.320	0.017	0.508	0.10	0.15	Gravity
D4-21057	D4-21058	8	340.0	0.6029	49.53	41.05	45.96	39.00	0.607	0.187	1.052	0.26	0.49	Gravity
D4-21058	D4-21060	12	300.0	3.1133	45.96	39.00	34.03	29.66	4.064	1.839	7.476	0.49	0.49	Gravity
D4-21059	D4-22026	6	243.0	0.1852	35.99	32.55	35.63	30.00	0.156	0.073	1.768	0.25	0.18	Gravity
D4-21060	D4-21061	12	140.0	3.5714	34.00	29.64	30.00	24.64	4.353	1.987	7.507	0.49	0.52	Gravity
D4-21061	D4-21062	12	160.0	2.9625	30.00	24.64	26.00	19.90	3.964	2.008	6.641	0.51	0.58	Gravity
D4-21062	D4-21064	15	300.0	1.5533	26.00	15.24	20.50	12.42	5.204	2.142	2.559	0.57	2.26	Surcharged
D4-21063	D4-21062	6	456.1	2.6595	36.66	32.03	26.00	19.90	0.592	0.067	0.509	0.13	0.58	Surcharged
D4-21064	D4-21065	15	300.0	0.2967	20.50	15.24	18.79	14.35	2.274	3.084	3.744	2.21	1.44	Throttled
D4-21065	D4-21079	15	38.0	0.3500	18.79	14.35	14.22	13.88	2.472	3.169	3.9	1.40	1.31	Throttled
D4-21066	D4-21067	20	49.0	0.4082	18.23	13.88	17.97	13.65	5.745	3.341	4.616	0.88	0.85	Gravity
D4-21067	D4-21080	20	16.0	0.8125	17.97	13.68	18.00	13.55	8.106	2.239	3.046	0.78	0.86	Gravity
D4-21067	D4-21068	18	397.4	0.0906	17.97	13.68	22.23	13.32	2.044	1.101	1.925	0.78	0.75	Gravity
D4-21068	D4-21069	18	196.9	0.1067	22.23	13.32	24.99	13.11	2.218	1.101	1.954	0.75	0.75	Gravity
D4-21069	D4-21070	8	143.4	7.1967	50.01	46.66	39.59	36.34	2.096	0.332	2.038	0.19	0.45	Gravity
D4-21070	D4-21071	8	225.2	1.7052	39.59	36.34	35.80	32.50	1.020	0.772	4.909	0.44	0.44	Gravity
D4-21071	D4-21072	8	160.0	4.5813	35.80	32.50	25.17	1.672	3.055	0.807	3.055	0.33	FULL	Throttled
D4-21072	D4-21073	8	50.0	0.4600	29.26	25.17	30.12	24.94	0.530	0.706	2.968	FULL	4.06	Throttled
D4-21073	D4-21102	8	150.8	0.7029	30.12	24.94	28.00	23.88	0.655	0.748	3.137	4.04	3.78	Throttled
D4-21074	D4-21075	8	400.0	0.5525	27.08	22.83	28.27	20.62	0.581	0.796	4.404	3.49	1.55	Throttled
D4-21075	D4-21076	8	390.0	1.3795	28.27	20.62	20.50	15.24	0.918	0.836	3.443	1.52	2.26	Surcharged
D4-21076	D4-21077	6	250.0	0.1880	22.84	15.54	23.83	15.07	0.157	0.146	1.748	0.49	0.53	Surcharged
D4-21077	D4-21078	8	112.4	0.4893	23.83	15.07	19.19	14.52	0.547	0.169	0.899	0.53	1.02	Surcharged
D4-21078	D4-21079	8	30.8	0.1299	19.19	14.52	18.20	14.48	0.282	0.173	1.468	1.02	1.04	Surcharged
D4-21079	D4-21066	15	96.1	0.3507	18.20	14.22	18.23	13.88	2.472	3.341	5.318	1.27	0.92	Throttled
D4-21101	D4-21101	24	391.0	0.1637	18.00	13.55	23.00	12.91	5.916	2.237	2.429	0.86	0.95	Gravity
D4-21080	D4-21083	6	294.3	3.3979	23.25	18.70	15.70	0.669	0.068	1.907	0.13	0.16	0.16	Gravity
D4-21084	D4-21086	12	290.0	0.7483	15.70	8.70	9.99	6.53	1.992	0.098	1.435	0.16	0.19	Gravity
D4-21085	D4-21105	6	159.9	1.7573	21.57	18.48	19.07	15.67	0.481	0.000	-0.002	0.07	0.12	Gravity
D4-21086	C4-21055	12	290.0	0.8552	9.99	6.53	6.56	4.05	2.130	0.150	0.94	0.19	0.35	Gravity
D4-21087	D4-21088	6	146.5	1.7884	17.02	13.42	13.21	10.80	0.485	0.075	1.979	0.15	0.17	Gravity
D4-21088	C4-21061	6	517.6	1.0587	13.21	10.80	8.32	5.32	0.373	0.077	1.239	0.17	0.25	Gravity
D4-21089	D4-21023	18	185.0	0.1189	24.99	13.11	27.63	12.89	2.342	1.100	2.623	0.75	0.80	Gravity
D4-21091	D4-21092	24	446.6	0.4344	28.30	10.88	20.60	8.94	9.638	7.290	5.682	1.30	1.21	Gravity
D4-21092	D4-21093	24	438.9	0.6243	20.60	8.94	13.70	6.20	11.554	7.290	6.017	1.15	1.15	Gravity
D4-21093	C5-21041	24	467.4	1.8314	13.70	6.20	9.30	-2.36	19.790	7.290	8.685	0.86	0.86	Gravity
D4-21094	D5-21070	10	311.9	0.2725	29.07	22.02	21.17	0.739	0.309	1.195	0.38	0.67	0.67	Gravity
D4-21095	D4-21050	10	28.0	0.7143	66.80	65.30	66.90	65.10	1.197	1.478	4.809	0.80	0.68	Gravity
D4-21097	D4-21029	18	129.4	1.3910	24.29	11.54	21.40	9.74	8.008	0.068	0.881	0.18	0.18	Gravity
D4-21098	D4-21097	8	16.9	2.7219	24.60	11.54	24.29	11.54	1.287	0.050	1.028	0.11	0.18	Gravity
D4-21099	D4-21098	8	443.7	1.6520	23.60	12.00	24.60	12.10	1.004	0.050	1.796	0.12	0.12	Gravity
D4-21101	D4-21025	24	386.0	0.1658	23.00	12.91	27.42	12.27	5.954	2.239	1.569	0.95	1.33	Gravity
D4-21102	D4-21074	18	149.2	0.7038	28.00	23.88	27.08	22.83	0.655	0.747	2.934	3.77	3.51	Throttled
D4-21104	C4-22021	18	148.7	1.4748	22.22	14.87	19.19	16.09	8.247	0.000	-0.004	0.15	0.29	Gravity
D4-21105	D4-21067	6	128.0	1.7578	19.07	15.67	17.02	13.42	0.481	0.046	1.465	0.12	0.15	Gravity
D4-22003	D3-21022	8	208.2	1.6859	82.58	76.58	78.79	73.07	1.014	0.006	0.451	0.08	0.07	Gravity
D4-22004	D4-21053	6	39.3	4.2494	90.77	87.67	91.85	86.00	0.748	0.003	0.304	0.07	0.07	Gravity
D4-22005	D4-21053	6	90.7	2.4256	91.70	88.20	91.85	86.00	0.565	0.005	0.414	0.07	0.07	Gravity
D4-22006	D4-21049	6	410.0	1.4390	69.65	66.07	64.32	60.17	0.435	0.011	0.085	0.08	0.52	Surcharged

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D4-22007	D4-21058	6	140.0	1.9214	48.55	41.69	45.96	39.00	0.503	0.080	0.631	0.15	0.49	Gravity
D4-22010	D4-21055	6	75.0	0.7200	94.74	91.69	96.05	91.15	0.308	0.009	0.532	0.09	0.10	Gravity
D4-22012	D4-21042	6	300.0	0.0000	52.83	52.83	59.53	52.83	0.000	0.039	1.323	0.31	0.14	Gravity
D4-22016	D4-21044	6	290.0	-2.9931	76.60	76.60	70.17	76.60	-0.628	-0.404	-0.404	0.31	0.07	Gravity
D4-22013	D4-21045	8	240.0	5.3250	62.85	60.60	53.87	47.82	1.803	0.014	0.104	0.08	0.38	Gravity
D4-22014	E4-22013	6	206.7	2.7092	63.96	56.61	54.10	51.01	0.597	0.006	0.452	0.07	0.08	Gravity
D4-22020	D4-21071	6	350.0	6.0343	56.32	53.62	35.80	32.50	0.891	0.021	0.232	0.08	0.34	Gravity
D4-22021	D4-21061	8	390.0	7.0513	54.84	52.14	30.00	24.64	2.075	0.018	0.093	0.08	0.52	Gravity
D4-22022	D4-22052	8	194.8	6.0370	41.42	36.93	36.88	25.17	1.919	0.019	0.074	0.08	4.21	Surcharged
D4-22026	D4-21060	6	189.5	1.2876	35.63	32.10	29.66	29.66	0.412	0.101	0.813	0.18	0.47	Gravity
D4-22027	D4-21059	6	107.3	2.7679	39.74	35.52	35.99	32.55	0.604	0.045	0.706	0.11	0.25	Gravity
D4-22028	D4-22027	6	89.2	6.8031	44.57	41.41	39.74	35.52	0.932	0.031	1.463	0.09	0.11	Gravity
D4-22036	D4-21003	6	182.1	1.1367	39.05	37.03	38.81	34.96	0.387	0.013	0.223	0.09	0.24	Gravity
D4-22037	D4-21005	6	175.0	0.6629	35.17	32.67	34.20	31.51	0.295	0.015	0.278	0.10	0.22	Gravity
D4-22038	D4-22039	6	255.0	1.1725	31.25	29.05	32.94	26.06	0.393	0.013	0.539	0.09	0.12	Gravity
D4-22039	D4-21022	6	20.0	0.8000	32.94	26.06	32.70	25.90	0.324	0.022	1.129	0.12	0.22	Gravity
D4-22040	D4-21007	6	136.0	0.4118	27.90	24.60	29.35	24.04	0.233	0.012	0.146	0.10	0.35	Gravity
D4-22046	C4-21060	6	416.0	0.5529	13.54	9.26	8.16	6.96	0.270	0.005	0.437	0.08	0.07	Gravity
D4-22050	C4-21078	6	101.0	1.7525	11.08	8.36	9.35	6.59	0.480	0.010	0.268	0.08	0.17	Gravity
D4-22051	D4-21086	6	27.0	3.2963	9.60	7.42	9.99	6.53	0.658	0.025	0.559	0.09	0.19	Gravity
D4-22052	D4-22053	8	9.5	0.0000	36.88	25.17	36.55	25.17	0.000	0.030	0.119	4.21	4.21	Throttled
D4-22053	D4-21072	8	195.2	0.0000	36.65	25.17	29.26	25.17	0.000	0.049	0.203	4.21	FULL	Throttled
D4-22054	D4-21083	8	253.6	0.7453	23.85	20.59	23.25	18.70	0.313	0.040	1.613	0.14	0.13	Gravity
D4-22055	D4-21037	8	112.7	2.7507	23.93	20.35	24.27	17.25	1.296	0.021	0.295	0.09	0.23	Gravity
D4-22056	D4-21084	12	136.8	2.3173	18.87	11.87	15.70	8.70	3.506	0.007	0.127	0.11	0.16	Gravity
D4-22057	D4-22058	6	108.8	1.1029	23.38	20.38	22.05	19.18	0.381	0.000	0	0.07	0.07	Gravity
D4-22058	D4-290	6	8.6	2.1163	22.05	19.18	22.00	19.00	0.528	0.000	0	0.07	0.07	Gravity
D4-22061	D4-22051	6	281.0	3.9359	21.03	18.48	9.60	7.42	0.720	0.014	0.842	0.08	0.09	Gravity
D4-290	D4-21104	6	33.9	2.1180	22.00	19.00	22.22	18.28	0.528	0.000	0	0.07	0.07	Gravity
D4-29005	D4-21094	10	76.4	0.4424	28.36	22.36	29.07	22.02	0.943	0.306	1.954	0.34	0.38	Gravity
D5-21002	D5-21003	6	192.1	0.5466	39.94	36.80	40.68	35.75	0.268	0.003	0.231	0.07	0.08	Gravity
D5-21003	D5-21004	6	310.8	5.2220	40.68	35.75	23.25	19.52	0.829	0.011	0.644	0.08	0.09	Gravity
D5-21004	E5-21073	8	159.5	7.1536	23.25	19.52	12.13	8.11	2.089	0.045	1.249	0.09	0.15	Gravity
D5-21005	D5-21006	10	153.5	0.2182	10.36	5.55	10.00	5.22	0.662	0.285	1.724	0.39	0.40	Gravity
D5-21006	D5-21010	10	153.5	0.2182	10.00	5.22	10.03	4.88	0.662	0.288	1.534	0.40	0.44	Gravity
D5-21007	E5-21048	6	171.7	0.2737	10.60	7.90	11.03	7.43	0.190	0.001	0.058	0.07	0.13	Gravity
D5-21008	D5-21008	8	154.7	0.8403	10.60	7.90	7.16	6.60	0.716	0.001	0.112	0.07	0.07	Gravity
D5-21008	D5-22029	8	125.2	0.3123	10.30	6.60	10.00	6.21	0.436	0.001	0.105	0.07	0.07	Gravity
D5-21009	D5-21011	6	120.7	0.4805	9.41	5.23	9.46	4.65	0.251	0.012	0.556	0.10	0.11	Gravity
D5-21010	D5-21013	10	151.9	0.1580	10.03	4.88	10.00	4.64	0.563	0.297	1.588	0.44	0.49	Gravity
D5-21011	D5-21014	6	174.5	0.2235	9.46	4.65	8.62	4.26	0.172	0.355	0.11	0.40	0.40	Gravity
D5-21012	D5-21016	8	290.0	0.2414	8.20	5.70	9.00	5.00	0.384	0.002	0.181	0.08	0.07	Gravity
D5-21013	D5-21017	10	145.3	0.1583	10.00	4.64	9.50	4.41	0.563	0.293	2.033	0.48	0.61	Gravity
D5-21014	D5-21018	6	288.8	0.2458	8.62	4.26	8.55	3.55	0.180	0.031	0.255	0.40	1.09	Surcharged
D5-21015	D5-21017	10	145.1	0.3901	9.50	4.41	10.00	3.84	0.885	0.298	1.159	0.61	1.11	Surcharged
D5-21016	D5-21022	8	259.7	0.7701	9.00	5.00	8.40	3.00	0.686	0.004	0.02	0.07	1.24	Surcharged
D5-21017	D5-21019	10	142.1	0.0732	10.00	3.84	8.85	3.74	0.383	0.298	2.181	1.11	1.15	Surcharged
D5-21018	D5-21020	10	15.9	1.3522	8.55	3.55	8.50	3.34	1.647	0.743	2.272	1.07	1.24	Surcharged
D5-21019	D5-21018	8	29.2	-0.8904	8.55	3.29	8.55	3.55	-0.737	0.706	3.319	1.58	1.09	Surcharged

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D5-21020	D5-21023	10	105.7	0.3690	8.50	3.35	8.40	2.96	0.861	0.762	2.409	1.21	1.28	Surcharged
D5-21021	D5-21019	12	14.4	1.1806	9.76	3.91	8.85	3.74	2.506	0.405	2.693	0.98	1.15	Surcharged
D5-21022	D5-21023	8	12.4	0.3226	8.40	3.00	8.40	2.96	0.444	0.024	0.024	1.24	1.28	Surcharged
D5-21023	D5-21024	10	8.3	2.4096	8.40	2.96	8.09	2.76	2.202	0.763	2.056	1.26	1.44	Surcharged
D5-21024	D5-21025	10	172.3	0.1219	8.09	2.76	8.00	2.55	0.494	0.763	2.075	1.42	1.12	Throttled
D5-21025	D5-21026	10	39.8	0.0000	8.00	2.55	8.00	2.55	0.000	0.766	2.089	1.10	0.99	Throttled
D5-21026	D5-21027	10	32.3	0.0000	8.00	2.55	9.02	2.55	0.000	0.766	2.115	0.97	0.88	Throttled
D5-21027	D5-21030	12	199.4	0.0752	9.02	2.55	8.43	2.40	0.632	0.923	3.566	0.87	0.55	Gravity
D5-21028	D5-21029	6	69.8	0.4441	9.15	4.99	8.63	4.68	0.242	0.159	2.426	0.31	0.26	Gravity
D5-21029	D5-21027	8	446.2	0.4774	8.63	4.68	9.02	2.55	0.540	0.159	0.674	0.26	0.88	Surcharged
D5-21030	D5-21034	12	410.1	0.2634	8.43	2.11	10.55	1.03	1.182	1.119	2.394	0.83	0.88	Gravity
D5-21031	D5-21030	6	280.1	0.2535	9.06	3.11	8.43	2.40	0.183	0.194	2.11	0.68	0.55	Throttled
D5-21034	D6-21060	12	301.9	0.2120	10.55	1.03	8.36	0.39	1.061	1.128	3.82	0.87	0.56	Gravity
D5-21036	D5-21036	27	273.3	0.1537	7.85	-3.21	8.22	-3.63	7.848	9.076	4.666	1.87	1.59	Gravity
D5-21036	D5-21037	27	138.0	0.3116	8.22	-3.63	9.44	-4.06	11.175	9.075	4.647	1.58	1.60	Gravity
D5-21037	C5-29014	27	121.9	0.1559	9.44	-4.06	10.00	-4.25	7.903	9.075	5.867	1.58	1.31	Gravity
D5-21038	D5-21046	6	183.2	0.8024	16.19	10.31	14.96	0.325	0.009	0.11	0.09	0.31	0.31	Gravity
D5-21039	D5-21041	8	290.1	2.1475	25.60	17.97	21.20	11.74	1.145	1.081	4.481	5.28	5.92	Surcharged
D5-21040	D5-21043	10	290.0	1.1345	23.66	17.16	19.89	13.87	1.509	0.769	4.207	0.43	0.43	Gravity
D5-21041	D5-21044	8	301.3	1.4537	21.20	17.16	17.50	1.942	1.085	4.456	5.88	4.51	2.78	Throttled
D5-21042	D5-21065	10	465.0	0.3183	18.04	10.14	21.64	8.66	0.793	0.412	1.651	1.71	2.78	Surcharged
D5-21043	D5-21046	10	290.0	1.7345	19.89	13.87	14.96	8.84	1.865	0.386	3.207	0.27	0.31	Gravity
D5-21043	D5-21042	10	210.0	1.7762	19.89	13.87	18.04	10.14	1.888	0.390	2.079	0.27	1.71	Surcharged
D5-21044	D5-21047	8	305.1	1.4356	17.50	7.36	11.40	2.98	0.936	1.089	4.821	4.47	3.05	Throttled
D5-21045	D5-21038	6	42.4	0.0000	15.63	10.31	16.19	10.31	0.000	0.005	0.376	0.10	0.09	Gravity
D5-21045	D5-22025	6	322.2	0.6030	15.63	10.31	17.87	8.37	0.282	0.014	0.302	0.10	2.01	Surcharged
D5-21046	D5-21049	10	291.0	1.0241	14.96	8.84	10.60	1.433	0.402	3.339	0.31	0.31	0.31	Gravity
D5-21047	D5-21048	10	106.1	0.2639	11.40	2.64	10.40	2.36	0.728	1.099	4.143	3.37	3.04	Throttled
D5-21048	D5-21053	15	167.7	1.5444	10.40	1.94	9.20	-0.65	5.190	2.987	3.382	3.43	5.10	Surcharged
D5-21048	D5-21050	8	45.4	-0.2863	10.40	2.36	10.49	-0.009	-0.192	-0.009	-0.192	3.04	2.91	Surcharged
D5-21049	D5-21021	12	310.5	0.1739	10.60	4.45	9.76	3.91	0.961	0.400	2.555	0.57	0.98	Gravity
D5-21051	D5-21052	10	26.6	2.7820	11.88	5.84	11.85	5.10	2.360	0.056	0.895	0.12	0.36	Gravity
D5-21052	D5-21048	6	176.1	0.3805	11.88	5.10	10.40	4.43	0.224	0.073	1.844	0.36	0.97	Surcharged
D5-21053	D5-21054	15	261.8	0.1719	9.20	-0.65	10.50	-1.10	1.731	2.985	3.439	5.07	4.17	Throttled
D5-21054	D5-21055	15	166.3	0.1864	10.50	-1.10	10.50	-1.41	1.803	2.984	3.476	4.14	3.59	Throttled
D5-21055	D5-21056	15	344.4	0.1539	10.50	-1.41	9.30	-1.94	1.638	2.983	3.56	3.56	2.32	Throttled
D5-21056	D5-21057	15	39.5	0.1772	9.30	-1.94	9.30	-2.01	1.758	2.983	3.572	2.27	2.14	Throttled
D5-21057	D5-21058	15	112.8	0.2128	9.30	-2.01	9.40	-2.25	1.926	3.125	3.776	2.08	1.68	Throttled
D5-21058	D5-21059	15	84.4	0.2133	9.40	-2.25	9.50	-2.43	1.929	3.125	3.832	1.63	1.33	Throttled
D5-21059	C5-21037	15	92.5	0.2054	9.50	-2.43	8.80	-2.62	1.893	3.125	5.156	1.29	0.89	Throttled
D5-21060	D5-21061	8	223.8	0.3083	36.01	24.65	31.38	23.96	0.434	0.411	3.126	0.53	0.38	Gravity
D5-21061	D5-21063	8	338.5	1.1581	31.38	23.96	26.00	20.04	0.841	0.484	3.718	0.37	0.37	Gravity
D5-21062	D5-21061	10	331.6	0.1448	15.80	6.05	15.71	5.57	0.539	0.932	3.351	1.80	0.81	Throttled
D5-21063	D5-21105	10	388.4	0.4300	26.00	20.04	24.72	0.929	0.171	1.72	0.25	0.27	0.27	Gravity
D5-21063	D5-21064	6	15.1	3.8146	26.00	20.04	26.00	19.46	0.708	0.324	4.562	0.25	0.28	Gravity
D5-21064	D5-21065	6	284.9	3.8133	26.00	19.46	21.64	8.60	0.708	0.374	2.564	0.27	2.84	Surcharged
D5-21065	D5-21066	10	290.0	0.3448	21.64	8.60	16.68	7.60	0.832	0.845	2.193	2.83	2.77	Throttled
D5-21066	D5-21067	10	285.0	0.2526	16.68	7.60	12.30	6.88	0.712	0.914	2.405	2.76	2.26	Throttled
D5-21067	D5-21062	10	291.4	0.2848	12.30	6.88	15.80	6.05	0.756	0.921	2.452	2.25	1.82	Throttled

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D5-21068	D5-21051	10	437.0	0.4073	12.05	8.79	11.68	7.01	0.904	0.038	1.208	0.13	0.12	Gravity
D5-21069	D4-21009	6	224.9	-2.9978	40.30	25.58	38.86	32.32	-0.628	-0.010	-0.826	0.31	0.08	Gravity
D5-21069	D5-21070	10	171.3	2.5733	40.30	25.58	34.92	21.17	2.272	0.613	2.439	0.31	0.67	Gravity
D5-21070	D5-21071	10	138.9	0.7559	34.92	21.17	31.75	20.12	1.232	0.915	2.49	0.66	1.09	Surcharged
D5-21071	D5-21073	10	282.3	0.2976	31.75	20.12	25.92	19.28	0.773	0.938	3.869	1.07	0.54	Throttled
D5-21072	D5-21104	8	11.0	0.0000	32.39	27.99	32.39	27.99	0.000	0.012	0.569	0.11	0.10	Gravity
D5-21073	D5-21093	10	291.6	0.8505	25.92	19.28	16.80	13.06	0.944	0.391	3.391	0.53	0.61	Gravity
D5-21075	D4-21039	6	379.4	0.8197	20.07	17.36	21.21	14.25	0.328	0.042	0.899	0.14	0.20	Gravity
D5-21076	D5-21090	10	295.6	0.8694	18.21	15.09	15.58	12.52	1.321	0.951	4.001	0.53	0.53	Gravity
D5-21077	D4-21041	6	544.4	1.1940	22.43	18.69	16.90	12.19	0.396	0.059	0.915	0.15	0.25	Gravity
D5-21078	D5-21081	18	150.0	0.3733	13.92	7.02	14.44	6.46	4.149	0.252	1.757	0.26	0.28	Gravity
D5-21079	C5-21001	8	456.6	0.8585	13.74	11.06	11.25	7.14	0.724	0.001	0.078	0.07	0.07	Gravity
D5-21079	D5-21078	6	16.1	25.0932	13.74	11.06	13.92	7.02	1.816	0.005	0.082	0.07	0.26	Gravity
D5-21080	D5-21085	8	319.3	0.9615	13.87	11.07	12.15	8.00	0.766	0.006	0.28	0.08	0.11	Gravity
D5-21081	D5-21082	21	329.0	0.2432	14.44	6.46	12.15	5.66	5.051	0.252	1.493	0.28	0.29	Gravity
D5-21082	C5-21106	21	177.8	0.2981	12.15	5.66	12.00	5.13	5.591	0.311	2.28	0.29	0.26	Gravity
D5-21083	D5-21082	6	121.0	4.1653	15.80	10.70	0.740	5.66	0.061	0.061	0.798	0.12	0.29	Gravity
D5-21084	D5-21083	6	269.0	0.5985	15.79	12.31	15.80	10.70	0.281	0.033	1.488	0.13	0.12	Gravity
D5-21085	C5-21003	8	140.9	0.9155	12.15	8.00	11.31	6.71	0.747	0.027	0.707	0.11	0.15	Gravity
D5-21087	C5-21003	8	403.7	0.5945	13.02	9.11	6.02	0.016	0.419	0.10	0.15	0.15	0.15	Gravity
D5-21088	D5-21092	24	182.0	0.1099	13.60	4.24	12.34	4.04	4.848	1.882	2.069	0.89	0.92	Gravity
D5-21090	D5-21091	10	16.7	41.0180	15.58	12.52	15.71	5.67	9.063	0.953	10.757	0.20	0.71	Gravity
D5-21091	D5-21088	12	175.8	0.6712	15.71	5.42	13.60	4.24	1.887	1.883	3.944	0.94	0.89	Gravity
D5-21092	C5-21028	24	283.0	0.0495	12.34	4.04	3.252	3.90	3.252	1.893	3.703	0.92	0.60	Gravity
D5-21093	D5-21076	10	289.0	0.5917	21.67	16.80	18.21	15.09	1.090	0.952	3.874	0.60	0.55	Gravity
D5-21096	D5-21101	36	552.6	0.1013	13.61	-6.09	12.60	-6.65	13.724	13.133	3.56	2.32	2.26	Gravity
D5-21097	D5-21088	21	192.1	0.0000	13.50	4.60	0.000	-0.011	0.000	-0.011	-0.069	0.53	0.53	Gravity
D5-21098	D6-21047	6	203.0	0.4778	8.28	6.23	7.76	5.26	0.251	0.005	0.275	0.08	0.10	Gravity
D5-21101	D5-21102	36	214.7	0.1025	12.60	-6.65	11.00	-6.87	13.801	13.131	3.624	2.25	2.22	Gravity
D5-21102	C5-21101	36	517.0	0.1006	11.00	-6.87	10.00	-7.39	13.673	13.129	3.926	2.21	2.06	Gravity
D5-21104	D4-21099	8	273.2	3.1332	32.39	27.99	23.60	19.43	1.383	0.035	1.269	0.10	0.12	Gravity
D5-21105	D5-21040	10	261.6	0.4320	24.72	18.37	23.66	17.24	0.931	0.199	1.499	0.27	0.35	Gravity
D5-22004	D5-22005	6	352.7	-1.5566	32.58	22.91	30.75	28.40	-0.453	-0.008	-0.631	0.10	0.08	Gravity
D5-22004	D5-21071	8	66.0	1.1818	32.58	22.91	31.75	22.13	0.849	0.020	1.016	0.10	0.10	Gravity
D5-22005	D5-22006	6	12.1	1.9008	30.75	28.40	30.54	28.17	0.501	0.009	0.429	0.08	0.11	Gravity
D5-22006	D5-21081	6	358.5	1.1743	30.54	28.17	31.38	23.96	0.393	0.027	0.26	0.11	0.38	Gravity
D5-22009	D5-21064	6	224.5	0.2940	28.50	20.70	26.00	20.04	0.197	0.043	1.521	0.17	0.14	Gravity
D5-22010	D5-22009	6	31.1	0.0000	28.42	20.70	28.50	20.70	0.000	0.034	0.88	0.20	0.17	Gravity
D5-22011	D5-22010	6	229.3	0.5689	25.11	22.00	28.42	20.70	0.273	0.021	0.44	0.11	0.20	Gravity
D5-22012	D5-22045	6	145.8	0.4527	25.22	22.85	25.88	22.19	0.244	0.000	-0.001	0.07	0.10	Gravity
D5-22012	D5-21073	8	75.5	1.0464	25.22	20.42	25.92	19.63	0.799	0.006	0.379	0.08	0.19	Gravity
D5-22020	D5-21093	8	50.3	2.4254	22.43	20.42	21.67	19.20	1.217	0.008	0.525	0.08	0.08	Gravity
D5-22020	D5-22021	6	288.6	0.9697	22.43	20.42	22.58	17.91	0.338	0.005	0.271	0.08	0.11	Gravity
D5-22021	D5-21065	6	364.0	2.5412	22.58	17.91	25.64	8.66	0.578	0.033	0.262	0.11	2.78	Surcharged
D5-22022	D5-22023	6	267.3	0.3068	18.21	14.73	18.08	13.91	0.201	0.009	0.52	0.10	0.10	Gravity
D5-22023	D5-22024	6	18.1	1.4917	18.08	13.91	18.21	13.64	0.443	0.020	0.998	0.10	0.11	Gravity
D5-22024	D5-21066	6	314.8	1.9187	18.21	13.64	16.68	7.60	0.503	0.034	0.23	0.11	2.77	Surcharged
D5-22025	D5-21066	6	127.1	0.6035	17.87	8.37	16.68	7.60	0.282	0.031	0.216	2.01	2.77	Surcharged
D5-22026	E5-21052	6	248.7	4.5718	21.52	18.99	12.05	7.62	0.776	0.005	0.248	0.07	0.11	Gravity

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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D5-22027	D5-21005	6	285.8	4.6921	19.50	18.96	10.36	5.55	0.786	0.008	0.072	0.07	0.39	Gravity
D5-22029	D5-21012	8	163.2	0.3119	10.00	6.21	8.20	5.70	0.436	0.002	0.167	0.07	0.08	Gravity
D5-22033	D5-21014	6	80.0	23.8125	28.10	23.31	8.62	4.26	1.770	0.017	0.485	0.07	0.40	Gravity
D5-22039	D5-22040	6	220.0	2.1045	15.57	8.97	8.70	4.34	0.526	0.013	0.349	0.08	0.26	Gravity
D5-22040	D5-22041	6	9.0	0.0000	8.70	4.34	8.31	4.34	0.000	0.020	0.572	0.26	0.26	Gravity
D5-22041	D5-21020	6	357.4	0.1175	8.31	4.34	8.50	3.92	0.124	0.025	1.007	0.26	0.65	Surcharged
D5-22042	D5-21049	6	84.0	2.2024	9.71	7.71	10.60	5.86	0.538	0.002	0.152	0.07	0.07	Gravity
D5-22044	E5-21074	6	260.0	2.5462	39.57	35.48	33.35	28.86	0.579	0.008	0.513	0.08	0.09	Gravity
D5-22045	D5-22011	6	42.1	0.4513	25.88	22.19	25.11	22.00	0.244	0.011	0.509	0.10	0.11	Gravity
D5-29008	C5-29003	30	413.7	0.0000	10.00	-2.50	7.81	-2.50	-	0.000	0.000	0.000	0.000	Pressure Foremain
D5-29010SG1	C5-29003	30	381.9	0.0000	10.00	-2.50	7.81	-2.50	-	0.000	0.000	0.000	0.000	Pressure Foremain
D5-29010SG2	C5-29008	30	25.6	0.0000	10.00	-2.50	10.00	-2.50	-	0.000	0.000	0.000	0.000	Pressure Foremain
D5-EL001	D5-21068	10	627.8	0.5941	15.31	12.52	12.05	8.79	1.092	0.023	0.644	0.11	0.13	Gravity
D6-21001	D6-21002	27	239.4	0.1420	18.89	9.90	18.01	9.56	7.545	6.785	3.003	1.80	1.85	Gravity
D6-21002	D6-21003	27	252.2	-0.0555	18.01	9.56	17.86	9.70	4.717	6.788	5.13	1.84	1.15	Gravity
D6-21003	D6-21004	27	200.0	0.4650	17.86	9.70	16.20	8.77	13.651	6.825	5.295	1.13	1.13	Gravity
D6-21004	D6-21026A	27	74.5	0.4966	16.20	8.77	13.80	8.40	14.110	6.826	5.379	1.11	1.11	Gravity
D6-21005	D6-29008	21	64.8	0.3549	13.80	8.40	14.00	8.17	6.102	1.911	2.177	0.81	0.96	Gravity
D6-21006	D6-21009	14	345.3	0.0434	14.00	8.34	16.23	8.19	0.724	0.639	3.049	0.72	0.40	Gravity
D6-21006	D6-21009	8	343.1	0.1341	14.00	8.34	16.23	7.88	3.750	1.304	2.668	0.72	0.62	Gravity
D6-21007	D6-21006	6	291.4	0.5148	16.24	10.44	16.23	8.94	0.260	0.032	1.559	0.13	0.12	Gravity
D6-21008	D6-21009	6	59.9	3.8731	15.43	10.20	16.23	7.88	0.714	0.018	0.429	0.08	0.62	Surcharged
D6-21009	D7-21009	21	229.2	0.1483	16.23	7.88	16.17	7.54	3.945	1.062	3.212	0.62	0.46	Gravity
D6-21009	D7-21009	14	231.4	0.2247	16.23	7.88	16.17	7.36	1.647	0.901	2.643	0.62	0.58	Gravity
D6-21010	D6-21011	27	280.4	0.1961	13.14	0.84	11.96	0.29	8.866	3.218	2.05	1.65	2.14	Gravity
D6-21011	D6-21014	18	52.8	0.4924	11.96	7.10	11.84	6.84	4.765	0.000	0	0.08	0.08	Gravity
D6-21011	D6-21012	27	9.9	0.5051	11.96	0.34	12.05	0.29	14.227	3.218	2.063	2.09	2.14	Gravity
D6-21012	D6-21013	27	37.4	0.0000	12.05	-5.30	12.01	-5.30	0.000	3.218	1.143	7.72	7.71	Throttled
D6-21013	D6-21014	27	10.5	0.4762	12.01	0.34	11.84	0.29	13.815	3.218	2.099	2.07	2.12	Gravity
D6-21014	D6-21015	27	286.6	0.0907	11.84	0.29	11.13	0.03	6.030	3.223	1.83	2.12	2.31	Surcharged
D6-21015	D6-21016	27	252.2	0.0833	11.13	0.03	10.47	-0.18	5.777	3.270	1.634	2.31	2.45	Surcharged
D6-21016	D6-21017	27	306.5	0.1533	10.47	-0.18	9.40	-0.65	7.839	3.275	1.226	2.45	2.84	Surcharged
D6-21017	D6-21045	27	303.9	0.1185	9.40	-0.65	8.89	-1.01	6.890	7.892	3.192	2.81	2.70	Throttled
D6-21018	D6-21019	8	309.8	0.4906	14.67	9.25	13.72	7.73	0.547	0.008	0.365	0.09	0.10	Gravity
D6-21019	D6-21074	8	156.6	0.5409	13.72	7.73	12.00	6.88	0.575	0.018	0.776	0.10	0.11	Gravity
D6-21021	D6-21022	8	161.1	2.0453	11.08	6.07	10.07	2.78	1.117	0.044	1.607	0.11	0.12	Gravity
D6-21022	D6-21024	8	175.2	-1.7837	10.07	2.78	11.38	5.90	-1.043	-0.004	-0.32	0.12	0.07	Gravity
D6-21022	D6-21015	8	134.2	1.8443	10.07	2.78	11.13	0.30	1.061	0.051	1.195	0.12	2.04	Surcharged
D6-21024	D6-21025	8	76.2	2.1916	11.38	5.90	11.05	4.23	1.156	0.005	0.26	0.07	0.09	Gravity
D6-21025	D6-21029	8	307.8	0.5296	11.05	4.23	10.67	2.60	0.569	0.011	0.611	0.09	0.09	Gravity
D6-21026	D6-21027	24	225.6	1.0505	14.22	8.09	13.19	5.72	14.988	4.917	5.904	0.82	0.86	Gravity
D6-21026A	D6-21026	24	67.0	0.8060	13.80	8.63	14.22	8.09	13.128	4.915	5.939	0.85	0.85	Gravity
D6-21026W	D6-21005	21	140.2	0.1284	13.80	8.58	13.80	8.40	3.670	1.911	2.738	0.87	0.81	Gravity
D6-21027	D6-21027A	24	280.0	0.7929	13.19	5.72	12.00	3.50	13.021	4.926	5.913	0.86	0.86	Gravity
D6-21027A	D6-21028	24	280.0	0.7964	12.00	3.50	12.01	1.27	13.050	4.933	5.499	0.86	1.25	Gravity
D6-21028	D6-21029	24	108.4	0.7934	12.01	1.27	10.67	0.41	13.025	4.964	4.905	1.24	1.94	Gravity
D6-21029	D6-21017	24	134.1	0.7905	10.67	0.41	9.40	-0.65	13.001	4.984	2.582	1.93	2.84	Surcharged
D6-21030	D6-21031	6	352.0	0.6392	15.68	11.08	12.45	8.83	0.290	0.035	0.667	0.14	0.22	Gravity
D6-21031	D6-21032	6	244.7	0.1921	12.45	8.83	13.37	8.36	0.159	0.055	0.978	0.22	0.23	Gravity

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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D6-21032	D6-21034	6	253.3	0.2053	13.37	8.36	13.93	7.84	0.164	0.065	1.077	0.23	0.25	Gravity	
D6-21033	D6-21034	6	301.0	0.4817	16.04	9.49	13.93	8.04	0.252	0.023	1.018	0.12	0.11	Gravity	
D6-21034	D6-21035	6	198.0	0.2980	13.93	7.84	11.62	7.25	0.198	0.093	1.435	0.25	0.25	Gravity	
D6-21035	D6-21036	6	360.3	0.3081	11.62	6.14	9.34	6.201	0.201	0.097	1.484	0.25	0.26	Gravity	
D6-21036	D6-21037	6	308.5	0.3501	9.34	6.14	7.50	5.06	0.215	0.104	1.289	0.26	0.40	Gravity	
D6-21037	D6-21038	8	175.8	0.3925	7.50	5.06	7.11	4.37	0.489	0.189	1.194	0.40	0.97	Surcharged	
D6-21038	D5-21031	6	519.8	0.2424	7.11	4.37	9.06	3.11	0.179	0.191	1.544	0.97	0.69	Throttled	
D6-21039	D6-21040	6	230.0	0.3913	10.10	6.93	8.08	6.03	0.227	0.018	0.314	0.11	0.23	Gravity	
D6-21040	D6-21037	6	298.4	0.3251	8.08	6.03	7.50	5.06	0.207	0.079	0.991	0.23	0.40	Gravity	
D6-21041	D6-21042	6	204.0	0.2696	10.32	7.66	10.31	7.11	0.188	0.017	0.427	0.12	0.18	Gravity	
D6-21042	D6-21040	6	298.4	0.3619	10.31	7.11	8.08	6.03	0.218	0.052	0.93	0.18	0.23	Gravity	
D6-21043	D6-21044	6	185.0	0.2757	11.64	8.09	11.04	8.09	0.190	0.015	0.55	0.11	0.13	Gravity	
D6-21044	D6-21042	6	298.4	0.3284	11.04	8.09	10.31	7.11	0.208	0.025	0.603	0.13	0.18	Gravity	
D6-21045	D6-21046	27	278.7	0.1292	8.89	-1.01	9.27	-1.37	7.195	7.899	3.208	2.67	2.60	Throttled	
D6-21046	D6-21057	27	280.8	0.1531	9.27	-1.37	8.91	-1.80	7.833	7.901	3.006	2.57	2.56	Throttled	
D6-21047	D6-21048	6	205.3	0.5114	7.76	5.26	7.44	4.21	0.259	0.011	0.679	0.10	0.09	Gravity	
D6-21048	D6-21052	6	283.5	0.4868	7.44	4.19	8.11	0.253	0.020	0.637	0.11	0.15	Gravity		
D6-21049	D6-21051	6	221.0	0.5158	8.85	4.50	8.40	3.36	0.261	0.010	0.397	0.09	0.12	Gravity	
D6-21050	D6-21051	6	233.1	0.4547	9.98	4.43	8.40	3.37	0.245	0.013	0.596	0.10	0.11	Gravity	
D6-21051	D6-21052	6	101.5	0.5320	8.40	3.36	8.11	2.82	0.265	0.026	0.925	0.12	0.14	Gravity	
D6-21052	D6-21053	6	239.0	0.8159	8.11	2.81	7.61	0.86	0.328	0.049	0.619	0.15	0.30	Gravity	
D6-21053	D6-21055	6	166.0	0.0301	7.61	0.86	8.91	0.81	0.063	0.055	1.222	0.30	0.19	Gravity	
D6-21054	D6-21055	6	310.6	1.8094	9.99	6.43	8.91	0.81	0.488	0.007	0.153	0.08	0.19	Gravity	
D6-21055	D6-21056	6	96.2	0.4782	8.91	0.81	8.81	0.35	0.251	0.069	1.939	0.19	0.43	Gravity	
D6-21056	D6-21057	6	57.2	1.1014	8.81	0.35	8.91	-0.28	0.381	0.069	2.134	0.43	1.04	Surcharged	
D6-21057	D6-21058	27	280.2	0.0964	8.91	-1.80	8.38	-2.07	6.214	7.956	3.19	2.54	2.36	Throttled	
D6-21058	D6-21059	27	292.1	0.1267	8.38	-2.07	7.88	-2.44	7.125	7.951	3.214	2.34	2.24	Throttled	
D6-21059	D6-21060	27	324.4	0.1726	7.88	-2.44	8.36	-3.00	8.318	7.948	3.056	2.23	2.27	Surcharged	
D6-21060	D5-21035	27	251.4	0.0835	8.36	-3.00	7.85	-3.21	5.785	9.073	3.943	2.25	1.89	Throttled	
D6-21062	D7-21001	6	124.0	0.8629	19.88	16.07	17.88	15.00	0.337	0.000	0	0.07	0.07	Gravity	
D6-21064	D6-21065	6	310.0	0.3065	13.37	8.45	11.74	7.50	0.201	0.019	0.24	0.12	0.47	Gravity	
D6-21065	D6-21067	6	134.5	0.4461	11.74	7.50	11.36	6.90	0.242	0.143	1.072	0.47	0.84	Surcharged	
D6-21066	D5-21028	6	416.7	0.4104	12.19	4.99	9.15	4.99	0.232	0.159	1.952	0.32	0.31	Gravity	
D6-21067	D6-21066	6	345.0	0.0580	11.36	6.90	12.19	6.70	0.087	0.157	1.834	0.83	0.32	Throttled	
D6-21068	D6-21067	6	410.0	0.4341	13.49	8.68	11.36	6.90	0.239	0.013	0.096	0.10	0.84	Surcharged	
D6-21069	D6-21059	6	283.6	0.2292	9.90	5.08	9.98	4.43	0.174	0.008	0.427	0.10	0.10	Gravity	
D6-21070	D6-21019	8	141.0	1.0496	12.00	9.21	13.72	7.73	0.800	0.001	0.055	0.07	0.10	Gravity	
D6-21074	D6-21021	8	150.2	0.5413	12.00	6.88	11.08	6.07	0.575	0.020	0.83	0.11	0.11	Gravity	
D6-22005	D6-21025	6	90.0	4.0556	10.21	7.88	11.05	4.23	0.731	0.002	0.134	0.07	0.09	Gravity	
D6-22006	D6-21025	6	80.0	3.1875	11.47	6.78	11.05	4.23	0.648	0.000	0.027	0.07	0.09	Gravity	
D6-22008	D6-21030	6	341.6	1.0919	17.60	14.81	15.68	11.08	0.379	0.012	0.435	0.09	0.14	Gravity	
D6-22009	D6-21033	6	273.9	1.2924	18.17	13.03	16.04	9.49	0.412	0.005	0.217	0.07	0.12	Gravity	
D6-22009	D6-21001	6	226.0	1.3850	18.17	13.03	18.89	9.90	0.427	0.005	0.036	0.07	1.81	Surcharged	
D6-22010	D6-21031	6	278.0	0.4784	13.80	10.16	12.45	8.83	0.251	0.007	0.134	0.09	0.22	Gravity	
D6-22011	D6-21043	6	194.4	0.4270	12.29	9.43	11.64	8.60	0.237	0.007	0.317	0.09	0.11	Gravity	
D6-22012	D6-21041	6	197.8	0.4702	11.25	8.59	10.32	7.66	0.249	0.008	0.347	0.09	0.12	Gravity	
D6-22013	D6-21039	6	240.0	0.3333	12.70	7.73	10.10	6.93	0.209	0.007	0.347	0.09	0.11	Gravity	
D6-22014	D6-21064	6	254.8	9.3524	34.87	32.28	13.37	8.45	1.109	0.009	0.363	0.07	0.12	Gravity	
D6-22015	D6-21044	6	86.5	0.6358	10.23	8.64	11.04	8.09	0.289	0.003	0.123	0.07	0.13	Gravity	

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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D6-22015	D6-21045	6	198.4	4.8639	10.23	8.64	8.89	-1.01	0.800	0.010	0.068	0.07	2.70	Surcharged
D6-22016	D6-21048	6	97.0	0.6495	7.73	4.82	7.44	4.19	0.292	0.003	0.15	0.07	0.11	Gravity
D6-22022	D6-21024	8	149.6	2.0722	12.00	9.00	11.38	5.90	1.125	0.005	0.341	0.07	0.07	Gravity
D6-29008	D6-21006	21	100.4	-0.1693	14.00	8.34	4.215	1.163	1.945	0.06	1.945	0.96	0.72	Gravity
D6-29008	D6-21006	14	101.5	-0.1675	14.00	8.17	14.00	8.34	-1.422	0.750	1.687	0.96	0.72	Gravity
D7-21001	D7-21002	6	151.2	0.8201	17.88	15.00	18.70	13.76	0.328	0.001	0.069	0.07	0.11	Gravity
D7-21002	D7-21004	6	195.0	0.3333	18.70	19.57	17.97	13.76	0.209	0.015	0.808	0.11	0.10	Gravity
D7-21003	D7-21002	6	111.0	0.8468	19.57	14.70	18.70	13.76	0.334	0.006	0.289	0.08	0.11	Gravity
D7-21004	D6-21007	6	238.0	1.1218	17.97	13.11	16.24	10.44	0.384	0.022	0.798	0.10	0.13	Gravity
D7-21005	D7-21006	6	303.0	0.8350	19.96	16.38	17.69	13.85	0.331	0.007	0.545	0.08	0.08	Gravity
D7-21006	D6-21008	6	253.0	0.9447	17.69	13.83	15.43	11.44	0.363	0.016	0.922	0.10	0.10	Gravity
D7-21009	D7-21010	14	166.2	0.3309	16.17	7.36	15.24	6.81	1.988	0.936	2.005	0.58	0.75	Gravity
D7-21009	D7-21010	21	164.1	0.1889	16.17	7.36	15.24	7.05	4.452	1.044	2.799	0.58	0.51	Gravity
D7-21010	D7-21011	14	149.3	0.2612	15.24	7.05	14.44	14.44	1.776	0.697	3.111	0.51	0.42	Gravity
D7-21010	D7-21011	21	147.1	0.4963	15.24	7.05	14.44	6.32	7.215	1.293	3.469	0.51	0.51	Gravity
D7-21011	D7-21012	24	35.2	9.5739	14.44	5.99	14.77	2.62	45.245	1.990	8.508	0.35	0.35	Gravity
D7-21012	D6-21010	27	443.5	0.0744	14.77	1.17	13.14	0.84	3.234	2.869	1.48	1.65	1.65	Gravity
D7-21013	E7-21024	6	270.9	0.0923	19.63	16.99	21.16	16.74	0.110	0.003	0.28	0.09	0.08	Gravity
D7-21013	D7-21014	6	375.3	1.3696	19.63	16.99	16.59	11.85	0.425	0.013	0.581	0.09	0.12	Gravity
D7-21014	D7-21018	6	264.1	0.6778	16.59	11.85	14.76	10.06	0.299	0.026	1.154	0.12	0.12	Gravity
D7-21015	D7-21016	6	216.0	0.8889	21.14	17.09	19.74	15.17	0.342	0.013	0.706	0.09	0.10	Gravity
D7-21016	D7-21017	6	240.0	1.0708	19.74	15.17	16.53	12.60	0.375	0.018	0.895	0.10	0.11	Gravity
D7-21017	D7-21018	6	220.0	1.1864	16.53	12.60	14.76	9.99	0.395	0.026	1.115	0.11	0.12	Gravity
D7-21018	D7-21019	6	113.0	3.0796	14.76	13.91	13.91	6.51	0.637	0.056	2.437	0.12	0.12	Gravity
D7-21019	D7-21024	10	207.2	0.4247	13.91	6.11	13.08	5.23	0.923	0.412	2.708	0.40	0.37	Gravity
D7-21020	D7-21021	6	201.0	0.5522	23.52	18.91	22.19	17.80	0.270	0.011	0.552	0.10	0.11	Gravity
D7-21021	D7-21022	6	278.9	0.6167	22.19	17.80	20.04	16.08	0.285	0.019	0.975	0.11	0.11	Gravity
D7-21022	D7-21023	6	279.6	1.3233	20.04	16.08	16.23	12.38	0.417	0.025	1.287	0.11	0.11	Gravity
D7-21023	D7-21024	6	287.3	2.4887	16.23	12.38	13.08	5.23	0.572	0.034	0.337	0.11	0.37	Gravity
D7-21024	D7-21029	10	258.2	0.6274	13.08	5.23	12.09	3.61	1.122	0.451	1.661	0.37	0.60	Gravity
D7-21025	D7-21026	6	206.0	0.6990	21.15	17.99	21.34	16.55	0.303	0.005	0.291	0.08	0.10	Gravity
D7-21026	D7-21027	6	284.0	0.5317	21.34	16.55	18.91	15.04	0.265	0.012	0.668	0.10	0.10	Gravity
D7-21027	D7-21028	6	292.9	1.2594	18.91	15.04	15.02	11.36	0.407	0.019	1.039	0.10	0.10	Gravity
D7-21028	D7-21029	6	272.8	2.1994	15.02	11.36	12.09	5.36	0.538	0.029	1.555	0.10	0.10	Gravity
D7-21029	D7-21034	10	263.0	0.1521	12.09	3.61	11.12	3.21	0.552	0.487	2.881	0.60	0.40	Gravity
D7-21030	D7-21031	6	208.0	0.5144	14.93	11.88	16.07	10.81	0.260	0.003	0.183	0.07	0.08	Gravity
D7-21031	D7-21032	6	184.2	0.8740	16.07	10.81	10.81	9.20	0.339	0.008	0.392	0.08	0.11	Gravity
D7-21032	D7-21033	6	285.3	0.2559	17.44	9.20	13.30	8.47	0.184	0.014	0.789	0.11	0.10	Gravity
D7-21033	D7-21034	6	284.8	1.6292	13.30	8.47	11.12	3.83	0.463	0.020	1.183	0.10	0.10	Gravity
D7-21034	D7-21037	10	32.7	0.8422	11.12	3.21	11.79	3.00	1.135	0.508	2.923	0.40	0.41	Gravity
D7-21035	D7-21038	6	376.1	1.2284	18.80	13.04	14.99	8.42	0.402	0.043	1.776	0.13	0.19	Gravity
D7-21036	D7-21037	10	355.0	0.3718	16.24	9.52	14.99	8.20	0.864	0.301	1.739	0.35	0.41	Gravity
D7-21037	D7-21038	10	260.0	0.2692	14.99	8.20	16.59	7.50	0.735	0.346	2.343	0.41	0.36	Gravity
D7-21038	D7-21039	10	183.3	0.4146	16.59	7.50	14.00	6.74	0.912	0.350	2.182	0.36	0.39	Gravity
D7-21039	D7-21019	10	180.5	0.3490	14.00	6.74	13.91	6.11	0.837	0.356	2.14	0.39	0.40	Gravity
D7-21040	D7-21042	10	280.8	0.5662	16.25	8.99	14.00	7.40	1.066	0.357	2.322	0.34	0.38	Gravity
D7-21041	D7-21040	6	261.7	0.1681	14.08	9.72	16.25	9.28	0.012	0.095	0.11	0.09	0.09	Gravity
D7-21042	D8-21016	10	136.9	0.4456	14.00	7.40	12.93	6.79	0.945	0.385	2.412	0.38	0.39	Gravity
D7-21043	D7-21042	6	256.8	0.1363	13.00	8.16	14.00	7.81	0.134	0.012	0.692	0.12	0.09	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D7-21045	D7-21046	6	224.6	0.4942	14.12	9.74	12.02	8.63	0.255	0.005	0.312	0.08	0.10	Gravity
D7-21046	D7-21047	6	279.6	0.5794	12.02	8.63	11.79	7.01	0.276	0.012	0.731	0.10	0.09	Gravity
D7-21047	D7-21049	6	281.5	1.1297	11.79	7.01	9.68	3.83	0.386	0.015	0.571	0.09	0.13	Gravity
D7-21048	D7-21049	6	221.3	0.3163	9.93	4.53	9.204	3.83	0.012	0.012	0.427	0.10	0.13	Gravity
D7-21049	D7-21050	6	288.3	0.6694	9.68	3.83	6.05	1.90	0.297	0.034	0.872	0.13	0.18	Gravity
D8-21050	D8-21015	6	88.9	0.3262	6.05	1.90	5.82	1.61	0.207	0.046	1.689	0.18	0.15	Gravity
D7-21051	D7-21052	8	342.0	0.2105	6.57	-1.43	-2.15	8.31	0.358	0.567	3.529	1.54	0.46	Throttled
D7-21052	399-Rollins-PS	12	48.0	0.9792	8.31	-2.15	8.84	-2.62	2.279	0.779	3.968	0.46	0.89	Gravity
D7-21053	D7-21054	6	207.4	1.0174	14.24	6.70	10.29	4.59	0.366	0.004	0.264	0.07	0.09	Gravity
D7-21054	D7-21055	6	220.4	0.7169	10.29	4.59	8.63	3.01	0.307	0.009	0.345	0.09	0.13	Gravity
D7-21055	399-Rollins-PS	6	194.0	0.8299	8.63	3.01	8.84	1.40	0.330	0.039	1.422	0.13	0.13	Gravity
D7-21056	D7-21057	6	300.0	0.6333	9.82	6.19	9.16	4.29	0.289	0.011	0.497	0.09	0.11	Gravity
D7-21057	D7-21058	6	297.9	0.4297	9.16	4.29	8.63	3.01	0.238	0.019	0.7	0.11	0.13	Gravity
D7-21058	D7-21059	6	190.0	0.3158	9.36	4.46	8.31	3.86	0.204	0.004	0.246	0.08	0.10	Gravity
D7-21059	D7-21060	6	242.0	0.3264	8.31	3.86	9.45	3.07	0.207	0.009	0.595	0.10	0.09	Gravity
D7-21060	D7-21061	8	28.7	0.2787	9.45	3.05	9.09	2.97	0.412	0.017	0.831	0.11	0.10	Gravity
D7-21061	D7-21062	8	345.5	0.4978	9.09	2.35	0.63	0.022	0.965	0.11	0.11	0.11	0.11	Gravity
D7-21062	D7-21063	8	105.5	0.4076	9.71	5.44	10.18	5.01	0.498	0.000	0	0.07	0.07	Gravity
D7-21063	D7-21064	8	156.5	0.7284	10.18	5.01	10.95	3.87	0.667	0.003	0.182	0.07	0.08	Gravity
D7-21064	D7-21065	8	178.5	0.4594	10.95	3.87	11.79	3.05	0.530	0.005	0.046	0.08	0.36	Gravity
D7-21065	D7-21078	8	108.2	0.0462	11.79	3.05	11.79	3.00	0.168	0.007	0.046	0.36	0.41	Gravity
D7-21066	D7-21067	15	250.0	0.1560	12.87	2.36	14.02	1.97	1.649	0.579	2.131	0.51	0.72	Gravity
D7-21067	D7-21012	15	254.8	0.3140	14.02	1.97	14.77	1.17	2.340	0.689	1.212	0.72	1.49	Surcharged
D7-21068	D7-21069	10	292.1	0.4108	8.38	3.80	8.70	2.60	0.908	0.020	0.684	0.11	0.12	Gravity
D7-21069	D7-21070	10	245.2	0.4364	8.70	2.60	8.40	1.53	0.936	0.026	0.694	0.12	0.14	Gravity
D7-21070	D7-21071	10	11.7	0.2564	8.40	1.53	8.38	1.50	0.718	0.031	0.789	0.14	0.14	Gravity
D7-21071	D7-21072	12	13.1	0.0000	8.38	1.50	8.25	1.50	0.000	0.031	0.905	0.14	0.12	Gravity
D7-21072	D7-21073	12	237.9	0.5464	8.25	1.50	9.00	0.20	1.702	0.035	0.474	0.12	0.20	Gravity
D7-21073	D7-21076	12	154.7	0.0259	9.00	0.20	9.00	0.16	0.370	0.038	1.075	0.20	0.12	Gravity
D7-21074	D7-21075	8	300.0	0.6000	8.32	2.87	9.38	1.07	0.605	0.007	0.371	0.08	0.09	Gravity
D7-21075	D7-21076	8	203.6	0.4470	9.38	1.07	9.00	0.16	0.522	0.009	0.305	0.09	0.12	Gravity
D7-21076	D7-21052	12	245.2	0.9421	9.00	0.16	8.31	-2.15	2.236	0.099	0.515	0.12	0.46	Gravity
D7-21077	D7-21035	15	240.0	0.7583	20.07	16.00	18.80	14.18	0.316	0.012	0.751	0.09	0.09	Gravity
D7-21078	D7-21066	15	203.6	0.3143	11.79	3.00	12.87	2.36	2.341	0.530	1.83	0.41	0.51	Gravity
D7-22002	D7-21014	6	133.0	1.5865	17.64	13.96	16.59	11.85	0.457	0.008	0.36	0.08	0.12	Gravity
D7-22003	D7-21043	6	195.6	0.3681	12.28	8.88	13.00	8.16	0.220	0.005	0.222	0.08	0.12	Gravity
D7-22004	D7-21081	6	111.0	0.1081	10.34	6.31	9.82	6.19	0.004	0.004	0.268	0.09	0.09	Gravity
D7-22005	D7-21055	6	133.6	1.7216	9.55	5.31	8.63	3.01	0.476	0.006	0.237	0.08	0.13	Gravity
D7-22006	D7-21015	6	214.0	0.6542	22.31	18.49	21.14	17.09	0.293	0.005	0.291	0.08	0.09	Gravity
D7-22007	D7-21020	6	204.0	0.5000	22.65	19.93	23.52	18.91	0.257	0.006	0.343	0.08	0.10	Gravity
D8-21001	D8-21002	6	311.9	0.1122	7.43	4.35	6.49	4.35	0.122	0.049	0.633	0.30	0.58	Surcharged
D8-21002	D8-21005	8	312.0	0.1250	6.49	4.35	7.17	3.96	0.276	0.103	0.649	0.58	0.93	Surcharged
D8-21003	D8-21004	6	288.3	0.4960	13.17	7.44	10.51	6.01	0.255	0.044	1.311	0.15	0.16	Gravity
D8-21004	D8-21002	6	298.2	0.5567	10.51	6.01	6.49	4.35	0.271	0.046	0.607	0.16	0.58	Surcharged
D8-21005	D8-21006	8	313.0	0.0511	7.17	3.96	8.40	3.80	0.177	0.118	0.613	0.93	1.04	Surcharged
D8-21006	D8-21012	8	43.7	0.8924	8.40	3.83	7.99	3.44	0.738	0.500	2.361	0.99	1.19	Surcharged
D8-21007	D7-21042	6	314.8	1.0515	14.13	11.12	14.00	7.81	0.372	0.091	0.733	0.09	0.09	Gravity
D8-21008	D8-21009	6	239.8	0.8632	12.12	8.25	11.59	6.18	0.337	0.015	0.142	0.10	0.39	Gravity
D8-21009	D8-21011	10	288.3	0.4509	11.59	6.18	8.61	4.88	0.951	0.410	2.263	0.39	0.43	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
D8-21010	D8-21011	6	362.1	0.4833	9.57	6.63	8.61	4.88	0.252	0.015	0.127	0.10	0.43	Gravity
D8-21011	D8-21006	10	301.3	0.3584	8.61	4.88	8.40	3.80	0.848	0.418	1.942	0.43	1.04	Surcharged
D8-21012	D8-21013	8	410.8	0.3797	7.99	3.44	5.82	1.88	0.481	0.501	2.397	1.18	0.98	Throttled
D8-21013	D8-21015	8	249.6	0.3966	5.82	249.6	1.88	0.89	0.492	0.505	2.876	0.96	0.87	Throttled
D8-21014	D7-21050	6	222.2	0.3780	7.05	2.74	6.05	1.90	0.223	0.010	0.246	0.10	0.18	Gravity
D8-21015	D7-21051	8	315.4	0.7356	5.82	0.89	6.57	-1.43	0.670	0.546	2.265	0.85	1.55	Surcharged
D8-21016	D8-21009	10	144.1	0.4233	12.93	6.79	11.59	0.922	0.390	2.401	0.39	0.39	0.39	Gravity
D8-21017	D7-21074	8	235.0	0.5149	9.08	4.08	8.32	2.87	0.561	0.005	0.312	0.08	0.08	Gravity
D8-21018	D7-21068	8	300.0	0.5000	8.30	5.30	8.38	3.80	0.552	0.007	0.295	0.08	0.11	Gravity
D8-22001	D8-21007	6	224.1	0.3570	9.98	7.19	9.64	0.006	0.217	0.006	0.31	0.09	0.11	Gravity
D8-22002	D8-21010	6	96.7	1.0238	9.82	7.62	9.57	6.63	0.367	0.008	0.411	0.08	0.10	Gravity
D8-22003	D8-21008	6	216.5	0.5173	12.76	9.37	12.12	8.25	0.261	0.009	0.5	0.09	0.10	Gravity
D8-22004	D8-21014	6	198.5	0.6650	7.87	4.06	7.05	2.74	0.296	0.003	0.189	0.07	0.10	Gravity
D8-22005	D7-21048	6	216.0	0.9630	10.61	6.61	9.93	4.53	0.356	0.005	0.266	0.08	0.10	Gravity
E1-21001	E1-21002	6	292.8	5.7377	552.70	546.30	536.60	529.50	0.869	0.005	0.459	0.07	0.08	Gravity
E1-21002	E1-21003	6	231.2	7.2664	536.60	529.50	523.40	512.70	0.978	0.013	0.748	0.08	0.10	Gravity
E1-21003	E1-21004	6	336.5	3.7741	523.40	512.70	508.50	500.00	0.705	0.030	1.387	0.10	0.11	Gravity
E1-21004	E2-21072	6	173.2	6.2933	508.50	500.00	498.00	489.10	0.910	0.072	1.7	0.11	0.18	Gravity
E1-21006	E1-21007	6	271.7	6.2569	558.70	552.00	541.50	535.00	0.907	0.015	1.155	0.08	0.08	Gravity
E1-21007	E1-21008	6	198.9	11.5636	541.50	535.00	520.00	512.00	1.234	0.026	1.656	0.08	0.09	Gravity
E1-21008	E1-21004	6	161.3	7.4396	520.00	512.00	508.50	500.00	0.989	0.037	1.671	0.09	0.11	Gravity
E1-21010	E2-21073	6	170.2	13.3960	520.90	514.80	500.20	492.00	1.328	0.010	0.776	0.07	0.08	Gravity
E1-21011	E1-21012	6	156.7	9.1257	557.60	551.20	543.80	536.90	1.096	0.014	0.915	0.08	0.09	Gravity
E1-21012	E1-21013	6	186.5	3.2708	543.80	536.90	539.00	530.80	0.656	0.022	1.434	0.09	0.09	Gravity
E1-21013	E1-21017	6	328.6	3.0128	539.00	528.00	526.40	518.10	0.630	0.056	2.125	0.12	0.13	Gravity
E1-21014	E1-21013	6	221.9	2.2983	542.60	535.90	539.00	530.80	0.560	0.026	1.469	0.10	0.10	Gravity
E1-21015	E1-21014	6	115.0	0.9565	543.20	537.00	542.60	535.90	0.355	0.012	0.679	0.09	0.10	Gravity
E1-21017	E1-21018	6	119.4	4.2714	526.40	518.10	519.50	513.00	0.750	0.084	3.938	0.13	0.13	Gravity
E1-21018	E1-21019	6	199.2	11.5462	519.50	513.00	495.80	490.00	1.233	0.093	4.088	0.11	0.12	Gravity
E1-21019	E1-21020	6	277.4	11.4636	495.80	490.00	464.60	458.20	1.228	0.105	2.498	0.12	0.18	Gravity
E1-21020	E2-21084	6	286.7	1.8137	464.60	458.20	459.60	453.00	0.489	0.124	2.43	0.18	0.21	Gravity
E1-21022	E1-21017	6	268.0	2.6493	531.40	525.20	526.40	518.10	0.591	0.024	0.89	0.09	0.13	Gravity
E1-21025	E1-21027	6	222.6	5.4807	504.20	494.60	488.00	482.40	0.849	0.101	4.195	0.13	0.12	Gravity
E1-21027	E1-21028	6	210.4	11.1692	488.00	482.40	464.50	458.90	1.212	0.115	4.357	0.12	0.13	Gravity
E1-21028	E1-21029	6	303.0	10.3960	464.50	458.90	434.60	427.40	1.170	0.129	4.429	0.13	0.14	Gravity
E1-21029	E2-21089	6	308.7	9.2323	434.60	427.40	404.70	398.90	1.102	0.146	4.874	0.14	0.14	Gravity
E1-21030	E2-21080	6	305.0	0.5066	522.20	515.90	505.40	498.80	0.859	0.010	0.819	0.07	0.07	Gravity
E1-21056	E2-21057	6	174.9	5.0886	491.50	485.00	482.80	476.10	0.818	0.014	1.045	0.08	0.08	Gravity
E1-22005	E1-21006	6	98.1	10.1937	569.20	562.00	558.70	552.00	1.158	0.008	0.646	0.07	0.08	Gravity
E1-22009	E1-21010	6	234.6	12.0205	549.40	543.00	520.90	514.80	1.258	0.006	0.527	0.07	0.07	Gravity
E1-22021	E1-21022	6	291.1	6.2521	550.30	543.40	531.40	525.20	0.907	0.008	0.489	0.07	0.09	Gravity
E1-22023	E1-21030	6	110.0	9.0000	532.40	525.80	522.20	515.90	1.088	0.005	0.398	0.07	0.07	Gravity
E1-22026	E1-21025	6	206.0	7.4757	516.00	510.00	504.20	494.60	0.992	0.008	0.309	0.07	0.14	Gravity
E1-22031	E1-21011	6	138.6	9.9567	571.40	565.00	557.60	551.20	1.145	0.006	0.519	0.07	0.08	Gravity
E2-21001	E2-21002	8	36.6	5.0820	475.76	470.16	475.40	468.30	1.760	0.288	5.315	0.19	0.19	Gravity
E2-21002	E2-21003	8	132.1	20.8662	475.40	468.30	444.20	441.00	3.551	0.288	2.985	0.14	0.30	Gravity
E2-21003	E2-21005	8	102.3	1.1730	444.20	441.00	443.50	439.80	0.846	0.329	3.411	0.30	0.30	Gravity
E2-21004	E2-21003	6	170.3	5.3905	457.16	450.18	444.20	441.00	0.842	0.030	0.381	0.09	0.30	Gravity
E2-21005	E2-21006	8	170.2	12.4558	443.50	439.80	422.00	418.60	2.757	0.341	2.565	0.17	0.38	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E2-21006	E2-21007	8	129.0	0.5426	422.00	418.60	423.00	417.90	0.575	0.341	2.878	0.38	0.35	Gravity
E2-21007	E2-21011	8	128.0	6.1719	423.00	417.90	414.50	410.00	1.941	0.676	7.46	0.28	0.28	Gravity
E2-21008	E2-21009	8	150.0	11.0133	470.83	461.29	450.77	444.77	1.204	0.318	5.857	0.19	0.22	Gravity
E2-21009	E2-21010	6	30.1	5.5482	450.77	444.77	449.77	444.77	0.854	0.318	5.877	0.22	0.22	Gravity
E2-21010	E2-21007	8	113.3	22.2418	449.77	443.10	423.00	417.90	3.685	0.329	3.633	0.15	0.28	Gravity
E2-21011	E2-21012	8	55.0	49.8182	414.50	410.00	385.50	382.60	5.514	0.682	8.475	0.17	0.26	Gravity
E2-21012	E2-21013	8	85.0	8.8235	385.50	382.60	381.00	375.10	2.321	0.682	8.884	0.26	0.25	Gravity
E2-21013	E2-29004	8	39.3	9.9924	381.00	375.10	373.81	371.17	2.469	0.682	8.63	0.25	0.25	Gravity
E2-21014	E2-22003	6	96.1	33.2986	397.00	394.00	367.50	362.00	2.094	0.072	4.012	0.09	0.10	Gravity
E2-21016	E2-21019	8	117.0	1.4530	343.50	338.00	343.17	336.30	0.942	0.799	4.609	0.48	0.48	Gravity
E2-21017	E2-21018	6	216.0	9.0185	455.10	449.81	435.98	430.33	1.089	0.025	1.625	0.08	0.09	Gravity
E2-21018	E2-21019	6	331.8	27.8059	435.98	430.33	343.17	338.07	1.913	0.061	4.028	0.09	0.09	Gravity
E2-21019	E2-21020	8	179.6	2.4722	343.17	336.30	337.56	331.86	1.228	0.874	5.748	0.43	0.43	Gravity
E2-21020	E2-21021	8	114.9	6.4056	337.56	331.86	329.50	324.50	1.977	0.888	8.162	0.32	0.32	Gravity
E2-21021	E2-21022	24	85.4	13.4660	329.50	324.50	318.10	313.00	53.665	0.902	5.719	0.27	0.26	Gravity
E2-21022	E2-21025	8	130.4	14.5706	318.10	313.00	300.60	294.00	2.983	0.902	7.054	0.26	0.37	Gravity
E2-21023	E2-21024	6	209.7	21.4115	416.00	411.80	1.679	366.90	371.00	0.060	3.828	0.09	0.09	Gravity
E2-21024	E2-21025	6	132.7	54.9359	371.00	366.90	300.60	294.00	2.689	0.092	0.924	0.09	0.37	Gravity
E2-21025	E2-21026	24	109.6	1.7336	300.60	294.00	296.50	292.10	19.250	0.994	2.586	0.37	0.50	Gravity
E2-21026	E2-21027	8	127.5	2.2745	296.50	289.20	293.30	289.20	1.178	0.994	5.75	0.48	0.48	Gravity
E2-21027	E2-21028	8	225.0	18.3111	293.30	289.20	253.40	248.00	3.343	1.074	10.063	0.27	0.32	Gravity
E2-21028	E2-21029	8	92.4	10.4978	253.40	248.00	242.20	238.30	2.532	1.097	7.664	0.32	0.41	Gravity
E2-21029	E2-21030	8	62.6	5.2716	242.20	238.30	238.60	235.00	1.794	1.097	5.631	0.38	0.55	Gravity
E2-21030	E2-21031	8	188.4	2.6539	238.60	235.00	236.00	230.00	1.273	1.138	6.295	0.51	0.51	Gravity
E2-21031	E2-21032	8	121.1	5.3675	236.00	230.00	227.90	223.50	1.810	1.137	4.963	0.39	2.83	Surcharged
E2-21032	E2-21033	8	127.4	1.9623	227.90	223.50	223.70	221.00	1.094	1.162	4.688	2.78	2.35	Throttled
E2-21033	E2-21034	8	90.0	1.3333	223.70	221.00	225.90	219.80	0.902	1.189	4.972	2.29	1.34	Throttled
E2-21034	E2-21035	8	62.3	1.4446	225.90	219.80	224.50	218.90	0.939	1.212	5.666	1.25	0.60	Throttled
E2-21035	E2-21036	8	111.2	8.4173	224.50	218.90	214.44	209.54	2.267	1.212	4.467	0.36	FULL	Surcharged
E2-21036	E2-21037	8	78.3	1.2299	214.44	209.54	238.12	208.58	0.867	0.916	3.793	FULL	4.87	Throttled
E2-21037	E2-21038	8	55.0	1.2309	238.12	208.58	212.70	207.90	0.867	0.916	3.413	4.84	4.73	Throttled
E2-21038	E2-21039	8	96.0	0.5208	212.70	207.90	211.08	207.40	0.564	0.919	3.529	4.70	FULL	Throttled
E2-21039	E2-21040	8	205.0	0.5366	212.08	207.40	206.30	206.30	0.572	0.607	2.623	FULL	3.73	Throttled
E2-21040	E3-21001	8	100.0	0.4700	211.09	206.30	212.15	205.83	0.536	0.602	2.677	3.71	3.60	Throttled
E2-21041	E2-21042	6	242.6	13.1080	403.10	400.93	370.91	369.13	1.313	0.022	1.49	0.08	0.09	Gravity
E2-21042	E2-21043	6	179.2	9.1842	370.91	369.13	362.69	352.67	1.099	0.031	1.776	0.09	0.10	Gravity
E2-21043	E2-21044	6	233.1	9.1828	362.69	352.67	338.56	331.27	1.099	0.048	2.25	0.10	0.11	Gravity
E2-21044	E2-21045	6	377.6	9.1811	338.56	331.27	307.01	296.60	1.099	0.084	3.401	0.11	0.13	Gravity
E2-21045	E2-21046	6	287.3	9.1803	307.01	296.60	272.18	270.22	1.099	0.110	4.075	0.13	0.13	Gravity
E2-21046	E3-21008	6	260.2	9.1826	272.18	270.22	255.20	246.33	1.099	0.126	4.667	0.13	0.13	Gravity
E2-21057	E2-21058	6	190.7	8.3901	482.80	476.10	469.40	460.10	1.051	0.025	1.507	0.08	0.10	Gravity
E2-21058	E2-21059	6	192.0	5.7292	469.40	460.10	455.80	449.10	0.868	0.035	1.995	0.10	0.10	Gravity
E2-21059	E2-21060	6	200.0	8.0500	455.80	449.10	441.80	433.00	1.029	0.048	1.726	0.10	0.14	Gravity
E2-21060	E2-21061	6	288.7	1.6973	441.80	433.00	433.80	428.10	0.473	0.058	1.534	0.14	0.17	Gravity
E2-21061	E2-21062	6	300.2	0.9993	433.80	428.10	430.90	425.10	0.363	0.076	1.84	0.17	0.18	Gravity
E2-21062	E2-21063	6	297.4	1.0087	430.90	425.10	427.80	422.10	0.364	0.090	2.187	0.18	0.18	Gravity
E2-21063	E2-21064	6	286.6	1.2212	427.80	422.10	418.60	418.60	0.401	0.096	2.353	0.18	0.18	Gravity
E2-21064	E2-21065	6	249.1	10.0281	423.00	418.60	398.42	393.62	1.149	0.107	4.487	0.12	0.12	Gravity
E2-21065	E2-21066	6	210.2	12.2217	398.42	393.62	373.11	367.93	1.288	0.118	4.444	0.12	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E2-21066	E2-21067	6	103.5	9.3527	373.11	367.93	363.57	358.25	1.110	0.124	4.435	0.13	0.14	Gravity
E2-21067	D2-21016	6	188.0	9.0319	363.57	358.25	347.57	341.27	1.090	0.133	3.533	0.14	0.17	Gravity
E2-21068	E2-21069	6	280.4	13.6943	435.97	430.99	400.45	395.33	1.343	0.042	2.413	0.09	0.10	Gravity
E2-21069	E2-21070	6	251.2	10.3519	400.45	395.33	374.47	369.33	1.167	0.053	2.882	0.10	0.10	Gravity
E2-21070	D2-21016	6	120.9	16.2366	366.05	360.90	347.57	341.27	1.482	0.064	1.706	0.10	0.17	Gravity
E2-21071	E2-21069	6	218.1	3.9413	367.94	362.23	368.73	353.63	0.720	0.015	0.906	0.08	0.09	Gravity
E2-21072	E2-21074	6	141.4	0.7072	498.00	489.10	494.50	488.10	0.305	0.078	1.976	0.18	0.17	Gravity
E2-21073	E2-21074	6	96.8	4.0289	500.20	492.00	494.50	488.10	0.728	0.016	0.412	0.08	0.17	Gravity
E2-21074	E2-21075	6	216.9	1.4753	494.50	488.10	490.80	484.90	0.441	0.097	2.475	0.17	0.17	Gravity
E2-21075	E2-21076	6	298.6	6.0281	490.80	484.90	472.90	466.90	0.891	0.111	3.37	0.14	0.15	Gravity
E2-21076	E2-21077	6	209.0	4.3062	472.90	466.90	464.80	457.90	0.763	0.128	3.275	0.15	0.17	Gravity
E2-21077	E2-21078	6	300.4	3.1625	464.80	457.90	454.50	448.40	0.645	0.140	3.422	0.17	0.18	Gravity
E2-21078	E2-21079	6	217.2	2.9006	454.50	448.40	448.80	442.10	0.618	0.149	2.887	0.18	0.23	Gravity
E2-21079	E2-21081	6	266.3	5.8205	448.80	442.10	429.20	426.60	0.875	0.335	6.062	0.22	0.22	Gravity
E2-21080	E2-21081	6	183.0	10.4918	505.40	498.80	485.60	479.60	1.175	0.015	1.181	0.07	0.08	Gravity
E2-21081	E2-21082	6	137.0	13.0657	485.60	479.60	470.20	461.70	1.311	0.022	1.504	0.08	0.09	Gravity
E2-21082	E2-21083	6	180.0	8.0556	470.20	461.70	453.80	447.20	1.030	0.028	0.584	0.09	0.20	Gravity
E2-21083	E2-21079	6	188.9	2.6998	453.80	447.20	448.80	442.10	0.596	0.181	3.273	0.20	0.23	Gravity
E2-21084	E2-21085	6	179.0	1.2849	459.60	453.00	457.20	450.70	0.411	0.136	2.674	0.21	0.21	Gravity
E2-21085	E2-21083	6	239.0	1.4644	450.70	447.20	453.80	447.20	0.439	0.146	3.025	0.21	0.20	Gravity
E2-21086	E2-21087	6	256.7	9.7390	429.20	426.60	406.40	401.60	1.132	0.337	7.072	0.20	0.20	Gravity
E2-21087	E2-21088	6	174.0	10.6897	406.40	401.60	388.00	383.00	1.186	0.353	5.898	0.20	0.24	Gravity
E2-21088	D2-21007	6	135.6	5.7522	388.00	383.00	382.60	375.20	0.870	0.364	4.236	0.24	0.34	Gravity
E2-21089	D2-21007	6	235.4	10.0680	404.70	398.90	382.60	375.20	1.151	0.163	1.893	0.14	0.34	Gravity
E2-21090	E2-21091	6	153.1	8.8178	335.40	325.00	315.00	311.50	1.077	0.011	0.618	0.07	0.10	Gravity
E2-21091	E2-21092	6	173.8	0.9781	315.00	311.50	317.00	309.80	0.359	0.017	1.431	0.10	0.08	Gravity
E2-21092	E2-21093	6	144.6	14.7303	317.00	309.80	296.00	288.50	1.392	0.020	1.242	0.08	0.09	Gravity
E2-21093	E2-21094	6	96.5	2.9534	296.00	288.50	288.50	285.65	0.623	0.022	1.023	0.09	0.11	Gravity
E2-21094	E2-21095	6	125.3	0.7582	288.50	285.65	295.50	284.70	0.316	0.024	1.075	0.11	0.12	Gravity
E2-21095	D2-21057	6	146.1	0.7529	295.50	284.70	298.50	283.60	0.315	0.026	1.348	0.12	0.11	Gravity
E2-21099	D2-21013	6	225.9	3.9416	368.73	353.63	349.64	344.73	0.720	0.028	1.78	0.09	0.09	Gravity
E2-21070	E2-21070	6	81.4	10.3514	374.47	369.33	366.05	360.90	1.167	0.060	3.489	0.10	0.10	Gravity
E2-22002	E2-21023	6	94.7	1.1616	420.00	412.90	416.00	411.80	0.391	0.037	1.925	0.12	0.12	Gravity
E2-22003	E2-21016	6	143.8	16.6898	367.50	362.00	343.50	338.00	1.482	0.072	0.565	0.10	0.49	Gravity
E2-22004	E2-21016	8	141.2	20.9674	374.00	367.61	343.50	338.00	3.578	0.710	3.953	0.21	0.50	Gravity
E2-22007	E2-21071	6	115.0	27.6696	399.25	394.05	367.94	362.23	1.908	0.006	0.476	0.07	0.08	Gravity
E2-29004	E2-22004	8	357	9.9916	373.81	371.17	374.00	367.61	2.469	0.710	9.041	0.25	0.35	Gravity
E3-21001	E3-21002	8	120.5	0.5145	212.15	205.83	210.31	205.21	0.560	0.612	2.594	3.59	3.46	Throttled
E3-21002	E3-21003	8	171.7	0.4892	210.31	205.21	208.37	204.37	0.546	0.641	2.554	3.44	3.08	Throttled
E3-21003	E3-21004	8	140.0	0.4929	208.37	204.37	206.20	203.68	0.687	2.744	3.07	FULL	FULL	Throttled
E3-21004	E3-21005	8	60.0	0.2500	206.20	203.68	212.46	203.53	0.391	0.608	2.967	FULL	FULL	Throttled
E3-21005	E3-21006	8	97.3	0.6578	212.46	203.53	206.73	202.89	0.633	0.608	2.548	2.50	2.70	Surcharged
E3-21006	E3-21007	8	105.7	0.4541	206.73	202.89	207.82	202.41	0.527	0.613	2.556	2.69	2.68	Throttled
E3-21007	E3-21010	8	340.3	0.5907	202.41	202.41	210.20	200.40	0.600	0.737	3.058	2.66	1.54	Throttled
E3-21008	E3-21009	6	195.3	9.1813	255.20	246.33	232.00	228.40	1.099	0.126	4.459	0.13	0.14	Gravity
E3-21009	E3-21007	6	232.4	11.1833	232.00	228.40	207.82	202.41	1.213	0.152	1.043	0.14	2.68	Surcharged
E3-21010	E3-21011	8	242.6	0.5853	210.20	200.40	198.98	198.98	0.598	0.762	4.047	1.51	0.52	Throttled
E3-21011	E3-21012	8	159.3	13.3082	203.18	198.98	181.54	177.78	2.850	0.791	8.956	0.25	0.28	Gravity
E3-21012	E3-21129	8	29.5	9.4237	181.54	177.78	180.00	175.00	2.397	0.791	9.016	0.28	0.28	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-21013	E3-21129	8	129.4	1.1592	182.50	176.50	180.00	175.00	0.841	0.013	0.167	0.09	0.25	Gravity
E3-21014	E3-21016	6	47.5	0.7368	161.59	156.44	162.11	156.09	0.311	0.017	1.28	0.10	0.08	Gravity
E3-21015	E3-21014	6	355.0	0.1268	163.80	156.89	161.59	156.44	0.129	0.010	0.538	0.11	0.10	Gravity
E3-21016	E3-21017	6	180.1	9.2671	162.11	156.09	145.40	139.40	1.104	0.021	0.265	0.08	0.30	Gravity
E3-21017	E3-21018	10	262.8	5.2131	145.40	139.40	131.70	125.70	3.234	0.829	7.282	0.30	0.30	Gravity
E3-21018	E3-21019	10	251.1	7.9849	131.70	125.70	112.90	105.65	4.003	0.838	5.662	0.27	0.36	Gravity
E3-21019	E3-21026	10	311.9	2.6771	112.90	105.65	103.30	97.30	2.317	0.874	5.916	0.36	0.36	Gravity
E3-21020	E3-21021	6	138.4	6.8425	140.60	135.00	131.97	125.53	0.949	0.016	0.942	0.08	0.10	Gravity
E3-21021	E3-21022	6	50.0	1.4400	131.97	125.53	132.01	124.81	0.435	0.018	1.263	0.10	0.09	Gravity
E3-21022	E3-21023	6	32.0	4.0938	132.01	124.81	128.75	123.50	0.734	0.020	1.139	0.09	0.10	Gravity
E3-21023	E3-21024	6	50.0	1.5600	128.75	123.50	129.23	122.72	0.453	0.021	1.511	0.10	0.08	Gravity
E3-21024	E3-21025	6	129.2	9.8994	129.23	122.72	117.83	109.93	1.142	0.029	1.791	0.08	0.09	Gravity
E3-21025	E3-21019	8	110.7	3.8663	117.83	109.93	112.90	105.65	1.536	0.033	0.261	0.09	0.36	Gravity
E3-21026	E3-21027	10	256.0	4.0078	103.30	97.30	93.04	87.04	2.836	0.877	6.384	0.33	0.34	Gravity
E3-21027	D3-21014	10	357.6	3.7584	93.04	87.04	81.29	73.60	2.746	0.905	3.256	0.34	0.73	Gravity
E3-21028	E3-21029	6	250.0	8.6120	158.91	155.60	137.85	134.07	1.065	0.002	0.137	0.07	0.07	Gravity
E3-21029	E3-21030	6	255.2	4.3299	137.85	134.07	123.02	123.02	0.755	0.007	0.55	0.07	0.08	Gravity
E3-21030	E3-21031	6	248.4	3.7520	126.03	123.02	116.80	113.70	0.703	0.012	0.945	0.08	0.08	Gravity
E3-21031	D3-21008	6	289.4	6.7761	116.80	113.70	97.64	94.09	0.944	0.019	1.234	0.08	0.09	Gravity
E3-21032	E3-21033	8	214.5	7.6830	163.37	158.97	147.19	142.49	2.165	0.005	0.385	0.07	0.07	Gravity
E3-21033	E3-21034	8	226.2	8.5853	147.19	142.49	127.60	123.07	2.289	0.011	0.814	0.07	0.07	Gravity
E3-21034	D3-21004	8	228.3	12.2733	127.60	123.07	102.39	95.05	2.737	0.012	0.768	0.07	0.08	Gravity
E3-21036	D3-21089	6	359.8	7.8933	144.00	139.80	117.60	111.40	1.019	0.012	0.88	0.07	0.08	Gravity
E3-21040	E3-21041	6	398.0	6.5503	288.59	275.75	252.46	249.68	0.928	0.139	3.4	0.15	0.18	Gravity
E3-21041	E3-21096	6	254.1	8.8371	252.46	249.68	232.91	227.23	1.078	0.257	6.268	0.18	0.18	Gravity
E3-21051	E3-21053	8	174.2	4.8220	203.40	198.30	195.99	189.90	1.715	1.344	5.692	0.46	1.86	Surcharged
E3-21052	E3-29001	8	38.2	8.5000	213.60	213.60	213.36	213.36	2.277	1.221	9.54	0.36	0.38	Gravity
E3-21053	E3-21057	8	189.1	2.7023	195.99	189.90	188.57	184.79	1.284	1.398	6.537	1.78	0.60	Throttled
E3-21054	E3-21053	6	20.0	2.7000	194.00	190.44	195.99	189.90	0.596	0.055	0.395	1.32	1.85	Surcharged
E3-21055	E3-21054	6	115.5	20.3680	232.92	213.97	194.00	190.44	1.637	0.048	1.516	0.09	1.32	Surcharged
E3-21057	E3-21058	8	257.6	5.4115	188.57	184.78	175.72	170.84	1.817	1.418	8.423	0.45	0.49	Gravity
E3-21058	E3-21059	8	214.7	6.9492	175.72	170.84	163.03	155.92	2.059	1.418	5.642	0.42	FULL	Surcharged
E3-21059	E3-21067	8	232.0	2.8103	163.03	155.92	156.80	149.40	1.310	1.405	5.059	FULL	FULL	Throttled
E3-21067	E3-21068	8	220.0	1.0500	156.80	149.40	151.18	147.09	0.801	1.427	6.673	5.80	0.60	Throttled
E3-21068	E3-21071	8	149.9	4.0427	151.18	147.09	145.18	141.03	1.571	1.437	7.77	0.52	0.52	Gravity
E3-21071	E3-21072	12	25.0	30.2800	145.18	141.03	140.18	133.46	12.674	1.852	9.465	0.28	0.41	Gravity
E3-21072	E3-21074	12	90.0	6.1778	140.18	133.46	133.57	127.90	5.725	1.852	3.428	0.41	2.16	Surcharged
E3-21073	E3-21071	6	290.1	11.6236	179.75	174.75	145.18	141.03	1.237	0.415	5.617	0.21	0.28	Gravity
E3-21074	E3-29002	12	59.1	0.0000	133.57	127.90	137.88	127.90	0.000	1.852	3.463	2.12	1.74	Throttled
E3-21075	E3-21076	12	183.4	1.8539	131.69	127.62	128.35	124.22	3.136	1.870	5.564	0.57	0.63	Gravity
E3-21076	E3-21077	12	120.0	1.4583	128.35	124.22	127.83	122.47	2.781	1.879	5.719	0.62	0.62	Gravity
E3-21077	E3-21078	12	190.4	1.2605	127.83	122.00	126.72	119.60	2.586	1.885	5.448	0.65	0.65	Gravity
E3-21078	E3-21128	18	345.9	2.0526	126.72	119.60	117.41	112.50	9.728	1.887	6.139	0.47	0.47	Gravity
E3-21078	E3-21126	8	123.7	13.2482	126.72	120.30	119.67	103.91	2.844	0.000	0	0.07	0.07	Gravity
E3-21079	E3-21123	12	121.8	1.6962	104.13	98.13	111.05	96.06	3.000	0.209	3.133	0.21	0.19	Gravity
E3-21080	E3-21081	12	105.3	0.8743	100.23	94.93	101.81	94.22	1.891	0.216	2.37	0.24	0.24	Gravity
E3-21081	E3-21082	12	45.6	4.0570	101.81	94.22	99.39	92.37	4.640	0.221	2.423	0.18	0.24	Gravity
E3-21082	E3-21083	12	111.8	0.7603	99.39	92.37	100.26	91.52	2.008	0.230	2.515	0.24	0.24	Gravity
E3-21083	E4-21019	12	191.2	0.8787	100.26	90.91	91.93	89.23	2.159	0.235	2.668	0.23	0.23	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-21084	E3-21122	6	104.2	0.0000	171.99	167.73	169.35	167.73	0.000	0.013	0.737	0.16	0.10	Gravity
E3-21085	E3-21086	6	157.0	5.0637	159.51	153.06	149.50	145.11	0.816	0.029	1.989	0.09	0.09	Gravity
E3-21086	E3-21087	6	20.0	10.9000	149.50	145.11	146.80	142.93	1.198	0.033	1.762	0.09	0.10	Gravity
E3-21087	E3-21088	6	50.0	4.0200	146.80	142.93	144.91	140.92	0.727	0.039	2.632	0.10	0.09	Gravity
E3-21088	E3-21089	6	107.0	12.7664	144.91	140.92	131.77	127.26	1.296	0.039	2.285	0.09	0.10	Gravity
E3-21089	E3-21090	6	69.3	6.1472	131.77	127.26	126.69	123.00	0.899	0.039	2.096	0.10	0.10	Gravity
E3-21090	E3-21092	6	124.1	9.9380	126.69	123.00	118.60	110.67	1.144	0.062	0.442	0.10	2.03	Surcharged
E3-21091	E3-21090	6	125.0	4.4080	136.06	128.51	126.69	123.00	0.762	0.021	1.118	0.09	0.10	Gravity
E3-21092	E3-29014	6	13.2	9.9697	118.60	110.67	117.69	109.35	1.144	0.062	0.417	2.03	3.34	Surcharged
E3-21093	E3-22013	6	124.7	5.5894	146.03	139.77	133.60	132.80	0.858	0.023	0.708	0.09	0.16	Gravity
E3-21094	E3-21095	6	300.0	1.3533	111.71	106.50	107.64	102.44	0.422	0.073	2.438	0.16	0.16	Gravity
E3-21095	E4-21066	6	148.5	6.5926	107.64	102.44	100.00	92.65	0.932	0.125	0.966	0.14	0.51	Surcharged
E3-21096	E3-21097	6	128.9	8.8386	232.91	227.23	217.03	215.83	1.078	0.257	6.028	0.18	0.19	Gravity
E3-21097	E3-21098	6	302.1	10.5369	217.03	215.83	187.30	184.00	1.178	0.302	5.774	0.18	0.22	Gravity
E3-21098	E3-21099	6	224.5	6.5479	187.30	184.00	172.18	169.30	0.928	0.322	2.355	0.22	1.36	Surcharged
E3-21099	E3-21100	6	84.3	-0.2966	172.18	169.30	172.05	169.55	-0.198	0.332	3.11	1.34	0.39	Surcharged
E3-21100	E3-21103	8	85.6	4.4626	172.05	169.55	165.73	169.15	1.651	0.343	5.354	0.22	0.22	Gravity
E3-21101	E3-21100	8	49.3	0.3245	172.05	169.71	172.05	169.55	0.445	0.010	0.15	0.10	0.22	Gravity
E3-21102	E3-21103	6	93.1	0.0000	169.15	165.73	169.15	165.73	0.000	0.006	0.131	0.19	0.19	Gravity
E3-21103	E3-21104	8	127.0	8.5197	169.15	165.73	158.89	154.91	2.280	0.351	6.363	0.19	0.20	Gravity
E3-21104	E3-21105	8	128.9	7.4476	158.89	154.91	149.41	145.31	2.132	0.356	6.049	0.20	0.21	Gravity
E3-21105	E3-21106	8	171.1	6.1309	149.41	145.31	140.82	134.82	1.934	0.358	5.945	0.20	0.21	Gravity
E3-21106	E3-21107	8	128.7	6.0917	140.82	134.82	134.55	126.98	1.928	0.368	5.043	0.21	0.24	Gravity
E3-21107	E3-21108	8	171.3	3.4793	134.55	126.98	127.00	121.02	1.457	0.372	5.114	0.24	0.24	Gravity
E3-21108	E3-21109	8	128.0	10.3750	127.00	121.02	114.79	107.74	2.516	0.383	5.537	0.19	0.23	Gravity
E3-21109	E3-21110	8	172.0	4.5349	114.79	107.74	105.08	99.94	1.684	0.385	5.175	0.23	0.24	Gravity
E3-21110	E3-21111	8	128.0	3.6641	105.08	99.94	99.17	95.25	1.495	0.396	5.264	0.24	0.25	Gravity
E3-21111	E3-21112	8	172.0	3.5698	99.17	95.25	92.51	89.11	1.476	0.399	5.309	0.25	0.25	Gravity
E3-21112	E3-21113	8	127.0	6.8031	92.51	89.11	86.47	80.47	2.038	0.410	4.131	0.21	0.30	Gravity
E3-21113	D3-21017	10	408.1	1.2399	86.47	80.47	81.41	75.41	1.577	0.412	3.464	0.30	0.31	Gravity
E3-21114	E3-21115	6	128.0	4.5156	113.64	108.46	106.08	102.68	0.771	0.012	0.888	0.08	0.08	Gravity
E3-21115	E3-21116	8	172.0	4.5291	106.08	102.68	100.43	94.89	1.663	0.014	0.818	0.08	0.09	Gravity
E3-21116	E3-21117	8	127.9	3.7295	100.43	94.89	93.04	90.12	1.508	0.023	1.095	0.09	0.10	Gravity
E3-21117	E3-21027	8	209.8	1.4681	96.12	90.12	87.04	87.04	0.947	0.025	0.216	0.10	0.34	Gravity
E3-21118	D3-21079	6	125.0	3.5920	94.06	89.68	89.68	85.19	0.688	0.005	0.383	0.07	0.08	Gravity
E3-21119	E3-21055	6	99.1	20.3653	268.33	234.15	232.92	213.97	1.637	0.048	3.274	0.09	0.09	Gravity
E3-21120	E3-21074	6	83.0	19.1928	177.37	161.59	156.44	156.44	1.590	0.005	0.296	0.07	0.10	Gravity
E3-21122	E3-21085	6	126.1	11.6336	169.35	167.73	159.51	153.06	1.237	0.018	1.115	0.08	0.09	Gravity
E3-21123	E3-21080	12	66.9	2.7414	111.05	96.06	100.23	94.23	3.815	0.211	0.427	0.19	0.94	Gravity
E3-21124	E3-21094	6	151.6	16.0290	133.60	132.80	111.71	108.50	1.452	0.026	2.023	0.08	0.08	Gravity
E3-21125	E3-21083	6	149.7	11.7502	116.34	109.11	100.26	91.52	1.243	0.002	0.192	0.07	0.07	Gravity
E3-21126	E3-21079	8	45.0	12.8489	119.87	103.91	104.13	98.13	2.800	0.003	0.044	0.07	0.21	Gravity
E3-21127	E3-21128	18	111.0	0.5315	121.65	110.42	109.83	106.95	4.951	-1.962	-1.762	0.68	1.41	Gravity
E3-21127	E4-21074	18	390.0	0.7385	121.65	109.83	120.35	109.83	5.835	1.962	4.092	0.61	0.66	Gravity
E3-21128	E3-21125	6	28.9	11.7301	117.41	112.50	116.34	109.11	1.243	0.000	0	0.07	0.07	Gravity
E3-21129	E3-21130	10	148.8	11.1492	180.00	175.00	164.37	158.41	4.730	0.803	7.409	0.25	0.29	Gravity
E3-21130	E3-22018	10	170.9	5.9743	164.37	158.41	148.20	148.20	3.463	0.803	7.442	0.29	0.29	Gravity
E3-21131	E3-21018	8	153.8	4.4213	139.52	132.50	131.70	125.70	1.643	0.005	0.052	0.07	0.28	Gravity
E3-21132	E3-21114	6	170.8	7.5644	128.38	121.38	113.64	108.46	0.998	0.002	0.194	0.07	0.08	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E3-21132	E3-21025	8	110.1	10.3996	128.38	121.38	117.83	109.93	2.519	0.001	0.059	0.07	0.09	Gravity
E3-21133	E3-21015	6	146.0	0.6233	166.20	157.80	163.80	156.89	0.286	0.005	0.23	0.08	0.11	Gravity
E3-21134	E3-21020	6	146.6	0.7299	141.07	135.07	140.60	134.00	0.667	0.013	0.054	0.10	1.08	Surcharged
E3-22006	E3-21084	6	100.0	2.7800	173.63	170.51	171.99	167.73	0.605	0.017	0.213	0.07	0.16	Gravity
E3-22013	E3-21124	6	23.7	0.0000	133.60	132.80	133.60	132.80	0.000	0.023	1.105	0.15	0.11	Gravity
E3-22016	E3-21013	8	482.7	1.4585	188.54	183.54	182.50	176.50	0.943	0.006	0.319	0.08	0.09	Gravity
E3-22017	E3-21101	8	196.7	3.1978	185.80	176.00	172.93	169.71	1.397	0.009	0.437	0.08	0.10	Gravity
E3-22018	E3-21017	10	89.2	9.8655	154.28	148.20	145.40	139.40	4.448	0.805	7.041	0.25	0.30	Gravity
E3-22019	E3-21020	8	163.3	2.3637	142.36	136.36	140.60	132.50	1.201	0.000	0	0.07	2.58	Surcharged
E3-22019	E3-21020	8	164.1	0.9141	142.36	134.00	140.60	132.50	0.747	0.002	0.008	1.08	2.58	Surcharged
E3-22020	E3-21104	6	194.2	4.5778	167.20	163.80	158.89	154.91	0.776	0.002	0.042	0.07	0.20	Gravity
E3-22020	E3-21133	6	215.0	2.7907	167.20	163.80	166.20	157.80	0.606	0.002	0.12	0.07	0.08	Gravity
E3-22021	E3-21105	8	194.7	1.3816	151.50	148.00	149.41	145.31	0.918	0.000	-0.002	0.07	0.21	Gravity
E3-22021	E3-21134	8	216.4	4.7274	151.50	145.30	141.07	135.07	1.699	0.006	0.299	0.07	0.10	Gravity
E3-22023	E3-21024	6	218.4	14.9176	157.40	155.30	129.23	122.72	1.401	0.005	0.332	0.07	0.08	Gravity
E3-22024	E3-21106	6	188.5	8.8488	157.50	151.50	140.82	134.82	1.079	0.004	0.071	0.07	0.21	Gravity
E3-22025	E3-21132	8	51.5	24.0194	139.75	133.75	128.38	121.38	3.829	0.001	0.098	0.07	0.07	Gravity
E3-22026	E3-21107	8	154.8	6.6214	143.23	137.23	134.55	126.98	2.010	0.002	0.037	0.07	0.24	Gravity
E3-22028	E3-21114	6	120.0	16.3333	131.56	128.06	113.64	108.46	1.466	0.005	0.377	0.07	0.08	Gravity
E3-22029	E3-21108	6	155.0	7.1419	136.59	132.09	127.00	121.02	0.969	0.006	0.143	0.07	0.19	Gravity
E3-22030	E3-21115	6	157.9	4.8702	116.37	110.37	106.08	102.68	1.724	0.000	0	0.07	0.08	Gravity
E3-22030	E3-21109	8	190.0	1.3842	116.37	110.37	114.79	107.74	0.919	0.000	-0.002	0.07	0.23	Gravity
E3-22032	E3-21116	6	100.0	12.8200	112.79	107.71	100.43	94.89	1.299	0.003	0.31	0.07	0.09	Gravity
E3-22033	E3-21110	6	160.0	7.4813	115.41	111.91	105.08	99.94	0.992	0.003	0.061	0.07	0.24	Gravity
E3-22035	E3-21111	8	189.8	1.0011	102.54	97.15	99.17	95.25	0.782	0.000	0.006	0.07	0.25	Gravity
E3-22035	E3-21117	8	158.2	4.4437	102.54	97.15	96.12	90.12	1.647	0.001	0.038	0.07	0.10	Gravity
E3-22036	D3-21079	6	153.0	3.7778	94.47	90.97	89.68	85.19	0.705	0.007	0.578	0.07	0.08	Gravity
E3-22037	E3-21112	6	155.0	2.7419	96.86	93.36	92.51	89.11	0.601	0.007	0.133	0.07	0.22	Gravity
E3-22038	D4-21054	6	89.3	6.0806	85.92	82.42	83.02	76.99	0.895	0.005	0.402	0.07	0.08	Gravity
E3-29001	E3-21051	8	141.9	8.4954	213.36	210.36	203.40	198.30	2.277	1.229	6.816	0.36	0.52	Gravity
E3-29002	E3-21075	12	178.3	0.1570	137.88	127.90	131.69	127.62	0.913	1.870	4.704	1.69	0.73	Throttled
E3-29014	E3-21128	8	7.0	-44.9857	117.69	109.35	117.41	112.50	-5.240	0.076	1.434	3.34	0.19	Surcharged
E4-21002	E4-21003	6	267.2	0.5576	64.41	61.02	66.21	59.53	0.271	0.034	1.15	0.14	0.14	Gravity
E4-21003	E4-21004	6	167.2	3.5586	66.21	59.53	58.00	53.58	0.684	0.099	2.21	0.14	0.19	Gravity
E4-21004	E4-21005	6	300.0	1.7800	58.00	53.58	52.07	48.24	0.484	0.134	2.333	0.19	0.23	Gravity
E4-21005	E5-21069	6	300.0	1.4467	52.07	48.24	47.62	43.90	0.436	0.174	2.715	0.23	0.25	Gravity
E4-21006	E4-21007	8	196.6	6.5768	73.75	69.07	61.35	56.14	2.004	0.206	0.22	0.56	0.38	Gravity
E4-21007	E4-21009	8	40.0	0.0000	61.35	56.14	61.35	56.14	0.000	0.416	3.152	0.55	0.38	Gravity
E4-21009	E4-21012	8	150.0	3.4800	61.35	56.14	56.01	50.92	1.457	0.442	5.137	0.26	0.27	Gravity
E4-21010	E4-21011	6	252.7	1.1634	59.01	56.30	58.00	53.36	0.391	0.017	0.639	0.10	0.13	Gravity
E4-21011	E4-21012	6	266.6	0.9152	58.00	53.36	56.01	50.92	0.347	0.038	0.55	0.13	0.27	Gravity
E4-21012	E4-21015	10	300.0	3.2133	56.01	50.92	50.85	41.28	2.539	0.521	3.41	0.27	0.37	Gravity
E4-21013	E4-21014	6	280.4	1.0753	51.73	47.25	48.60	44.45	0.376	0.019	0.739	0.10	0.13	Gravity
E4-21014	E4-21015	6	308.7	1.0269	48.60	44.45	45.85	41.28	0.368	0.039	0.382	0.13	0.37	Gravity
E4-21015	E4-21017	10	300.0	1.1367	50.85	41.28	49.23	37.87	1.510	0.597	2.452	0.37	0.54	Gravity
E4-21016	E4-21017	6	257.1	0.4201	41.40	38.95	49.23	37.87	0.235	0.040	0.308	0.15	0.54	Surcharged
E4-21017	E4-21018	10	300.0	0.4000	49.23	37.87	45.65	36.67	0.896	0.666	3.38	0.54	0.46	Gravity
E4-21018	D4-21004	8	333.9	0.2725	45.65	36.75	40.65	35.84	0.408	0.138	1.349	0.28	0.31	Gravity
E4-21018	D4-21001	10	300.0	1.1233	45.65	36.67	44.50	33.30	1.501	0.547	3.773	0.36	0.36	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E4-21019	E4-21020	12	62.6	11.0703	91.93	89.23	89.03	82.30	7.666	0.240	3.954	0.15	0.18	Gravity
E4-21020	E4-21021	12	87.6	5.1826	89.03	82.30	85.45	77.76	5.243	0.245	1.502	0.18	0.36	Gravity
E4-21021	E4-21022	12	75.4	0.1061	85.45	77.76	82.54	77.68	0.750	0.245	2.367	0.36	0.28	Gravity
E4-21022	E4-21023	12	87.0	1.2529	82.54	75.88	81.98	75.88	2.578	1.167	4.843	0.49	0.49	Gravity
E4-21023	E4-21024	12	41.1	1.4112	81.98	75.88	86.42	75.30	2.737	1.173	4.966	0.47	0.47	Gravity
E4-21024	E4-21025	12	51.1	2.3288	86.42	75.30	80.13	74.11	3.513	1.172	6.053	0.41	0.41	Gravity
E4-21025	E4-21026	12	69.2	2.5578	80.13	74.11	78.84	72.34	3.683	1.179	5.119	0.41	0.46	Gravity
E4-21026	E4-21027	12	82.1	1.5104	78.84	72.34	92.25	71.10	2.830	1.179	5.311	0.46	0.45	Gravity
E4-21027	E4-21028	12	160.1	1.6615	92.25	71.10	74.96	68.44	2.969	1.186	5.484	0.45	0.44	Gravity
E4-21028	E4-21029	12	108.6	1.7864	74.96	68.44	71.80	66.50	3.079	1.188	4.762	0.44	0.49	Gravity
E4-21029	E4-21067	12	21.8	1.2661	71.80	66.50	93.78	66.22	2.592	1.198	4.806	0.49	0.49	Gravity
E4-21030	E4-21031	12	249.7	1.6740	71.82	66.13	67.25	61.95	2.980	1.204	4.375	0.45	0.53	Gravity
E4-21031	E4-21032	12	127.6	0.9326	67.25	61.95	65.76	60.76	2.224	1.211	4.153	0.53	0.56	Gravity
E4-21032	E4-21033	12	118.1	0.8383	65.76	60.76	64.08	59.77	2.109	1.210	3.403	0.56	0.66	Gravity
E4-21033	E4-21034	12	69.5	0.4604	64.08	59.77	64.39	59.45	1.562	1.210	3.639	0.65	0.62	Gravity
E4-21034	E4-21035	12	66.7	0.5697	64.39	59.45	63.20	59.07	1.739	1.217	3.917	0.62	0.59	Gravity
E4-21035	E4-21036	12	92.8	1.0345	63.20	59.07	62.27	58.11	2.342	1.224	3.63	0.53	0.63	Gravity
E4-21036	E4-21037	12	82.6	0.5690	62.27	58.11	62.06	57.64	1.738	1.228	3.931	0.63	0.59	Gravity
E4-21037	E4-21038	12	109.5	0.7763	62.06	57.64	60.87	56.79	2.029	1.232	3.872	0.57	0.60	Gravity
E4-21038	E4-21039	12	151.6	0.6662	60.87	56.79	64.89	55.78	1.880	1.237	3.748	0.60	0.62	Gravity
E4-21039	E4-21040	12	79.8	0.6516	64.89	55.78	64.51	55.26	1.860	1.241	3.538	0.61	0.65	Gravity
E4-21040	E4-21042	12	132.0	0.8591	64.51	55.26	61.37	54.39	1.870	1.383	4.115	0.64	0.63	Gravity
E4-21042	E4-21075	18	49.8	1.4257	61.37	53.21	60.22	52.50	8.108	1.787	3.832	0.51	0.64	Gravity
E4-21043	E4-21042	8	227.4	2.0053	65.37	58.95	61.37	54.39	1.106	0.401	4.337	0.29	0.29	Gravity
E4-21045	D4-21014	18	325.4	1.2846	53.53	45.78	47.74	41.60	7.896	3.814	6.563	0.76	0.76	Gravity
E4-21047	E3-21084	6	307.0	4.4691	127.92	120.22	111.71	106.50	0.767	0.025	0.751	0.09	0.16	Gravity
E3-21095	E3-21095	6	307.0	0.7720	114.29	104.81	107.64	102.44	0.319	0.029	0.991	0.12	0.14	Gravity
E4-21048	E4-21048	6	20.0	2.3500	113.30	105.28	114.29	104.81	0.556	0.029	1.236	0.10	0.12	Gravity
E4-21051	E4-21052	6	150.0	0.5533	103.22	97.04	103.77	96.21	0.270	0.009	0.464	0.09	0.11	Gravity
E4-21052	E4-21053	6	20.0	1.3000	103.77	96.21	104.99	95.95	0.414	0.029	1.413	0.11	0.11	Gravity
E4-21053	E4-22020	6	194.2	1.3182	104.99	95.95	97.17	93.39	0.416	0.029	0.583	0.11	0.21	Gravity
E4-21054	E4-21055	6	143.4	2.2566	104.81	92.65	91.40	89.41	0.545	0.196	3.644	0.22	0.22	Gravity
E4-21055	E4-21061	6	156.6	2.2567	91.40	89.41	91.58	85.88	0.545	0.200	1.881	0.22	0.84	Surcharged
E4-21056	E4-21065	6	100.2	2.0559	80.85	77.56	77.63	75.50	0.520	0.266	3.954	0.28	0.28	Gravity
E4-21057	E4-21066	6	111.0	3.6216	91.99	81.58	80.85	77.56	0.690	0.284	3.867	0.24	0.28	Gravity
E4-21058	E4-21057	6	50.0	1.7600	93.07	82.48	91.99	81.58	0.481	0.276	3.722	0.28	0.28	Gravity
E4-21059	E4-21059	6	20.0	1.6500	94.19	82.79	93.07	82.46	0.466	0.272	3.611	0.29	0.29	Gravity
E4-21060	E4-22031	6	223.0	0.6457	88.28	84.23	91.37	82.79	0.291	0.248	1.816	1.01	1.32	Surcharged
E4-21061	E4-21060	6	353.5	0.4688	91.58	85.88	88.28	84.23	0.248	0.224	2.089	0.83	1.02	Surcharged
E4-21062	E4-22027	6	239.1	3.1221	84.26	78.64	81.33	71.18	0.641	0.056	2.152	0.12	0.13	Gravity
E4-21063	E4-21064	6	44.0	1.1591	69.85	62.93	66.92	62.42	0.391	0.379	3.509	0.43	0.40	Gravity
E4-21064	E4-21043	8	115.2	3.0122	66.92	62.42	65.37	58.95	1.356	0.390	4.213	0.25	0.29	Gravity
E4-21065	E4-21063	6	162.0	7.7593	77.63	75.50	68.85	62.93	1.011	0.291	2.557	0.20	0.45	Gravity
E4-21066	E4-21054	6	151.5	0.0000	100.00	92.65	104.81	92.65	0.000	0.129	2.347	0.51	0.22	Throttled
E4-21067	E4-21030	12	7.4	1.2703	93.78	66.22	71.52	66.13	2.592	1.198	4.81	0.49	0.49	Gravity
E4-21068	E4-21075	18	102.8	1.8482	62.09	54.40	60.22	52.50	9.234	1.967	4.397	0.50	0.64	Gravity
E4-21069	E4-21071	18	330.2	-5.5300	74.77	86.50	92.00	86.50	-15.968	-1.967	-8.418	0.40	0.39	Gravity
E4-21069	E4-21068	18	274.1	5.0493	74.77	68.24	62.69	54.40	15.259	1.967	5.936	0.40	0.50	Gravity
E4-21072	E4-21071	18	397.1	3.3966	105.93	100.00	92.00	86.50	12.519	1.962	7.305	0.43	0.43	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E4-21073	E4-21072	18	319.7	2.0050	116.37	106.41	105.93	100.00	9.615	1.962	6.134	0.49	0.49	Gravity
E4-21074	E4-21073	18	100.6	0.5368	120.35	106.95	116.37	106.41	4.976	1.962	4.094	0.66	0.66	Gravity
E4-21075	E4-21045	18	279.2	2.4069	60.22	52.50	53.53	45.78	10.535	3.768	6.463	0.64	0.76	Gravity
E4-22013	E4-21045	6	105.5	1.7156	54.10	51.01	49.20	0.475	0.011	0.011	0.08	0.08	0.08	Gravity
E4-22020	E4-22021	6	19.5	0.0000	97.17	93.39	96.99	93.39	0.000	0.038	0.889	0.21	0.19	Gravity
E4-22021	E4-21054	6	243.3	0.2959	96.99	93.39	104.81	92.67	0.197	0.051	1.098	0.19	0.20	Gravity
E4-22023	E4-21059	6	59.3	0.0000	94.83	82.79	94.19	82.79	0.000	0.073	0.29	0.29	0.29	Gravity
E4-22024	E4-21061	6	75.0	7.7467	94.74	91.69	91.58	85.88	1.010	0.013	0.129	0.08	0.84	Surcharged
E4-22025	E4-22026	6	15.7	0.0000	91.97	87.59	91.97	87.59	0.000	0.030	1.297	0.16	0.12	Gravity
E4-22026	E4-21062	6	178.2	5.0224	91.97	87.59	84.26	78.64	0.873	0.039	1.721	0.10	0.12	Gravity
E4-22027	E4-22028	6	20.7	3.1256	81.33	71.18	80.55	70.53	0.641	0.070	2.495	0.13	0.14	Gravity
E4-22028	E4-21063	6	243.4	3.1216	80.65	70.53	69.85	62.93	0.641	0.079	0.699	0.14	0.45	Gravity
E4-22029	E4-21043	6	231.3	2.7756	75.12	65.37	65.37	58.95	1.302	0.005	0.049	0.07	0.29	Gravity
E4-22031	E4-21059	6	180.5	0.1828	91.37	82.79	94.19	82.46	0.155	0.267	2.018	1.31	0.62	Throttled
E5-21003	E5-21004	6	260.9	0.7742	53.63	48.15	49.61	46.13	0.319	0.029	1.575	0.12	0.12	Gravity
E5-21004	E5-21005	6	120.0	4.3667	49.61	46.13	44.58	40.89	0.758	0.039	1.931	0.10	0.11	Gravity
E5-21005	E5-21006	6	120.0	2.7500	44.58	42.00	40.89	37.59	0.043	0.32	0.11	0.89	Surcharged	
E5-21006	E5-21007	6	34.5	1.4203	41.20	37.59	41.28	37.10	0.432	0.560	4.654	0.83	0.45	Throttled
E5-21007	E5-21008	10	94.4	1.1335	41.28	37.07	39.20	36.00	1.508	0.659	3.953	0.40	0.40	Gravity
E5-21008	E5-21009	10	238.9	1.7539	39.20	34.38	34.78	30.19	1.876	0.674	4.485	0.36	0.37	Gravity
E5-21009	E5-21031	12	230.0	1.2696	34.78	30.19	31.65	27.27	2.595	0.704	4.067	0.37	0.37	Gravity
E5-21010	E5-21009	6	250.0	3.2600	41.85	38.40	34.78	30.25	0.655	0.019	0.471	0.09	0.31	Gravity
E5-21011	E5-21031	8	154.0	0.6494	32.27	28.27	31.65	27.27	0.630	0.013	0.189	0.09	0.37	Gravity
E5-21012	E5-21013	6	185.0	-7.3297	41.17	37.07	53.27	50.63	-0.982	-0.004	-0.353	0.40	0.07	Gravity
E5-21012	E5-21007	6	159.7	0.0000	41.17	37.07	41.28	37.07	0.000	0.007	0.07	0.40	0.40	Gravity
E5-21013	E5-21014	6	205.0	0.5463	53.27	50.63	53.69	49.51	0.288	0.001	0.079	0.07	0.08	Gravity
E5-21014	E5-21015	6	188.4	0.5573	53.69	49.51	52.84	48.46	0.271	0.005	0.345	0.08	0.09	Gravity
E5-21015	E5-21016	6	190.0	0.3579	52.84	48.46	52.13	47.78	0.217	0.006	0.315	0.09	0.10	Gravity
E5-21016	E5-21026	6	383.5	2.6988	52.13	47.78	40.69	37.43	0.596	0.035	1.396	0.10	0.13	Gravity
E5-21017	E5-21007	10	790.2	0.7466	52.51	43.06	41.28	37.16	1.224	0.096	1.02	0.17	0.31	Gravity
E5-21018	E5-21017	10	275.0	1.0909	51.67	46.06	52.51	43.06	1.479	0.093	1.786	0.17	0.17	Gravity
E5-21021	E5-21022	8	266.4	2.2973	43.05	38.20	36.09	32.08	1.184	0.000	0	0.07	0.07	Gravity
E5-21022	E5-21023	8	35.0	0.5143	36.09	32.09	35.91	31.91	0.560	0.000	0	0.07	0.07	Gravity
E5-21023	E5-21024	8	160.3	0.8796	35.91	31.91	34.93	30.50	0.733	0.000	0	0.07	0.07	Gravity
E5-21024	E5-21025	8	172.7	0.3764	34.93	30.30	36.13	29.65	0.479	0.028	0.412	0.13	0.23	Gravity
E5-21025	E5-21029	8	285.3	0.2173	36.13	29.65	36.66	29.03	0.364	0.084	1.646	0.23	0.19	Gravity
E5-21026	E5-21025	6	356.0	1.9607	40.69	37.43	36.13	30.45	0.508	0.051	2.046	0.13	0.13	Gravity
E5-21027	E5-21026	6	264.1	1.0451	44.09	40.33	40.69	37.57	0.371	0.012	0.793	0.09	0.09	Gravity
E5-21028	E5-21027	6	283.8	0.4475	45.19	41.60	44.09	40.33	0.243	0.002	0.145	0.07	0.09	Gravity
E5-21028	E5-21009	6	358.6	3.0006	45.19	41.60	46.28	30.84	0.628	0.006	0.507	0.07	0.07	Gravity
E5-21029	E5-21030	8	270.8	0.6647	36.66	29.03	35.51	27.23	0.637	0.092	1.777	0.18	0.19	Gravity
E5-21030	E5-21032	8	385.8	0.6143	35.51	27.23	34.86	24.86	0.612	0.097	1.291	0.19	1.46	Surcharged
E5-21031	E5-21033	12	193.0	1.2642	31.65	24.86	34.86	24.83	2.590	0.716	3.604	0.37	1.48	Surcharged
E5-21032	E5-21033	10	21.7	0.9677	34.86	24.86	1.392	0.098	0.484	1.46	1.66	1.46	1.66	Surcharged
E5-21033	E5-21034	10	290.0	0.3069	34.69	24.65	33.58	23.76	0.785	0.805	2.47	1.65	1.58	Throttled
E5-21034	E5-21035	10	288.7	0.3312	33.58	23.76	33.01	22.87	0.815	0.816	2.481	1.57	1.55	Throttled
E5-21035	E5-21035A	15	83.0	0.5060	33.01	22.55	31.66	22.13	2.971	4.506	5.84	1.75	1.18	Throttled
E5-21035A	E6-21050	18	213.0	0.5211	31.66	22.13	30.40	21.02	4.902	4.505	4.88	1.15	1.14	Gravity
E5-21036	E5-21035	15	44.1	1.3152	33.78	23.24	33.01	22.66	4.787	3.685	4.444	1.55	1.76	Surcharged

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E5-21038	E5-21039	8	210.0	3.6048	24.29	21.11	20.32	13.54	1.483	0.009	0.257	0.08	0.14	Gravity
E5-21039	E5-21041	8	320.5	0.4243	20.32	13.54	18.06	12.18	0.509	0.040	1.337	0.14	0.13	Gravity
E5-21040	E5-21039	6	243.1	1.0366	24.91	16.06	20.32	13.54	0.369	0.017	0.563	0.10	0.14	Gravity
E5-21041	E5-21046	8	244.9	0.8983	18.06	12.03	12.82	9.83	0.740	0.122	1.936	0.19	0.22	Gravity
E5-21042	E5-21041	8	239.1	1.7900	21.29	23.91	18.06	12.03	1.045	0.034	0.622	0.10	0.19	Gravity
E5-21043	E5-21041	6	181.0	1.1160	21.30	14.20	18.06	12.18	0.383	0.040	1.566	0.13	0.13	Gravity
E5-21044	E5-21045	6	447.1	0.3688	27.49	22.29	23.57	20.65	0.220	0.007	0.286	0.09	0.13	Gravity
E5-21044	E5-21044	6	128.3	6.3055	27.49	22.29	21.30	14.20	0.911	0.029	1.152	0.09	0.13	Gravity
E5-21045	D5-21004	6	265.1	0.3998	23.57	20.65	23.25	19.59	0.229	0.023	1.089	0.13	0.11	Gravity
E5-21046	E5-21047	8	276.2	0.7133	12.82	9.83	11.43	7.86	0.660	0.134	1.28	0.22	0.32	Gravity
E5-21047	E5-21048	8	255.4	0.1919	11.43	7.86	11.03	7.37	0.342	0.147	2.196	0.32	0.23	Gravity
E5-21048	E5-21049	8	150.4	0.6250	11.03	7.29	11.64	6.35	0.618	0.198	1.401	0.27	0.40	Gravity
E5-21049	E5-21050	8	188.0	0.2340	11.64	6.35	10.72	5.91	0.378	0.249	2.603	0.40	0.29	Gravity
E5-21050	D5-21005	10	46.6	0.7725	10.72	5.91	10.36	5.55	1.245	0.276	1.897	0.28	0.39	Gravity
E5-21051	E5-21050	10	25.9	3.1274	10.72	6.72	10.72	5.91	2.505	0.026	0.249	0.10	0.28	Gravity
E5-21052	E5-21051	6	96.6	0.9317	12.05	7.62	10.72	6.72	0.350	0.021	1.107	0.11	0.10	Gravity
E5-21053	E5-21049	6	171.6	6.6200	25.57	18.57	11.64	7.21	0.933	0.043	2.437	0.10	0.10	Gravity
E5-21054	E5-21053	6	335.4	3.0501	31.47	28.91	25.57	18.68	0.834	0.009	0.755	0.08	0.10	Gravity
E5-21055	E5-21053	6	395.3	3.3747	38.05	31.91	25.57	18.57	0.666	0.024	1.366	0.09	0.10	Gravity
E5-21056	E5-21057	6	319.9	1.5286	49.39	45.57	46.28	40.68	0.449	0.016	4.401	0.09	4.66	Surcharged
E5-21057	E5-21058	6	319.9	0.4939	46.28	40.68	50.54	39.10	0.255	-0.131	-0.768	4.66	6.61	Surcharged
E5-21058	E5-21059	6	13.9	0.0000	50.54	39.60	50.80	39.60	0.000	-1.058	-6.022	6.12	7.35	Throttled
E5-21059	E5-21060	6	319.9	0.1876	50.54	39.10	44.39	38.50	0.157	0.500	4.077	6.59	0.89	Throttled
E5-21059	E5-21061	8	304.5	0.4039	50.80	38.73	44.60	37.50	0.497	1.088	5.093	8.28	3.67	Throttled
E5-21060	E5-21063	6	301.8	1.9980	44.39	38.50	36.69	32.47	0.513	0.510	4.43	0.84	0.45	Surcharged
E5-21061	E5-21062	8	302.1	4.3793	44.60	37.50	37.30	24.27	1.635	1.079	3.685	3.62	10.88	Surcharged
E5-21062	E5-21066	8	175.1	0.3883	37.30	24.27	35.80	23.59	0.487	1.073	3.984	10.86	8.21	Throttled
E5-21063	E5-21064	6	125.2	4.5048	36.69	32.47	36.36	26.83	0.770	0.510	3.851	0.31	0.69	Surcharged
E5-21064	E5-21067	8	262.5	0.4267	36.36	26.83	31.22	25.71	0.510	0.525	3.405	0.67	0.43	Throttled
E5-21065	E5-21064	8	195.0	3.6103	36.42	26.83	36.36	26.83	1.484	0.007	0.153	0.08	0.68	Surcharged
E5-21066	E5-21068	8	227.0	0.3961	35.80	23.59	30.20	22.70	0.492	1.075	4.915	8.18	4.79	Throttled
E5-21067	D5-21040	10	377.0	2.2679	31.22	25.71	23.66	17.16	2.133	0.563	3.132	0.30	0.43	Gravity
E5-21068	D5-21039	8	215.4	2.1959	30.20	22.70	25.60	17.97	1.158	1.078	5.323	4.75	5.32	Surcharged
E5-21069	E5-21070	6	300.0	1.5067	47.62	43.90	43.33	39.38	0.445	0.212	2.411	0.25	0.33	Gravity
E5-21070	E5-21071	6	300.0	1.0900	43.33	39.38	39.94	36.11	0.379	0.269	2.575	0.32	0.39	Gravity
E5-21071	E5-21072	6	300.0	1.1000	39.94	36.11	36.94	32.81	0.380	0.334	3.287	0.38	0.37	Gravity
E5-21072	D5-21060	8	125.0	6.5280	36.94	32.81	36.01	24.65	1.996	0.403	2.101	0.22	0.53	Gravity
E5-21073	E5-21048	8	148.6	0.5518	12.13	8.11	11.03	7.29	0.580	0.049	0.57	0.15	0.27	Gravity
E5-21074	E6-21076	6	310.0	4.3129	33.35	28.86	23.48	15.49	0.753	0.024	1.583	0.09	0.09	Gravity
E5-21075	E5-21069	6	252.8	1.4517	46.90	42.40	50.80	38.73	0.437	0.447	2.898	FULL	8.31	Throttled
E5-21076	E5-21075	6	391.2	0.8691	59.40	45.80	46.90	42.40	0.338	0.638	4.038	FULL	FULL	Throttled
E5-22002	E5-21056	6	230.0	0.8739	48.85	47.58	49.39	45.57	0.339	0.008	0.547	0.08	0.09	Gravity
E5-22003	E5-21057	6	252.7	0.3364	44.84	41.53	46.28	40.68	0.210	-0.150	-0.95	FULL	4.66	Surcharged
E5-22005	E5-21058	6	163.1	0.7664	43.36	40.35	50.54	39.10	0.318	-0.430	-2.516	FULL	6.59	Throttled
E5-22007	E5-21071	6	225.0	-0.0489	38.91	36.00	39.94	36.11	-0.080	0.024	0.237	0.51	0.39	Surcharged
E5-22008	E5-21060	6	235.0	0.1447	40.32	38.84	44.39	38.50	0.138	0.009	0.174	0.55	0.89	Surcharged
E5-22009	E5-21072	6	318.7	0.3263	37.39	33.85	36.94	32.81	0.207	0.020	0.381	0.12	0.22	Gravity
E5-22010	E5-21065	6	55.0	1.0545	36.20	34.45	36.42	33.87	0.373	0.002	0.209	0.07	0.08	Gravity
E5-22011	E5-21003	6	50.0	6.2600	53.56	51.28	53.63	48.15	0.908	0.004	0.153	0.07	0.12	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E5-22012	E5-21010	6	300.0	0.6967	43.19	40.49	41.85	38.40	0.303	0.009	0.643	0.09	0.09	Gravity
E5-22013	E5-22013A	8	105.0	0.6667	34.90	29.50	33.65	28.80	0.638	0.012	0.654	0.09	0.09	Gravity
E5-22013A	E5-21011	8	81.0	0.6543	33.65	28.80	32.27	28.27	0.632	0.012	0.638	0.09	0.09	Gravity
E5-22014	E5-21055	6	432.6	1.1442	37.97	36.86	38.05	31.91	0.388	0.008	0.474	0.08	0.09	Gravity
E5-22015	E5-21040	6	183.7	5.9118	33.72	27.12	24.91	16.26	0.882	0.005	0.501	0.07	0.07	Gravity
E5-22016	E5-21040	6	159.5	8.0564	31.13	28.91	24.91	16.06	1.030	0.004	0.248	0.07	0.10	Gravity
E5-22019	E5-21021	8	304.3	1.2751	49.72	42.08	43.05	38.20	0.882	0.000	0	0.07	0.07	Gravity
E5-22039	E5-21070	8	146.7	0.6885	44.69	40.39	43.33	39.38	0.648	0.021	0.193	0.10	0.33	Gravity
E6-21001	E6-21002	6	376.5	0.3772	34.56	30.65	32.64	29.23	0.223	0.039	0.672	0.16	0.24	Gravity
E6-21002	E6-21003	6	337.6	0.2695	32.64	29.23	30.98	28.32	0.188	0.077	1.893	0.24	0.18	Gravity
E6-21003	E7-21057	6	223.0	1.3049	30.98	28.32	30.96	25.41	0.414	0.077	2.193	0.16	0.16	Gravity
E6-21006	E6-21294	8	259.0	1.4479	29.35	23.06	28.00	19.31	0.940	0.000	0.009	0.07	0.13	Gravity
E6-21007	E6-21008	6	276.0	0.9457	30.93	25.49	28.86	22.88	0.353	0.012	0.467	0.09	0.13	Gravity
E6-21008	E6-21009	6	60.9	2.1232	28.56	22.88	28.59	21.59	0.529	0.065	2.062	0.13	0.14	Gravity
E6-21009	E6-21010	6	163.3	2.1231	28.69	21.59	27.34	18.12	0.529	0.065	0.514	0.14	0.49	Gravity
E6-21010	E6-21925	18	130.0	0.3077	27.34	18.12	27.73	17.72	3.767	0.841	3.046	0.48	0.44	Gravity
E6-21013	E6-21294	8	273.0	1.0293	27.17	22.12	28.00	19.31	0.793	0.067	2.078	0.15	0.15	Gravity
E6-21017	E6-21030	18	289.6	0.4489	25.48	16.53	23.78	15.23	4.549	0.921	1.596	0.46	0.76	Gravity
E6-21018	E6-21019	6	218.0	1.3028	34.71	29.61	31.97	26.77	0.414	0.035	1.274	0.12	0.13	Gravity
E6-21019	E6-21021	6	230.1	1.1604	31.97	26.77	29.02	24.10	0.391	0.046	0.592	0.13	0.30	Gravity
E6-21020	E6-21021	6	454.4	0.8737	33.28	28.07	29.02	24.10	0.339	0.276	3	0.36	0.34	Gravity
E6-21021	E6-21022	6	107.8	2.1521	29.02	24.10	27.08	21.78	0.532	0.327	4.314	0.29	0.29	Gravity
E6-21022	E6-21026	8	224.8	1.3746	27.08	21.78	28.90	18.69	0.916	0.337	1.43	0.29	0.89	Surcharged
E6-21023	E6-21024	8	305.0	1.1607	34.53	26.09	30.20	22.55	0.842	0.449	3.684	0.35	0.35	Gravity
E6-21024	E6-21025	10	299.0	0.6020	30.20	22.15	28.91	20.35	1.099	0.537	2.622	0.42	0.47	Gravity
E6-21025	E6-21026	10	331.6	0.5006	28.91	20.35	28.90	18.69	1.002	0.585	1.717	0.47	0.89	Surcharged
E6-21026	E6-21027	10	260.9	0.3756	26.90	17.71	25.51	0.868	0.931	3.318	0.88	0.63	0.63	Throttled
E6-21027	E6-21028	10	218.1	0.6006	25.51	17.71	24.65	16.40	1.088	0.950	2.981	0.62	0.83	Gravity
E6-21028	E6-21030	10	246.0	0.4756	24.65	16.40	23.78	15.23	0.977	0.978	2.905	0.82	0.76	Gravity
E6-21030	E6-21041	18	363.0	0.3085	23.78	15.23	21.39	14.11	3.772	1.908	3.413	0.76	0.74	Gravity
E6-21032	E6-21033	8	255.0	0.6118	35.73	30.53	34.00	28.97	0.611	0.018	0.367	0.10	0.18	Gravity
E6-21034	E6-21034	6	328.3	0.5178	34.00	28.97	32.16	27.27	0.261	0.065	1.859	0.18	0.17	Gravity
E6-21034	E6-21035	8	228.5	1.7155	32.16	27.27	27.67	23.35	1.023	0.094	1.99	0.15	0.18	Gravity
E6-21035	E6-21036	8	227.1	1.4839	27.67	23.35	25.31	19.98	0.952	0.122	1.719	0.18	0.24	Gravity
E6-21036	E6-21038	8	250.0	0.6520	25.31	19.98	23.60	18.35	0.631	0.154	2.175	0.24	0.23	Gravity
E6-21037	E6-21038	21	140.0	0.3857	18.99	11.49	18.56	10.95	6.361	3.240	2.843	0.96	1.21	Gravity
E6-21037	E6-21046	21	45.8	1.4410	18.99	11.49	10.83	12.295	3.548	1.50	0.96	1.50	0.96	Gravity
E6-21038	E6-21039	8	243.6	0.7471	23.60	16.18	22.38	14.36	0.675	0.188	0.816	0.25	0.69	Surcharged
E6-21039	E6-21040	10	281.9	0.0674	22.38	14.36	21.62	14.17	0.388	0.248	0.717	0.69	0.79	Gravity
E6-21040	E6-21041	10	253.3	0.0237	21.62	14.17	21.39	14.11	0.218	0.287	0.869	0.79	0.74	Gravity
E6-21041	E6-21043	18	307.0	0.4625	21.39	14.11	18.71	12.69	4.618	2.202	4.159	0.74	0.71	Gravity
E6-21043	E6-21037	14	43.0	0.6744	18.71	12.69	18.99	12.40	2.863	1.104	3.843	0.51	0.51	Gravity
E6-21043	E6-21037	14	43.0	0.6744	18.71	12.69	18.99	12.40	2.863	1.104	3.843	0.51	0.51	Gravity
E6-21046	E6-21084	21	234.3	0.1921	19.41	10.38	18.43	4.489	3.543	2.408	1.49	1.66	1.66	Gravity
E6-21050	E6-21052	18	379.0	0.5435	30.40	21.02	32.22	18.96	5.006	4.512	5.027	1.11	1.10	Gravity
E6-21052	E6-21055	18	327.0	0.5872	32.22	18.96	23.29	17.04	5.203	4.524	5.429	1.08	1.03	Gravity
E6-21053	E6-21053	8	182.0	0.5000	24.01	18.20	23.29	17.06	0.552	0.008	0.052	0.09	0.95	Surcharged
E6-21055	E6-21056	21	348.0	0.5977	23.29	17.04	20.04	14.96	7.919	4.540	5.185	0.96	0.97	Gravity
E6-21056	E6-21057	21	225.0	0.6044	20.04	14.96	19.21	13.60	7.963	4.551	5.215	0.96	0.96	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E6-21057	E6-21061	21	135.0	0.6296	19.21	13.60	18.75	12.75	8.127	4.560	5.323	0.95	0.95	Gravity
E6-21058	E6-21064	8	192.8	0.4046	18.53	13.27	18.34	12.49	0.497	0.017	0.106	0.16	0.93	Surcharged
E6-21059	E6-21058	8	149.3	0.0536	17.51	13.35	18.53	13.27	0.181	0.014	0.601	0.14	0.16	Gravity
E6-21060	E6-21059	8	250.9	0.2631	15.88	14.01	17.51	13.35	0.401	0.005	0.139	0.08	0.14	Gravity
E6-21061	E6-21065	14	50.0	0.6000	18.75	12.60	18.74	12.30	2.691	2.283	3.347	1.05	1.12	Gravity
E6-21061	E6-21065	14	50.0	0.6000	18.75	12.60	18.74	12.30	2.691	2.283	3.347	1.05	1.12	Gravity
E6-21064	E6-21065	8	17.9	-0.9497	18.34	12.49	18.74	12.66	-0.762	0.017	0.434	0.93	0.76	Surcharged
E6-21065	E6-21066	21	137.0	0.3796	18.74	12.30	18.67	11.78	6.310	4.585	4.607	1.11	1.07	Gravity
E6-21066	E6-21037	21	77.0	0.3766	18.67	11.78	18.99	11.49	6.286	4.590	5.068	1.06	0.99	Gravity
E6-21068	E6-21069	6	168.5	1.4896	18.84	12.73	16.32	10.22	0.443	0.000	0	0.07	0.08	Gravity
E6-21068	E6-21037	6	12.8	0.4688	18.84	12.73	18.99	12.67	0.248	0.000	0	0.07	0.07	Gravity
E6-21068	E6-21068	6	380.4	0.4311	16.32	10.22	13.49	8.58	0.238	0.005	0.106	0.08	0.20	Gravity
E6-21070	E6-21071	6	255.0	0.2275	21.13	14.98	23.40	14.40	0.173	0.028	0.799	0.15	0.16	Gravity
E6-21071	E6-21074	6	260.9	1.9471	23.40	14.40	15.12	9.32	0.506	0.094	1.742	0.16	0.22	Gravity
E6-21072	E6-21074	6	245.6	0.5415	14.80	10.65	15.12	9.32	0.267	0.017	0.323	0.11	0.22	Gravity
E6-21072	E6-21072	6	126.0	0.4444	14.12	11.21	14.80	10.65	0.242	0.008	0.384	0.09	0.11	Gravity
E6-21074	E6-21065	6	221.5	0.8217	15.12	9.32	11.74	7.50	0.329	0.121	1.474	0.22	0.47	Gravity
E6-21075	E6-21076	6	330.0	0.7000	24.23	17.59	23.48	15.28	0.304	0.028	1.187	0.12	0.12	Gravity
E6-21076	E6-21071	6	27.0	2.8889	23.48	15.18	23.40	14.40	0.617	0.061	1.748	0.13	0.16	Gravity
E6-21077	E6-21078	6	354.0	0.7599	30.00	26.25	28.34	23.56	0.316	0.018	0.674	0.10	0.13	Gravity
E6-21078	E5-21044	6	214.4	0.5924	28.34	23.56	27.49	22.29	0.279	0.031	1.26	0.13	0.12	Gravity
E6-21079	E6-21080	6	346.7	0.0750	20.09	15.41	20.58	15.15	0.099	0.008	0.218	0.12	0.17	Gravity
E6-21080	E6-21070	6	220.0	0.0773	20.58	15.15	21.13	14.98	0.101	0.020	0.633	0.17	0.15	Gravity
E6-21083	E6-21085	21	156.0	0.3782	18.56	10.95	18.06	10.36	6.299	2.138	1.21	1.64	1.64	Gravity
E6-21084	E6-21085	21	24.9	0.1606	18.43	10.36	18.06	10.34	4.108	3.542	2.397	1.65	1.66	Gravity
E6-21085	D6-21001	27	225.9	0.1948	18.06	10.34	18.89	9.90	8.835	6.778	3.062	1.65	1.81	Gravity
E6-21086	E6-21097	8	249.1	-0.9635	32.00	28.66	31.94	31.06	-0.767	-0.011	-0.643	0.10	0.09	Gravity
E6-21086	E6-21096	8	55.3	2.7306	32.00	28.66	31.02	27.15	1.291	0.032	1.476	0.10	0.10	Gravity
E6-21088	E6-21010	15	249.0	0.4538	28.98	19.25	27.34	18.12	2.813	0.778	2.742	0.45	0.49	Gravity
E6-21092	F6-21027	8	184.0	2.5272	40.53	38.75	39.09	34.10	1.242	0.028	1.426	0.09	0.09	Gravity
E6-21093	E6-21039	8	293.4	1.5644	24.64	22.20	22.38	17.61	0.977	0.025	1.235	0.10	0.10	Gravity
E6-21096	E6-21024	8	163.6	2.8117	31.02	27.15	30.20	22.55	1.310	0.041	1.869	0.10	0.10	Gravity
E6-21097	E6-21034	8	114.8	3.3014	31.94	31.06	32.16	27.27	1.419	0.019	0.506	0.09	0.15	Gravity
E6-21098	E6-21032	8	295.0	2.1932	39.92	37.00	35.73	30.53	1.157	0.012	0.566	0.08	0.10	Gravity
E6-21294	E6-21925	8	74.0	2.1486	28.00	19.31	27.73	17.72	1.145	0.071	0.458	0.13	0.44	Gravity
E6-21923	E6-21023	8	120.9	0.0000	36.00	26.09	34.53	26.09	0.000	0.427	3.183	0.82	0.38	Throttled
E6-21925	E6-21017	18	217.0	0.5484	27.73	17.72	25.48	16.53	5.028	0.912	3.055	0.44	0.46	Gravity
E6-21926	E6-21013	8	325.0	0.4985	26.92	23.74	27.17	22.12	0.552	0.023	0.647	0.11	0.15	Gravity
E6-22001	E6-21001	6	170.0	0.0647	33.30	31.05	34.56	30.94	0.092	0.003	0.266	0.09	0.08	Gravity
E6-22002	E6-21002	6	160.0	0.6187	33.17	30.22	32.64	29.23	0.285	0.013	0.216	0.10	0.24	Gravity
E6-22003	F7-21020	6	350.0	0.2171	33.30	29.17	34.10	28.41	0.169	0.010	0.074	0.10	0.55	Surcharged
E6-22008	E5-21042	8	443.9	2.3384	27.62	26.75	21.29	16.37	1.195	0.023	1.234	0.09	0.09	Gravity
E6-22015	E6-21077	6	141.0	0.8156	31.05	27.40	30.00	26.25	0.328	0.004	0.234	0.08	0.10	Gravity
E6-22016	E6-22017	6	125.0	1.3840	24.99	20.72	24.91	18.99	0.427	0.006	0.281	0.08	0.11	Gravity
E6-22017	E6-21075	6	307.8	0.4548	24.91	18.99	24.23	17.59	0.245	0.016	0.677	0.11	0.12	Gravity
E6-22018	E6-21076	6	192.6	4.2575	27.35	23.38	23.48	15.18	0.749	0.007	0.263	0.07	0.13	Gravity
E6-22019	E6-21072	6	153.7	0.7807	15.39	11.85	14.80	10.65	0.321	0.003	0.303	0.07	0.11	Gravity
E6-22020	E6-21073	6	124.1	0.8219	14.86	12.23	14.12	11.21	0.329	0.004	0.289	0.08	0.09	Gravity
E7-21001	E7-21002	6	190.0	1.4579	34.47	27.87	30.18	25.10	0.438	0.005	0.091	0.07	0.21	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E7-21002	E7-21003	6	325.0	0.1785	30.18	25.14	30.76	24.56	0.153	0.033	0.74	0.17	0.19	Gravity
E7-21003	E7-21004	6	343.3	0.2039	30.76	24.56	31.55	23.86	0.164	0.046	1.569	0.19	0.34	Gravity
E7-21004	E7-21013	6	172.9	0.9717	31.55	23.70	29.94	22.02	0.358	0.263	2.748	0.49	1.17	Surcharged
E7-21005	E7-21006	10	180.0	0.9500	33.61	26.81	33.00	25.10	1.381	0.821	3.991	0.47	0.47	Gravity
E7-21006	E7-21012	6	183.7	0.2123	33.00	25.10	32.26	24.71	0.167	0.158	1.825	0.40	0.33	Gravity
E7-21006	E7-21007	10	231.0	1.1688	33.00	25.10	33.30	22.40	1.531	0.669	2.099	0.40	0.72	Gravity
E7-21007	E7-21055	10	311.8	0.2213	33.30	22.40	30.68	21.71	0.666	0.682	3.373	0.72	0.47	Gravity
E7-21012	E7-21004	6	141.1	0.7158	32.26	24.71	31.55	23.70	0.307	0.218	2.391	0.32	0.50	Gravity
E7-21013	E7-21016	6	148.4	0.9299	29.94	22.02	28.55	20.64	0.350	0.265	2.498	1.16	1.67	Surcharged
E7-21014	E7-21013	6	402.6	0.7079	29.57	24.87	29.94	22.02	0.305	0.007	0.055	0.07	1.17	Surcharged
E7-21015	E7-21016	6	270.0	0.5704	27.78	22.52	28.55	20.98	0.274	0.008	0.271	0.07	1.33	Surcharged
E7-21016	E7-21017	6	164.1	0.7861	28.55	20.64	26.67	19.35	0.322	0.269	1.911	1.66	1.97	Surcharged
E7-21017	E7-21025	6	359.8	0.1890	26.67	19.35	22.82	18.67	0.158	0.282	3.069	1.96	0.34	Throttled
E7-21018	E7-21017	6	231.8	0.9232	26.39	21.49	26.67	19.35	0.349	0.006	0.044	0.08	1.97	Surcharged
E7-21019	E7-21017	6	340.0	0.3000	24.86	20.37	26.67	19.35	0.199	0.013	0.098	0.95	1.97	Surcharged
E7-21020	E7-21021	6	341.8	1.0035	27.32	23.29	23.65	19.86	0.363	0.005	0.295	0.08	0.11	Gravity
E7-21021	E7-21022	6	360.0	0.4361	23.65	18.29	25.57	18.29	0.240	0.018	0.79	0.11	0.12	Gravity
E7-21022	E7-21023	6	360.0	0.3333	25.57	18.29	22.87	17.09	0.209	0.018	0.726	0.12	0.12	Gravity
E7-21023	E7-21024	6	360.0	0.3750	22.87	17.09	21.16	15.74	0.222	0.022	0.914	0.12	0.12	Gravity
E7-21024	D7-21035	6	375.0	0.7200	21.16	15.74	18.80	13.04	0.308	0.029	1.112	0.12	0.13	Gravity
E7-21025	E7-21028	8	362.1	0.2044	22.82	18.67	26.49	17.93	0.353	0.169	1.714	0.33	0.30	Gravity
E7-21025	E7-21028	10	360.2	0.2054	22.82	18.67	26.49	17.93	0.642	0.205	1.809	0.33	0.30	Gravity
E7-21026	E7-21025	6	287.7	0.3650	25.88	20.04	22.82	18.99	0.219	0.030	1.251	0.14	0.12	Gravity
E7-21027	E7-21028	6	315.0	0.3556	24.32	19.05	26.49	17.93	0.216	0.018	0.226	0.12	0.30	Gravity
E7-21028	E7-21030	10	360.0	0.3806	26.49	17.93	25.17	16.56	0.874	0.232	2.383	0.30	0.27	Gravity
E7-21028	E7-21030	6	362.4	0.8195	26.49	17.93	25.17	14.96	0.328	0.208	1.559	0.30	0.84	Surcharged
E7-21029	E7-21030	6	270.0	0.2000	22.38	17.73	25.17	17.19	0.162	0.019	0.956	0.13	0.11	Gravity
E7-21030	E7-21031	8	377.0	0.3156	25.17	14.96	22.50	13.77	0.439	0.481	3.292	0.82	0.41	Throttled
E7-21030	E7-21031	10	375.0	0.7440	25.17	16.56	22.50	13.77	1.222	0.000	-0.005	0.07	0.29	Gravity
E7-21031	E7-21032	10	374.8	0.8324	22.50	13.69	17.34	10.57	1.292	0.506	1.72	0.37	0.65	Gravity
E7-21032	D7-21036	10	260.0	0.5346	17.34	10.91	16.24	9.52	1.036	0.291	2.077	0.31	0.35	Gravity
E7-21032	D7-21040	10	285.1	0.6734	17.34	10.91	16.25	8.99	1.162	0.326	2.393	0.31	0.34	Gravity
E7-21033	E7-21034	6	262.0	0.3053	27.73	22.88	27.29	22.08	0.200	0.018	0.609	0.12	0.14	Gravity
E7-21034	E7-21035	6	305.0	0.5443	27.29	22.08	27.27	20.42	0.268	0.036	0.981	0.14	0.17	Gravity
E7-21035	E7-21025	6	320.7	0.5457	27.27	20.42	22.82	18.67	0.268	0.054	0.601	0.17	0.33	Gravity
E7-21036	E7-21037	6	285.0	0.3088	28.19	24.71	26.93	23.83	0.202	0.020	0.753	0.12	0.13	Gravity
E7-21037	E7-21038	6	365.0	0.4219	26.93	23.83	26.34	22.29	0.236	0.026	1.043	0.13	0.13	Gravity
E7-21037	E7-21034	6	360.0	0.6139	26.93	24.29	27.29	22.08	0.284	0.000	-0.001	0.07	0.14	Gravity
E7-21038	E7-21028	6	260.0	1.3692	26.34	22.29	26.49	18.73	0.424	0.042	1.707	0.13	0.13	Gravity
E7-21039	E7-21040	6	245.0	0.5714	26.91	21.28	24.30	19.88	0.274	0.019	0.831	0.11	0.12	Gravity
E7-21040	E7-21043	6	375.0	1.1840	24.30	19.88	20.08	15.44	0.395	0.035	0.717	0.12	0.21	Gravity
E7-21041	E7-21030	6	245.0	0.2816	24.49	17.88	25.17	17.19	0.193	0.014	0.799	0.11	0.10	Gravity
E7-21042	E7-21031	6	250.0	0.4040	21.15	14.79	22.50	13.78	0.231	0.014	0.21	0.11	0.28	Gravity
E7-21043	E7-21045	6	373.5	0.3668	20.08	15.44	18.89	14.07	0.220	0.069	1.225	0.21	0.23	Gravity
E7-21044	E7-21043	6	311.4	0.3757	21.47	17.11	20.08	15.94	0.222	0.024	1.121	0.13	0.11	Gravity
E7-21045	E7-21046	6	310.0	0.4065	18.89	14.07	17.91	12.81	0.231	0.091	1.69	0.23	0.22	Gravity
E7-21046	E7-21032	6	315.0	0.6032	17.91	12.81	10.91	0.282	0.104	1.266	0.22	0.31	0.31	Gravity
E7-21047	D7-21040	6	244.9	0.4328	17.25	10.34	16.25	9.28	0.239	0.013	0.763	0.10	0.10	Gravity
E7-21048	E7-21049	6	269.0	0.5167	28.26	25.33	29.87	23.94	0.261	0.004	0.305	0.08	0.08	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
E7-21049	E7-21050	6	360.2	0.5997	29.87	23.94	26.02	21.78	0.281	0.004	0.312	0.08	0.07	Gravity
E7-21050	E7-21051	6	375.0	0.8107	26.02	21.78	23.09	18.74	0.327	0.004	0.21	0.07	0.10	Gravity
E7-21051	E7-21044	6	312.4	0.5218	23.09	18.74	21.47	17.11	0.262	0.012	0.45	0.10	0.13	Gravity
E7-21052	E7-21053	6	216.4	0.3420	18.51	17.55	17.72	16.81	0.212	0.000	0	0.07	0.07	Gravity
E7-21053	D7-21001	6	322.1	0.5619	17.72	16.81	17.88	15.00	0.272	0.000	0	0.07	0.07	Gravity
E7-21055	E7-21057	10	66.9	0.7623	30.68	21.71	30.96	21.20	1.236	0.692	2.867	0.46	0.54	Gravity
E7-21057	E7-21058	10	113.6	0.7105	30.36	21.20	30.38	20.56	1.063	0.773	3.566	0.53	0.49	Gravity
E7-21058	E6-21088	15	257.8	0.5081	30.38	20.56	28.98	19.25	2.977	0.774	2.992	0.44	0.45	Gravity
E7-22001	E7-21033	6	244.5	0.8094	28.22	24.47	27.73	22.98	0.283	0.010	0.641	0.09	0.09	Gravity
E7-22002	E7-21036	6	276.2	0.2824	29.48	25.49	28.19	24.71	0.193	0.009	0.363	0.10	0.12	Gravity
E7-22003	E7-21039	6	287.5	0.5809	26.36	22.95	26.91	21.28	0.276	0.009	0.448	0.09	0.11	Gravity
E7-22005	E7-21040	6	260.0	0.7077	26.67	21.72	24.30	19.88	0.305	0.008	0.355	0.09	0.12	Gravity
E7-22007	E7-21018	6	218.0	0.7844	26.70	23.20	26.39	21.49	0.321	0.002	0.158	0.07	0.08	Gravity
E7-22008	E7-21041	6	200.0	0.4000	24.13	18.68	24.49	17.88	0.229	0.006	0.281	0.08	0.11	Gravity
E7-22009	E7-21042	6	200.0	0.5050	20.49	15.80	21.15	14.79	0.258	0.005	0.261	0.08	0.11	Gravity
E7-22010	E7-21005	6	345.0	0.1681	30.31	27.74	33.61	27.16	0.149	0.016	0.995	0.13	0.13	Gravity
E7-22011	E7-21015	6	254.6	1.1233	28.44	25.38	27.78	22.52	0.385	0.000	0	0.07	0.07	Gravity
E7-22012	E7-22013	6	15.0	0.0000	24.62	21.21	24.63	21.21	0.000	0.012	0.681	0.11	0.10	Gravity
E7-22012	E7-21019	6	110.0	0.7636	24.62	21.21	24.86	20.37	0.317	-0.007	0.161	0.11	0.95	Surcharged
E7-22013	E7-21021	6	150.0	0.9000	24.63	21.21	23.65	19.86	0.344	0.013	0.635	0.09	0.11	Gravity
E7-22014	E7-21026	6	251.7	0.4450	25.72	21.16	25.88	20.04	0.242	0.012	0.411	0.10	0.14	Gravity
E7-22015	E7-21027	6	235.0	0.6085	23.09	20.48	24.32	19.05	0.283	0.006	0.291	0.08	0.12	Gravity
E7-22016	E7-21029	6	250.0	0.1840	27.03	18.19	22.38	17.73	0.156	0.009	0.321	0.10	0.13	Gravity
E7-22017	E7-21047	6	210.0	0.2190	17.35	17.35	17.25	10.34	0.170	0.006	0.346	0.09	0.10	Gravity
E7-22018	D7-21013	6	430.0	0.6395	23.69	19.31	19.63	16.99	0.266	0.007	0.451	0.08	0.09	Gravity
E7-22019	D7-21077	6	251.4	0.2387	21.16	16.60	20.07	16.00	0.177	0.002	0.136	0.07	0.09	Gravity
E7-22019	E7-21031	6	123.6	2.2816	21.16	16.60	13.78	13.78	0.548	0.007	0.103	0.07	0.28	Gravity
E8-21001	E8-22002	6	125.0	0.3360	23.76	18.79	22.36	18.37	0.210	0.002	0.207	0.07	0.07	Gravity
E8-21002	E8-21003	6	281.0	0.8470	18.53	14.72	16.01	12.34	0.334	0.006	0.419	0.08	0.08	Gravity
E8-21003	E8-21004	6	281.6	1.3672	16.01	12.34	12.87	8.49	0.424	0.010	0.503	0.08	0.11	Gravity
E8-21004	E8-21006	6	288.3	0.9712	12.87	8.49	9.51	5.69	0.358	0.026	0.512	0.11	0.21	Gravity
E8-21005	E8-21004	6	233.2	0.2058	12.83	8.97	12.87	8.49	0.165	0.012	0.557	0.11	0.11	Gravity
E8-21006	E8-21008	6	295.6	0.1319	9.51	5.69	8.56	5.30	0.132	0.042	0.943	0.21	0.19	Gravity
E8-21007	E8-21006	6	220.0	0.3182	9.64	6.39	9.51	5.69	0.205	0.013	0.258	0.11	0.21	Gravity
E8-21008	D8-21001	6	318.5	0.1884	8.56	5.30	7.43	4.70	0.157	0.043	0.739	0.19	0.30	Gravity
E8-21009	E7-21045	6	315.2	0.7773	22.44	16.52	18.89	14.07	0.320	0.017	0.309	0.10	0.23	Gravity
E8-21010	E8-21011	6	233.3	0.5915	17.45	13.13	13.13	11.75	0.279	0.012	0.715	0.10	0.09	Gravity
E8-21011	E8-21013	6	281.0	1.2349	17.21	11.65	14.00	8.18	0.403	0.021	0.529	0.10	0.17	Gravity
E8-21012	E8-21013	6	241.7	0.5544	14.11	9.64	14.00	8.30	0.270	0.012	0.714	0.10	0.09	Gravity
E8-21013	D8-21003	6	281.0	0.2633	14.00	8.18	1.186	7.44	0.186	0.040	1.206	0.17	0.15	Gravity
E8-22001	E8-21001	6	262.3	0.6100	23.00	20.34	23.76	18.74	0.283	0.002	0.093	0.07	0.12	Gravity
E8-22002	E8-21002	6	161.8	2.2559	22.36	18.37	18.53	14.72	0.545	0.004	0.292	0.07	0.08	Gravity
E8-22004	E8-21010	6	221.7	0.8435	17.97	15.00	17.45	13.13	0.333	0.005	0.3	0.08	0.10	Gravity
E8-22005	E8-21012	6	212.6	0.7056	14.91	11.14	14.11	9.64	0.305	0.005	0.296	0.08	0.10	Gravity
E8-22006	E8-21005	6	208.9	1.1202	13.04	11.31	12.63	8.97	0.384	0.005	0.245	0.08	0.11	Gravity
E8-22007	D8-21007	6	136.5	0.2198	14.20	11.42	14.13	11.12	0.170	0.003	0.221	0.08	0.09	Gravity
F1-21001	E1-21003	6	355.0	0.6197	522.90	514.90	523.40	512.70	0.286	0.009	0.549	0.09	0.10	Gravity
F1-21002	F2-21106	6	167.2	3.7620	523.21	517.52	517.09	511.23	0.704	0.096	2.256	0.14	0.18	Gravity
F1-21006	F1-21002	6	170.0	3.8118	530.13	524.00	523.21	517.52	0.708	0.040	1.35	0.10	0.14	Gravity

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Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F2-21001	F2-21002	6	357.5	0.4783	558.12	553.39	562.29	551.68	0.251	0.040	0.948	0.15	0.19	Gravity
F2-21002	F2-21003	6	377.8	0.5956	562.29	551.68	553.93	549.43	0.280	0.072	1.226	0.18	0.24	Gravity
F2-21003	F2-21004	6	216.2	1.7068	553.93	549.43	555.00	545.74	0.474	0.195	3.313	0.24	0.24	Gravity
F2-21004	F2-21005	6	99.5	6.3317	555.00	545.74	549.29	539.44	0.913	0.195	5.486	0.17	0.17	Gravity
F2-21005	F2-21006	6	213.3	10.0985	549.29	539.44	523.40	517.90	1.163	0.195	5.323	0.15	0.17	Gravity
F2-21006	F2-21009	6	128.8	10.6056	523.40	517.90	508.66	504.24	1.182	0.231	6.315	0.17	0.17	Gravity
F2-21009	F2-21010	6	179.3	10.6748	508.66	504.24	488.81	485.10	1.185	0.231	5.739	0.16	0.18	Gravity
F2-21010	F2-21017	6	59.0	10.8814	488.81	485.10	481.79	478.68	1.197	0.274	6.941	0.18	0.18	Gravity
F2-21017	F2-21018	6	206.5	11.7579	481.79	478.68	458.87	454.40	1.244	0.274	5.767	0.17	0.20	Gravity
F2-21018	F2-21019	6	117.2	10.6741	458.87	454.40	445.03	441.89	1.185	0.352	8.06	0.20	0.19	Gravity
F2-21019	F2-21020	6	166.8	11.1643	445.03	441.88	425.20	423.26	1.212	0.352	6.946	0.20	0.21	Gravity
F2-21020	F2-21021	6	154.1	11.1668	425.20	423.26	410.04	406.05	1.212	0.394	7.895	0.21	0.21	Gravity
F2-21021	F2-21025	6	230.6	11.7303	410.04	406.05	383.45	379.00	1.242	0.394	6.409	0.21	0.24	Gravity
F2-21025	F2-21032	6	161.1	9.3917	383.45	379.00	368.75	363.87	1.112	0.484	7.188	0.24	0.26	Gravity
F2-21032	F2-21033	6	150.8	7.3077	368.75	363.87	356.75	352.85	0.981	0.484	7.246	0.26	0.26	Gravity
F2-21033	F2-21034	6	160.9	8.5581	356.75	352.85	343.62	339.08	1.061	0.517	7.693	0.26	0.26	Gravity
F2-21034	F2-21035	6	160.6	8.4496	343.62	339.08	331.43	325.51	1.055	0.517	3.721	0.26	FULL	Surcharged
F2-21035	F2-21044	6	101.8	7.1513	331.43	325.51	323.51	318.23	0.970	0.973	6.989	5.91	FULL	Throttled
F2-21044	F2-21052	6	83.1	6.8833	323.51	318.23	317.25	312.51	0.952	0.951	6.143	5.25	FULL	Surcharged
F2-21052	F2-21053	6	256.0	5.4648	317.25	312.51	303.52	298.52	0.848	0.825	5.471	4.63	3.14	Throttled
F2-21053	F2-21055	6	145.5	4.8385	303.52	298.56	300.11	291.52	0.977	0.044	0.295	0.10	3.13	Surcharged
F2-21054	F2-21055	6	83.8	7.2554	299.83	297.60	300.11	291.52	0.977	0.044	0.295	0.10	3.13	Surcharged
F2-21055	F2-21056	6	69.1	3.0680	300.11	291.52	296.02	289.40	0.635	0.924	7.681	3.04	0.45	Throttled
F2-21056	F2-21081	8	255.0	11.5608	296.02	289.40	265.52	259.92	2.656	1.161	8.377	0.32	0.41	Gravity
F2-21081	F3-21045	8	160.3	6.3631	265.52	259.92	254.04	249.72	1.971	1.161	7.282	0.38	0.45	Gravity
F2-21082	F3-21042	6	171.1	1.1981	294.21	290.19	290.77	288.14	0.397	0.013	0.928	0.09	0.08	Gravity
F2-21084	F2-29008	6	200.0	9.0235	563.04	563.04	556.31	544.99	1.090	0.021	1.291	0.08	0.09	Gravity
F2-21085	F2-21086	6	282.3	8.9656	553.54	547.50	522.99	522.19	1.086	0.059	2.087	0.10	0.14	Gravity
F2-21086	F2-21087	6	175.2	5.6507	527.99	522.19	522.57	512.29	0.862	0.108	3.09	0.14	0.16	Gravity
F2-21087	F2-21090	6	103.4	2.6209	512.29	509.58	519.06	509.58	0.587	0.108	1.724	0.16	0.25	Gravity
F2-21088	F2-21089	6	287.5	4.5739	555.90	551.80	543.68	538.65	0.776	0.009	0.764	0.07	0.08	Gravity
F2-21089	F2-21090	6	211.1	13.7707	543.68	538.65	519.06	509.58	1.346	0.018	0.284	0.08	0.25	Gravity
F2-21090	F2-21091	6	189.3	0.6815	519.06	509.58	515.24	508.29	0.299	0.135	2.259	0.25	0.24	Gravity
F2-21091	F2-21092	6	198.8	6.5040	515.24	508.29	505.52	495.36	0.925	0.166	3.969	0.16	0.18	Gravity
F2-21092	F2-21100	6	244.6	7.8332	505.52	495.36	484.35	476.20	1.015	0.251	3.591	0.18	0.27	Gravity
F2-21093	F2-21109	6	261.4	14.1890	544.88	537.18	507.19	500.09	1.366	0.040	1.977	0.09	0.11	Gravity
F2-21094	F2-21095	6	201.1	3.4411	545.24	540.83	533.91	538.49	0.673	0.016	1.099	0.08	0.09	Gravity
F2-21094	F2-21093	6	275.0	1.3273	545.24	540.83	544.88	537.18	0.418	0.010	0.694	0.08	0.09	Gravity
F2-21095	F2-21096	6	242.6	12.6092	538.49	533.91	508.52	503.32	1.288	0.038	2.59	0.09	0.09	Gravity
F2-21096	F2-21097	6	125.0	2.2560	508.52	503.32	505.44	500.42	0.545	0.063	2.298	0.13	0.13	Gravity
F2-21097	F2-21092	6	198.4	2.5504	505.44	500.42	505.52	495.36	0.579	0.069	1.652	0.13	0.18	Gravity
F2-21098	F2-21099	6	435.0	3.7609	497.12	493.37	480.69	477.01	0.704	0.005	0.255	0.07	0.11	Gravity
F2-21098	F2-21098	6	255.0	16.9373	497.12	493.37	457.16	450.18	1.493	0.010	0.664	0.07	0.09	Gravity
F2-21099	F2-21100	6	107.2	0.7556	480.69	477.01	484.35	476.20	0.315	0.019	0.278	0.11	0.27	Gravity
F2-21100	F2-21101	6	207.5	2.2554	484.35	476.20	481.86	471.52	0.545	0.285	4.117	0.27	0.27	Gravity
F2-21101	F2-21102	6	112.9	6.6076	481.86	471.52	470.04	464.06	0.933	0.295	2.326	0.21	0.97	Surcharged
F2-21102	F2-21103	6	203.3	0.5952	470.04	464.06	469.29	462.85	0.280	0.303	2.494	0.96	0.65	Throttled
F2-21103	E2-21008	6	221.7	0.7037	469.29	462.85	470.83	461.29	0.304	0.314	3.197	0.63	0.36	Throttled
F2-21105	F2-21106	6	245.0	13.6816	550.92	544.83	517.09	511.31	1.342	0.024	1.441	0.08	0.10	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F2-21106	F2-21108	6	263.7	2.2943	517.09	511.23	510.96	505.18	0.549	0.140	3.317	0.18	0.18	Gravity
F2-21107	F2-21108	6	327.5	14.4244	558.08	552.50	510.96	505.26	1.378	0.029	2.556	0.08	0.08	Gravity
F2-21108	F2-21110	6	151.3	9.0218	510.96	505.18	496.69	491.53	1.090	0.192	5.493	0.16	0.16	Gravity
F2-21109	F2-21110	6	177.3	4.8280	507.19	500.09	496.69	491.53	0.797	0.053	1.505	0.11	0.16	Gravity
F2-21001	F2-21001	6	141.6	15.0918	496.69	491.53	470.16	470.16	1.409	0.257	5.656	0.16	0.19	Gravity
F2-21111	F2-21112	6	174.0	14.1839	510.30	504.80	485.54	480.12	1.366	0.013	0.863	0.07	0.09	Gravity
F2-21001	F2-21001	6	227.5	4.3780	485.54	480.12	475.76	470.16	0.759	0.022	0.475	0.09	0.19	Gravity
F2-21113	F2-21017	6	250.0	4.9120	466.59	462.09	455.10	449.81	0.804	0.013	0.997	0.08	0.08	Gravity
F2-21115	F2-21116	6	60.0	5.2333	421.00	414.77	417.00	411.63	0.830	0.008	0.55	0.07	0.09	Gravity
F3-21039	F3-21039	6	211.4	1.0123	417.00	417.00	414.00	409.49	0.365	0.012	0.946	0.09	0.08	Gravity
F2-22002	F2-21084	6	206.0	2.9903	573.28	569.20	567.99	563.04	0.627	0.021	1.638	0.09	0.08	Gravity
F2-22004	F2-21105	6	227.7	16.1704	584.25	581.65	550.92	544.83	1.459	0.012	0.964	0.07	0.08	Gravity
F2-21088	F2-21088	6	190.0	6.4737	656.40	653.90	555.90	551.60	0.923	0.005	0.073	0.07	0.27	Gravity
F2-22007	F2-21111	6	126.9	6.4381	518.30	512.97	510.30	504.80	0.920	0.009	0.797	0.07	0.07	Gravity
F2-22008	F2-21096	6	195.0	0.8205	512.09	504.84	508.52	503.24	0.329	0.013	0.489	0.09	0.13	Gravity
F2-22009	F2-21095	6	90.5	5.2376	541.80	538.65	538.49	533.91	0.830	0.011	0.736	0.08	0.09	Gravity
F2-22010	F2-21091	6	139.5	0.0358	534.36	508.34	515.24	508.29	0.069	0.013	0.378	0.16	0.16	Gravity
F2-22107	F2-21107	6	160.0	5.3250	562.72	561.02	558.08	552.50	0.837	0.008	0.635	0.07	0.08	Gravity
F2-29008	F2-21086	6	252.7	9.0237	556.31	544.99	527.99	522.19	1.090	0.043	1.527	0.09	0.14	Gravity
F3-21002	F3-21003	6	271.3	10.9362	485.05	479.11	450.75	449.44	1.200	0.022	1.517	0.08	0.09	Gravity
F3-21003	F3-21004	6	226.9	17.9330	450.75	449.44	412.63	408.75	1.536	0.044	2.324	0.09	0.10	Gravity
F3-21004	F3-21005	6	177.8	15.7255	412.63	408.75	386.04	380.79	1.439	0.082	4.119	0.10	0.11	Gravity
F3-21007	F3-21007	6	50.0	14.8540	386.04	380.79	383.04	373.36	1.398	0.088	4.384	0.11	0.11	Gravity
F3-21008	F3-21008	6	205.4	14.8549	383.04	373.36	355.16	342.85	1.398	0.092	4.487	0.11	0.11	Gravity
F3-21008	F3-21009	6	137.3	14.8514	355.16	342.85	335.29	322.46	1.398	0.097	4.731	0.11	0.11	Gravity
F3-21009	F3-21010	6	83.9	14.8510	335.29	322.46	314.00	310.00	1.398	0.097	4.291	0.11	0.12	Gravity
F3-21010	F3-21012	6	90.1	19.2120	314.00	296.95	292.69	292.69	1.590	0.135	4.789	0.12	0.14	Gravity
F3-21011	F3-21059	6	53.3	-10.5816	337.16	323.26	334.40	328.90	-1.180	0.012	0.597	5.68	0.11	Surcharged
F3-21012	F3-21013	6	125.0	8.9440	296.95	292.69	283.37	281.51	1.085	0.135	5.435	0.14	0.13	Gravity
F3-21013	F3-21014	6	136.8	14.0241	283.37	281.51	271.33	262.33	1.359	0.135	5.435	0.13	0.13	Gravity
F3-21014	F3-21015	6	149.9	14.0327	271.33	262.33	245.19	241.29	1.359	0.135	5.457	0.13	0.13	Gravity
F3-21015	F3-21016	6	98.9	18.5187	245.19	241.29	226.85	222.98	1.561	0.154	4.337	0.12	0.16	Gravity
F3-21016	F3-21037	6	40.0	18.5125	228.85	222.98	219.04	215.57	1.561	0.291	2.007	0.16	2.61	Surcharged
F3-21017	F3-21022	6	120.0	5.6167	381.10	376.74	379.14	370.00	0.860	0.022	1.181	0.08	0.10	Gravity
F3-21019	F3-21020	6	288.4	9.0361	424.50	420.24	398.37	394.18	1.091	0.013	0.964	0.07	0.08	Gravity
F3-21020	F3-21021	6	288.6	8.9166	398.37	394.18	375.85	370.23	1.083	0.025	0.639	0.08	0.18	Gravity
F3-21021	F3-21022	6	125.2	0.1837	375.85	370.23	379.14	370.00	1.055	0.035	1.397	0.18	0.13	Gravity
F3-21022	F3-21023	6	235.0	8.7830	379.14	370.00	355.00	349.36	1.075	0.061	2.994	0.10	0.11	Gravity
F3-21023	F3-21024	6	298.5	11.9196	355.00	349.36	318.58	313.78	1.253	0.084	3.776	0.11	0.12	Gravity
F3-21024	F3-21025	6	210.0	11.1667	318.58	295.48	290.33	290.33	1.212	0.101	5.048	0.12	0.11	Gravity
F3-21025	F3-21026	6	141.2	27.3612	295.48	290.33	276.49	251.70	1.897	0.122	5.808	0.11	0.11	Gravity
F3-21026	F3-21016	6	105.0	27.3533	276.49	251.70	226.85	222.98	1.897	0.137	3.849	0.11	0.16	Gravity
F3-21027	F3-21028	6	86.2	46.8910	382.99	381.99	342.57	341.57	2.484	0.003	0.242	0.07	0.08	Gravity
F3-21028	F3-21034	6	223.4	28.7198	342.57	341.57	284.58	277.41	1.944	0.031	1.765	0.08	0.10	Gravity
F3-21029	F3-21030	6	114.1	1.0868	332.44	310.80	313.30	309.56	0.378	0.012	0.914	0.09	0.08	Gravity
F3-21030	F3-21031	6	227.4	6.3149	313.30	309.56	300.20	295.20	0.912	0.019	1.397	0.08	0.08	Gravity
F3-21031	F3-21032	6	78.3	6.7433	300.20	295.20	294.92	289.92	0.942	0.023	0.567	0.08	0.18	Gravity
F3-21032	F3-21055	6	99.6	1.1044	294.92	289.92	293.82	288.82	0.381	0.089	1.047	0.18	0.32	Gravity
F3-21033	F3-21034	6	123.9	9.2090	293.82	288.82	284.58	277.41	1.101	0.089	5.017	0.12	0.10	Gravity

Burlingame Wastewater Collection System Master Plan
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Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F3-21034	F3-21035	6	105.8	53.4594	284.58	277.41	229.37	220.85	2.652	0.125	4.569	0.10	0.13	Gravity
F3-21035	F3-21054	6	38.1	8.6168	229.37	220.85	218.33	217.57	1.064	0.125	2.212	0.13	0.23	Gravity
F3-21037	F3-21054	6	48.4	4.2934	219.04	215.57	218.33	213.49	0.752	0.291	1.865	2.60	4.30	Surcharged
F3-21038	F3-21073	6	304.6	11.3854	214.71	209.43	179.75	174.75	1.224	0.416	8.056	0.21	0.21	Gravity
F3-21039	F3-21040	6	232.1	17.4451	414.00	409.49	373.20	369.00	1.515	0.027	2.166	0.08	0.08	Gravity
F3-21040	F3-21041	6	151.3	28.1560	373.20	369.00	332.33	326.40	1.925	0.030	1.942	0.08	0.09	Gravity
F3-21041	F2-21054	6	305.0	9.4426	332.33	326.40	299.83	297.60	1.115	0.038	2.188	0.09	0.10	Gravity
F3-21042	F3-21043	8	253.7	5.9992	290.77	288.14	286.63	272.92	1.913	0.021	1.5	0.08	0.08	Gravity
F3-21043	F3-21044	6	72.0	43.8750	286.63	272.92	246.37	241.33	2.402	0.032	1.99	0.08	0.09	Gravity
F3-21044	F3-21047	6	26.0	5.6154	246.37	241.33	243.33	239.87	0.859	0.032	0.319	0.09	0.37	Gravity
F3-21045	F3-21047	8	208.1	4.7333	254.04	249.72	243.33	239.87	1.700	1.161	7.864	0.42	0.42	Gravity
F3-21047	F3-21048	8	145.2	8.7397	243.33	239.87	230.93	227.18	2.310	1.221	9.59	0.35	0.38	Gravity
F3-21048	F3-21049	8	100.0	8.4970	230.93	227.18	223.16	218.68	2.277	1.221	9.59	0.36	0.38	Gravity
F3-21049	F3-21052	8	59.8	8.4967	223.16	218.68	218.42	213.60	2.277	1.221	9.589	0.36	0.38	Gravity
F3-21050	F3-21051	6	340.9	4.7668	318.56	314.89	303.42	298.64	0.792	0.016	1.176	0.08	0.08	Gravity
F3-21051	F3-21052	6	150.4	12.5997	303.42	298.64	285.29	279.69	1.288	0.030	2.289	0.08	0.08	Gravity
F3-21052	F3-21119	6	223.5	20.3772	279.69	268.33	234.15	1.637	0.034	0.034	2.271	0.08	0.09	Gravity
F3-21054	F3-21038	6	94.5	8.6106	218.33	217.57	214.71	209.43	1.064	0.416	7.398	0.23	0.23	Gravity
F3-21055	F3-21033	6	59.6	0.0000	293.82	288.82	293.82	288.82	0.000	0.089	2.094	0.32	0.19	Gravity
F3-21058	F3-21010	6	37.1	5.3908	318.00	312.00	314.00	310.00	0.843	0.028	1.253	0.09	0.12	Gravity
F3-21059	F3-21058	6	41.5	40.7229	334.40	328.90	318.00	312.00	2.315	0.012	0.794	0.07	0.09	Gravity
F3-22001	F2-21115	6	69.5	1.0360	418.40	415.49	421.00	414.77	0.369	0.004	0.387	0.07	0.07	Gravity
F3-22012	F3-21011	6	80.1	3.7453	342.00	338.00	337.16	335.00	0.702	0.008	0.675	0.07	0.07	Gravity
F3-22013	F3-21027	6	33.7	4.8368	385.62	383.62	382.99	381.99	0.798	0.003	0.298	0.07	0.07	Gravity
F3-22014	F3-21029	6	68.8	0.8576	345.13	311.39	332.44	310.80	0.336	0.008	0.505	0.08	0.09	Gravity
F3-22020	F3-21058	6	34.4	2.3837	313.43	312.82	318.00	312.00	0.560	0.016	1.036	0.09	0.09	Gravity
F6-21010	F6-21011	8	220.9	1.0457	54.95	52.64	55.12	52.64	0.799	0.069	2.055	0.15	0.14	Gravity
F6-21011	F6-21012	8	35.5	1.7183	55.12	52.64	54.80	52.03	1.024	0.073	1.06	0.14	0.23	Gravity
F6-21012	F6-21013	8	171.9	0.2036	54.80	52.03	55.04	51.68	0.352	0.081	1.072	0.23	0.25	Gravity
F6-21013	F6-21014	8	199.3	0.1957	55.04	51.68	55.70	51.29	0.346	0.095	1.39	0.25	0.23	Gravity
F6-21014	F6-21016	8	275.0	0.8000	55.70	51.34	52.27	49.14	0.699	0.094	2.014	0.18	0.18	Gravity
F6-21014	F6-21021	8	354.7	0.2143	55.70	51.29	54.22	50.53	0.362	0.083	1.816	0.23	0.17	Gravity
F6-21015	F6-21014	8	285.1	1.1294	58.27	54.96	55.70	51.34	0.830	0.066	1.349	0.14	0.18	Gravity
F6-21016	F6-21017	8	204.9	2.0595	52.27	49.14	49.51	44.92	1.121	0.117	2.147	0.16	0.19	Gravity
F6-21017	F6-21018	8	401.0	1.2120	49.51	44.92	43.79	40.06	0.860	0.143	1.276	0.19	0.33	Gravity
F6-21018	F6-21069	8	324.0	0.6451	43.79	40.06	41.68	37.97	0.627	0.296	2.729	0.33	0.32	Gravity
F6-21020	F6-21021	8	282.0	0.9149	56.53	52.03	54.22	50.43	0.747	0.016	0.366	0.09	0.17	Gravity
F6-21021	F6-21022	8	197.6	1.5789	54.22	50.43	50.05	47.31	0.982	0.111	2.181	0.17	0.18	Gravity
F6-21022	F6-21023	8	240.0	1.1458	50.05	47.31	47.73	44.56	0.836	0.121	2.375	0.18	0.18	Gravity
F6-21023	F6-21018	8	313.2	1.4368	47.73	44.56	46.97	40.06	0.937	0.135	1.205	0.18	0.33	Gravity
F6-21024	F6-21025	8	84.1	5.7669	39.57	35.88	38.37	31.03	1.876	0.360	4.491	0.21	0.26	Gravity
F6-21025	F6-21026	12	52.0	1.6538	38.37	31.03	37.32	30.17	2.961	0.359	3.534	0.26	0.25	Gravity
F6-21026	F6-21923	8	133.3	3.0608	37.32	30.17	36.00	26.09	1.367	0.360	1.684	0.25	0.83	Surcharged
F6-21027	F6-21026	8	200.0	1.3750	39.09	37.32	37.32	30.17	0.916	0.036	0.477	0.11	0.25	Gravity
F6-21029	F6-21030	8	351.2	0.9282	58.59	56.06	56.30	52.80	0.763	0.016	0.478	0.09	0.14	Gravity
F6-21030	F6-21031	8	222.6	0.8580	56.30	52.80	54.51	50.89	0.724	0.052	1.082	0.14	0.18	Gravity
F6-21031	F6-21035	8	282.4	1.3739	54.51	50.89	50.72	47.01	0.916	0.119	2.511	0.18	0.18	Gravity
F6-21032	F6-21031	8	361.7	0.5834	56.49	53.00	54.51	50.89	0.597	0.046	0.966	0.14	0.18	Gravity
F6-21033	F6-21034	8	403.7	1.4887	59.00	54.80	52.12	48.79	0.953	0.011	0.357	0.08	0.13	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F6-21033	F6-21039	8	360.7	4.0144	59.00	54.80	46.04	40.32	1.565	0.017	0.462	0.08	0.15	Gravity
F6-21034	F6-21035	8	428.9	0.4150	52.12	48.79	50.72	47.01	0.503	0.029	0.722	0.13	0.16	Gravity
F6-21035	F6-21037	8	383.1	0.3054	50.72	47.01	49.48	45.84	0.432	0.043	1.278	0.16	0.14	Gravity
F6-21036	F6-21037	8	8.0	2.3250	50.72	47.01	50.83	46.82	1.193	0.117	2.804	0.16	0.16	Gravity
F6-21036	F6-21037	8	232.4	1.1618	51.82	48.54	49.48	45.84	0.842	0.005	0.153	0.08	0.14	Gravity
F6-21037	F6-21037	8	8.0	1.2500	49.48	45.84	49.53	45.74	0.873	0.058	1.332	0.14	0.17	Gravity
F6-21038	F6-21039	6	338.6	1.8252	45.75	42.14	40.96	35.96	0.490	0.110	0.896	0.18	0.46	Gravity
F6-21039	F6-21041	8	384.3	0.0390	40.96	35.96	40.34	35.81	0.154	0.141	1.207	0.46	0.34	Gravity
F6-21040	F6-21041	8	342.2	1.3267	44.00	40.45	40.34	35.91	0.418	0.041	0.995	0.13	0.24	Gravity
F6-21041	F6-21042	8	240.0	0.2475	40.34	35.81	38.90	35.22	0.389	0.198	1.669	0.34	0.35	Gravity
F6-21042	F6-21043	8	44.4	0.1351	37.73	34.85	37.81	34.79	0.287	0.218	2.454	0.37	0.28	Gravity
F6-21043	F6-21043	6	490.6	1.3698	37.81	34.79	33.28	28.07	0.435	0.232	2.374	0.28	0.36	Gravity
F6-21044	F6-21045	8	221.2	1.0714	45.79	41.38	43.44	39.01	0.809	0.153	1.979	0.21	0.25	Gravity
F6-21045	F6-21071	6	271.5	1.1083	43.44	39.01	40.00	36.00	0.382	0.178	2.917	0.25	0.25	Gravity
F6-21046	F6-21046	8	10.6	0.0000	40.28	35.74	40.00	35.74	0.000	0.196	2.468	0.31	0.26	Gravity
F6-21047	F6-21048	6	382.2	0.9916	40.12	35.12	36.63	31.33	0.361	0.206	2.093	0.28	0.36	Gravity
F6-21048	F7-21020	6	376.5	0.7756	36.63	31.33	34.10	28.41	0.319	0.261	1.981	0.36	0.56	Surcharged
F6-21049	F6-21050	6	90.0	0.4444	37.57	33.37	36.75	32.97	0.242	0.019	0.908	0.11	0.11	Gravity
F6-21050	F6-21048	6	220.0	0.7000	36.75	32.97	36.63	31.43	0.304	0.022	0.605	0.11	0.26	Gravity
F6-21051	F6-21048	6	215.0	0.3349	35.73	32.10	36.63	31.38	0.210	0.022	0.316	0.13	0.31	Gravity
F6-21052	F6-21011	8	190.7	1.1536	51.35	47.63	48.44	45.43	0.839	0.009	0.889	0.08	0.10	Gravity
F6-21054	F6-21017	8	8.0	1.0875	46.49	43.33	46.41	43.24	0.815	0.026	0.889	0.11	0.13	Gravity
F6-21054	F6-21038	8	359.7	0.7729	46.49	43.44	44.83	40.66	0.687	0.000	-0.001	0.07	0.12	Gravity
F6-21055	F6-21056	6	275.2	1.0538	43.25	40.35	39.93	37.45	0.372	0.065	1.175	0.16	0.22	Gravity
F6-21056	F7-21009	8	361.0	0.2410	39.93	37.45	39.45	36.58	0.384	0.084	1.89	0.22	0.17	Gravity
F6-21057	F6-21058	8	428.3	0.7565	47.08	43.90	44.83	40.66	0.679	0.014	0.519	0.09	0.12	Gravity
F6-21058	F6-21018	8	8.0	0.7625	44.83	40.66	45.49	40.60	0.680	0.030	0.973	0.12	0.13	Gravity
F6-21059	F6-21014	8	8.0	22.2500	46.04	40.32	46.71	38.54	3.685	0.019	0.079	0.15	1.90	Surcharged
F6-21060	F6-21061	6	335.0	0.8179	39.53	34.73	36.95	31.99	0.328	0.012	0.514	0.09	0.12	Gravity
F6-21061	E6-21018	6	339.2	0.7017	36.95	31.99	34.71	29.61	0.304	0.028	1.254	0.12	0.12	Gravity
F6-21062	E6-21001	6	305.0	0.6754	36.57	32.71	34.56	30.65	0.298	0.026	0.763	0.12	0.16	Gravity
F6-21063	F6-21039	6	177.6	1.1543	41.00	38.01	40.96	35.96	0.390	0.032	0.258	0.12	0.46	Gravity
F6-21069	F6-21024	8	206.7	0.9821	41.68	37.91	35.88	32.57	0.774	0.320	3.154	0.31	0.31	Gravity
F6-21071	F6-21046	8	23.5	1.1106	40.00	36.00	40.28	35.74	0.823	0.196	1.928	0.24	0.31	Gravity
F6-21073	F6-21040	6	257.2	1.4697	47.03	44.23	44.00	40.45	0.440	0.012	0.476	0.09	0.13	Gravity
F6-21074	F6-21017	8	165.0	0.4061	46.95	45.75	49.51	45.08	0.498	0.014	0.709	0.10	0.09	Gravity
F6-22010	F6-21062	6	183.0	0.7486	38.08	34.08	36.57	32.71	0.314	0.008	0.364	0.08	0.12	Gravity
F6-22011	F6-21051	6	135.0	0.1481	35.65	32.30	35.73	32.10	0.140	0.008	0.327	0.10	0.13	Gravity
F6-29011	F6-21054	8	190.0	1.1053	48.44	45.43	46.49	43.33	0.821	0.019	0.816	0.10	0.11	Gravity
F6-29012	F6-21042	8	147.8	0.2476	38.90	35.22	37.73	34.85	0.390	0.191	1.568	0.35	0.37	Gravity
F6-29013	F6-21047	8	57.5	1.0435	40.00	35.74	40.12	35.14	0.798	0.26	2.361	0.24	0.26	Gravity
F6-29014	F7-21001	8	469.3	0.3793	46.71	40.32	44.59	38.54	0.481	0.026	0.834	0.12	0.13	Gravity
F6-29015	F6-21038	6	288.0	1.2500	49.53	45.74	45.75	42.14	0.406	0.080	2.022	0.17	0.18	Gravity
F6-29016	F6-21044	8	233.5	2.3315	50.83	46.82	45.79	41.38	1.193	0.127	2.131	0.16	0.21	Gravity
F6-29017	F6-21055	8	265.9	1.0880	46.41	43.24	43.25	40.35	0.378	0.039	1.165	0.13	0.16	Gravity
F6-29018	F7-21010	8	250.5	0.7581	45.49	40.60	43.37	38.70	0.680	0.040	1.115	0.13	0.15	Gravity
F7-21001	F7-21002	6	405.0	0.4222	44.59	40.50	43.70	36.83	0.236	0.026	1.285	0.13	0.11	Gravity
F7-21002	F7-21003	8	395.0	0.7873	43.70	36.83	41.88	33.72	0.693	0.026	1.02	0.11	0.11	Gravity
F7-21003	F7-21004	8	268.7	0.6066	41.88	33.72	40.33	32.09	0.608	0.026	0.335	0.11	0.26	Gravity

Burlingame Wastewater Collection System Master Plan
Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
F7-21004	F7-21018	8	626.2	0.2092	40.33	32.09	37.10	30.78	0.357	0.107	0.735	0.26	0.42	Gravity
F7-21006	F7-21007	8	398.0	0.4221	42.83	39.22	41.79	37.54	0.508	0.012	0.212	0.10	0.20	Gravity
F7-21008	F7-21008	8	377.3	0.2306	41.79	37.54	39.58	36.67	0.375	0.037	1.752	0.20	0.16	Gravity
F7-21008	F7-21009	8	32.6	0.0000	39.58	36.51	39.45	36.51	0.000	0.137	1.85	0.32	0.24	Gravity
F7-21009	F7-21011	8	79.3	0.8575	39.45	36.49	39.11	35.81	0.723	0.221	2.636	0.26	0.27	Gravity
F7-21010	F7-21033	8	247.1	0.8863	43.37	38.70	39.60	36.51	0.735	0.062	0.479	0.15	0.37	Gravity
F7-21011	F7-21017	6	172.3	1.4510	39.11	35.81	37.76	33.31	0.437	0.225	2.996	0.27	0.29	Gravity
F7-21012	F7-21013	8	135.6	1.0619	39.73	36.23	39.85	34.79	0.805	0.009	0.459	0.08	0.10	Gravity
F7-21013	F7-21014	8	280.0	0.4429	39.85	34.79	40.20	33.55	0.520	0.017	0.459	0.10	0.15	Gravity
F7-21014	F7-21015	6	55.5	0.3784	40.20	33.55	40.17	33.34	0.223	0.035	1.376	0.15	0.13	Gravity
F7-21015	F7-21004	8	37.5	2.7200	40.17	33.34	40.33	32.32	1.288	0.050	2.047	0.11	0.11	Gravity
F7-21016	F7-21015	8	246.2	0.5890	39.53	34.79	40.17	33.34	0.600	0.014	0.589	0.10	0.11	Gravity
F7-21017	F7-21018	6	191.9	1.3184	37.76	33.31	37.10	30.78	0.417	0.240	2.112	0.28	0.42	Gravity
F7-21018	F7-21019	8	308.8	0.4210	37.10	30.78	35.59	29.48	0.507	0.348	2.141	0.42	0.45	Gravity
F7-21019	F7-21020	8	315.0	0.3397	35.59	29.48	34.10	28.41	0.455	0.354	1.768	0.45	0.55	Gravity
F7-21020	E7-21005	10	365.0	0.3425	34.10	28.41	33.61	27.16	0.829	0.638	3.331	0.55	0.45	Gravity
F7-21021	F7-21023	6	295.0	0.6339	38.00	34.13	36.62	32.26	0.289	0.061	0.832	0.17	0.28	Gravity
F7-21022	F7-21023	6	230.0	0.4087	36.73	33.04	36.62	32.10	0.232	0.026	0.218	0.13	0.44	Gravity
F7-21023	F7-21024	6	310.0	0.2710	36.62	32.26	34.83	31.42	0.189	0.105	1.961	0.28	0.22	Gravity
F7-21024	E7-21005	6	315.0	1.3524	34.83	31.42	34.22	27.16	0.422	0.154	2.879	0.22	0.22	Gravity
F7-21025	F7-21026	6	228.3	1.1389	38.65	33.45	35.02	30.85	0.387	0.006	0.509	0.08	0.08	Gravity
F7-21026	F7-21027	6	278.1	1.1758	35.02	30.85	30.77	27.58	0.393	0.006	0.306	0.08	0.11	Gravity
F7-21027	F7-21028	6	330.0	0.2727	30.77	27.58	29.52	26.68	0.189	0.013	0.671	0.11	0.11	Gravity
F7-21028	F7-21029	6	323.7	0.2780	29.52	26.67	29.50	25.77	0.191	0.016	0.524	0.12	0.15	Gravity
F7-21029	E7-21002	6	330.0	0.1909	29.50	25.77	30.18	25.14	0.159	0.025	0.651	0.15	0.17	Gravity
F7-21030	F7-21032	6	300.0	0.2833	35.20	30.96	35.40	30.11	0.193	0.038	1.066	0.17	0.16	Gravity
F7-21031	F7-21032	6	192.0	0.6615	31.38	31.38	32.95	30.11	0.295	0.021	0.586	0.11	0.16	Gravity
F7-21032	F7-21012	6	625.0	0.7760	35.40	30.11	32.26	25.26	0.320	0.060	1.693	0.16	0.16	Gravity
F7-21033	E7-21008	8	38.7	-0.4134	39.60	36.51	39.58	36.67	-0.502	0.070	1.393	0.37	0.18	Gravity
F7-22003	F6-21049	8	231.9	0.6813	38.65	34.95	37.57	33.37	0.299	0.013	0.582	0.10	0.11	Gravity
F7-22005	F7-21021	6	295.0	0.1356	39.59	34.53	38.00	34.13	0.134	0.019	0.508	0.14	0.17	Gravity
F7-22006	F7-21031	6	141.7	3.5286	37.00	36.38	35.60	31.38	0.681	0.002	0.104	0.07	0.11	Gravity
F7-22007	E7-21001	6	153.7	1.6396	35.24	30.39	34.47	27.87	0.465	0.000	0	0.07	0.07	Gravity
F7-22008	F7-21030	6	235.2	0.3656	34.75	31.82	35.20	30.96	0.219	0.005	0.139	0.08	0.17	Gravity
G2-21004	G2-21005	6	60.0	41.2333	610.37	586.20	580.08	561.46	2.329	0.062	1.366	0.09	0.20	Gravity
G2-21005	G2-21006	6	155.9	0.4362	580.08	561.46	566.26	560.78	0.240	0.068	1.779	0.20	0.17	Gravity
G2-21006	G2-21007	6	240.5	2.3992	560.78	555.01	555.54	549.43	0.562	0.079	2.006	0.14	0.18	Gravity
G2-21007	F2-21003	6	354.4	1.5745	555.54	555.01	553.93	549.43	0.455	0.101	1.721	0.17	0.24	Gravity
G2-22006	G2-21004	6	32.4	0.0000	610.37	586.20	610.37	586.20	0.000	0.060	1.867	0.23	0.15	Gravity
G2-29006	G2-21006	6	38.3	3.1854	566.26	562.00	566.26	560.78	0.647	0.004	0.145	0.07	0.14	Gravity
G6-21001	G6-21002	6	16.3	43.6196	89.97	86.46	89.45	79.35	2.393	0.016	0.983	0.07	0.10	Gravity
G6-21002	G6-21003	8	194.4	1.2191	89.45	79.35	87.64	76.98	0.863	0.019	1.117	0.09	0.09	Gravity
G6-21003	G6-21004	8	123.3	4.4688	87.64	76.98	74.84	71.47	1.652	0.025	1.454	0.09	0.09	Gravity
G6-21004	G6-21005	8	119.2	6.2584	74.64	71.47	71.08	64.01	1.954	0.028	1.36	0.09	0.10	Gravity
G6-21005	G6-21006	8	133.8	2.2347	71.08	64.01	64.35	61.02	1.168	0.031	1.525	0.10	0.32	Gravity
G6-21006	F6-21001	8	200.0	3.2500	64.35	61.02	59.93	54.52	1.408	0.042	0.152	0.32	6.80	Surcharged
G6-21007	G6-21008	8	252.7	0.8033	67.46	62.34	64.61	60.31	0.700	0.023	0.716	0.10	0.14	Gravity
G6-21008	G6-21009	8	250.0	0.9120	64.61	60.31	61.92	58.03	0.746	0.051	1.704	0.14	0.13	Gravity
G6-21009	F6-21010	8	329.1	0.9359	61.92	58.03	58.46	54.95	0.756	0.044	1.202	0.13	0.15	Gravity

Burlingame Wastewater Collection System Master Plan

Project No. 136414-4.5

Consent Decree Scenario

Upstream Manhole ID	Downstream Manhole ID	Pipe Diameter (in)	Length (ft)	Gradient (%)	US Rim Elevation (ft)	US Invert Elevation (ft)	DS Rim Elevation (ft)	DS Invert Elevation (ft)	Pipe Full Capacity (mgd)	Peak Modeled Flow (mgd)	Peak Modeled Velocity (ft/s)	Maximum Depth in US Manhole (ft)	Maximum Depth in DS Manhole (ft)	Hydraulic Condition at Peak Flow
G6-21009	F6-21015	8	298.9	1.1643	61.92	58.04	58.27	54.56	0.843	0.039	1.119	0.12	0.14	Gravity
G6-21010	G6-22004	8	117.5	0.0426	61.44	57.68	60.78	57.63	0.161	0.003	0.135	0.09	0.09	Gravity
G6-21010	F6-21032	8	381.1	1.2280	61.44	57.68	56.49	53.00	0.866	0.014	0.391	0.09	0.14	Gravity
G6-21012	G6-21007	8	410.8	4.6665	85.48	81.51	67.46	62.34	1.688	0.014	0.639	0.08	0.10	Gravity
G6-21013	F6-21029	8	278.4	1.1925	62.04	59.38	58.59	56.06	0.853	0.005	0.255	0.08	0.09	Gravity
G6-22003	G6-21010	8	322.0	0.3820	62.76	58.91	61.44	57.68	0.483	0.007	0.375	0.09	0.09	Gravity
G6-22004	F6-21033	8	282.0	1.0035	60.78	57.63	59.00	54.80	0.783	0.016	1.016	0.09	0.08	Gravity
NEWHALL	E5-21059	10	100.0	7.6700	50.80	46.40	50.80	38.73	3.923	2.089	4.692	2.99	8.31	Surcharged
RR_Cleanout	D7-21062	8	380.0	0.4132	9.09	7.01	9.71	5.44	0.502	0.000	0	0	0.07	Gravity
SSWH5H21	E5-21036	15	222.4	1.9627	36.18	27.61	33.78	23.24	5.850	3.671	5.384	0.73	1.62	Surcharged

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FINAL

Prepared for: City of Burlingame, California
Project Title: Burlingame Wastewater Collection System Master Plan
Project No: 136414-5.3

Technical Memorandum No. 6

Subject: Capital Improvement Plan
Date: October 15, 2010
To: Donald Chang, PE, Project Manager
Copy to: Art Morimoto, PE, Assistant Public Works Director

Prepared by: Lani Good, PE, Senior Engineer, California, License No. C 73677

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6. CAPITAL IMPROVEMENT PLAN

This technical memorandum (TM) builds upon TM 5 - Hydraulic Model Development and System Performance Evaluation, which describes the surcharging and potential overflows that the City of Burlingame's (City's) collection system experiences during the two 10-year, 24-hour design storms. This TM recommends a Capital Improvement Plan to improve the performance of the City's wastewater collection system and to meet the requirements of the City's NPDES permit and Consent Decree.

This TM is organized into the following sections:

1. Capital Improvement Plan Development
2. Construction Costs
3. Capital Improvement Plan
4. Other Recommendations

6.1 Capital Improvement Plan Development

This section describes the approach, development, and prioritization of the Capital Improvement Plan.

6.1.1 Approach

The approach for the development of the Capital Improvement Plan is based on the following requirements, which were identified in the City's NPDES permit and Consent Decree:

1. Eliminate capacity-related sanitary sewer overflows (SSOs) during rain events of less than the Consent Decree design storm.
2. Eliminate discharges to the Nearshore outfall during rain events less than the Consent Decree design storm.
3. Minimize blending events at the wastewater treatment plant (WWTP).

6.1.1.1 Eliminate Capacity-Related SSOs

Hydraulic capacity and maintenance projects were identified to reduce the occurrence of SSOs in the collection system. These projects will eliminate pipe and pump station hydraulic restrictions, improve areas of the system with historic maintenance issues, and help the City reduce rainfall-dependant inflow and infiltration (RDI/I) in the system. Hydraulic capacity and maintenance projects are positive steps toward eliminating capacity-related SSOs in the collection system during rain events of less than the Consent Decree design storm. However, additional projects are necessary to eliminate discharges to the Nearshore outfall during rain events less than the Consent Decree design storm and to minimize blending events at the WWTP.

6.1.1.2 Eliminate Discharges to the Nearshore Outfall

The City's WWTP effluent is permitted to be discharged up to a maximum rate of 16 million gallons per day (mgd) to the San Francisco Bay via the North Bayside System Unit (NBSU) outfall, a jointly-owned outfall pipe shared by the cities of Burlingame, San Bruno, South San Francisco, Millbrae, Colma, and the San Francisco Airport.

Figure 6-1 shows that under Design Storm conditions, peak (hourly) wet weather flows (PWWFs) reach approximately 32 mgd at the WWTP. Since the NBSU outfall is contractually limited to 16 mgd, either wet weather flows over 16 mgd must be reduced through RDI/I reduction, stored and discharged over a longer period of time, or the NBSU outfall capacity must be increased to prevent the use of the City's unpermitted Nearshore outfall.

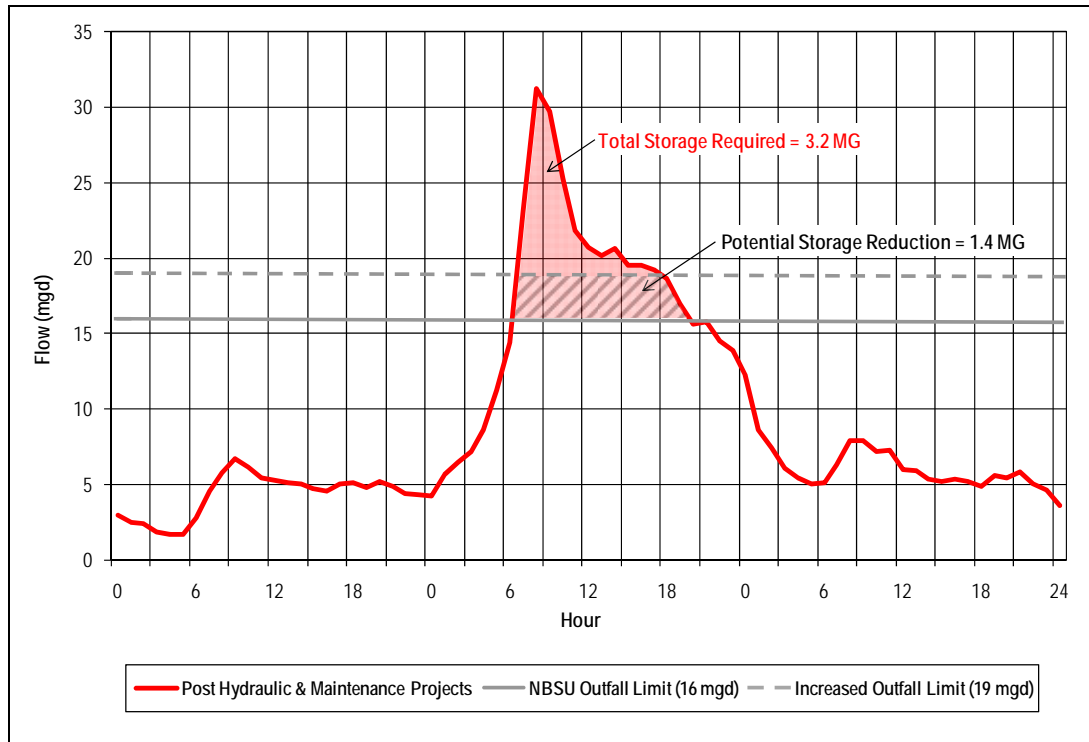


Figure 6-1. Hydrograph at the WWTP under the Design Storm

The volume of wastewater which must be stored under the design storm is approximately 3.2 million gallons (MG), as shown in Figure 6-1. The City's past attempts to site such a large storage facility have been unsuccessful because of space constraints at the WWTP. The City was able to site and design a 1.5 MG wet weather storage facility at the WWTP, which is expected to be under construction by 2011. With the use of the 1.5 MG wet weather storage facility and an additional 0.3 MG of storage available in an existing process basin at the WWTP, the City is able to store wet weather flows of approximately 1.8 MG before triggering the use of the Nearshore outfall.

Since only partial storage is available, additional measures must be taken to prevent the use of the Nearshore outfall. One option yet to be explored is the possibility of increasing the NBSU outfall limit. If the capacity of the outfall could be increased to 19 mgd (see Figure 6-1), the volume of wastewater which must be stored under Design Storm conditions is approximately 1.8 MG, which can be provided at the WWTP. Note that this volume estimate is approximate, is based on a single storm evaluation, and assumes that the wet weather storage facility basins are empty prior to the storm. Increasing the NBSU outfall limit may help eliminate discharges to the Nearshore outfall during rain events less than the Consent Decree design storm, but increasing the outfall limit alone would not contribute to minimizing blending events at the WWTP.

Other methods of eliminating the use of the Nearshore outfall involve reducing the RDI/I in the collection system, which reduces wet weather flows to the WWTP. Although this master plan does not identify specific RDI/I reduction projects, removing RDI/I from the collection system typically involves the disconnection of

direct inflow sources and collection system rehabilitation to reduce infiltration. Collection system rehabilitation produces widely varying results, therefore, a range of candidate rehabilitation projects were identified based on the temporary flow monitoring results.

6.1.1.3 Minimize Blending Events at the WWTP

Blending events occur at the WWTP when wet weather flows exceed the capacity of the secondary treatment process, which is 13 mgd (see Figure 6-2). Wet weather flows above 13 mgd receive primary treatment, but bypass secondary treatment, and are blended with secondary effluent before discharge.

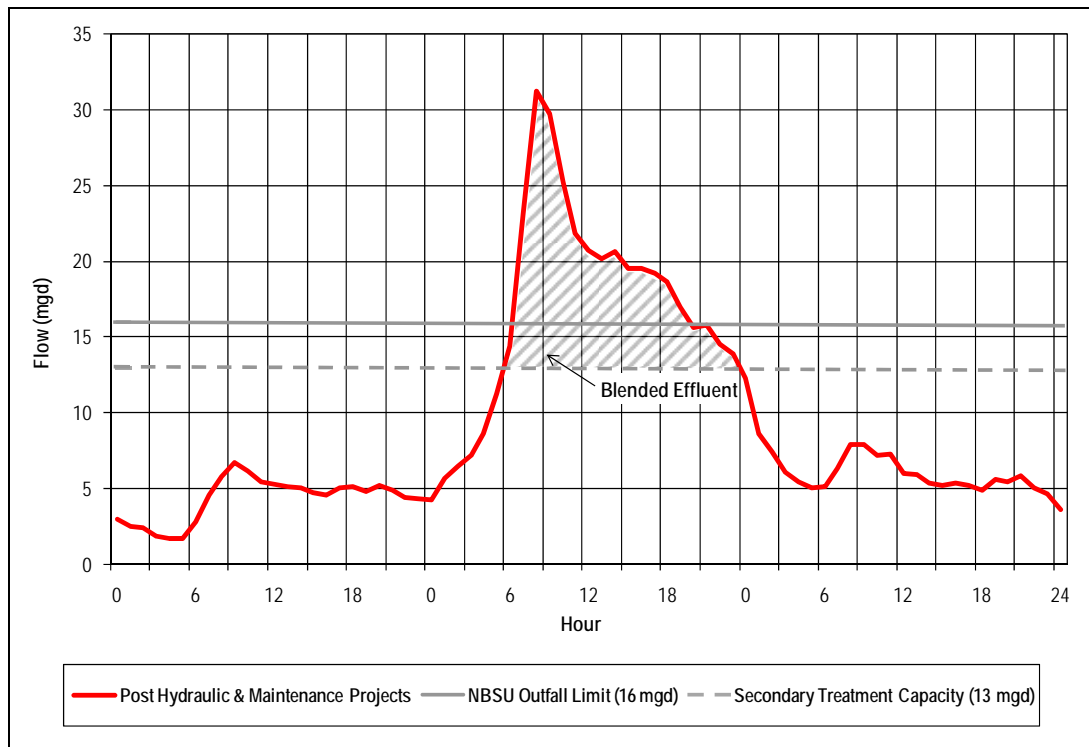


Figure 6-2. Blended Effluent at the WWTP under the Design Storm

The City's proposed 1.5 MG wet weather storage facility at the WWTP reduces the volume of blended effluent since stored wastewater will be returned to the headworks of the WWTP for secondary treatment before discharge. RDI/I reduction methods such as collection system rehabilitation also minimize blending by lowering wet weather flows to the WWTP.

6.1.2 Project Development

Capital projects are based on maintenance improvements and capacity-related surcharging identified in TM 5. Structural projects were not included unless they were identified by the City as high-priority improvements. Potential pump station and forcemain deficiencies were also identified in TM 5.

6.1.2.1 Capacity Improvement Projects

Capacity improvement projects are based on the results of the hydraulic assessment and are intended to provide hydraulic capacity in the system for the two 10-year design storm conditions. TM 5 identified hydraulic deficiencies by pipe reach and highlighted those that were deemed critical. These deficiencies were

evaluated, and the most effective improvement (e.g. relief sewers, sewer replacement, and sewer re-routing) were modeled iteratively from upstream to downstream until system surcharge levels dropped to an acceptable level.

6.1.2.2 High Priority Projects

High Priority improvements, including major structural repair projects were identified by the City during the development of this plan. Preliminary design plans for the proposed projects were provided by the City and were incorporated as High Priority projects in this plan. High Priority projects were reviewed to verify that the solutions were hydraulically acceptable.

6.1.2.3 Basin-Wide Collection System Rehabilitation

Rehabilitation within the collection system for the purpose of reducing RDI/I can take several forms. Experience throughout the country has shown that rehabilitation should occur on an area approach. With this approach, the entire collection system within a designated basin is rehabilitated as compared to trying to identify and repair specific defects (e.g. cracks, offset joints) spread throughout the collection system. The later approach has proven ineffective because storm water can migrate past rehabilitated defects and enter the collection system through other defects that were not rehabilitated.

In many collection systems, upper laterals are found to be a significant source of RDI/I. Upper lateral rehabilitation throughout the collection system can occur through a program that requires the property owner to rehabilitate the upper privately owned portion of the lateral at the sale of property, as a condition for a building permit, or under some other trigger. Two approaches are often used to rehabilitate the collection system within the designated areas. These approaches include:

- Rehabilitation of mains, manholes, and lower laterals (within the public right-of-way or easement).
- Rehabilitation of mains, manholes, lower laterals, and upper (privately-owned) laterals.

A review of documented case studies (including the Water Environment Research Foundation study 99-WWF-8 titled “Reducing Peak Rainfall-Derived Infiltration/Inflow Rates – Case Studies and Protocol”) and BC’s experience indicates the following:

- Rehabilitation of just mains, manholes, and lower laterals generally provides little reduction in PWWFs, but can be effective in reducing RDI/I volumes. One study showed a 30 percent reduction in RDI/I volume with this approach while others documented five percent or less reduction. While reductions in RDI/I volumes benefit the WWTP, they do not necessarily benefit the collection system which must convey PWWFs.
- Rehabilitation of mains, manholes, lower laterals, and upper laterals achieved significant reduction in PWWFs. Reductions of 50 to 70 percent of PWWFs were documented when upper laterals were rehabilitated along with mains, manholes, and lower laterals.
- The City has some experience with sewer rehabilitation to reduce RDI/I. Rehabilitation in the Burlinghome Subdivision (completed in 2007) addressed the mains, manholes, and lower laterals and resulted in some discernable RDI/I reduction.
- The City has a program to rehabilitate privately-owned upper laterals which requires testing and rehabilitation at the sale of property.
- The Town of Hillsborough, a satellite collection system to the City, has recently implemented a Town ordinance to require the rehabilitation of privately-owned upper laterals at the sale of property.
- The Burlingame Hills Sewer Maintenance District (BHSMD), a satellite collection system to the City, does not currently have a privately owned upper lateral rehabilitation program.

Based on the above analysis, and for purposes of meeting the City's NPDES permit and Consent Decree requirements, 30-50 percent RDI/I reduction scenarios were tested in a selection of the most promising basins. The lower range of RDI/I reduction (30 percent) includes the comprehensive, area-wide rehabilitation of mains, manholes, and the lower laterals (within the public right-of-way or easement). The higher range of RDI/I reduction (50 percent) also includes upper (privately owned) lateral rehabilitation.

Analysis of the flow monitoring data collected for this project identified a number of flow basins that are potential candidates for rehabilitation. Basins were selected for rehabilitation based on the following criteria:

- High potential for RDI/I reduction based on modeled R-factor (percent of rainfall volume that enters the collection system).
- Effectiveness of RDI/I reduction (gallons of RDI/I per lineal foot of pipe) with a focus on basins with small diameter pipe primarily in residential areas where RDI/I is expected to be prevalent.
- Basins where RDI/I reduction projects have not been previously implemented.

Table 6-1 summarizes the properties of each of the 18 flow monitoring basins, including the primary agency that contributes the flow, and indicates which basins were selected for the RDI/I reduction scenario. Note that average dry weather flow (ADWF) and PWWF values presented in Table 6-1 include flows from upstream basins.

Table 6-1. RDI/I Reduction Scenarios

Flow Monitor Basin	Responsible Agency	ADWF ¹ (mgd)	Consent Decree Scenario ²		Contributing Area (ac)	Wet Weather GWI (mgd)	R-factor (% of Rainfall Volume)	Consent Decree Scenario ²	Total Length of Pipe (LF)	Gallons RDI/I per Total LF	Candidate for Collection System Rehabilitation
			PWWF ¹ (mgd)	Peaking Factor				Volume RDI/I (MG)			
Unmetered	City				159	0.0	1.0	0.04	32,083	1	
1	City	0.24	2.24	9.3	240	0.1	3.9	0.94	48,675	19	
2	City	0.11	2.07	18.8	114	0.0	7.8	0.89	19,329	46	✓
3	City and BHSMD	0.10	0.79	7.9	79	0.1	7.1	0.56	19,222	29	✓
4	BHSMD	0.01	0.32	32.0	24	0.0	9.5	0.23	5,069	45	✓
5	City	0.21	1.52	7.2	50	0.0	3.4	0.17	20,365	8	
6	City	0.21	3.17	15.1	74	0.0	9.2	0.69	20,518	34	✓
7	City, Hillsborough and BHSMD	0.20	1.88	9.4	208	0.2	5.7	1.18	42,881	28	✓
8	City and Hillsborough	0.07	1.38	19.7	140	0.0	5.7	0.81	28,977	28	✓
9	City and Hillsborough	0.05	0.67	13.4	52	0.0	7.0	0.37	9,035	41	✓
10	Hillsborough	0.17	1.08	6.4	638	0.0	2.6	1.66	90,913	18	
11	City	0.65	2.19	3.4	155	0.5	4.2	0.65	42,957	15	
13	City	0.17	1.10	6.5	103	0.2	3.0	0.31	29,180	11	
14	City	1.00	7.84	7.8	265	0.0	2.0	0.53	85,181	6	
15	City	1.76	17.20	9.8	333	0.0	7.8	2.72	82,253	33	✓
16	City	0.13	2.98	22.9	6	0.0	5.0	0.03	2,812	11	
17	City and Hillsborough	0.26	1.86	7.2	125	0.1	6.3	0.79	29,686	27	✓
Floribunda	Hillsborough	0.17	3.65	21.5	759	0.1	2.6	1.94	105,448	18	✓

¹Flow rates include all flows upstream of the meter, including flows from tributary basins.

²SSOs occur under both wet weather scenarios, therefore, PWWFs and peaking factors do not include system losses.

The implementation of the 30 to 50 percent RDI/I reduction in the candidate basins results in a lower volume and PWWF at the WWTP. Figure 6-3 shows that under Design Storm conditions (the conservative storm), the modified hydrograph at the WWTP after the high-priority and hydraulic capacity projects and the collection system rehabilitation shown in Figure 6-4 have been completed, PWWFs reach approximately 28 mgd, and 1.8 MG of wet weather flows must be stored to eliminate the use of the Nearshore outfall.

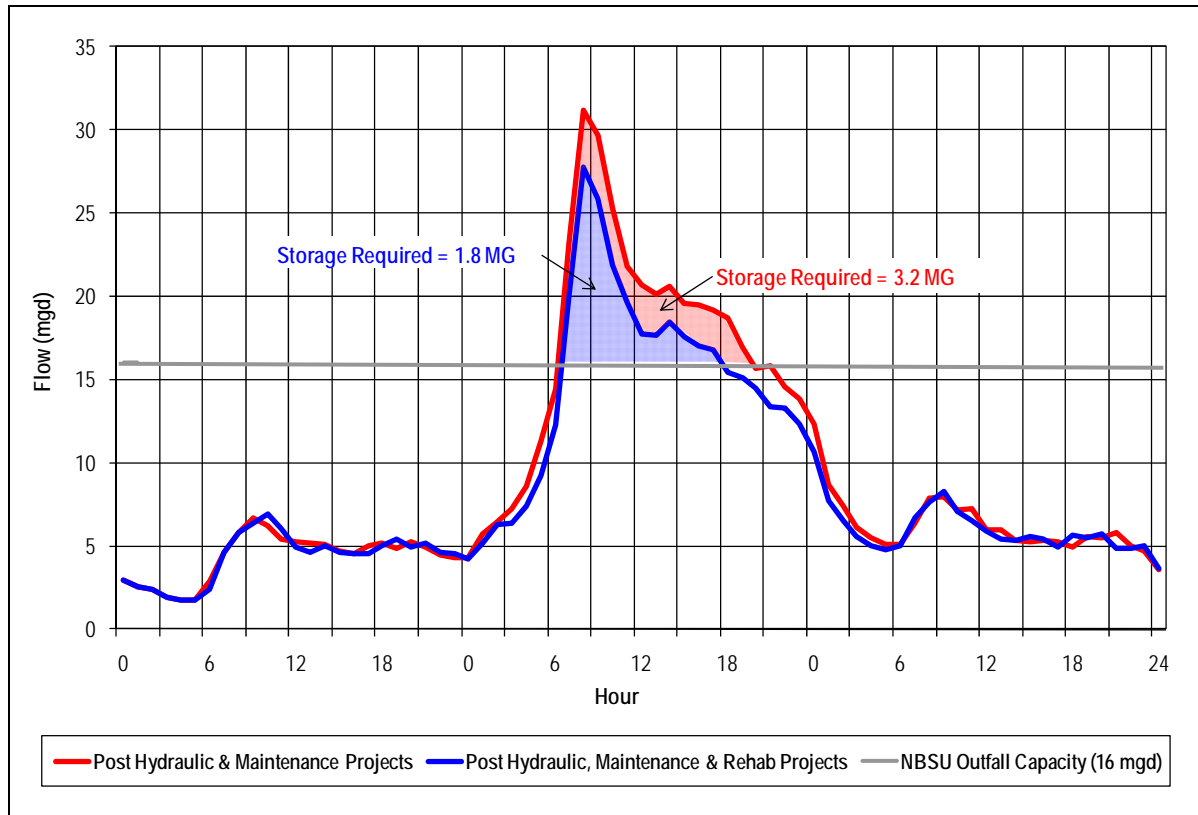


Figure 6-3. Hydrograph at the WWTP – After Collection System Rehabilitation

The City has tested this hydrograph in its Nearshore Discharge Model (with the proposed 1.5 MG wet weather storage facility implemented and the existing 0.8 MG of storage at the WWTP), and it resulted in no model Nearshore discharges for the Design Storm. This model assumed that the wet weather storage facility basins were empty at the beginning of the storm. Often, at the planning level, the storage basin volume is increased by approximately 30 percent to account for consecutive storms that occur before the storage basins are empty from the previous storm. If the lower (30 percent) RDI/I removal rates are achieved in all candidate basins, the wet weather flows shown in Figure 6-4 will not allow much freeboard in the City's storage basins. However, if the higher (50 percent) RDI/I removal rates are achieved, a safety factor will be provided to allow for the occurrence of consecutive storms.

It's important to understand that there are a myriad of potential rehabilitation scenarios. Alternative scenarios can be further modeled to meet the City's RDI/I reduction goals. Basins selected for rehabilitation are shown in Figure 6-4, and are the most promising, effective candidates for RDI/I removal.



**Wastewater Collection
System Master Plan**
Project No. 136414

Legend

- ▲ WWTP
- Pump Station (PS)
- Modeled Sanitary Sewer Collection System
- Burlingame City Limits
- Parcels

Basins to be Rehabilitated

- Basin 2
- Basin 3
- Basin 4
- Basin 6
- Basin 7
- Basin 8
- Basin 9
- Basin 17
- Basin Floribunda
- Basin 15 (Residential)

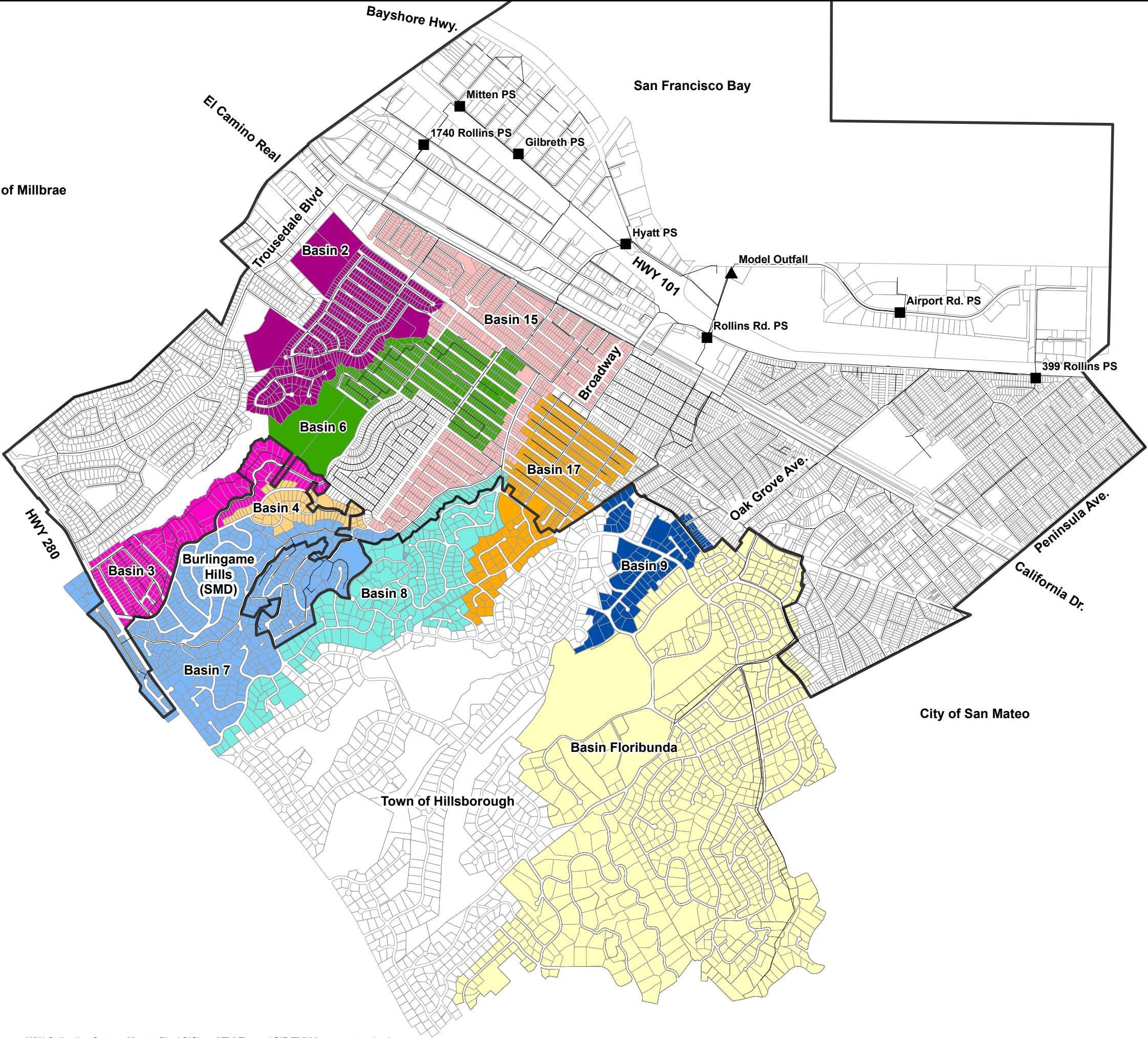


Figure 6-4

**Candidate Basins
for Rehabilitation**



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6.1.3 Project Prioritization

The City's primary goal is to meet the requirements of its Consent Decree. However, there are other capital projects included in the recommended Capital Improvement Plan. Therefore, as summarized in Table 6-2, high-priority projects are expected to be completed first, within the next five years; hydraulic capacity projects that are necessary to meet the requirements of the Consent Decree must be completed in the next ten years; and hydraulic capacity projects triggered by the Design Storm are expected to be completed more than ten years from now, and should be reevaluated after the conditions of the Consent Decree are met.

Table 6-2. Project Prioritization		
Priority		Projects
5-Years	High	High Priority Projects
10-Years	Medium	Capacity Improvement Projects
10-Years	Medium	Basin-Wide Collection System Rehabilitation Projects
Beyond 10-Years	Low	Capacity Improvement Projects

6.2 Construction Costs

This section describes the development of construction costs for recommended improvements to the City's collection system. Construction costs are based on recent bid tab unit costs which are discussed below.

6.2.1 Pipelines

Two construction methods are considered for this master plan: pipe bursting and open cut construction. The City prefers replacing sewers by the pipe bursting method because of its cost effectiveness. Therefore, pipe bursting was the default construction method chosen for pipeline projects, and open cut construction was only recommended in cases of extremely shallow cover, required grade change, or where pipe diameters increased more than two nominal sizes.

Pipe Bursting. Pipe bursting is a trenchless method of constructing replacement sewer pipe. The replacement sewer can be of the same or slightly larger diameter (up to two nominal pipe diameter sizes) as the existing pipe, but the pipe grade must remain the same. In the past, minor soil heaving in shallow pipe trenches has been mitigated with a pavement saw-cut trench over the pipe.

Open Cut Construction. Open cut construction is the traditional method of installing sewer pipe and consists of excavating a trench along the alignment of the existing sewer reach, removing the existing pipeline, and installing a new sewer. The replacement sewer can be of the same or larger diameter, and can be constructed at a different grade depending on the downstream conditions.

Planning Level Unit Costs. Project costs were developed based on planning level unit costs and preliminary pipeline lengths and diameters. Planning level unit costs were developed from bid tabs from recent pipeline construction projects in Northern California and confirmed with bid results from several recent City sewer projects, details of which can be found in Attachment A.

The planning level unit costs are presented in Table 6-3, and are for sewers installed less than ten feet deep, unless otherwise specified. Unit costs for open cut sanitary sewer include mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and typical dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; typical surface restoration; erosion, sediment and stormwater control; overhead; and profit. Unit costs for sewer replacement by pipe bursting include mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard

dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; erosion, sediment and stormwater control; overhead; and profit.

Table 6-3. Sanitary Sewer Unit Costs			
Item		Unit	\$/Unit
Open Cut Sanitary Sewer Replacement			
8-inch		LF	\$272
10-inch		LF	\$280
12-inch		LF	\$336
15-inch		LF	\$420
Open Cut Sanitary Sewer			
18-inch	Depth <10'	LF	\$414
21-inch	Depth <10'	LF	\$420
	10' < Depth <15'	LF	\$462
Sewer Rehabilitation: Pipe Bursting			
8-inch		LF	\$184
10-inch		LF	\$220
12-inch		LF	\$264
Other			
CCTV		LF	\$2
35% Contingency		%	35%
Engineering, Admin, Change Orders etc.		%	35%

6.2.2 Pump Stations

Planning level costs for the pump station capacity upgrades assumed that the pump station structures and appurtenances are in good working condition and that the capacity issue can be addressed by upsizing the pumps. No condition assessments or capacity confirmations were performed. The existing capacities presented in TM 5 were based on City draw-down tests, which should be confirmed by a full hydraulic analysis prior to design.

Planning level costs for replacing pumps include the cost of the pump, pump installation, gate and check valve replacements, and estimated electrical equipment upgrades. The pump costs are based on estimates provided by a pump manufacturer (Flygt). Pump installation is estimated to be approximately half the cost of the pump. Electrical equipment upgrades and valve costs are based on item costs from other similar projects.

6.2.3 Collection System Rehabilitation

In a planning level analysis, it is difficult to predict the amount of collection system infrastructure that will need rehabilitation within each basin. To date, only gross-level flow monitoring data is available for large basins. More intensive flow monitoring and detailed field investigations within the basins with significant RDI/I are necessary to characterize how RDI/I is distributed within the basins and to identify portions of the basins that do not need rehabilitation. For the purpose of this plan, it is necessary to examine a range, between 40 and 80 percent, of the quantity of mains, manholes, and laterals in each basin will require rehabilitation. Costs for collection system rehabilitation are based on the unit costs listed in Table 6-3, and do

not include the rehabilitation of upper (privately-owned) laterals, which can cost approximately \$4,000 per lateral plus contingencies and engineering, administration, *etc.*

6.2.4 Other Costs

Contingency. A contingency of 35 percent was added to the planning level costs to obtain planning level construction costs. Planning level projects have many inherent uncertainties and it is appropriate to include a contingency allowance to cover the potential additional construction costs. Uncertainties associated with planning-level projects include unexpected geotechnical conditions, extraordinary utility relocation, alignment changes, and permits. All of these uncertainties can increase the construction cost.

Engineering, Admin, Change Orders, etc. 35 percent was added to the planning level costs to account for design, construction services, administration, legal and environmental services, and construction change orders. Engineering services associated with projects are estimated at 15-17 percent of the construction cost and include preliminary investigations and design services, site and route surveys, geotechnical explorations, preparation of drawings and specifications, construction services, surveying and staking, and sampling and testing of materials. Administrative charges are estimated at 8-10 percent of the construction cost and include administrative costs, legal and environmental services, financing expenses, and interest during construction. A 10 percent allowance is also included for unforeseen construction change orders. The total allowance for engineering, administrative, and change orders costs is 35 percent of the construction cost.

6.3 Capital Improvement Plan

The Capital Improvement Plan (CIP) is comprised of sanitary sewer hydraulic capacity projects and pump station upgrades required to meet the Consent Decree Scenario and/or the Design Scenario (described in TM 5) and the City's high-priority projects. The capital improvement projects are summarized in Table 6-4, and are shown in **Error! Reference source not found.** Attachment B provides detailed project descriptions including manhole numbers, pipe lengths and diameters, minimum sewer slopes, pump station capacities, along with detailed project costs.

Table 6-4. Capital Improvement Project Summary

Project No.	Contributing Agency	Location	Project Description	Existing Size	Future Size	Quantity	Construction Cost	Engineering, Admin, Etc.	Total Project Cost
5-Years: High Priority Projects									
11	City	Upper Carmelita Ave.	Upsize by pipe bursting.	6-in	8-in	1,800 LF	\$451,980	\$158,190	\$610,170
14	City	Grove Ave.	Open cut replacement.	6-in	8-in	3,510 LF	\$850,000 ²	\$297,500 ²	\$1,147,500 ²
15	City	Easement: California Dr./ Edgehill Dr.	Re-route collection system by open cut installation.	N/A	8-in to 12-in	3,190 LF	\$1,254,180	\$438,960	\$1,693,140
23	City	Majilla Ave. Easements	Sewer rehabilitation.	6-in	8-in	1,140 LF	\$150,000 ²	\$52,500 ²	\$202,500 ²
24	City	Downtown Burlingame	Sewer rehabilitation.	6-in, 10-in	8-in, 10-in	6,809 LF	\$1,400,000 ²	\$300,000 ²	\$1,700,000 ²
Subtotal - High Priority Projects							\$4,106,160	\$1,247,150	\$5,353,310
10-Years: Medium Priority Capacity Improvement Projects									
2	City	Upper Trousdale Dr.	Upsize by pipe bursting. (Recently paved.)	8-in	10-in	1,280 LF	\$383,620	\$134,270	\$517,890
3	City & BHSMD	Adeline Dr. Easement	Upsize and re-grade by open cut replacement.	8-in	10-in, 12-in	3,212 LF	\$1,349,810	\$472,430	\$1,822,240
5	City & BHSMD	Canyon Rd.	Upsize and re-grade by open cut replacement.	6-in, 8-in, 12-in	8-in to 18-in	4,010 LF	\$1,706,600	\$597,310	\$2,303,910
7	City	Adeline Dr. - Cabrillo & Cortez	Upsize by pipe bursting and open cut replacement.	6-in, 8-in, 15-in	8-in to 21-in	2,215 LF	\$838,200	\$293,370	\$1,131,570
8	City	Columbus Ave. to Bernal Ave.	Upsize by pipe bursting.	6-in	8-in	892 LF	\$223,980	\$78,390	\$302,370
9	City	Hale Dr. to Bernal Ave.	Install new pipe and 3 new manholes by open cut.	-	10-in	1,400 LF	\$532,980	\$186,540	\$719,520
12 ¹	City & Hillsborough	Lower Sanchez Ave. (DS of California Dr.)	Upsize and re-grade by open cut replacement.	15-in	21-in	1,110 LF	\$695,300	\$243,360	\$938,660
13 ¹	Hillsborough	Sanchez Ave. (Hillsborough)	Upsize and re-grade by open cut replacement.	6-in, 8-in, 10-in	10-in, 15-in	2,880 LF	\$1,517,890	\$531,260	\$2,049,150
17	City	Carolan Ave.	Upsize by pipe bursting. Not enough fall to re-grade.	6-in	8-in	800 LF	\$200,880	\$70,310	\$271,190
18	City	Rollins Rd. & Humboldt Rd.	Upsize by pipe bursting and open cut replacement.	8-in	10-in, 12-in	1,330 LF	\$452,600	\$158,410	\$611,010
19	City & Hillsborough	Upper Oak Grove Ave. & El Camino R.	Upsize by open cut replacement.	15-in	21-in	85 LF	\$53,240	\$18,630	\$71,870

Table 6-4. Capital Improvement Project Summary

Project No.	Contributing Agency	Location	Project Description	Existing Size	Future Size	Quantity	Construction Cost	Engineering, Admin, Etc.	Total Project Cost
20	City	1740 Rollins PS	Pump station upgrade. Confirm capacity with hydraulic analysis.	1.0 mgd	2.0 mgd	-	\$132,500	\$46,000	\$178,500
21	City	Airport Road PS	Pump station upgrade. Confirm capacity with hydraulic analysis.	0.3 mgd	0.4 mgd	-	\$50,000	\$18,000	\$68,000
Subtotal - Medium Priority Capacity Improvement Projects							\$8,137,600	\$2,848,280	\$10,985,880
10-Years: Medium Priority Basin-Wide Collection System Rehabilitation Projects									
22A	City	Basins 2, 3, 6, 7, 8, 9, 15, 17, Floribunda	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 12-in	8-in to 12-in	50,450 LF to 100,800 LF	\$12,700,000 to \$25,400,000	\$4,400,000 to \$8,900,000	\$17,100,000 to \$34,300,000
22B	BHSM	Basin 3, 4, 7	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 8-in	8-in to 12-in	10,400 LF to 20,800 LF	\$2,600,000 to \$5,300,000	\$900,000 to \$1,900,000	\$3,500,000 to \$7,200,000
22C	Hillsborough	Basin 7, 8, 9, 17, Floribunda	Rehabilitate or replace mains, manholes, and lower laterals.	4-in to 12-in	8-in to 12-in	46,450 LF to 92,800 LF	\$11,700,000 to \$23,400,000	\$4,100,000 to \$8,200,000	\$15,800,000 to \$31,600,000
Subtotal - Medium Priority Basin-Wide Collection System Rehabilitation Projects – Minimum							\$27,000,000	\$9,400,000	\$36,400,000
Subtotal - Medium Priority Basin-Wide Collection System Rehabilitation Projects – Maximum							\$54,100,000	\$19,000,000	\$73,100,000
Beyond 10-Years: Low Priority Capacity Improvement Projects									
1	City	Lower Trousdale Dr.	Upsize and re-grade by open cut replacement and pipe bursting.	12-in, 18-in	15-in, 24-in	2,700 LF	\$1,662,930	\$582,030	\$2,244,960
4	City	La Mesa Dr.	Upsize by pipe bursting.	6-in	8-in	610 LF	\$153,170	\$53,610	\$206,780
6	City	Davis Dr.	Upsize by pipe bursting, and install relief sewer by open cut.	6-in	8-in, 10-in	1,773 LF	\$511,690	\$179,090	\$690,780
10	City	Columbus Ave. Hillside/Easton	Upsize by pipe bursting.	6-in	8-in	1,250 LF	\$313,880	\$109,860	\$423,740
16	City	California Dr. & Palm Dr.	Upsize by pipe bursting.	6-in	8-in	840 LF	\$210,920	\$73,820	\$284,740
Subtotal - Low Priority Capacity Improvement Projects							\$2,852,590	\$998,410	\$3,851,000
Grand Total – Minimum							\$42,096,350	\$14,493,840	\$56,590,190
Grand Total – Maximum							\$69,196,350	\$24,093,840	\$93,290,190

¹ CIP projects 12 and 13 primarily convey flows from the Town of Hillsborough. These recommendations should be confirmed following the completion of the Town of Hillsborough Collection System Master Plan.

² Cost estimates provided by the City.

6.4 Other Recommendations

Although not included in the Capital Improvement Plan, the following activities are also recommended to meet the stated NPDES permit and Consent Decree requirements.

- NBSU Outfall Hydraulic Investigation
- Wet Weather Flow Monitoring and RDI/I Investigations (including Smoke Testing)
- Private Lateral Rehabilitation Programs
- Satellite Collection Systems Agreements
- Master Plan Update

6.4.1 NBSU Outfall Hydraulic Investigation

The City is contractually limited to a peak discharge of 16 mgd through the NBSU outfall. An investigation should be performed to determine the limits of the outfall, and whether additional capacity is available. The capacity of the NBSU outfall could be limited by the pipeline pressure rating, the capacity of an in-line pump station, bay dilution requirements that are tide-dependant, or by over-conservative modeling assumptions made at the time of the original design. It is in the City's best interest to investigate whether additional capacity is available since it could potentially provide a much quicker and less-costly method for eliminating the use of the Nearshore outfall.

6.4.2 Wet Weather Flow Monitoring and RDI/I Investigations (Including Smoke Testing)

Further intensive wet weather flow monitoring can be completed to isolate smaller basins and to identify where RDI/I reduction will be most effective. The City should also conduct detailed field investigations, including smoke and dye testing, to characterize how RDI/I is distributed with each smaller basin and to identify portions of the basins that do not need rehabilitation. The City's smoke testing program will be included as part of the 10-year CIP. Tests will be conducted in conjunction with the lower lateral replacement and illegal storm drain disconnection.

6.4.3 Private Lateral Rehabilitation Programs

The City's satellite collection systems should expand their efforts to control and reduce RDI/I by implementing rigorous private lateral inspection and rehabilitation programs. RDI/I from private laterals has been found to account for approximately 50 percent of the total RDI/I in several Bay Area cities. A program to inspect and rehabilitate private service laterals at the sale of property can provide on-going RDI/I control at low cost.

6.4.4 Satellite Collection Systems Agreements

The City should review the agreements with its satellite collection systems to ensure that appropriate limits on PWWFs are included. PWWFs are the primary criteria for sizing collection system facilities including pipes and pump stations. Wet weather flows are also a significant cause of overflows in the City's collection system. Responsibilities for limiting, conveying, and paying for PWWFs should be clearly delineated. Satellite collection systems should have active programs to control and reduce RDI/I that include identifying and disconnecting inflow sources, private lateral inspection and rehabilitation programs, and regular monitoring and evaluation of wet weather flows.

6.4.5 Master Plan Update

This master plan should be updated in 5 years as the City completes improvements and RDI/I reduction projects, and as updated flow monitoring information becomes available. The existing hydraulic model should be updated periodically to reflect changes in the collection system, including collection system rehabilitation and sewer upsizing projects. Future flow monitoring should include long-term (12 month) flow monitoring of the Town of Hillsborough and BHSMC flows to recalibrate the model and for continuous simulation modeling of the storage at the WWTP.










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Wastewater Collection System Master Plan

Project No. 136414

Legend

-  CIP Project Number
-  WWTP
-  Pump Station (PS)
-  Existing Sanitary Sewer
-  10-Years - Capacity / Rehab
-  5-Years - High Priority
-  >10-Years - Capacity
-  Burlingame City Limits
-  Burlingame Parcels



0 750 1,500 3,000

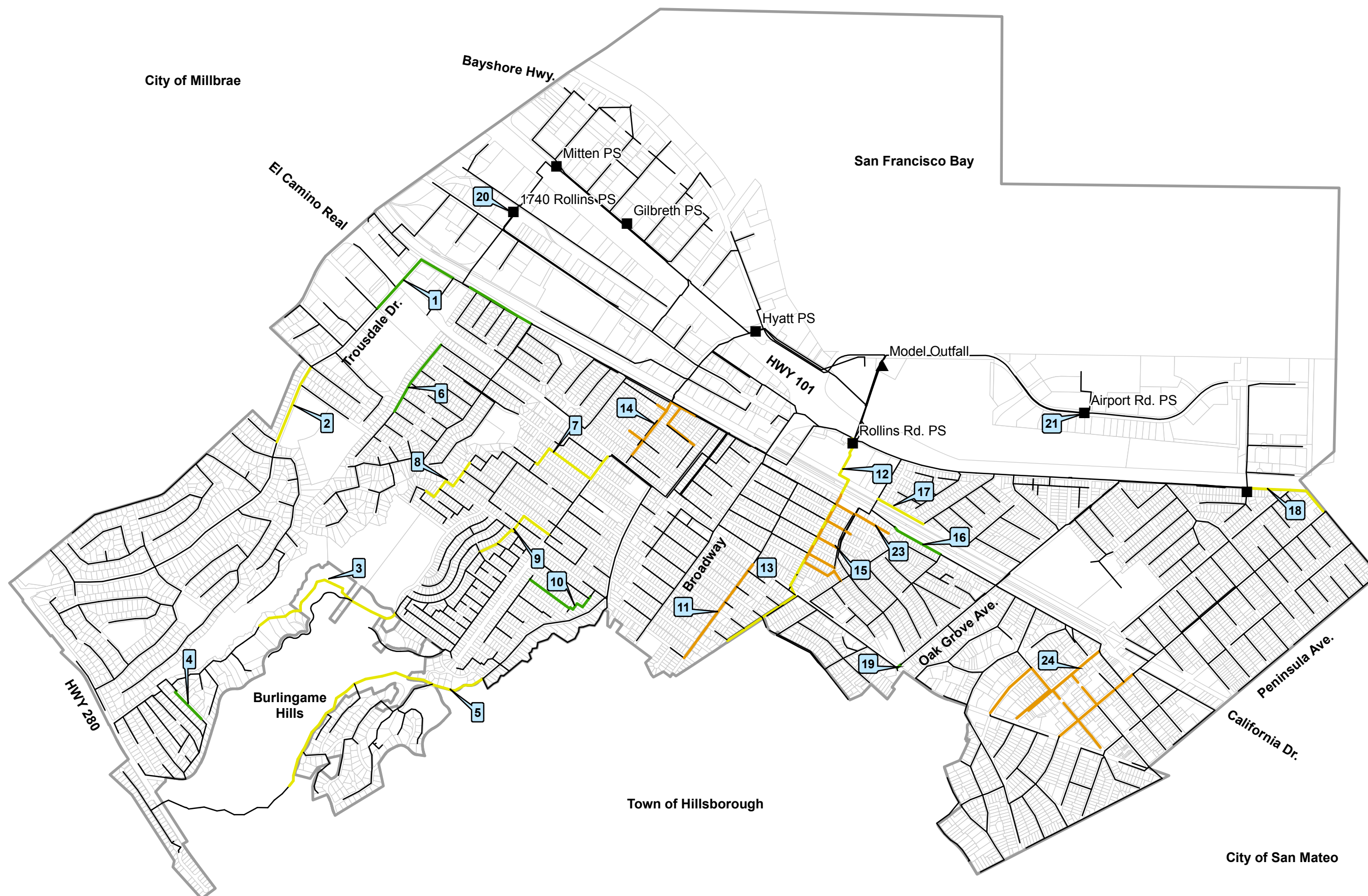
Scale in Feet

Figure 6-5

Capital Improvement Projects

BROWN AND
CALDWELL

Last Revision: 10/12/2010



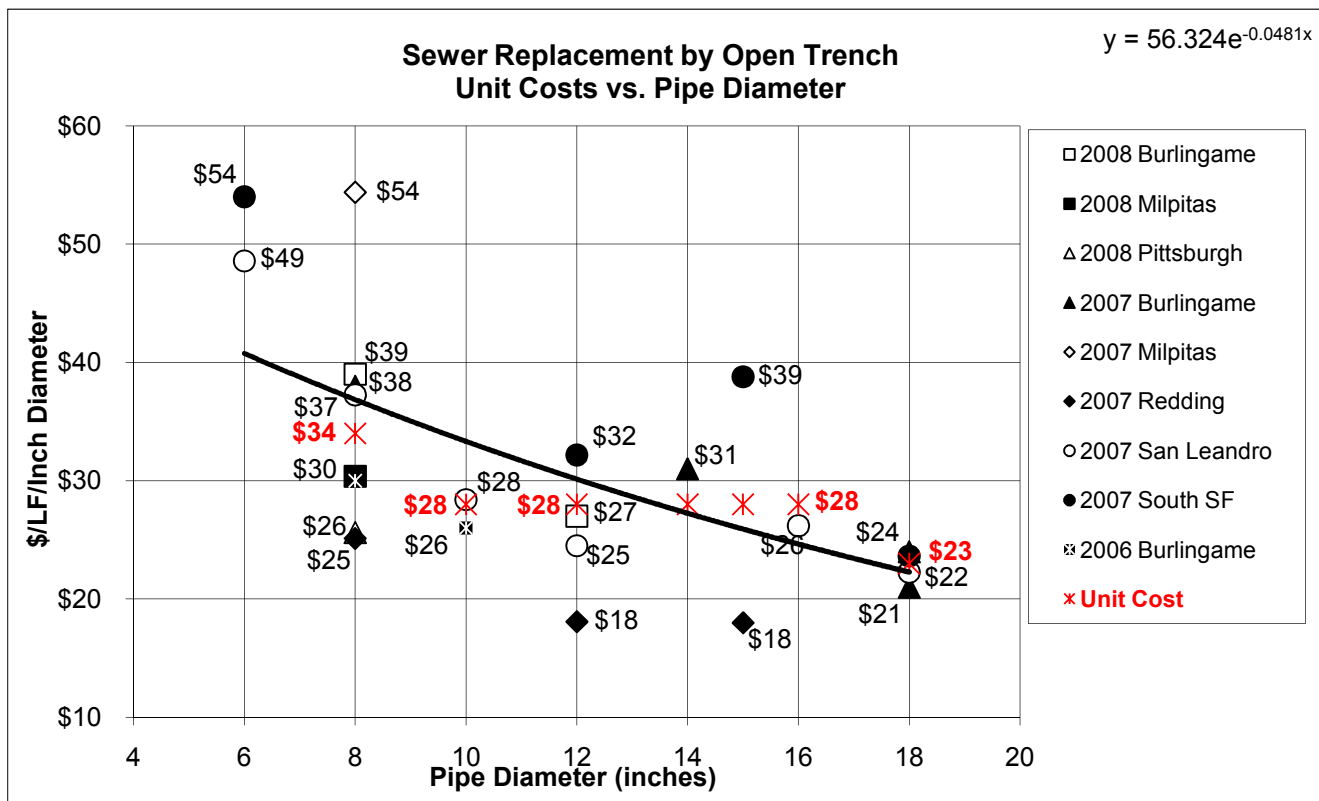
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ATTACHMENT A: PLANNING LEVEL UNIT COST DEVELOPMENT

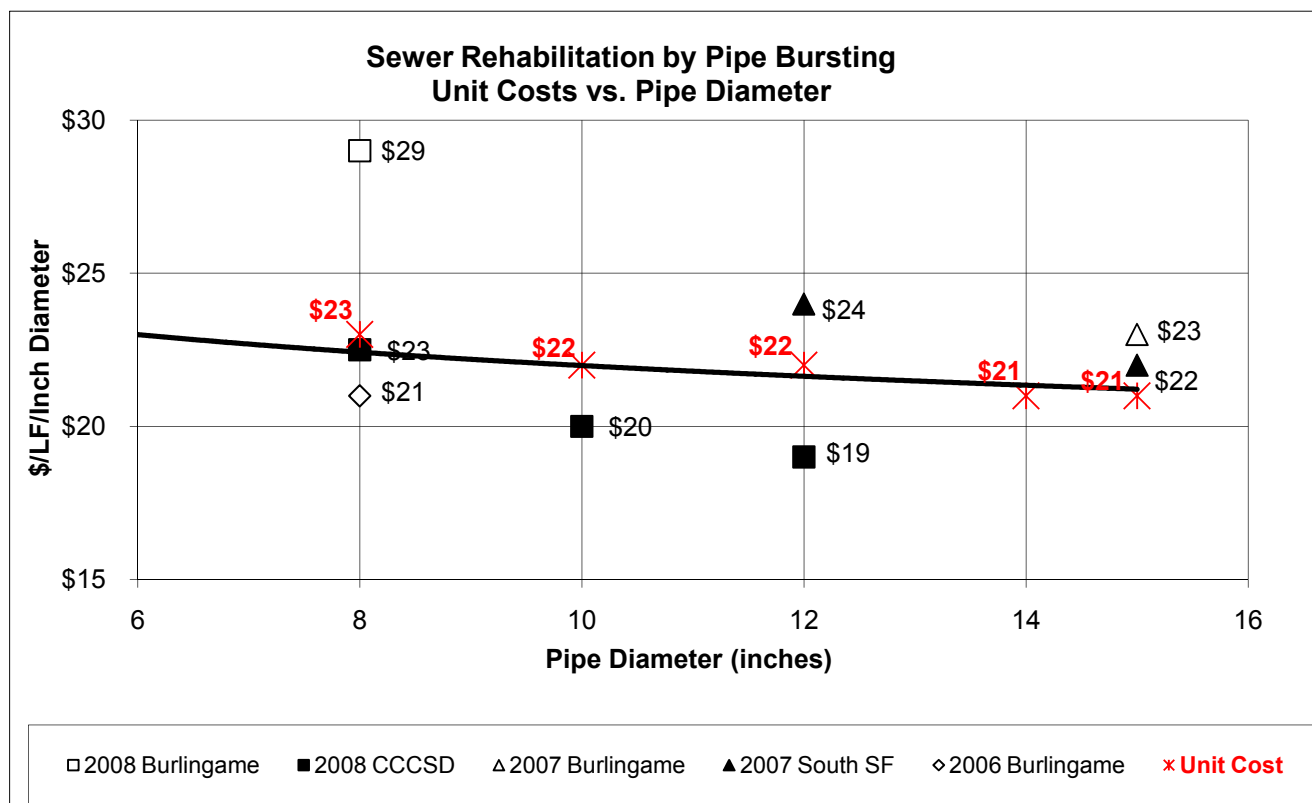
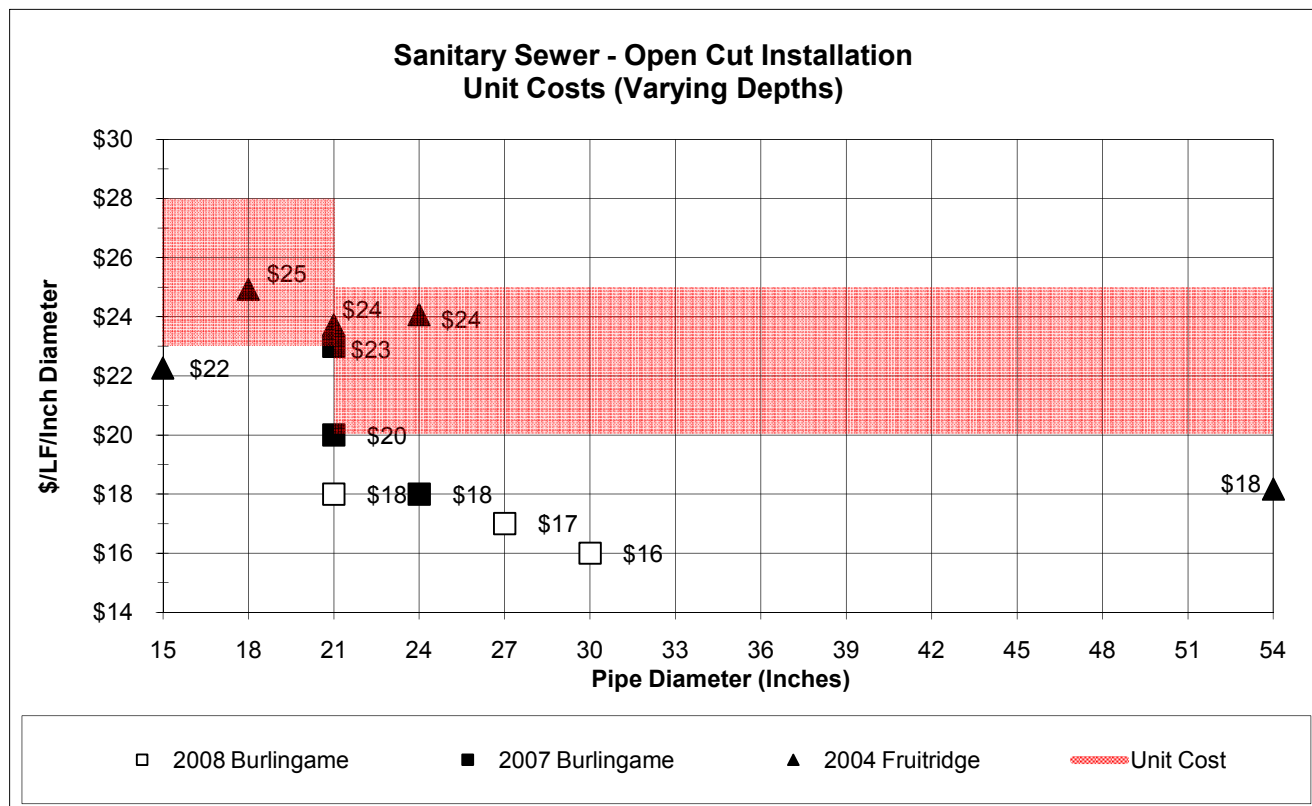
Date: October 23, 2009
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engineer: Lani Good

Planning level unit costs for both sanitary sewer installation and rehabilitation were developed using the following methodology:

1. Construction bids were tabulated for recent comparable projects in and around the Bay Area.
2. Only construction projects having a minimum of three responsive bids were included.
3. The comparable projects were equalized by excluding the following project-specific line items, if any:
 - a. jack and bore highway or railroad crossings,
 - b. junction structures,
 - c. cured-in-place pipe linings,
 - d. installation of owner-provided materials, and
 - e. small quantity pipe installation, relocation, or abandonment.
4. The average bid for each line item was calculated for each project.
5. Lump sum line items such as contractor mobilization, traffic control, and sheeting and shoring were then redistributed in a weighted fashion to each linear pipe line item.
6. The unit cost for each construction method was calculated as a cost per linear foot per inch diameter of pipe.
7. The unit costs were plotted for each construction method by project on the following charts. The "Unit Costs" used in this master plan were then developed from the trends identified.



Unit Cost Development



ATTACHMENT B: DETAILED PROJECT DESCRIPTIONS AND COSTS

Capital Improvement Plan

Sanitary Sewer Improvement Project Descriptions

Date: October 13, 2010
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engr: Colin Dudley
 Reviewed by: Lani Good

Project No.	Location	Issue	USMH	DSMH	Improvement Project	Existing Diameter	Future Diameter	Length	Grade* (%)	CIP Priority
1	Lower Trousdale Dr.	Under capacity due to flat slope. Freeboard concern.	B3-21010	B3-29002	Upsize and re-grade by open cut replacement.	12-in	15-in	1,248'	0.743 (Min Slope = 0.51)	Low
			B3-29002	B3-21017	Upsize and re-grade by open cut replacement.	12-in	15-in	352'	0.966 (Min Slope = 0.51)	
			B3-21046	B3-21081	Upsize by pipe bursting.	18-in	24-in	1,100'	Existing grade.	
2	Upper Trousdale Dr.	Under capacity and shallow.	D2-21073	C2-21008	Upsize by pipe bursting. (Recently paved.)	8-in	10-in	1,280'	Existing grade.	Medium
3	Adeline Dr. Easement	Under capacity. Flat and very shallow.	E2-21026	E2-21036	Upsize by open cut replacement.	8-in	10-in	1,208'	Existing grade.	Medium
			E2-21036	E2-21038	Upsize and re-grade by open cut replacement.	8-in	10-in	134'	1.66	
			E2-21038	E2-21039	Upsize and re-grade by open cut replacement.	8-in	12-in	96'	0.604	
			E2-21039	E3-21004	Upsize and re-grade by open cut replacement.	8-in	12-in	738'	0.712	
			E2-21004	E3-21011	Upsize and re-grade by open cut replacement.	8-in	12-in	846'	0.908	
			E3-21011	E3-21012	Upsize and re-grade by open cut replacement.	8-in	10-in	160'	10.09	
5	Canyon Rd.	Under capacity and shallow. Causes overflows.	E3-21012	E3-21129	Upsize and re-grade by open cut replacement.	8-in	10-in	30'	9.42	Medium
			F2-21102	E2-21010	Upsize by pipe bursting.	6-in	8-in	610'	Existing grade.	
			F2-21035	F3-21055	Upsize by open cut replacement.	6-in	8-in	586'	Existing grade.	
			F3-21055	E3-21067	Upsize by open cut replacement.	6-in, 8-in	10-in	2,208'	Existing grade.	
			E3-21067	E3-21071	Upsize by open cut replacement.	8-in	12-in	370'	Existing grade.	
			E3-21071	E3-21074	Upsize by open cut replacement.	12-in	16-in	115'	Existing grade.	
			E3-21074	E3-21076	Upsize and re-grade by open cut replacement.	12-in	16-in	421'	0.87	
			E3-21076	E3-21077	Upsize by open cut replacement.	12-in	16-in	120'	Existing grade.	
			E3-21077	E3-21078	Upsize by open cut replacement.	12-in	18-in	190'	Existing grade.	

Capital Improvement Plan

Sanitary Sewer Improvement Project Descriptions

Date: October 13, 2010
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engr: Colin Dudley
 Reviewed by: Lani Good

Project No.	Location	Issue	USMH	DSMH	Improvement Project	Existing Diameter	Future Diameter	Length	Grade* (%)	CIP Priority
6	Davis Dr.	Flat pipe is under capacity.	C3-21025	C3-21037	Upsize by pipe bursting.	6-in	8-in	1,260'	Existing grade.	Low
		Existing 12-in pipe under capacity	C3-21054A	C4-21006	Open cut installation of relief sewer and new manhole.	-	10-in	513'	0.63	
7	Adeline Dr. - Cabrillo & Cortez	Under capacity	D4-21070	D4-21072	Upsize by pipe bursting.	8-in	10-in	385'	Existing grade.	Medium
		Under capacity.	D4-21072	D4-21064	Upsize by pipe bursting.	8-in	12-in	1,140'	Existing grade.	
			D4-21064	D4-21066	Upsize by open cut replacement.	15-in	21-in	440'	Existing grade.	
		Under capacity	D4-21076	D4-21077	Upsize by pipe bursting.	6-in	8-in	250'	Existing grade.	
8	Columbus Ave. to Bernal Ave.	Under capacity and shallow. Freeboard concern at MH D3-21030 and MH D3-21037.	D3-21030	D3-21080	Upsize by pipe bursting.	6-in	8-in	892'	Existing grade.	Medium
9	Hale Dr. to Bernal Ave.	Under capacity. Freeboard concern: 1 ft at MH D4-21047.	D3-21014	D4-21045	Install new pipe and 3 new manholes by open cut.	-	10-in	1,400'	1.85	Medium
10	Columbus Ave. Hillside/Easton	Flat pipe, under capacity. Freeboard concern: 2 ft at MH E4-21060.	E4-21061	E4-21064	Upsize by pipe bursting.	6-in	8-in	1,250'	Existing grade.	Low
11	Upper Carmelita Ave.	Maintenance problem.	E4-21003	D5-21060	Upsize by pipe bursting.	6-in	8-in	1,800'	Existing grade.	High
12	Lower Sanchez Ave. (Downstream of California Dr.)	Pipe under capacity after upstream projects are completed.	D5-21053	C5-21037	Upsize and re-grade by open cut replacement.	15-in	21-in	1,110'	0.404 (Min Slope = 0.24)	Medium
13	Sanchez Ave. (Combined Burlingame & Hillsborough lines)	Under capacity.	E5-21056	D5-22026	Upsize and re-grade by open cut replacement.	6-in, 8-in	15-in	1,875'	1.54 (Min Slope = 0.98)	Medium
			D5-22026	D5-21053	Upsize and re-grade by open cut replacement.	6-in, 8-in, 10-in	21-in	1,185'	0.35 (Min Slope = 0.23)	
14	Grove Ave.	Maintenance problem.	City	City	Upsize by open cut replacement.	6-in	8-in	3,510'	Existing grade.	High

Capital Improvement Plan

Sanitary Sewer Improvement Project Descriptions

Date: October 13, 2010
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engr: Colin Dudley
 Reviewed by: Lani Good

Project No.	Location	Issue	USMH	DSMH	Improvement Project	Existing Diameter	Future Diameter	Length	Grade* (%)	CIP Priority
15	Easement: California Dr./ Edgehill Dr.	Maintenance problem. Easement sewer runs under private buildings.	D5-21067	D5-21023	Re-route collection system by open cut installation. See Sanchez Avenue Sanitary Sewer Relocation Project plans (2000).	N/A	8-in to 12-in	3,190'	Varies	High
16	California Dr. & Palm Dr.	Flat, shallow pipe. Freeboard concern: 3.5 ft at MH D6-21067.	D6-21067	D5-21029	Upsize by pipe bursting.	6-in	8-in	840'	Existing grade.	Low
17	Carolan Ave.	Flat, shallow pipe. Under capacity. Causes overflows. Known problem.	D6-21038	D5-21030	Upsize by pipe bursting. Not enough fall to re-grade. (1.7 fps full flow velocity.)	6-in	8-in	800'	Existing grade.	Medium
18	Rollins Rd. & Humboldt Rd.	Under capacity. Causes overflows in shallow line in Humboldt.	D8-21012	D8-21013	Upsize by open cut replacement.	8-in	10-in	410'	Existing grade.	Medium
			D8-21013	D7-21051	Upsize by pipe bursting.	8-in	10-in	570'	Existing grade.	
			D7-21051	D7-21052	Upsize by pipe bursting.	8-in	12-in	350'	Existing grade.	
19	Upper Oak Grove Ave. & El Camino Real	Pipe under capacity	E5-21035	E5-21035A	Upsize by open cut replacement.	15-in	21-in	85'	Existing grade.	Medium
23	Majilla Ave. Easements	Maintenance problem.	City	City	Upsize by pipe bursting.	6-in	8-in	1,140'	Existing grade.	High
24	Downtown Burlingame	Maintenance problem.	City	City	Open cut replacement.	6-in, 10-in	8-in, 10-in	6,809'	Existing grade.	High

* Grade shown is the proposed grade in the hydraulic model. The "Min Slope" shown is the minimum installation grade for the proposed sewer diameter, and is either the minimum slope required to meet a peak flow flushing velocity, or to meet the peak capacity required.

Date: October 12, 2010
Client: City of Burlingame
Project: Collection System Master Plan
Project No.: 136414
Project Engr: Lani Good

		Project No.:		1		2		3		4		5		6		7		8		9		10		11	
		Priority:		Low		Medium		Medium		Low		Medium		Low		Medium		Medium		Medium		Low		High	
		Location:		Lower Trousdale Dr.		Upper Trousdale Dr.		Adeline Dr. Easement		La Mesa Dr.		Canyon Rd.		Davis Dr.		Adeline Dr. - Cabrillo & Cortez		Columbus Ave. to Bernal Ave.		Hale Dr. to Bernal Ave.		Columbus Ave. Hillside/Easton		Upper Carmelita Ave.	
		Ownership:		City		City		City & BHSMD		City		City & BHSMD		City		City		City		City		City		City	
Item	Unit	\$/Unit	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	
Open Cut Sanitary Sewer Replacement ¹																									
8-inch	LF	\$272		\$0		\$0		\$0		\$0	586	\$159,392		\$0		\$0		\$0		\$0		\$0		\$0	
10-inch	LF	\$280		\$0		\$0	1,532	\$428,960		\$0	2,208	\$618,240	513	\$143,640		\$0		\$0	1,400	\$392,000		\$0		\$0	
12-inch	LF	\$336		\$0		\$0	1,680	\$564,480		\$0	370	\$124,320		\$0		\$0		\$0		\$0		\$0		\$0	
15-inch	LF	\$420	1,600	\$672,000		\$0		\$0		\$0	656	\$275,520		\$0		\$0		\$0		\$0		\$0		\$0	
Open Cut Sanitary Sewer ¹																									
18-inch	Depth <10'	LF	\$414	\$0		\$0		\$0		\$0	190	\$78,660		\$0		\$0		\$0		\$0		\$0		\$0	
21-inch	Depth <10'	LF	\$420	\$0		\$0		\$0		\$0		\$0		\$0	440	\$184,800		\$0		\$0		\$0		\$0	
	10'< Depth <15'	LF	\$462	\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0	
Sewer Rehabilitation: Pipe Bursting ²																									
8-inch	LF	\$184		\$0		\$0		\$0	610	\$112,240		\$0	1,260	\$231,840	250	\$46,000	892	\$164,128		\$0	1,250	\$230,000	1,800	\$331,200	
10-inch	LF	\$220		\$0	1,280	\$281,600		\$0		\$0		\$0		\$0	385	\$84,700		\$0		\$0		\$0		\$0	
12-inch	LF	\$264		\$0		\$0		\$0		\$0		\$0		\$0	1,140	\$300,960		\$0		\$0		\$0		\$0	
24-inch	LF	\$504	1,100	\$554,400		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0	
Other																									
CCTV	LF	\$2	2,700	\$5,400	1,280	\$2,560	3,212	\$6,424	610	\$1,220	4,010	\$8,020	1,773	\$3,546	2,215	\$4,430	892	\$1,784	1,400	\$2,800	1,250	\$2,500	1,800	\$3,600	
Totals																									
Subtotal			\$1,231,800		\$284,160		\$999,864		\$113,460		\$1,264,152		\$379,026		\$620,890		\$165,912		\$394,800		\$232,500		\$334,800		
35% Contingency	%	35%	\$431,130		\$99,460		\$349,950		\$39,710		\$442,450		\$132,660		\$217,310		\$58,070		\$138,180		\$81,380		\$117,180		
Construction Cost			\$1,662,930		\$383,620		\$1,349,810		\$153,170		\$1,706,600		\$511,690		\$838,200		\$223,980		\$532,980		\$313,880		\$451,980		
Engineering, Admin, etc.	%	35%	\$582,030		\$134,270		\$472,430		\$53,610		\$597,310		\$179,090		\$293,370		\$78,390		\$186,540		\$109,860		\$158,190		
Total Project Cost			\$2,244,960		\$517,890		\$1,822,240		\$206,780		\$2,303,910		\$690,780		\$1,131,570		\$302,370		\$719,520		\$423,740		\$610,170		

Note: Cost estimates for Project Nos. 14, 23 and 24 provided by the City.

¹ Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; typical surface restoration; erosion, sediment and stormwater control; overhead; and profit.

² Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; erosion, sediment and stormwater control; overhead; and profit.

Date: October 12, 2010
Client: City of Burlingame
Project: Collection System Master Plan
Project No.: 136414
Project Engr: Lani Good

			Project No.:		12		13		15		16		17		18		19	
			Priority:		Medium		Medium		High		Low		Medium		Medium		Medium	
			Location:		Lower Sanchez Ave. (DS of California		Sanchez Ave.		Easement: California Dr. /Edgehill Dr.		California Dr. & Palm Dr.		Carolan Ave.		Rollins Rd. & Humboldt Rd.		Oak Grove Ave & El Camino Real	
			Ownership:		City & Hillsborough		Hillsborough		City		City		City		City		City	
Item	Unit	\$/Unit	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
Open Cut Sanitary Sewer Replacement ¹																		
8-inch	LF	\$272		\$0		\$0	1,570	\$427,040		\$0		\$0		\$0		\$0		\$0
10-inch	LF	\$280		\$0	650	\$182,000	870	\$243,600		\$0		\$0	410	\$114,800		\$0		\$0
12-inch	LF	\$336		\$0		\$0	750	\$252,000		\$0		\$0		\$0		\$0		\$0
15-inch	LF	\$420		\$0	2,230	\$936,600		\$0		\$0		\$0		\$0		\$0		\$0
Open Cut Sanitary Sewer ¹																		
18-inch	Depth <10'	LF	\$414	\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
21-inch	Depth <10'	LF	\$420	\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
	10'< Depth <15'	LF	\$462	1,110	\$512,820		\$0		\$0		\$0		\$0		\$0	85	\$39,270	
Sewer Rehabilitation: Pipe Bursting ²																		
8-inch	LF	\$184		\$0		\$0		\$0	840	\$154,560	800	\$147,200		\$0		\$0		\$0
10-inch	LF	\$220		\$0		\$0		\$0		\$0		\$0	570	\$125,400		\$0		\$0
12-inch	LF	\$264		\$0		\$0		\$0		\$0		\$0	350	\$92,400		\$0		\$0
24-inch	LF	\$504		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Other																		
CCTV	LF	\$2	1,110	\$2,220	2,880	\$5,760	3,190	\$6,380	840	\$1,680	800	\$1,600	1,330	\$2,660	85	\$170		
Totals																		
Subtotal					\$515,040		\$1,124,360		\$929,020		\$156,240		\$148,800		\$335,260		\$39,440	
35% Contingency	%	35%			\$180,260		\$393,530		\$325,160		\$54,680		\$52,080		\$117,340		\$13,800	
Construction Cost					\$695,300		\$1,517,890		\$1,254,180		\$210,920		\$200,880		\$452,600		\$53,240	
Engineering, Admin, etc.	%	35%			\$243,360		\$531,260		\$438,960		\$73,820		\$70,310		\$158,410		\$18,630	
Total Project Cost					\$938,660		\$2,049,150		\$1,693,140		\$284,740		\$271,190		\$611,010		\$71,870	

¹ Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; typical surface restoration; erosion, sediment and stormwater control; overhead; and profit.

² Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; erosion, sediment and stormwater control; overhead; and profit.

Project 20: 1740 Rollins PS Upgrade Costs

Date: February 12, 2010
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engr: Alex Park

Assumptions:

Approximate Current Firm Capacity: 0.96 mgd (based on City draw-down tests)
 Design Scenario PWWF: 1.96 mgd
 2 duty pumps, 1 stand-by, Estimated TDH = 41 ft

Item	Notes	Cost
Cost per Pump	Manufacturer Provided Cost	\$14,000
Pump Installation	Estimated as 1/2 pump cost	\$7,000
Gate & Check Valves	BC Cost Estimating Department	\$8,000
Overload Relay Heater		\$500
Subtotal per pump		\$29,500
Pumps Total (3 pumps)		\$88,500
Wiring	Replacing 10 gauge with 8 gauge	\$10,000
Subtotal		\$98,500
Contingency, 35%		\$34,000
Construction Cost		\$132,500
Engineering, Admin, Change Orders, 35%		\$46,000
Capital Cost		\$178,500

Project 21: Airport Rd. PS Upgrade Costs

Date: March 4, 2010
 Project: City of Burlingame Collection System Master Plan
 Project No.: 136414
 Project Engr: Alex Park

Assumptions:

Approximate Current Firm Capacity: 0.27 mgd (based on City draw-down tests)
 Design PWWF: 0.38 mgd
 1 duty pumps, 1 stand-by, Estimated TDH = 20 ft

Item	Notes	Cost
Cost per Pump	Manufacturer Provided Cost	\$5,000
Pump Installation	Estimated as 1/2 pump cost	\$2,500
Gate & Check Valves	BC Cost Estimating Department	\$8,000
Misc. Appurtenances		\$500
Subtotal per pump		\$16,000
Pumps Total (2 pumps)		\$32,000
Wiring		\$5,000
Subtotal		\$37,000
Contingency, 35%		\$13,000
Construction Cost		\$50,000
Engineering, Admin, Change Orders, 35%		\$18,000
Capital Cost		\$68,000

Project 22: Rehabilitation Project Costs

Date: March 12, 2010
 Client: City of Burlingame
 Project: Collection System Master Plan

Project No.: 136414
 Project Engr: Lani Good

		City of Burlingame					BHSMD				Hillsborough				
		Project No.:		Rehab Minimum		Rehab Maximum	Rehab Minimum		Rehab Maximum		Rehab Minimum		Rehab Maximum		
		Priority:		Medium		Medium	Medium		Medium		Medium		Medium		
		Location:		Basin 2, 3, 6, 7, 8, 9, 15, 17, Floribunda				Basin 3, 7, 8				Basin 7, 8, 9, 17, Floribunda			
		Ownership:		Shared		Shared		Shared		Shared		Shared		Shared	
Item	Unit	\$/Unit	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	
Sewer Rehabilitation: Pipe Bursting ²															
8-inch	LF	\$184	50,100	\$9,218,400	100,100	\$18,418,400	10,400	\$1,913,600	20,800	\$3,827,200	46,100	\$8,482,400	92,200	\$16,964,800	
10-inch	LF	\$220	200	\$44,000	400	\$88,000		\$0		\$0	100	\$22,000	200	\$44,000	
12-inch	LF	\$264	150	\$39,600	300	\$79,200		\$0		\$0	250	\$66,000	400	\$105,600	
Other															
CCTV	LF	\$2	50,450	\$100,900	100,800	\$201,600	10,400	\$20,800	20,800	\$41,600	46,450	\$92,900	92,800	\$185,600	
Totals															
Subtotal				\$9,400,000		\$18,800,000		\$1,900,000		\$3,900,000		\$8,700,000		\$17,300,000	
35% Contingency		%	35%	\$3,300,000		\$6,600,000		\$700,000		\$1,400,000		\$3,000,000		\$6,100,000	
Construction Cost				\$12,700,000		\$25,400,000		\$2,600,000		\$5,300,000		\$11,700,000		\$23,400,000	
Engineering, Admin, etc.		%	35%	\$4,400,000		\$8,900,000		\$900,000		\$1,900,000		\$4,100,000		\$8,200,000	
Total Project Cost				\$17,100,000		\$34,300,000		\$3,500,000		\$7,200,000		\$15,800,000		\$31,600,000	

¹ Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; typical surface restoration; erosion, sediment and stormwater control; overhead; and profit.

² Includes mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and standard dewatering; standard manholes at typical intervals; lower lateral and cleanout at typical intervals; erosion, sediment and stormwater control; overhead; and profit.

