Sewer Master Plan Update

City of Carlsbad

June 2019

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Acknowledgements

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Abbreviations and Acronyms

ABS	acrylonitrile-butadiene-styrene
ADS	American Digital Systems
ADWF	average dry weather flows
BIS	Buena Interceptor
BSD	Buena Sanitation District
Carlsbad	City of Carlsbad
CCFRPM	centrifugally cast fiberglass reinforced polymer mortar
CI	cast iron
CIP	capital improvement program
CIPP	Cured in place pipe
City	City of Carlsbad
CSSA	Carlsbad sewer service area
CWRF	Carlsbad Water Reclamation Facility
DIP	ductile iron pipe
EDU	equivalent dwelling unit
Encinitas	City of Encinitas
ESD	Encinitas Sanitary District
ESVCP	extra strength vitrified clay pipe
EWA	Encina Wastewater Authority
EWPCF	Encina Water Pollution Control Facility
FOG	Fats, Oils, and Grease
FPVC	flexible polyvinyl chloride
GIS	geographic information system
gpd	gallons per day
HDPE	high-density polyethylene
HPF	hourly peaking factors
HPLS	Home Plant Lift Station
LF	linear foot/ linear feet
LFMZ	Local Facility Management Zone
LS	lift station
LWD	Leucadia Wastewater District
mgd	million gallons per day

NAHI	North Agua Hedionda Interceptor
NBI	North Batiquitos Interceptor
PVC	polyvinyl chloride
PWWF	peak wet weather flow
RBA	Revised Basic Agreement
RCP	reinforced concrete pipe
RDII	rainfall-induced inflow and infiltration
RWQCB	Regional Water Quality Control Board
SAHI	South Aqua Hedionda Interceptor
SANDAG	San Diego Association of Governments
SCADA	supervisory control and data acquisition
SSMP	sewer system management plan
SSO	sanitary sewer overflow
SWRCB	State Water Resources Control Board
V/C	Vista/Carlsbad Interceptor
VCP	vitrified clay pipe
VIS	Vallecitos Interceptor
Vista	City of Vista
VWD	Vallecitos Water District
WDR	waste discharge requirement

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1 Introduction

The City of Carlsbad (Carlsbad) provides wastewater collection service to 29 square miles, approximately 74 percent of the City limits, through 6 interceptor pipelines, approximately 265 miles of collection and conveyance pipelines, and 11 lift stations (LS). All wastewater flows are conveyed to the Encina Water Pollution Control Facility (EWPCF), located in Carlsbad, for treatment and then disposal through the ocean outfall or delivery to the adjacent Carlsbad Water Recycling Facility for reuse. Several interceptors are jointly owned with Carlsbad, and convey outside agency flows to the EWPCF in addition to flows generated within the Carlsbad service area.

Carlsbad last updated its Sewer Master Plan in 2012 based on data through 2010. In the past 6 years, the economic recession, combined with a multi-year drought, resulted in significantly reduced water and recycled water demands and sewer flows, and consequentially reduced revenues to Carlsbad. As the economy rebounds and extreme drought conditions recede, there is also a need to adjust the current plans to correspond with the new General Plan, to reflect a “new normal” in water use behaviors, and assess the impact on sewer flows.

Preparation of the Potable Water, Recycled Water and Sewer Master Plan Updates was authorized by the Carlsbad City Council on January 24, 2017 in the form of a contract for engineering services granted to HDR Engineering Inc., entitled *Agreement for Engineering Services to update the Carlsbad Potable Water, Recycled Water and Sewer Master Plans*.

This Sewer Master Plan Update provides a system evaluation and capacity assessment of the wastewater collection system and recommends a capital improvement/replacement program to provide for continued reliable wastewater service through buildout conditions, which are projected to occur by 2040. By updating this master plan, the resulting capital improvement program (CIP) will help guide Carlsbad in spending precious funds in the most cost-effective manner.

Key references used in the development of the updated Sewer Master Plan include the following documents:

- City of Carlsbad, *2012 Sewer Master Plan*
- City of Carlsbad, *2015 General Plan Update*
- City of Carlsbad, *2015 Climate Action Plan*

1.1 Background

The Carlsbad Sanitary District, formed in 1929, provided the first sewer service to areas now within the City of Carlsbad. A sewage treatment plant and a system of sewer pipelines, serving the northwest corner of the present Carlsbad Village area, were initially constructed with the formation of the Sanitary District. Thus, portions of Carlsbad's existing conveyance system date back as far as 1929. The original treatment plant location was on the south shore of the Buena Vista Lagoon, adjacent to Carlsbad Boulevard. This is the present location of the Home Plant Lift Station (HPLS).

The Carlsbad Sanitary District provided sewer service until the City of Carlsbad incorporated in 1952. When Carlsbad incorporated, there were approximately 600 parcels being served by the Carlsbad Sanitary District. Carlsbad expanded the sewer system and increased the number of connections, and by 1960, it was apparent that a larger treatment facility would be required.

To meet the growing regional needs for sewer service, Carlsbad and the Vista Sanitation District jointly constructed the EWPCF, located just south of Palomar Airport Road and west of I-5. When the EWPCF was put into operation in 1965, wastewater flows to the old Carlsbad Sanitary District plant were diverted to the new treatment facility. The EWPCF is now jointly-owned and operated by six northern San Diego County agencies through a Joint Powers Agreement, and operated by the Encina Wastewater Authority (EWA). The member agencies of EWA are: Carlsbad, City of Vista (Vista), City of Encinitas (Encinitas), Vallecitos Water District (VWD), Buena Sanitation District (BSD), and the Leucadia Wastewater District (LWD).

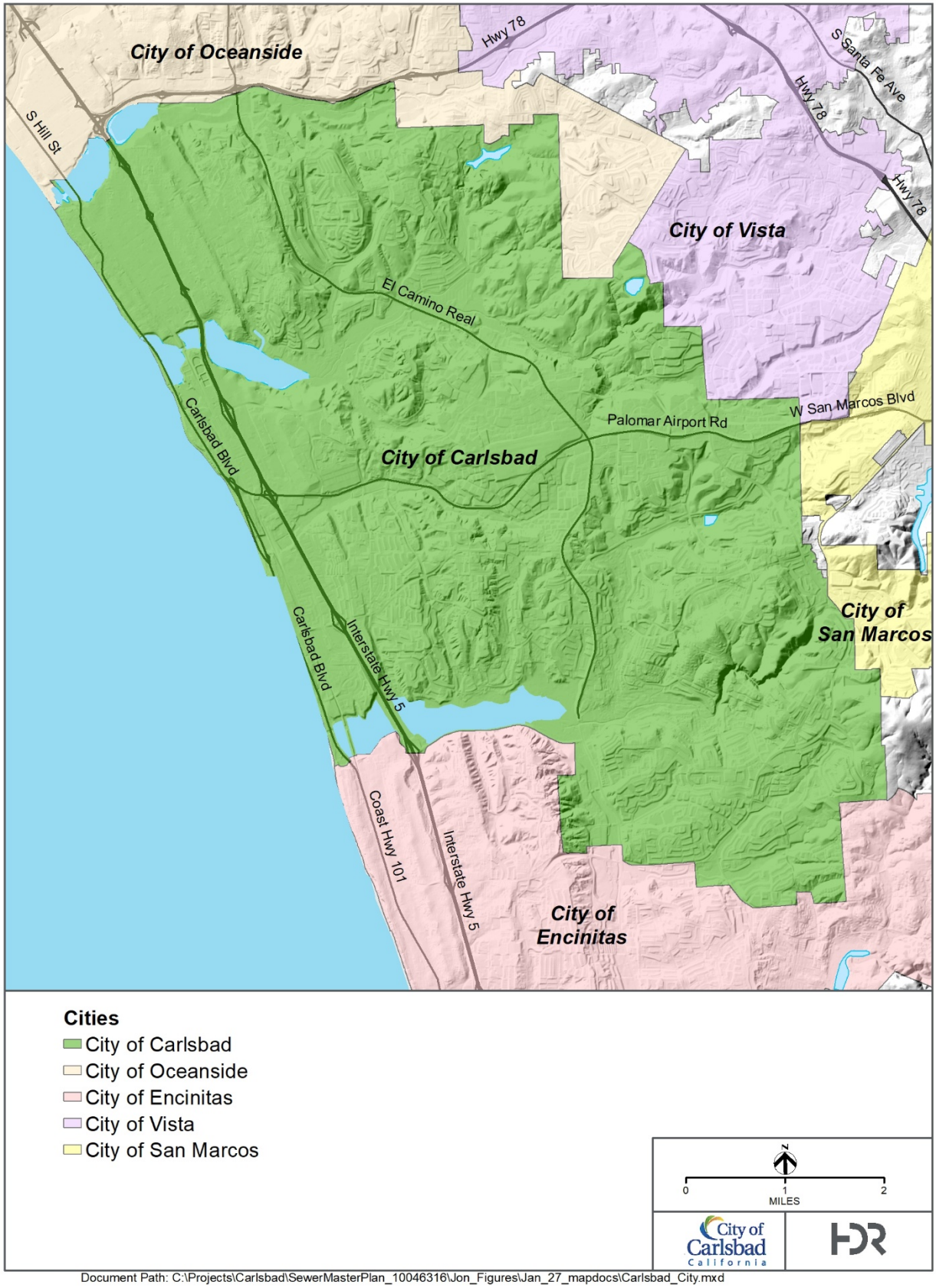
1.2 Service Area Description

The City of Carlsbad occupies approximately 39 square miles of rolling hills, beaches and bluffs along the northern coast of San Diego County. Carlsbad is located about 30 miles north of San Diego and about 90 miles south of Los Angeles. The city boundaries are shown on Figure 1-1. In addition to the Pacific Ocean coastline along its western boundary, the communities surrounding Carlsbad include the city of Oceanside to the north, the city of Encinitas to the south, and the cities of Vista and San Marcos and unincorporated areas of San Diego County to the east.

1.2.1 Setting

Along Carlsbad's northern edge, urban development abuts Highway 78, with the highway and Buena Vista Lagoon acting as a boundary between Carlsbad and Oceanside. Similarly, Batiquitos Lagoon along the city's southern edge defines the boundary between Carlsbad and Encinitas. To the east, city boundaries are less distinctive, as a mix of hillsides and urban development are located adjacent to the cities of Vista and San Marcos and unincorporated lands. The topography ranges from sea level along the western coastline to nearly 700 feet above mean sea level along the eastern boundary.

Figure 1-1. Location Map



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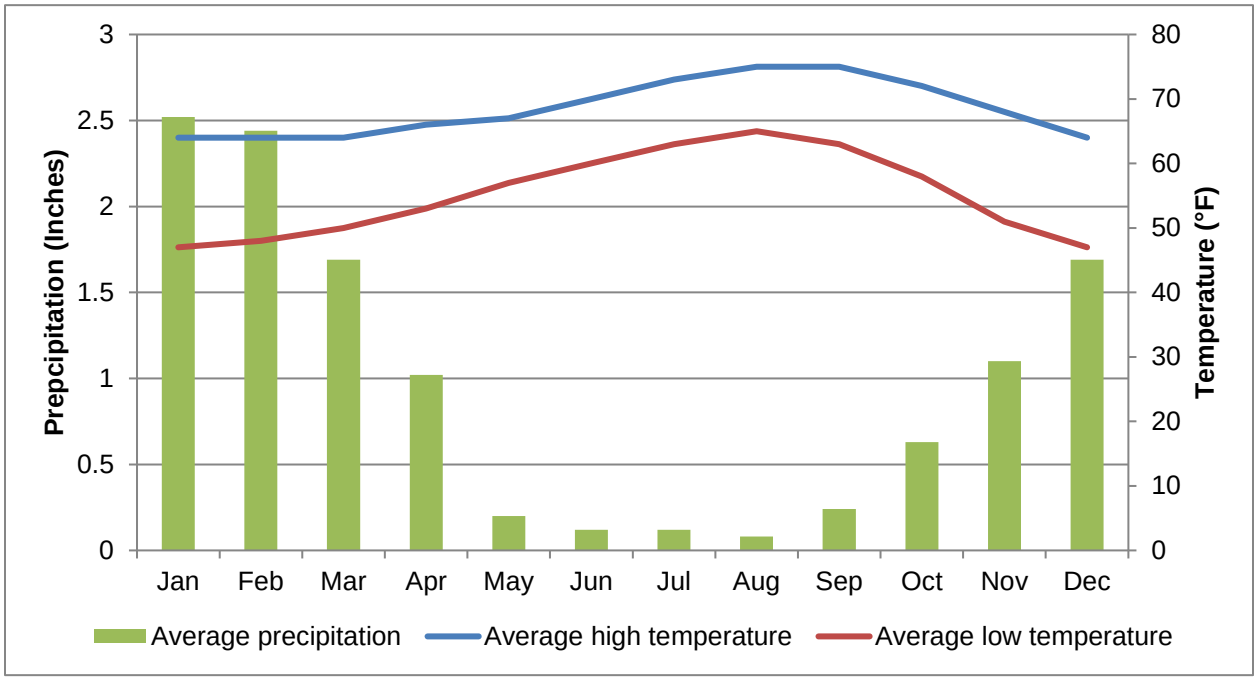
1.2.2 Climate

Carlsbad's climate is categorized as a semi-arid Mediterranean climate, with mild, sunny weather throughout the year. This mild climate is derived equally from the warm ocean water being pulled north from Mexico and from its subtropical, semi-desert locale. Daily temperatures range from a low of nearly 30°F in the winter months to a high of nearly 100°F in the summer. Based on the 30-year (1981 to 2010) normal, shown on Figure 1-2, monthly averages are approximately 55°F for the low and 68°F for the high.

Figure 1-2. Carlsbad 30-Year Climate Data (1981-2010)



Source: http://www.usclimatedata.com/climate-on-your-site.php?id=usca1608

The average annual precipitation ranges from approximately 11 to 13 inches, typically between the months of October and April. The months of September through February can bring warm wind from the desert called a "Santa Ana." Occurring about 10 days out of the year, these winds typically bring hot and dry conditions, which can spread and worsen wildfires.

As noted in Carlsbad's 2015 Urban Water Management Plan, data from the National Oceanic and Atmospheric Administration's climate station at the McClellan Palomar Airport indicates that temperatures were above the 30-year normal in 2015, while precipitation was lower. There was also a shift in the precipitation pattern, with higher than the 30-year normal rainfall in the summer months and lower in the winter months.

1.3 Sewer Service Area

The Carlsbad sewer service area (CSSA) covers approximately 29 square miles, or 74 percent of the 39 square miles comprising the City limits. The CSSA boundary and adjacent district boundaries are shown on Figure 1-3. Sewer service to the southeast quadrant of the City is provided by LWD, and VWD provides service to the eastern edge of the City limits.

As shown on Figure 1-3, LWD has jurisdictional ownership of three small areas, covering 97 acres, within Carlsbad's service area. These areas include a narrow strip of land along Carlsbad's coastline in the southwest part of the city, a rectangular parcel located in the vicinity of the future Poinsettia Lane extension, and a small triangular parcel adjacent to El Camino Real and Dove Lane. There is currently flow generated on all three small areas: The State Park Campground along the coastline, condos in the small triangle west of El Camino Real, and recent development in the isolated rectangle in addition to forthcoming Poinsettia 61. All of them are being billed by City of Carlsbad for their sewer. LWD has acknowledged that it is not practical for them to provide sewer service to these areas and they have agreed to cooperate with the City in the de-annexation of these areas to Carlsbad through the Local Area Formation Commission process.

1.3.1 Drainage Basins

The geography of the CSSA is characterized by hills that range from gently rolling to highly dissected and mesa-like. Elevations range from sea level along the coast to over 700 feet along the eastern boundary. The CSSA is comprised of four major drainage basins which drain from the eastern boundary west to the coast. The coastal geography is characterized by three lagoons. Descriptions of the drainage basins, below, were obtained from the Carlsbad Drainage Master Plan (2008).

Buena Vista Creek Watershed. This drainage area originates in the County of San Diego, northeast of the City of Vista. The creek drains a 9-mile-long, 2-mile-wide area measuring approximately 19 square miles (12,160 acres).

Agua Hedionda Creek Watershed. The Agua Hedionda Creek originates south of the San Marcos Mountains and, together with its major tributary, the Buena Creek, drains an area measuring approximately 29 square miles (18,560 acres). After merging with the Buena Creek 3 miles downstream of the origin, the Agua Hedionda Creek runs for a few miles before mixing with Calavera Creek.

Encinas Creek Watershed. The Encinas Creek originates 3,000 feet east of El Camino Real and runs west to the Pacific Ocean. This drainage basin covers an area approximately 4 square miles (2,560 acres). The drainage course generally parallels Palomar Airport Road along an alignment just south of this roadway.

San Marcos Creek Watershed. The San Marcos Creek originates in the coastal mountain range near San Marcos. The San Marcos Creek watershed, together with the Encinitas Creek watershed, forms the Batiquitos Lagoon watershed measuring about 56 square miles (36,000 acres).

These drainage basins align with the gravity sewer alignments shown on Figure 1-4. Sewage collected within the Buena Vista Creek and Agua Hedionda Creek Watersheds are conveyed via the Vista Carlsbad Interceptor (V/C), North Agua Hedionda Interceptor (NAHI), and South Agua Hedionda Interceptor (SAHI) for treatment at the regional EWPCF.

Figure 1-3. Carlsbad Sewer Service Area

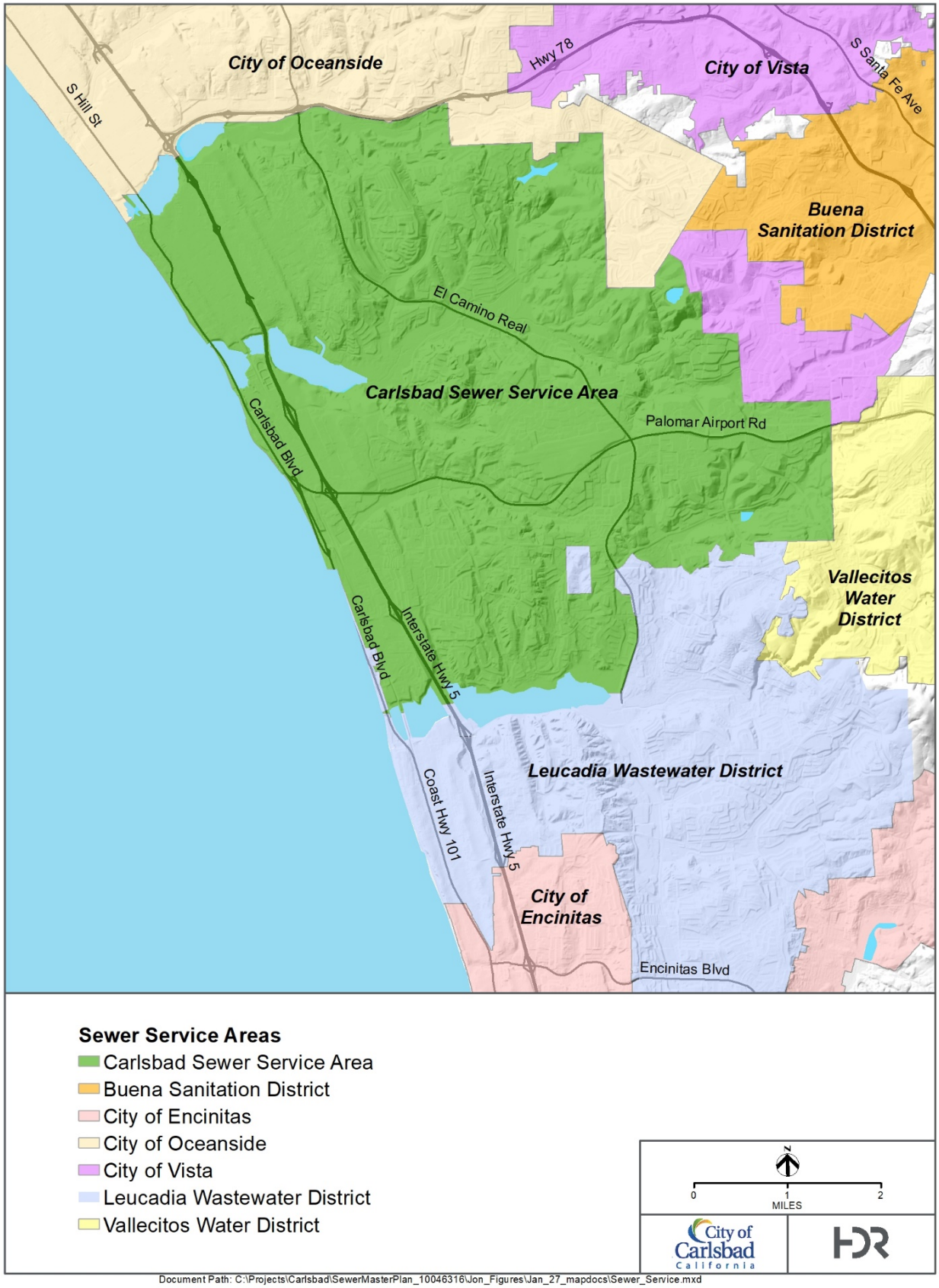
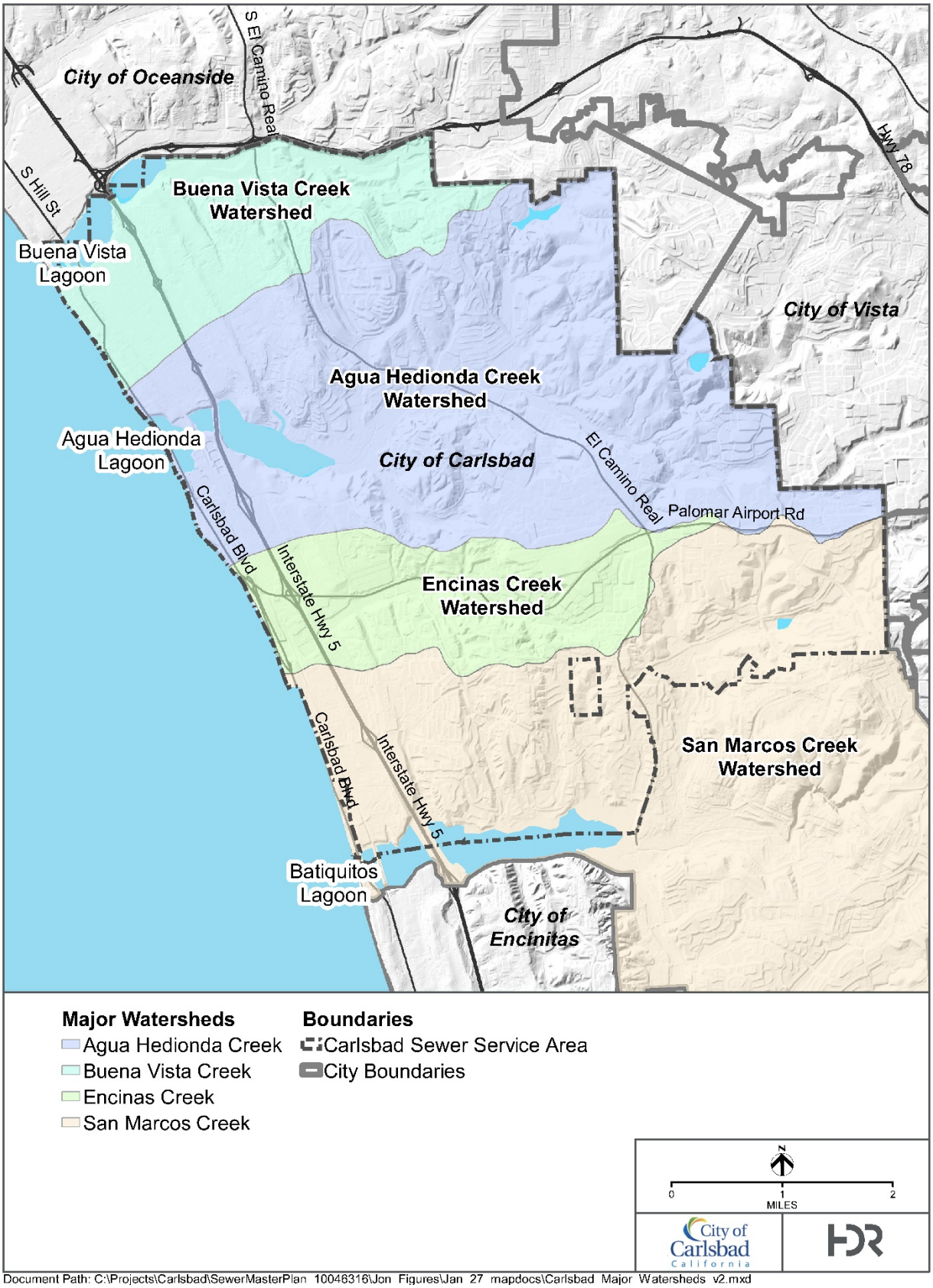


Figure 1-4. Carlsbad Major Watershed Basins



Two interceptors collect sewage from the Encinas Creek watershed: the Buena Interceptor (BIS) and Vallecitos Interceptor (VIS). These interceptors convey the sewage to the ECWPF, which is located at the west end of the Encina Creek Basin. The North Batiquitos Interceptor (NBI) collects sewage from the San Marcos Creek and Encinas Creek watersheds.

The North and South Agua Hedionda Interceptors collect only Carlsbad flows and discharge to the V/C at separate locations. The other four interceptors convey Carlsbad flows, plus outside agency flows, to EWPCF. Each of these facilities is further described in Section 2.

1.3.2 Land Use

Land uses within the service area are primarily residential with a mix of agricultural, light industrial and commercial. In addition, there is a county airport, tourist attractions such as LEGOLAND, and a mix of resorts. Current and planned land uses are described in more detail below.

Existing Land Use

The existing land uses within the City and CSSA are listed in Table 1-1**.** The existing sewer service area is predominantly residential and park/open space area, as shown on Figure 1-5. Approximately 1,095 acres, or 6 percent, of the sewer service area is currently undeveloped vacant properties. These vacant properties are anticipated to be developed in the future.

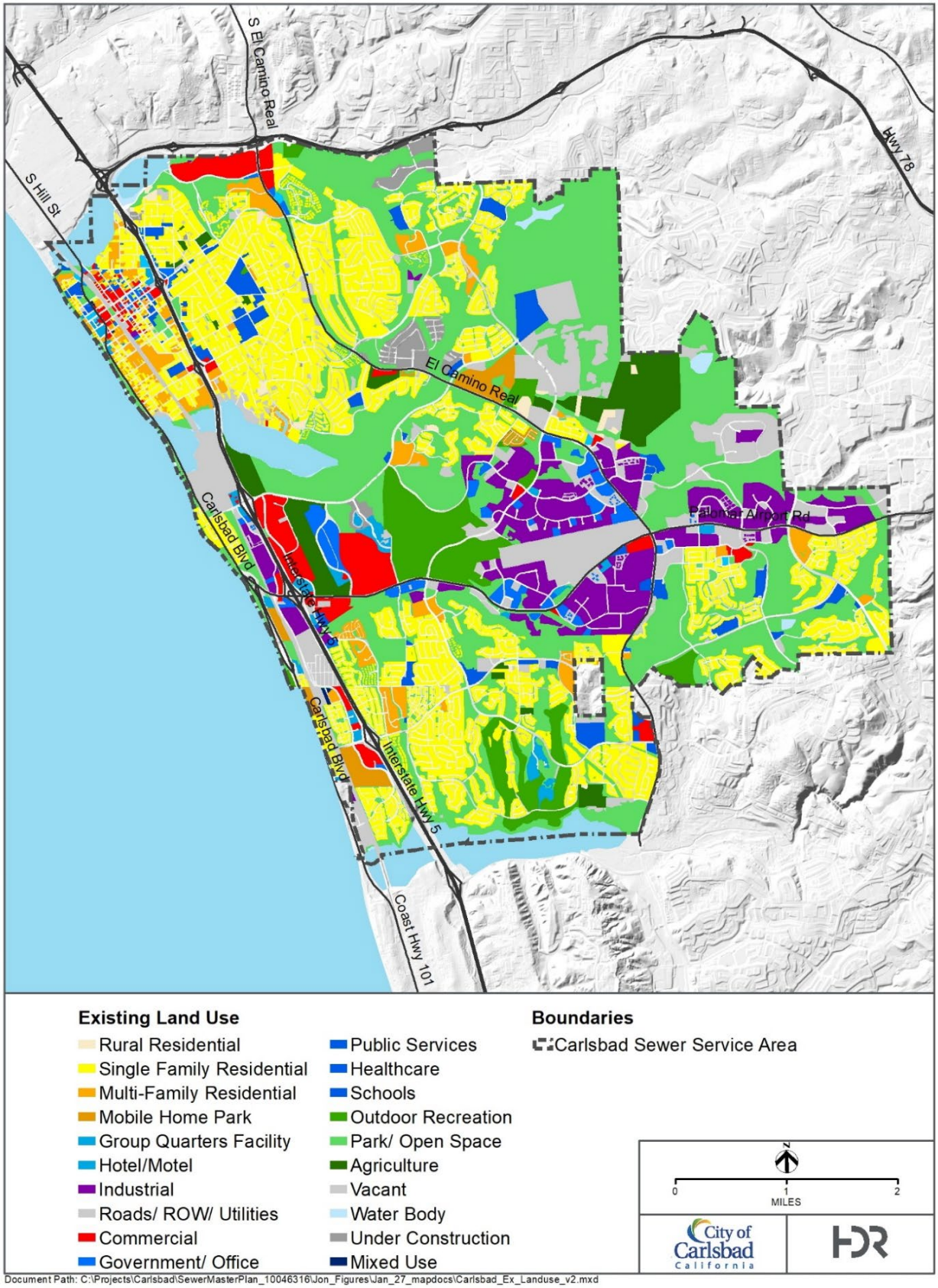
Table 1-1. Carlsbad Major Watershed Basins

Land Use	City Acres	% of Total Area	CSSA Acres	% of Total Area
Single Family Residential	6,071	24	3,839	21
Multi-Family Residential	983	4	665	4
Commercial/Office	1,156	5	988	5
Industrial	1,113	4	1,110	6
Roads/Right-of-Way	4,213	17	3,193	17
Institutional	578	2	437	2
Park/Open Space	8,293	33	6,105	33
Agriculture	556	2	536	3
Water	839	3	583	3
Vacant	1,220	5	1,095	6
Total	**25,024**	**100**	**18,551**	**100**

Source: SANDAG 2015 Existing Land Use shapefiles (2/2/2016)

Notes:
CSSA=Carlsbad sewer service area; SANDAG=San Diego Association of Governments

Figure 1-5. Existing Land Use Map



Source: SANDAG 2015 Existing Land Use shapefiles (2/2/2016) Buildout Land Use

In accordance with the City's 2015 General Plan, the buildout land uses within the City and CSSA are listed in Table 1-2. The future sewer service area remains predominantly residential and park /open space area, as shown on Figure 1-6, with agricultural areas diminishing and vacant areas assigned an active land use designation.

Table 1-2. Buildout Land Use

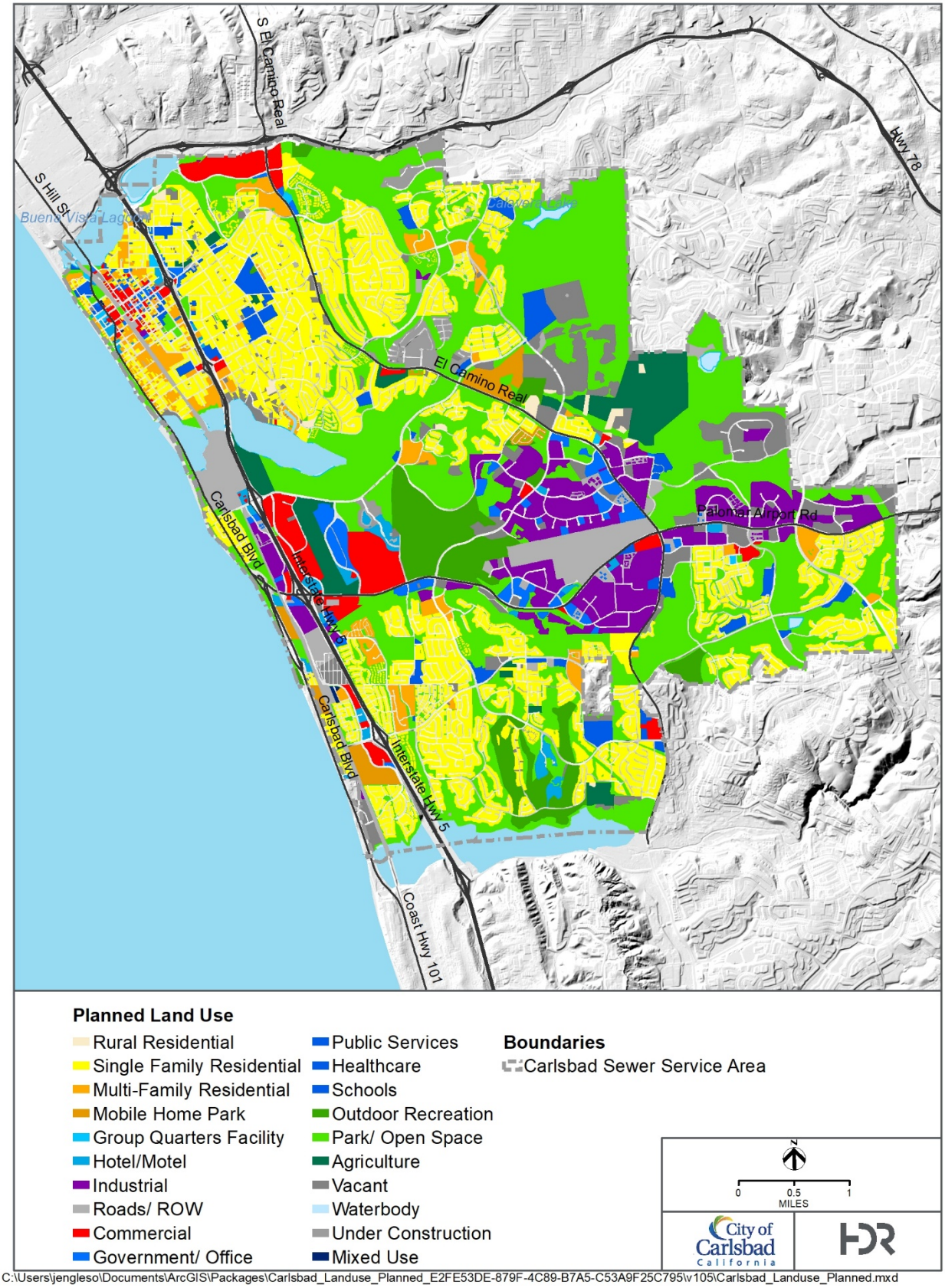
Land Use	City Acres	% of Total Area	CSSA Acres[1]	% of Total Area
Single Family Residential	6,940	28	4,660	25
Multi-Family Residential	1,103	4	775	4
Commercial/Office	1,398	6	1,205	6
Industrial	1,508	6	1,508	8
Roads/Right-of-Way	4,138	17	3,135	17
Institutional	663	3	499	3
Park/Open Space	8,335	33	6,182	33
Agriculture	101	0	101	1
Water	838	3	582	3
Total	**25,024**	**100**	**18,648**	**100**

Source: SANDAG Series 13 Planned Land Use shapefiles (10/2/2014)
Notes:
[1] Total acreage within the CSSA increases at buildout, assuming future annexation of LWD parcels.
CSSA=Carlsbad sewer service area

To manage growth, the City was divided into 25 separate planning areas, referred to as Local Facility Management Zones (LFMZ), which are shown on Figure 1-7. The City has maintained a Growth Management Plan and Growth Database since 1986 to monitor development within the City and to ensure that adequate facilities are constructed in an orderly manner to support future growth. The Growth Database includes information on existing and vacant parcels, including the existing and future land uses, current percent built out, current population, future growth potential and anticipated timing of such growth. It should be noted that not all 25 LFMZs shown on Figure 1-7 are located within the CSSA. The majority of the City's southeastern quadrant is served by either VWD or LWD.

In addition to the 25 LFMZs, the City is also divided into four quadrants for planning purposes as shown on Figure 1-8. The City prepares an annual Growth Management Plan Monitoring Report which includes information on current and proposed development plans, including the number of projected residential dwelling units and the estimated building square footage for non-residential land uses, as well as an estimated timing for when each unit will be constructed. The May 2017 Growth Management Plan Monitoring Report was used for this Master Plan update. City staff provided an update on growth projections by quadrant, as summarized on Figure 1-8.

Figure 1-6. Buildout Land Use Map



Source: SANDAG Series 13 Planned Land Use shapefiles (10/2/2014)

Figure 1-7. Local Facility Management Zones

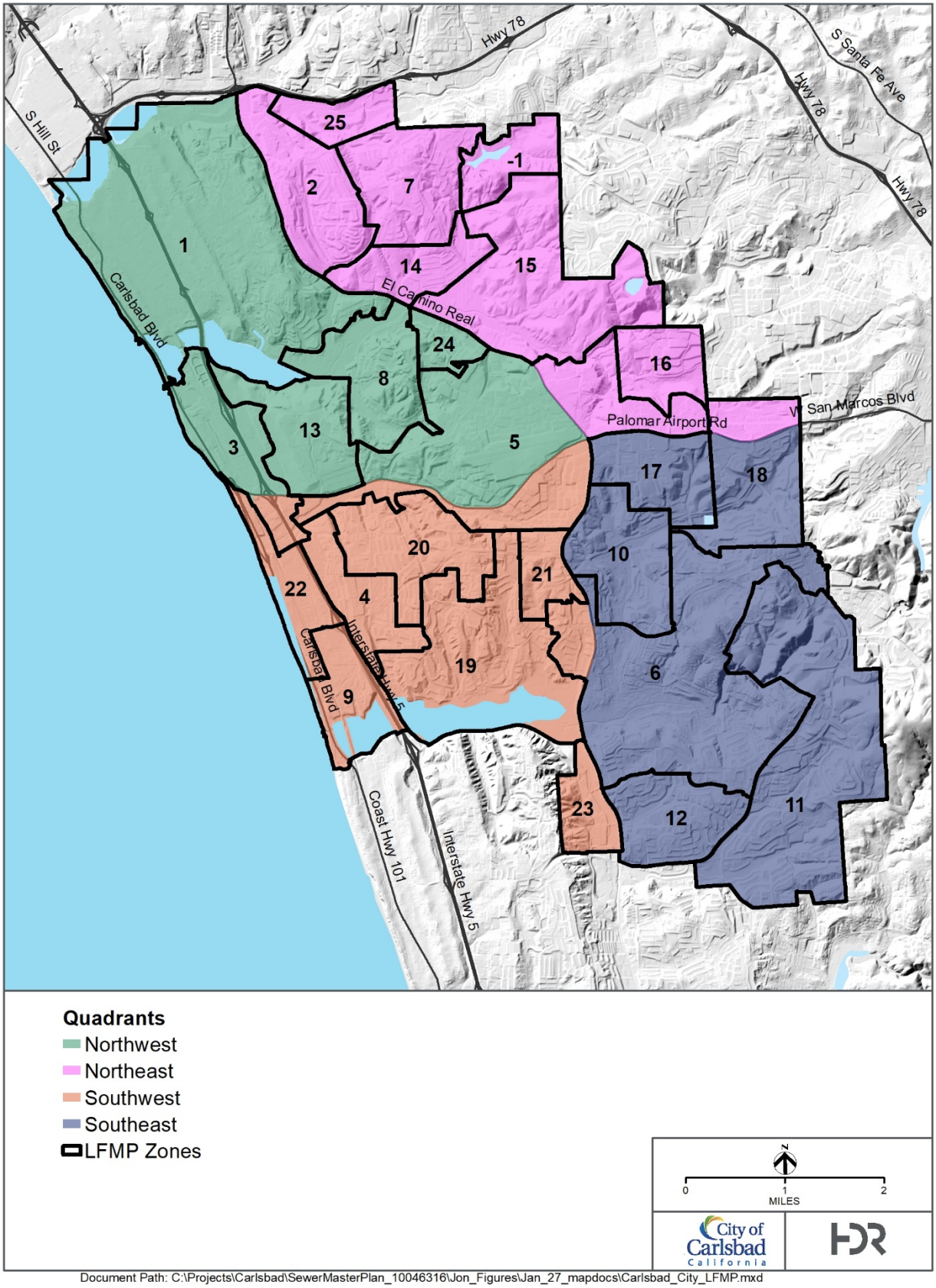


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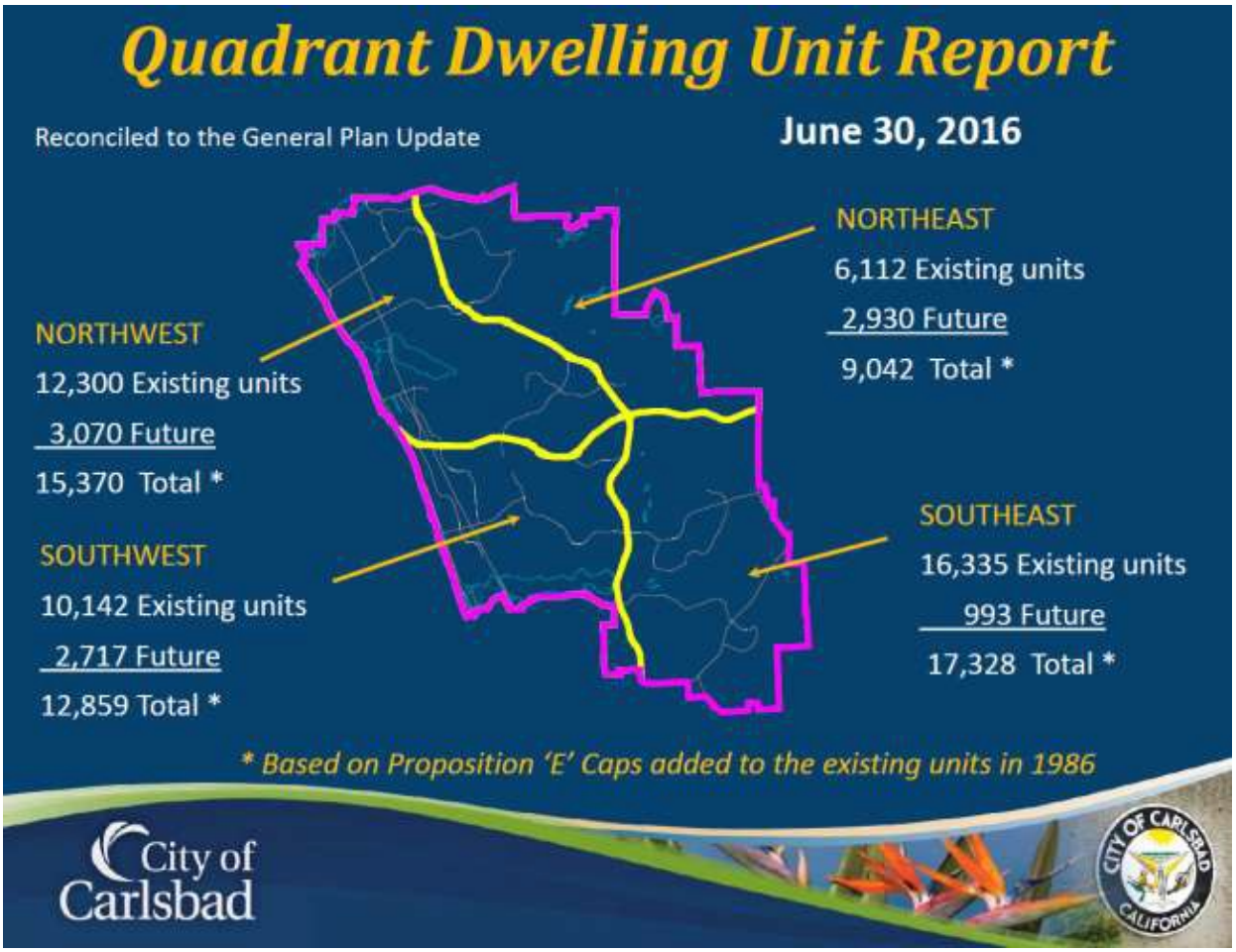
Figure 1-8. Growth Management Plan Dwelling Unit Report Update



Source: Carlsbad 2015 General Plan Update

As shown in Table 1-3, the City is anticipating total buildout projections of 51,821 residential units, which is less than the maximum number of dwelling units that could be constructed under the Growth Management Plan (54,599 units).
Table 1-3 shows potential buildout in the City resulting from application of land uses on vacant and underutilized sites, according to analysis undertaken for the General Plan update. A majority of the new development will continue to occur in the northern portion of the City. These developments are in various stages of planning, design, and construction. Additional growth within the City includes "in-fill" or redevelopment projects in the older portions of the City.

Table 1-3. Growth Management Plan 2035 Dwelling Unit Projections

Quadrant	Dwelling Units	2035 Population Projection
NW	15,121	37,904
NE	8,945	22,423
SW	11,088	27,795
SE	16,667	41,780
Citywide Total	**51,821**	**129,901**

Source: City of Carlsbad, Fiscal Year 2015-16 Growth Management Plan Monitoring Report, May 2017

The recent rebound of the economy has resulted in increased development activity throughout the City, including build-out of several master-planned communities and industrial parks, and the planning of new urban re-development projects. The master-planned communities that were underway or entitled during the last master plans are now substantially built-out including:

- Calaveras Hills
- Bressi Ranch
- Robertson Ranch
- Quarry Creek

Development activity has also increased for industrial land uses, which include Carlsbad Raceway Business Park along Faraday Road and Palomar Forum Business Park along Palomar Airport Road, both in the eastern portion of the City.

The Cantarini and Mandana properties in the northeast are planned residential projects which require a major extension of College Avenue and appear to continue to be delayed due to funding constraints. This timing issue should be considered in planning facilities in the master plans. The planned Poinsettia 61 residential project is currently under construction and will complete the extension of Poinsettia Avenue.

The City has seen increased activity in urban redevelopment projects, in particular, within the Village of Carlsbad. An approved Specific Plan for the core village area allows for the addition of 800 new residential units and there are discussions regarding residential apartment development at the Carlsbad Mall and El Camino Real.

1.3.3 Population Projections

The 2010 Federal Census determined that the average number of persons per dwelling unit in Carlsbad is 2.36 persons (total population divided by total number of dwelling units). As of June 30, 2016, the City's population is estimated to be 109,004, which is calculated by multiplying 2.36 persons per dwelling unit by the number of dwelling units, second dwelling units, and commercial living units (which were counted as dwelling units in the 2010 Federal Census); in total there are 46,182 dwellings and commercial living units, as shown in Table 1-4.

Table 1-4. 2016 Population Estimate

Quadrant	Dwelling Units	Second Dwelling Units	Commercial Living Units	Total Units	Population
NW	12,300	156	226	12,682	29,904
NE	6,112	42	—	6,154	14,511
SW	10,142	25	685	10,852	25,614
SE	16,335	159	—	16,494	38,975
Total	**44,889**	**382**	**911**	**46,182**	**109,004**

Source: Carlsbad 2016-17 Comprehensive Annual Financial Report, June 2017

It is important to note that although the construction of residential and commercial development is estimated to be built out by 2035, population is anticipated to continue to increase through 2050, as forecasted by San Diego Association of Governments (SANDAG). SANDAG is responsible for the development of demographic projections and various integrated land use, housing, employment, transportation programs, measures, and strategies for the San Diego area.

Persons per dwelling unit may also increase. The population projections provided in Table 1-5 estimates a 2035 population of 129,901, with 51,821 dwelling units, which results in an average of 2.5 persons per household.

The City of Carlsbad has a strong and growing economy. The top five clusters of business are estimated to employ over 40,000 people, as shown in Table 1-5.

Table 1-5. Business Employment Estimates

Business Category	Estimated Number of Employees
Hospitality and tourism	14,776
Information and communications technology	10,049
Life sciences	7,393
Clean technology	4,988
Action sports manufacturing	2,658

Source: Carlsbad 2016-17 Comprehensive Annual Financial Report, June 2017

The City's Fiscal Year 2016-17 Comprehensive Annual Finance Report estimates a total of 82,100 employees within the City. Annual visitors range from 3 to 4 million, with overnight guests ranging between approximately 75,000 and 199,000 people per month.

Within the CSSA, which covers approximately two thirds of the City's acreage, population projections can be assessed by using SANDAG Series 13 projected growth rates, which take into account the future land use plans developed by municipalities within San Diego County. The series incorporates SANDAG defined population; housing and employment growth rates and applies them at a transportation analysis zone level to account for spatial variability. SANDAG maintains two sets of transportation analysis zone data for

the Regional Transportation Plan (2015-2040) along with socioeconomic data for the region. Within each transportation analysis zone, SANDAG has derived spatial data relating to population, housing, and employment under current conditions, and developed projections for the years 2020 and 2040. This detailed and comprehensive dataset was used for this Master Plan project. A summary of the SANDAG data for the CSSA is provided in Table 1-6.

Table 1-6. San Diego Association of Governments' Projections for the Carlsbad Sewer Service Area[1]

CSSA Area	Population 2012	Population 2020	Population 2035	Population 2050
NE Quadrant	19,410	22,228	23,646	24,177
NW Quadrant	36,727	39,224	43,106	43,482
SE Quadrant	2,459	2,480	2,766	2,791
SW Quadrant	16,434	26,390	28,872	29,013
CSSA Population Total	**75,030**	**90,322**	**98,390**	**99,463**
NE Quadrant	10,482[2]	9,943	10,495	11,705
NW Quadrant	32,634[2]	14,681	16,201	16,873
SE Quadrant	1,401[2]	11,848	12,014	12,329
SW Quadrant	15,723[2]	10,954	11,634	11,745
CSSA Employment Total	**60,240**[2]	**47,426**	**50,344**	**52,652**

Notes:

[1] All values are based on transportation analysis zone layer data spatially joined with the CSSA and General Plan growth quadrants.

[2] The 2012 employment values are based on census tract values (as represented in the transportation analysis zone database, which do not align with the SANDAG transportation analysis zones used to project future years)CSSA=Carlsbad sewer service area

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2 Sewer Facilities

This section summarizes the existing wastewater facilities within the CSSA. These facilities include the collector sewers, manholes, sewer interceptors, lift stations, and wastewater treatment and disposal facilities. Information regarding the existing wastewater collection systems facilities was obtained from the City's sewer system geographic information system (GIS), previous reports and studies, and City Engineering and Public Works staff input. Capacity evaluations for the gravity interceptors are based on the sewer system GIS and were generated from the hydraulic model.

Local gravity mains, lift stations and forcemains owned by Carlsbad convey flows from east to west to the interceptors leading to the EWPCF, which is along the coast and approximately centered north-south in the service area. As a member of EWA, Carlsbad shares ownership of regional interceptors, lift stations and forcemains, and the EWPCF for treatment capacity. Four interceptors convey Carlsbad plus outside agency flows to EWPCF. An additional two interceptors are owned by Carlsbad and convey only Carlsbad flows. Five lift stations are part of the interceptor systems and six smaller lift stations are located within the collection system to convey wastewater flow to the EWPCF. These facilities are described in detail in the following sections.

2.1 Collection System Facilities

Carlsbad currently operates and maintains approximately 265 miles of wastewater pipelines, including gravity flow collector pipelines, inverted siphons and City-owned interceptors. The size of gravity pipelines range in size from 6 to 60 inches in diameter and approximately 6,300 manholes are located within the system. Smart covers are used at manholes located at known problem areas, adjacent to sensitive habitats to detect high water levels and notify City staff before a spill can occur.

Table 2-1 provides a summary by pipeline diameter of the City-owned gravity sewers, siphons and interceptor sewers. Pipe materials and decade of installment are summarized in Table 2-2. This information was developed from the City of Carlsbad Sewer System GIS as provided in April 2017. Information in the Sewer System GIS was obtained from as-built drawings, construction drawings, and the City's existing Sewer Atlas Book. Information from the Sewer Atlas Books was used for pipelines for which no design drawings could be located.

A portion of Carlsbad's sewers were installed as far back as 1929 in the "Village" area north of Carlsbad Village Drive in the proximity of State Street, but less than 1 percent of the City's system dates back prior to 1950. Vitrified clay pipe (VCP) was predominately installed in Carlsbad prior to 1990, then the City started to transition to installing polyvinyl chloride (PVC) pipe. With most of the City's development occurring since the mid-1980s, approximately 50 percent of Carlsbad's gravity sewer system has been installed in the past 30 years.

Table 2-1. Carlsbad Collection and Conveyance System Summary

Pipeline Diameter (inches)	Total Length of Pipelines (feet)		
	Gravity[1]	Siphon	Total
< or = 6	82,199	—	82,199
8	1,065,287	147	1,065,434
10	93,524	200	93,724
12	57,705	—	57,705
15	14,258	—	14,258
16	53	409	462
18	10,781	—	10,781
20	2,692	—	2,692
21	7,154	—	7,154
24	22,603	—	22,603
27	5,166	—	5,166
30	45	—	45
36	10,931	—	10,931
39	1,308	—	1,308
42	20,814	—	20,814
48	5,288	—	5,288
60	362	—	362
Total (feet)	**1,400,169**	**756**	**1,400,926**
Total (miles)	**265.2**	**0.1**	**265.3**

Source: City of Carlsbad Sewer System GIS (April 2017)
Notes:
[1] Includes City-owned Interceptor Sewers

Table 2-2. Sewer Pipe by Age

Time Period Installed	Length of Pipe by Material (feet)[1]										
	ABS	CCFRPM	CI	DIP	ESVCP	FPVC	HDPE	PVC	RCP	VCP	Total
Unknown	—	—	—	—	290	—	—	1,325	1,055	14,000	16,670
Pre-1950s	—	—	—	—	—	—	—	345	—	12,454	12,799
1950s	—	—	—	—	879	—	—	1,060	—	103,256	105,195
1960s	—	—	609	—	194	—	—	271	11,370	121,435	133,878
1970s	—	—	320	119	2,805	—	—	11,817	—	186,488	201,549
1980s	1,967	—	—	8,100	1,390	—	—	193,531	—	104,503	309,490
1990s	—	5,819	—	50	211	—	—	326,696	1,530	12,019	346,326
2000s	—	784	—	4,589	30	622	1,609	255,030	4,536	2,266	269,466
2010s	—	—	—	—	—	—	785	4,522	—	246	5,553
Total (feet)	**1,967**	**6,603**	**929**	**12,857**	**5,798**	**622**	**2,394**	**794,598**	**18,492**	**556,667**	**1,400,926**
Total (miles)	**0.4**	**1.3**	**0.2**	**2.4**	**1.1**	**0.1**	**0.5**	**150.5**	**3.5**	**105.4**	**265.3**

Source: City of Carlsbad Sewer System GIS (April 2017)

Notes:

[1] Includes all collector, trunk, and interceptor pipelines maintained and operated by Carlsbad, Does not include the BIS and VIS sewers or forcemains.

ABS=acrylonitrile-butadiene-styrene; CCFRPM=centrifugally cast fiberglass reinforced polymer mortar; CI=cast iron; DIP=ductile iron pipe; ESVCP=extra strength vitrified clay pipe; FPVC=flexible polyvinyl chloride; HDPE=high-density polyethylene; PVC=polyvinyl chloride; RCP=reinforced concrete pipe; VCP=vitrified clay pipe

2.2 Lift Stations and Force Mains

Thirteen wastewater lift stations currently serve the CSSA. Figure 2-1 illustrates the lift station locations and associated forcemain alignments. Eleven of the lift stations and approximately 4 miles of forcemains are owned and operated by Carlsbad. Table 2-3 provides a summary of lift station capacities and features.

The Buena Vista LS and Agua Hedionda LS are operated and maintained by EWA through an agreement with Carlsbad and Vista. Carlsbad is responsible for maintenance of the forcemains for those lift stations.

The City of Vista owns approximately 90 percent of the Buena Vista LS, and the City of Carlsbad owns approximately 10 percent. Flow exits the Buena Vista LS through two parallel 24-inch forcemains that discharge to a gravity flow pipeline just west of I-5. This parallel force main configuration was created in 2011 when the existing 24-inch ductile iron pipe (DIP) force main was relined and a second 24-inch high-density polyethylene (HDPE) force main was constructed.

The firm capacity of a lift station, as indicated in Table 2-3, is the hydraulic output of the installed pumping units with the largest pumping unit out-of-service. The "installed" capacity of a lift station is equal to the hydraulic output of all installed pumping units. The "hydraulic output" of a single pump is defined by the certified pump curve, the losses within the force main system, and design operation point for the equipment. The hydraulic output of several pumps working in parallel is defined by the cumulative hydraulic effect of the pumps, and is not equal to the mathematical sum of the individual nameplate pump capacities. A hydraulic analysis of both the pump and the forcemain systems is required to determine the hydraulic output of a given lift station.

The majority of the Carlsbad lift stations consist of two pumping units designed in an alternating lead/lag configuration, but operated in a duty/standby mode. This means that under normal operating conditions, only one pump is operating at a time and the pumps alternate as the pumps start and stop. However, if one pump cannot keep up or fails to start, the second pump will operate automatically.

Each lift station has telemetry (supervisory control and data acquisition [SCADA] system) for monitoring the pump status and wet well levels, and standby power capability consisting of either installed generators or a connection for a portable generator. When station alarms occur, a signal is sent to the City cell phones. A SCADA Master Plan was completed in 2019 to identify necessary upgrades and improvements.

The temporary lift stations Vancouver, Gateshead, and Simsbury have all been removed in the past several years. None of the other lift stations in the Carlsbad system are considered temporary and none are currently planned for removal.

The Agua Hedionda LS is in the process of being replaced in situ with a new lift station as part of a joint project with the City of Vista. The new structure will house replacement motors and pumps, as well as new system enhancements including an emergency generator and bypass motors and pumps, an electrical control building, and odor control facilities.

The new Agua Hedionda lift station has a lift pump side and a force main side. Both sides include four pumps and both sides have the capacity of 21 mgd. Combined, the lift pumps and force main pumps have a capacity of approximately 33 mgd. The force main pumps discharge into the 4,000-foot, 30-inch internal diameter HDPE pressure pipeline, which discharges south of Cannon Rd into a new 54 inch gravity main in Avenida Encinas. This 54-inch gravity main conveys flow approximately 7,000 linear feet to the EWPCF. The lift station pumps discharge into the existing 42-inch PCV-lined reinforced concrete pipe (RCP) gravity main, which extends south of Palomar Airport Road where it connects to the new 54-inch gravity main for the remaining distance to EWPCF.

Figure 2-1. Existing Lift Stations and Force Mains

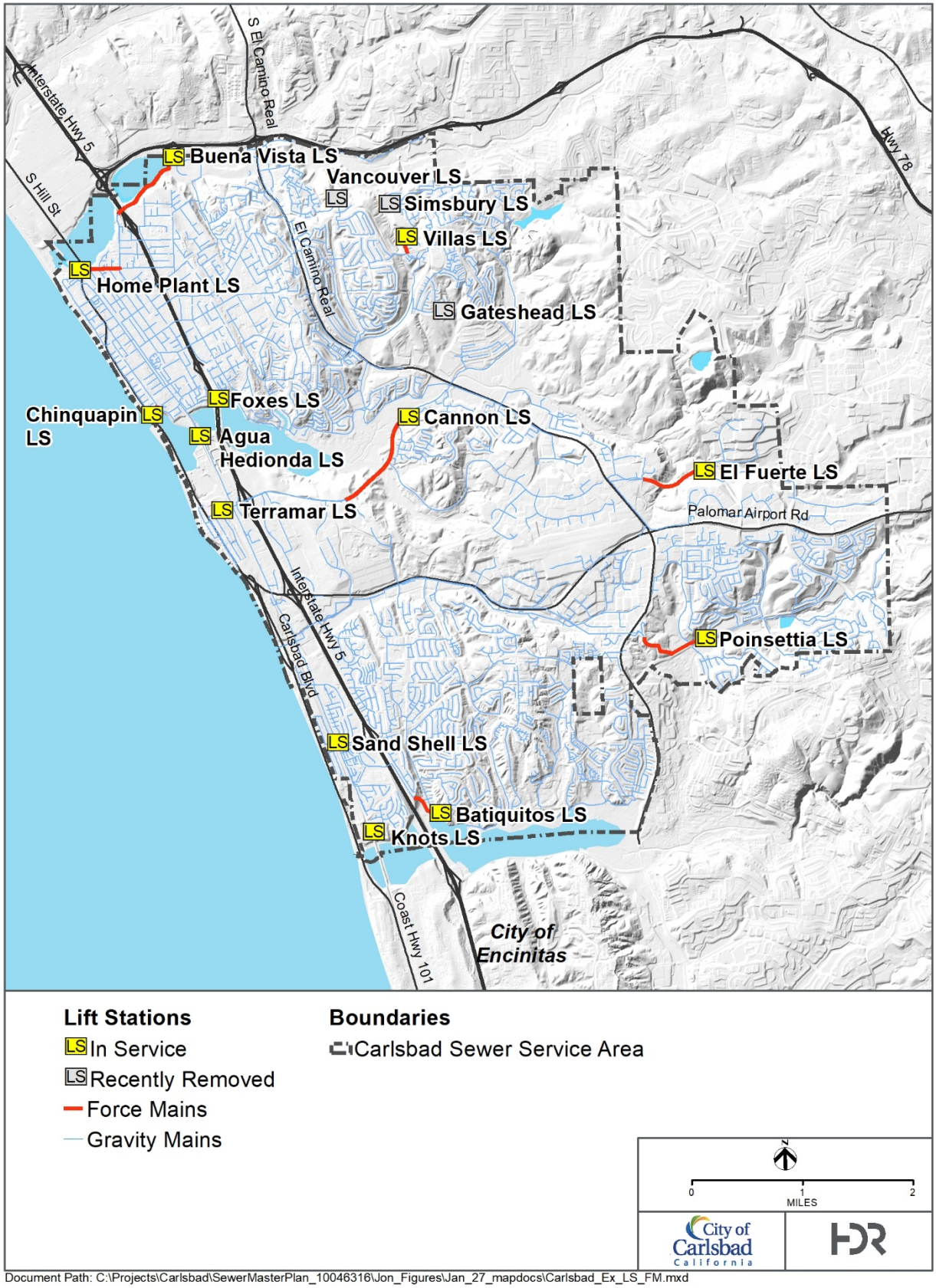

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Table 2-3. Summary of Existing Lift Stations

Name	Operated and Maintained by (Interceptor System Discharge)	Construction/ Rehabilitation Date	Pump/Motor Information				Firm Station Capacity[1]		Forcemain		Comments
			Quantity	Motor Size (Horse-power)	Motor Type	Design Point	(gpm)	(mgd)	Diameter (inches)	Material	
Agua Hedionda	EWA (V/C)	2019	Lift Side: 4 FM Side: 4	100	VFD	Lift Side: 4860 gpm x 30' FM Side: 3820 gpm x 40'	22,900	33.0	FM Side: 30	HDPE	Replaced in 2018
Buena Vista	EWA (V/C)	1975, 1994, 2018	4	300	VFD	6000 gpm x 142'	14,900	21.5	24" 24"	HDPE CIPP lined DIP	Upgrades ongoing in 2018
Cannon Road	Carlsbad (SAHI)	2005, 2007, 2017	3	105	CSD	1420 gpm x 200'	2,440	3.5	14"	HDPE	Flygt NP3301
Chin-quapin	Carlsbad (V/C)	2001	2	7.5	CSD	360 gpm x 50'	360	0.5	6"	PVC	1 duty and 1 standby
El Fuerte	Carlsbad (BIS)	2009	2	50	CSD	970 gpm x 127'	970	1.4	8"	HDPE	1 duty and 1 standby
Foxes Landing	Carlsbad (NAHI)	2001, 2018	3	38.7	VFD	1500 gpm x 61'	2,600	3.7	16"	HDPE	Reconstruction ongoing to be completed in 2019 including addition of redundant force mains
Home Plant	Carlsbad (V/C)	2012	3	20	VFD	800 gpm x 70'	1,100	1.6	8" 10" (back up)	HDPE PVC	2 duty and 1 standby
Knots Lane	Carlsbad (NBI)	1999	2	10	CSD	355 gpm x 44'	355	0.5	6"	PVC	1 duty and 1 standby
North Batiquitos	Carlsbad (NBI)	1997, 2008	3	100	CSD	1210 gpm x 164'	2,250	3.2	14"	PVC	172,300 gal overflow tank

Table 2-3. Summary of Existing Lift Stations

Name	Operated and Maintained by (Interceptor System Discharge)	Construction/ Rehabilitation Date	Pump/Motor Information				Firm Station Capacity[1]		Forcemain		Comments
			Quantity	Motor Size (Horse-power)	Motor Type	Design Point	(gpm)	(mgd)	Diameter (inches)	Material	
Poinsettia	Carlsbad (VIS)	1997, 2008, 2017	3	125	CSD	1080 gpm x 245'	1,550	2.2	12"	PVC	Fairbanks Morse BS444 Engine driven emergency bypass pump installed 2017(on call)
Sand Shell	Carlsbad (NBI)	2002, 2009	2	6	CSD	324 gpm x 23'	320	0.5	6"	PVC	Pumps replaced in 2009
Terramar	Carlsbad (V/C)	2014	2	3	CSD	100 gpm x 25'	250	0.4	6"	PVC	1 duty and 1 standby
Villas	Carlsbad (NAHI)	1983, 2004, 2010	2	15	CSD	125 gpm x 90'	125	0.2	4"	PVC	Scheduled for replacement in 2021 due to age

Notes:

[1] Firm Station Capacity is the duty capacity with one pump out-of-service

BIS=Buena Interceptor; CIPP=Cured in place pipe; DIP=ductile iron pipe; gpm= gallons per minute; HDPE=high-density polyethylene; mgd=million gallons per day; NBI=North Batiquitos Interceptor; NAHI=North Agua Hedionda Interceptor; PVC=polyvinyl chloride; SAHI=South Aqua Hedionda Interceptor; V/C=Vista/Carlsbad; VIS=Vallecitos Interceptor

2.3 Interceptor System

There are six pipeline interceptors serving the CSSA, conveying the collected wastewater to the EWPCF, as shown on Figure 2-2:

Regional Interceptors

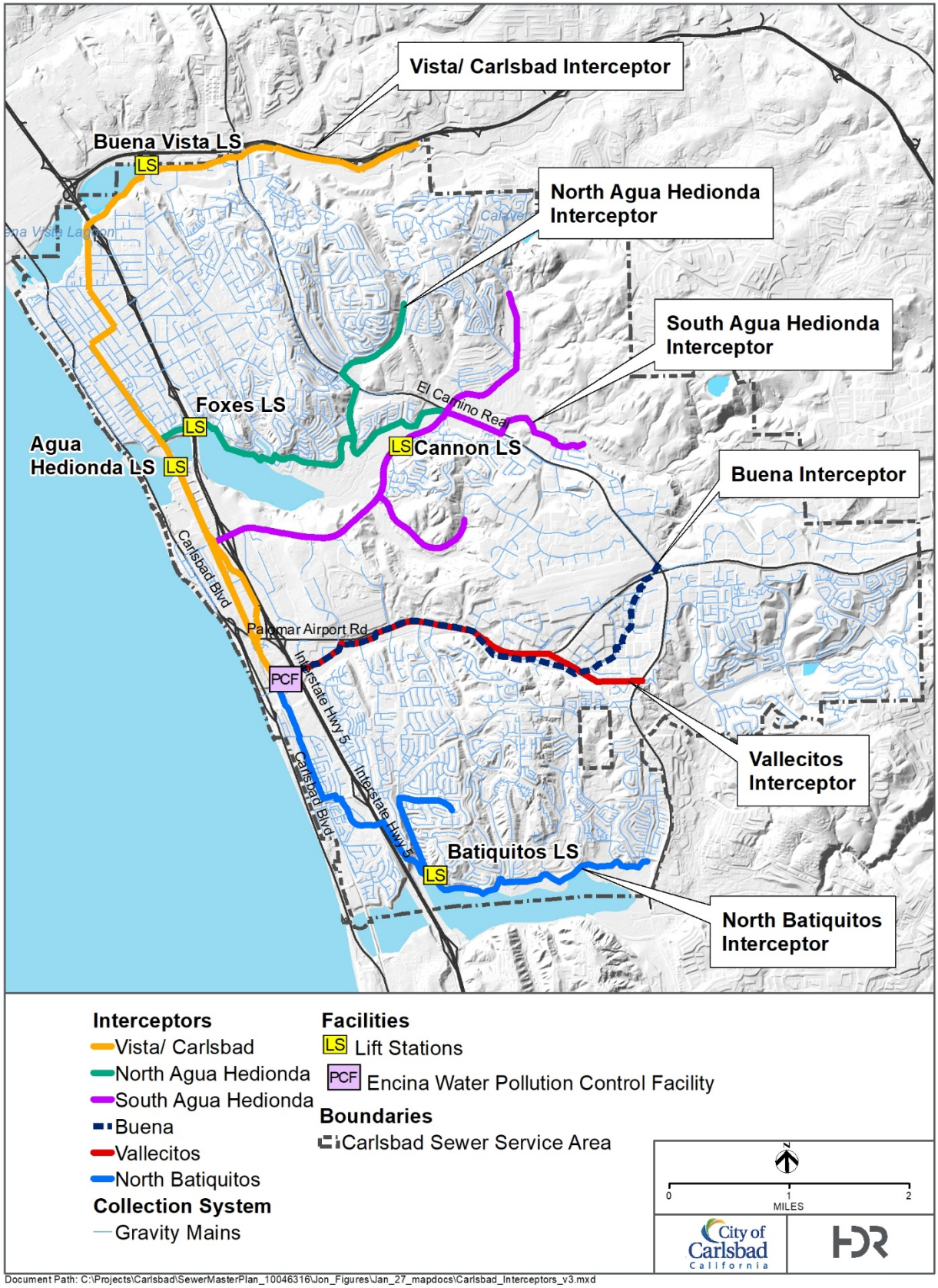
- Vista/Carlsbad Interceptor (V/C)
- Buena Interceptor (BIS)
- Vallecitos Interceptor (VIS)

Carlsbad Interceptors

- North Agua Hedionda Interceptor (NAHI)
- South Aqua Hedionda Interceptor (SAHI)
- North Batiquitos Interceptor (NBI)

The NAHI and SAHI collect only Carlsbad flows and discharge to the V/C at separate locations. The other four interceptors convey Carlsbad flows, plus outside agency flows, to EWPCF. The alignments and reach designations of the existing interceptor sewers are shown on Figure 2-2 and also on the figures included in the following sub-sections for each individual interceptor system.

Figure 2-2. Existing Interceptor System



2.3.1 Vista/Carlsbad Interceptor

The V/C is jointly owned by Vista and Carlsbad. This interceptor is approximately 8 miles long, and extends from the Vista (V1) meter station just west of College Boulevard and Highway 78 to the EWPCF. Flows from the City of Vista gravity feed into the interceptor upstream of the V1 meter location. Additionally, the City of Oceanside has an agreement with Vista and Carlsbad to discharge up to 2.15 mgd of flow into the interceptor upstream of the V1 meter. The Buena Vista LS and Agua Hedionda LS, both of which are maintained and operated by EWA, are a part of the interceptor system. The V/C serves all of the LFMZ 3, portions of LFMZs 1, 2, 7, 22 and 25, and also collects flow from the NAHI and SAHI.

Flow from the NAHI enters the V/C just upstream of the Agua Hedionda LS. Flow from the SAHI enters the V/C at Cannon Road, just downstream of the Agua Hedionda LS. Flow from the NBI is collected in the last reach of the V/C before entering the EWPCF. Figure 2-3 illustrates the V/C and reach designations, VC1 through VC16, which are established in ownership agreements. It is noted that each named pipeline reach actually consists of multiple pipeline segments between manholes which may have varying capacities.

The V/C was originally constructed in 1965. Sections of the interceptor were replaced with larger diameter pipelines in 1979, 1988, and in 2003, when a 2-mile section through the downtown Carlsbad area was replaced with 36-inch to 54-inch diameter pipeline (reaches VC5 through VC11A).

The current V/C includes gravity pipelines ranging from 36 to 60 inches in diameter, a new 30-inch force main at the Agua Hedionda LS, and two parallel 24-inch diameter force mains at the Buena Vista LS. The material for the gravity pipelines is VCP, RCP with a PVC liner (T-Lock liner), or centrifugally cast fiberglass reinforced polymer mortar (CCFRPM) pipe. Approximately 3,500 linear feet (LF) of centrifugally cast fiberglass reinforced plastic mortar CCFRPM pipe was installed in Jefferson Street and Oak Avenue using microtunneling technology in 2001 (VC5B-VC7).

Recent upgrades to the V/C include a rehabilitation project performed by the City of Vista on reach VC1. Vista is also planning rehabilitation on reaches VC2 and VC3 consisting of a cured-in-place liner on the interior of the pipelines and rehabilitated manholes.

Additionally, several upgrades have recently been made to the V/C as part of the Agua Hedionda Lift Station and V/C Interceptor Replacement Project. This project includes the addition of a high head lift station component to the Agua Hedionda LS and replacing the low head lift station components of the lift station. The new high head lift station component includes four new high head pumps, while the low head lift station component includes four new low head pumps. All eight pumps have suction bells in the same trench-type, self-cleaning wet well. The new low head pumps discharge to the existing 42 inch gravity main. Upgrades to the V/C related to conveying the flows from the new high head lift station component include the addition of an approximately 4,000 LF, 30 inch force main from Agua Hedionda LS to Ave Encinas (VC12-VC13) and the addition of approximately 5,300 LF of 54 inch diameter CCFRPM pipe in Ave Encinas (VC14). V/C upgrades related to both the high head and low head aspects of the lift station project include upsizing part of reach VC11 to a 54 inch diameter pipe (now called VC11B) and the replacement of reach VC15 with 54 inch diameter pipe. The addition of

the 30 inch force main and the 54 inch diameter gravity main in Ave Encinas result in new parallel V/C alignments with the existing 42” reaches of VC12 through VC14.

It should also be noted that in previous master plans and agreements, the 54-inch pipeline that entered the EWPCF was identified as VC16 of the Vista Carlsbad Interceptor Sewer. The existing 54-inch West Encina Influent Sewer was replaced in 2010 with a 60-inch diameter CCFRPM pipe, which extends approximately 300 LF to the Influent Junction Structure of the EWPCF. Since this pipeline conveys wastewater for Vista, Carlsbad, Encinitas and LWD, the pipeline has since been renamed the West Encina Influent Sewer and a new ownership agreement was written in 2015 to assign cost share and capacity ownership for the four agencies who contribute flow in this line. Each agency has capacity ownership rights in the pipeline relative to their projected ultimate peak wet weather flow (PWWF). The agreement cites ownership capacity of the pipeline to be 76.961 mgd. Agency ownership percentages are: City of Carlsbad 34.8 percent; City of Encinitas 6.7 percent; LWD 26.1 percent; and City of Vista 32.4 percent.

The most recent V/C ownership capacities and agreements are represented in Table 2-4.

Figure 2-3. Vista/Carlsbad Interceptor

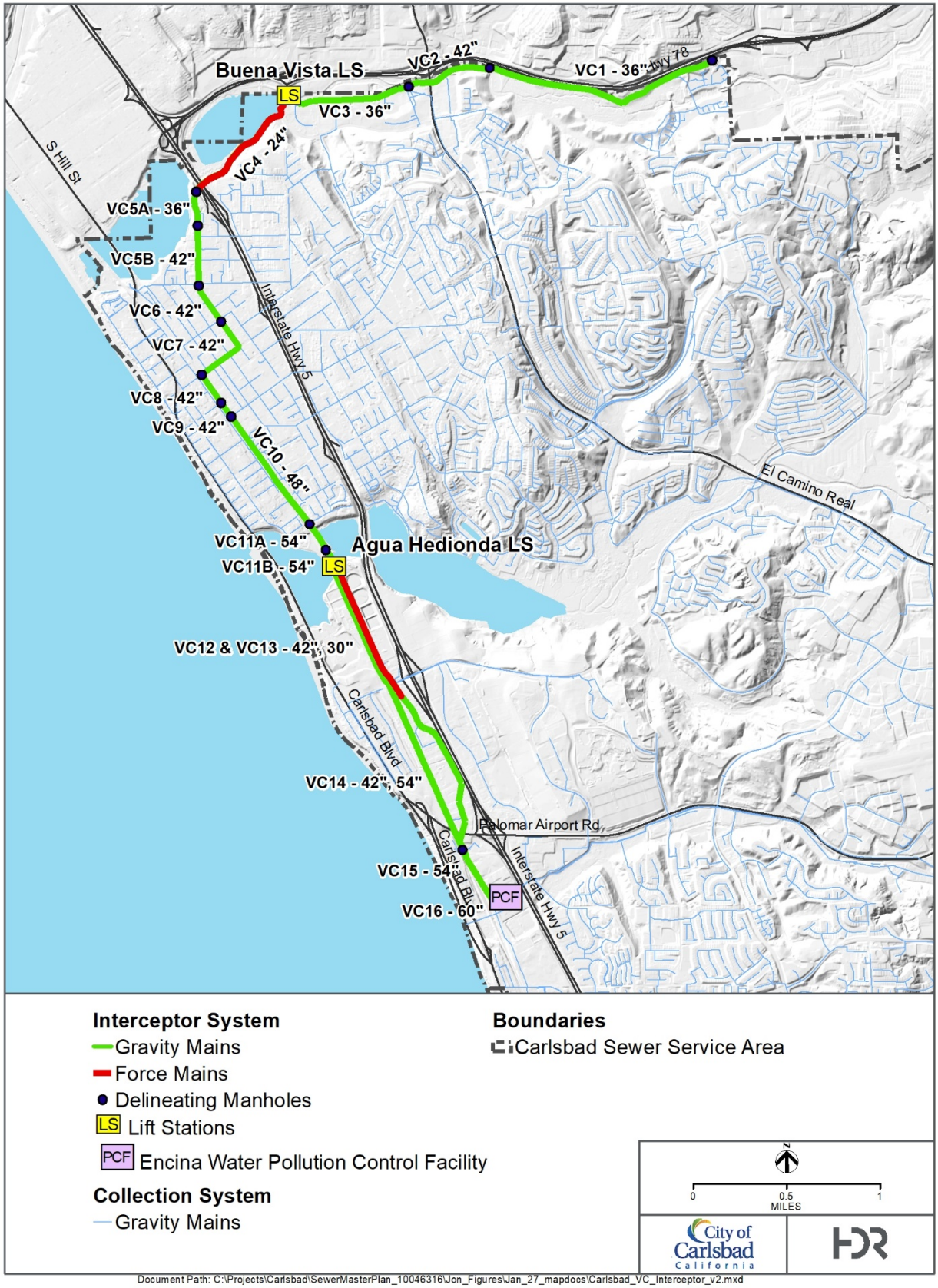


Table 2-4. Vista/Carlsbad Interceptor Ownership

Pipeline Reach	Pipe Size (inches)	Full Flow Pipe Capacity (mgd) [5]	City of Vista			City of Carlsbad		
			Average Flow [6] (mgd)	Percent Capacity[7]	Capacity Rights [8] (mgd)	Average Flow [6] (mgd)	Percent Capacity[7]	Capacity Rights [8] (mgd)
VC1 [1]	36	30.0	10.38	96.6	29.0	0.37	3.4	1.0
VC2 [2]	42	34.0	10.38	93.4	31.8	0.73	6.6	2.2
VC3 [2]	36	19.5	10.38	89.6	17.5	1.20	10.4	2.0
Buena Vista LS [2]	—	23.1	10.38	89.6	20.7	1.20	10.4	2.4
VC4 [2]	2x24 (FM)	23.1	10.38	89.6	20.7	1.20	10.4	2.4
VC5 [2]	42	31.5	10.38	89.6	28.2	1.20	10.4	3.3
VC6 [2]	42	31.5	10.38	81.9	25.8	2.29	18.1	5.7
VC7 [2]	42	31.5	10.38	79.4	25.0	2.69	20.6	6.5
VC8 [2]	42	31.5	10.38	79.4	25.0	2.69	20.6	6.5
VC9 [2]	48	28.5	10.38	75.5	21.5	3.37	24.5	7.0
VC10 [2]	48	28.5	10.38	74.7	21.3	3.51	25.3	7.2
VC11A [2]	42	20.5	10.38	69.1	14.2	4.65	30.9	6.3
VC11B [3]	54	33.0	10.38	69.1	22.8	4.65	30.9	10.2
Agua Hedionda LS	—	33.0	10.38	69.1	22.8	4.65	30.9	10.2
VC12	2x18 (FM) [2] 30 (FM) [3]	21.0 21.0	10.38	69.1	14.5 14.5	4.65	30.9	6.5 6.5
VC13	42 [2] 30 (FM) [3]	20.5 21.0	10.38	69.1	14.2 14.5	4.65	30.9	6.3 6.5
VC14	42 [2] 54 [3]	20.5 30.3	10.38	56.1	11.5 17.0	8.11	43.9	9.0 13.3
VC15 [3]	54	46.3	10.38	56.1	26.0	8.13	43.9	20.3
VC16 [4]	60	84.0	10.38	50.2	42.2	10.28	49.8	41.8

Table 2-4. Vista/Carlsbad Interceptor Ownership

Pipeline Reach	Pipe Size (inches)	Full Flow Pipe Capacity (mgd) [5]	City of Vista			City of Carlsbad		
			Average Flow [6] (mgd)	Percent Capacity[7]	Capacity Rights [8] (mgd)	Average Flow [6] (mgd)	Percent Capacity[7]	Capacity Rights [8] (mgd)

Notes:

[1] Per February 2002 Ownership, Operation, and Maintenance Agreement with the City of Vista agreement, as amended on June 11, 2013 and May 20, 2014.

[2] Per the February 2002 Agreement for Ownership, Operation, and Maintenance of the Vista/ Carlsbad Interceptor Sewer. In this agreement average flow rates were obtained from the October 1997 Sewer Master Plan Update for the City of Carlsbad. The Master Plan Update used a peaking factor of 2.0 for the Vista Carlsbad Interceptor System. The percent capacity for each pipeline reach is based on the ratio of average flow to total flow.

[3] Per the 2011 Agreement for Planning and Design Phase Services for the Agua Hedionda Sewer Lift Station and Vista/ Carlsbad Interceptor Sewer, Reaches VC11B-VC15.

[4] A separate multiagency agreement was prepared for Reach VC16, now referred to as the West Encina Influent Sewer.

[5] Pipe capacity is based on a depth of flow (D) to pipe diameter (d) ratio of one and Manning's "n" value of 0.013 except for VC5 through VC10 which were assigned n=0.012 for PVC-lined pipe.

[6] Average flow rates were obtained from the October 1997 Sewer Master Plan Update for the City of Carlsbad.

[7] Percent capacity based on ratio of agency's average flows shown in this table.

[8] Capacity rights based on percent capacity multiplied by full flow pipe capacity.

FM=force main; LS=lift station; mgd=million gallons per day

2.3.2 North Agua Hedionda Interceptor

The NAHI is entirely owned by the City of Carlsbad and conveys only City of Carlsbad wastewater. Beginning at the abandoned Calavera Hills Treatment Plant, the interceptor flows westerly along the north shore of the Agua Hedionda Creek and Lagoon to just east of I-5. At the downstream end, the Foxes Landing LS pumps the wastewater across I-5 and discharges into a short gravity interceptor, which flows to the V/C upstream of the Agua Hedionda LS. The NAHI system is shown on Figure 2-4. This interceptor currently serves portions of LFMZs 1, 2 and 14, all of LFMZ 7.

The main NAHI was constructed in 1966 and the northern branch was constructed in 1980. Several rehabilitation projects were completed in or around 2010, including rehabilitation of manholes, replacement, and alignment change for approximately 1,800 feet of 24-inch diameter pipeline in Reach 5 between Cove Drive and Hoover Street along the lagoon, minor realignments and replacement of an 8-inch diameter upstream reach (NAHT1A) in Tamarack Avenue that was originally designed as the Calavera Hills Treatment Plant outfall. The gravity pipelines in the main branch range in size from 18 to 24 inches in diameter, and a triple barrel siphon with parallel 10-inch, 16-inch, and 16-inch pipelines comprises Reach NAH4.

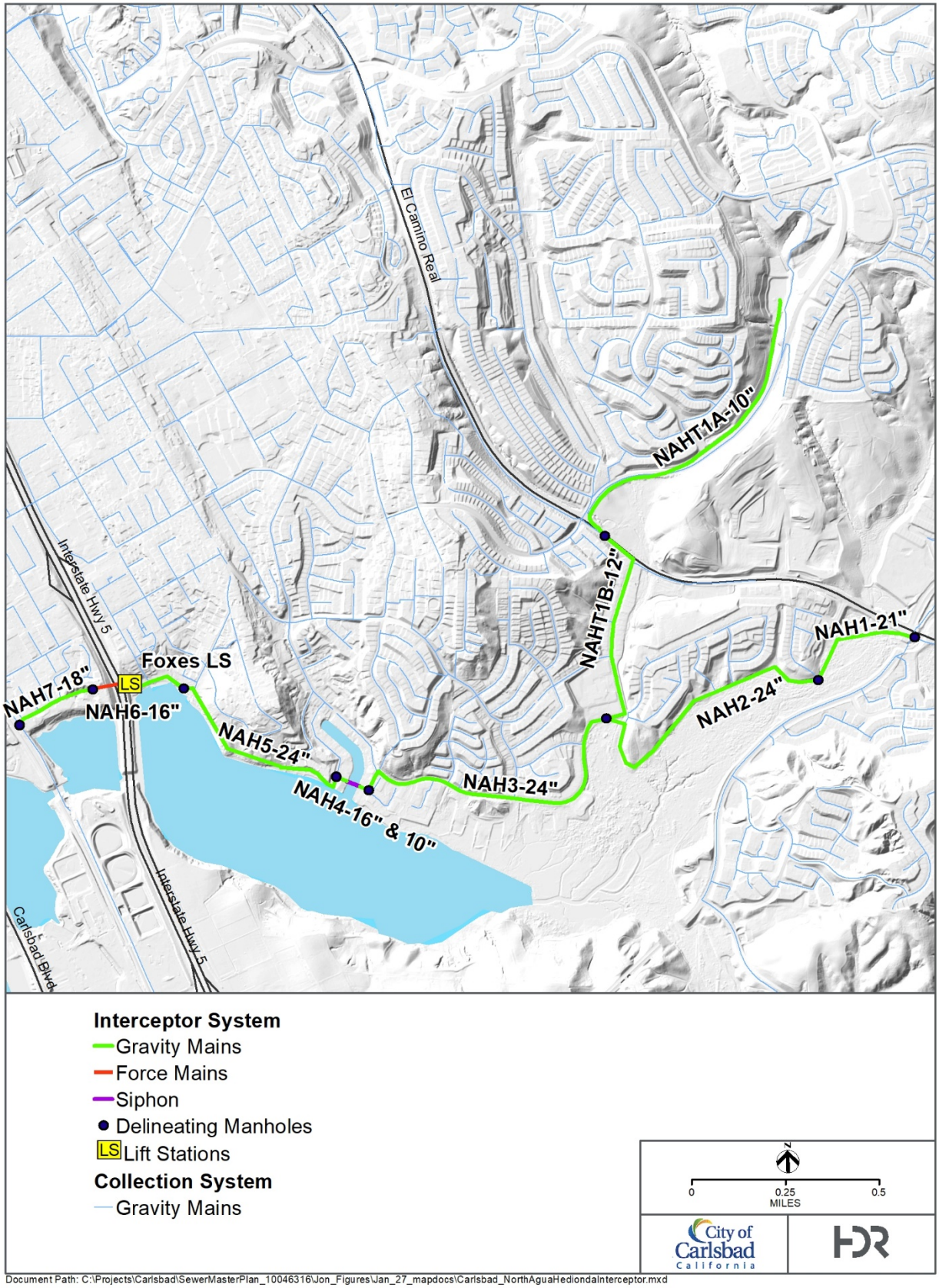
Reach NAH1 is normally a dry pipe and is used as a failsafe connection for the SAHI system. The structure at the east end of NAH1 has a weir wall that allows the SAHI to overflow into the NAHI if the Cannon Road LS fails or the SAHI backs up.

The hydraulic profile of the interceptor is very flat, and most of the 24-inch and 18-inch diameter downstream reaches have a slope of less than 0.15 percent. Most of the gravity pipelines are constructed of VCP.

The NAHI includes a triple barrel inverted siphon where the interceptor crosses Bristol Cove called the Cove Siphon. . This siphon consists of two parallel 16-inch diameter CIPP lined DIP and a parallel 8-inch diameter DIP. Only one of the 16-inch diameter pipes is typically used.

Pipeline capacity in the NAHI is limited to approximately 6 mgd upstream of the Foxes LS at NAH6-16.

Figure 2-4. North Agua Hedionda Interceptor



2.3.3 South Agua Hedionda Interceptor

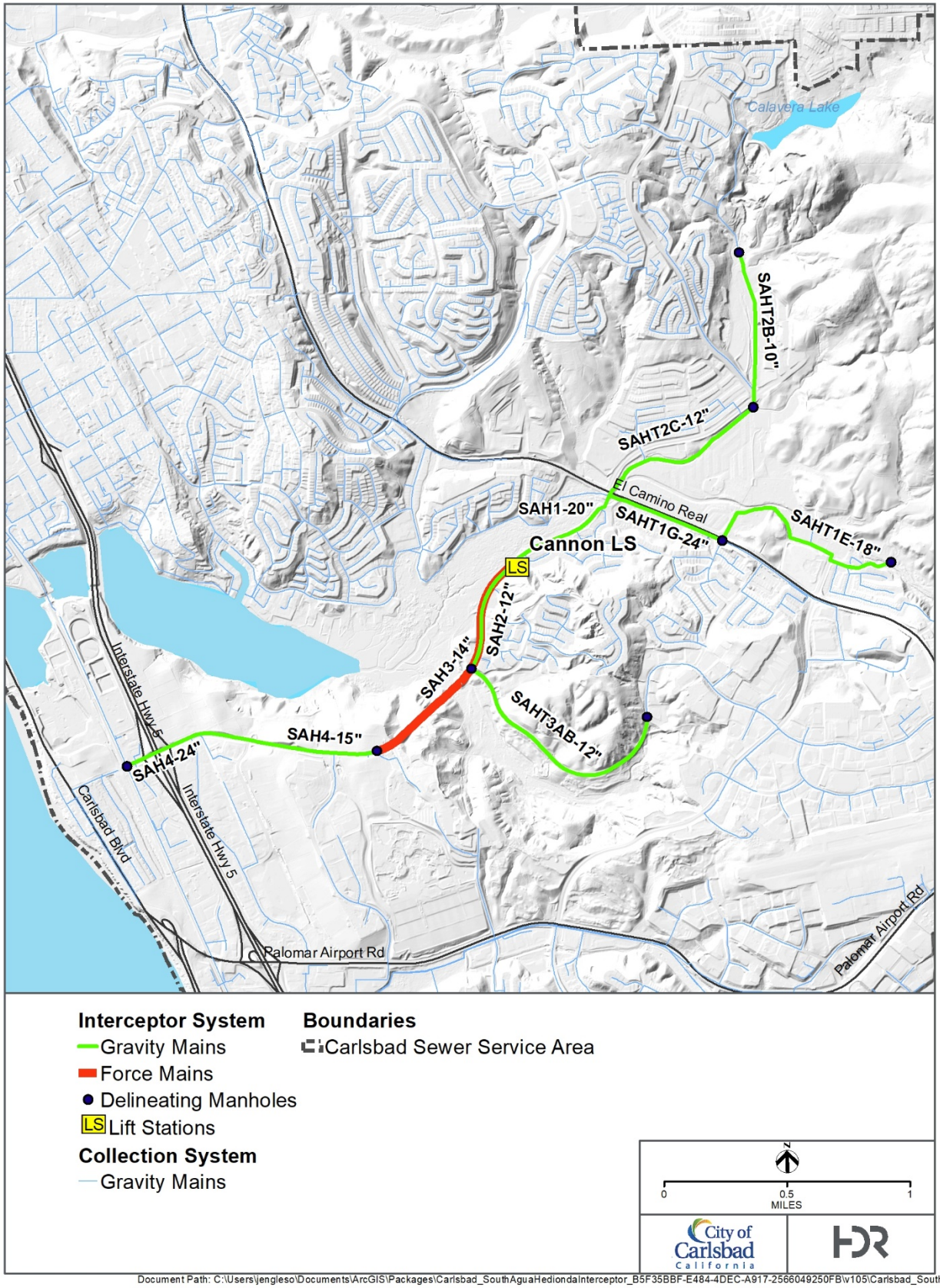
The SAHI is the newest interceptor system and conveys only City of Carlsbad wastewater. The interceptor has two upstream branches. The northern branch begins near Lake Calavera and flows south in an easement adjacent to Calavera Creek to the intersection of Cannon Road and El Camino Real. The second branch begins in Sunny Creek Road, just east of Badger Lane, and flows west through the Rancho Carlsbad Golf Course to El Camino Real. These two branches join at El Camino Real and Cannon Road. The SAHI system is shown on Figure 2-5.

The SAHI then flows southwest in Cannon Road, which follows along the south side of the Aqua Hedionda Creek and Lagoon. Flow is pumped at the Cannon Road LS, which is located just off Cannon Road between Hemmingway Drive and Frost Avenue. There is a weir in a manhole upstream of Cannon Road LS, near the intersection of El Camino Real and Cannon Rd which allows SAHI flow to spill into the NAHI should the SAHI or Cannon Road LS fail.

From the Cannon Road LS, the Cannon Road LS force main continues west in Cannon Road and discharges to a 24-inch diameter gravity main that connects with the V/C near the intersection of Cannon Road and Avenida Encinas.

Pipeline capacity in the southern branch of the SAHI is limited to approximately 4.7 mgd at SAH4-15.

Figure 2-5. South Agua Hedionda Interceptor



2.3.4 Buena and Vallecitos Interceptors

Two major interceptors follow the Encinas Canyon to the EWPCF: the BIS and VIS. The City of Carlsbad has partial capacity ownership in both of these interceptors based on separate interagency agreements included in Appendix A. Maintenance of the interceptors are the responsibility of the BSD and VWD for the BIS and VIS, respectively. Carlsbad is responsible for paying their cost share of maintenance in proportion to their percentage ownership. The interceptors have a parallel alignment for much of their length, and cross over each other at three separate locations. The BIS and VIS are both shown on Figure 2-6.

Buena Interceptor Sewer

The first interceptor constructed through the Encinas Canyon was the BIS, built in 1964. This interceptor was owned by the BSD, which is now a part of the City of Vista. The City of Carlsbad has capacity rights that vary by reach in this pipeline. The BIS begins at the corner of El Camino Real and Palomar Airport Road, downstream of the discharge of the City of Vista's Buena Creek LS and Raceway LS. The BIS conveys flows through the City of Carlsbad's industrial park and then parallels Palomar Airport Road, crossing under I-5 and continuing to the EWPCF. The total length of the BIS is approximately 4.2 miles.

Minor realignments were made to the BIS in 1987, 1989, and 1992. The existing BIS consists of gravity pipelines ranging from 15 to 30 inches in diameter. There are no lift stations or siphons along the alignment. Most of the gravity pipelines are constructed of VCP, with a few sections of PVC. The BIS currently serves portions of LFMZs 3, 4, 5 and 20.

The original agreement for the lease of capacity by Carlsbad in the BIS was prepared in 1966, and the agreement was replaced with a new agreement in 1981. The 1981 agreement defines Carlsbad's ownership rights based on a percentage of the full pipe capacity. Carlsbad's percent ownership increases in the direction of flow and approaches 35 percent ownership in the downstream reaches.

In 1987, Carlsbad entered into a temporary agreement with BSD to lease an additional 0.8 mgd of capacity to accommodate flows from the Carlsbad Research Center. The 1987 agreement expired after the completion of Phase 4 of the Carlsbad Research Center in 1991, which included the construction of lift stations to pump flows to the VIS. The current ownership and capacity rights based on the 1981 agreement and flow capacities calculated from GIS data are illustrated on Figure 2-6 and summarized in Table 2-5.

The City of Vista is currently planning to construct a new forcemain to convey flows from the Buena Sanitation District and portions of the City of Vista. The City of Carlsbad will consequently acquire full ownership and operational rights to the BIS in order convey only Carlsbad flows through the majority of the BIS to the EWPCF. Flows from the new Vista forcemain will enter the BIS and the VIS upstream of I-5 in reaches B8 and V8, respectively, for conveyance to the EWPCF.

Figure 2-6. Buena and Vallecitos Interceptor Sewers

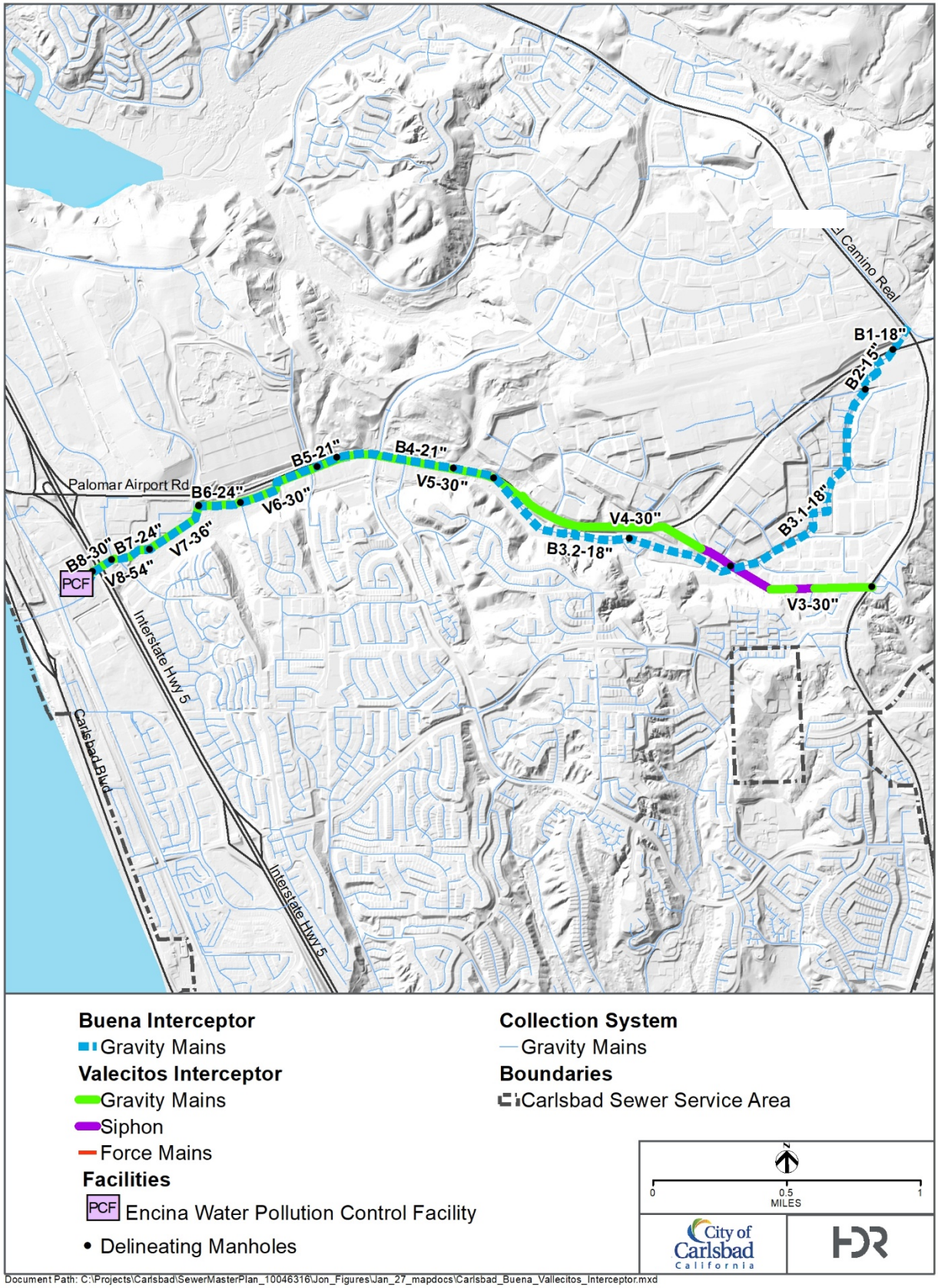


Table 2-5. Carlsbad Capacity Rights in the Buena Interceptor Sewer

Pipeline Reach	From Station	To Station	Minimum Size (inches)	Minimum Slope (%)	Design Capacity (mgd)	Carlsbad Ownership (%)	Carlsbad Capacity (mgd)
B1	0+00	20+81.43	18	2.20	10.06	17.65	1.78
B2	20+81.43	33+36.43	15	2.60	6.73	17.65	1.19
B3	33+36.43	42+28.18	18	1.00	6.79	18.84	1.28
B4	42+28.18	67+42.43	21	0.46	6.94	21.13	1.47
B5	67+42.43	87+57.43	21	0.56	7.66	28.21	2.16
B6	87+57.43	190+93.29	24	0.27	7.59	28.21	2.14
B7	190+93.29	204+08.65	24	0.60	11.34	31.71	3.60
B8	204+08.65	209+56.94	30	0.10	8.38	34.88	2.92

Notes:
mgd=million gallons per day

Vallecitos Interceptor Sewer

The VIS was constructed in 1984 by the San Marcos County Water District, which is now VWD. The City of Carlsbad, City of Vista, and VWD share capacity ownership in this pipeline beginning at El Camino Real. The VIS begins at the end of the Vallecitos Siphon, which is near the intersection of Camino Vida Roble and El Camino Real. The VIS then follows Palomar Airport Road in the same approximate alignment as the BIS, crossing under I-5 to the EWPCF. The total length of the VIS is approximately 3.4 miles.

The existing VIS consists of gravity pipelines ranging from 30 to 54 inches in diameter and includes two siphons near the upstream end and a 54-inch diameter siphon under I-5 to the EWPCF. There are no lift stations along the alignment. The gravity pipelines are constructed of VCP and the siphons are DIP or CML&C Steel pipe. The VIS currently serves portions of LFMZs 5, 6, 13, 18 20, and 21 and all of LFMZs 10 and 17.

The title of the original interagency agreement for the VIS is the Palomar Joint Land Outfall Interceptor Interagency Agreement, which was signed in 1985. Under this agreement, VWD has a capacity ownership of 12.1 mgd, the City of Vista has an ownership of 3.75 mgd, and the City of Carlsbad's capacity ownership is 5.0 mgd. The capacity ownership is based on a total interceptor capacity of 20.85 mgd, which is the approximate minimum full flow gravity capacity of the interceptor. It should be noted that the City of Vista does not currently discharge flow into the VIS.

2.3.5 North Batiquitos Interceptor

The NBI is identified by nine reaches and collects only City of Carlsbad flows in the upper reaches, NB1-NB8. The last 2,415 feet upstream of the EWPCF, reach NB8 and NB9, is jointly owned by the City of Carlsbad, LWD, and the City of Encinitas. This downstream section is sometimes referred to as the Ponto Sewer, but was originally termed the Occidental Sewer. The NBI is illustrated on Figure 2-7.

The NBI begins on the north shore of the Batiquitos Lagoon near El Camino Real. The interceptor flows west along the north shore of the lagoon to the North Batiquitos LS. Access to the interceptor is shared with a public trail in this area. The North Batiquitos LS pumps City of Carlsbad flows to a gravity outfall east and parallel to I-5 which conveys flows to Avenida Encinas before crossing I-5 and continuing to the railroad right-of-way.

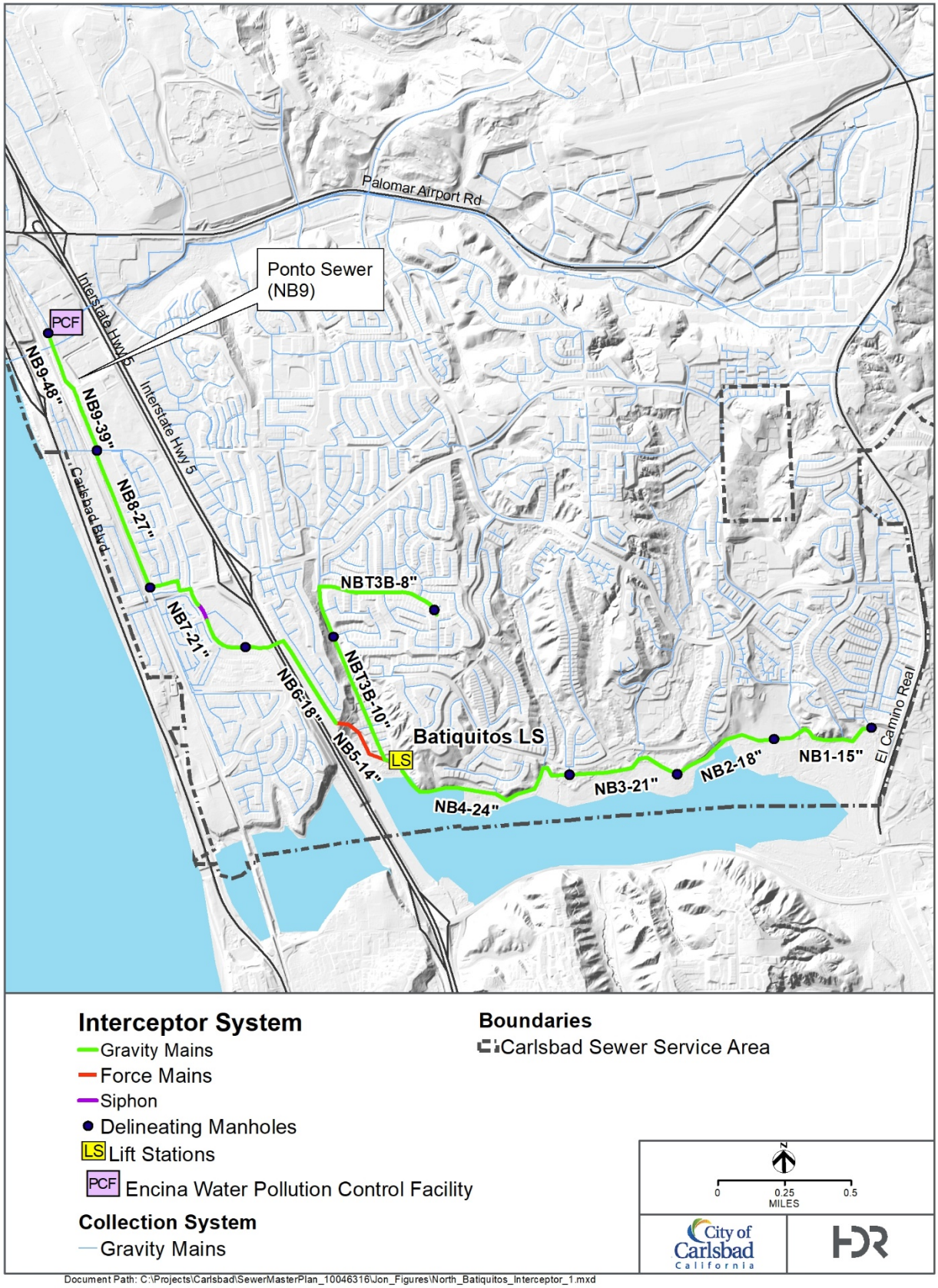
The NBI includes an inverted siphon in Ave Encinas (NB 7) which includes an air jumper. The inverted siphon was added to avoid vertical conflict with a service drain from the shopping mall at Ave Encinas and Poinsettia Lane. The air jumper was subsequently added to address odor and corrosion problems caused by the inverted siphon.

The NBI turns north at Poinsettia Lane and the railroad right-of-way and then collects flow from LWD and City of Encinitas immediately north of the North County Transit District Coaster Station. The NBI then continues in a northerly direction adjacent to Avenida Encinas until it reaches the confluence with the V/C Interceptor. The combined flow enters the West Encina Influent Sewer which conveys the combined flows to the EWPCF.

Reaches NB8 and NB9 (Ponto Sewer) were constructed in 1974 and are approximately 1.6 miles in length. The last 1,000-foot section of the sewer before reaching the EWPCF was originally constructed as a 24-inch diameter siphon, but was replaced with a 48-inch diameter RCP (T-Lock Lined) gravity sewer as part of the EWPCF Phase III expansion in 1981. Ownership of Reaches NB8 and NB9 of the NBI (Ponto/Occidental Sewer) is stipulated in the Occidental-Carlsbad-Leucadia-Encinitas Agreement of 1972. Capacity ownership is identified as: 40.0 percent Carlsbad, 40.3 percent Leucadia and 19.7 percent Encinitas. Based on a full flow capacity of 21.3 mgd for the 39-inch diameter pipeline section; the peak flow capacity for Carlsbad is approximately 8.5 mgd. Costs for operation and maintenance of the Ponto Interceptor are shared in the same percentages, with Carlsbad named as the agency responsible for management of maintenance. These reaches were rehabbed in 2013, including manhole rebuilds and included installation of approximately 700 LF of CIPP liner.

The upstream portion of the NBI that conveys only City of Carlsbad flows is approximately 5.9 miles in length. The interceptor sewer ranges in size from 15 to 48 inches in diameter, and is primarily constructed of VCP, with some T-lock lined RCP. The NBI serves all of LFMZs 9 and 19, most of LFMZ 21, and portions of LFMZs 4, 6, 20 and 22. Improvements to the NBI were completed in 2011, which included rehabilitation of manholes in Reaches NB 1 to NB6. Currently, the City of Carlsbad is planning a project to provide improved access to the NBI. Feedback from contractors indicates that access to the NBI for the purposes of cleaning and CCTV is currently difficult to nonexistent.

Figure 2-7. North Batiquitos Interceptor



2.4 Interagency Agreements

Wastewater collection systems operate primarily on a gravity flow basis. However, political boundaries are not always established to match natural drainage contours. As a result, some portions of a given service area may drain across district boundaries, away from the remainder of the gravity collection system. Interagency agreements are developed to allow the wastewater flows to be conveyed into the collection system of an adjacent district or agency.

The City jointly owns capacity in most of the interceptors with upstream sewer agencies, as described in Section 2.3. The joint ownership agreements are summarized in Table 2-6 and are included in Appendix A, Interagency Agreements. The active agreements date back to 1972. Since 1972 some of the agency and interceptor names have changed. To clarify, the agencies involved in the agreements include:

- City of Carlsbad
- City of Vista
- Buena Sanitation District (BSD)
- Leucadia Wastewater District (LWD), formerly known as the Leucadia County Water District
- Vallecitos Water District (VWD), formerly known as the San Marcos Water District
- Encinitas Sanitary District (ESD)

The interceptors included in the agreements include:

- Vista Carlsbad Interceptor (V/C)
- Buena Interceptor (BIS), formerly known as the Encina Outfall
- Vallecitos Interceptor (VIS), formerly known as the Palomar Joint Land Outfall
- Ponto Sewer, part of the North Batiquitos Interceptor (NBI), formerly known as the Occidental Sewer.

Table 2-6. Interagency Agreements for Sewer Interceptors

Interceptor	Joint Agency	Agreement Name	Agreement Date
V/C	City of Vista	Agreement for Ownership, Operation and Maintenance of the V/C Sewer	February 26, 2002, Amended June 11, 2013 and May 20, 2014
	City of Oceanside	Agreement for Transferring Oceanside flows to the V/C	October 24, 1984
BIS	BSD	Agreement between BSD and City of Carlsbad for capacity in the Buena Outfall Agreement between BSD and City of Carlsbad for construction, operation, and maintenance of BIS odor control facility	December 15, 1981 June 11, 2015
VIS	VWD, City of Vista	Palomar Joint Land Outfall Interceptor Interagency Agreement	January 8, 1985
NBI	LWD, ESD	Occidental-Carlsbad-Leucadia-Encinitas Agreement in Regard to Construction of Sewer Pipeline South from EWPCF	August 24, 1972

Notes:
BIS=Buena Interceptor; BSD=Buena Sanitation District; ESD=Encinitas Sanitary District; EWPCF=Encina Water Pollution Control Facility; LWD=Leucadia Wastewater District ; NBI=North Batiquitos Interceptor; V/C=Vista/Carlsbad Interceptor; VIS=Vallecitos Interceptor; VWD=Vallecitos Water District

In addition to the interagency agreements for the interceptors, the City of Carlsbad has secured agreements with adjacent agencies to provide sewer service to several small, geographically isolated areas along the service area boundary. Several of these agreements have been terminated with the construction of gravity sewer line extensions.

- The Meadowlark Estates/Rancho Carrillo Sewer Flow Agreement dated March 24, 2000, provides for the transfer of wastewater flows from 80 residential units in VWD to Carlsbad. VWD wastewater flows are delivered to the Carlsbad collection system at Paseo Privado from a gravity pipeline constructed in an easement. The VWD flows are then conveyed to the Poinsettia LS and into the VIS.

2.5 Wastewater Treatment and Disposal

Wastewater generated within the CSSA is treated at the EWPCF. The EWPCF provides full secondary treatment, sludge handling, and disposal through a deep ocean outfall. The treatment levels meet current State and Federal requirements for secondary treatment. The EWPCF is owned and operated by the EWA, a joint powers authority made up of six northern San Diego County agencies, including the City of Carlsbad.

The EWA maintains a 10 member Board consisting of council members or directors from each of the member agencies. The EWA operates and maintains the EWPCF (Unit I) and the ocean outfall (Unit J) through an agreement known as the Revised Basic Agreement (RBA), most recently amended in October 2014.

In addition, the City of Carlsbad owns a water reclamation facility that diverts secondary effluent from disposal via the EWPCF Ocean Outfall to produce recycled water for local irrigation use.

2.5.1 Encina Water Pollution Control Facility

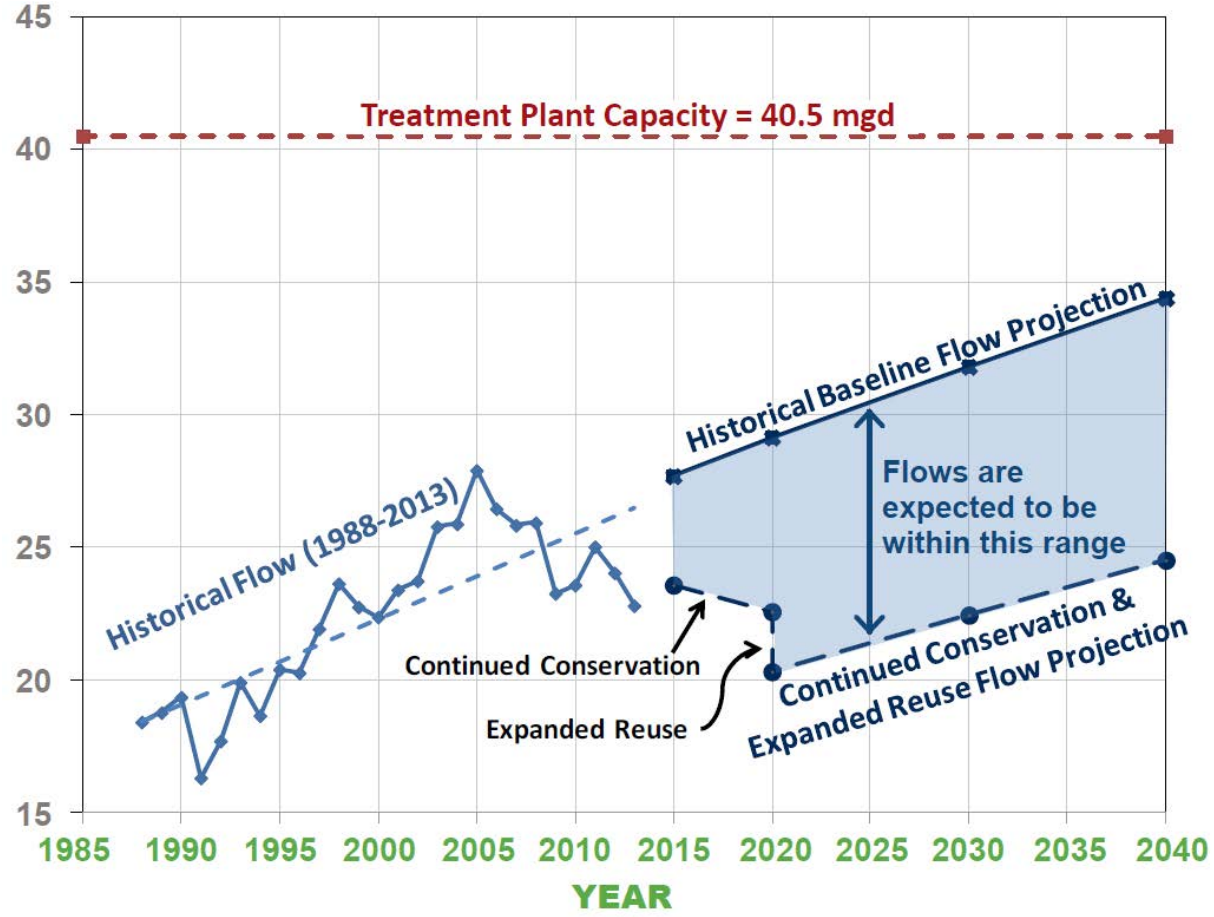
EWA's state-of-the-art treatment facility is designed to treat wastewater to the secondary level. Most of the treatment plant's highly treated wastewater is discharged into the ocean through an outfall. Up to 5 mgd of water is recycled for onsite use, while up to 7 mgd of treated water can be sent to the Carlsbad Water Reclamation Facility (CWRF) for further treatment and reuse.

Treatment processes at the EWPCF include screening, grit removal, primary clarification, and treatment of activated sludge. The waste activated sludge is thickened and pumped to anaerobic digesters for stabilization. Biosolids are withdrawn from the digesters and are dewatered, dried and processed to produce biosolids pellets. The biosolids pellets are transported by truck and sold for reuse as biofuel or fertilizer. The energy management system maximizes on-site power generation to reduce outside energy dependence. The dryer and engine-generators can be fueled by biogas or natural gas, and recovered heat is used to heat the sludge in the anaerobic digesters.

There have been five major expansions to the EWPCF in its 45 years of operation. In 1995, EWA purchased 37 acres adjacent to the southern boundary of the EWPCF to provide for future facility needs. The Phase V Expansion Project was completed in December 2009, increasing treatment capacity to 40.51 mgd. The project included new 43.31 mgd biosolids handling and energy management facilities, plus miscellaneous site and process improvements. The difference in the treatment and biosolids handling capacities accounts for the additional sludge disposed back to the sewer system from upstream Meadowlark Water Reclamation Plant, owned and operated by VWD.

In 2014, EWA completed its 2040 Master Plan for the EWCPF. Based on their projections, shown on Figure 2-8**,** the EWPCF will have sufficient liquid and solids treatment capacity beyond the planning horizon. Influent flow trends will continue to be monitored annually and capacities addressed accordingly.

Figure 2-8. Encina Water Pollution Control Facility Annual Average Flows and Treatment Capacity



Source: 2040 Master Plan (EWA 2014)

Each EWA member agency has capacity ownership in the EWPCF and the ocean outfall system as established in the RBA. In this agreement, treatment facilities are referred to as Unit I, and the ownership is broken down into liquid and solids handling portions. The ocean outfall system is referred to as Unit J. The February 2000 RBA established capacity rights based on the EWPCF Phase IV expansion. Carlsbad's Phase IV ownership capacity was 9.24 mgd (average flow) for treatment, and 25.51 mgd (peak flow) in the outfall. These capacity rights were updated for the Phase V capital Improvements per the provisions of Exhibit D to the RBA, which was added in 2004, and included a 1.02 mgd increase in capacity for Carlsbad.

The Phase V required ownership percentages based on projected wastewater flows for each agency are provided in Table 2-7. The footnotes in Table 2-7 include provisions added in the October 2014 amendment of the RBA, a copy of which is included in Appendix A.

Table 2-7. Encina Water Pollution Control Facility Phase V Capacity Ownership[1,2,3]

Encina Member Agency	Unit I - Treatment		Unit J - Outfall		Solids	
	2025 Ownership (%)	2025 Capacity (mgd)	2025 Ownership (%)	2025 Capacity (mgd)[4]	2025 Ownership (%)	2025 Capacity (mgd)
Carlsbad	25.33	10.26	23.69	10.26	23.69	10.26
Vista	26.34	10.67	24.64	10.67	24.64	10.67
VWD	18.93	7.67	24.17	10.47	24.17	10.47
LWD	17.55	7.11	16.42	7.11	16.42	7.11
BSD	7.41	3.00	6.93	3.00	6.93	3.00
Encinitas	4.44	1.80	4.16	1.80	4.16	1.80
Total	**100**	**40.51**	**100**	**43.31**	**100**	**43.31**

Notes:

[1] Based on the RBA for Ownership, Operation and Maintenance of a Joint Sewage System, as amended on October 22, 2014, Section 9.

[2] Member agencies agree to make available up to 5 percent of their respective shares of total capacities through a reserve capacity pool. When any member agency's flows exceed 100% of its capacity allocation for the treatment of solids, and/or treatment and/or disposal of liquids, for any continuous 3-month period, such member agency shall pay for the use of such capacity from the reserve capacity pool.

[3] If at any time a member agency commits to provide future sewer service which, when added to its then existing actual flows, equals 95% of its allocated capacity plus 40% of the Total Reserve Capacity, such agency shall immediately halt the acceptance or issuance of any building permits, letters of availability, certificates or other entitlements for use which represent that sewer capacity is the agency to provide future sewer service, and notify EWA of its proposed mitigating actions.

[4] The total disposal capacity of Unit J shall be 43.31 mgd average daily flow. This capacity rating assumes that the wet weather peaking factor on the flows to Unit J shall continue to be less than 2.76, and all the parties hereto agree to make good faith efforts to ensure that the wet weather peaking factor on the flows to Unit J remains below 2.76.

mgd=million gallons per day

Effluent from the EWPCF is discharged to the Pacific Ocean through the Encina Ocean Outfall or delivered to the 4.0 mgd Carlsbad Water Recycling Facility or LWD's 1.0 mgd Gafner Water Reclamation Plant for further treatment to produce recycled water for irrigation. These facilities are further described in the following section.

The Encina Ocean Outfall system includes flow equalization facilities, which were upgraded in 2005, the effluent pump station, and the outfall. If influent flows exceed the hydraulic capacity of the outfall, the excess secondary effluent can be pumped to the flow equalization facilities. When flow rates fall to within acceptable levels, the stored effluent flows by gravity back to the outfall. The equalization allows the plant to pass high flows associated with storm events at a flow rate greater than the hydraulic capacity of the downstream outfall.

The Encina outfall extends along the ocean floor to a point 1.5 miles off shore, at a depth of over 150 feet. The outfall pipeline consists of two individual sections, including the original 48-inch, 6,600-foot outfall constructed in 1965 and the 72-inch, 2,300-foot extension constructed in 1973. The outfall extension project also added an 800-foot diffuser system to the end of the outfall. The current capacity of the Encina Ocean Outfall

is estimated to be approximately 75 mgd. It is noted that the reported PWWF capacity of the outfall takes into account the flow equalization facilities.

2.5.2 Carlsbad Water Reclamation Facility

The CWRF is located adjacent to the EWPCF site. Secondary effluent from the EWPCF is conveyed to the CWRF where it undergoes additional treatment to produce up to 7.0 mgd of disinfected tertiary recycled water that meets Title 22 of the California Administrative Code for “unrestricted non-potable reuse.” The CWRF is owned by the Carlsbad Municipal Water District and operated under contract by EWA through a memorandum of understanding dated May 1, 2005. Under the 2014 RBA, discussed in the previous section, any member agency of EWA, at its own expense, has the right to reclaim water from any wastewater in the Joint System which emanates within the jurisdiction of the respective member agency.

CWRF was designed and constructed in 2005 to produce up to 4.0 mgd. The CWRF’s capacity was expanded to 7.0 mgd in 2016. The goals of the expansion were to increase filtration reliability, enhance operational flexibility, and improve stored recycled water quality. The CWRF currently operates under a master recycling permit from the San Diego Regional Water Quality Board, Order Number R9-2016-0183.

The CWRF utilizes granular media filtration and membrane microfiltration for filtration of secondary effluent from the EWPCF to comply with Title 22 of the California Administrative Code for “unrestricted non-potable reuse.” The CWRF expansion included the addition of three pressurized ultrafiltration skids to produce 3.4 mgd of additional filtrate flow, the addition of a second chlorine contact basin to double the disinfection capacity, and replacement of alum and polymer metering pumps to increase coagulant feed capacities.

Recycled water produced at the CWRF is conveyed throughout the City of Carlsbad via a non potable water distribution system, supplying non potable water customers, primarily for irrigation use.

3 Wastewater Flows

As population has grown and the northern coastal areas of San Diego County continue to develop, Carlsbad has experienced gradually increasing wastewater customers due to growth, but diminished flows due to region-wide water conservation efforts. This section documents existing wastewater flows within the sewer service area and results of the flow measurement program. Historical wastewater flows are summarized and unit flows are developed for residential and commercial/industrial areas. Peaking curves for each interceptor system and contributing upstream agency are developed for dry weather flows. Existing defect flows from rainfall-induced inflow and infiltration (RDII) are quantified based on historical events.

3.1 Existing Wastewater Flows

The EWA operates and maintains numerous flow meters throughout the service areas of its six member agencies for billing and informational purposes. The flow meters used for billing purposes are calibrated semi-annually. Flow data can be downloaded from a web-based, graphical information management system and monthly flow summary reports are provided to member agencies. Wastewater flows generated within the CSSA are metered in the interceptor pipelines upstream of the EWPCF. Figure 3-1 illustrates the locations of the Encina meters (permanent meters) that are used to calculate Carlsbad flows. Details of each Encina meter are provided in Table 3-1.

Table 3-1. Encina Flow Meters

Meter ID	Location	Meter Type	Metered Flow	
			Carlsbad	Other Agencies
V1 QC1 BVPS C3	Haymar Drive, Vista Haymar Drive, Vista Buena Vista LS Discharge V/C at EWPCF	ADS 3600 [1] Tigermag FlowShark ADS 3600 [1]	— Portions of Quarry Creek Portions of V/C V/C and NAHI	Vista and Oceanside — Vista and Oceanside (V1) Vista and Oceanside (V1)
B2 V2 B1	BSD Buena LS Discharge Vista Raceway LS BIS at EWPCF	FlowShark FlowShark ADS 3600 [1]	— — BIS	BSD Raceway Basin (Vista) BSD and Raceway (B2, V2)
VA1 C1	Vallecitos LS, Downstream VIS at EWPCF	FlowShark ADS 3600 [1]	— VIS	VWD VWD (VA1)
L1 C2	Batiquitos LS Discharge NBI at EWPCF	FlowShark ADS 3600 [1]	— NBI	LWD and Encinitas LWD and Encinitas (L1)

Notes:

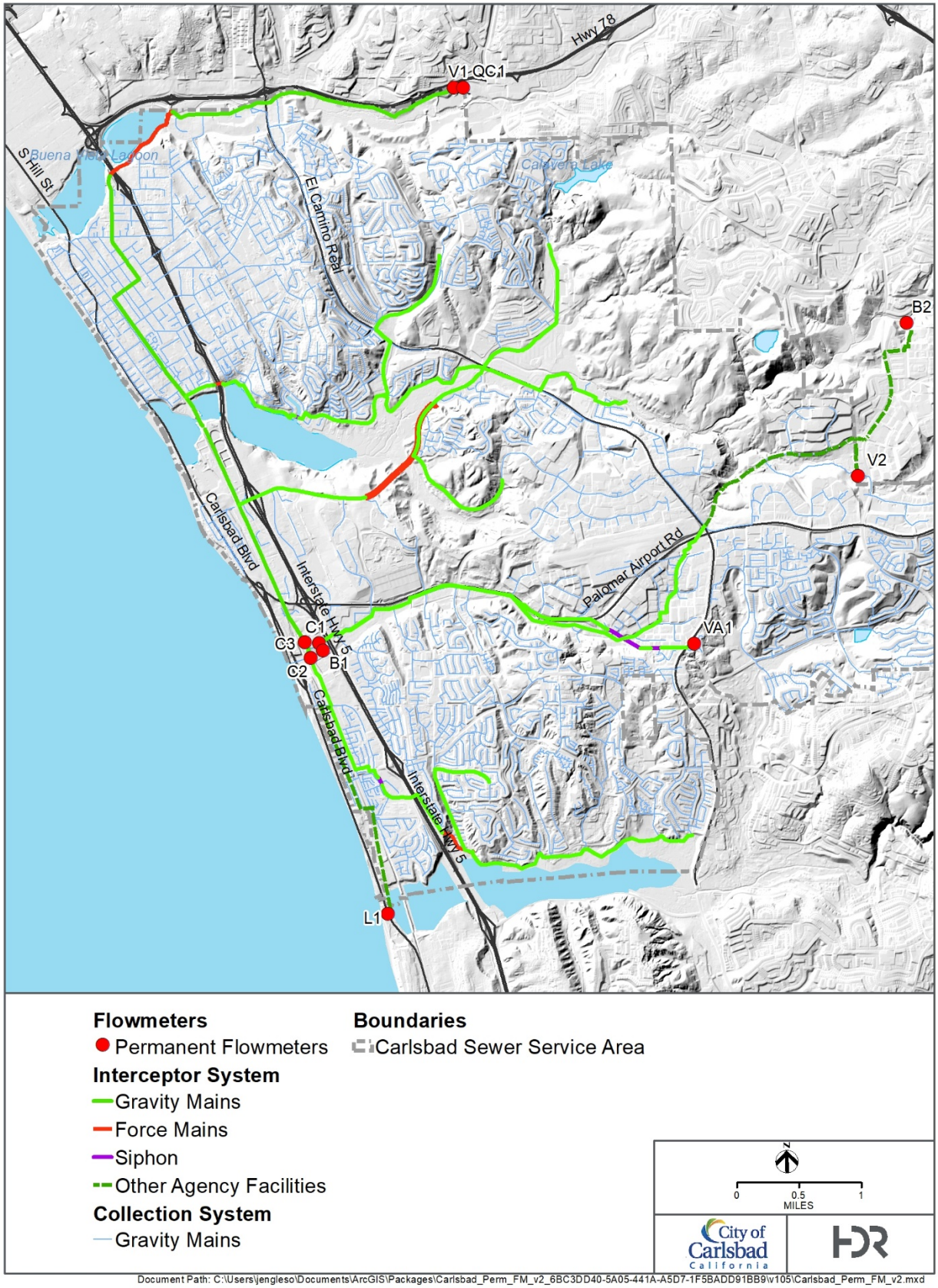
[1] Accuracy of Model 3600 meter is within plus/minus 5% under ideal flow conditions.

ADS= American Digital Systems; BIS=Buena Interceptor; BSD=Buena Sanitation District; EWPCF=Encina Water Pollution Control Facility; LS=lift station; LWD= Leucadia Wastewater District; NAHI= North Agua Hedionda Interceptor; NBI=North Batiquitos Interceptor; V/C=Vista/Carlsbad; VWD=Vallecitos Water District

Because of flow contributions from upstream agencies, Carlsbad flows must be determined by subtracting other agency flows from measured flows at the EWPCF, which increases the margin of error. The total flow from Carlsbad is calculated from the following formula:

Carlsbad Flow = (C3-(V1-QC1)) + (B1-(B2 + V2)) + (C1-VA1) + (C2-L1)

Figure 3-1. City of Carlsbad Encina Wastewater Authority Flow Meter Locations

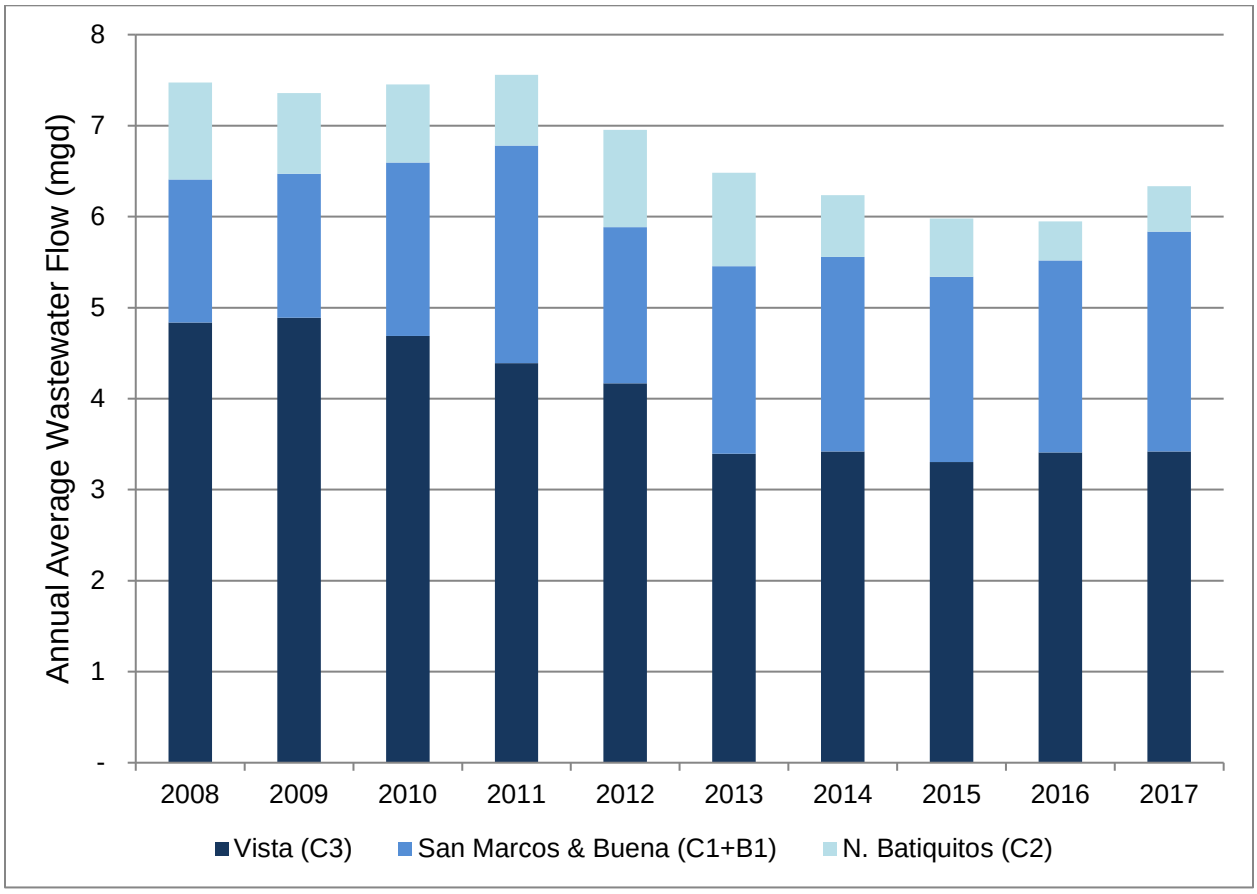


3.1.1 Historical Flows

Carlsbad average annual wastewater flows, as calculated from EWA meter data, are summarized for the past 10 years on Figure 3-2**.** As shown on the chart, wastewater flows have gradually decreased from 2008 through 2016, and started to rebound in 2017. This was typical of most Southern California sewer agencies, and can be attributed to a combination of economic recession and drought.

The economic downturn dramatically slowed new construction starting in 2009 through 2016. Additionally, statewide drought related water conservation measures went into effect in 2009 and again in 2015, with drought measures ending in 2016. Some of the conservation measures were temporary, but many, such as the installation of low-flow bathroom fixtures and high efficiency appliances, are projected to have a lasting effect. For the purposes of this Master Plan update, 2014 is used to reasonably represent existing system flows.

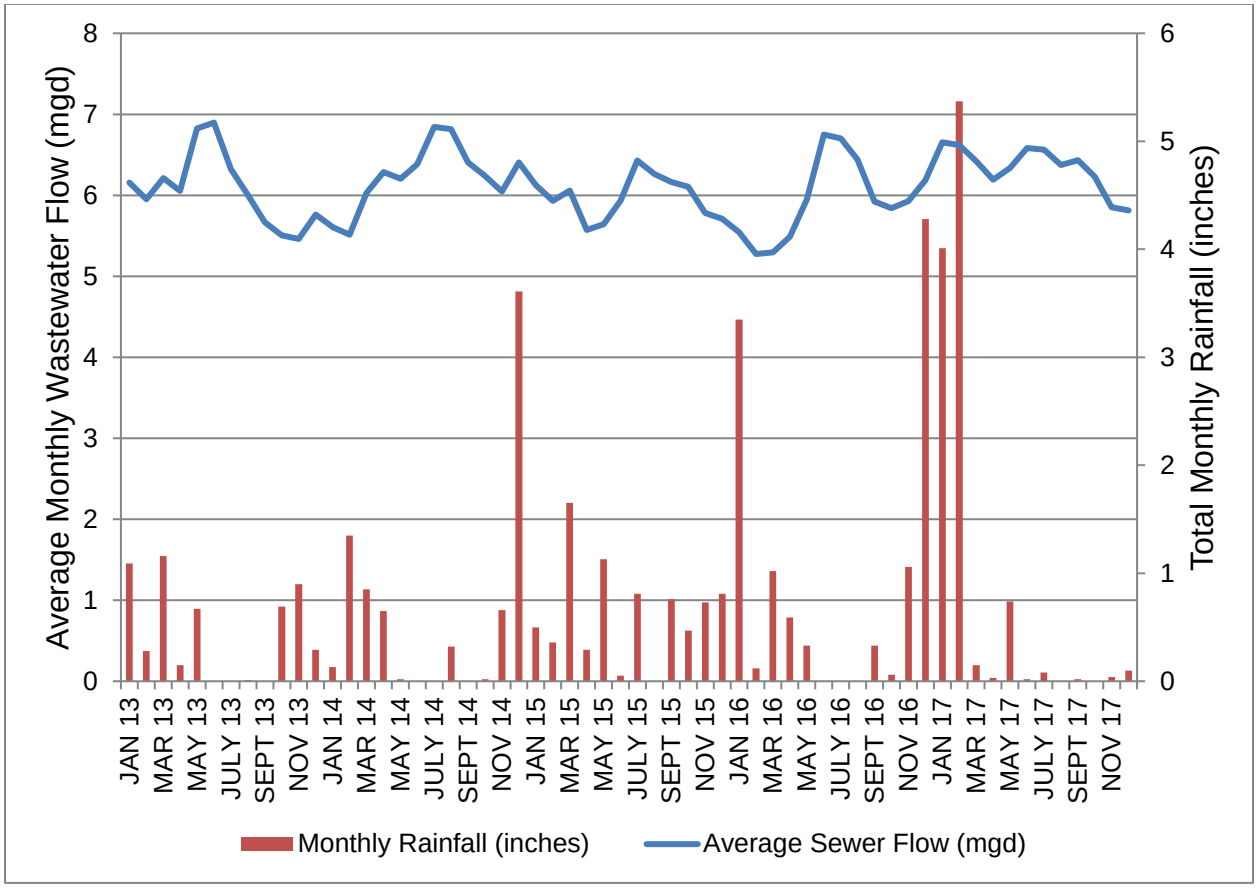
Figure 3-2. Historical Average Annual Wastewater Flows



Source: EWPCF Monthly Capacity Management Reports (2014-2017); EWA raw flow meter data (2008 -2013).

Daily wastewater flows for 2014 through 2017 were obtained from EWA's EWPCF Capacity Management Reports. Raw SCADA data from the permanent EWA flow meters was used to calculate flows for 2008 through 2013. Monthly historical flows are shown on Figure 3-3, along with corresponding monthly rainfall totals. Based on this data comparison, there does not appear to be a strong seasonal wet weather influence on wastewater flows from Carlsbad. Note also that, Carlsbad's wastewater flows during summer months exceed winter month flows, likely due to increased peak season occupancies at hotels and attendance at local entertainment venues, including LEGOLAND.

Figure 3-3. Monthly Wastewater Flows versus Rainfall

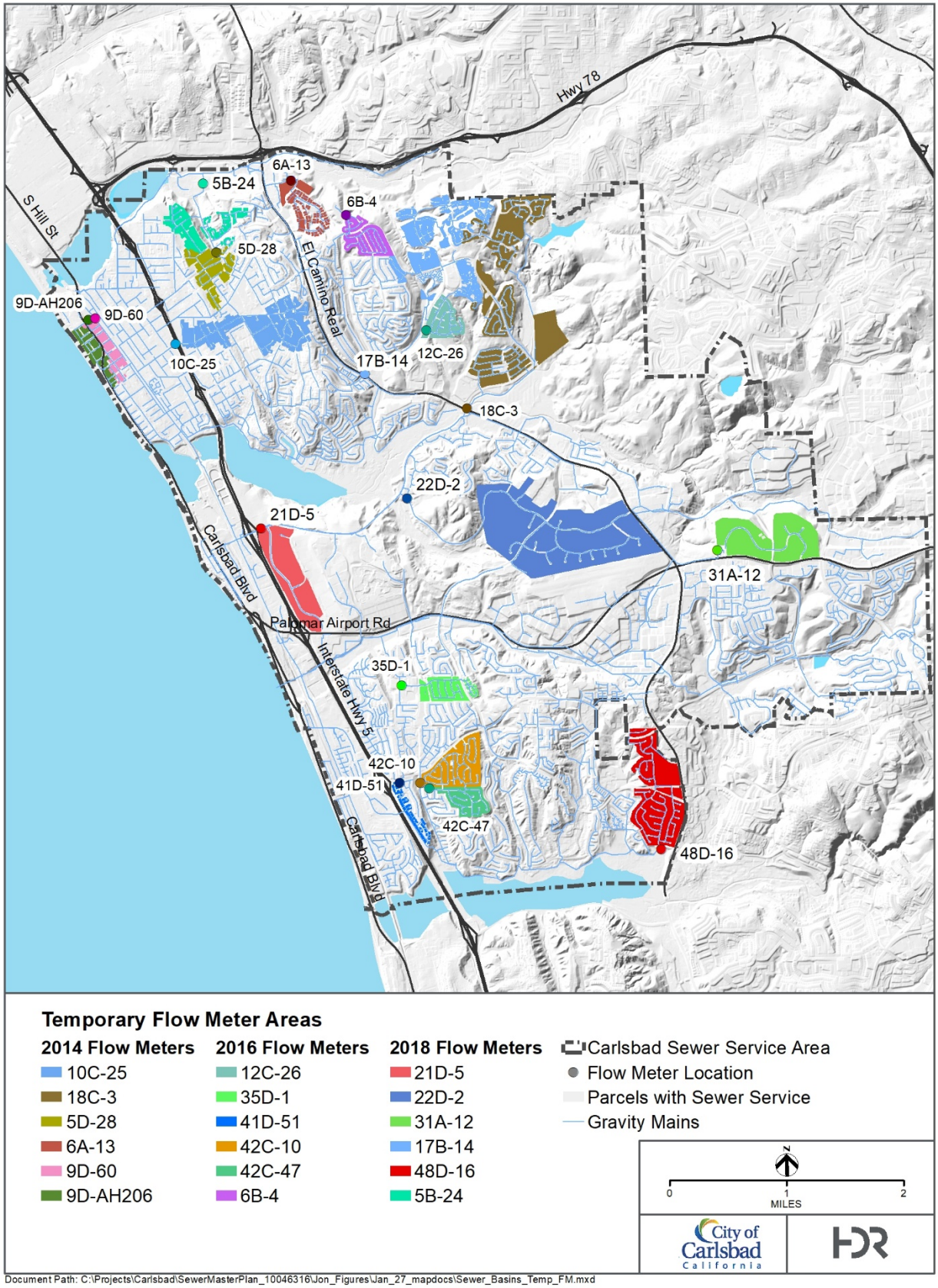


Source: EWPCF Monthly Capacity Management Reports (2014-2017); EWA raw flow meter data (2013); National Oceanic and Atmospheric Administration Monthly Totals for McClellan Palomar Airport Rain Gauge

3.1.2 Flow Monitoring

In 2014, 2016, and 2018, the City of Carlsbad contracted temporary flow metering studies for the sanitary sewer collection system. Each of the three flow studies installed meters at six different strategic locations for the purposes of characterizing flow rates and trends in specific areas of the system. The metered basins varied by size and most included a mix of residential and non-residential land use, although 2 meters measured purely non-residential flows from industrial/commercial business parks. The flow measurement locations and the approximate tributary basins are shown on Figure 3-4. No significant rainfall occurred during either the 2014 or the 2016 temporary flow monitoring periods.

Figure 3-4. Temporary Flow Meter Tributary Basins



The temporary meter data were used in conjunction with EWA meter data over the same period to characterize and quantify dry weather flows. Specifically, the flow measurements from all sites were analyzed to characterize the average dry weather flows (ADWF) and support dry weather hydraulic modeling. Figure 3-5 provides a flow schematic illustrating the flow routing through both the Carlsbad temporary meters and EWA permanent meters.

The temporary meters were used to monitor system flows from February 22, 2014 through May 11, 2014, from January 22, 2016 through March 27, 2016, and again from January 25, 2018, through March 26, 2018. Data were collected and recorded every 15 minutes during the monitoring period. None of these flow monitoring periods experienced rainfall sufficient to calculate RDII for the areas of the system monitored. The full reports for the flow measurement programs and analysis of the results are provided in Appendix B, American Digital Systems Temporary Flow Meter Reports. EWA flow meter data from the same flow measurement period were used to validate the hydraulic model, as discussed in Section 5.2.

Average Dry Weather Flows

ADWFs were calculated using a combination of EWA permanent flow meter data from 2014 and temporary flow meter data collected during the 2014 and 2016 temporary flow meter studies. ADWF were calculated based on data collected during dry days. Dry days are defined as those days where rainfall did not occur and in which there were no lingering effects of prior rainfalls. Table 3-2 summarizes the ADWF for Carlsbad and the other EWA agencies by interceptor. This information is illustrated graphically by interceptor system on Figure 3-6. From Figure 3-6, it is apparent that Carlsbad flows comprise a minority of the total flows in the Vista/Carlsbad, BIS, VIS, and NBI.

Table 3-2. Average Dry Weather Flow Summary

Interceptor System	Carlsbad Flows (mgd)	Other Agency Flows		Total Flow (mgd)
		Agency	Flow (mgd)	
Vista/Carlsbad	3.42	City of Vista City of Oceanside	4.59	8.01
BIS	0.83	City of Vista, BSD	2.38	3.21
VIS	1.31	VWD	2.92	4.23
NBI	0.68	LWD City of Encinitas	4.98	5.66
Total	**6.24**	**—**	**14.88**	**21.11**

Notes:
BIS=Buena Interceptor; BSD=Buena Sanitation District; LWD= ; mgd=million gallons per day; NBI=North Batiquitos Interceptor; VIS=Vallecitos Interceptor; VWD=Vallecitos Water District

Figure 3-5. Flow Measurement Schematic

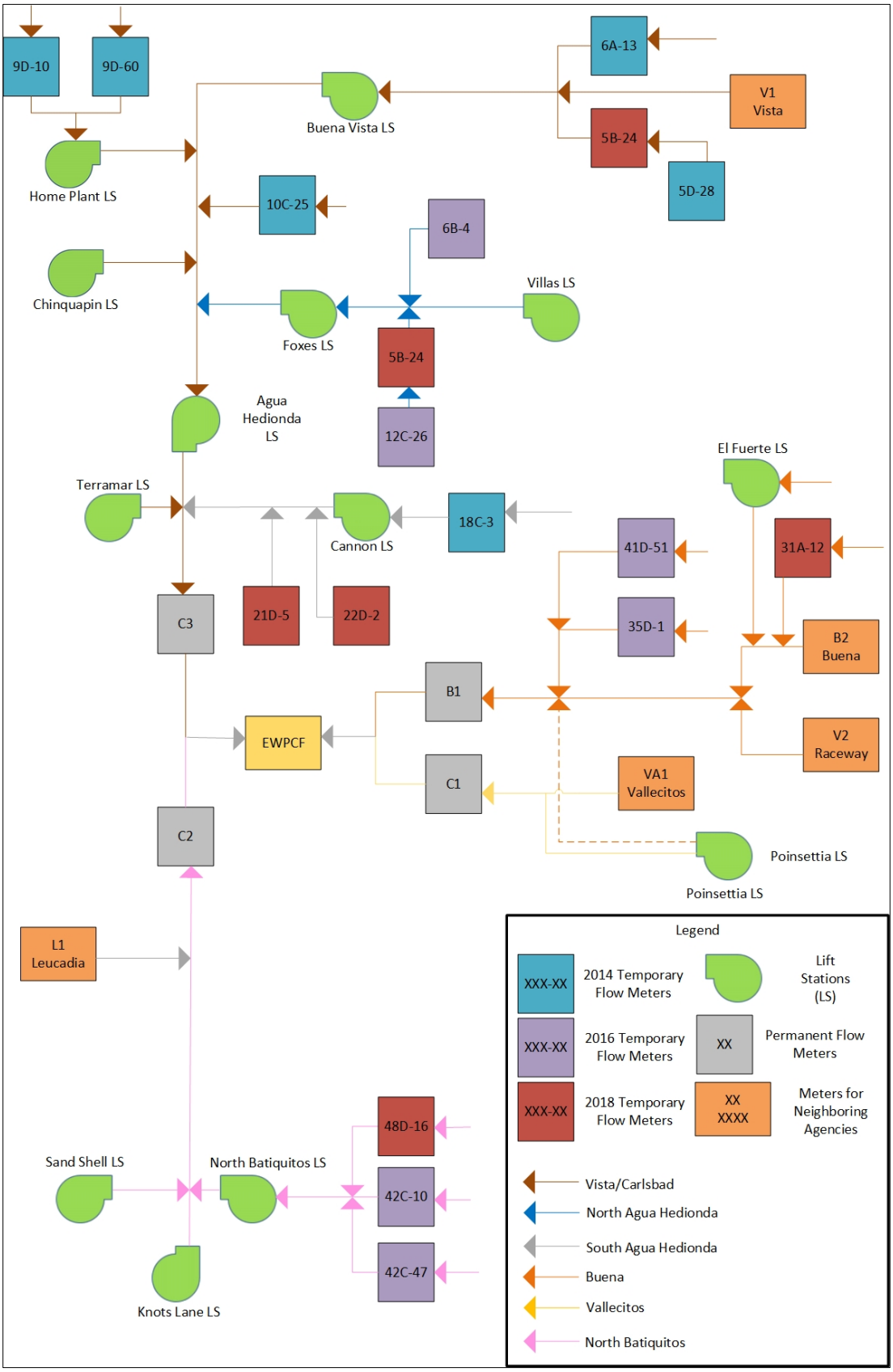
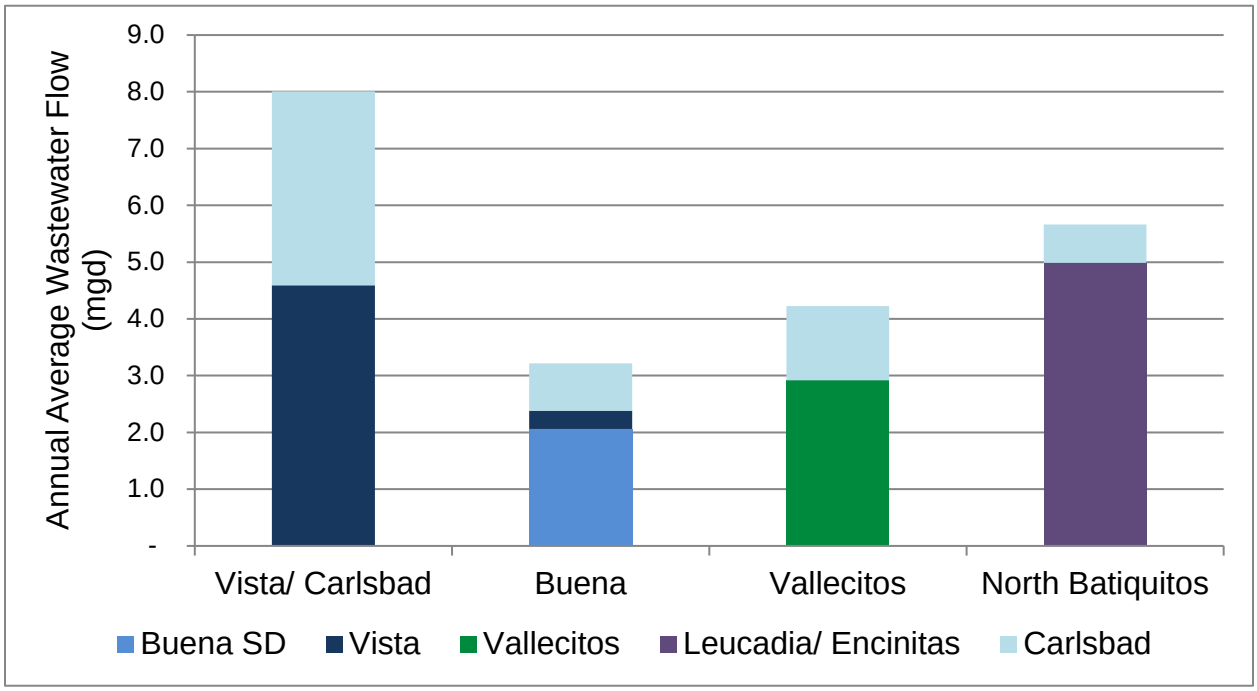


Figure 3-6. Flow Summary by Interceptor

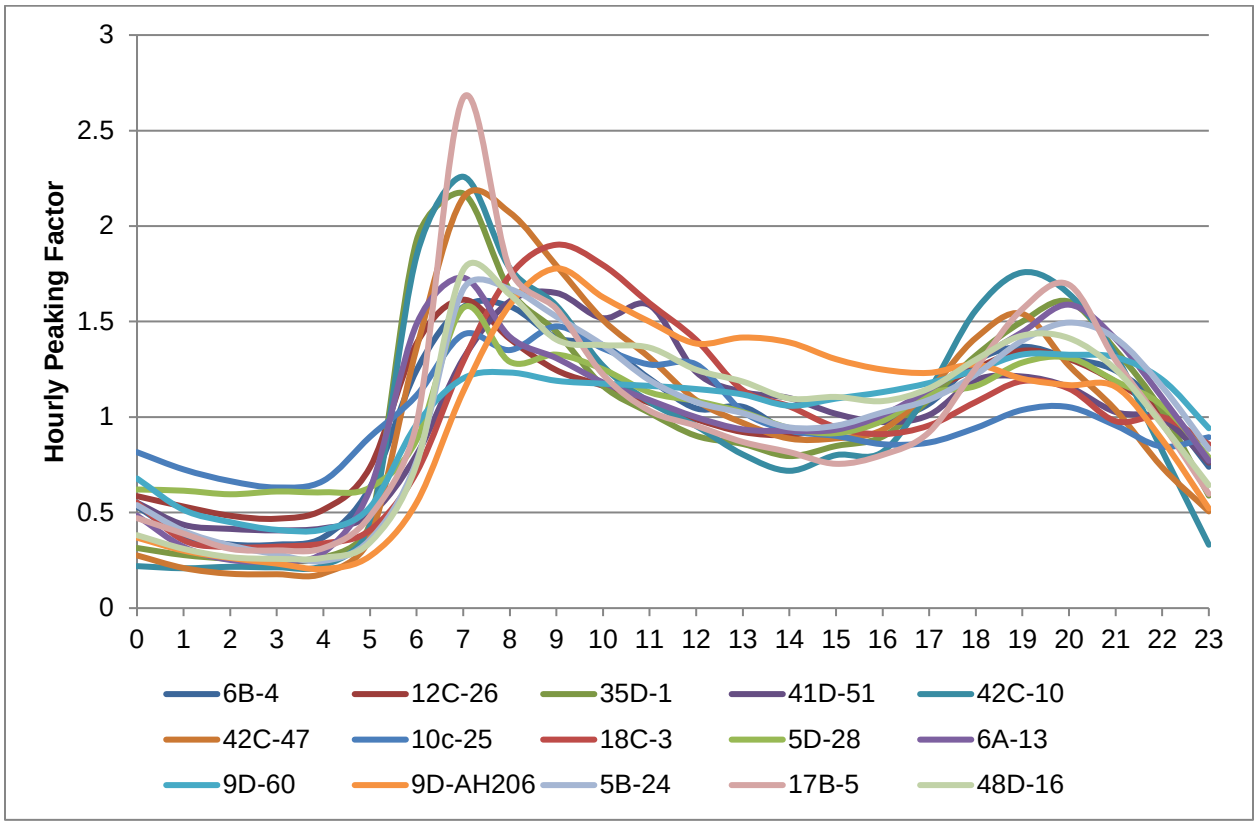


Peak Dry Weather Flows

Flow measurement data from the permanent EWA meters and temporary meters indicate distinct and repeatable flow patterns for weekday and weekend day conditions. In order to normalize the flow patterns for comparison, unitless diurnal curves were developed for each of the flow meters based on a series of calculated hourly peaking factors (HPF). HPF were calculated by averaging hourly flows for each hour of the day and dividing by the overall daily ADWF. The result is a HPF that can be applied to the ADWF to calculate the expected hourly flow. Diurnal curves consist of a series of 24 HPF representing each hour of the day, resulting in a unit flow pattern that can be applied to an ADWF value to calculate the expected flow rate and pattern. Diurnal curves were created for both weekday and weekend day conditions based on dry weather flow data at temporary flow meter sites. The peak dry weather flow is the maximum HPF times the average daily flow for that basin.

Figure 3-7 illustrates typical residential flow characteristics including an early morning and mid-evening peak, with the highest peak generally occurring between the hours of 7 and 9 a.m.

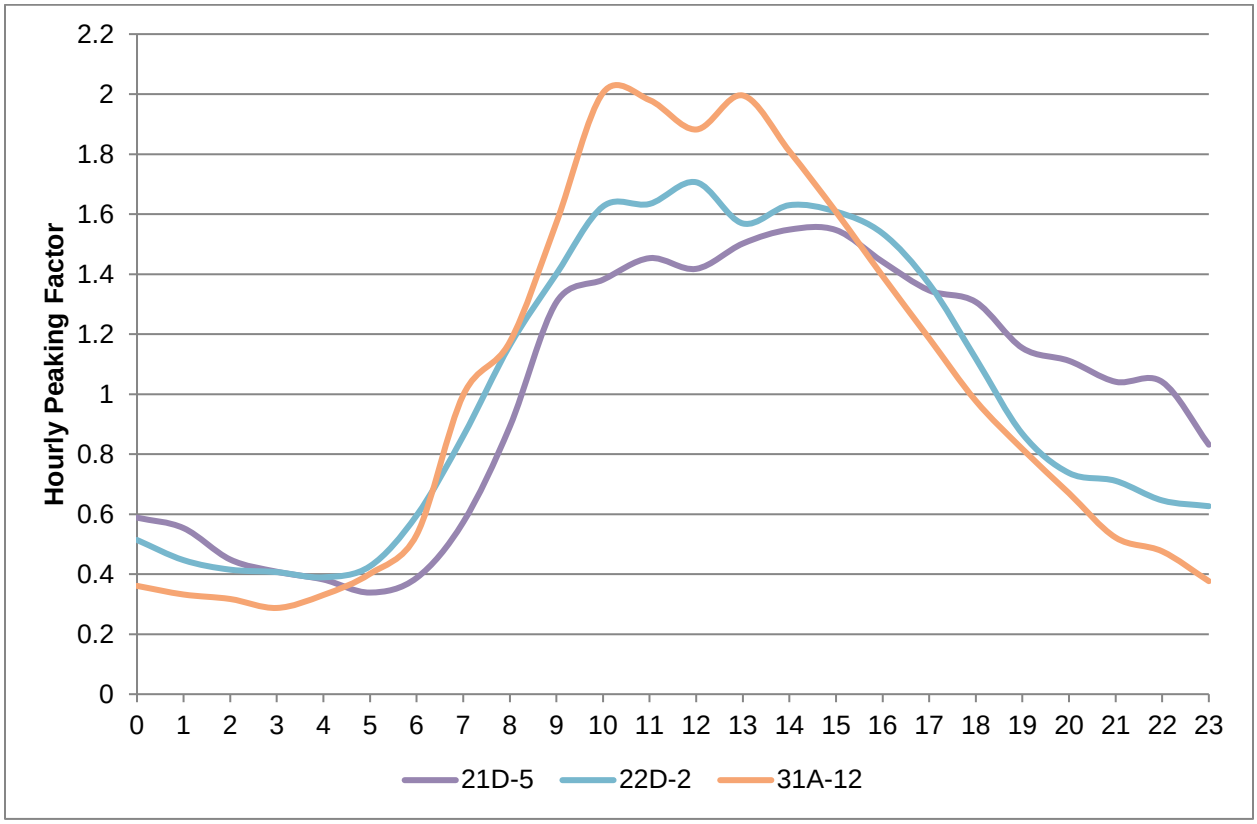
Figure 3-7. Diurnal Patterns for Primarily Residential Area Temporary Meters



Source: Weekday ADWF

Figure 3-8 illustrates typical commercial/ industrial flow characteristics including midday peaks.

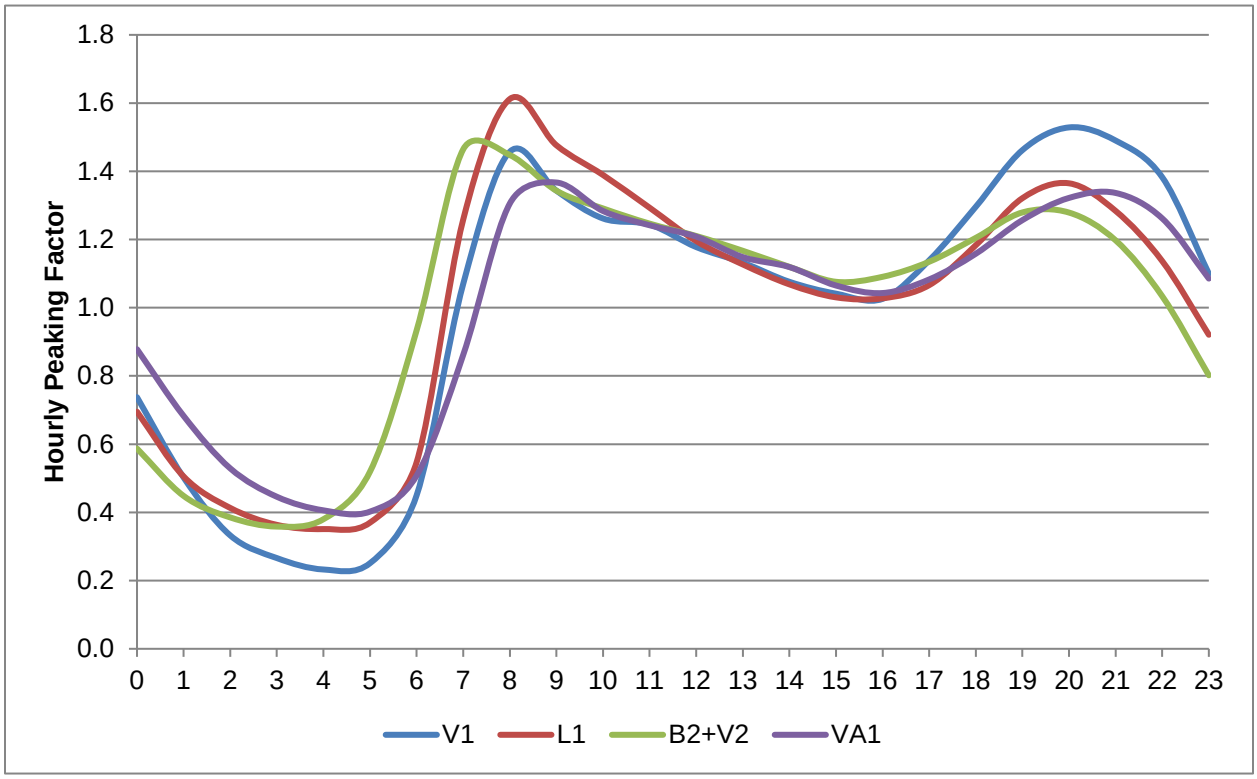
Figure 3-8. Diurnal Patterns for Primarily Non-Residential Area Temporary Meters



Source: Weekday ADWF

Hydrographs for upstream agency weekday flows recorded by Encina meters are shown on Figure 3-9. Based on the diurnal curves, these flows appear to be dominated by residential type users, which is typical of municipal collection systems.

Figure 3-9. Hourly Flow Factors for Upstream Agencies (Weekday Average Dry Weather Flow)



Source: Weekday ADWF

3.1.3 Inflow and Infiltration

RDII is the combination of direct storm inflow and wet weather infiltration that establishes the maximum required hydraulic capacity of wastewater conveyance facilities.

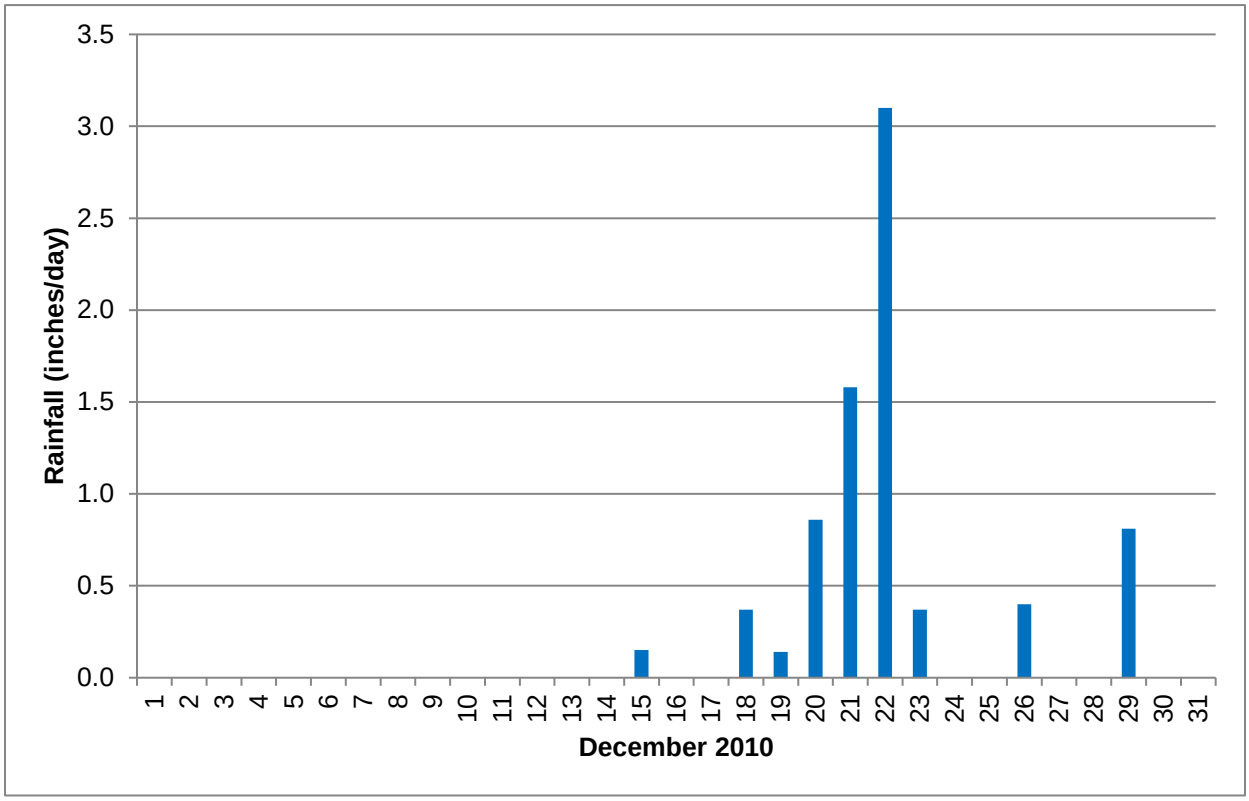
Inflow in a collection system generally refers to extraneous water that flows directly into the system as a result of storm water runoff. Entry points may be at manholes or from illicit connections to the sewer system, such as roof and yard drains. The primary characteristics of inflow are the rapid response to the onset and cessation of rainfall. The rate of inflow depends on the amount and intensity of rainfall and the ground saturation level.

Infiltration enters the collection system underground through holes, cracks and leaky pipe or manhole joints, due to either a permanently high groundwater table or as a result of rainfall percolation and temporary rising of groundwater levels. While the amount of infiltration from rainfall events can be estimated from an evaluation of flow data and rainfall records, infiltration that occurs year-round can typically only be detected from pipeline video inspection or manhole inspections. The presence of excessive amounts of infiltration indicates broken or poorly constructed pipes, pipe joints, or manholes in areas with high groundwater elevations.

Wet weather flow loading was updated based on the most recently available wet weather flow data for a significant rainfall event. Because Southern California experienced drought conditions for most of the past decade, the most recent significant recent rainfall event occurred in December 2010. Flow data during this rainfall event was collected by EWA flow meters. Although one of the EWA flow meters (C2) was offline for maintenance during the rainfall event, flows for this meter were back calculated using EWPCF inflows.

Daily rainfall for December 2010 for the McClellan Palomar Airport rain gauge is shown on Figure 3-10. Based on the rain gauge data, December 22, 2010, experienced approximately 3.10 inches of rainfall, which is approximately equivalent to a 10 year 24 hour storm. December 22 was selected as the basis for PWWFs. Flow data from December 22 plotted together with the 24-hour average flow curves, is provided in Appendix C-2.

Figure 3-10. December 2010 Wet Weather



Source: National Oceanic and Atmospheric Administration Daily Totals for McClellan Palomar Airport Rain Gauge

Inflow and Infiltration within Carlsbad

EWA flow meter data for the December 2010 rainfall event were analyzed to provide estimates of RDII rates within the monitored sub-basins. In each of the sub-basins there is a wide variation in the total drainage area and upstream length of pipe. To make a comparison between basins, the flows were normalized or standardized by dividing the calculated RDII by the length of upstream pipe and dividing by the total rainfall. This provides an RDII volume per foot of pipe per inch of rainfall. Basin unit RDII rates, or defect flows, may then be used as the basis of determining which basin is the leakiest

during the flow measurement period. Table 3-3 indicates the relative ranking of RDII observed during the flow measurement period.

Table 3-3. Metered Basins Ranked by Rainfall-Derived Inflow and Infiltration Rates

Rank	Basin	Meter[1]	Defect Flow Volume (gallon/feet/inch)	
			24 hour	72 hour
1	Vallecitos	= C1 - VA1	6.3	12.8
2	North Batiquitos	= C2 - L1	4.6	7.9
3	Vista/Carlsbad	= C3 - V1	1.4	2.5
4	Buena	= B1 - B2 - V2	0.9	1.7

Sources: EWA flow meter data, National Oceanic and Atmospheric Administration Daily Totals for McClellan Palomar Airport Rain Gauge

Notes:

[1] See Figure 3-1 for meter locations.

The highest ranked RDII response was observed in flows loaded to the VIS downstream of the VA1 meter. The source of this RDII could be either the Carlsbad collection system area tributary to the C1 meter or the VIS itself.

The second ranked RDII response was observed in flows loaded to the NBI. The source of this RDII is probably the Carlsbad collection system area tributary to the C2 meter since the flows metered at L1 are delivered to the NBI via forcemain which is not affected by RDII. Parts of this area of the Carlsbad collection system are near the Batiquitos Lagoon and coastal areas that could be more susceptible to RDII.

The third ranked RDII response was observed in flows loaded to the V/C downstream of the V1 flow meter. The source of this RDII could be either the Carlsbad collection system area tributary to the C3 meter or the Vista/ Carlsbad Interceptor itself. Parts of this area of the Carlsbad collection system are near the Buena Vista Lagoon, the Agua Hedionda Lagoon, and coastal areas that could be more susceptible to RDII.

The fourth ranked RDII response was observed in flows loaded to the BIS downstream of the V2 and B2 flow meters. The source of this RDII could be either the Carlsbad collection system area tributary to the B1 meter or the BIS itself. However, the RDII observed in this basin were significantly less than the RDII response observed in the rest of the system.

Upstream Agency Inflow and Infiltration

EWA flow meter data from December 2010, shown in Table 3-4, were analyzed to estimate peak RDII rates from upstream agencies to the four interagency interceptors in the system.

Results of the RDII investigation indicate high RDII flow rates to the V/C from the City of Vista area tributary to EWA meter V1. In past investigations wastewater flows from Vista were observed to remain elevated for several months after periods of heavy rainfall indicating infiltration from high groundwater levels, although high infiltration rates were

not apparent during the December 2010 rainfall event. The RDII analysis used in the 2017 City of Vista Sewer Master Plan Update are also based on the December 2010 rainfall event.

The highest rate of RDII from upstream agencies was observed from the VWD collection system to the VIS (EWA meter VA1). After the rainfall event in December 2010, flows from VA1 took nearly 3 weeks to return to prior base flow levels. This indicates that the Vallecitos collection system is subject to widespread infiltration defects. The peak RDII rate from the December 2010 rainfall event is estimated at 13.4 mgd, and wastewater flows during this event exceeded VWD's peak flow capacity ownership of 12.1 mgd for the days of December 21-22, 2010.

Outside agency flows to the BIS are monitored by the EWA meters V2 and B2. Meter V2 monitors flows from the City of Vista Raceway service area. Meter B2 monitors flows from the Buena Creek Pump Station. Flows analyzed from EWA meters B2 and V2 indicate a combined peak RDII flow rate to the BIS of approximately 6.8 mgd on December 22, 2010.

Flows analyzed from EWA meter L1 indicate a peak RDII rate to the NB Interceptor of approximately 6.5 mgd on December 22, 2010. The LWD 1999 Master Plan assumes a peak PWWF rate of 5.3 mgd for the ultimate flow condition. Because the measured RDII from LWD and the City of Encinitas through the L1 meter is higher based on more recent flow data, a peak RDII rate of 6.5 mgd will be assumed for this Master Plan.

Table 3-4. Peak Hourly Rainfall-Induced Inflow and Infiltration Flow Rates from Upstream Agencies

Interceptor	Inflow Meter	Upstream Agency	Peak RDII Flow Rate (mgd)
VIS	VA1	VWD	13.4
Vista/ Carlsbad	V1	City of Vista City of Oceanside	11.4
BIS	V2, B2	City of Vista BSD	6.8
NBI	L1	LWD City of Encinitas	6.5

Source: EWA flow meter data December 22, 2010

Notes:
BIS=Buena Interceptor; BSD=Buena Sanitation District; LWD=Leucadia Wastewater District; mgd=million gallons per day; NBI=North Batiquitos Interceptor; VIS=Vallecitos Interceptor; VWD=Vallecitos Water District

3.2 Flow Generation Factors

Flow generation factors were estimated based on available information including planning information discussed in Section 1.3 and the flow meter data discussed in Section 3.1. Two primary approaches were used to estimate flow generation factors including a focused, land use based unit flow study approach using data from the temporary flow meter studies to estimate generation rates for specific land use types in homogenous areas of the system isolated by the temporary flow meters. Additionally, a

system-wide approach was used based on data from the permanent EWA flow meters that developed average unit flow generation rates for the entire CSSA as well as the three major interceptor basins. Finally, planning level flow generation factors were developed based on the results of these flow studies.

3.2.1 Land Use Specific Unit Flow Studies

Unit flow studies were conducted for residential and commercial/ industrial land use areas based on temporary flow meter data to characterize the magnitude of flow that could be expected from future developments. Temporary flow meter locations were chosen for each the residential and commercial/ industrial unit flow studies based on the land use designations of the properties in the area tributary to the meters. Homogeneous residential or commercial/ industrial areas were desired in order to characterize the flow for each study without interference from other land use types. The following subsections discuss the unit flow studies performed.

Residential Unit Flow Study

A unit flow factor analysis was conducted with wastewater flow data to determine flow generation factors for use in future residential unit flow projections. Land use in the upstream collection areas was reviewed for all temporary meters. The meter selected for the residential unit flow study was meter 6B-4, which was monitored as part of the 2016 temporary flow meter study.

Meter 6B-4 was located in Vancouver Street near Hidden Canyon Community Park. The tributary area is 100 percent residential and serves 227 detached single family units. The residential properties in the tributary area total approximately 49 acres with lot sizes ranging from 0.15 to 0.79 acres. Average dry weather flow for this area we recorded to be approximately 34,500 gallons per day (gpd) per the 2016 flow monitoring study.

Wastewater flow meter data was compared and verified with water billing data over the same flow metering period. Water billing data indicated a total potable demand of approximately 62,400 gpd for the tributary area during the flow monitoring period. Compared with the average metered flow for the area during this time period results in a return to sewer rate of approximately 55 percent which is within the range expected for detached single family homes with yards.

Average unit flow factors within the tributary area were then determined from non-rain days and number of residential units within the service area. Unit flows per acre were calculated to be approximately 700 gpd/ acre. Unit flows per single family residence were calculated to be approximately 152 gpd/ equivalent dwelling unit (EDU). Unit density was calculated to be 4.6 EDU/ acre.

The parameters and calculation results for this unit flow study are summarize in Table 3-5. The flow generation rates used for planning are discussed in Section 3.2.3.

Table 3-5. Residential Unit Flow Analysis

Parameter	Value	Unit
Single Family Residential Parcels[1]	227	EDU
Single Family Area[1]	49	acres
Flow from Temporary Meter Data[2]	34,472	gpd
Water Demands[3]	62,363	gpd
Return to Sewer	55	%
Unit Flow per Acre	705	gpd/acre
Unit Flow per EDU	152	gpd/EDU
Dwelling Unit per Acre	4.6	EDU/acre

Notes:
[1] Source: SANDAG Series 13 Planned Land Use shapefiles (10/2/2014)
[2] Source: City of Carlsbad Sewer Flow Verification Study January 2016
[3] Source: Carlsbad Municipal Water District 2016 Water Billing Database
EDU=equivalent dwelling unit; gpd=gallons per day

Commercial/Industrial Unit Flow Study Studies

A unit flow factor analysis was conducted with wastewater flow data to determine flow generation factors for use in future commercial/ industrial unit flow projections. Land use in the upstream collection areas was reviewed for all temporary flow meters. The meter selected for the commercial/industrial unit flow study was meter 31A-12, which was monitored as part of the 2018 temporary flow meter study.

Meter 31A-12 was located in a parking lot in the northwest corner of Palomar Airport Road and Loker Avenue. The tributary area for this meter includes the businesses located off Loker Avenue. This area is 100 percent commercial/ industrial including primarily light industrial and office buildings totaling approximately 146 acres. Average dry weather flow for this area we recorded to be approximately 40,600 gpd per the 2016 flow monitoring study.

Wastewater flow meter data was compared and verified with water billing data over the same flow monitoring period. Water billing data indicated a total potable demand of approximately 44,500 gpd for the tributary area during the flow monitoring period. Compared with the average metered flow for the area during this time period results in a return to sewer rate of approximately 90 percent, which while high is within the range that can be expected for office and light industrial customers, especially if there are separate accounts for landscape irrigation.

Water billing data was also used to estimate EDU values for the tributary area using the standardized method for calculating EDUs for sewer billing purposes. This method assumes a return to sewer ratio of 80 percent and a sewer generation rate of 220 gpd/ EDU. Applying this formula to the potable demand for the tributary area from the water billing data results in approximately 178 EDUs.

Average unit flow factors within the tributary area were then determined from non-rain days and number of residential units within the service area. Unit flows per acre were calculated to be approximately 278 gpd/ acre. Unit flows per single family residence were calculated to be approximately 228 gpd/ EDU. Density was calculated to be 1.2 EDU/ acre.

The parameters and calculation results for this unit flow study are summarized in Table 3-6. Based on the current Carlsbad flow rate generation criteria, industrial parcels are assumed to be 4.5 EDU/ acre which is over times as conservative as the density calculated as part of this unit flow study.

Table 3-6. Commercial Unit Flow Analysis

Parameter	Value	Unit
Calculated EDUs[1]	178	EDU
Industrial Park Area[2]	146	acres
Flow from Temporary Meter Data[3]	40,571	gpd
Water Demands[4]	44,535	gpd
Return to Sewer	91	%
Unit Flow per Acre	278	gpd/acre
Unit Flow per EDU	228	gpd/EDU
Dwelling Unit per Acre	1.2	EDU/acre

Notes:

[1] Commercial/ Industrial EDUs calculated from water billing data as Water Use (gallons) X 0.80 Return to Sewer Ratio/ 220 gpd/EDU

[2] Source: SANDAG Series 13 Existing Land Use shapefiles (10/2/2014)

[3] Source: City of Carlsbad Sewer Flow Verification Study January – March 2016

[4] Source: Carlsbad Municipal Water District 2016 Water Billing Database

EDU=equivalent dwelling unit; gpd=gallons per day

3.2.2 System Wide and Major Basin Equivalent Dwelling Unit Calculation

Flow studies were conducted to estimate a system-wide unit flow factor for the average flow per EDU. The studies were based on data from the permanent EWA flow meters and focused on CSSA areas tributary to the EWA interceptors, including V/C, NBI, BIS, and VIS. Because of the proximity of the BIS and VIS and the similarity of land use types, these two basins are evaluated as a single basin. These basins are shown on Figure 3-11.

Monthly flow reports are compiled by EWA that document estimated flows from member service areas based on data from the permanent EWA flow meters. These monthly flow reports, provided in Appendix C-1, Encina Wastewater Authority Flow Meter Data Reports, include calculations for each of the three major CSSA basins. For Carlsbad, the EDU estimates for each of the major CSSA basins are based on the formula shown in Table 3-7.

The year chosen to represent current system flows for this Master Plan update is 2014, as discussed in Section 3.1.1. Flow generation factors for the three major CSSA basins were calculated based on 2014 ADWF values and EDU counts from the December 2014 EWA monthly flow report. The resulting generation rates are shown in Table 3-8. The calculated flow generation rates for each basin vary from 108 gpd/EDU for the V/C basin to 236 gpd/EDU for the Buena, Vallecitos basin. The overall average generation rate for the CSSA system is 140 gpd/EDU.

The variation in generation rates between the basins could be due to several factors including EDU estimates, land use types, and return to sewer rates for the different areas of the system. The V/C basin is comprised primarily of detached single family residences that might have a lower sewer generation rate due to lower population density than estimated by the EDU density calculations and a lower return to sewer ration due to more outdoor irrigation. The Buena, Vallecitos basin includes many businesses that may have higher return to sewer ratios and underestimated EDU values. The North Batiquitos basin includes many single family homes with smaller yards that might represent a higher EDU density and larger return to sewer ratio.

The planning level EDU generation rate is discussed in the following section.

Table 3-7. Formula for Calculating Carlsbad Sewer Service Area Flows from Encina Wastewater Authority Flow Meter Data

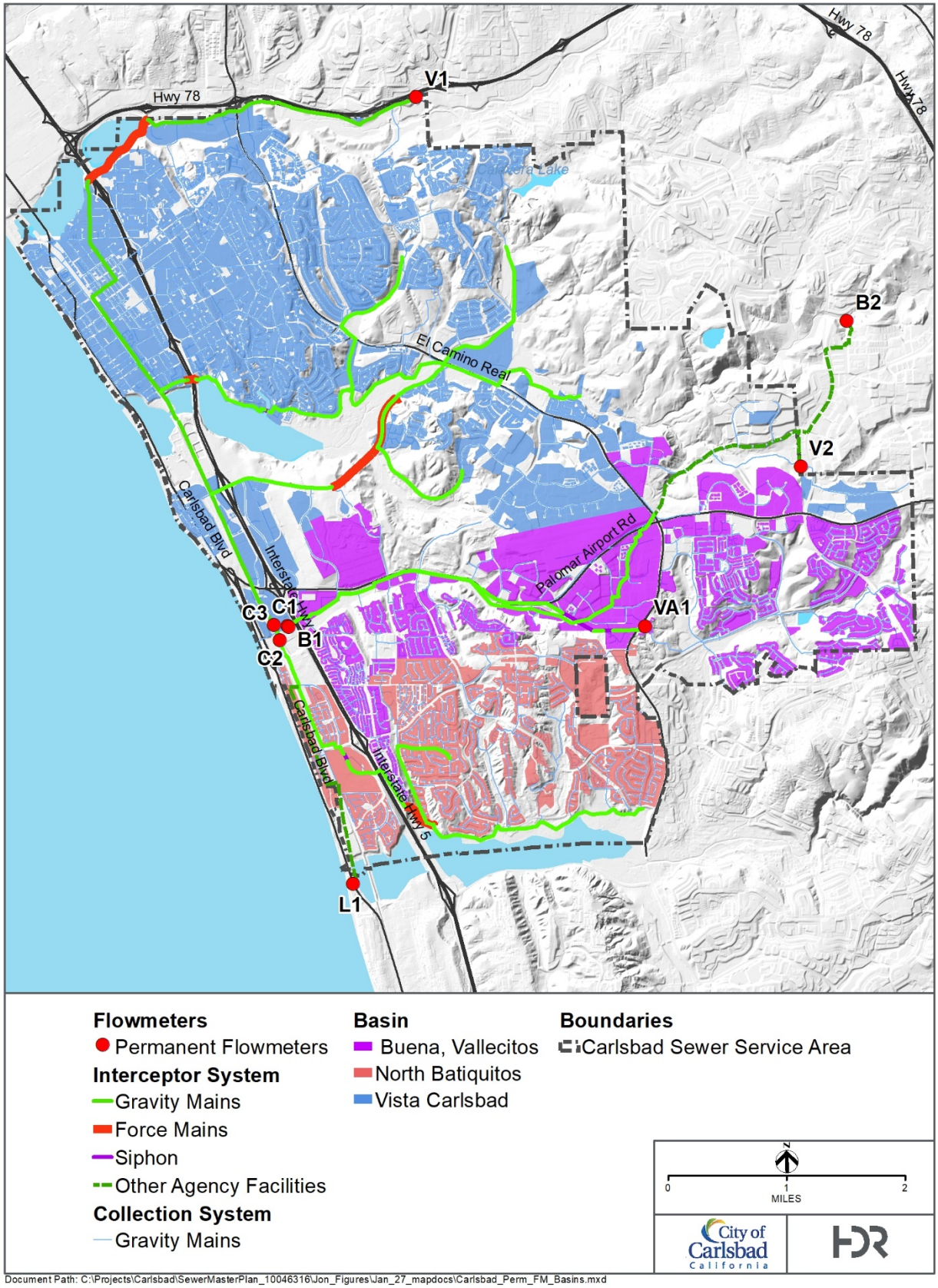
Carlsbad Flow =	(C3-V1) +	(B1-(B2 + V2)) +	(C1-VA1) +	(C2-L1)
Interceptor Tributary Area	Vista Carlsbad	Buena	Vallecitos	North Batiquitos
Study Basin	Vista Carlsbad	Buena, Vallecitos		North Batiquitos

Table 3-8. Flow Rate Calculations per Basin

Study Basin	Vista Carlsbad	Buena, Vallecitos	North Batiquitos	CSSA Total
Flow (mgd)	3.42	2.14	0.68	6.24
EDU	31,784	9,081	3,632	44,497
Generation Rate (gpd/EDU)	108	236	187	140

Notes:
CSSA=Carlsbad sewer service area; EDU=equivalent dwelling unit; gpd=gallons per day; mgd=million gallons per day

Figure 3-11. Major Flow Monitoring Basins



3.2.3 Planning Level Flow Generation Factors

Planning level flow generation rates were updated including unit flow factors and land use based flow factors.

Unit Flow Factors

Because of the variance in calculated generation rates, a conservative approach for choosing an EDU generation rate for planning purposes must be conservative enough to reasonably represent all areas of the system. 2012 Master Plan, which relied on historical data up to 2009, used 220 gpd/EDU as the planning generation rate for that study. As discussed in Section 3.1.1, CSSA sewer generation has decreased since approximately 2011 with current flows equaling approximately 85 percent of the flow volume seen in 2009.

To maintain the same conservative approach used in previous versions of this Master Plan, a planning level flow generation factor of 200 gpd/EDU was used. This planning number represents a 10 percent decrease from the 220 gpd/EDU planning number used in the 2012 Master Plan. This is a conservative approach considering CSSA sewer flows have decreased by 15 percent when compared with the data used for the 2012 Master Plan.

This value is also in line with planning generation factors used by other agencies in the area. Example of flow factors used for design of sewer systems by other north San Diego County agencies at the time of this study:

- 200 gpd/EDU for the City of Solana Beach
- 205 gpd/EDU for the City of Vista and BSD (recently reduced from 220 gpd/EDU in the Vista Master Plan 2016 Update)
- 215 gpd/EDU for the City of Encinitas and Leucadia
- The VWD 2018 Master Plan bases flow generation primarily on acreage, but the equivalent generation rate for single family residential land use ranges from 188 to 375 gpd/EDU.

The City of San Diego Water & Sewer Design Guide recommends the use of 80 gallons per capita per day, which equates to 197 gpd/EDU for the City of Carlsbad (based on 2.46 persons per household). Based on these comparisons and the calculated unit flow rate for current conditions, the flow generation rate of 200 gpd/EDU is considered to be appropriately conservative for flow projections in this master plan update.

To maintain the same approach used in previous versions of this Master Plan, planning unit flow factors from the 2012 Master Plan were adjusted to reflect the 200 gpd/EDU flow generation factor. The updated factors are shown in Table 3-9. Table 3-9 reflects the unit flow factor of 200 gpd/EDU for low to mid density residential. A lower unit flow factor of 160 gpd (80 percent of 200 gpd/EDU) is applied to multi-family residential customers.

A non-residential land use flow factor of 800 gpd per 10,000 square feet of building area is applied to commercial and industrial development projections as was done in the 2012 Master Plan. It is noted that projections made using this factor are based on a mix of development types in existing business/industrial parks and may not be representative

of smaller areas with a single land use type. Flow projections for future schools, resort hotels, and the LEGOLAND Water Park are based on EDU conversions documented in the Carlsbad Municipal Code (Table 13.10.020c).

Table 3-9. Wastewater Unit Flow Factors

Land Use Category	Unit Flow	
Residential Low to Med-High Density	200	gpd/EDU
Residential High Density (Apartments)	160	gpd/EDU
Commercial	730	gpd/10k sqft
Industrial	730	gpd/10k sqft
School	6.66	gpd/student
Hotel	120	gpd/room
Water Park (LEGOLAND)	3,400	gpd/acre

Notes:
EDU=equivalent dwelling unit; gpd=gallons per day

Land Use Flow Factors

Flow factors based on land use type and overall acreage were also updated using existing land use data and information from the Carlsbad water and sewer billing database.

Flow factors were calculated by first estimating the equivalent density of the major land use types listed in the billing database (including single family and multi-family residential, commercial, and institutional) by calculating EDU/acre values. Existing land use information was based on GIS data from SANDAG Series 13 Existing Land Use shapefiles (updated October 2014). Existing acreage was calculated by identifying parcels with sewer service and calculating total acreage for each land use type. EDU values were estimated using the Carlsbad water and sewer billing database. Single family residential accounts were assigned one EDU. For multi-family facility accounts, the database lists the number of units. These number of units were converted to EDUs by applying a factor of 0.8 as discussed in the previous section. EDU values for non-residential accounts were calculated based on water used based on the equation used for sewer billing (Water Use Rate gpd * 0.8 Return to Sewer Ratio / 220 gpd/EDU). The resulting EDU/acre values are shown in Table 3-10.

The EDU/acre density values in Table 3-10 were compared with the equivalent density values from the Carlsbad Engineering Standards Volume 1, Chapter 6, Section 4E (2/16/2016). The most conservative EDU density values for each land use type were chosen and are listed in Table 3-11. These values were then used to calculate generation rates per acre based on the 200 gpd/EDU planning value. The generation rates per acre values are also shown in Table 3-11.

Table 3-10. Calculated Equivalent Dwelling Unit Densities per Land Use Type

Land Use Group	Total EDUs[1]	Area (acres)[2]	Density (EDU/acre)
Single Family	23,082	3,871	6.0
Multi Family	9,011	667	13.5
Commercial	11,760	2,117	5.6
Institutional	644	294	2.2
Total	**44,497**	**6,949**	**6.4**

Source: SANDAG Series 13 Existing Land Use shapefile (10/2/2014)
Notes:
[1] Calculated from Carlsbad water and sewer billing database
[2] Only includes parcels with sewer service.

Table 3-11. Sewer Generation Rates per Acre

Land Use	Density (EDU/acre)	Generation Rate (gpd/acre)	Source
Rural Residential	6	1,195	Billing Database[1]
Single Family	6	1,195	Billing Database[1]
Multi Family	13.5	2,160	Billing Database[1]
Mobile Home	13.5	2,160	Billing Database[1]
Group Quarters Facility	7.3	1,450	Engineering Standards[2]
Hotel/Motel	7.3	1,450	Engineering Standards[2]
Industrial	4.5	895	Engineering Standards[2]
Commercial	7.3	1,450	Engineering Standards[2]
Government/Office	7.3	1,450	Engineering Standards[2]
Public Services	7.3	1,450	Engineering Standards[2]
Healthcare	7.3	1,450	Engineering Standards[2]
Schools	2.2	395	Billing Database[1]
Mixed Use	7.3	1,450	Engineering Standards[2]

Notes:
[1] Billing database calculation discussed in this section
[2] Carlsbad Engineering Standards Volume 1, Chapter 6, Section 4E (2/16/2016)
EDU=equivalent dwelling unit; gpd=gallons per day

3.3 Projected Buildout Flows

Projected buildout flows for the CSSA were based on a comparison of existing and planned land use types within the service area. Areas planned for densification were assumed to contribute increased flow to the buildout system.

3.3.1 Densification Areas

Based on the EDU density values shown in Table 3-11, existing EDU density and planned future EDU density values were calculated for each parcel in the CSSA. Parcels that are projected to experience an increased density based on the planned land use were designated as areas of densification, indicating future growth. These future densification parcels are shown on Figure 3-12.

Also included as future densification parcels are parcels that are suspected to be currently on septic. Carlsbad does not maintain a list of customers currently on septic. To estimate the number of customers currently on septic, billing data was used to identify accounts with water use but no sewer accounts. Addresses for these customers was then geocoded in GIS and aerial imagery was used to check the location of the accounts, eliminating accounts for properties that are either planned or currently under construction. This exercise resulted in 25 units that are suspected to currently be on septic. Of these, 7 are associated with properties that are already planned for redevelopment, resulting in 18 additional residential properties that could be added to the collection system.

Table 3-12 shows the projected additional count of EDUs added to the system by LFMZ. The result is approximately 10,400 EDUs added to the service area with the majority of the growth due to single family residential type customers.

Figure 3-12. Carlsbad Sewer Service Area Future Densification Parcels

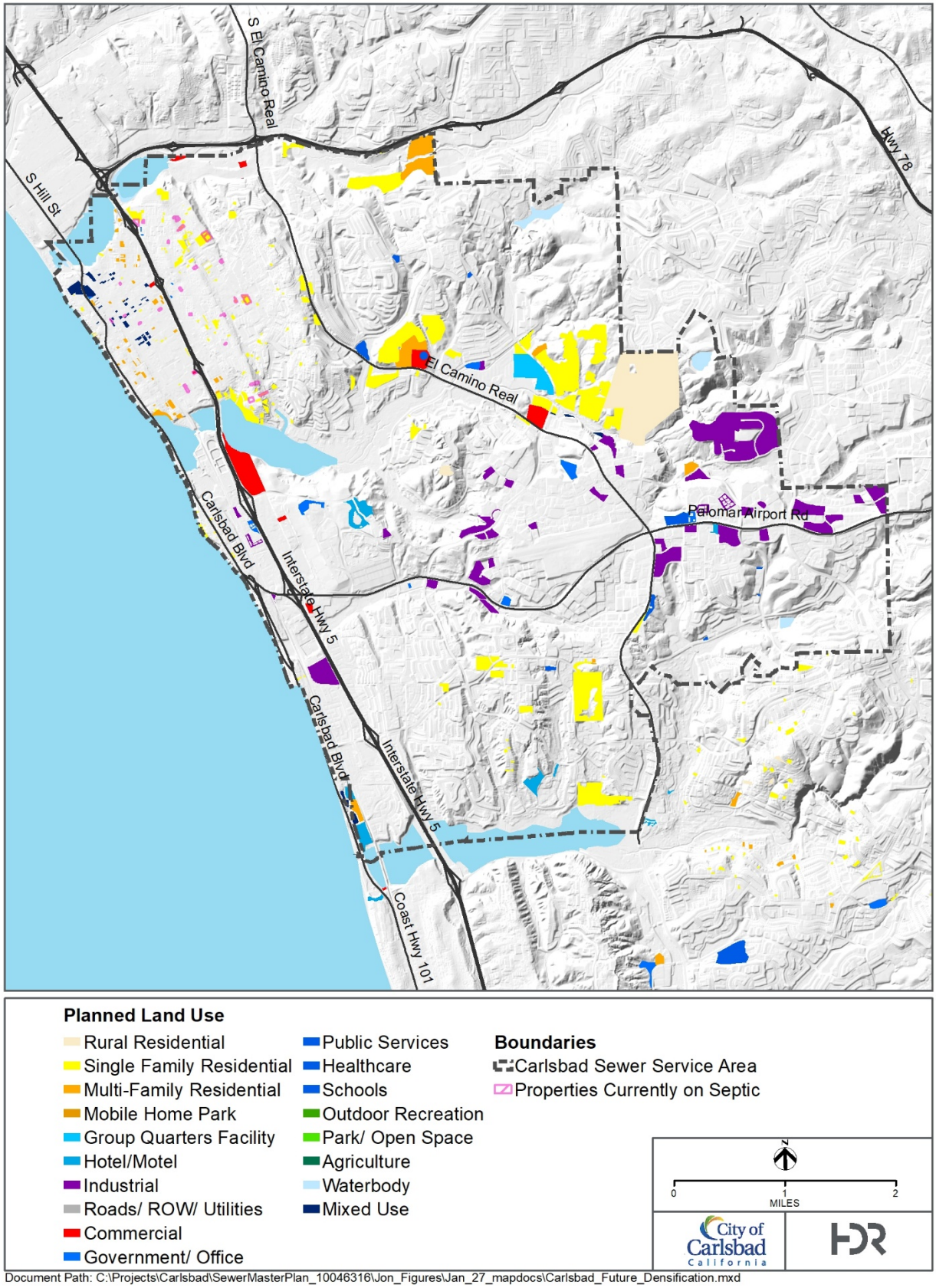


Table 3-12. City of Carlsbad Growth Database Summary

LFMZ (Figure 1-7)	Future EDUs per Land Use Group (EDU)				
	Single Family Residential	Multi Family Residential	Existing Units on Septic[1]	Non-Residential	Total
1	596	334	18	249	1,198
2	47	—	—	—	47
3	24	—	—	85	109
4	—	—	—	—	—
5	—	—	—	561	561
6	170	95	—	26	291
7	0	—	—	22	22
8	63	0	—	16	80
9	0	81	—	161	242
10	23	—	—	313	336
11	63	—	—	52	115
12	0	—	—	44	44
13	—	—	—	574	574
14	390	309	—	221	919
15	2,431	58	—	471	2,960
16	—	77	—	680	757
17	—	—	—	—	—
18	0	0	—	275	275
19	215	0	—	98	313
20	150	—	—	5	155
21	339	11	—	—	351
22	2	—	—	169	171
23	—	55	—	61	116
24	9	0	—	—	9
25	196	559	—	5	760
Total	**4,719**	**1,580**	**18**	**4,088**	**10,405**

Notes:

[1] This is based on parcels with water billing but no sewer billing data. Of the 25 parcel count, 7 parcels are slated for development/ redevelopment, resulting in 18 additional future EDUs added to the system from septic.

EDU=equivalent dwelling unit; LFMZ=Local Facility Management Zone

3.3.2 Carlsbad Sewer Service Area Projected Buildout Flows

Projected buildout flows were calculated by applying the planning flow factor of 200 gpd/EDU to the EDU values for the parcels shown on Figure 3-12 and listed in Table 3-12. The resulting calculated flow rates are shown in Table 3-13 by LFMZ and total approximately 2.08 mgd of additional flow.

Table 3-13. Projected Future Wastewater Flows by Local Facility Management Zone

LFMZ (Figure 1-7)	Future Flows per Land Use Group (gpd)				
	Single Family Residential	Multi Family Residential	Existing Units on Septic[1]	Non-Residential	Total
1	119,246	66,779	3,600	49,898	239,523
2	9,365	—	—	—	9,365
3	4,807	—	—	17,051	21,858
4	—	—	—	—	—
5	—	—	—	112,250	112,250
6	33,905	18,967	—	5,270	58,142
7	24	—	—	4,422	4,445
8	12,631	14	—	3,289	15,934
9	10	16,247	—	32,223	48,480
10	4,634	—	—	62,601	67,235
11	12,642	—	—	10,325	22,966
12	5	—	—	8,727	8,732
13	—	—	—	114,767	114,767
14	77,932	61,807	—	44,155	183,894
15	486,289	11,636	—	94,150	592,075
16	—	15,415	—	136,017	151,433
17	—	—	—	—	—
18	7	0	—	54,936	54,944
19	42,992	0	—	19,510	62,502
20	29,969	—	—	951	30,920
21	67,899	2,274	—	—	70,174
22	488	—	—	33,748	34,236
23	—	10,930	—	12,270	23,200
24	1,760	9	—	—	1,769

Table 3-13. Projected Future Wastewater Flows by Local Facility Management Zone

LFMZ (Figure 1-7)	Future Flows per Land Use Group (gpd)				
	Single Family Residential	Multi Family Residential	Existing Units on Septic[1]	Non-Residential	Total
25	39,288	111,839	—	958	152,085
Total	**943,892**	**315,917**	**3,600**	**817,518**	**2,080,927**

Notes:

[1] This is based on parcels with water billing but no sewer billing data. Of the 25 parcel count, 7 parcels are slated for development/ redevelopment, resulting in 18 additional future EDUs added to the system from septic.

gpd=gallons per day; LFMZ=Local Facility Management Zone

To estimate buildout flow, the calculated additional flow was added to the existing flows as shown in Table 3-14. The total buildout flow for the CSSA is projected to be 8.31 mgd which is approximately 33 percent higher than current flows. This projection is approximately 17 percent lower than the buildout projection of 10 mgd predicted in the 2012 Master Plan.

Figure 3-13 illustrates historical flows and shows the ultimate flow projected in this master plan update. The buildout date has been established as 2035 for this master plan based update based on the City's General Plan.

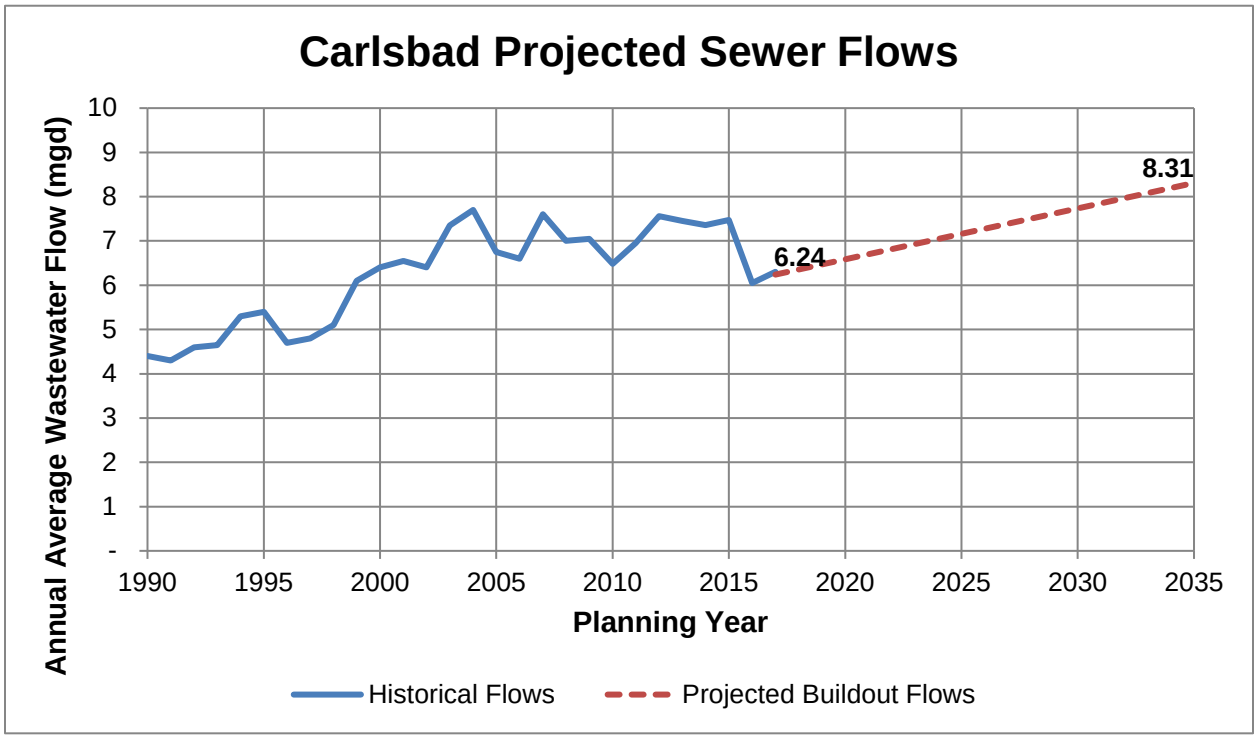
Table 3-14. Projected Carlsbad Buildout Flows

Interceptor System	Carlsbad Flows (mgd)		
	Existing	Future Development	Total Buildout
Vista/Carlsbad	1.68	0.35	2.04
NAHI	1.27	0.26	1.54
SAHI	0.91	0.83	1.74
BIS	1.74	0.34	2.07
VIS	0.25	0.04	0.29
NBI	0.39	0.25	0.64
Total	**6.24**	**2.08**	**8.31**

Notes:

BIS=Buena Interceptor; mgd=million gallons per day; NAHI=North Agua Hedionda Interceptor; NBI=North Batiquitos Interceptor; SAHI=South Aqua Hedionda Interceptor; VIS=Vallecitos Interceptor

Figure 3-13. Historical and Projected Ultimate Flows



3.3.3 Other Agency Flow Projections

Buildout flow projections from other agencies that discharge to the Carlsbad sewer system were obtained from recent planning documents. Table 3-15 lists the total projected buildout flow for all Carlsbad interceptors including EWA interceptors.

Flows from other EWA agencies are allocated to the same interceptor system to which existing flows are currently discharged. However, a new forcemain extension project is currently being planned by the City of Vista that will allow all of the flow that is currently entering the BIS to be pumped most of the distance to the EWPCF. The current plan has the forcemain discharging into the last gravity section upstream of the EWPCF on the east side of I-5. This may be the VIS, the BIS, or a combination of both. The remaining flow in the existing BIS Sewer will then be entirely from Carlsbad. Carlsbad plans to utilize the available capacity in the Buena Sewer to improve operational efficiencies and reduce maintenance issues.

All of the flow from the El Fuerte LS will be diverted to the BIS instead of the South Agua Hedionda Sewer System. This will reduce the need to pump the wastewater a second time at the Cannon Road LS. Additionally, the wastewater from the Poinsettia LS will be diverted to the BIS, which will create available capacity in the VIS that can sold to Vallecitos. This will also reduce Carlsbad's maintenance responsibility and liability in the VIS.

Table 3-15. Projected Buildout Average Dry Weather Flows for Carlsbad Interceptors

Interceptor System	Carlsbad Flows (mgd)	Other Agency Flows		Total Flow (mgd)
		Agency	Flow (mgd)	
Vista/Carlsbad	2.04	City of Vista	8.56	12.75
		Oceanside	2.15	
NAHI	1.54	—	—	1.54
SAHI	1.74	—	—	1.74
BIS	2.07	Buena	4.37	7.08
		Vista (raceway)	0.64	
VIS	0.29	Vallecitos	14.4	14.69
NBI	0.64	Leucadia	5.21	7.10
		Encinitas	1.25	
Total	**8.31**	—	**36.57**	**44.89**

Notes:
BIS=Buena Interceptor; mgd=million gallons per day; NAHI=North Agua Hedionda Interceptor; NBI=North Batiquitos Interceptor; SAHI=South Aqua Hedionda Interceptor; VIS=Vallecitos Interceptor

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4 Regulations and Design Criteria

The level of service that is provided to a community is directly related to compliance with applicable regulations and the implementation of improvements that are planned and designed in accordance with accepted criteria. This section describes the federal, state, and local regulations associated with designing and operating the City's sewer system, as well as the design criteria to be used for planning and design of new sewer facilities and "trigger" criteria for evaluating capacity of existing infrastructure.

4.1 Sewer Regulations Overview

The Carlsbad sewer collection system is operated and maintained by the City. The City has established a level of service that complies with state and federal sanitary sewer regulations in order to ensure that the collection system within its service area meets public health and safety standards. This section discusses existing regulations and summarizes upcoming regulatory issues that may impact sewer collection within the service area.

4.1.1 Federal Sewer Regulations

The federal Water Pollution Control Act, known as the Clean Water Act (33 United States Code sections 1251 et seq.), was widely accepted in 1972 and is the principal federal statute for water quality protection. The Clean Water Act requires the State to adopt water quality standards and to submit those standards for approval by the United States Environmental Protection Agency. For point source discharges to surface water, the Clean Water Act made it unlawful to discharge pollutants from a point source into navigable waters, and it authorizes the United States Environmental Protection Agency and/or approved states (such as California) to administer the National Pollutant Discharge Elimination System program.

4.1.2 State Sewer Regulations

California's principal law governing water quality regulation is the Porter-Cologne Act. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution, unlike the federal regulation that only addresses point sources.

Pursuant to the Porter-Cologne Act (California Water Code Section 13000 et seq.), the policy of the State is as follows:

> *That the quality of all the waters of the State shall be protected,*
>
> *That all activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason, and*
>
> *That the State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation.*

The Porter-Cologne Act established nine Regional Water Quality Control Boards (RWQCB), based on hydrogeologic boundaries, and the overarching State Water Resources Control Board (SWRCB). Both the regional and state agencies are charged with implementing the Act's provisions and have primary responsibility for protecting water quality in California. Carlsbad is located in the San Diego RWQCB jurisdiction (Region 9). The RWQCBs regulate discharges under the Porter-Cologne Act primarily through issuance of National Pollutant Discharge Elimination System permits for point source discharges and waste discharge requirements (WDR) for nonpoint source discharges.

On May 2, 2006, SWRCB adopted statewide general WDR for sewer systems. Subsequently, RWQCB issued Order R9-2007-0005, which included compliance measures for monitoring and reporting, as well as compliance with the *San Diego Water Quality Improvement Plan* (San Diego Basin Plan). The intent of the order is to regulate all wastewater collections systems in the State in an effort to reduce or eliminate the number of sanitary sewer overflows (SSO) which, by their nature, pollute the environment. The order is applicable for all publicly-owned sewage collection systems with more than 1 mile of sewer pipe. The 2006 WDR Order requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans (SSMP) and report all SSOs to the state water board's online SSO database.

In response to the 2006 WDR Order, the City submitted an application for permit coverage with SWRCB and was issued Agency Waste Discharger Identification # 9SSO11209. In compliance with the 2006 WDR Order, Carlsbad developed an SSMP that documents its approach to properly operating and maintaining its sanitary sewer system. The SSMP is organized as follows:

- Goal
- Organization
- Legal Authority
- Operation and Maintenance Program
- Design and Performance Provisions
- Overflow Emergency Response Plan
- Fats, Oils, and Grease (FOG) Control Program
- System Evaluation and Capacity Assurance Plan
- Monitoring, Measurement, and Program Modifications
- SSMP Program Audits
- Communication Program

The SSMP must be audited every 2 years and updated every 5 years to include any significant program changes. Re-certification by Carlsbad's City Council is required when significant updates to the SSMP are made. The City is required to provide an electronic copy of their SSMP to the Online SSO Database. The City's most recent SSMP was updated in February 2016. The City conducts an internal audit of the SSMP every 2 years.

4.1.3 Carlsbad's Title 13 Sewer Regulations

Title 13 of the Carlsbad Municipal Code represents the City's adopted general regulations regarding sewers. It was last updated in 2009. The Title 13 Ordinance is organized as shown below:

- Title 13 SEWERS
  - Chapter 13.04 General Regulations
  - Chapter 13.06 Discharge of Fats, Oils, and Grease
  - Chapter 13.08 Payment for Line Cost
  - Chapter 13.10 Sewer Connection and Capacity Permits and Fees
  - Chapter 13.12 Sewer Service Charges
  - Chapter 13.16 Discharge of Industrial Waste
  - Chapter 13.20 Septic Tank Systems

In discussions with City staff the following issues were raised regarding Title 13:

- Need for consistent inspection protocols and enforcement for FOG compliance.
  - The City's Title 13 definition mentions the Industrial Pretreatment Classes and their required inspection times. This is the basis for the inspection protocol, but additional language could be added to provide clarity to the customers that if they are a FOG generator, they should anticipate inspections from the City annually. An additional inspection may occur if needed.
  - Fees may be imposed on customers for the inspections with decreased fees for businesses that consistently show compliance and could be mentioned in Section 13.060.070: Grease Mitigation and Inspection Fees.
  - Title 13 13.04.080: Violations of Chapter is clear that there may be enforcements regarding violation. While it is clear that notice will be given to violators to comply, a fine may be a reasonable response to repeat violators.
- Need to define appropriate City Action triggers for FOG inspections.
  - Coordination with permitting within the City regarding change of business can indicate when a potential FOG generator may be added to the system. Information on new food facilities or changes to food facilities could trigger an inspection by City staff to determine the need for FOG requirements.
- Need for clarity on when septic systems should be converted to the public sewer system and how the City should be notified, since the County issues septic permits.
  - Implementing a protocol to coordinate with County will help the transfer of information. Part of the permitting process could be to have the City also review the permit application as additional users will affect their system.
  - Prior to converting a septic system to public, the City will need to determine if a lateral is available for the customer and if there is capacity in the system. This is especially important for converting multiple customers in a neighborhood.

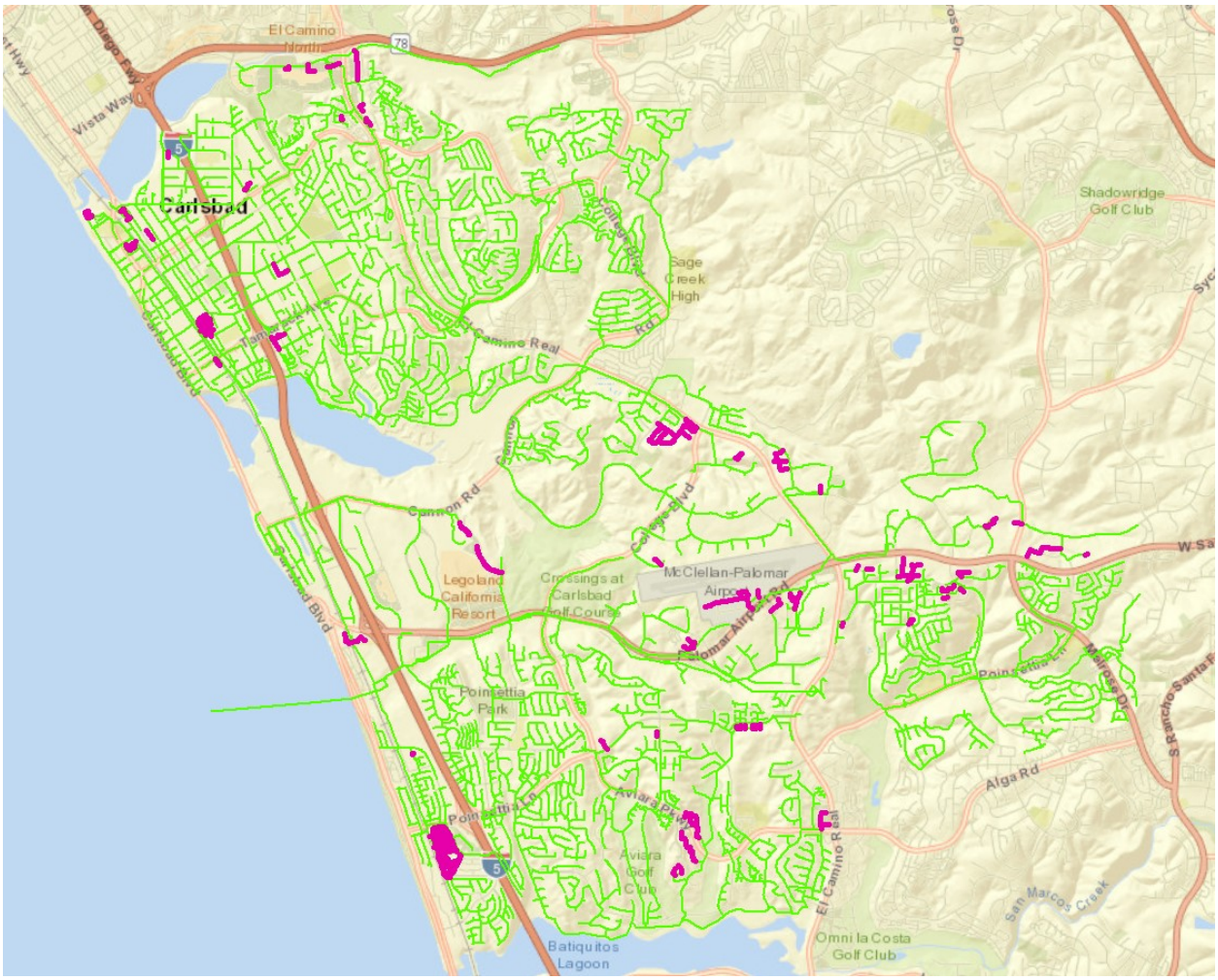
- Need for a better correlation of sewer strength to business type and a better understanding of the impact of increased strength on regional sewer treatment charges.
- Need to review Dwelling Units equivalency for various businesses.
- Need to review City's cost of service study approach related to strength of sewer treatment costs.
- Updates to Title 13 are currently being developed for consideration in Fiscal Year 2019-2020.

4.1.4 Impending Sewer Regulatory Issues

The SWRCB is considering implementing updates to the 2006 WDR Order. Organizations such as California Association of Sanitation Agencies continue to monitor the situation and address concerns with SWRCB in a direction that is aligned with the interests of wastewater agencies. At the Clean Water Environment Association San Diego Section workshop in December 2017, representatives from SWRCB discussed potential updates. Updates being considered include better alignment of the 2-Year Audit and the 5-Year SSMP Recertification Requirements, as well as efficiencies to maximize value for cost of compliance. The following new requirements are being considered:

- Monitoring and measuring the effectiveness of each SSMP element
- Identifying and illustrating SSO trends. This should include SSO frequencies, locations, and volumes
- Additional guidelines on the expected timing and content of the change log
- Additional guidelines on frequency of review and definition of significant change for updating the SSMP
- The addition of planning requirements for present and future climate change impacts on sewer system operations such as water conservation, drought, high intensity rain events and sea level rise
- Improved quality of data in California Integrated Water Quality System
- Regulations for larger private collection systems (see Figure 4-1 for private collection systems in the CSSA that could be impacted)

Figure 4-1. Private Sewer Collection Systems in Carlsbad



At a Clean Water Environment Association collection system specialty conference in 2017, several updates to regional regulations were discussed, in addition to the state-specific updates noted above. Key notes from the conference are provided below with respect to upcoming RWQCB activity which could have significant impacts on Carlsbad:

Region 9 is making plans to audit each collection system in the next 5 years.

Region 9 is drafting updates to the WDR Order R9-2007-0005 to include the following:

- Exfiltration studies
- Background water quality monitoring for receiving waters
- Trigger for increased monitoring of large SSOs to waters
- Tie Region 9 order to the Statewide WDR order with respect to SSO categorization and other inconsistencies

When these updates are introduced, updates to the City's SSMP and Title 13 will be required.

4.1.5 Recommendations

In reviewing both the City's Title 13 Ordinance and SSMP, potential opportunities for improvement were identified. The following recommendations are presented for consideration:

Title 13 Recommendations. City officials may be reluctant to enforce Title 13 violations based on the terminology in 13.04.080: Violations of Chapter that states "Any person who continues any violation beyond the above time, or who violates the provisions of Section 13.04.070, is guilty of a misdemeanor." While it is clear that notice will be given to violators to comply, a fine may be a reasonable response to repeat violators.

Fees may be shown on the City's website for inspections and could be reduced for compliant customers.

Regarding septic systems, Title 13 has 13.20.030: Connection to Public Sewer System to prohibit new customers when capacity is not available and 13.04.030 Use of Public Sewers Required. Adding additional text to note that customers on septic would be allowed to connect when capacity is available may encourage participation.

It is recommended that updates to Title 13 include language to direct to the City's standard drawings and specifications.

SSMP Recommendations. According to the SWRCB California Integrated Water Quality System, the City's SSMP was last updated on November 13, 2014. On November 21, 2014, City Council adopted Resolution Number 2014-251 authorizing the legally responsible official to re-certify and submit the SSMP to SWRCB. The current version posted to the City's website is not dated, so it is not clear whether this is the same version that was certified by City Council in November 2014. The version posted on the website has a filepath on the bottom of the first page with a date of February 1, 2016. The SSMP does not include a change log as required by the 2013 amendment to the Monitoring and Reporting Program, which should note the changes that have been made since the last certification by the governing board.

This version posted on the City's website does not include any of the attachments referenced in the document. The City may want to update the SSMP to incorporate referenced attachments or provided information where referenced documents can be found.

The SSMP documents that the City performed the last SSMP Program Audit on July 11, 2011. The last audit was performed more recently, and the SSMP should be updated to either document when the City performed the last audit or remove the date of the last audit from the document.

The SSMP still includes reference to the original SSMP Development Plan and Schedule for the original SSMP developed in 2009. This portion of the document can be removed in the next SSMP update. The City could update the section documenting the steps taken to update the SSMP and meet the 5-year recertification of the SSMP. The updated section could also include a plan and schedule for the next SSMP update and recertification due in November 2019.

The WDR requires the SSMP to have a Goal element. The WDR states a goal for the SSMP, yet does not provide guidance as to whether any additional information is

necessary regarding the Goal of the document or whether this section should include the City's goals for the overall SSMP program. The SWRCB has stated that reiterating the goal language included in the WDR does not meet the intent of the WDR requirement for this section and the SSMP should include an agencies goals for the program. The City's Goal goes beyond the expectation of SWRCB by including several goals with quantifiable objectives for operations and maintenance of the sewer system. Specific examples of goals including quantifiable objectives include:

- Clean all gravity mains (12 inches and smaller) within the City's wastewater collection system on a 3-year rotation
- Clean all gravity mains (larger than 12 inches) every 5 years
- Perform routine sewer lift station checks 3 days per week for larger stations (greater than 50,000 gallons) and 2 days per week for smaller stations (less than 50,000 gallons), and preventive maintenance according to manufacturer's standards
- Perform routine closed circuit televising inspections of the gravity sewer system on a 3 to 5 year cycle
- Perform sewer mark outs as received by Dig-Alert within 2 business days for routine markouts and immediately for emergency markouts
- Maintain easements and assure access for maintenance activities

The City may want to update the goal element of the SSMP to remove the quantifiable objectives from the goals and to focus the goals on the end result the City wants to achieve with the overall program. The quantifiable objectives associated with meeting the goals included in the Goal element can be included within the appropriate elements of the SSMP. Any quantifiable objectives included in the SSMP should be achievable and appropriately resourced.

The WDR requires the Organization element of the SSMP to include the "names for management, maintenance, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with narrative explanation." The SSMP references an organization chart that is not included in the document posted on the City's website. The SSMP includes a summary of key positions, yet most of the positions and descriptions focus on the operations and maintenance aspects of the SSMP. The City may want to dissect the SSMP to identify specific measures included in the program to meet WDR requirements and then identify who is the lowest level person in the organization fully responsible for the specific measure. The SSMP should then include a narrative explanation of what each of these positions are responsible for with respect to the SSMP Program. The lines of authority can be shown through the City's organization chart, which should be included, or by a SSMP Program specific organization chart that focuses on showing lines of authority for just the positions associated with the SSMP Program.

The Organization element of the SSMP includes narrative regarding SSO notification which still references the pre-2013 categorization of SSOs. The 2013 amendment to the Monitoring and Reporting Program modified SSO categories to include a new Category 3 SSO. This should be updated in the SSMP.

The Operations and Maintenance element is one of the core elements of the City's SSMP and should include detail regarding system mapping; operations and maintenance program activities to reduce SSOs and the systems in place to manage those activities; the City's program to identify and remediate system condition-related deficiencies; and, a CIP plan to address identified deficiencies. The SSMP discusses each of these topics, yet not to the level of detail required to meet the intent of the WDR. The City should describe or summarize the underlying processes in place to accomplish the Operations and Maintenance Program elements required in the WDR. For example, the WDR requires maintenance of an up-to-date map of sewer system. The SSMP should not simply state the City has an up-to-date map, it should describe the processes by which the map is kept up-to-date including how map corrections are communicated internally, how new construction is incorporated, or how pipelines acquired from new development is added. The City may also want to discuss the process for archival of asset data for assets that are rehabilitated or replaced.

Another example is the identification of system condition-related deficiencies and development of a rehabilitation and replacement program. The SSMP states that "issues found during localized televising are evaluated and solutions developed on a case-by-case basis" and the "Capital Improvement Program uses replacement funding, which is set aside annually, to fund Capital Improvement and Replacement Programs". The process for collecting, evaluating, ranking, decision-making, and funding should be described in more detail to describe the processes, systems, and staff involved in developing the capital improvement plan to address proper management and protection of system assets. The FOG Control Program element of the SSMP should include a list of acceptable disposal facilities for FOG disposal. The current version of the SSMP does not include a list of FOG disposal locations.

The FOG Control Program section of the SSMP states "The City has the authority to inspect grease producing facilities…, and enforces any violation of its sewer ordinances in accordance with Section 13.04.080 Violations of Chapter." The SSMP also states, "The City has yet to establish adequate legal authority to administer penalties and fines, and for FOG Program cost recovery". These statements conflict and do not adequately represent the current state of FOG program source control and enforcement. The City has adequate legal authorities to require implementation and maintenance of grease removal equipment, especially in areas with known grease issues, yet the enforcement process currently in place is not always applied because the remedy is either cost-prohibitive or the approach embedded in the ordinance is onerous (i.e., citation with a misdemeanor). In some cases, the City is actively cleaning sewer pipe segments with known grease issues frequently (e.g., quarterly) with the knowledge that food service establishments upstream are discharging FOG into the sewer system and without grease removal devices present at their facilities.

The City could address this in the SSMP using two approaches. First, the SSMP could accurately document the current approach to FOG blockage control (i.e., in cases where source control is not present, the City utilizes an aggressive cleaning strategy to reduce risk of FOG-related SSOs). Only three FOG-related SSOs have been identified since 2007, due to the City's aggressive cleaning schedule in known problem areas. Those locations are shown on Figure 4-2.

Figure 4-2. Locations of Fat, Oil, and Grease-related Sanitary Sewer Overflows

Second, the City could consider modifying the Title 13 Ordinance and enforcement approach to escalate consequences of non-compliance following a progression the City is willing to implement. Variances from the enforcement approach should be documented and an appropriate mitigation measure implemented to reduce the risk of sewer overflow.

The Monitoring, Measurement, and Program Modifications sections of the City's SSMP includes a list of performance indicators the City is using to monitor program effectiveness on an annual basis. The section also states the City as assigned a team to review the SSMP annually to update elements of the SSMP as appropriate and that Collection system personnel are consulted annually to support this process. The City should review current processes are in place to monitor the performance indicators listed as well as the review processes stated in the document and should consider updating the SSMP to reflect the most current processes for monitoring, measurement, and program modification.

4.2 Design Criteria

The City of Carlsbad General Engineering Standards, Volume I, Chapter 6, Design Criteria for Gravity Sewer Lines and Appurtenances, provides design guidelines for the design of sewer gravity mains, lift stations, and forcemains. New sewer improvement plans must be reviewed and approved by the City Engineer.

4.2.1 Engineering Standards Design Criteria

The design criteria from City's Engineering Standards are shown in Table 4-1. Criteria to be reconsidered in this Master Plan update, highlighted in Table 4-1, include sewer generation rates, as lower water demands per capita due to voluntary and mandated water conservation measures are also reflected in lower wastewater flows.

Table 4-1. Sewer Design Criteria

Parameter	Engineering Standard Criteria (Volume 1, Chapter 6)	Recommended Revised Criteria
Sewer Generation Rate		
Residential, Single Family	220 gpd/EDU	200 gpd/EDU
Residential, Multi- Family	176 gpd (80 percent of 220 gpd/EDU)	160 gpd (80 percent of 200 gpd/EDU)
Commercial, Industrial or Institutional	Flow projections for future schools, resort hotels, and certain industrial uses are based on EDU conversions documented in the Carlsbad Municipal Code (Table 13.10.020c).	No change
Peak Daily Flow Factor	2.5 x Average Daily Flow	No change
d/D Ratio for Gravity Mains		
For sewer mains ≤ 12-inch	0.50 at peak hour dry weather flows	No change
For sewer mains > 12-inch	0.75 at peak hour dry weather flows	No change
For all sewer mains	0.90 at peak hour wet weather flows	No change
Manning's Roughness Coefficient		
For PVC-lined pipes in the V/C	0.012	No change
For all other pipes	0.013	No change
Velocity for Gravity Mains		
Minimum allowable velocity	2 feet per second	No change
Maximum allowable velocity	12 feet per second	No change
Velocity for Force Mains		
Minimum allowable velocity	2.5 feet per second	No change
Maximum allowable velocity	8 feet per second	No change

Notes:
d/D=depth-to-diameter ratio; EDU=equivalent dwelling unit; V/C=Vista/Carlsbad

The most important evaluation criteria for gravity sewers is the depth of flow, which is calculated in the hydraulic model based on Manning's Equation. The capacity of each gravity sewer is based on the relative depth of flow within the respective pipeline reach. Sewer interceptors are not typically designed to flow full, as unoccupied space at the top of the pipe is required for conveyance of sewage gasses and to provide contingent capacity for wet weather inflow and infiltration. Interceptor sizing is typically based on the pipeline flowing 75 percent full at the PWWF if the pipe is larger than 12-inches in diameter (D/d = 0.75). If the pipeline is 12-inches in diameter or smaller, a D/d factor of 0.50 is used.

Friction factors for pipelines are a required input to the model. The factors vary with the material and the age of the pipe. A roughness factor as indicated by a Manning's' coefficient ("n") of 0.013 is typically used to evaluate existing interceptors and for projection of future sizing needs. Previous studies have shown that this value typically accounts for most pipe roughness, joints, and fouling that occur after several years of operation. At the direction of City staff, a Manning's coefficient of 0.012 was used in the evaluation of the PVC-lined RCP and centrifugally cast fiberglass reinforced plastic mortar pipeline sections of the V/C installed in 2002 (reaches VC5 through VC11A).

In the design of sewer lift stations, it is required that spare pumping units be included for mechanical reliability. A wastewater facility must be capable of conveying PWWFs with the largest operating unit out of service. Lift stations are typically equipped with a minimum of two pumps and have a secondary or emergency power source, consisting of either installed generators or a connection for a portable generator. Forcemains are evaluated based on maintenance of a minimum or maximum allowable flow velocity, varying between 2.5 and 8.0 feet per second. Velocities less than 2.5 feet per second can result in deposition in the forcemain, while velocities greater than 8.0 feet per second can damage the pipeline through excessive abrasion.

4.2.2 Existing System Capacity Evaluation Criteria

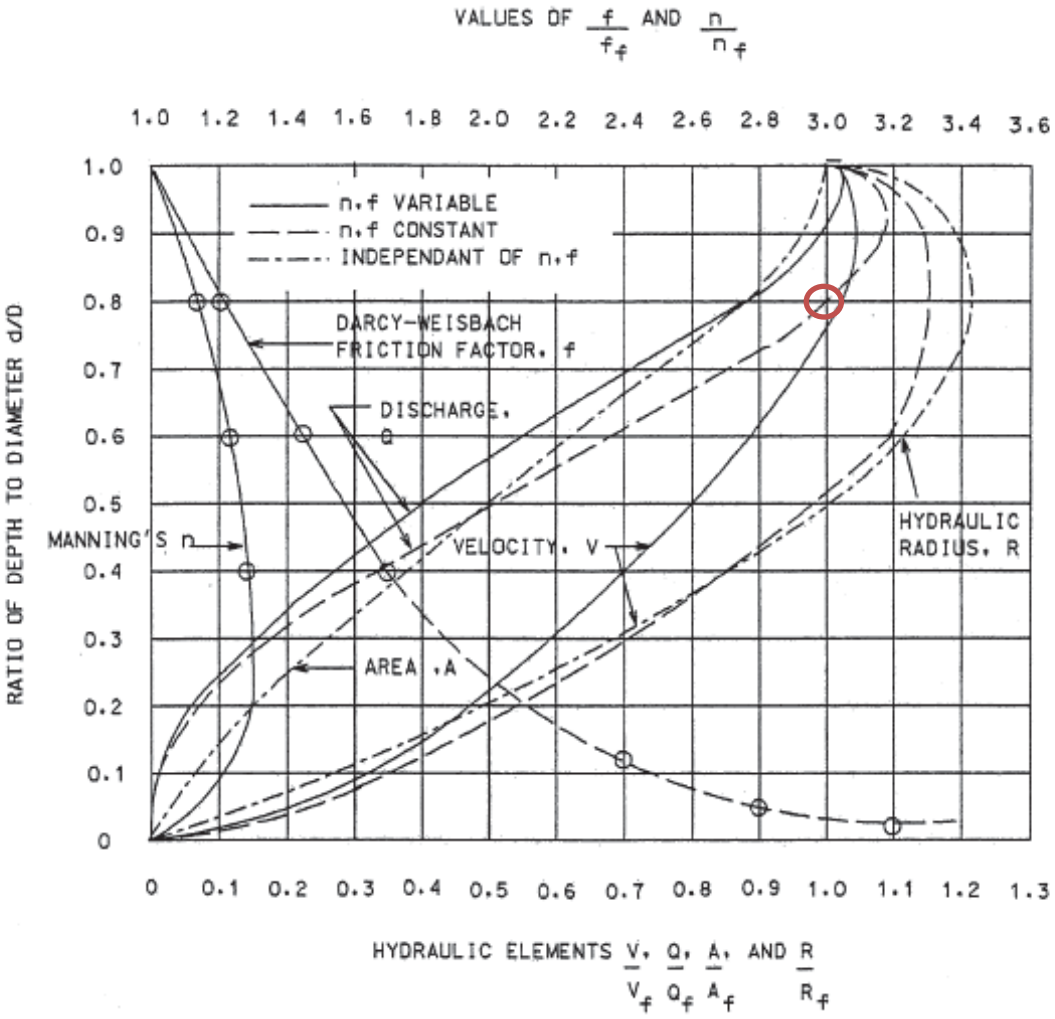
As stated in the previous section, the design criteria for gravity sewers provides unoccupied space at the top of the pipe for conveyance of sewage gasses and to provide contingent capacity for wet weather inflow and infiltration. In this Master Plan, the PWWF analysis assumes peak I&I rates coincide with the peak dry weather flow, and the duration of the PWWF condition is brief. When gravity pipelines are evaluated to determine if there is adequate capacity under the PWWF condition, a separate pipeline evaluation criteria is often used to determine the permissible flow level before the pipeline should be upsized. This criteria is often referred to as "trigger" criteria.

The 2012 Sewer Master Plan used a design storm from 2005 to estimate inflow and infiltration during wet weather flows. The 1.5 inch rainfall event on Wednesday, February 23, 2005 was therefore selected as the basis for PWWF. For this 2018 Master Plan update, the December 2010 storms will be used as the basis for PWWFs. This storm was a 10-year design storm event and is consistent with the assessment by the City of Vista in its 2017 Comprehensive Sewer Management Plan, which shares sewer interceptor systems that convey wastewater to the EWPCF. In addition, the 2012 Sewer Master Plan allowed for gravity sewers to flow up to 90 percent full under PWWF conditions before improvement projects were required. This same approach was used in the 2018 Master Plan Update for the large diameter interagency interceptor gravity

mains. A different approach was used in the 2018 Master Plan Update for the Carlsbad collection system which is made up of smaller diameter gravity mains.

Figure 4-3 shows the d/D ratios and the corresponding flow/maximum or full flow (Q/Q_f) ratios for circular pipes with a constant friction factor as used in the existing system capacity analysis.

Figure 4-3. Comparison Depth Flow Relationship



As indicated in red, the pipe is flowing at 99 percent of its full pipe flow capacity when the depth is 80 percent of full pipe. In areas between 80 percent and 100 percent of depth the hydraulic regime is unstable. The use of the 0.80 value is considered more conservative than the 0.85 value.

The InfoSWMM model reports the partial flow ratio of full flow using the equation Q/Q_f. In instances where the d/D is greater than 0.980 and the $Q/Q_f < 0.99$ the line is surcharging because of a downstream restriction. In this Master Plan Update, improvement projects were triggered in the existing system when pipes had both a d/D >0.80 and $Q/Q_f > 0.99$. Pipelines that had only one or the other of these constraints were put on a “watch” list.

Using a d/D ratio of 0.5 for small diameter pipes and 0.75 for larger diameter pipes for peak dry weather flow has been considered. However, with the potential for RDII, using a d/D ratio of 0.80 for capacity evaluation of the system during PWWF is a conservative approach. If RDII is reduced significantly in future years, the alternative standard may become appropriate.

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5 Hydraulic Model Development

This section describes the hydraulic model development and update for the 2018 Master Plan. As part of this model development process, the hydraulic model used in the previous (2012) Master Plan was updated with regard to infrastructure, flow loading, and RDII.to represent the following systems:

- Existing System Hydraulic Model – Updated to represent the 2017 collection system and calibrated based on available information
- Near-Term System Hydraulic Model – Calibrated existing system model updated with near-term improvement projects and used to identify potential capacity constraints
- Buildout System Hydraulic Model – Updated with projected buildout flows and improvement projects and used to identify potential future capacity constraints.

5.1 Model Parameters

Hydraulic modeling and analysis was performed using the software package InfoSWMM by Innovyze. The version of the software used was InfoSWMM Suite 14.5 Update #5. This section discusses some important aspects of the modeling software.

5.1.1 Modeling Software

InfoSWMM performs hydraulic calculations with extended period simulations and fully dynamic flow routing to calculate water depth in open channels and velocities and headloss in force mains.

Hydraulic modeling software is composed of two primary parts including the graphical user interface and the computational engine. The graphical user interface is the aspect of the model that is used to input data, provide scenario settings and assumptions, initiate analyses and review results. The computational engine performs the hydraulic calculations. The InfoSWMM modeling software package used for this Master Plan is a fully ArcGIS integrated, highly advanced, and comprehensive hydrologic, hydraulic, and water quality simulation model. The InfoSWMM graphical user interface runs within the ESRI ArcMap platform, allowing direct importation of the existing sewer geodatabase maintained by the City.

The InfoSWMM computational engine is based on the Environmental Protection Agency Storm Water Management Model. InfoSWMM software has the capability to perform hydraulic analysis using a Fully Dynamic Wave routing method in addition to solving the Manning's equation for calculating headloss. The Fully Dynamic Wave routing method solves the complete one-dimensional Saint Venant flow equations. These equations consist of the continuity and momentum equations and take into account the inertial and pressure forces and can predict surcharge, overflow, and backwater conditions. The InfoSWMM computational engine also solves Hazen-William's equation for pressurized flow in the force mains.

5.1.2 Physical Data Input

InfoSWMM represents collector and interceptor gravity mains, siphons, force mains, and lift stations as links, whereas wet wells, manholes, cleanouts, and other appurtenances are represented as nodes. This type of model is referred to as a link-node model. Link alignments, node locations, and basin modeling data associated with links and nodes (including invert elevations, manhole depths, pipeline diameters, pipeline lengths) were imported directly from the City's wastewater geodatabase. Lift station data, including wet well dimensions, were entered manually based on information provided by City staff.

5.2 Existing System Model Update and Calibration

The existing system hydraulic model consists of 6,871 pipeline segments totaling over 287 miles of pipeline. Pipeline diameters range from 3 to 54 inches. The interceptor reach naming convention established in the previous Master Plans has been maintained for this analysis.

The existing system hydraulic model was updated based on available information to represent the collection system as it existed and operated in 2017. The model was then calibrated by comparing actual flow data with model results. Modeled and recorded flow comparison plots from the model verification process are provided in Appendix C-2, Model Validation Results. The existing system model includes gravity interceptors and collector pipelines, siphons, lift stations, force mains, manholes, cleanouts, and other appurtenances that were operational during 2017.

5.2.1 Infrastructure Updates

Infrastructure in the existing hydraulic model was updated by importing facilities added to the City’s geodatabase since the previous hydraulic model update that was performed as part of the 2012 Master Plan. Facilities were imported from the City’s geodatabase to the InfoSWMM model using the Import Manager tool. Facilities imported included pipes and manholes listed as both active and future in the geodatabase. The total number of facilities imported to the model includes 559 pipes (219 existing, 340 future) for a total of over 16 miles of pipe and 512 manholes (200 existing, 312 future). Active facilities were included in the existing system model. Future facilities in the geodatabase represent planned projects with specific facility information including the location of planned pipes and manholes. Examples of future facilities in the geodatabase are the Agua Hedionda LS improvements and facilities associated with new developments such as Robertson Ranch and Quarry Creek. These facilities were included in the near-term and buildout system models. Flows from the El Fuerte LS were also redirected to the BIS as part of the model update.

5.2.2 Dry Weather Flow Update and Calibration

Dry weather flow loading was updated in the model based on 2017 data. Following the dry weather flow loading update, the model was calibrated by comparing model output with flow meter data available from dry weather periods in 2017.

Dry Weather Flow Updates

Dry weather flow loading in the existing system model was based on a combination of the temporary and permanent flow meter data discussed in Section 3. Temporary flow meters were installed in the system in 2014 and 2016 which collected dry weather flow data for the areas shown on Figure 3-4. EWA maintains permanent flow meters shown on Figure 3-1 which collect flow data on a continual basis except during infrequent maintenance periods. ADWFs were based on dry weather periods. The 2014 and 2016 flow monitoring periods did not experience significant rainfall events. Data from these temporary flow meters were used to calculate ADWF and diurnal patterns for the areas tributary to the meters as shown on Figure 3-7.

EWA permanent flow meter data from the summer of 2017 were used to calculate ADWF for the balance of the service area not monitored by the temporary flow meters. EWA flow meter data was also used to calculate ADWF entering the interceptors from neighboring agencies (external flows). Flows generated within Carlsbad (internal flows) were distributed by performing an upstream trace to calculate the number or nodes (manholes and cleanouts) within each upstream metered service area, calculating an average flow per node, and then loading each node with the average flow for that metered basin. Average flows for outside agencies (external flows) were input to interceptors at the location of each upstream EWA meter.

Flow meter data was also used to develop diurnal curves, which are 24-hour unit hydrographs that are applied to ADWF to represent flow fluctuations throughout a typical day. Diurnal curves were developed for week day and weekend day conditions for the tributary areas of each of the flow meter locations used to develop ADWF loading. The use of diurnal curves when accounting for the wastewater generation of each contributor allows for a more accurate representation of flow variations and accounts for the routing of wastewater through the collection system on a temporal basis.

Dry Weather Calibration

The hydraulic model was calibrated based on dry weather flows during each of the 2014 and 2016 flow monitoring periods, for the temporary flow monitor tributary areas, and during summer 2017 for the remainder of the system. A week long hydraulic simulation was performed, and downstream flows in the model at the EWPCF were compared with recorded flows from the four permanent meters at the treatment facility (EWA meters C1, C2, C3, and B1). Downstream model flows at the temporary flow meter locations were also compared with recorded flows. The diurnal curves were adjusted, as required to match the downstream flows.

At the conclusion of the model calibration process, all model flows were within 10 percent of recorded flow, which is the general acceptance criterion for model calibration results. Additionally, effort was focused on matching peak flow rates, and the variance between modeled and recorded peak flows was generally less than 5 percent.

5.2.3 Wet Weather Flow Loading Update and Calibration

Wet weather flow loading in the model was updated with RDII information calculated based on data collected during a significant rainfall event in December 2010 as discussed in Section 3.1.3. Following the wet weather flow loading updates, the model

was calibrated by comparing model output with flow meter data available from the December 2010 rainfall event.

Wet Weather Flow Updates

Wet weather flow updates in the model were performed by using a combination of peak flow loading and RTK unit hydrographs based on the 2012 Master Plan model update and flow meter data from the December 2010 rainfall event as discussed in Section 3.1.3.

The 2012 Master Plan employed peak RDII flow loading superimposed on ADWF patterns to represent wet weather flows in the hydraulic model. RTK unit hydrographs were used in the model update for the 2018 Master Plan, when data were available, in order to provide a more accurate representation of PWWFs in the collection system. RTK unit hydrographs represent (1) the percent of rainfall that results in RDII over an area and (2) the flow pattern of the RDII as it enters the system relative to rainfall intensity.

The RTK unit hydrographs developed for this Master Plan update were based on hourly flow meter data compared with hourly precipitation data for the December 2010 rainfall event discussed in Section 3.1.3. RTK hydrographs were assigned to model nodes in the tributary areas of three of the four EWA EWPCF meters, including C3, C1, and B1 meters. These three EWA meters were operational during the December 2010 rainfall event, and continuous flow meter data are available for these meters as well as the corresponding upstream interceptor EWA meters used to calculate the contribution of Carlsbad flows to the EWPCF. For each of the Carlsbad tributary areas of these three EWA meters, preliminary RTK unit hydrographs were developed based on hourly flow meter data and assigned to corresponding model nodes.

EWA meter C2 was offline during the December 2010 rainfall event, but daily flows during this period were calculated based on EWPCF inflows and included in the EWA monthly log sheet. Carlsbad RDII for the C1 tributary area was compared with wet weather flow loading included in the 2012 Master Plan hydraulic model, and the 2012 hydraulic model flows for this area of the system were slightly more conservative than the RDII calculated based on the December 2010 rainfall event. Therefore, the wet weather flow loading used in the 2012 version of the model was carried over and used in the updated model for C2.

The RTK curves included in the model as part of the wet weather flow updates were updated as part of the wet weather calibration process to better match the flow meter data collected during the December 2010 rainfall event.

Wet Weather Calibration

The hydraulic model was calibrated based on wet weather flows during the December 2010 rainfall event. The RTK unit hydrographs uploaded to the model were iteratively updated based on comparisons of model output and the EWA SCADA data. At the conclusion of the model calibration process, all model flows were within 10 percent of recorded flow, which is the general acceptance criterion for model calibration results. Additionally, effort was focused on matching peak flow rates, and the variance between modeled and recorded peak flows was generally less than 5 percent.

5.3 Near-Term System Model Development

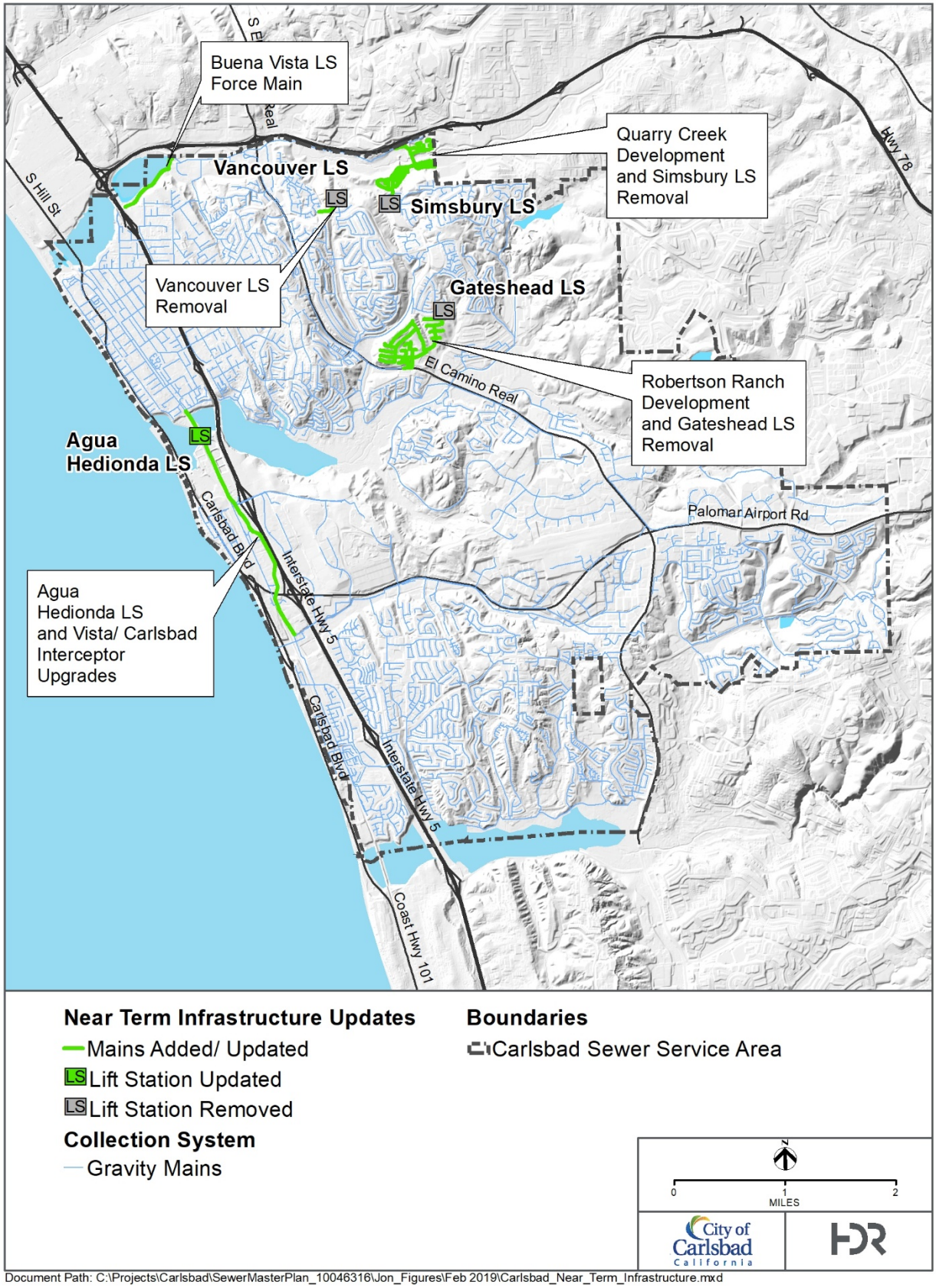
The near-term system model was developed by updating the calibrated existing system model with planned near-term infrastructure upgrades significantly affecting the collection system hydraulics. This model was developed to identify potential existing hydraulic deficiencies in the collection system while incorporating planned near-term system upgrades and developer projects in order to avoid misidentifying potential hydraulic deficiencies that are currently being addressed or affected by ongoing projects.

Infrastructure in the model was updated with near-term developer related projects based on the City's geodatabase. Two primary development projects include Robertson Ranch and Quarry Creek, each of which include the addition of gravity main networks and the removal of a lift station (Gateshead and Simsbury LSs, respectively). The Vancouver LS was also removed for the near-term scenario.

The model was also updated with the upgrades associated with the ongoing Agua Hedionda LS project including the forcemain and significant large diameter gravity main additions. Additionally, upgrades to the NAHI were included in the near-term model scenario.

The infrastructure added and updated in the near-term model scenario is shown on Figure 5-1. Following model analysis, system improvements were added to the near-term model to address potential hydraulic deficiencies identified based on the evaluation criteria.

Figure 5-1. Near-Term System Model Infrastructure Updates



5.4 Buildout System Model Development

The buildout system model was developed by adding additional infrastructure and flows to the near-term model to represent projected buildout conditions based on available information. Additional infrastructure was added to the model based on the City's geodatabase. Flows were updated in the model based on the buildout flow projections discussed in Section 3.3.2.

An additional system update that is handled as a separate buildout model scenario is the planned acquisition of the BIS by Carlsbad which will result in Carlsbad owning 100 percent capacity of the interceptor for the majority of the pipeline. The effect this project has on the buildout system model development is limited to allocating Vista flows to a different location on the BIS and will be addressed in Section 6.3.

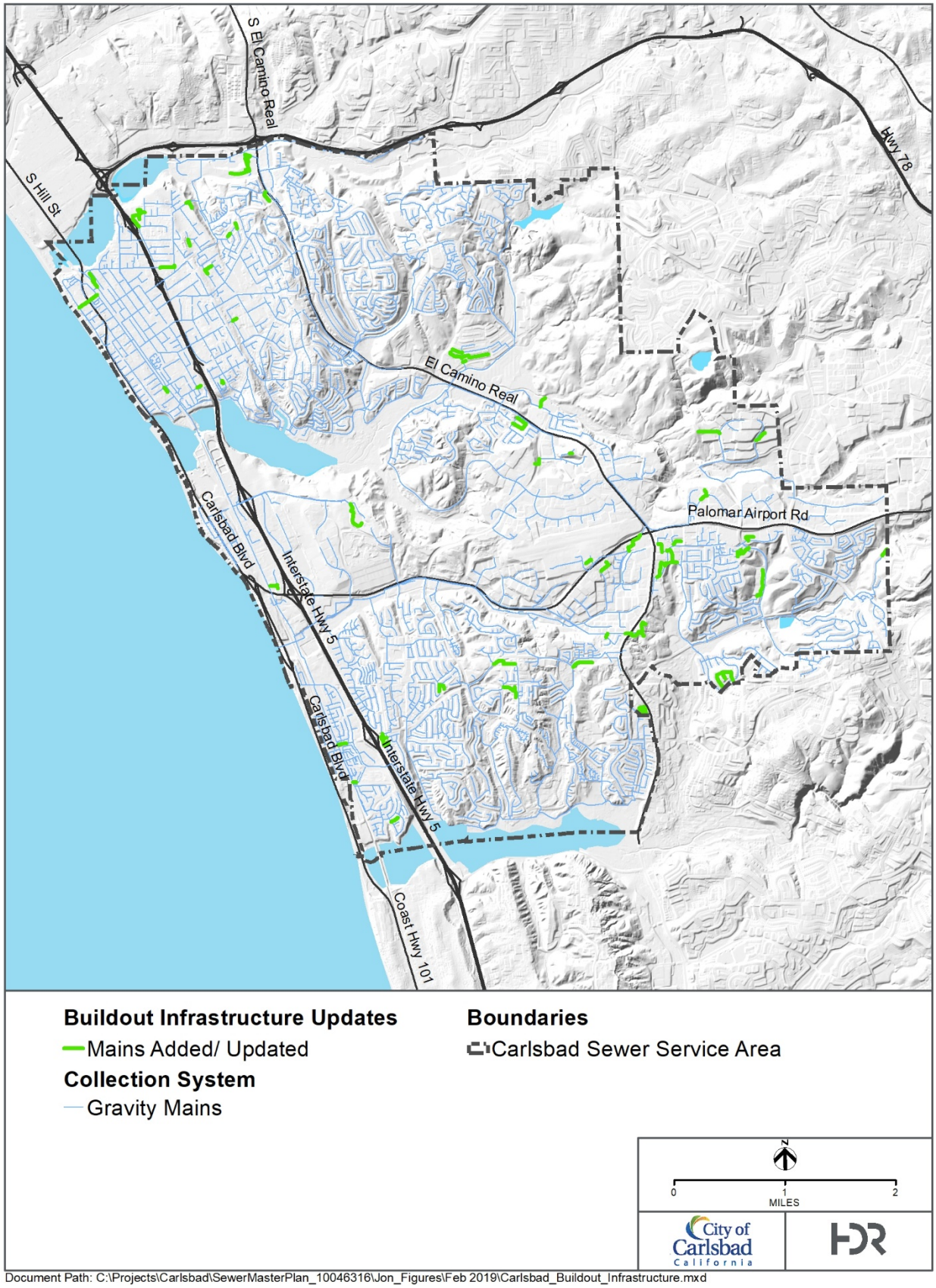
5.4.1 Infrastructure Updates

Infrastructure updates to the buildout model included several small system expansion projects identified in the City's geodatabase. Additionally, planned CIP projects that fundamentally change the way the system is operated were added to the buildout model including the Las Palmas trunk sewer project which redirects flows from the Poinsettia LS to the BIS. Removal of Gateshead, Simsbury, and Vancouver LSs and associated system expansion projects were included in the near-term model and carried over to the buildout model.

The remainder of the capacity related projects on the City's CIP list at the time of this master plan were not included in the initial buildout system model in order to use the model analysis to check that these projects were required based on the evaluation criteria.

The infrastructure initially added to the buildout model is shown on Figure 5-2. Following model analysis, system improvements were also added to the buildout model to address potential hydraulic deficiencies identified based on the evaluation criteria.

Figure 5-2. Buildout System Model Infrastructure Updates



5.4.2 Flow Loading Update

Flows for the buildout model were updated based on the projected buildout flows discussed in Section 3.3.2. ADWF from the model calibration discussed in Section 5.2 were carried over to the buildout model and projected additional buildout ADWF was added. The existing and projected buildout flows included in the buildout model are summarized in Table 3-14.

Projected buildout flows were allocated to model nodes spatially based on the location of the parcels contributing buildout flows (Figure 3-12) and their proximity to the updated buildout system infrastructure discussed in previous section. Spatial allocations were reviewed for parcels not immediately adjacent to infrastructure included in the model for the most reasonable allocation node based on existing right of ways.

Buildout flows allocated to the model were designated as either residential, for all residential land use types, or commercial, for all non-residential land use types. Each type of flow was assigned diurnal patterns, based on the flow meter data analysis discussed in Section 3.1.2, for weekday and weekend conditions. The diurnal patterns used for the buildout flows allocated to the model are shown on Figure 5-3. The flow patterns were also normalized using weekly patterns for each land use type consisting of the daily multipliers shown on Figure 5-4.

Figure 5-3. Diurnal Patterns for Residential and Commercial Buildout Flows

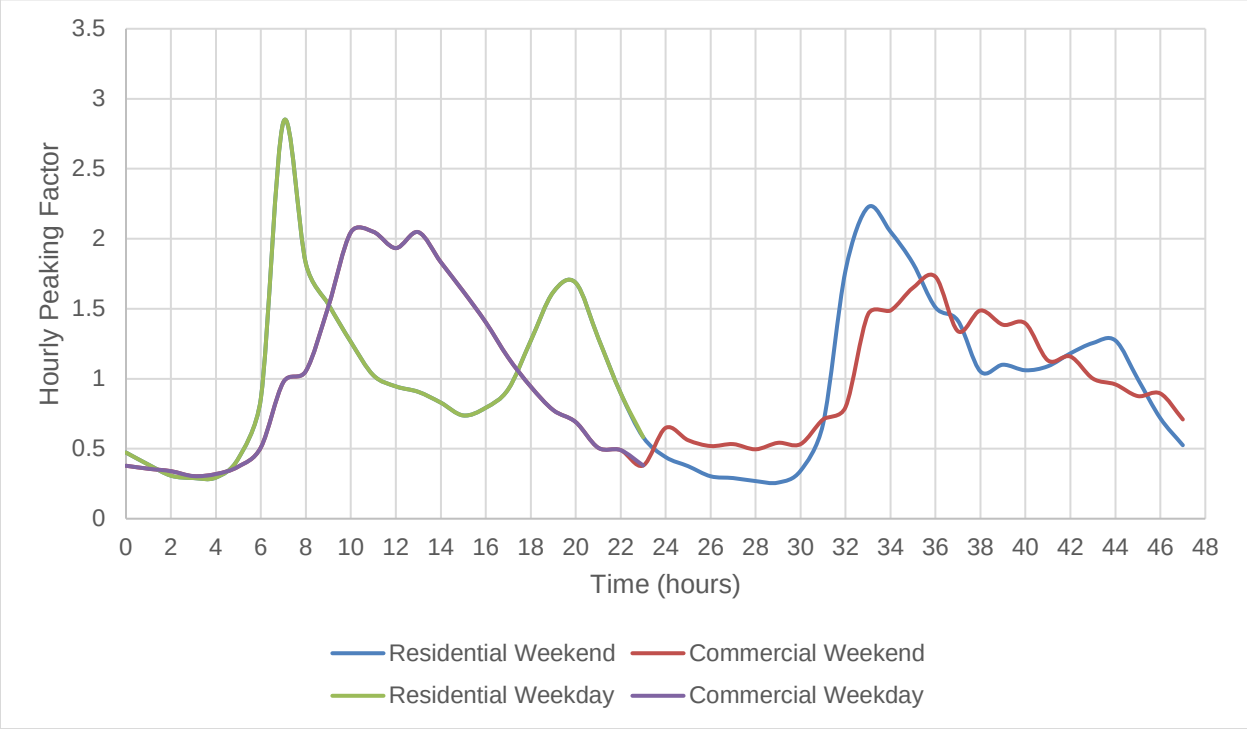
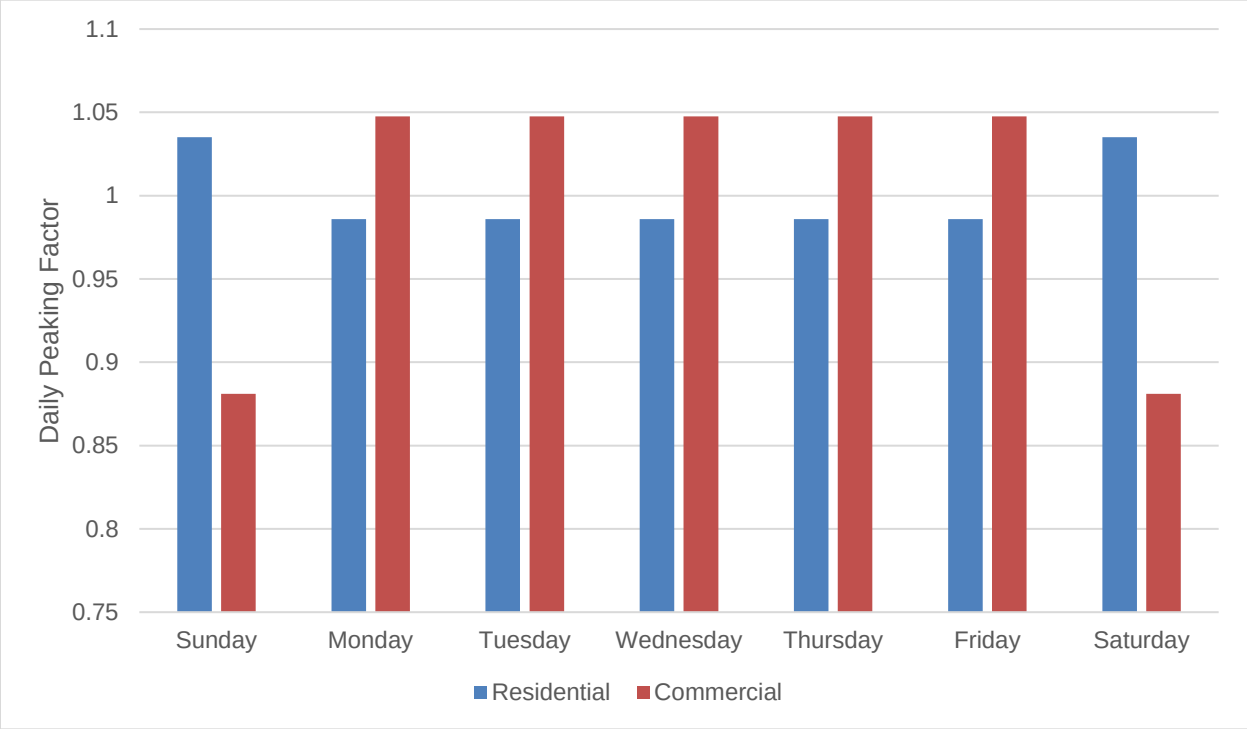


Figure 5-4. Weekly Patterns for Residential and Commercial Buildout Flows



6 System Evaluation

This section discusses the evaluation of the modeled systems discussed in Section 5. System evaluations were based on hydraulic capacity analyses conducted by running the models for wet weather flow conditions and comparing model results with the evaluation criteria discussed in Section 4.2.2.

6.1 Near-Term System Capacity Analysis

As discussed in Section 5.3, the near-term model represents the existing system plus significant, near-term planned infrastructure changes. This section discusses the capacity analysis of the projected near-term system.

6.1.1 Collection System

This section addresses model results for the Carlsbad collection system gravity mains, lift stations, and forcemains. The following section addresses interagency facilities.

Gravity Mains

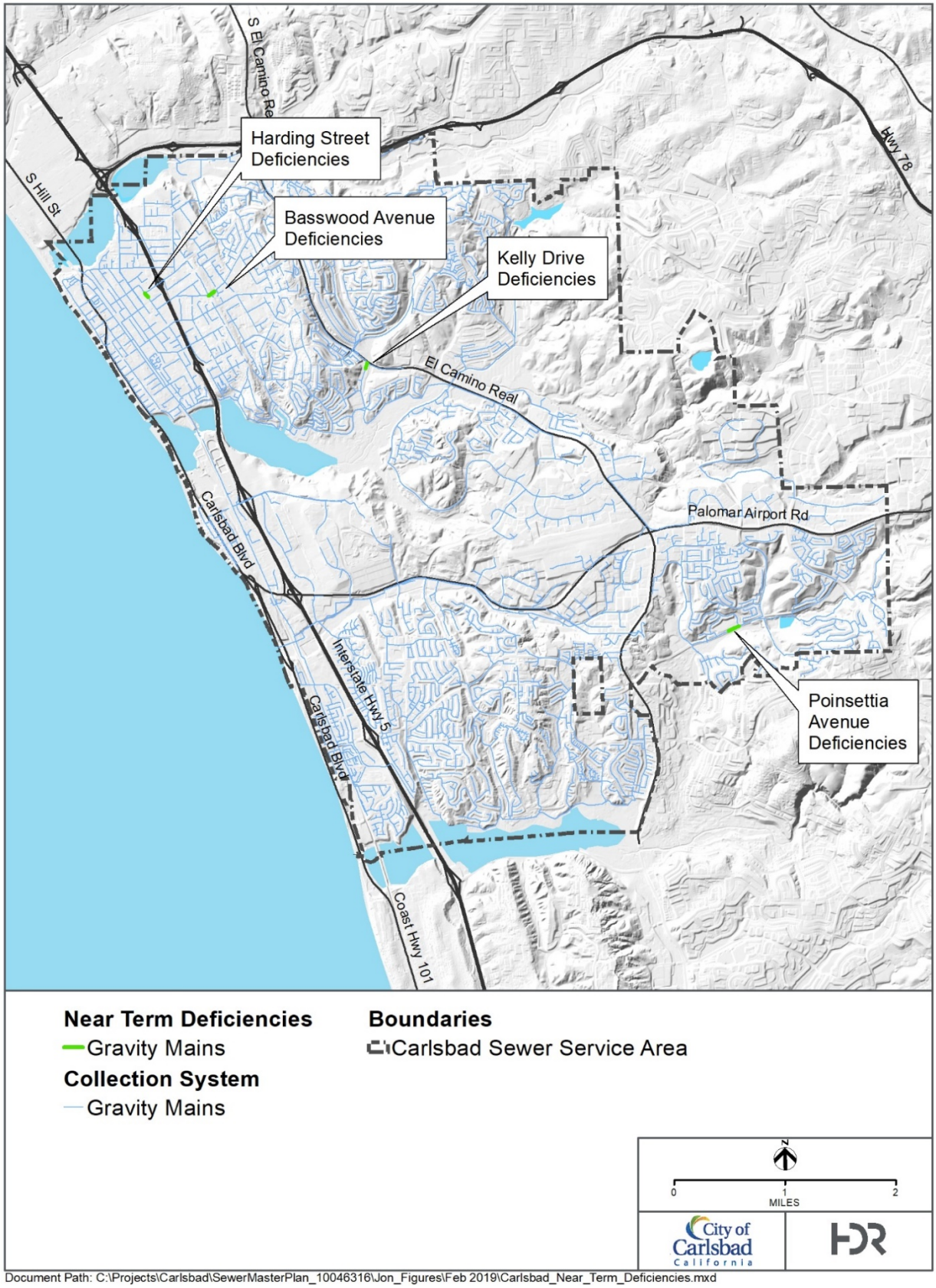
Capacity assessment for gravity mains in the collection system was based on the evaluation criteria discussed in Section 4.2.2. Based on the evaluation criteria, gravity mains were considered over capacity if PWWF exceeded d/D of 0.8 and q/Q of 1.0. Based on this criteria, four gravity mains were found to exceed capacity including:

- Poinsettia Lane Deficiencies (mains SWM4793, SWM6349) 12 inch mains in Poinsettia Lane west of the intersection of Mica Road (CIP Project # C-6)
- Harding Street Deficiencies (main SWM4273) 10 inch main in Harding Street at the intersection of Carlsbad Village Drive (CIP Project # C-7)
- Kelly Drive Deficiencies (main SWM1659) 12 inch main in Kelly Drive at the intersection of El Camino Real (CIP Project # C-8)
- Basswood Avenue Deficiencies (main SWM3653) 8 inch main in Basswood Avenue at the intersection of James Drive (CIP Project # C-9)

None of these potential capacity issues resulted in SSOs in the model. The location of these mains is shown on Figure 6-1. Appendix C-3, Existing System Capacity Analysis Results, includes Hydraulic Grade Line profiles and location maps of the areas requiring improvements.

It should be noted that, due to limited wet weather flow meter data, model RDII was globally allocated to the major collection system basins based on EWA flow meter data, as discussed in Section 5.2.3. Therefore, the distribution of RDII within the collection system is likely not as homogenous as is represented in the model. It is recommended that future wet weather flow monitoring studies be conducted to access the areas tributary to the recommended improvements listed here.

Figure 6-1. Existing Carlsbad Collection System Modeled Hydraulic Deficiencies



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Lift Stations

Model results indicate that all lift stations within the collection system satisfied the evaluation criteria of conveying peak wet weather flows with their firm capacity with the exception of the Poinsettia LS experienced peak flows exceeding the station's firm capacity, however no upstream spills resulted in the model, indicating that the upstream capacity was able to absorb the peak flows and convey wet weather flows without overflow.

However, due to limited wet weather flow meter data, model RDII was globally allocated to the major collection system basins based on EWA flow meter data, as discussed in Section 5.2.3. Therefore, the distribution of RDII within the collection system is likely not as homogenous as is represented in the model. It is recommended that future flow monitoring studies be used to access the areas tributary to the Poinsettia LS to better determine the RDII contribution from these areas. Specifically, RDII may be over represented in the area tributary to the Poinsettia LS considering that the area is at a higher elevation, not near any major water bodies or rivers.

6.1.2 Interagency Facilities

This section addresses analysis results for modeled facilities shared by EWA member agencies including regional, interagency interceptors and lift stations.

Interceptors

This section addresses results for interagency interceptors included in the hydraulic model.

Vista Carlsbad Interceptor

The V/C Interceptor was represented in the near-term model including the current updates to the Agua Hedionda LS, force main, and related large diameter gravity main additions. Including these improvements, model results indicate that the V/C Interceptor satisfies evaluation criteria with the existing system flow loading included in this scenario.

Vista wet weather flow to the V/C Interceptor peaks at approximately 15.9 mgd. Model results indicate that pear flows at the terminus of this interceptor are anticipated to reach 24.9 mgd. The Buena Vista and Agua Hedionda LSs convey flows in this interceptor and are discussed in the following section.

Buena Interceptor

Model results indicate that the BIS potentially exceeds the evaluation criteria at two primary locations shown on Figure 6-2. However, although the criteria is exceeded, the model results do not indicate that the interceptor is more than 85 percent full during PWWF conditions.

City of Vista wet weather flows to the BIS peak at approximately 4.9 mgd. Model results indicate that peak flows at the terminus of this interceptor are anticipated to reach 9.3 mgd. Carlsbad wet weather flows to the interceptor peak at 4.6 mgd based on model results. Attenuation decreases the peak flows as they travel through the interceptor.

As discussed previously, Carlsbad is planning to take full ownership of the BIS when the City of Vista completes construction of a parallel force main to convey their flows to the EWPCF. The capacity analysis for this scenario is discussed in Section 6.3.

Vallecitos Interceptor

Model results indicate that the VIS potentially exceeds the evaluation criteria at one location shown on Figure 6-2. However, although the criteria is exceeded, the model results do not indicate that the interceptor is more than 90 percent full during PWWF conditions.

VWD wet weather flow to the VIS peaks at approximately 16.1 mgd. Model results indicate that peak flows at the terminus of this interceptor are anticipated to reach 24.6 mgd.

Carlsbad has capacity rights of 5.0 mgd in the VIS, and the PWWF from Carlsbad is estimated at approximately 5.1 mgd. However, significant flow from the Poinsettia LS that is currently routed to the VIS is planned to be diverted to the BIS as part of the Las Palmas trunk sewer project to coincide with Carlsbad's acquisition of the BIS. The BSD owns 3.75 mgd of capacity in the VIS, but does not currently contribute any flow.

North Batiquitos Interceptor

The Ponto Sewer (NB9) is part of Carlsbad's NBI Sewer System and is jointly owned by the City of Carlsbad, the City of Encinitas, and LWD in accordance with an agreement dated August 24, 1972. The capacity of the 39-inch diameter gravity pipeline flowing full is approximately 21 mgd. Hydraulic analysis results indicate a potential PWWF of approximately 14.2 mgd in this pipeline. Carlsbad owns a total of 40.0 percent of the available capacity, or approximately 8.5 mgd and ESD/LWD own the remaining 12.5mgd. PWWFs from Carlsbad are attenuated by the operation of the upstream NB LS, and are currently estimated at approximately 3.5 mgd with two of the fixed speed pumps in operation. The City of Carlsbad is therefore using less than 50 percent its allocated capacity in the Ponto Sewer.

Interceptor Lift Stations

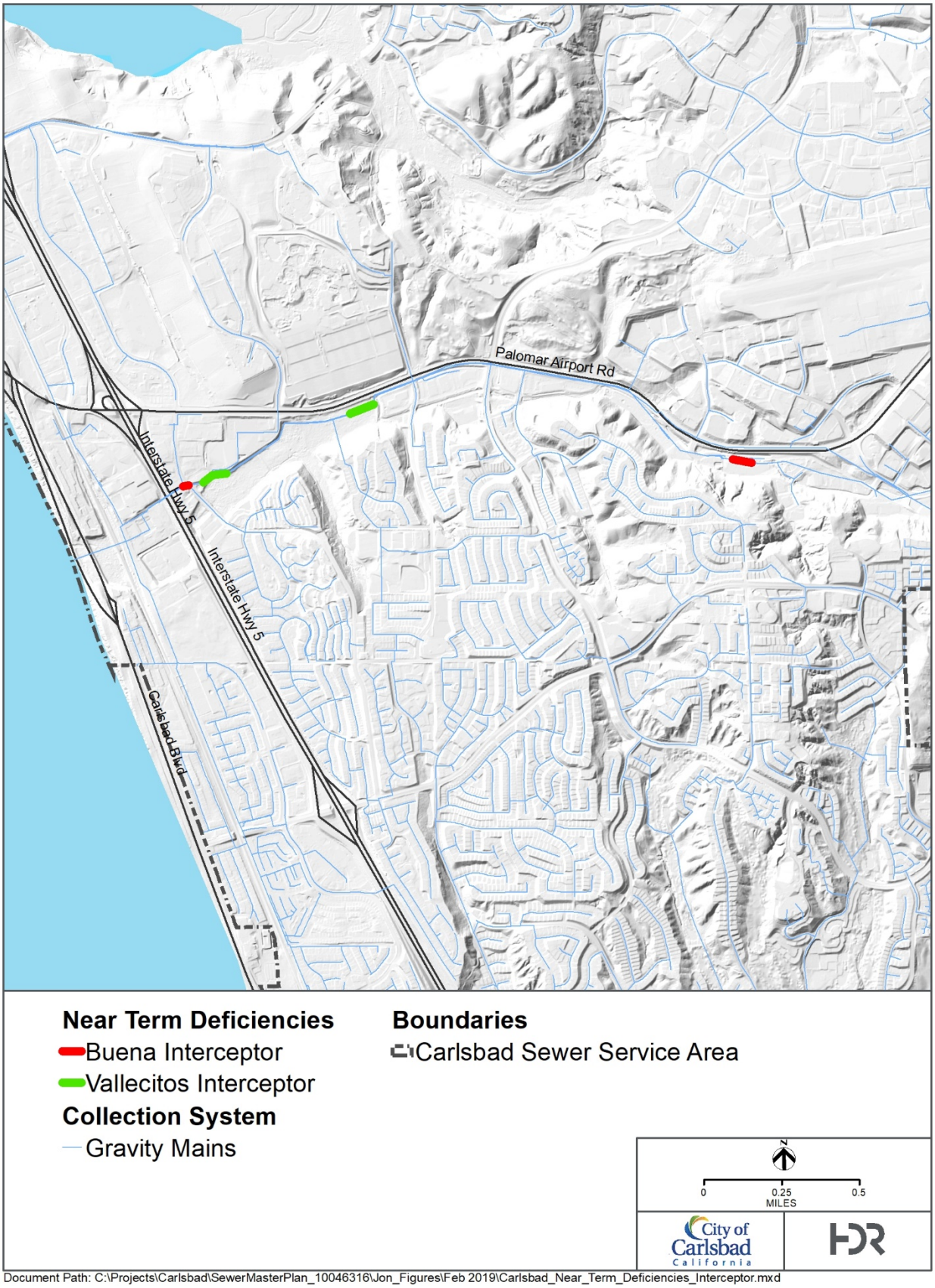
The interagency interceptor system includes two lift stations represented in the hydraulic model including the Buena Vista and Agua Hedionda LSs, which both convey V/C Interceptor flows. The Agua Hedionda LS is currently undergoing an upgrade, and an upgrade for the Buena Vista LS is planned for the near term. For the near-term model analysis, the lift stations' pre-upgrade firm capacities were used to check the flows indicated by the model analysis (updated lift station capacity information may be included when the upgrades are complete).

The Buena Vista LS currently has a firm capacity of 21.5 mgd. Model results indicate a PWWF of 16.7 at the lift station.

Following the upgrades, the Agua Hedionda LS is planned to have a firm capacity of 33.0 mgd. Model results indicate a PWWF of 21.7 mgd at the lift station.

Based on the hydraulic analysis, both the Buena Vista and Agua Hedionda LSs should have sufficient capacity to convey the existing flows indicated in the model runs assuming the lift station upgrades will not decrease either station's capacity.

Figure 6-2. Existing Interceptor System Modeled Hydraulic Deficiencies



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6.1.3 Flows to the Encina Water Pollution Control Facility and Outfall

Evaluation of Carlsbad's use of EWPCF is based on the ADWF for treatment plant capacity and the PWWF for capacity in the ocean outfall. As summarized in Section 3, the existing wastewater flow for Carlsbad, based on metered flows from 2014, is approximately 6.24 mgd. Compared to the City of Carlsbad's Phase V capacity ownership of 10.26 mgd for treatment and solids handling in the EWPCF, Carlsbad is currently using approximately 60 percent of its capacity ownership.

The Encina Ocean Outfall has a maximum instantaneous capacity of 104.9 mgd, considering the capacity enhancement of constructed flow equalization facilities. Carlsbad's peak flow capacity rights in the outfall per the RBA are 25.5 mgd. Peak hourly flows from Carlsbad cannot be determined from Encina flow meters since Carlsbad flows are subtracted from other agency flows. Resultant peak flows from Carlsbad at Encina are likewise not directly available from the hydraulic analysis, since peak flows in the interceptors occur at different hours in the simulation. Based on the peaking factor curves presented in Section 3 and the estimates of RDII generated within the Carlsbad service area, the PWWF from Carlsbad is estimated to be approximately 15.6 mgd, which is 2.5 times the ADWF. It is therefore estimated that the City of Carlsbad is currently using approximately 61 percent of its capacity ownership in the Encina Ocean Outfall. It is noted that Carlsbad outfall flows are reduced by recycled water production.

6.2 Buildout System Capacity Analysis

As discussed in Section 5.4, the buildout model represents the near-term system plus planned future infrastructure and projected buildout flows. This section discusses the capacity analysis of the projected buildout system.

6.2.1 Carlsbad Collection System

This section addresses model results for the Carlsbad collection system. The following section addresses interagency facilities.

Gravity Mains

Capacity assessment for gravity mains in the collection system was based on the evaluation criteria discussed in Section 4.2.2. Based on the evaluation criteria, gravity mains were considered over capacity if PWWF exceeded d/D of 0.8 and q/Q of 1.0. Based on this criteria, three gravity mains were found to exceed capacity including:

- Faraday Avenue Deficiencies (main SWM239) 8 inch main near Faraday Avenue and El Camino Real (CIP Project # C-4)
- Poinsettia Lane Deficiencies (main SWM4790) 12 inch main in Poinsettia Avenue west of the intersection of Quartz Way (CIP Project # C-6)
- Kelly Drive Deficiencies (main SWM1659) 12 inch main in Kelly Drive near the intersection of El Camino Real (CIP Project # C-8)

None of these potential capacity issues resulted in SSOs in the model. The location of these mains is shown on Figure 6-3. Two of these projects (C-6 and C-8) were also

identified as having existing deficiencies. CIP Project # C-4 is based on the City's plans to re-route from El Fuerte LS along Faraday, south to Palomar Airport Road. The 2012 Master Plan identified the need to upsize this entire stretch of pipe (3,323 feet) from 8 and 10 inch to 12 inch pipe. With lower unit flows, this improvement project can be reduced to upsizing only the 643 feet of 8 inch pipe to 10 inch pipe. Appendix C-4, Buildout Capacity Analysis Results, includes Hydraulic Grade Line profiles and location maps of the areas requiring improvements.

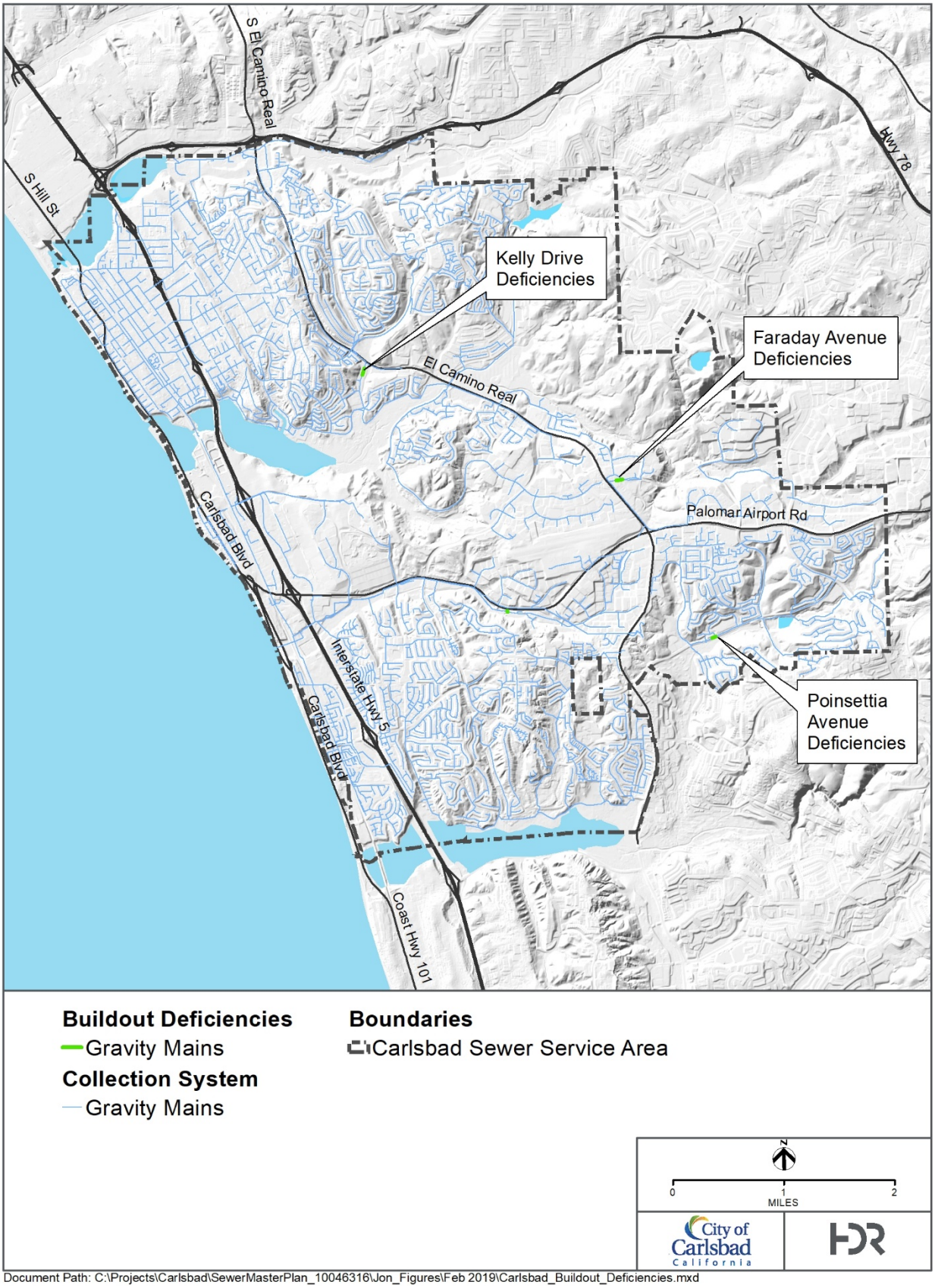
Lift Stations

Thirteen lift stations were included in the buildout system model including 11 lift stations in the Carlsbad collection system and two serving interagency interceptors which are discussed in the next section. The Carlsbad collection system lift stations Gateshead, Simsbury, and Vancouver were removed from the buildout scenario as planned. Of the 11 lift stations, 4 experienced PWWF exceeding their firm capacity based on the model results, but did not cause any upstream spills.

The lift stations that experienced PWWF above their rated capacity include the Cannon Road, Foxes Landing, North Batiquitos, and Poinsettia. However, it should be noted that, due to limited wet weather flow meter data, the distribution of RDII within the collection system is not as accurate as it would be if quality intra basin wet weather flow monitoring data were available for the wet weather model calibration.

It is recommended that future flow monitoring studies be used to access the areas tributary to the lift stations projected to experience PWWF exceeding their firm capacity in order to better determine the RDII contribution from these areas before decisions are made regarding buildout system lift station upgrades.

Figure 6-3. Buildout Carlsbad Collection System Modeled Hydraulic Deficiencies



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6.2.2 Interagency Facilities

This section addresses analysis results for modeled facilities shared by EWA member agencies including interceptors and lift stations.

Interceptors

This section addresses results for interagency interceptors included in the hydraulic model. The model results included in this section do not take into account the planned construction of the Vista forcemain, the related Carlsbad acquisition of the BIS, and planned rerouting of Carlsbad flows to the BIS which affect the capacity analysis of both the VIS and the BIS. For model results related to the Carlsbad acquisition of the BIS, see Section 6.3.

Vista Carlsbad Interceptor

The V/C was represented in the buildout model including the current updates to the Agua Hedionda LS, force main, and related large diameter gravity main additions. Model results indicate that the V/C does not satisfy evaluation criteria for reach VC-3 with the buildout system flow loading included in this scenario. At the time of this master plan update, the majority the VC-3 interceptor reach consists of 36 inch diameter gravity main and is scheduled for upsizing to 42 inches (listed currently as CIP Project # I-1). The sections of the interceptor upstream of VC-3 are currently 42 inch diameter gravity main. The model results indicate that the 36 inch diameter gravity mains of Reach VC-3 are not sufficient to convey the flows from the upstream 42 inch diameter mains.

Vista wet weather flow to the V/C peaks at approximately 23.4 mgd. Model results indicate that peak flows at the terminus of this interceptor are anticipated to reach 30.3 mgd.

The Buena Vista and Agua Hedionda LSs convey flows in this interceptor and are discussed in the following section.

Buena Interceptor

Model results indicate that the BIS potentially exceeds the evaluation criteria and surcharges throughout most of its length when projected buildout flows are loaded to the model. However, the model results included in this section do not take into account the planned Carlsbad acquisition of the BIS. For model results related to the Carlsbad acquisition of the BIS, see Section 6.3.

Vista buildout wet weather flow to the BIS peaks at approximately 8.2 mgd. Model results indicate that peak flows at the terminus of this interceptor are anticipated to reach 11.7 mgd. Carlsbad wet weather flows to the interceptor peak at 7.0 mgd based on model results. Attenuation decreases the peak flows as they travel through the interceptor.

As discussed previously, Carlsbad is planning to take full ownership of the BIS when Vista completes construction of a parallel force main to convey their flows to the EWPCF. The capacity analysis for this scenario is discussed in Section 6.3.

Vallecitos Interceptor

Model results indicate that the VIS potentially exceeds the evaluation criteria at several locations shown on Figure 6-4. The interceptor is projected to surcharge during PWWF conditions with the flow loading included in this scenario. However, the model results included in this section do not take into account the planned Carlsbad acquisition of the BIS and related flow diversions from the VIS to the BIS. For model results related to the Carlsbad acquisition of the BIS, see Section 6.3

VWD wet weather flow to the VIS peaks at 16.85 mgd. Model results indicate that peak flows at the terminus of this interceptor are anticipated to reach 28.8 mgd.

Carlsbad has capacity rights of 5.0 mgd in the VIS, and the PWWF from Carlsbad is estimated at approximately 6.5 mgd. However, all flow from the Poinsettia LS that is currently routed to the VIS is planned to be diverted to the BIS as part of the Las Palmas trunk sewer project to coincide with Carlsbad's acquisition of the BIS. The BSD currently owns 3.75 mgd of capacity in the VIS, but does not currently contribute any flow. With these flows being re-routed, Carlsbad's PWWF contribution to the VIS will be back within its 5.0 mgd capacity rights.

North Batiquitos Interceptor

The Ponto Sewer (NB9) is part of Carlsbad's NBI Sewer System and is jointly owned by the City of Carlsbad, the City of Encinitas, and the LWD in accordance with an agreement dated August 24, 1972. The capacity of the 39-inch diameter gravity pipeline flowing full is approximately 21 mgd. Hydraulic analysis results indicate a potential buildout PWWF of approximately 14.27 mgd in this pipeline. Carlsbad owns a total of 40.0 percent of the available capacity, or approximately 8.5 mgd and ESD/ LWD own the remaining 12.5 mgd. PWWFs from Carlsbad are attenuated by the operation of the upstream North Batiquitos LS, and are estimated at approximately 3.9 mgd for buildout conditions with two of the fixed speed pumps in operation. The City of Carlsbad is therefore projected to use less than 50 percent its allocated capacity in the Ponto Sewer.

Interceptor Lift Stations

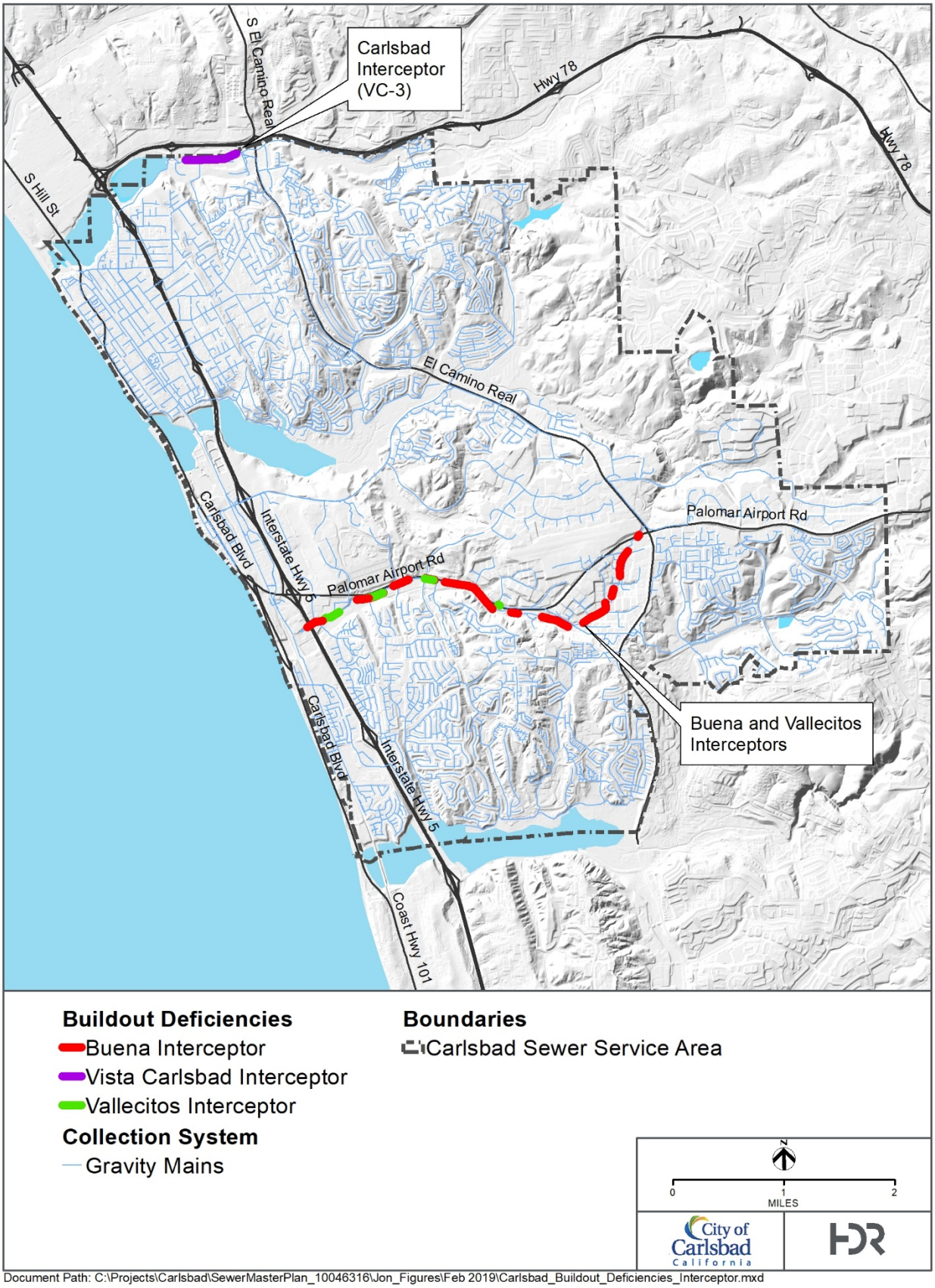
The interagency interceptor system includes two lift stations represented in the hydraulic model including the Buena Vista and Agua Hedionda LSs, which both convey V/C flows. The Agua Hedionda LS is currently undergoing an upgrade, and an upgrade for the Buena Vista LS is planned for the near term. For the buildout model analysis, the lift stations' pre-upgrade firm capacities were used to check the flows indicated by the model analysis.

Following upgrades, the Agua Hedionda LS is projected to have a firm capacity of 33.0 mgd. Model results indicate a PWWF of 30.3 mgd at the lift station, indicating that the lift station is projected to have sufficient capacity at buildout.

The Buena Vista LS currently has a firm capacity of 21.5 mgd. Model results predict a PWWF of 24.8 mgd at the lift station, indicating that the lift station may be under capacity for buildout PWWF conditions by approximately 3.3 mgd. However, no upstream spills were evident from the model results.

Based on the hydraulic analysis, the Buena Vista LS is projected to experience buildout PWWF in excess of the station's firm capacity. However, the Buena Vista LS is projected to have sufficient capacity to convey existing PWWF. As the meter at the Buena Vista LS failed during the December 2010 storm, the peaking factor was estimated based on upstream data. It is recommended that flows arriving at the lift station from the tributary Carlsbad and Vista service areas be monitored during future wet weather events to better assess the peaking factor and determine if lift station capacity upgrades will be necessary as the upstream tributary areas approach buildout...

Figure 6-4. Buildout Interceptor System Modeled Hydraulic Deficiencies



Document Path: C:\Projects\Carlsbad\SewerMasterPlan_10046316\Jon_Figures\Feb 2019\Carlsbad_Buildout_Deficiencies_Interceptor.mxd

6.2.3 Flows to the Encina Water Pollution Control Facility and Outfall

Evaluation of Carlsbad's use of EWPCF is based on the ADWF for treatment plant capacity and the PWWF for capacity in the ocean outfall. As summarized in Section 3, the existing wastewater flow for Carlsbad, based on metered flows from 2014, is approximately 6.60 mgd. Compared to Carlsbad's Phase V capacity ownership of 10.26 mgd for treatment and solids handling in the EWPCF, Carlsbad is projected to use approximately 8.31 mgd or 80 percent of its capacity ownership at buildout.

The Encina Ocean Outfall has a maximum instantaneous capacity of 104.9 mgd, considering the capacity enhancement of constructed flow equalization facilities. Carlsbad's peak flow capacity rights in the outfall per the RBA are 25.5 mgd. Peak hourly flows from Carlsbad cannot be determined from Encina flow meters since Carlsbad flows are subtracted from other agency flows. Resultant peak flows from Carlsbad at Encina are likewise not directly available from the hydraulic analysis, since peak flows in the interceptors occur at different hours in the simulation.

Based on the peaking factor curves presented in Section 3 and the estimates of RDII generated within the CSSA, the PWWF from Carlsbad is projected to be approximately 20.8 mgd, which is 2.5 times the ADWF. It is therefore estimated that the City of Carlsbad will use approximately 82 percent of its capacity ownership in the Encina Ocean Outfall at buildout. It is noted that Carlsbad’s outfall flows are reduced by recycled water production.

6.3 Carlsbad Full Ownership of Buena Interceptor Sewer Analysis

Model results for the buildout system scenario indicate capacity issues in the BIS and VIS. The BIS is currently shared by Vista and Carlsbad, while the VIS is currently shared by VWD and Carlsbad with Vista holding unused capacity rights to the interceptor. In order to deal with the capacity issues in these interceptors, Vista is planning to build an additional forcemain that would convey the Vista flows currently conveyed by the BIS in a parallel alignment with the forcemain flows reentering the BIS and VIS via a planned flow diversion structure at Paseo Del Norte before flowing under the freeway. Carlsbad would then take full ownership of the BIS and redirect flows from the Poinsettia LS, currently routed to the VIS, to the BIS as part of the Las Palmas trunk sewer project (listed currently as CIP Project #3). While Poinsettia LS flows would be routed away from the VIS in this scenario, some Carlsbad flows would continue to gravity feed into the VIS via existing small diameter gravity main connections. A buildout model scenario was created and analyzed to estimate the projected capacities of the BIS and VIS under these conditions.

Model results indicate that the BIS would reach approximately 69 percent full under PWWF conditions with Carlsbad sole ownership of the interceptor and redirected flows from the Poinsettia LS via the Las Palmas trunk main. Total PWWF in the BIS is projected to be 7.3 mgd under these conditions based on model results. The BIS is projected to satisfy the evaluation criteria under these conditions.

Model results indicate that with Poinsettia LS flow routed away from the VIS via the Las Palmas trunk main, Carlsbad would still contribute approximately 2.8 mgd of PWWF via

collection system gravity mains; a flow rate which is below the 5.0 mgd capacity rights that Carlsbad owns in the interceptor. Model results indicate that in this scenario the VIS would reach approximately 90 percent full under PWWF conditions. Total PWWF in the VIS is projected to be 25.9 mgd under these conditions based on model results. The VIS is projected to satisfy the interceptor evaluation criteria under these conditions.

Furthermore, in addition to the Poinsettia LS flows being diverted from the VIS to the BIS via the Las Palmas trunk main, if all remaining Carlsbad collection system gravity mains feeding in to the VIS were diverted to the BIS, the BIS is projected to reach approximately 80 percent full under PWWF conditions based on model results. Total PWWF in the BIS is projected to be 9.4 mgd under these conditions based on model results. The BIS is projected to satisfy the interceptor evaluation criteria under these conditions. Additionally, because more flow is being diverted away from the VIS, the VIS is also projected to satisfy the interceptor evaluation criteria under these conditions

The model results project that the Vista forcemain project, coupled with Carlsbad flow diversion(s) from the VIS to the BIS, will resolve capacity issues in the BIS. However, the Vista forcemain flows will reenter the BIS in Paseo Del Norte before flowing under the I-5 freeway en route to the EWPCF. The VIS also passes under the freeway at this location in a parallel alignment with the BIS before discharging to the EWPCF. As part of the forcemain project, Vista is planning a flow diversion structure at the Paseo Del Norte location in order to divert flow to the BIS and the VIS as needed to comply with capacity rights in the interceptors. Further hydraulic studies are recommended to evaluate the effects of diverting Carlsbad flows from the Poinsettia LS and collection system gravity mains to the BIS to demonstrate that Vista forcemain flows can be redistributed between the BIS and the VIS at Paseo Del Norte to avoid surcharging in the interceptors as they pass under the freeway.

6.4 Recommended System Improvements

Based on the model results the following new or revised improvement projects are recommended related to modeled existing and projected buildout hydraulic capacity issues discussed in Sections 6.2 and 6.3. The new projects were assigned new CIP project numbers to follow projects already on the CIP project list. Recommended projects are listed in Table 6-1 and shown on Figure 6-5.

Table 6-1. Recommended System Improvement Projects

Project Number	Title	Description	Size/Quantity	Unit Cost ($/LF)[1]	Projected Project Cost Rounded to nearest $1000)
C-4	Faraday Improvements	Upsizing of gravity main SWM239, SWM6422, and SWM6423 between Faraday and El Camino Real	643 LF of 10” pipe	290	186,000
C-6	Poinsettia Improvements	Upsizing gravity mains SWM4793, SWM6349, SWM4790 in Poinsettia Lane near Poinsettia Elementary	250 LF of 18" pipe 490 LF of 15" pipe	523 436	345,000
C-7 [2]	Harding Street Improvements	Upsizing gravity mains SWM4273 in Harden Street at Carlsbad Village Drive	240 LF of 12" pipe	349	84,000
C-8	Kelly Drive Improvements	Upsizing gravity mains SWM1658 in Kelly Drive south of El Camino Real	580 LF of 15" pipe	436	253,000
C-9	Basswood Avenue Improvements	Upsizing gravity mains SWM3653 in Basswood Ave at Highland Drive	350 LF of 10" pipe	290	102,000
				Total	**970,000**

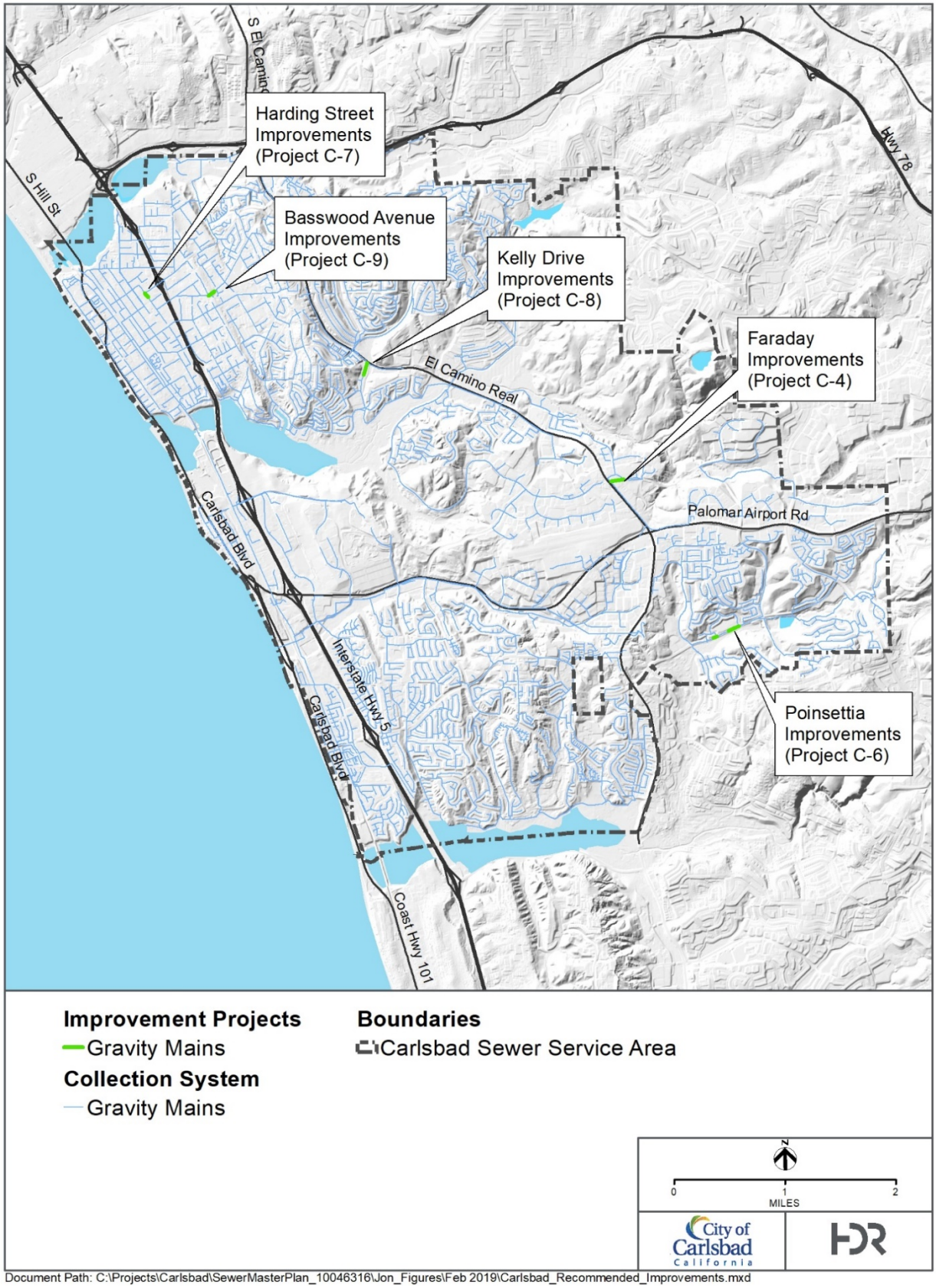
Notes:

[1] Unit Costs include material costs, based on recent City of Carlsbad bid documents, multiplied by a 1.6 installation factor and 1.45 soft cost factor (including planning, design, legal, construction administration, and 10% contingency costs.)

[2] Subsequent model analysis based on revised invert elevation information of the Harding Street location indicates that existing gravity mains at the Harding Street location are projected to be sufficient for existing and buildout flow loading conditions and may be removed from the City’s CIP list.

LF=linear feet

Figure 6-5. Recommended Improvement Projects



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Appendix A. Interagency Agreements

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Appendix A

A-1. Occidental-Carlsbad-Leucadia-Encinitas Agreement in regard to Construction of Sewer Pipeline south from the Encina Water Pollution Control Facility, August 1972.

A-2. Agreement between the Buena Sanitation District and City of Carlsbad for the Lease of Capacity in the Encina Outfall, December 1981.

A-3. Agreement between the Leucadia County Water District and City of Carlsbad regarding the Wolley Annexation, April 1984.

A-4. Palomar Joint Land Outfall Interceptor Interagency Agreement between the San Marcos County Water District, the City of Vista and the City of Carlsbad, January 1985.

A-5. Agreement between the Buena Sanitation District and City of Carlsbad for the Lease of Additional Capacity in the Encina Outfall, December 1987.

A-6. Agreement for Exchange of Sewage Flows between the Vallecitos Water District and the City of Carlsbad (Meadowlark Estates/Rancho Carrillo Sewer Flow Agreement), March 2000

A-7. Revised Basic Agreement for Ownership, Operation and Maintenance of a Joint Sewage System, as Amended February 8, 2000, City of Vista, City of Carlsbad, Buena Sanitation District, Vallecitos Water District, Leucadia County Water District and City of Encinitas. June 30, 2000.

A-8. Reimbursement Agreement for Temporary Wastewater Collection for Carlsbad Tract No. 93-04 with Leucadia County Water District, June 2000.

A-9. Reimbursement Agreement for Wastewater Treatment and Disposal for Carlsbad Tract No. 73-29 Carrillo Estates Unit No. 2, no date.

A-10. Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, City of Vista and City of Carlsbad, February 2002.

A.11. Agreement for Sewage Flows between the City of Carlsbad and Buena Sanitation District, February 2003.

A-12. Agreement between City of Carlsbad and City of Vista for Planning and Design Phase Services for the Aqua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B-VC15, October 2011.

A-13. Amended and Restated Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, June 2013.

A-14. First Amendment to the Amended and Restated Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, May 2014.

A-15. Agreement for the Ownership, Operation and Maintenance of the West Influent Pipeline, March 2015.

A-16. Joint Agreement for Construction, Operation and Maintenance of the Buena Outfall Odor Control Unit, June 2015.

A-17. Revised Establishment Document for Encina Wastewater Authority JPA effective November 9, 1994 and Revised Basic Agreement for Ownership, Operation and Maintenance of the Joint Sewage System as amended October 22, 2014, January 2017.

A-1. Occidental-Carlsbad-Leucadia-Encinitas Agreement in regard to Construction of Sewer Pipeline south from the Encina Water Pollution Control Facility, August 1972.

OCCIDENTAL-CALRSBAD-LEUCADIA-ENCINITAS AGREEMENT IN REGARD TO CONSTRUCTION OF SEWER PIPELINE SOUTH FROM THE ENCINA WATER POLLUTION CONTROL FACILITY

OCCIDENTAL-CARLSBAD-LEUCADIA-ENCINITAS AGREEMENT IN REGARD TO CONSTRUCTION OF SEWER PIPELINE SOUTH FROM THE ENCINA WATER POLLUTION CONTROL FACILITY

THIS AGREEMENT is made and entered into this 24th day of August, 1972, by and among OCCIDENTAL PETROLEUM LAND AND DEVELOPMENT CORPORATION ("Occidental"), CITY OF CARLSBAD ("Carlsbad"), LEUCADIA COUNTY WATER DISTRICT ("Leucadia"), and ENCINITAS SANITARY DISTRICT ("Encinitas").

RECITALS

A. Occidental has employed Salkin Engineering Corporation to design sewer siphon inlet and outlet structures, sewer siphons and a 27-inch sewer pipeline from a point within the Encina Water Pollution Control Facility in the City of Carlsbad to a point approximately 7,400 feet southerly of the siphon outlet structure.

B. Leucadia and Encinitas have requested the redesign of both structures and pipeline from the outlet structure to a point approximately 2,415 feet south of the outlet structure so as to increase the size of both structures and the pipeline to 39 inches to provide capacity for Leucadia and Encinitas.

C. The cost of construction of the original structures and the 27-inch line is to be borne by Occidental and the cost of oversizing the structures and line from 27 inches to 39 inches is to be borne by Leucadia and Encinitas.

D. Both structures shall be sized to handle the ultimate capacity of the 39 inch pipeline. They shall have stub-outs for a 16 inch and 18 inch siphon. The 16 inch and 18 inch siphons from the junction stub-outs are to be constructed by Leucadia and Encinitas at their expense. The 16 inch siphon shall be constructed

prior to the time Leucadia and Encinitas connect to the 39 inch pipeline. The 18 inch siphon shall be constructed at a time prior to the time at which the combined sewer flow rates of Carlsbad, Leucadia and Encinitas exceed the combined maximum capacities of the 16 inch, 18 inch and 24 inch siphons (the latter two siphons are to be constructed by Occidental for Carlsbad as part of the original project). When the 16 inch and 18 inch siphons are constructed, the stub-outs and siphons shall be the property of Leucadia and Encinitas.

IT IS, THEREFORE, AGREED BETWEEN THE PARTIES AS FOLLOWS:

Section 1. Construction of Sewer Facilities. Occidental shall cause to be constructed the sewer facilities described above (with the exception of the 16 inch and 18 inch siphon). The pipeline and structures shall be constructed in accordance with specifications approved by Carlsbad, Leucadia and Encinitas. Plans for the pipeline shall be subject to the approval of Carlsbad, Leucadia and Encinitas. No construction shall be started until required changes or corrections, if any, have been incorporated in the final plans and the final plans have been approved by Carlsbad, Leucadia and Encinitas. No changes shall be made in the approved plans without the consent of Occidental, Carlsbad, Leucadia and Encinitas. Carlsbad, Leucadia and Encinitas shall be allowed to inspect the facilities at all stages of construction, however, primary responsibility for inspection shall rest with the City of Carlsbad. The facilities shall be constructed in strict conformity with the approved plans and specifications. Construction of the facilities shall commence by September 15, 1972, and shall be completed by January 15, 1973.

Section 2. Payment for Oversizing. The cost of the construction of the structures and pipeline shall be borne by Occidental, except for the cost of oversizing which shall be borne by Leucadia

and Encinitas. Leucadia and Encinitas shall pay the cost of oversizing the portion of the pipeline that is increased in size from 27 inches to 39 inches and the inlet and outlet structures as follows:

a. For the cost of engineering, survey, and all other incidental expenses, Leucadia and Encinitas shall pay $1,500.00, as follows: Leucadia $1,050.00; Encinitas $450.00. The entire sum shall be due and payable to Salkin Engineering Corporation at the time the plans are approved. Any engineering changes requested by Leucadia or Encinitas and performed by Salkin Engineering Corporation after the date of approval of this Agreement shall be paid at the rate of $25.00 per hour for engineering plus costs for blueprints, mileage or other incidental items. Any modifications shall be approved by all parties signatory to this Agreement.

b. Leucadia shall pay 67% and Encinitas shall pay 33% of the cost of oversizing the siphon inlet and outlet structures and the difference between the 27 inch unit price and the 39 inch unit price, which cost is hereby fixed as $20.93 per foot (including the cost of oversizing the inlet and outlet structures and the cost of constructing 40 feet of 15 inch and 40 feet of 18 inch diameter siphon barrels across the existing outfall) multiplied by the length of the 39 inch pipeline actually installed. $27,520.20, which is the estimated total cost based upon the design length of the pipeline, shall be deposited with Occidental by Leucadia and Encinitas upon commencement of construction. The final cost, adjusted for the length of the 39 inch pipeline actually installed, shall be paid to Occidental (or

refunded by Occidental in the event the deposit exceeds the installed cost) by Leucadia and Encinitas upon completion of construction.

c. Leucadia and Encinitas shall pay the entire cost of the manhole in La Costa Boulevard where the Leucadia-Encinitas pipeline joins the Occidental pipeline. The cost of the manhole is hereby fixed as $1,000.00 (shared: Leucadia $670.00; Encinitas $330.00).

Section 3. Bond. Occidental shall file a good and sufficient bond in an amount not less than the estimated cost of the work and improvements (including the facilities described in this Agreement and all other work and improvements done under the same construction contract) securing payment to the contractor, his subcontractors and to persons renting equipment or furnishing labor or materials for the improvements. The form of the bond shall be as specified by Carlsbad, Leucadia and Encinitas.

Section 4. Dedication of Pipeline. Upon completion of the structures and the 39 inch pipeline in accordance with the approved plans and specifications, and acceptance thereof by Carlsbad, Leucadia and Encinitas, Occidental shall convey it to Carlsbad, Leucadia and Encinitas, who shall take title to and own the structures and the 39 inch pipeline as follows:

Leucadia - 40.3%

Encinitas - 19.7%

Carlsbad - 40.0%

The costs of maintaining, operating and repairing the inlet and outlet structures, all siphons, and the 39 inch pipeline shall be borne 40.3% by Leucadia, 19.7% by Encinitas and 40.0% by Carlsbad. Carlsbad shall manage the maintenance of the foregoing facilities (by contracting with San Diego County or in some other man-

ner acceptable to Leucadia and Encinitas) and will bill Leucadia for 40.3% and Encinitas for 19.7% of the maintenance costs. (The 27 inch pipeline south from the 39 inch pipeline shall be owned, maintained, operated and repaired 100% by Carlsbad.)

Section 5. Warranty. Occidental shall, and hereby does, warrant workmanship and materials for the structures and pipeline for a period of one year after the date of acceptance of the pipeline by Carlsbad, Leucadia and Encinitas. Occidental shall repair or replace any and all such faulty workmanship or materials (including settlement of backfill), together with any other work which may be displaced in so doing, within a one-year period from the date of acceptance of the work by Carlsbad, Leucadia and Encinitas without expense whatsoever to Carlsbad, Leucadia or Encinitas, ordinary wear and tear, unusual abuse or neglect excepted.

Section 6. Easements. This Agreement is contingent and conditional upon the receipt of grants of easement to Leucadia and Encinitas (at no cost to them) covering property in which the sewer facilities are to be located in all instances where the facilities are not to be located in dedicated streets. The legal descriptions and title conveyed must meet with the approval of Leucadia and Encinitas (as evidenced by policies of title insurance which shall be procured).

IN WITNESS WHEREOF, this Agreement has been signed by the parties on the date indicated below:

Dated: 5-22-72

OCCIDENTAL PETROLEUM LAND AND DEVELOPMENT CORPORATION

By _____
Asst Vice President

Dated: September 25, 1972

CITY OF CARLSBAD

By _____

ATTEST:

_____

WATER DISTRICT
RECEIVED
JUN 1 1974
BY _____

Dated: August 29 1972

LEUCADIA COUNTY WATER DISTRICT

By Harold Timmons

By [illegible]

Dated: AUG 29 1972

ENCINITAS SANITARY DISTRICT

By C.D. Eichar

By [illegible]

WATER DISTRICT
RECEIVED
JUN 1 1974
BY

A-2. Agreement between the Buena Sanitation District and City of Carlsbad for the Lease of Capacity in the Encina Outfall, December 1981.

AGREEMENT BETWEEN THE BUENA SANITATION DISTRICT AND CITY OF CARLSBAD FOR THE LEASE OF CAPACITY IN THE ENCINA OUTFALL

This Agreement, made and entered into this 15th day of December, 1981, by and between BUENA SANITATION DISTRICT, a county sanitation district, formed and existing under the County Sanitation District Act (Section 4700, et seq., Health and Safety Code) hereinafter referred to as "Buena" and the City of Carlsbad, a municipal corporation hereinafter referred to as "Carlsbad."

WITNESSETH:

1. The City of Carlsbad and Buena Sanitation District entered into an Agreement for the lease of capacity in a land sewage outfall on June 20, 1966.

2. Now Buena and Carlsbad desire to rescind that Agreement and replace it by a new Agreement.

NOW THEREFORE, the parties hereto agree as follows:

Section 1. EFFECTIVE DATE: This Agreement shall take effect December 15, 1981.

Section 2. LEASE OF CAPACITY: Buena agrees to lease to Carlsbad the following listed percentages of capacity in the Encina Outfall:

STATION TO STATION*			% OF TOTAL LINE CAPACITY		AMOUNT
B7&B6	0 + 00	20 + 81.43	MH # 0-6	34.88	$ 48,625
	20 + 81.43	33 + 36.43	6-9	31.71	14,280
B6	33 + 36.43	42 + 28.18	9-12	28.21	10,070
	42 + 28.18	67 + 42.43	12-20	28.21	20,900
B5	67 + 42.43	87 + 57.43	20-24	21.13	11,735
B2&B4	87 + 57.43	190 + 93.29	24-51	18.84	45,950
B1	190 + 93.29	204 + 08.65	51-54	17.65	5,630
	204 + 08.65	209 + 56.94	54-55	17.65	2,410
				Total	$159,600

*Stations as shown on hereinafter mentioned plans.
**Capacity is defined as the total amount of sewage conveyed by each section of the Encina Outfall, flowing full without surcharge or spillage.

Said Encina Outfall is the outfall sewer line, shown on those certain plans entitled "Plans for the Project-Sheets 1 through 7 Inclusive" on file in the office of the Department of Public Works of the County of San San Diego, 5555 Overland Avenue, Building 1, San Diego, California, a copy of which has been furnished to Carlsbad.

Section 3. TERMS OF LEASE

1. Buena shall lease to Carlsbad for a period commencing the effective date of this agreement and ending on or before July 1, 1996, the percentages of capacity listed in Section 2 herein, said lease to be upon the following terms and conditions:

(a) The total rental sum shall be $159,600 of which $85,120 shall be paid on or before the date of this Agreement. The remaining sum shall be payable as follows: 14 equal annual payments of $5,320 each, beginning July 1, 1982, and payable each July 1 thereafter until fully paid.

(b) Options are hereby granted by Buena to Carlsbad to purchase the capacity which is the subject of this lease. These options may be exercised provided lessee is not in default

of lease payments at the time lessee exercises the option to purchase. The option purchase price shall be the sum of $159,600 less the amount of rental already paid to Buena under the terms of this Agreement.

2. Carlsbad may exercise the option to purchase at any time by giving one month's notice in writing, sent by registered or certified mail to Buena Title to the capacity shall vest in Carlsbad upon delivery to Buena of payment in the full amount of said purchase price together with any rental payment d at the time of the exercise of said option. Until such time as Carlsbad exercises its option, title to the capacity which is the subject of this Agreement will remain in Buena.

3. Carlsbad shall not lose its right to exercise said option upon termination of the lease period, unless Carlsbad fails to exercise the same in ten (10) days after receipt of written notice from Buena to do so and to make prompt payment of any amount due or if no amount is due then one dollar.

Section 4. CONNECTIONS: Carlsbad, at its sole expense, shall be responsible for the construction, installation, maintenance, repair, replacement or reconstruction of any necessary transmission facilities from the Carlsbad Service Area to the Encina Outfall and for the connection of such transmission facilities together with any necessary appurtenances to the Encina Outfall.

Section 5. ENGINEER'S APPROVAL: The location, installation, construction, repair (except emergency repairs) replacement and/or reconstruction of the connections to the Encina Outfall shall be according to plans and specifications first approved by Buena's engineer.

Section 6. LIMITATIONS ON TYPE AND CONDITION OF SEWAGE: All sewage discharged by Carlsbad into Encina Outfall shall conform to the ordinances, resolutions, rules and regulations which Buena must adopt in accordance with Agreements of the Encina Joint Powers concerning the condition of sewage and waste permitted to be discharged to the Joint System or any part thereof.

Section 7. METERING: Carlsbad shall provide a device to meter the flow of sewage in the Encina Outfall at a point below any lateral connection, but above the Encina Sewage Treatment Facility. The meter will be installed and operated solely at Carlsbad's expense.

Section 8. INFILTRATION: It is understood and agreed that there will be inflow of water into the Encina Outfall because of leakage between the Carlsbad connection and the Encina Treatment Plant. Buena shall estimate the total waters that infiltrate the Encina Outfall between said connection and treatment plant (sometimes referred to herein as "infiltration") and apportion the same among all of such users of the Encina Outfall in the proportion that the amount of sewage discharged into the Encina Outfall by each such user bears to the total amount of sewage discharged into the Encina Outfall by all of such users of said Outfall. The amount of infiltration apportioned to each such user shall be deemed a part of the sewage of such user for all purposes.

Section 9. MAINTENANCE CHARGE:

1. During such period as Carlsbad is authorized to use a portion of the capacity of the Encina Outfall, whether as lessee or owner of such capacity, Carlsbad shall pay to Buena a share of the cost of the maintenance and operation of the Encina Outfall, said share of the cost to be in proportion to the average flow of sewage discharged into the Encina Outfall through Carlsbad's connections to said outfall as compared to the total average flow of sewage discharged into said Encina Outfall.

2. Buena shall bill Carlsbad for its share of the cost from time to time, but at least annually, and Carlsbad shall pay its share of the cost to Buena within thirty (30) days after being so billed.

3. Buena shall keep accurate records of its cost of maintaining and operating the Encina Outfall and such records shall be open to inspection by Carlsbad at all reasonable times.

Section 10. CHARGE AGAINST CAPACITY RIGHTS IN ENCINA TREATMENT PLANT AND OCEAN OUTFALL: All sewage discharged into the Encina Outfall through Carlsbad's connection, under the terms of this Agreement, and thereafter discharged into the Encina Treatment Plant, and all infiltration allocable to Carlsbad as determined by Section 8 of this Agreement, shall be charged against Carlsbad's capacity rights in and to the Encina Treatment Plant and Ocean Outfall.

Section 11. REPAIRS: The Encina Outfall Sewer shall be maintained by Buena in good repair and working order in accordance with sound engineering practices. It shall be the duty of Buena to make repairs on said Encina Outfall required to keep such outfall sewer in good operating condition. Except as provided in Section 12, the cost of all repairs shall be part of the maintenance costs of the Encina Outfall.

Section 12. MAJOR REPAIRS AND RECONSTRUCTION AND REPLACEMENT: Notwithstanding the provisions of Section 11 hereof, if it becomes necessary for Buena to undertake major repairs of said Encina Outfall or any portion thereof or to replace or reconstruct said Encina Outfall or any portion thereof, the parties hereto shall pay all costs of such major repair, replacement or reconstruction in the same proportion as the parties own or lease capacity in the Encina Outfall or portion thereof repaired, replaced or reconstructed.

Section 13. INTERRUPTION OF SERVICE: In the event of an interruption of services to Carlsbad in the Encina Outfall, as a result of disaster, operation of State or Federal law, discontinuance or intdrruption of service to Buena by the Encina Treatment Plant or Ocean Outfall, or any other cause beyond the control of Buena, Buena shall bear no liability and shall be held harmless by Carlsbad from any claims and liabilities for any injury to or damage to any person or persons or property or for the death of any person or persons arising from or out of such interruption of service or for any other damages or costs incurred by Buena as a result of such interruption of service.

Section 14. ARBITRATION: Except as otherwise provided herein, all controversies arising out of the interpretation or application of this agreement or the refusal of either party to perform the whole or any part thereof shall be settled by arbitration in accordance with the provisions of this section and where not provided by this section, in accordance with the statutory provisions of the State of California then in force. The controversy shall be submitted to a board of three (3) arbitrators which shall be appointed, one by Buena, one by Carlsbad and the third by the first two. The party desiring arbitration shall notify the other party by a written notice stating the following: (1) that it desires arbitration, (2) the controversy to be arbitrated, (3) that it has appointed its nominee, and (4) that it requests the other party to appint its nominee. Within thirty (30) days from the receipt of said notice the other party shall appoint its nominee. Within fifteen (15) days after the last party has appointed its nominee the two nominees shall appoint the third. None of the arbitrators shall be a resident of, or taxpayer in, or own property in, or have a place of business in, or be employed in or by, or have any contract with, or be an officer or employee of, either party. The arbitration board shall hold at least one hearing and, at least ten (10) days before said hearing, shall give each party written notice thereof. The arbitration shall be restricted to matters relative to that stated in the notice requesting arbitration. The arbitration board shall have no authority to add to or subtract from this agreement. Each party shall be given an opportunity to be heard and to present evidence. Upon conclusion of the hearing or hearings the arbitration board shall reduce

their findings of fact, conclusions of law and the award to writing, and shall sign the same and deliver one signed copy thereof to each public agency. Such award shall be final and binding upon both parties. A majority finding shall govern if the arbitrators' determination is not unanimous. Each party shall pay its own expenses, including the expenses of the arbitrator which it nominates. The expenses of the third arbitrator and the administrative costs of the arbitration proceedings shall be shared equally.

Any controversy which can be determined by an engineer's findings and which under this section could be submitted to arbitration may, if the parties thereto agree in writing to do so, be submitted to a named engineer who shall be the sole arbitrator.

Such engineer shall be a member of the American Society of Civil Engineers and shall be disinterested as hereinbefore in this section required of arbitrators on an arbitration board. He shall proceed in the same manner and shall make findings, conclusions and an award in the manner provided herein for an arbitration board.

Section 15. NOTICE: Notices required or permitted under this agreement shall be sufficiently given if in writing and if either served pesonally upon or mailed by registered or certified mail to the clerk or secretary of the governing body of the affected party to this agreement.

Section 16. LIABILITY: Nothing herein contained shall operate to relieve Carlsbad of any liability for damages to persons or property arising from or out of the installation, construction, operation, maintenance, repair, replacement or reconstruction of the aforesaid sewer connections and appurtenances or from any action or inaction of Carlsbaqd or of its officers, agents or employees in connection therewith.

And except as provided in Section 16 nothing herein contained shall operate to relieve Buena of any liability for damages to persons or property arising from or out of the installation, construction, operation, maintenance, repair, replacement and/or reconstruction of the aforesaid sewer connections and appurtenances or from any action or inaction of Buena or of its officers, agents or employees in connection therewith.

Section 17. INDEMNITY: To the extent it may legally do so, Carlsbad shall defend and save and hold free and harmless Buena and its agents, officers and employees from any claims, liabilities, penalties or fines for injury to or damage to any person or property or for the death of any person arising from or out of any act or omission of Carlsbad, its agents, officers, employees or contractors, arising from or out of any defects in the installation, construction, operation, maintenance, repair, replacement or reconstruction of said sewer connections or appurtenances.

Section 18. TIME OF ESSENCE: Time is of the essence of this agreement.

Section 19. SEVERABILITY: If any section, subsection, sentence, clause, phrase or word of this agreement, or the application thereof, to any party, or to any other person or circumstance is for any reason held invalid, it shall be deemed severable and the validity or the remainder of the agreement or the application of such provision to the other parties or to any other persons or circumstances shall not be affected thereby. Each party hereby declared that it would have entered into this agreement and each section, subsection, sentence, clause, phrase and work thereof irrespective of the fact that one or more sections, subsections, sentences, clauses, phrases or words, or the application thereof to any party or any other person or circumstance be held invalid.

Section 20. This agreement shall be binding upon the parties hereto and the successors and assigns of each of them.

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by its respective governing body caused this agreement to be executed the date first above written.

BUENA SANITATION DISTRICT

By Kathryn A. Nelson
Ass't. Clerk of Board of Directors

APPROVED BY THE
DISTRICT BOARD OF DIRECTORS

DEC 15 1981 #1 Buena

Porter D. Cremans
CLERK OF THE DISTRICT BOARD OF DIRECTORS

CITY OF CARLSBAD

By Ronald R. Packard
Mayor

APPROVED AS TO FORM AND LEGALITY
COUNTY COUNSEL
BY William D. Smith
DEPUTY 12-4-81

A-3. Agreement between the Leucadia County Water District and City of Carlsbad regarding the Wolley Annexation, April 1984.

AGREEMENT BETWEEN THE LEUCADIA COUNTY WATER DISTRICT

AND

THE CITY OF CARLSBAD

REGARDING THE WOOLLEY ANNEXATION

A G R E E M E N T

This agreement is made by and between the CITY OF CARLSBAD ("City"), a California municipal corporation, and the LEUCADIA COUNTY WATER DISTRICT ("LCWD").

R E C I T A L S

1. WHEREAS, there is a proposed annexation ("The Annexation") to the City of Carlsbad, identified as the Woolley Annexation; and

2. WHEREAS, the major portion of the annexation is located within the sewer service area of LCWD and the remaining small portion is within LCWD's draft Sphere of Influence; and

3. WHEREAS, with some additions to be supplied by the developer of the annexation, LCWD has existing transmission facilities in the area of the annexation; and

4. WHEREAS, LCWD has existing facilities for the collection and treatment of sewage from the annexation area; and

5. WHEREAS, the parties to the annexation proceedings at LAFCO desire that the annexation be approved by the LAFCO commission as soon as possible; and

6. WHEREAS, the parties to this agreement desire to settle any possible conflicts on sewer service to the annexation.

NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

1. City agrees that sewer service to the annexation within the LCWD sewer service area as shown on the map attached hereto marked Exhibit "A" and incorporated herein by this reference, shall be supplied by LCWD.

2. LCWD agrees to provide such services on a nondiscriminatory basis according to LCWD policies, ordinances, rules and regulations adopted by LCWD from time to time.

3. City shall not levy any tax for sewer service or facilities or for general obligation bonds of the City relating to sewer service facilities on the property within the area served by LCWD as shown on Exhibit "A" and shall affirmatively exclude such area from all such taxation.

4. The commission be requested to consider this agreement as one of the salient facts bearing on their consideration of the annexation.

5. Each party to this agreement agrees to take any and all other necessary action to carry out the intent of this agreement.

6. The effective date of this agreement is _____ 1984.

IN WITNESS WHEREOF, each of the parties hereto has caused this agreement to be executed by their respective officers theretofore duly authorized.

CITY OF CARLSBAD

Mary H. Casey
MARY H. CASEY, Mayor

Aletha L. Rautenkranz
ALETHA L. RAUTENKRANZ, City Clerk

AUTHORIZED BY RESOLUTION NO. 7534 OF THE CITY COUNCIL OF THE CITY OF CARLSBAD DULY ADOPTED ON April 24, 1984.

LEUCADIA COUNTY WATER DISTRICT

_____
LOIS HUMPHREYS, President

_____
JOAN GEISELHART, Secretary-Manager

AUTHORIZED BY RESOLUTION NO. _____ OF THE LEUCADIA COUNTY WATER DISTRICT DULY ADOPTED BY ITS BOARD OF DIRECTORS ON _____.

5

Diana	10	2,300	AC	03-0100	1962
Encinitas Estates	6	2,230	AC	05-9080	1974
Village Park 5	6	1,945	PVC	06-0270	1974
Village Park 7	6	1,500	AC	07-0330	1973
Rancho Verde	4	460	PVC	10-12160	1997
Meadows 1	4	860	AC	11-6050	1971
Meadows 3	6	1,187	AC	11-6095	1972

3.4.4 Miscellaneous System Components

3.4.4.1 Inter-Agency Agreements

Wastewater collection systems operate primarily on a gravity flow basis. However, political boundaries are not always established to match natural drainage contours. As a result, some portions of a given service area may drain in a undesirable direction, away from the remainder of the gravity collection system. In some of these cases, there is no viable way to avoid pumping, and pump stations are constructed. In others, inter-agency agreements can be developed to allow the wastewater flows to be conveyed into the collection system of an adjacent District or agency.

The District has entered into several such agreements with both the Carlsbad Municipal Water District, and the Cardiff Sanitation District. These agreements include wastewater conveyance both into and out of the District, and are sometimes located along the District boundary. Inter-agency agreements are typically interim agreements designed to provide wastewater service to an isolated development prior to construction of identified collection facilities, these agreements have a fixed term, and are eventually terminated. However, some agreements are designed to provide long-term or permanent service to isolated developments. Under these circumstances, the agreement is typically terminated when the isolated development is either annexed into or de-annexed from the District. The following discussions provide a list of the current inter-agency agreements maintained by the District:

- *Rancho Verde Unit 4, Carlsbad Tract 89-18*. The District's jurisdictional boundary includes the City of Carlsbad Tract 89-18, also known as Rancho Verde Unit 4. This property was approved by the City of Carlsbad for an 18 lot residential subdivision. The City of Carlsbad conditioned this development to annex to the District based on sewer availability. The topography of the property is such that wastewater collected on the property cannot gravity

flow to the District's facilities, but could gravity flow to Cardiff Sanitation District. LAFCO staff discouraged the concept of this City of Carlsbad property from annexing to Cardiff SD, which is a City of Encinitas sewer service district. The District and the developer agreed that this area would best be served by gravity sewer service to Cardiff Sanitation District. Through cooperative efforts between the District, the developer, and Cardiff Sanitation District, service to this area is now provided by Cardiff Sanitation District in accordance with an Interagency Agreement To Provide Wastewater Collection, Treatment, and Disposal Service effective August 1998.

Subject to the terms of the Interagency Agreement, Cardiff Sanitation District is responsible for plan checking, easements, construction inspection, maintenance, collection of sewer service fees, and all other responsibilities normally provided by the sewering agency for all of the on-site facilities within the District and all off-site facilities in Cardiff Sanitation District. There are separate agreements between the District and the developer, and between Cardiff Sanitation District and the developer, governing other remaining details.

The Rancho Verde Unit 4 Interagency Agreement shall remain in force so long as the property is not detached from the District and allows for initiation of annexation to Cardiff Sanitation District at the discretion and effort of Cardiff Sanitation District.

- *Rancho Carrillo Village Q4, Carlsbad Tract 93-04*. The City of Carlsbad's jurisdictional boundary for sewer service includes the City of Carlsbad Tract 93-04, also known as Rancho Carrillo Village Q4. This property was approved by the City of Carlsbad for a 25 lot subdivision. The topography of the property is such that wastewater collected on the property will flow to the City of Carlsbad in the future after additional off-site gravity conveyance facilities are constructed. The City of Carlsbad and the developer requested a temporary connection to the wet well of the District's Meadows III Pump Station. A Reimbursement Agreement for Temporary Wastewater Collection was approved in October 1998. The agreement will remain in force until off-site facilities tributary to Carlsbad are completed, which is anticipated to be a period of less than 10 years. As part of the Agreement, the City of Carlsbad will reimburse the District quarterly for 100 percent of the District's sewer service charges in effect at the time.

  It is recommended that the District consider negotiating a future agreement with the City of Carlsbad for the detachment of about 66 lots now in the District and now served by the Meadows III Pump Station. These lots could be served in the future by the City of Carlsbad and the Meadows III Pump Station could be demolished, if such an agreement were approved by both agencies.

- *Carrillo Estates Unit No. 2, Carlsbad Tract 73-29*. The City of Carlsbad's jurisdictional boundary for sewer service includes the City of Carlsbad Tract 73-29, also known as Carrillo Estates Unit No. 2. This property was approved by the City of Carlsbad for a 111 lot subdivision. The topography of the property is such that wastewater collected on the property will flow to the City of Carlsbad in the future after additional off-site gravity conveyance facilities are constructed.

  Agreements were required between the District and the City, and between the District and the developer. The developer was responsible for on-site gravity sewer improvements and off-site improvements to the Meadows I Pump Station. In accordance with the agreement, the City pays quarterly to the District for the term of the agreement an amount equal to 75 percent of the City's charges to the property owners. In addition, 111 EDU's of capacity and flow are to be transferred from District to City on EWA flow and EDU reports until such time as the wastewater service by the District is terminated.

  This agreement has been in effect since 1981 and shall not expire until wastewater collection facilities tributary to the City of Carlsbad system have been constructed and connected.

3.4.4.2 Septage Receiving Station

The District maintains a septage receiving station at the Batiquitos Pump Station. This facility is designed to allow wastewater to be trucked to the Batiquitos site and discharged into the wetwell of the station, where it is then pumped to the EWA plant for treatment and disposal. The Batiquitos septage station is used exclusively by District staff for discharge of wastes collected using the District's two Vactor trucks. These trucks are used to clean wastewater pipelines, dewater wastewater facilities, and generally collect and transport miscellaneous wastewater volumes.

3.5 WASTEWATER TREATMENT AND DISPOSAL

The District has recently undergone a significant change in its overall operation with regard to wastewater treatment. Traditionally, the District has maintained two separate facilities for treatment of collected wastewater, including the Gafner Water Reclamation Plant and the EWA Water Pollution Control Facility. The following discussions focus on defining the historical and current operation of the District's treatment systems. Chapter 8 of this Master Plan is dedicated to a full discussion of the District's future planning for wastewater treatment and disposal, primarily regarding the EWA treatment facility.

WOOLLEY ANNEXATION

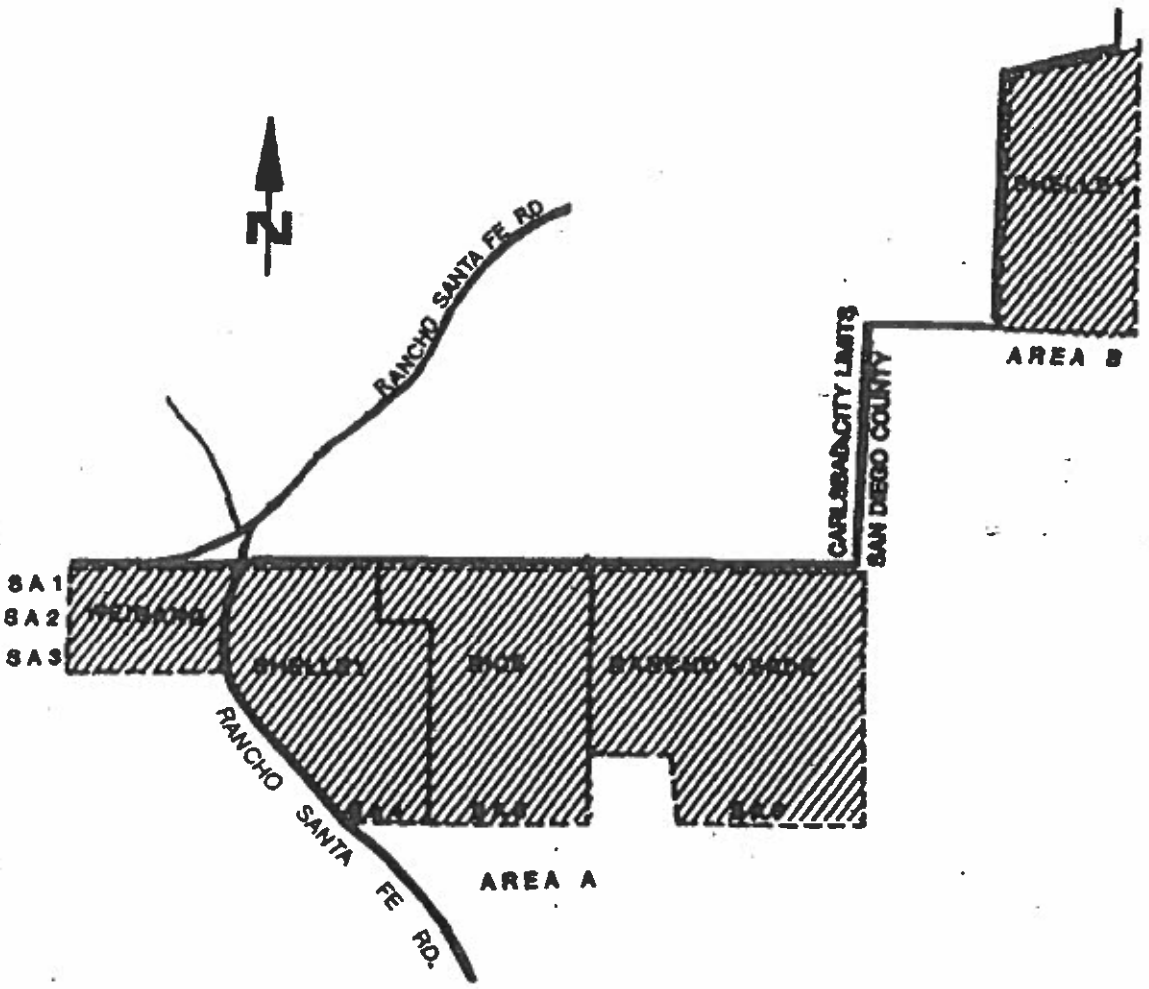

EXHIBIT A

A-4. Palomar Joint Land Outfall Interceptor Interagency Agreement between the San Marcos County Water District, the City of Vista and the City of Carlsbad, January 1985.

PALOMAR JOINT LAND OUTFALL
INTERCEPTOR INTERAGENCY
AGREEMENT

PALOMAR JOINT LAND OUTFALL INTERCEPTOR

INTERAGENCY AGREEMENT

THIS AGREEMENT is made and entered into this 8th day of January, 1985 by and between the SAN MARCOS COUNTY WATER DISTRICT (SAN MARCOS), the CITY OF VISTA (VISTA), and the CITY OF CARLSBAD (CARLSBAD), collectively referred to as PARTIES.

RECITALS:

WHEREAS, SAN MARCOS and BUENA entered into an agreement dated June 19, 1967, for lease of capacity by SAN MARCOS in BUENA SANITATION DISTRICT'S ENCINA OUTFALL SEWER LINE (BUENA LINE), this agreement expired July 1, 1978; and

WHEREAS, SAN MARCOS and BUENA entered into a second agreement for lease of capacity by SAN MARCOS in the BUENA LINE for the period of July 1, 1978, through July 1, 1981; and

WHEREAS, this second lease agreement was subsequently amended to extend an additional year to July 1, 1982; and

WHEREAS, SAN MARCOS, the DAON CORPORATION, and BUENA entered into a third agreement for lease of capacity by SAN MARCOS in the BUENA LINE for the period of July 1, 1982 through January 1, 1984, (the estimated operational date for the then proposed San Marcos Outfall Sewer Line to the Encina Treatment Plant or the Meadowlark Water Reclamation Facility for use by SAN MARCOS); and

WHEREAS, on June 20, 1966, BUENA and CARLSBAD entered into an agreement for lease of capacity in the BUENA LINE; and

WHEREAS, on December 15, 1981, BUENA and CARLSBAD rescinded the aforementioned agreement and entered into a new agreement entitled "AGREEMENT BETWEEN THE BUENA SANITATION DISTRICT AND THE CITY OF CARLSBAD FOR THE LEASE OF CAPACITY IN THE ENCINA OUTFALL, the BUENA LINE, the period of this lease extends to July 1, 1996; and

WHEREAS, because of these leases of capacity to SAN MARCOS and CARLSBAD, and because of continued increase in sewage from SAN MARCOS, CARLSBAD, and BUENA, the BUENA LINE has almost reached its capacity; and

WHEREAS, VISTA desires to obtain sewage transmission capacity to the Encina Water Pollution Control Facilities to serve the development in VISTA'S service area, known as Raceway Basin area; and

WHEREAS, CARLSBAD desires to obtain additional sewage transmission capacity to the Encina Water Pollution Control Facilities to serve in the developments in the south and central CARLSBAD service area; and

WHEREAS, in 1979 SAN MARCOS initiated a project entitled "SAN MARCOS COUNTY WATER DISTRICT LAND OUTFALL INTERCEPTOR" (State Water Resources Control Board Project No. C-06-1571-010) which extended from SAN MARCOS to the Encina Plant. Plans, specifications, and an environmental impact report were prepared. The design criteria for the lower reach from El Camino Real to the Encina Plant was 12.1, more or less, millions of gallons per day maximum flow capacity; and

WHEREAS, PARTIES to this Agreement have expressed a desire to cooperate in the construction, operation, and maintenance of the Palomar Joint Land Outfall Interceptor, as shown on Plans and Specifications prepared by Neste, Brudin and Stone, Civil Engineers, dated August 23, 1983, as set forth in this Agreement and hereinafter called "INTERCEPTOR"; and

WHEREAS, PARTIES are entering into this Agreement in order to establish their respective rights and duties with respect to the ownership of capacity in each reach of the facilities and for the operation and maintenance of the facilities;

COVENANTS

NOW THEREFORE, incorporating recitals of facts above, the PARTIES hereto agree as follows:

Article 1. OWNER: SAN MARCOS shall be the owner and shall be responsible for the preparation of the contract documents, the environmental impact report for SAN MARCOS, the Coastal Commission permits, all other permits, property acquisition and easements, supervision of construction, operation and maintenance of the INTERCEPTOR, and for the fiscal management of the INTERCEPTOR. Assistance from other agencies shall be provided to facilitate the process upon request by SAN MARCOS.

Article 2. OWNER'S RESPONSIBILITIES: SAN MARCOS shall diligently and faithfully pursue all the foregoing responsibilities knowing that time is of the essence for construction of the INTERCEPTOR to relieve the surcharging in the BUENA LINE.

ARTICLE 3. CAPACITY OWNERSHIP: The ownership of capacity in the INTERCEPTOR is shown in Table 1.

TABLE I
CAPACITY OWNERSHIP PERCENTAGES

Carlsbad		Vista		San Marcos	
MGD	%	MGD	%	MGD	%
5.0	23.98	3.75	17.99	12.1	58.03

(See Exhibit A for location)

The final maximum peak flow capacity for the City of Carlsbad equals 5.0 Million Gallons Per Day and the City of Vista equals 3.75 Million Gallons Per Day. For purposes of distributing costs, the costs shall be shared by all three agencies in accordance with their capacity ownership, and for the construction cost. Final adjustments to these costs will be made after the INTERCEPTOR is finally constructed and all costs are known.

Article 4. PRE-CONSTRUCTION: The pre-construction work to be completed shall include, but not be limited to, the following tasks:

1. Preparation of an Environmental Impact Report (EIR) the project.
2. Revisions to the construction documents for the oversizing to accommodate the Carlsbad and Vista flows prepared by NESTE, BRUDIN & STONE, INC.

3. Acquisition of permits.

4. Acquisition of easements and rights-of-way.

5. Administration, miscellaneous engineering, and legal tasks.

Since SAN MARCOS has already prepared an EIR and completed construction documents for their original "Land Outfall Interceptor" Project, SAN MARCOS will not share in any additional costs for tasks 1 and 2.

Costs for tasks 1 and 2 shall be shared between VISTA and CARLSBAD in accordance with their capacity ownership percentages (omitting SAN MARCOS) so weighted and averaged to account for the construction cost. These computations are shown in Exhibit B and summarized as follows:

CARLSBAD 57.14 percent

VISTA 42.86 percent

Final adjustments to these percentages will be made after the project is finally constructed and all costs are known.

Pre-construction costs shall be shared among the agencies in accordance with their capacity ownership as set forth in Article 3.

With the assistance of CARLSBAD and VISTA, SAN MARCOS shall take any and all steps necessary to acquire easements of right-of-way for the project. In the event eminent domain proceedings are necessary, all PARTIES agree to take any necessary legal proceedings required. All PARTIES agree to adopt any necessary resolutions connected with said legal proceedings. The cost of all such legal proceedings shall be borne in accordance with Article 3.

Article 5. CONSTRUCTION: SAN MARCOS shall be the contracting agency, shall administer the construction contract, in accordance with Division 12, Water Code, State of California, and shall take any and all steps necessary to ensure the INTERCEPTOR is completed in accordance with the plans and specifications. Change orders or amendments to the approved plans and specifications affecting the costs to be paid by other PARTIES hereto may beauthorized by SAN MARCOS on individual change orders of $25,000.00 or less, up to an aggregate of five (5%) percent of the INTERCEPTOR construction costs, without approval from the other affected PARTIES.

Article 6. COST ACCOUNTING (Pre-Construction and Construction): SAN MARCOS shall keep and maintain proper books of account and records in which complete and current entries shall be made of all transactions.

For the construction contract of the project SAN MARCOS shall prepare or cause to be prepared a cash flow table. The cash flow tables shall be updated quarterly to reflect any changes in the schedules or in anticipated costs, and shall reflect the capacity ownerships shown in Articles 3. Upon execution of "Notice to Proceed" of contract, all of the PARTIES hereto shall deposit in a trust fund to be held by SAN MARCOS fifteen (15%) percent of each PARTY'S share of the estimated total construction costs as shown in initial cash flow table. SAN MARCOS shall then bill each of the PARTIES quarterly, in advance to insure that SAN MARCOS always has sufficient funds on hand to make timely disbursements in the Administration of the project. VISTA and CARLSBAD shall pay such statements within a reasonable period thereafter. SAN MARCOS shall submit with each quarterly billing a copy of the updated cash flow table showing how each PARTY'S anticipated costs were established. In the event that SAN MARCOS borrows any monies in order to pay such costs as they become due because of delay in required payments by any of the parties hereto, the costs of such borrowing shall be paid by the PARTY or PARTIES causing such delay in proportion to the amount of their respective obligations and the period of delay caused by each such PARTY.

SAN MARCOS shall invest all deposits made with it pursuant to this Agreement until needed for payment of the costs and all earnings thereon shall inure to the PARTIES hereto in proportion to the respective amounts credited to them.

SAN MARCOS shall be strictly accountable to all PARTIES hereto for all funds received by it pursuant to this Agreement, and shall maintain and make available to the PARTIES hereto adequate records of all receipts and disbursements pursuant thereto.

Article 7. ROUTINE MAINTENANCE AND OPERATION OF THE PROJECT:

On completion of the INTERCEPTOR, each PARTY shall enjoy the capacity ownerships set forth in Article 3, Table I. However, SAN MARCOS shall provide routine maintenance and operation functions for the INTERCEPTOR in accordance with this Agreement. Costs of maintenance and operation shall be shared by the PARTIES hereto in proportion to their capacity ownerships, as set forth in Article 3, Table I.

Costs of expendables for all PARTIES, such as, but not limited to, power, chemicals, etc., will be borne and paid by each of the PARTIES in a ratio of their flow to the total flow of wastewater transported through the INTERCEPTOR for each of the PARTIES for the preceding calendar year. Until such time as a preceding calendar year is available, the period of time shall be the cumulative preceding months of operation. Costs of expendables benefitting less than all PARTIES shall be borne by the PARTY or PARTIES concerned.

SAN MARCOS shall bill VISTA and CARLSBAD periodically (but not less than annually) for that PARTY'S share of such costs and maintenance; VISTA and CARLSBAD shall pay such statement within a reasonable period of time thereafter.

SAN MARCOS shall keep and maintain proper books of account and records in which complete and current entries shall be made of all transactions, including all receipts and disbursements, relating to the administration, maintenance, operation, and repair of the INTERCEPTOR; VISTA and CARLSBAD shall have the right, at reasonable times, from time to time, during regular business hours to inspect all such books and records to verify any statement rendered by SAN MARCOS to VISTA or CARLSBAD for charges payable by those PARTIES to SAN MARCOS. SAN MARCOS shall utilize the "Uniform Accounting Program" of the State Controller's office for this purpose.

It is acknowledged and agreed by the PARTIES that it is difficult to establish in advance a detailed plan for accounting and allocation of operation and maintenance costs. Maintenance and operating costs shall mean the necessary costs of maintaining and operating the INTERCEPTOR based on generally accepted accounting principles, including, but not limited to, expenses necessary to maintain and preserve the INTERCEPTOR in good repair and working order, as well as insurance, taxes, administration, and any costs attributable to maintenance and operation.

Article 8. REPAIRS OR REPLACEMENT: Except in cases of emergency repairs, prior to making any repairs to any part of the INTERCEPTOR in which VISTA or CARLSBAD have capacity rights which are estimated to cost in excess of Ten Thousand Dollars, SAN MARCOS shall obtain prior approval of VISTA and CARLSBAD for any such expenditures.

The expenses of repair shall be charged to each PARTY on the basis of capacity ownership, and shall be substantiated by customary accounting procedures; and shall be paid by VISTA and CARLSBAD within a reasonable period of time provided, however, such costs benefitting less than all PARTIES shall be borne by the PARTY or PARTIES concerned.

The cost of replacing any portion of the INTERCEPTOR shall be allocated on the basis of the capacity of ownership as set forth herein for the INTERCEPTOR being replaced.

SAN MARCOS shall undertake any necessary repairs or replacement at the earliest possible date.

Article 9. METERS: VISTA and SAN MARCOS shall maintain meters to measure the flow of wastewater into the INTERCEPTOR. CARLSBAD'S flow shall be determined by subtracting the sum of the flows from VISTA and SAN MARCOS from the total flows measured by the Palomar Parshall flume meter at the headworks of the Encina Water Pollution Control Facilities.

Each PARTY shall bear the full cost of the meter and appurtenances installed for the use of that PARTY in measuring the amount of wastewater discharge into the INTERCEPTOR.

Article 10. PROHIBITION OF TOXIC MATERIALS: Each PARTY agrees to adopt and enforce on a continuing basis regulations prohibiting the discharge of toxic materials to the Encina Water Pollution Control Facilities.

Each PARTY agrees to enforce rules and regulations relative to the discharge of sewage and wastewater to the INTERCEPTOR to insure that anything introduced into the INTERCEPTOR is consistent with the Encina NPDES discharge permit.

Any PARTY failing to comply with the provisions of this Article shall pay any costs directly or indirectly resulting therefrom, including the cost of ascertaining and establishing that such violation did occur as well as any fines, penalties, engineering, accounting, administrative and legal costs, as well as any resulting increased operating, maintenance and replacement or repair costs that are incurred.

Article 11. INDEMNITY OF VISTA AND CARLSBAD: SAN MARCOS shall indemnify, assume the defense of, and hold free and harmless, VISTA and CARLSBAD, their officers, directors, agents and employees from any and all

obligations, liabilities, liens, claims, demands, losses, damages and expenses, of whatever type or nature, including, but not limited to, attorney's fees and all litigation costs arising out of SAN MARCOS'S operation or maintenance of the INTERCEPTOR or any other act or omission to act by SAN MARCOS, its agents, servants, employees, invitees, or independent contractors relating to the operation and maintenance of the INTERCEPTOR.

Notwithstanding, the foregoing, the indemnity agreement created by this Article shall not indemnify VISTA or CARLSBAD, their directors, agents or employees against any liability arising from the negligence or willful misconduct of VISTA or CARLSBAD, their officers, directors, agents, employees or independent contractors.

Article 12. SAN MARCOS TO MAINTAIN INSURANCE: SAN MARCOS shall maintain in force, beginning with the completion of the construction and extending through the full period of this Agreement, a full comprehensive public liability and property damage insurance policy insuring against any and all claims for injuries or death of persons or damage to property occurring in, upon, or about the property subject to this Agreement.

The insurance contract shall have limits of not less than $1,000,000.00 single-limit coverage; VISTA and CARLSBAD, their officers, directors, agents and employees, shall be listed as named insureds, and it shall provide for at least forty-five (45) days notice of cancellation or modification of coverage or limits. Said insurance shall be included as an operating and maintenance expense as provided in Article 7.

Article 13. NOTICES: Notices which any PARTY is required to give or desires to give hereunder may be served upon another PARTY by personally delivering a copy thereof, or by mailing any such notice by certified mail, return receipt requested, postage prepaid, addressed as follows:

CITY OF CARLSBAD
1200 Elm Avenue
Carlsbad, California

CITY OF VISTA
P.O. Box 1988
Vista, California 92083

SAN MARCOS COUNTY WATER DISTRICT
788 West San Marcos Boulevard
San Marcos, California 92069

Any PARTY may from time to time designate a different address for notice by notifying the other PARTIES; any notice mailed by regular mail shall be deemed received by the PARTY to whom such notice is addressed on the date of the return receipt.

Article 14. AMENDMENTS TO THIS AGREEMENT: This Agreement may not be altered in whole or in part except by modification in writing, executed by all PARTIES to this Agreement.

Article 15. ATTORNEY'S FEES: In the event any litigation in law or in equity, including action for declaratory relief, is brought to enforce or interpret the provisions or performance of this Agreement, the prevailing PARTY shall be entitled to the award of a reasonable attorney's fee and the costs of the proceeding, which shall be determined by the Court or the presiding officer having authority to make this determination.

If any PARTY to this Agreement becomes a party to any litigation, concerning the enforcement or interpretation of the provisions of this Agreement or the performance of this Agreement by reason of any act or omission of the other PARTY or authorized representatives of another PARTY to this Agreement and not by any act or omission of its authorized representatives, the PARTY that causes the other PARTY to become involved in the proceeding shall be liable to that PARTY for reasonable attorney's fees and costs of the proceeding incurred by that PARTY in the proceeding. The award of reasonable attorney's fees and costs shall be determined as provided above.

In the event opposing PARTIES have each prevailed on one or more causes of action actually contested or admitted by pleadings or pre-hearing documents on file, the presiding officer shall make an award of attorney's fees and costs, but the presiding officer may prorate such fees and costs between prevailing PARTIES based on the necessity of the proceeding and the importance of the issue upon which each PARTY has prevailed.

Article 16. ENTIRE AGREEMENT: This Agreement, together with the Exhibits hereto, contains all representations and the entire understanding between the PARTIES with respect to the subject matter of this Agreement. Any prior correspondence, memoranda or agreements are replaced in total by this Agreement and Exhibits hereto.

Article 17. ASSIGNMENT: No PARTY to this Agreement shall be entitled to assign all or any portion of their rights or obligations contained in this Agreement without obtaining the prior written consent of the other PARTIES. This shall not apply to successor agencies which are also PARTIES to this Agreement.

Article 18. BINDING EFFECT: This Agreement shall inure to the benefit of and be binding upon PARTIES hereto and their respective successors, heirs, and assigns.

Article 19. APPLICABLE LAW: This Agreement and any disputes relating to this Agreement shall be construed under the laws of the State of California.

Article 20. UNENFORCEABLE PROVISIONS: The terms, conditions, and covenants of this Agreement should be construed, wherever possible, consistent with applicable laws and regulations.

To the extent that any provision of the Agreement violates any applicable law or regulation, the remaining provisions shall nevertheless be carried into full force and effect and remain enforceable.

Article 21. VENUE: For the purpose of litigation or arbitration, venue shall lie in the North County Judicial District, County of San Diego, State of California, or, if such venue cannot be exercised, in the Federal or State Court nearest to the North County Judicial District, County of San Diego.

Article 22. TERM: This Agreement is executed and is to be performed in the North County Judicial District, County of San Diego, State of California, and consists of 23 pages (including Exhibits), and shall continue in effect until terminated by mutual agreement of the PARTIES.

Article 23. SIGNATURE AND SEALS: This Agreement shall be effective on and from the day and year first above written.

IN WITNESS WHEREOF, we have hereunto set our hands and seals.

ATTEST:

Alethia L. Rautenkranz
City Clerk

CITY OF CARLSBAD

By Mary D. Casler
Mayor

ATTEST:

William W. Rucker, Secretary

SAN MARCOS COUNTY WATER DISTRICT

Dale Mason, President

ATTEST:

City Clerk - Jean Brooks

CITY OF VISTA

Mayor - R. Michael Flick

E X H I B I T "A"

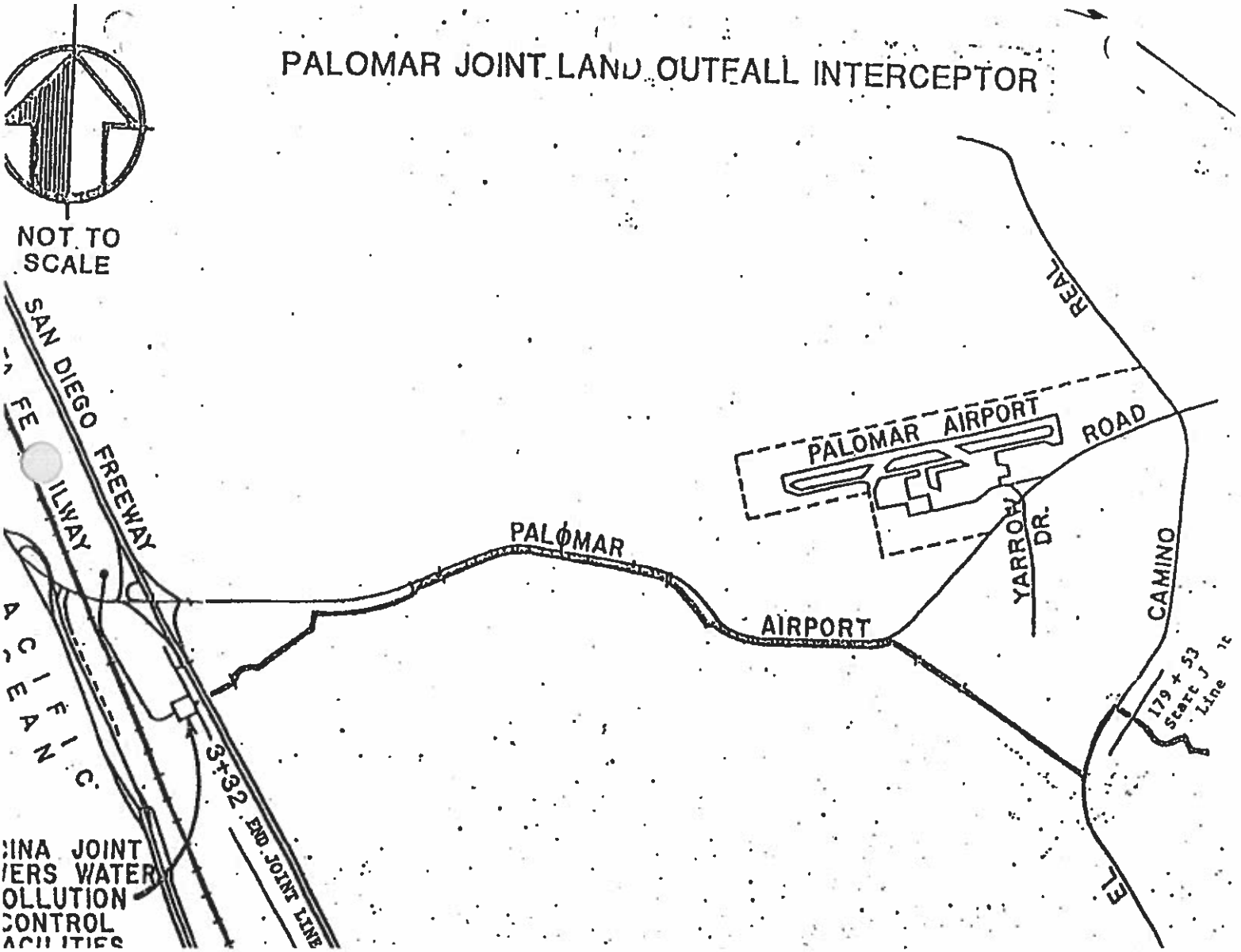
PALOMAR JOINT LAND OUTFALL INTERCEPTOR
NOT TO SCALE
SAN DIEGO FREEWAY
PALOMAR AIRPORT
ROAD
PALOMAR
AIRPORT
YARROW DR.
CAMINO
3+32 END JOINT LINE
179 + 53 Start J Line
AIRPORT

EXHIBIT "B"

E X H I B I T "B"

PALOMAR JOINT LAND OUTFALL INTERCEPTOR

PRE-CONSTRUCTION COST ALLOCATION FOR TASKS 1 AND 2

FROM TABLE 1 CAPACITY OWNERSHIP PERCENTAGES FOR THE THREE AGENCIES ARE:

CARLSBAD	23.98%
VISTA	17.99%
SAN MARCOS	58.03%

DELETING SAN MARCOS, THE OWNERSHIP PERCENTAGES ARE:

CARLSBAD	23.98/100 - 58.03 = 57.14
VISTA	17.99/100 - 58.03 = 42.86

ITEM NO.	DESCRIPTION	QUANTITY	UNIT COST	SAN MARCOS SHARE	VISTA SHARE	CARLSBAD SHARE	TOTAL JOINT COST
2A2	30" RCP	11,837 Ft.	$90.00/Ft.	$ 618,211.00	$ 191,652.87	$ 255,466.13	$ 1,065,330.00
2A3	Concrete Cradle	910 Ft.	$25.00/Ft.	13,201.83	4,092.72	5,455.45	22,750.00
2A4	Special Bedding	2,144 Ft.	$5.00/Ft.	6,220.82	1,928.53	2,570.65	10,720.00
5A1	24" Steel Pipe	830 Ft.	$55.50/Ft.	26,731.52	8,287.09	11,046.39	46,065.00
5A2	Cathodic Protection	11.84%	L.S.	1,030.19	319.37	425.71	1,775.27
12	5' Dia. Std. Manhole	24	$2,100 Ea.	29,247.12	9,066.96	12,085.92	50,400.00
13	5' Dia. Std. Manhole (25')	1	$3,500 Ea.	2,031.05	629.65	839.30	3,500.00
15	5' Dia. Manhole (35')	1	$5,250 Ea.	3,046.57	944.48	1,258.95	5,250.00
16	6' Dia. Std. Manhole	6	$2,200 Ea.	7,659.96	2,374.68	3,165.36	13,200.00
17	6' Dia. Manhole (25')	1	$4,500 Ea.	2,611.35	809.55	1,079.10	4,500.00
18	6' Dia. Manhole (35')	1	$6,500 Ea.	3,771.95	1,169.35	1,558.70	6,500.00
19	6' Siphon Discharge Manhole	2	$9,000 Ea.	10,445.40	3,238.20	4,316.40	18,000.00
20	Siphon Entrance MH (Protected)	2	$4,200 Ea.	4,874.52	1,511.16	2,014.32	8,400.00
21	6' Dia. MH (Protected & Vented)	2	$10,000 Ea.	11,606.00	3,598.00	4,796.00	20,000.00
22	5' Dia. MH (Protected)	3	$3,500 Ea.	6,093.15	1,888.95	2,517.90	10,500.00
23	Clean Out Manhole	1	$4,850 Ea.	2,814.46	872.51	1,163.03	4,850.00
31	Erosion Control/Restoration	L.S.	L.S.	4,199.05	1,301.76	1,735.19	7,236.00
32	Pavement Removal & Replacement	6,200 LF	$10 LF	35,978.60	11,153.80	14,867.60	62,000.00
	Sheeting, Shoring & Bracing	L.S.	L.S.	2,820.17	874.28	1,165.39	4,859.84

ITEM NO.	DESCRIPTION	QUANTITY	UNIT COST	SAN MARCOS SHARE	VISTA SHARE	CARLSBAD SHARE	TOTAL JOINT COST
34	Permits	L.S.	L.S.	$ 3,481.80	$ 1,079.40	$ 1,438.80	$ 6,000.00
35	Interruption Business Motel 6	L.S.	L.S.	5,803.00	1,799.00	2,398.00	10,000.00
39	54" Lined RCP (2500-D) in Casing	267 Ft.	$800/Ft.	123,952.08	38,426.64	51,221.28	213,600.00
40	54" Lined RCP (2000-D)	185 Ft.	$295/Ft.	31,669.87	9,818.04	13,087.09	54,575.00
	Special Bedding for 54" Lined RCP	185 Ft.	$20/Ft.	2,147.11	665.63	887.26	3,700.00
4281	39" Lined Reinf. Concrete Pipe	395 Ft.	$154/Ft.	35,299.65	10,943.32	14,587.03	60,830.00
4282	39" Lined Reinf. Concrete Pipe	70 Ft.	$154/Ft.	6,255.64	1,939.32	2,585.04	10,780.00
4283	39" Lined Reinf. Concrete Pipe	794 Ft.	$154/Ft.	70,956.76	21,997.45	29,321.79	122,276.00
4284	Special Bedding	385 Ft.	$10/Ft.	2,234.15	692.62	923.23	3,850.00
43	36" YCP	1,068 Ft.	$103.99/Ft.	64,448.88	19,979.94	26,632.50	111,061.32
44	Special Bedding 36" YCP	85 Ft.	$6/Ft.	295.95	91.75	122.30	510.00
45	Concrete Cradle for 36" YCP	67 Ft.	$30/Ft.	1,166.40	361.60	482.00	2,010.00
	33" YCP	557 Ft.	$98/Ft.	31,676.26	9,820.02	13,089.72	54,586.00
47	Special Bedding for 33" YCP	45 Ft.	$10/Ft.	261.14	80.95	107.91	450.00
48	Concrete Cradle for 33" YCP	108 Ft.	$30/Ft.	1,880.17	582.88	776.95	3,240.00
49A	30" Steel Pipe	290 Ft.	$80/Ft.	13,462.96	4,173.68	5,563.36	23,200.00
50	30" DIP CL50 w/Special Lining	879 Ft.	$124/Ft.	63,250.38	19,608.38	26,137.24	108,996.00
51	Cathodic Protection (49A & 50)	L.S.	L.S.	4,642.40	1,439.20	1,918.40	8,000.00
	6' Manhole (30')	1	$5,000/Ea.	2,901.50	899.50	1,199.00	5,000.00

ITEM NO.	DESCRIPTION	QUANTITY	UNIT COST	SAN MARCOS SHARE	VISTA SHARE	CARLSBAD SHARE	TOTAL JOINT COST
53	6' Manhole (Protected)	1	$4,650/Ea.	$ 2,698.40	$ 836.53	$ 1,115.07	$ 4,650.00
54	Relocate Carlsbad Sewer	L.S.	L.S.	1,160.60	359.80	479.60	2,000.00
55	Encina Connection (Reused)	L.S.	L.S.	63,833.00	19,789.00	26,378.00	110,000.00
	TOTALS			$ 1,326,072.81	$ 411,098.56	$ 547,979.06	$ 2,285,150.43

A-5. Agreement between the Buena Sanitation District and City of Carlsbad for the Lease of Additional Capacity in the Encina Outfall, December 1987.

AGREEMENT BETWEEN THE BUENA SANITATION DISTRICT AND CITY OF CARLSBAD FOR THE LEASE OF ADDITIONAL CAPACITY IN THE ENCINA OUTFALL

This Agreement, made and entered into this 15th day of December, 1987, by and between BUENA SANITATION DISTRICT, a county sanitation district, formed and existing under the County Sanitation District Act (Section 4700, et seq., Health and Safety Code) hereinafter referred to as "Buena" and the CITY OF CARLSBAD, a municipal corporation hereinafter referred to as "Carlsbad."

WITNESSETH:

1. Carlsbad and Buena Sanitation District entered into an Agreement for the lease of capacity in a land sewage outfall on June 20, 1966.

2. The City of Carlsbad and Buena Sanitation District rescinded the 1966 Agreement and replaced it with a new agreement in 1981.

3. Now the City of Carlsbad desires to temporarily lease additional capacity in the land sewage outfall from Buena.

NOW THEREFORE, the parties hereto agree as follows:

Section 1. EFFECTIVE DATE: This agreement shall take effect July 1, 1988.

Section 2. LEASE OF CAPACITY: Buena agrees to lease to Carlsbad on a temporary basis .8 peak mgd until a replacement sewer is constructed in accordance with Section 3 of this Agreement.

Section 3. NEW CONSTRUCTION: When peak flows in the interceptor reach 75% of the depth of the pipe in any reach of the Encina Outfall, as determined by the Buena Sanitation District, Carlsbad shall construct a replacement outfall to eliminate the need for this lease. When the construction is completed this lease shall terminate. When flows reach 75% of the depth of flow of the pipe all payments required in Section 4 of this agreement shall double and they will double again each year until the flows are removed from the line. If other unanticipated capacity problems arise relating to this lease, Carlsbad, at Buena's request, will be required to pay their share to correct the problem.

Section 4. TERMS OF LEASE: Carlsbad shall pay to Buena $7,500 per year for the term of this lease. If permanent capacity should become available for acquisition Carlsbad shall retain the option to acquire said capacity and apply previous lease payments towards the acquisition price.

Section 5. CONNECTIONS: Carlsbad, at its sole expense, shall be responsible for the construction, installation, maintenance, repair, replacement or reconstruction of any necessary transmission facilities from the Carlsbad Service Area to the Encina Outfall and for the connection of such transmission facilities together with any necessary appurtenances to the Encinas Outfall.

Section 6. ENGINEER'S APPROVAL: The location, installation, construction, repair (except emergency repairs) replacement and/or reconstruction of the connections to the Encinas Outfall shall be according to plans and specifications first approved by Buena's engineer.

Section 7. LIMITATIONS ON TYPE AND CONDITION OF SEWAGE: All sewage discharged by Carlsbad into Encina Outfall shall conform to the ordinances, resolution, rules and regulations which Buena must adopt in accordance with Agreements of the Encina Joint Powers concerning the condition of sewage and waste permitted to be discharged to the Joint System or any part thereof.

Section 8. METERING: Carlsbad shall, upon request of Buena, provide a device to meter the flow of sewage in the Encina Outfall at a point below any lateral connection, but above the Encina Sewage Treatment Facility. The meter will be installed and operated solely at Carlsbad's expense.

Section 9. INFILTRATION: It is understood and agreed that there will be inflow of water into the Encina Outfall because of leakage between the Carlsbad connection and the Encina Treatment Plant. Buena shall estimate the total waters that infiltrate the Encina Outfall between said connection and treatment plant (sometimes referred to herein as "infiltration") and apportion the same among all of such users of the Encina Outfall in the proportion that the amount of sewage discharged into the Encina Outfall by each such user bears to the total amount of sewage discharged into the Encina Outfall by all of such users of said Outfall. The amount of infiltration apportioned to each such user shall be deemed a part of the sewage of such user for all purposes.

Section 10. MAINTENANCE CHARGE:

1. During such period as Carlsbad is authorized to use a portion of the capacity of the Encina Outfall, whether as lessee or owner of such capacity, Carlsbad shall pay to Buena a share of the cost of the maintenance and operation of the Encina Outfall, said share of the cost to be in proportion to the average flow of sewage discharged into the Encina Outfall through Carlsbad's connections to said outfall as compared to the total average flow of sewage discharged into said Encina Outfall.

2. Buena shall bill Carlsbad for its share of the cost from time to time, but at least annually, and Carlsbad shall pay its share of the cost to Buena within thirty (30) days after being so billed.

3. Buena shall keep accurate records of this cost of maintaining and operating the Encina Outfall and such records shall be open to inspection by Carlsbad at all reasonable times.

Section 11. CHARGE AGAINST CAPACITY RIGHTS IN ENCINA TREATMENT PLANT AND OCEAN OUTFALL: All sewage discharged into the Encina Outfall through Carlsbad's connection, under the terms of this Agreement and thereafter discharged into the Encina Treatment Plant, and all infiltration allocable to Carlsbad as determined by Section 9 of this Agreement, shall be charged against Carlsbad's capacity rights in and to the Encina Treatment Plant and Ocean Outfall.

Section 12. REPAIRS: The Encina Outfall Sewer shall be maintained by Buena in good repair and working order in accordance with sound engineering practices. It shall be the duty of Buena to make repairs on said Encina Outfall required to keep such outfall sewer in good operating condition. Except as provided in Section 13, the cost of all repairs shall be part of the maintenance cost of the Encina Outfall.

Section 13. INTERRUPTION OF SERVICE: In the event of an interruption of services to Carlsbad in the Encina Outfall, as a result of disaster, operation of State or Federal law, discontinuance or interruption of service to Buena by the Encina Treatment Plant or Ocean Outfall, or any other cause beyond the control of Buena, Buena shall bear no liability and shall be held harmless by Carlsbad from any claims and liabilities for any injury to or damage to any person or persons or property or for the death of any person or persons arising from or out of such interruption of service or for any other damages or costs incurred by Buena as a result of such interruption of service.

Section 14. ARBITRATION: Except as otherwise provided herein, all controversies raising out of the interpretation or application of this agreement or the refusal of either party to perform the whole or any part thereof shall be settled by arbitration in accordance with the provisions of this section and where not provided by this section, in accordance with statutory provisions of the State of California then in force. The controversy shall be submitted to a board of three (3) arbitrators which shall be appointed, one by Buena, one by Carlsbad and the third by the first two. The party desiring arbitration shall notify the other party by a written notice stating the following: (1) that it desires arbitration, (2) the controversy to be arbitrated, (3) that it has appointed its nominee, and (4) that it request the other party to appoint its nominee. Within thirty (30) days from the receipt of said notice the other party shall appoint its nominee. Within fifteen (15) days after the last party has appointed its nominee the two nominees shall appoint the third. None of the arbitrators shall be a resident of, or taxpayer in, or own property in, or have a place of business in, or be employed in or by, or have any contract with, or be an officer or employee of, either party. The arbitration board shall hold at least one hearing and, at least ten (10) days before said hearing, shall give each party written notice thereof. The arbitration shall be restricted to matters relative to that stated in the notice requesting arbitration. The arbitration board shall have no authority to add to or subtract from this agreement. Each party shall be given an opportunity to be heard and to present evidence. Upon conclusion of the hearing or hearings,the arbitration board shall reduce their findings of fact, conclusions of law and the award to writing, and shall sign the same and deliver one signed copy thereof to each public agency. Such award shall be final and binding upon both parties. A majority finding shall govern if the arbitrators' determination is not unanimous. Each party shall pay its own expenses, including the expenses of the arbitrator which it nominates. The expenses of the third arbitrator and the administrative costs of the arbitration proceedings shall be shared equally.

Any Controversy which can be determined by an engineer's findings and which under this section could be submitted to arbitration may, if the parties thereto agree in writing to do so, be submitted to a named engineer who shall be the sole arbitrator.

Such engineer shall be a member of the American Society of Civil Engineers and shall be disinterested as hereinbefore in this section required of arbitrators on an arbitration board. He shall proceed in the same manner and shall make findings, conclusion and an award in the manner provided herein for an arbitration board.

Section 15. NOTICE: Notice required or permitted under this agreement shall be sufficiently given if in writing and if either served personally upon or mailed by registered or certified mail to the clerk or secretary of the governing body of the affected party to this agreement.

Section 16. LIABILITY: Nothing herein contained shall operate relieve Carlsbad of any liability for damages to persons or property arising from or out of the installation, construction, operation, maintenance, repair, replacement or reconstruction of the aforesaid sewer connections and appurtenances or from any action or inaction of Carlsbad or its officers, agents or employees in connection therewith.

And except as provided in Section 17 nothing herein contained shall operate to relieve Buena of any liability for damages to persons or property arising from or out of the installation, construction, operation, maintenance, repair, replacement and/or reconstruction of the aforesaid sewer connections and appurtenances or from any action or inaction of Buena or of its officers, agents or employees in connection therewith.

Section 17. INDEMNITY: To the extent it may legally do so, Carlsbad shall defend and save and hold free and harmless Buena and its agents, officers and employees from any claims, liabilities, penalties or fines for injury to or damage to any person or property or for the death of any person arising from or out of any act or omission of Carlsbad, its agents, officers, employees or contractors, arising from or out of any defects in the installation, construction, operation, maintenance, repair, replacement or reconstruction of said sewer connections or appurtenances.

Section 18. TIME OF ESSENCE: Time is of the essence of this agreement.

Section 19. SEVERABILITY: If any section, subsection, sentence, clause, phrase or word of this agreement, or the application thereof, to any party, or to any other person or circumstance is for any reason held invalid, it shall be deemed severable and the validity or the remainder of the agreement or the application of such provision to the other parties or to any other persons or circumstances shall not be affected thereby. Each party hereby declared that it would have entered into this agreement and each section, subsection, sentence, clauses, phrase and work thereof irrespective of the fact that one or more sections, subsections, sentences, clauses, phrases or words, or the application thereof to any party or any other person or circumstance be held invalid.

Section 20. This agreement shall be binding upon the parties hereto and the successors and assigns of each of them.

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by its respective governing body caused this agreement to be executed the date first above written.

APPROVED BY THE
DISTRICT BOARD OF DIRECTORS
12-15-87(3)

BUENA SANITATION DISTRICT

By _____
Clerk of the Board of Directors

City of Carlsbad

By _____
CLAUDE A. LEWIS, Mayor

A-6. Agreement for Exchange of Sewage Flows between the Vallecitos Water District and the City of Carlsbad (Meadowlark Estates/Rancho Carrillo Sewer Flow Agreement), March 2000

AGREEMENT FOR EXCHANGE OF SEWAGE FLOWS BETWEEN THE VALLECITOS WATER DISTRICT AND THE CITY OF CARLSBAD
(MEADOWLARK ESTATES/RANCHO CARRILLO SEWER FLOW AGREEMENT)

This Agreement for Exchange of Sewage Flows ("Agreement") is made and entered into by and between the VALLECITOS WATER DISTRICT ("VALLECITOS"), a public agency organized and existing pursuant to the County Water District Law, California Water Code section 30000 et seq., and the CITY OF CARLSBAD ("CITY"), a municipal corporation of the State of California, with reference to the following recitals:

R-E-C-I-T-A-L-S

A. VALLECITOS and CITY are members of the Encina Wastewater Pollution Control Facility ("ENCINA"), through which member agencies own and operate facilities for the treatment and disposal of sewage effluent in the region.

B. The land outfall sewer to ENCINA is owned and operated by VALLECITOS and provides sewer conveyance capacity for VALLECITOS and CITY from El Camino Real west to ENCINA.

C. VALLECITOS and CITY desire to take advantage of more efficient and cost-effective transfers of certain sewage flows from VALLECITOS through CITY's Rancho Carrillo Sewer Facilities ("Rancho Carrillo Sewer"), which convey sewage to the land outfall sewer at El Camino Real, pursuant to the terms and conditions of this Agreement as shown on the attached Exhibit "A."

D. VALLECITOS and CITY at all times shall remain responsible for providing sewer service to the customers and land owners within the respective boundaries of each agency.

NOW, THEREFORE, it is agreed by and between the parties as follows:

AGREEMENT

Section 1. Flow Exchange Area. VALLECITOS and CITY have determined that some customers may be better served by gravity sewage flows through the Rancho Carrillo Sewer, and VALLECITOS shall transfer specific sewage flows from eighty (80) single-family homes within the boundaries of VALLECITOS to the Rancho Carrillo Sewer as shown on the attached Exhibit "A."

Section 2. Capacity Purchased. CITY has determined that adequate capacity is available and, as part of this Agreement, VALLECITOS agrees to pay CITY a one-time capital facility charge of $963.00 per equivalent dwelling unit, with an average flow of 220 gallons per day, for permanent use of the Rancho Carrillo Sewer by the 80 single-family homes as shown on the attached Exhibit "A."

Section 3. Discharge Standards. All transferred sewage flows from VALLECITOS to CITY shall meet federal, state, and local discharge requirements, which shall include all industrial waste discharge limitations.

Section 4. Payment of Operation & Maintenance Compensation. To compensate CITY for costs of operation and maintenance of the Rancho Carrillo Sewer, VALLECITOS shall pay CITY quarterly a sum equal to one hundred percent (100%) of the CITY's then

current sewer charge. Nothing in this Agreement shall restrict the CITY's power to adjust its sewer service charges. The current rate is $13 per equivalent dwelling unit.

Section 5. Maintenance of Facilities. It shall be VALLECITOS' responsibility to maintain its sewer system in a state of repair and maintenance that will prevent excessive infiltration and inflow from entering the CITY's Rancho Carrillo Sewer.

Section 6. ENCINA Capacity Adjustment. Flows from VALLECITOS to the Rancho Carrillo Sewer shall be allocated to VALLECITOS for purposes of capacity charges at ENCINA. VALLECITOS will provide an allowance for the connected flows and monthly flow reports to ensure CITY is not charged by ENCINA for flows from VALLECITOS. The adjustment will be based upon readings taken and reported at the VAI meter site.

Section 7. Miscellaneous Provisions.

7.1 Venue. In the event of any legal or equitable proceeding to enforce or interpret the terms or conditions of this Agreement, the parties agree that venue shall lie only in the federal or state courts in or nearest to the North County Judicial District, County of San Diego, State of California.

7.2 Modification. This Agreement may not be altered in whole or in part except by a modification, in writing, executed by all the parties to this Agreement.

7.3 Incorporation of Service Agreement. This Agreement and the terms and conditions shall be incorporated by reference as an exhibit to the service agreement entered into by the agencies and the customer receiving the exchange of sewage flows.

7.4 Entire Agreement. This Agreement, together with all the exhibits attached to this Agreement, contains all representations and the entire understanding between the parties with respect to the subject matter of this Agreement. Any prior correspondence, memoranda, or agreements, whether or not such correspondence, memoranda, or agreements are in conflict with this Agreement, are intended to be replaced in total by this Agreement and its exhibits.

7.5 Indemnification. VALLECITOS agrees to indemnify and hold the CITY, its officers, and employees harmless for any injuries, damages, costs, and judgments, which are caused by or are the result of any negligent or wrongful act or omission of VALLECITOS or arising from the exercise of any rights by VALLECITOS under this Agreement.

7.6 Effective Date. The effective date of this Agreement is MARCH 24, 2000.

"VALLECITOS":
VALLECITOS WATER DISTRICT

By _____
President
Board of Directors

"CITY":
CITY OF CARLSBAD

By _____
Mayor

By _____
City Clerk

A-7. Revised Basic Agreement for Ownership, Operation and Maintenance of a Joint Sewage System, as Amended February 8, 2000, City of Vista, City of Carlsbad, Buena Sanitation District, Vallecitos Water District, Leucadia County Water District and City of Encinitas. June 30, 2000.

REVISED BASIC AGREEMENT
FOR
OWNERSHIP, OPERATION AND MAINTENANCE OF A JOINT SEWAGE SYSTEM

AS AMENDED FEBRUARY 8, 2000

Ref:F&HR.00-4441

June 30, 2000

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REVISED BASIC AGREEMENT
FOR
OWNERSHIP, OPERATION AND MAINTENANCE OF A JOINT SEWAGE SYSTEM
AS AMENDED
EFFECTIVE FEBRUARY 8, 2000

THIS AGREEMENT (hereinafter referred to as the Revised Basic Agreement), is made and entered into this 8th day of February 2000, by and among the CITY OF VISTA, a general law city (hereafter VISTA), the CITY OF CARLSBAD, a general law city (hereafter CARLSBAD), the BUENA SANITATION DISTRICT, a County Sanitation District (hereafter BUENA), the VALLECITOS WATER DISTRICT, a County Water District (hereafter VALLECITOS), the LEUCADIA COUNTY WATER DISTRICT, a County Water District (hereafter LEUCADIA), and the City of Encinitas, a general law city (hereafter ENCINITAS).

RECITALS

WHEREAS, the parties hereto are responsible for providing sewage collection, transmission, treatment and disposal services in their respective service areas and are authorized to contract with other parties for the provision of such services; and,

WHEREAS, on July 13, 1961, VISTA and CARLSBAD entered into a Basic Agreement pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code to acquire, construct and operate a Joint Sewer System; and,

WHEREAS, the Basic Agreement provided that other municipal corporations and public districts or agencies may become parties to the Basic Agreement, thereby becoming members of the joint powers authority; and,

WHEREAS, on January 6, 1964, BUENA became a member of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, on March 22, 1965, VALLECITOS (then San Marcos) became a member of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, on August 17, 1971, LEUCADIA and ENCINITAS (then Encinitas Sanitary District) became members of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, it is the desire of the parties hereto to (a) continue functioning through a joint powers authority and (b) modify and condense the enabling legal documents for the joint powers authority by entering into a Revised Basic Agreement pursuant to Article 1, Chapter 5, Division 7, Title 1 of California Government Code relating to the joint exercise of powers, for the purposes of planning, designing, owning, operating, and maintaining a joint sewer system and concurrently establishing, by separate agreement, the Encina Wastewater Authority.

NOW THEREFORE, THE PARTIES HERETO COVENANT WITH EACH OTHER AS FOLLOWS:

Section 1 DEFINITIONS

For the purposes of this agreement the following terms shall have the meanings indicated:

1.1 Joint Advisory Committee (JAC). A committee composed of representatives of the member agencies that advises both the member agencies and the Operator/Administrator on issues relating to the Joint System.

1.2 Joint System. The Encina Water Pollution Control Facility (Unit I), and the Encina Ocean Outfall (Unit J) including all related land, rights of way, and appurtenances.

1.3 Member Agencies. The six members of the Encina Wastewater Authority: Vista, Carlsbad, Buena, Vallecitos, Leucadia, and Encinitas.

1.4 Operator/Administrator. The public agency designated by the member agencies as being responsible for operating, maintaining, and administering the Encina Joint System. Since August 1, 1988, the Operator/Administrator has been the Encina Wastewater Authority.

1.5 Biosolids. Primarily organic solid product, produced by the wastewater treatment processes, that can be beneficially recycled.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 2 JOINT PARTICIPATION

The member agencies shall participate jointly in the planning, design, acquisition, construction, ownership, operation, maintenance and use of the Joint System (including any future expansions thereof), and shall pay for such activities as hereinafter specified.

History: Adopted December 17, 1990.

Section 3 AREA TO BE SERVED BY THE JOINT SYSTEM

3.1 Existing Service Area. The area to be served by the Joint System is shown on Exhibit A, which is attached hereto and made a part of this Revised Basic Agreement by reference. Areas lying outside a member agency's legal boundary but inside that member agency's Exhibit A service area may be served by the member agency, providing the member agency provides assurance in the form of a legally binding agreement that these discharges will meet all applicable rules and regulations. Any wastewater or biosolids received from outside a member agency's legal boundary pursuant to such agreement shall be regarded as the wastewater or biosolids of the member agency for the purposes of billing, capacity, and source control.

3.2 Revisions to the Service Area. Areas lying outside the Exhibit A service areas of the member agencies may be served, provided such areas are annexed by a member agency. Notification of such annexations must be made in writing to the Joint Advisory Committee so that Exhibit A can be modified as appropriate. Member agencies can also request alteration of their Exhibit A service areas; such modifications must be approved in writing by all member agencies, as

evidenced by receipt of resolutions from the governing bodies of all member agencies. Member agencies whose Exhibit A service areas are enlarged shall be responsible for providing adequate capacity.

3.3 Prohibition on Discharges from Outside the Exhibit A Service Area. Each member agency agrees that it will neither permit nor knowingly countenance the use of the Joint System, directly or indirectly, for the disposal of wastewater or biosolids originating outside of its legal boundary except in the above manner, extent and conditions.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 4 ENLARGEMENT OF THE JOINT SYSTEM

Any member agency having first obtained the consent of Carlsbad and Vista, may at its sole cost and expense enlarge any portion of Unit I or J of the Joint System in which it is the owner of capacity rights and any increased capacity in such unit or portion resulting from such enlargement shall belong to the member agency paying the cost and expense thereof. No member agency shall unreasonably withhold consent to such enlargement. Any such enlargement shall be constructed in accordance with plans and specifications approved by Carlsbad and Vista.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 5 PROTECTION OF THE JOINT SYSTEM/SOURCE CONTROL

5.1 Protection of the Joint System. The Joint System shall not be used by any member agency for any purpose other than the conveyance, treatment, reuse, or disposal of wastewater and its by-products. Wastewater shall be construed to mean domestic sewage and trade wastewaters. Each member agency shall adopt and enforce ordinances, resolutions, rules and regulations, concerning the type and condition of wastewater permitted to be discharged into the sewers under its control and shall prohibit the discharge of any wastewater which would be detrimental to the Joint System, or to the use of by-products generated by the Joint System. Such ordinances, resolutions, rules and regulations shall reflect the applicable federal and state statutes and regulations and shall be consistent with the Operator/Administrator's industrial pretreatment regulations.

5.2 Prohibitions. No member agency shall allow excessive infiltration of any surface or storm waters to be discharged directly or indirectly into the Joint System. No member agency shall allow cooling water or other unpolluted industrial wastewater to be discharged directly or indirectly into the Joint System without the consent of all other member agencies. No member agency shall authorize a discharge from any groundwater cleanup site unless the discharge is authorized in advance by the Operator/Administrator.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 6 CAPACITY AND USE OF CAPACITY (CAPACITY INFRINGEMENT)

Each member agency shall own and enjoy a perpetual right to use its Joint System capacity in the proportions set forth immediately below herein. No member agency shall in any way grant,

encumber, limit or restrict its interest in any part of the Joint System for any purpose other than the treatment and disposal or reuse of wastewater and the management of wastewater treatment byproducts, or use the Joint System or any part thereof to a greater percentage than its capacity rights, except as set forth in Section 9 herein, without the prior written consent of the other member agencies, provided that no such excessive use without written consent shall be construed as a waiver of capacity rights by any member agency.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 7 CAPACITY MONITORING

Each member agency shall participate in a joint flow metering system, operated and administered by the Operator/Administrator, and facilitate such measurements of flow into the Joint System as needed for billing purposes and to verify that each agency is within its capacity rights. This metering system shall be maintained according to a separate agreement executed by the Operator/Administrator and the member agencies.

History: Adopted December 17, 1990.

Section 8 ACQUISITION/SALE OF EXCESS CAPACITY

In the event that any member agency hereafter requires additional capacity in the Joint System and capacity is available from another member agency, the capacity may be licensed, leased or purchased as necessary. Such lease or purchase shall be on terms as are hereafter agreed upon by the member agencies involved. In the event an inter-agency capacity agreement is adopted, the Joint Advisory Committee shall be notified in writing. Licensing, lease or purchase shall be subject to the terms and conditions established in Section 9 herein.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 9 CAPACITY RIGHTS IN UNITS

9.1 Unit I and Unit J Capacity. Capacity rights shall be as follows:

Member Agency	Unit I Liquid		Unit I Solids		Unit J Disposal	
	MGD	Percentage	MGD	Percentage	MGD	Percentage
Vista	8.05	22.36%	8.05	21.18%	8.05	21.18%
Carlsbad	9.24	25.67%	9.24	24.32%	9.24	24.32%
Buena	2.26	6.28%	3.51	9.24%	3.51	9.24%
Vallecitos	7.54	20.94%	7.54	19.84%	7.54	19.84%
Leucadia	7.11	19.75%	7.86	20.68%	7.86	20.68%
Encinitas	1.80	5.00%	1.80	4.74%	1.80	4.74%
Total	**36.00**	**100.00%**	**38.00**	**100.00%**	**38.00**	**100.00%**

The total disposal capacity of Unit J shall be 38.0 MGD average daily flow. This capacity rating assumes that the wet weather peaking factor on the flows to Unit J shall continue to be less than 2.76, and all the parties hereto agree to make good faith efforts to ensure that the wet weather peaking factor on the flows to Unit J remains below 2.76.

9.2 Unit I Capacity Infringement. The member agencies agree to make available up to 5 percent of their respective shares of total capacities, as set forth in Section 9.1 through a reserve capacity pool, in accordance with the following terms and conditions:

9.2.1. Flow Calculation. For the purposes of calculating payments due for licensing under this section, flows shall be based on measured (ADS) flows, to the maximum extent feasible. Solids loading flows shall be based on the total flow originating within each member agency. Voting rights, as described in Section 11 shall be in no way affected by temporary use of reserve capacity under this section. Total Reserve Capacity is the total capacity shown in paragraph 9.2.7. below.

9.2.2. Monitoring of Capacity Demand. Each agency shall provide monthly reports to EWA regarding future capacity committed, based upon its acceptance of applications for or issuance of any building permits, letters of availability, certificates or other entitlements for use which represent that sewer capacity is available to the applicant or project, or which enforceable or practically commit the agency to provide future sewer service. Reports shall be submitted in such form as the Board of EWA may require. Before the measured and committed flows reach 75% of Encina's total capacity (per Section 9.1), the EWA shall initiate a program to ensure adequate capacity to meet projected needs.

9.2.3. Excess Use a Trespass. Any use of capacity in excess of 95% of their respective share of Encina's total capacity (per Section 9.1) plus 50% of the Total Reserve Capacity, or otherwise in violation of this section, shall be considered a trespass. At the request of any member agency, EWA shall, and is hereby authorized to specifically enforce the terms of this section (Section 9.2) against a member agency or agencies on behalf of the remaining member agencies, including through commencement of a proceeding at law or equity. The parties agree that specific enforcement is a proper remedy in that payment of damages is not an adequate remedy for the potential losses to any member agency resulting from the loss of capacity. For example, replacement of capacity may be impractical and the consequences for the economic development of the members are not readily subject to quantification. Each member agency hereby consents to the commencement of such action or actions by EWA, and waives any right it may have to further approval of such actions under the joint powers agreement creating and establishing EWA. In addition to any injunctive relief, EWA may seek consequential damages on behalf of the remaining member agencies. In any such action, the prevailing party shall be entitled to attorney's fees and costs.

9.2.4. Indemnity and Hold Harmless. In addition to payment of the amount specified herein, each agency agrees to indemnify, defend and hold harmless the EWA and the other member agencies for any claim, demand, cost, penalty, fine or damage (including reasonable attorney's fees and costs of investigation), arising out of its violation of this section, whether resulting from the agency's active or passive, negligent or intentional act or failure to act to prevent a violation, and notwithstanding the active or passive negligence of those member agencies which are in compliance with the provisions of this section.

9.2.5. License Payments. When any member agency's flows exceed 100% of its capacity allocation for the treatment of solids, and/or treatment and/or disposal of liquids, for any continuous three-month period, such member agency shall pay for the use of such capacity from the reserve capacity pool in accord with the schedule of values, as adjusted each July 1 (commencing in

July 1996) by updating the facility spreadsheet to include any additional and changed capital project costs, and to reflect the current ENRLA construction cost index, as follows (see Exhibit C):

(a) Any portion of reserve up to 50% of Total Reserve Capacity:

$93,200	per MGD of Unit I liquid capacity per year
$155,800	per MGD of Unit I solids capacity per year
$44,000	per MGD of Unit J capacity per year

(b) The use of reserve amounts over 50% of Total Reserve Capacity shall be a violation of this section. In addition to any other remedy provided herein, or available to EWA or the member agencies, an agency shall pay for such use:

$153,300	per MGD of Unit I liquid capacity per year
$259,700	per MGD of Unit I solids capacity per year
$73,300	per MGD of Unit J capacity per year

(c) Payments to member agencies with unused reserve shall be made annually. Payments from member agencies shall be made quarterly to the EWA and held in a special account.

9.2.6. Restrictions on Use Over 40% of Reserve. If at any time any agency shall have enforceable or practically committed to provide future sewer service which, when added to its then existing actual flows, equals 95% of its allocated capacity (per Section 9.1) plus 40% of the Total Reserve Capacity, such agency shall:

(a) Immediately halt the acceptance or issuance of any building permits, letters of availability, certificates or other entitlements for use which represent that sewer capacity is the agency to provide future sewer service.

(b) Immediately inform EWA, in writing, that it has reached this threshold, of the actions it has taken to implement 9.2.6(a) above, and of its intention to present a plan to EWA, within 30 days, for capacity management to prevent the agency from exceeding use of 50% of the Total Reserve Capacity.

9.2.7. Reserve Capacity. Reserve capacity shall be as follows:

Member Agency	Unit I Liquid		Unit I Solids		Unit J Disposal	
	MGD	Percentage	MGD	Percentage	MGD	Percentage
Vista	0.40	22.36%	0.40	21.18%	0.40	21.18%
Carlsbad	0.46	25.67%	0.46	24.32%	0.46	24.32%
Buena	0.11	6.28%	0.18	9.24%	0.18	9.24%
Vallecitos	0.38	20.94%	0.38	19.84%	0.38	19.84%
Leucadia	0.36	19.75%	0.39	20.68%	0.39	20.68%
Encinitas	0.09	5.00%	0.09	4.74%	0.09	4.74%
Total	**1.80**	**100.00%**	**1.90**	**100.00%**	**1.90**	**100.00%**

9.2.8. Sole Method of Allocation. No agency shall provide capacity to any other member agency except pursuant to this section without the unanimous consent of the member agencies; provided that an agency may agree to provide additional capacity on a temporary basis to an agency which has used the maximum reserve capacity authorized by this section if: (1) such arrangement provides for payments at rates not less that the maximum reserve capacity rate per paragraph 9.2.5(b), above; and (2) the capacity so provided does not reduce the Total Reserve Capacity available.

History: Adopted December 17, 1990; Amended effective November 18, 1992; January 14, 1997.

Section 10 CAPACITY RIGHTS FOR RECLAMATION

10.1 Future Reclamation. Any member agency, at its own expense, may, and shall have the right to, reclaim water from any wastewater in the Joint System which emanates within the jurisdiction of the respective member agency. And, subject to the following limitations, each member agency shall have the right to install facilities for the reclamation of water from wastewater. Any proposed reclamation shall require the approval of all the member agencies in the event that the proposed reclamation facility is designed and/or constructed such that (i) any solids or non-treated effluent from any such facility may be discharged into Unit I of the Joint System and/or (ii) any reclaimed water may be discharged into Unit J of the Joint System. Such approval shall not be withheld unless the use of the proposed reclamation facility would adversely affect one or more of the member agencies and the reclaimer cannot reasonably mitigate the adverse impact. Nothing in this section shall be construed so as to require approval by the member agencies as to the geographic location of a reclamation facility constructed solely within the boundaries of any member agency.

10.2 Existing Reclamation. Section 10.1 above pertains to all future reclamation facilities. Currently constructed facilities may be operated to their capacity without further action by owners. The current reclamation facilities and capacities are as follows:

MEMBER AGENCY	RECLAMATION FACILITY	CAPACITY IN MGD
Carlsbad	Calavera Hills	1.20 MGD
Leucadia	Gafner	0.75 MGD
Vallecitos	Meadowlark	2.00 MGD
Buena	Shadowridge	1.16 MGD

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 11 JOINT ADVISORY COMMITTEE

The member agencies have created a Joint Advisory Committee (JAC) to advise the member agencies and the Operator/ Administrator. JAC shall continue in this advisory role.

11.1 Powers. Recommendations of JAC shall be advisory only. The JAC shall have the following responsibilities:

11.1.1 To review the operation and maintenance of the Joint System, including the cost thereof, and make reports and recommendations to the governing bodies of the member agencies;

11.1.2 To review and make recommendations regarding proposed expansion, enlargements or modifications of the Joint System to the governing bodies of the member agencies; and,

11.1.3 To review and make recommendations regarding contracts, budget matters, regulations, policies, permits and other documents and issues as appropriate to the Operator/Administrator. Each report and recommendation of the JAC permitted by this Section shall be considered as having been made by all the member agencies when made to the Operator/ Administrator and made in accordance with the voting rights and percentages set forth below in Section 11.4.4.

11.2 Representation on JAC. JAC shall be constituted by two appointed representatives from each member agency, with one alternate for each appointed representative. JAC representatives may, but need not, be members of the governing bodies of the member agencies.

11.3 Officers of JAC. JAC shall elect its own officers, which shall include a Chairman, Vice-Chairman, and Secretary. The Chairman and Vice-Chairman shall be JAC representatives and the Secretary may, but need not, be a JAC representative.

11.4 Meetings of the JAC.

11.4.1 Regular Meetings. The JAC shall provide for its regular meetings; provided, however, it shall hold at least one regular meeting per year. The dates, hour, and place of the regular meetings shall be established by JAC.

11.4.2 Ralph M. Brown Act. All meetings of the JAC, including, without limitations, regular, adjourned regular, and special meetings, shall be called, noticed, held, and conducted in accordance with the provisions of the Ralph M. Brown Act (commencing with Section 54950 of the California Government Code).

11.4.3 Minutes. The JAC Secretary shall cause to be kept minutes of all meetings of the JAC, and shall cause a copy of the minutes to be forwarded to each JAC representative.

11.4.4 Vote. The total vote of all members of the JAC shall equal 100%. When voting on a matter involving the Treatment Plant (Unit I) or Ocean Outfall (Unit J) each JAC representative's percentage vote shall equal one-half of the percentage of that unit's capacity owned by the representative's agency. If only one of an agency's representatives is present, this representative's percentage vote shall equal the total percentage of that unit' s capacity owned by the representative's agency. If both representatives are absent, each alternate shall have a percentage vote equal to one-half of the percentage capacity of the alternate's member agency; provided, however, at any JAC meeting where any member agency is represented by only one alternate, the alternate shall have a percentage of vote equal to the total percentage of the capacity of the agency he/she represents.

11.5 Rules. JAC shall adopt rules and regulations for the place, time and conduct of JAC meetings.

11.6 Payment for Attendance. The Operator/Administrator (or, if requested by the appointing member agency, that member agency as to its representatives) shall pay each representative (or alternate who attends a meeting by reason of the absence of a representative) an attendance fee of twenty-five ($25) for each JAC meeting, provided that such payment does not exceed fifty dollars ($50) per calendar month. Attendance fees shall be paid monthly. [This fee waived per legal counsel opinion.]

11.7 Assistance from the Operator/Administrator. The Operator/ Administrator shall provide supplies and clerical and secretarial help for JAC. The cost of such supplies and assistance shall be considered part of the expense of operating and maintaining the Joint System.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994; February 8, 2000.

Section 12 OPERATOR/ADMINISTRATOR

The Joint System shall be maintained and operated by any one of the parties hereto, or by another Public Agency, which party or other public agency shall be known as the Operator/ Administrator.

12.1 General Duties.

12.1.1 Joint System. The Operator/ Administrator shall maintain and operate the Joint System, and shall preserve it in good repair and working order, all in accordance with recognized sound engineering and accounting practices and local, state, and federal laws and regulations.

12.1.2 Pump Stations. The Operator/Administrator also shall operate and maintain, at the expense of the Cities of Vista and Carlsbad, the Agua Hedionda and Buena Vista Pump Stations (formerly Units G and C of the Joint System) within an annual budget prepared by the Operator/Administrator and approved by Vista and Carlsbad.

12.1.3 Other Facilities. The Operator/Administrator shall have the authority to operate and maintain other facilities outside the Joint System as recommended unanimously by JAC and in accordance with Operator/Administrator executed operation agreements, which may include budgeting responsibilities.

12.2 Designation and Specific Powers. Effective August 1, 1988, the member agencies created a public agency known as the Encina Wastewater Authority (EWA) to serve as the Operator/Administrator of the Encina Joint System. The EWA shall continue to serve as the Operator/Administrator until such time as EWA is terminated by written consent of a majority of the member agencies, evidenced by certified copies of resolutions by their governing bodies. The organization, administration, rules, and specific powers of the EWA shall be as set forth in the Revised Establishment Document establishing the EWA. Upon termination of the EWA and replacement with another Operator/Administrator, employees of the EWA shall become the employees of the new Operator/Administrator subject to existing employment contracts, seniority, retirement rights and any other employee benefits or rights now enjoyed by those employees.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 13 BUDGETING AND ACCOUNTING

13.1 Annual Budgets. Annually, the Operator/ Administrator shall prepare an operation, maintenance, and administration budget (hereafter referred to as the O & M budget) and a capital improvement program budget (hereafter referred to as the capital budget.) The budgets shall be prepared in accordance with generally accepted accounting principles.

13.1.1 Preparation of Estimated O & M Budget. No later than May 1 of each year, the Operator/Administrator shall prepare an estimated budget of the (a) amount of money required to operate, maintain and administer the Joint System during the ensuing fiscal year, and (b) the proportionate amount to be paid by each member agency. Such estimate shall be based on the total operation, maintenance, and administration costs during the current fiscal year as such costs are set forth in the current approved budget for the Joint System.

13.1.2 Approval of Estimated O & M Budget. Each estimated O & M budget adopted by the Operator/Administrator shall be forwarded to the JAC for consideration and for submission to the member agencies for approval. The Operator/ Administrator's estimated O & M budget shall be deemed effective upon unanimous approval by the member agencies and upon the receipt by the Operator/Administrator of certified copies of approving resolutions or minute orders from the governing bodies of each of the member agencies. Until such time as formal approval has been received from each member agency, the estimated O & M budget shall constitute merely a proposed budget, subject to consideration or revisions. The O & M budget shall be considered separately from the capital budget and may be approved independently. In the event a proposed budget is not approved, the Operator/Administrator shall continue to operate using the O & M budget figures from the previous fiscal year.

13.1.3 O & M Contributions. Each member agency shall pay its estimated portion of the budgeted operation, maintenance, and administration costs and shall pay its actual portion of the costs as determined pursuant to Section 16 of this Revised Basic Agreement. Quarterly on October 15, January 15, April 15 and July 15, the Operator Administrator shall bill the member agencies and the member agencies shall deposit with the Operator/Administrator approximately one fourth of the annual cost of operation, maintenance, and administration for the preceding quarter as described herein. Provided, however, that each invoice shall be increased or decreased to adjust the estimated amount payable based upon the estimated total expenses incurred in the preceding quarter and the estimated total amount and strength of wastewater received from each member agency during the preceding quarter. In the event that at the end of any fiscal year the amount paid by a member agency exceeds the amount that should have been charged, the excess shall be credited to the member agency the following fiscal year. In case of an underpayment, the member agency shall be assessed the amount that should have been charged in the following fiscal year. Each member agency shall make quarterly contribution payments to the Operator/Administrator promptly at the time they become due.

13.1.4 Actual O & M Contributions. The member agencies agree to contribute from their treasuries the actual annual costs of the Joint System as divided among the member agencies pursuant to Section 16 of this Revised Basic Agreement. Such costs shall include the actual costs of (1) all materials and supplies used or purchased for the operation, maintenance, or administration of the Joint System, (2) all contracts let by the Operator/Administrator for the performance of budgeted O & M work, and (3) the salaries and wages of all Operator/ Administrator employees providing such

services, including vacations and sick leave benefits, workers' compensation, social security and retirement payments, and health insurance. Such costs shall be paid out of the funds deposited with the Operator/Administrator by the member agencies; provided however, the failure of any member agency to pay the Operator/ Administrator shall not relieve the other member agencies of their obligation to pay their proportionate shares of operation, maintenance, and administration of the Joint System.

13.1.5 Preparation of Estimated Capital Budget. No later than May 1 of each year, the Operator/Administrator shall prepare an estimated budget of the amount of money required for capital improvement projects during each of the next five fiscal years and over the next twenty years. The estimated capital budget shall show the estimated amount to be paid by each member agency. Such estimate shall be based on existing and/or projected ownership as appropriate.

13.1.6 Approval of Estimated Capital Budget. Each estimated capital budget adopted by the Operator/ Administrator shall be forwarded to the JAC for consideration and for submittal to the member agencies for approval. The Operator/ Administrator's estimated capital budget shall be deemed effective upon unanimous approval by the member agencies and upon the receipt by the Operator/Administrator of certified copies of approving resolutions or minute orders from the governing bodies of each of the member agencies. Until such time as formal approval has been received from each member agency, the estimated capital budget shall constitute merely a proposed budget, subject to consideration or revisions. The capital budget shall be considered separately from the O & M budget and may be approved independently.

13.1.7 Capital Contributions. Each member agency shall pay its actual portion of the capital costs except as noted in Section 17 of this Revised Basic Agreement. Quarterly on October 15, January 15, April 15 and July 15, the Operator/Administrator shall bill the member agencies and the member agencies shall deposit with the Operator/Administrator approximately one fourth of the actual estimated capital costs incurred in the preceding quarter, except as otherwise specified in Section 18. Any capital funds remaining at the end of the fiscal year shall be retained and credited toward the member agencies for the following fiscal year. Any capital expenses unfunded at the end of the fiscal year shall be debited and charged to the member agencies in the following fiscal year. Each member agency shall make quarterly contribution payments to the Operator/Administrator promptly at the time they become due.

13.1.8 Actual Capital Contributions. The member agencies agree to contribute their actual capital costs pursuant to Section 17 of this Revised Basic Agreement. Such costs shall include the actual costs of (1) all materials and supplies used or purchased for capital improvement of the Joint System and (2) all contracts let by the Operator/Administrator for the performance of capital improvement projects. Provided however, the failure of any member agency to pay the Operator/ Administrator shall not relieve the other member agencies of their obligation to pay their proportionate shares of the capital expenses of the Joint System.

13.1.9 Audit. Annually the Operator/ Administrator shall cause the preparation of an independent accountant audit of the financial statements.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994; August 12, 1998.

Section 14 ASSISTANCE TO OPERATOR/ADMINISTRATOR

When requested by the Operator/Administrator, the EWA shall provide assistance, and make recommendations to said Operator/Administrator relative to all services and duties it is to perform under the terms of this Revised Basic Agreement.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 15 RIGHTS OF WAY AND LAND ACQUISITIONS

The Operator/Administrator and/or any of the member agencies may, as agreed upon in writing by all the member agencies, act on behalf of the member agencies in acquiring lands and rights of way necessary for the operation, maintenance, ownership, and use of the Joint System.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 16 PAYMENT OF OPERATION AND MAINTENANCE EXPENSES

16.1 Allocation of Expenses. All operation, maintenance and administration expenses for Units I and J of the Joint System, hereafter referred to as O & M expenses, shall be paid by each member agency based on each member agency's percentage of ownership and usage in these units. For the purpose of this section, the following definitions shall apply: "usage" shall mean the costs for power, chemicals, maintenance, and other sewage treatment, solids handling, and disposal processes which result from wastewater entering Unit I or Unit J; "ownership" shall mean the costs for insurance, administration expenses, laboratory expenses, plant operations, services and maintenance, and other wastewater collection and treatment, solids handling and effluent disposal costs which are incurred irrespective of the amount of wastewater which enters Unit I or Unit J.

16.2 Payment Schedule. Each member agency shall pay its proportionate share of the operation, maintenance and administration expenses in accordance with Section 13.1 of this Revised Basic Agreement.

16.3 Revenue from By-Products. Any revenue received from the sale of by-products arising out of the operation of the Joint System shall be apportioned to each member agency in the same proportion as their share of the O & M expenses for the Joint System in the year in which the revenue is received.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 17 PAYMENT OF CAPITAL EXPENSES

17.1 Allocation of Expenses. Unless otherwise specified herein, capital expenses shall be allocated based on existing or projected Unit I or Unit J ownership as appropriate. Exceptions are as follows:

17.1.1 Phase IV Expansion. Phase IV capacity and costs are allocated according to the methodology shown in Exhibit B, attached hereto and made part of this Revised Basic Agreement by reference.

17.1.2 Joint Flow Metering System. Each member agency is responsible for the capital expenses of meters and monitors serving its respective service area. Capital expenses for the monitors serving the entire Exhibit A service area shall be paid on the basis of Unit J flow.

17.1.3 Additional Land/Right of Way Acquisition. All expenses shall be allocated in accordance with the terms of a separate agreement to be adopted unanimously by the member agencies.

17.2 Payment Schedule. Unless otherwise specified herein, capital expenses shall be paid on a quarterly basis. Exceptions are as follows:

17.2.1 Phase IV Expansion. Phase IV contract expenses approved by the Operator/Administrator shall be paid once a month based on invoices from the contractor, the design engineer, and the construction manager. The payments will vary over the duration of the job. The Operator/Administrator shall notify the member agency financial representatives of the amounts needed following receipt of each month's invoices. In addition, upon the completion and acceptance by the Operator/Administrator of each of: (a) the Western Summit/TIC construction contract project, and (b) the Phase IV odor control and associated facilities, and (c) again, upon completion and acceptance of the Avenida Encinas street widening project by the City of Carlsbad per its contract with EWA, adjustments shall be calculated and paid in the manner set forth in Exhibit B, considering all Phase IV Expansion work completed to date or invoiced to the member agencies. Upon completion and acceptance of all work authorized by the Operator/Administrator as part of the Phase IV Expansion, a final adjustment shall be calculated and paid in accordance with Exhibit B.

17.2.2 Additional Land/Right of Way Acquisition. All expenses shall be paid in accordance with the terms of a separate agreement to be adopted unanimously by the member agencies.

17.2.3 Other Capital Expenses. On occasion, capital expenses may occur earlier in the fiscal year than would allow for regular quarterly billing. If regular quarterly billings do not provide needed capital early enough during the fiscal year, supplemental capital billings shall be sent to the member agencies. In such cases, the Operator/Administrator will notify the member agency financial representatives as far in advance as possible.

History: Adopted December 17, 1990; Amended effective November 18, 1992; August 12, 1998.

Section 18 SETTLEMENT OF DISPUTE OR CONTROVERSY

18.1 Right to Arbitration. Should any dispute or controversy arise in connection with the books, records or accounts of any member agency or in connection with the acquisition, construction, maintenance, operation repair, reconstruction or enlargement of the Joint System or in connection with any of the affairs or operation thereof, or the execution of this agreement, the governing bodies of member agencies that are affected by such dispute may elect to arbitrate the dispute or controversy in accordance with this section. In the event of such election, the governing body of each member agency affected shall appoint or designate one disinterested person as an arbitrator. Said arbitrators so chosen, if an even number, shall designate an additional disinterested person to make an odd number of arbitrators. Said arbitrators so chosen shall act as a Board of Arbitrators in connection with any such dispute or controversy. The findings of fact approved by a

vote of the majority of the members of the Board of Arbitrators shall be binding upon the affected member agencies.

18.2 Right of Observation. The parties to any arbitration proceedings held under the provisions of this agreement shall notify every other member agency not a party thereto of such arbitration proceedings and any other member agency shall have the right to be represented at such proceedings by a member agency designated observer.

18.3 Right to Expert Arbitration. Any controversy which can be determined by an engineer's or other expert's findings and which under this section could be submitted to arbitration may, if the parties thereto agree in writing to do so, be submitted to a named engineer or expert who shall be the sole arbitrator. Any such engineer shall be a Registered Engineer in the State of California. Any such engineer or expert shall be disinterested as required of arbitrators on an arbitration board. He shall proceed in the same manner provided herein for an arbitration board.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 19 APPORTIONMENT OF LIABILITY

Any liability incurred by the member agencies, which liability arises out of or in connection with the operation and/or maintenance of the Joint System, except for costs of improvements to such facilities and operating and maintenance costs, shall be discharged by payment by each member hereof in proportion to their respective ownership in the facilities at the time of the incident which results in the liability.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 20 NOTICES

Notices required or permitted under this Revised Basic Agreement shall be sufficiently given if in writing and if either served personally or mailed by certified mail to the member agencies.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 21 SEVERABILITY

If any one or more of the terms, provisions, promises, covenants or conditions of this agreement shall by any extent by adjudged invalid, unenforceable, void or voidable for any reason whatsoever by a court of competent jurisdiction, each and all of the remaining terms, provisions, promises, covenants and conditions of this agreement shall not be affected thereby and shall be valid and enforceable to the fullest extent permitted by law.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 22 MODIFICATION OF AGREEMENT

This agreement shall contain all the terms and conditions made between the parties hereto and shall not be amended except by an agreement in writing signed by all the member agencies.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 23 SUCCESSION

The provisions of this agreement shall be binding upon and shall inure to the benefit of the successors of the parties hereto.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 24 APPROVAL

This agreement shall be approved as of the date that all of the member agencies have approved this agreement and the Revised Establishment Document.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by their respective governing bodies caused this Revised Basic Agreement to be executed the day and year first above written.

CITY OF VISTA

By_____
Mayor
Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor
Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

Resolution and Signature Sheets are on file with Encina Wastewater Authority.

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

Resolution and Signature Sheets are on file with Encina Wastewater Authority.

EXHIBIT B
PHASE IV COST ALLOCATION

1. Phase IV cost shall be allocated as follows:

a. All costs shall be allocated by unit process and among flow, BOD, and suspended solids in the manner recommended for revenue programs by the State Water Resources Control Board.

b. The replacement value of the existing Unit I and Unit J facilities at the mid-point of construction (projected ENRLA of 6465) shall be determined. In determining replacement value, grant funding shall be included except for the grant funding used to pay for the "oversized" portion of "oversized" items (i.e., items sized or undertaken for the ultimate site capacity, such as site grading and paving, piping, etc.).

c. Dollar ownership of the existing facilities shall be determined by multiplying existing ownership percentages times the replacement values determined in step b.

d. The cost of the proposed Phase IV facilities at the midpoint of construction (projected ENRLA of 6465) shall be estimated by the design engineer.

e. The total value of the EWPCF following construction of Phase IV shall be estimated by adding the replacement value of the existing facilities (determined in step b) to the estimated cost of the Phase IV project (determined in step d).

f. Needed dollar ownership of the EWPCF following construction of Phase IV shall be determined by multiplying the revised Unit I liquid and solids and Unit J ownership's (determined in Exhibit A of the Thirty-Ninth Supplement) by the total value of the EWPCF following construction of Phase IV (determined in step e).

g. Phase IV cost allocations shall be calculated by subtracting existing dollar ownership's (determined in step c) from needed dollar ownership's following construction of Phase IV (determined in step f). Credits and buy-ins for existing facilities are automatically included in this calculation and need not be calculated separately; however, the dollar values of each are included below for background.

Estimated Phase IV cost allocations in dollars and percent of total are as follows:

Agency	Existing Ownership	Projected Ownership Following Phase IV	Estimated Phase IV Cost	Effective	Credit/Buyin
Vista	22,739,000	28,938,000	6,199,000	11.44	(5,455,000)
Carlsbad	20,585,000	33,216,000	12,631,000	23.31	(745,000)
Leucadia	13,314,000	27,297,000	13,983,000	25.81	2,916,000
San Marcos	14,099,000	27,105,000	13,006,000	24.01	2,091,000
Buena	4,436,000	11,020,500	6,584,500	12.15	2,023,000
Encinitas	4,694,000	6,470,500	1,776,500	3.28	(830,000)
Total	79,867,000	134,047,000	54,180,000	100.00	0

Final Phase IV cost allocations will be determined following completion of Phase IV construction and will use the actual project costs spread according to the final engineer's estimate instead of the current engineer's estimate in steps d through g above. Actual ENRLA at mid-point of construction will be substituted for the projected value in step b.

EXHIBIT C
LICENSE PAYMENTS & SCHEDULE OF VALUES

(1) Any portion of reserve up to 50% of Total Reserve Capacity:

The license payment shall be 8% of the current replacement value of the facilities, without grants deducted, adjusted each July 1 (commencing in July 1996) by updating the asset allocation spreadsheet to include any additional and changed capital project costs, and to reflect the current ENRLA construction cost index. Unit I and J license payments shall be based on a flow rate of 38 MGD. Unit I liquid license payments shall be proportioned based on the percentage of the Flow value of the total replacement value. Unit I solids license payments shall be proportioned based on the percentage of the sum of the BOD and SS replacement values, as compared to the total replacement value.

(1) 1996 - Example calculations:

Unit I - Total replacement value of Unit I (treatment facilities) without grant deducted, July 1996 at ENRLA of 6522 – $118,310,000, Flow value – $44,272,000, BOD value – $43,882,000, SS value – 30,157,000. Utilizing an interest rate of 8% yields a license payment of $249,000 per MGD ($118,310,000 times .08 divided by 38 MGD).

Split between liquid and solids payments:

liquid portion – $249,000 times 44,272,000/118,310,000 – $93,200
solid portion – $249,000 times (43,882,000 + 30,157,000)/118,310,000
– $155,800

Unit J total replacement value – $20,881,000.

$20,881,000 times .08 divided by 38 MGD – $44,000

July 1, 1996 license payments

$93,200	per MGD of Unit I liquid capacity per year
$155,800	per MGD of Unit I solids capacity per year
$44,000	per MGD of Unit J capacity per year

(2) The use of reserve amounts over 50% of Total Reserve Capacity:

License payments shall be increased by 2/3.

(3) July 1, 1996 license payments:

$153,300	per MGD of Unit I liquid capacity per year
$259,700	per MGD of Unit I solids capacity per year
$73,300	per MGD of Unit J capacity per year

A-8. Reimbursement Agreement for Temporary Wastewater Collection for Carlsbad Tract No. 93-04 with Leucadia County Water District, June 2000.

RESOLUTION NO. 2000-172

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CARLSBAD, CALIFORNIA, TO APPROVE AND AUTHORIZE EXECUTION OF REIMBURSEMENT AGREEMENT FOR TEMPORARY WASTEWATER COLLECTION FOR CARLSBAD TRACT NO. 93-04 WITH LEUCADIA COUNTY WATER DISTRICT.

WHEREAS, Carlsbad Tract 93-04 is located within the City of Carlsbad and is within the City's sewer service area; and

WHEREAS, the City is unable to provide sewer service to 25 residential units within Carlsbad Tract No. 93-04 until the Bressi Ranch property is developed; and

WHEREAS, the Leucadia County Water District has an existing sewer system that is able to provide adequate sewer service on a temporary basis to 25 residential units in *Carlsbad Tract No. 93-04; and*

WHEREAS, a Reimbursement Agreement with Leucadia County Water District has been prepared to provide for the temporary sewer service and requires the City to collect from the 25 residential units the sewer service charge imposed by Leucadia County Water District and to pay this charge on a quarterly basis to Leucadia County Water District.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Carlsbad, California, as follows:

1. That the above recitations are true and correct.

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G16 : 8

2. That the Mayor is authorized and directed to execute the Reimbursement Agreement for Temporary Wastewater Collection for Carlsbad Tract No. 93-04 with Leucadia County Water District.

PASSED, APPROVED AND ADOPTED at a regular meeting of the Carlsbad City Council held on the 6th day of June, 2000 by the following vote, to wit:

AYES: Council Members Lewis, Hall, Finnila, Nygaard and Kulchin

NOES: None

ABSENT: None

CLAUDE A. LEWIS, Mayor

ATTEST:

LORRAINE M. WOOD, City Clerk (SEAL)

A-9. Reimbursement Agreement for Wastewater Treatment and Disposal for Carlsbad Tract No. 73-29 Carrillo Estates Unit No. 2, no date.

REIMBURSEMENT AGREEMENT FOR WASTEWATER TREATMENT AND DISPOSAL FOR CARLSBAD TRACT NO. 73-29 CARRILLO ESTATES UNIT NO. 2

This Agreement is made and entered into in the County of San Diego, State of California, by and between the LEUCADIA COUNTY WATER DISTRICT (hereinafter "DISTRICT") and the CITY OF CARLSBAD (hereinafter "CITY") with reference to the following facts:

RECITALS

A. PONDEROSA HOMES (hereinafter "PONDEROSA") is the owner of that certain real property located in the City of Carlsbad, County of San Diego, State of California, known as Tract No. 73-29, Carrillo Estates Unit No. 2 (hereinafter the "Subject Tract"), said tract to consist of 111 dwelling units.

B. DISTRICT is a public entity organized and functioning pursuant to the County Water District Law, California Water Code section 30000.

C. City is a general Law City (Gov. Code, section 34102), organized and functioning pursuant to the provisions of the California Constitution, Art. XI, section 2(a) and Government Code section 36501 et seq.

D. PONDEROSA has received tentative map approval from CITY and filed improvement plans, tract map and grading plans with CITY for the development of the Subject Tract.

E. PONDEROSA desires to develop Subject Tract and proceed with the construction of the 111 dwelling units contained therein, but has been unable to continue with development and construction due to the present lack of wastewater conveyance and treatment facilities in the area.

F. DISTRICT has wastewater conveyance facilities from Subject Tract to the Encina Water Pollution Control Facility (hereinafter the "Encina WPCF") and is willing to provide PONDEROSA with interim transportation of wastewater to the Encina WPCF through its conveyance facilities until such time that Subject Tract is served by other facilities.

G. CITY contemplates that other wastewater transmission or treatment facilities will be constructed to serve the area in which the Subject Tract is located. Until such time, CITY desires to compensate DISTRICT for the costs of conveyance and treatment of wastewater generated from the Subject Tract.

NOW THEREFORE, it is agreed by and between the parties as follows:

AGREEMENT

Section 1. DISTRICT agrees that for the term of this Agreement, as defined in Section 2, it will convey wastewater from all 111 units of Subject Tract to the Encina WPCF.

Section 2. This Agreement shall expire when both of the following have occurred: (1) wastewater transmission or treatment facilities serving the Subject Tract have been constructed and accepted by City and (2) the sewage collection system serving the Subject Tract has been connected to said facilities.

Section 3. CITY shall have the right and duty to charge the owners of all or any part of the Subject Tract its usual and customary charges for sewer services.

Section 4. To compensate DISTRICT for costs of operation and maintenance of the wastewater conveyance facilities servicing the Subject Tract and costs of treatment of sewage from the Subject Tract at the Encina WCPF, CITY shall pay DISTRICT quarterly, for the term of this Agreement, a sum equal to 75 percent of the CITY's charges to owners of the Subject Tract for sewer service. The remaining percentage of said charges generally represent the CITY's costs of billing and collection.

Section 5. One Equivalent Dwelling Unit (hereinafter "E.D.U.") of capacity, per dwelling unit, to a maximum of 111 E.D.U.s, shall be transferred from DISTRICT TO CITY on the monthly flow and E.D.U. report for Encina WPCF until such time as wastewater transmission through DISTRICT's sanitary sewer facilities is discontinued. Said transfer shall be made six months after the issuance of a building permit on any dwelling unit on the Subject Tract. The aforementioned transfer shall be for purposes of allocating capacity between DISTRICT and CITY only and shall not affect billing for sewage treatment. For purposes of this Agreement one E.D.U. shall equall 238 gallons per day.

Section 6. No party to this Agreement shall be entitled to assign all or any portion of its rights or obligations contained herein without obtaining the prior written consent of the other parties; such consent shall not be unreasonably withheld.

Section 7. This Agreement shall inure to the benefit and be binding upon all of the parties hereto and their respective successors, heirs and assigns.

Section 8. This Agreement and any disputes relat[illegible]

A-10. Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, City of Vista and City of Carlsbad, February 2002.

AGREEMENT FOR
OWNERSHIP, OPERATION, AND MAINTENANCE OF
THE VISTA/CARLSBAD INTERCEPTOR SEWER

THIS AGREEMENT is made and entered into as of the 26th day of February, 2002, by and between the City of Vista, a general law city ("Vista"), and the City of Carlsbad, a general law city ("Carlsbad"), collectively, ("the Parties").

RECITALS

WHEREAS, the Parties are responsible for providing sewage collection and transmission in their respective service areas and are authorized to contract with others for the provision of such services; and

WHEREAS, on July 13, 1961, Vista Sanitation District and Carlsbad entered into an agreement pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code to acquire, construct and operate a Joint Sewer System and allocated ownership and capacity rights to Vista Sanitation District and Carlsbad in an interceptor sewer system, sewage treatment facility, and ocean outfall (the "Basic Agreement"). The joint sewer system components were divided into pipeline reaches and pumping stations referenced by Units A, B, C, D, E, F, G, and H.

WHEREAS, on August 17, 1971, Vista Sanitation District and Carlsbad entered into an agreement whereby Vista Sanitation District agreed to bear all cost of maintenance and operation of Unit "A", a trunk sewer pipeline paralleling I-78 and extending from Vista to the Carlsbad city limit; and

WHEREAS, on September 3, 1975, Vista and Carlsbad entered into an agreement whereby Unit C (Buena Vista Pump Station), Unit D (Buena Vista Force Main), and Unit G (Agua Hedionda Pumping Station) were increased in capacity and Carlsbad's capacity rights in Units C and D increased from 5.5 percent to 15.5 percent and Carlsbad's capacity rights in Unit G were reduced from 40.5 percent to 38.5 percent; and

WHEREAS, on or about September 14, 1983, the Vista Sanitation District was dissolved, and Vista assumed the District's rights and obligations, including those contained in the Basic Agreement; and

WHEREAS, the Parties by written agreement dated December 27, 1983, deleted Unit A and a portion of Unit B from the Joint System and released them to Vista as sole owner with complete responsibility for maintenance thereof.

WHEREAS, on October 24, 1984, the City of Vista and the City of Oceanside entered into an agreement to transfer sewage flow between the agencies; and

WHEREAS, on May 22, 1987, a "Letter of Understanding for Upgrading of the Vista/Carlsbad Interceptor" was prepared by Carlsbad and submitted to Vista designating a "trigger mechanism" to start construction of replacement pipelines on the Vista/Carlsbad Interceptor; and

WHEREAS, pursuant to Article 1, Chapter 5, Division 7, Title 1 of the California Government Code, the Parties have entered into a Revised Basic Agreement, as may be amended from time to time, with the other member agencies of the Encina Wastewater Authority for the purpose of operating and maintaining a sewage treatment facility (Unit I) and ocean outfall (Unit J) (the "Revised Basic Agreement"); and

WHEREAS, Section 12.1.2 of the Revised Basic Agreement stipulates that the Administrator of the Encina Wastewater Authority shall operate and maintain, at the expense of Vista and Carlsbad, the Buena Vista and Agua Hedionda Pumping Stations (formerly Units C and G, respectively, in the Basic Agreement); and

WHEREAS, Units B, D, E, F, and H of the Basic Agreement were not incorporated into the Revised Basic Agreement with regard to operation, maintenance, or construction of the Vista/Carlsbad Interceptor; and

WHEREAS, the Parties desire to enter into an agreement for ownership, operation, and maintenance of the Vista/Carlsbad Interceptor, described herein as VC1 through VC16, the Buena Vista Pump Station and the Agua Hedionda Pump Station, the location of said facilities is as shown on attached Exhibits "A-1", "A-2" and "A-3" and incorporated herein by reference.

THEREFORE, THE PARTIES HERETO AGREE TO THE FOLLOWING:

SECTION 1. DEFINITIONS

For the purposes of this agreement, the following terms shall have the meanings indicated:

1.1 Vista/Carlsbad Interceptor. An interceptor sewer pipeline, jointly owned by Vista and Carlsbad, beginning at Manhole No. 35 (according to City of Vista Drawing No. 1981, As-Built 2/27/87) located in the City of Oceanside approximately 360 feet east of the northeasterly City boundary of Carlsbad and extending to the Encina Water Pollution Control Facility and includes the Buena Vista Pumping Station and force main and the Agua Hedionda Pumping Station and force main, and any future improvements, and replacements, all as shown on Exhibits "A-1", "A-2" and "A-3".

1.2 Preliminary Design Report. A report that investigates a proposed improvement or enlargement to the Vista/Carlsbad Interceptor and provides information on the need for the improvement or enlargement, a description of facilities, materials, and design criteria, and a detailed cost estimate for the improvements or enlargement including engineering, right-of-way, legal, administrative, construction and inspection, and a tentative schedule for final design and construction. The Preliminary Design Report may be prepared for any component needing upgrading when the peak dry weather flow rate reaches sixty (60) percent of full pipe capacity.

1.3. Administrator. The Administrator shall be the individuals designated to administer the functions of the sewer system for that City. For Vista and Carlsbad, the Administrator is each City's City Manager or his/her designated representative.

1.4 Lead Agency. The Party to Project Agreements given responsibility for planning, design, and construction of a given component of the Vista/Carlsbad Interceptor.

1.5 Pipeline Reach. A portion or segment of the Vista/Carlsbad Interceptor sewer. A Pipeline Reach designates a change in pipe capacity or capacity ownership by the Parties. The unit designation contained in the Basic Agreement for Pipeline Reaches and pumping stations is hereby replaced with Pipeline Reaches designated VC1 through VC16, the Buena Vista Pumping Station and the Agua Hedionda Pumping Station, all as shown on Exhibits "A-1", "A-2" and "A-3".

1.6 Inflow and Infiltration. The sewer pipeline shall be maintained to exclude excessive inflow of surface water and infiltration of groundwater through manhole risers, covers and pipeline joints. Allowable infiltration shall not exceed 500 gpd per inch-diameter per mile.

1.7 Wastewater. Wastewater shall be construed to mean domestic sewage, authorized industrial discharges that are in compliance with the Encina Wastewater Authority's Source Control Program, and Inflow/Infiltration.

1.8 Improvement or Enlargement Costs. The cost of land, easements and rights-of-way, engineering, construction management, construction inspection, and construction.

1.9 Project Agreement. A separate agreement between Vista and Carlsbad which defines the project-specific requirements of each Party, cost sharing for design and construction, the method of cost accounting and the payment schedule for the improvement or enlargement of any portion of the Vista/Carlsbad Interceptor.

1.10 Service Area. The Service Area shall be the sanitation sewer area served by the City of Vista or the City of Carlsbad. It shall not include the sanitation sewer area of Buena Sanitation District unless approved by the Parties in writing.

1.11 Capacity. Capacity, as defined herein, shall be construed to be the sewage flowrate that may be conveyed through a pipeline when flowing full and is based on a depth of flow (D) to pipe diameter (d) ratio of one (i.e., D/d = 1.0).

SECTION 2. JOINT PARTICIPATION

The Parties shall participate jointly in the proportions hereinafter specified in the acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor, including the parts thereof which may be subsequently acquired or constructed for the improvement or enlargement thereof. Further, the Parties shall pay for such acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor in the proportions hereinafter shown in Exhibit B.

SECTION 3. CAPACITY RIGHTS

3.1 For the duration of this Agreement, each Party shall own and enjoy the right to use eighty percent (80%) of the Capacity of the Vista/Carlsbad Interceptor in the proportions set forth in the table identified as "Vista/Carlsbad Interceptor Sewer System – Capacity Rights" which is attached hereto and incorporated herein by reference as Exhibit "B". No Party shall use the Vista/Carlsbad Interceptor, or any part thereof, to a greater percentage of its capacity and shall not in any way grant, encumber, limit or restrict its interest in any part of the Vista/Carlsbad Interceptor, or partition or seek to partition the same or have the use of any part thereof for any purpose other than the disposal of sewage, without the prior written notification of the other Party.

3.2 If responsibility for the disposal of the sewage from a particular area regulated by this Agreement is to be transferred from one Party to the other, or a third Party, the capacity service shall be transferred accordingly on the effective date of the transfer of such responsibility, and the charges against the Parties amended to correspond therewith. Any Party proposing such transfer shall notify the other Party in advance of the transfer.

No such transfer shall affect the capacity rights or obligations of the Parties in or to the Vista/Carlsbad Interceptor until the Parties shall have executed appropriate amendments to this Agreement.

3.3 The capacity rights identified herein in Exhibit "B" include the increased capacities that will be available as the result of the sewer replacement project for Pipeline Reaches VC5B through VC11A of the Vista/Carlsbad Interceptor and subject to a separate Project Agreement as addressed in Section 5.

3.4 Neither Party shall exceed their capacity rights in the Vista/Carlsbad Interceptor. In the event a Party temporarily exceeds its capacity rights, it shall reimburse the other party the value of the excess capacity rights used. If the capacity used is one year or less, the value of the capacity used shall be determined on a percentage of the overall O&M Budget unless the Parties agree to transfer its respective percentage of ownership of the Vista/Carlsbad Interceptor permanently.

SECTION 4. ACQUISITION OF ADDITIONAL CAPACITY

In the event either Party requires capacity in the Vista/Carlsbad Interceptor in excess of the proportionate capacity allocated under this Agreement, and the Vista/Carlsbad Interceptor is not being used by the other Party to the full percentage of the total capacity to which they are entitled, the Party requiring additional capacity may lease or purchase such additional capacity from the other Party. Such lease or purchase shall be accomplished by written agreement.

SECTION 5. RESPONSIBILITIES OF LEAD AGENCY

Carlsbad shall be the Lead Agency with responsibility for the Vista/Carlsbad Interceptor, unless agreed upon otherwise by a separate Project Agreement; and therefore, Carlsbad and Vista shall mutually agree on all recommendations for improvements and enlargements to the Vista/Carlsbad Interceptor. A separate Project Agreement shall be prepared and executed by the Parties for all future improvements and enlargements to the Vista/Carlsbad Interceptor and to determine the Lead Agency for the Project Agreement .

SECTION 6. IMPROVEMENTS OR ENLARGEMENTS OF THE VISTA/ CARLSBAD INTERCEPTOR

6.1 As deemed necessary, the Parties shall meet to discuss future improvements or enlargements of the Vista/Carlsbad Interceptor. Once it is agreed between the Parties that an improvement or enlargement is necessary, a Preliminary Design Report for the improvement or enlargement of the Vista/Carlsbad Interceptor shall be prepared. Upon completion and acceptance by the Parties of a Preliminary Design Report detailing an improvement or enlargement, a Lead Agency will be designated that will prepare a Project Agreement which will identify the project specific requirements of each Party including the cost sharing of the Preliminary Design Report.

6.2 When the Project Agreement has been accepted by the City Council of each Party, the Lead Agency under the Project Agreement shall engage the services of a consultant or consultants to prepare plans, specifications, and related materials necessary for the acquisition and construction of the improvements or enlargements. The specifications shall contain all appropriate hold harmless clauses, insurance requirements and indemnifications for those agencies affected by the project.

6.3 Upon completion of the plans, specifications, and related materials, their approval by the other Party, the acquisition of the necessary lands and rights-of-way, and at such time as the Parties are prepared to finance their proportionate shares of the acquisition and construction cost, the Lead Agency under the Project Agreement shall advertise for bids for the construction of the improvements or enlargements or such portion thereof as may be hereafter agreed to by the Parties. The decision to accept bids and award the construction contract shall be the sole responsibility of the Lead Agency. The Lead Agency shall cause the work to be inspected, administer the execution of the contract, and approve necessary change orders.

6.4 The Parties may, at their sole cost and expense, enlarge any pipeline reach or pumping station or portion thereof of the Vista/Carlsbad Interceptor in which it is the owner of capacity rights and any increased capacity in such pipeline reach or portion resulting from the enlargement shall belong to such Party paying the cost and expense thereof. The enlargement shall be performed in accordance with the requirements of this Section and by separate agreement.

SECTION 7. LANDS AND RIGHTS-OF-WAY

7.1 Any land or rights-of-way acquired for the improvement or enlargement of the Vista/Carlsbad Interceptor shall be acquired in the name of Carlsbad and Vista as tenants in common.

7.2 At such time as the plans specifying the location of the necessary lands and rights-of-way for improvement or enlargement of the Vista/Carlsbad Interceptor have been prepared and approved by the Parties and the respective funds of the Parties are available for the acquisition thereof, the Lead Agency shall proceed to acquire the necessary land and rights-of-way. The Lead Agency shall notify the other Party of the amount to be deposited by the other Party with the Lead Agency to pay its proportionate share of the acquisition costs. The other Party shall deposit its share with the Lead Agency prior to recording acquisition documents.

SECTION 8. COST SHARING OF IMPROVEMENTS OR ENLARGEMENTS

8.1 All improvement or enlargement costs of the Vista/Carlsbad Interceptor which are deemed necessary and beneficial to both Parties under any Project Agreement shall be borne and paid by the Parties in proportion to each Party's capacity rights for each Pipeline Reach listed in the table attached as Exhibit "B", except as otherwise required by Section 6.4 of this Agreement. Under this section "necessary and beneficial" shall mean those expenses that are necessary for the

completion of the improvement or enlargement of the Vista/Carlsbad Interceptor and benefit both Parties to the Project Agreement .

8.2 Cost sharing shall be based on percentage of capacity owned after improvements are constructed.

SECTION 9. OPERATION AND MAINTENANCE

9.1 Operation and maintenance of the Vista/Carlsbad Interceptor shall include the labor, equipment and materials required for daily operation and routine maintenance. Routine annual maintenance activities typically include visual inspections of all manholes, clearing around manholes, grading and maintaining access roads and replacement of severely corroded or damaged manhole frames and lids. Cleaning and special inspections, such as the inspection of the trestle crossing of the Agua Hedionda Lagoon, will be performed every three to five years or as necessary to maintain the intended function of the Vista/Carlsbad Interceptor. Cleaning and special inspections shall not be considered to be routine annual maintenance.

9.2 Carlsbad shall operate and maintain the Vista/Carlsbad Interceptor, except for that portion specifically excluded in Section 9.3 below, in good repair and working order in accordance with recognized sound engineering practice. Carlsbad shall maintain accurate records and accounts in connection with the operation and maintenance of the Vista/Carlsbad Interceptor. These records and accounts shall be available for inspection by Vista upon request by written notice.

9.3 Operation and maintenance of the Buena Vista and Agua Hedionda Pump Stations and force mains of the Vista/Carlsbad Interceptor shall be the responsibility of the Administrator/Operator of the Encina Wastewater Authority as identified in Section 12.1.2 of the Revised Basic Agreement with the Encina Joint Powers Authority, as may be amended from time to time, a copy of which is on file with the Administrator of

each Party. Operation and maintenance of existing Pipeline Reaches VC1 through VC3 shall be the responsibility of Vista until the pipeline and manholes have been rehabilitated or a replacement pipeline is constructed, finally accepted, and operational.

SECTION 10. BUDGETING AND ACCOUNTING FOR OPERATION AND MAINTENANCE

10.1 Annual expenses for routine operation and maintenance of the Vista/Carlsbad Interceptor shall be based on a rate of $2,000 per mile of gravity sewer as detailed in Exhibit "C", for a total annual cost of $14,000. An inflation rate of three percent (3%) shall be applied annually to these expenses. These expenses, hereinafter referred to as O&M expenses, include the labor, equipment, materials and administration necessary to maintain the daily operation of the Vista/Carlsbad Interceptor as identified in Section 9.1.

10.2 Carlsbad and Vista shall share in the operation and maintenance expenses of the Vista/Carlsbad Interceptor, except as stated otherwise in Section 10.3, based on the approximate ownership of each Party at the mid-point of the sewer. Vista shall be responsible for seventy-five percent (75%) and Carlsbad shall be responsible for twenty-five percent (25%) of all O&M expenses . Annually, on or around July 1 of each year, Carlsbad shall invoice Vista for their share of the operation and maintenance costs identified in Section 10.1 for the forthcoming fiscal year. Special inspections and cleaning, not included as part of routine annual maintenance, will be performed as necessary by Carlsbad or a qualified contractor, as agreed by both Parties, and invoiced to Vista on a time and material basis in proportion to the percentage identified herein.

10.3 The budget for the operation and maintenance of the Buena Vista and Agua Hedionda Pump Stations and force mains shall be prepared by the Administrator/Operator of the Encina Wastewater Authority in accordance with the Revised Basic Agreement.

Vista shall be entitled to a credit for its operation and maintenance of existing pipeline Reaches VC1 through VC3 until said responsibility is relinquished to Carlsbad in accordance with the terms of Section 9.3. The annual credit to Vista shall be $3,600 plus (3%) three percent inflation for each subsequent year that these reaches are maintained by Vista.

SECTION 11. EMERGENCY REPAIRS OR RECONSTRUCTION

11.1 Carlsbad shall be allowed to perform emergency repairs or reconstruction of the Vista/Carlsbad Interceptor, in whole or in part, without prior approval from Vista as necessary to maintain the continuous operation of the system such that the need for repair or reconstruction is necessary to prevent property damage or imminent danger to health and safety.

11.2 The Parties shall each pay all costs of reconstruction of the Vista/Carlsbad Interceptor, or portion thereof, in the same proportion as the Parties own capacity in the Vista/Carlsbad Interceptor as provided in attached Exhibit "B".

SECTION 12. MEASUREMENT OF SEWAGE FLOW/CAPACITY MONITORING

Flows in the Vista/Carlsbad Interceptor shall be monitored in accordance with Section 7 of the Revised Basic Agreement with the Encina Joint Powers Authority, as may be amended from time to time. A copy of which is on file with the Administrator of each Party.

Additional flow monitoring may be performed by either Party as may be needed to monitor the capacity in selected reaches of the interceptor. The Party's proposed flow monitoring program shall be presented to the other Party for their review and approval prior to initiation of the activity. The cost of a temporary flow monitoring program shall be shared by the Parties in proportion to their respective capacity ownership rights identified in Exhibit "B". Either Party may conduct a flow monitoring program at its own expense without prior approval of the other Party.

SECTION 13. PROTECTION OF THE VISTA/CARLSBAD INTERCEPTOR/ SOURCE CONTROL

13.1 The Vista/Carlsbad Interceptor shall not be used by any Party to this Agreement for any purpose other than the conveyance of wastewater unless mutually agreed to by separate written agreement.

13.2 Each Party to this Agreement shall take reasonable steps to prevent excessive inflow of any surface or storm waters or excessive infiltration of groundwater, as defined by Section 1.6, to be discharged into the Vista/Carlsbad Interceptor, either directly or indirectly. When wet weather flow exceeds 160% of the 30-day average maximum day dry weather flow as determined by flow monitoring, an Infiltration and Inflow Study shall be initiated. The Lead Agency shall perform all studies on the Vista/Carlsbad Interceptor with cost for the study being shared equally between the Parties.

Should the results of the study identify upstream collector or trunk sewers as the source of inflow or infiltration, Each Party shall be responsible for the cost to repair the sewer system within its Service Area to reduce Inflow and Infiltration to acceptable levels.

13.3 No Party to this Agreement shall allow cooling water or other unpolluted industrial wastewater to be discharged directly or indirectly into the Vista/Carlsbad Interceptor without the consent of the Parties to this Agreement and Encina Wastewater Authority.

SECTION 14. RULES AND REGULATIONS CONCERNING USE OF SEWERS

Each Party shall adopt and enforce ordinances, resolutions, rules and regulations, concerning the type and condition of sewage and waste permitted to be discharged directly or indirectly into the Vista/Carlsbad Interceptor and shall prohibit persons and users of every kind and nature, including but not limited to, other public agencies from discharging into such sewers any sewage or waste which would be detrimental to the Vista/Carlsbad Interceptor or any part thereof. Such ordinances, resolutions and rules shall comply with the "Pre-Treatment Ordinance for the Encina Wastewater Authority", amended March 28, 2001, as may be amended from time to time.

Each Party shall also comply with the applicable statutes, ordinances, rules and regulations of agencies of the United States, State of California, County of San Diego, California Regional Water Quality Control Board-San Diego Region, the Encina Water Pollution Control Facility, and any city having jurisdiction over the collection, transmission, treatment and disposal of sewage and wastes.

SECTION 15. CONNECTION TO VISTA/CARLSBAD INTERCEPTOR

Connections to the Vista/Carlsbad Interceptor shall be made only at manholes. Only collection or trunk sewer lines may be connected to the Vista/Carlsbad Interceptor or any part thereof, and no Party to this Agreement shall approve or permit the direct connection of any premises to the Vista/Carlsbad Interceptor without issuing advance written notice to the other Party.

SECTION 16. BUDGETING AND ACCOUNTING

Each Party shall be strictly accountable for all funds received and shall maintain adequate records of all receipts and disbursements pursuant to this Agreement. In addition, each Party shall maintain such additional records relating to the acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor as is appropriate. Each of the Parties, with reasonable notice, has the right to inspect and examine the records of the other Party insofar as such records relate to the Vista/Carlsbad Interceptor.

SECTION 17. INSURANCE

Each Party shall maintain for the duration of the Agreement, and any and all amendments, liability insurance against claims for injuries to persons or damage to property which may arise out of or in connection with performance of the services of each Party, their agents, representatives, employees or subcontractors. Each Party shall maintain worker's compensation coverage and limits as required by the California Labor Code.

SECTION 18. SEWAGE SPILLS

Except as otherwise provided below, any sewage spill which occurs as a result of an unforeseen condition, and said sewage spill could not have been prevented with normal and routine maintenance, then each Party shall be responsible for the costs for cleanup and payment of any legal fines and expenses incurred in proportion to each Party's Capacity Ownership in the Vista/Carlsbad Interceptor. Any Party, who by its sole negligence or willful misconduct, causes a sewage spill shall be solely responsible for all costs for cleanup and payment of any legal fines and expenses incurred.

SECTION 19. HOLD HARMLESS

Except for the other Party's sole negligence or willful misconduct, if the Lead Agency constructs any facility, pipeline, or improvement, the other Party, its officers and employees shall not be liable for any claims, liabilities, penalties, fines, or any damage to goods, properties, or effects of any person whatever, nor for personal injuries or death caused by, or resulting from, any intentional or negligent acts, errors or omissions of the Lead Agency or its agents, employees or representatives in connection with said construction. The Lead Agency shall defend, indemnify, and hold free and harmless the other Party and its officers and employees against any of the foregoing claims, liabilities, penalties or fines, including liabilities or claims by reason of alleged defects in any plans and specifications, and any cost, expense or attorney's fees which are incurred by the other Party on account of any of the foregoing.

Where loss occurs from the negligent operation or maintenance of the Lead Agency, the Lead Agency shall indemnify the other agency for all liabilities, lawsuits, and/or fines by Regulatory Agencies incurred therefrom. In addition, where construction work is performed by the Lead Agency, the Lead Agency shall indemnify the other Party for all liabilities arising out of the construction work as a result of negligence, lawsuits, and/or fines by Regulatory Agencies.

For purposes of this section, the Lead Agency for the operation and maintenance of existing Pipeline Reaches VC1 through VC3 shall be Vista until the pipeline and manholes have been rehabilitated or a replacement pipeline is constructed, finally accepted, and operational.

SECTION 20. NOTICE

Notice required or permitted under this Agreement shall be provided in writing, either served personally upon or mailed by registered or certified mail to the Administrator of the other Party.

SECTION 21. SETTLEMENT OF DISPUTE OR CONTROVERSY

21.1 Should any dispute or controversy arise in connection with the books, records or accounts of any Party to this Agreement or in connection with the acquisition, construction, maintenance, operation, repair, reconstruction or enlargement of the Vista/Carlsbad Interceptor or in connection with any of the affairs or operation thereof, or the execution of the term of this Agreement, the Parties shall make reasonable efforts to resolve the dispute. In the event that the Parties are unable to reach a resolution to the dispute, the Parties shall select a disinterested mediator to assist in the resolution of the dispute. Each party shall share equally in the cost of the mediator.

21.2 In the event that the Parties are unable to resolve the dispute with a disinterested mediator, the Parties shall submit to non-binding arbitration. In the event of such election, each Party shall appoint or designate one disinterested person as an arbitrator and said arbitrators so chosen, if an even number, shall designate an additional disinterested person to make an odd number of arbitrators and said arbitrators so chosen shall act as a Board of Arbitrators in connection with any such dispute or controversy. The decision of the arbitrators shall be binding unless a Party files a legal action for a trial de-novo. If the Party seeking trial de-novo fails to obtain a judgment better than the arbitrator's decision, that Party shall be liable for all cost, including attorneys fees of the other Party.

SECTION 22. MODIFICATION OF AGREEMENT

Agreement shall contain all the terms and conditions made between the Parties hereto and shall not be amended except by an agreement in writing signed by all Parties.

SECTION 23. SEVERABILITY

If any section, subsection, sentence, clause, phrase or work of this Agreement, or the application thereof, to any Party, or to any other person or circumstance is for any reason held invalid, it shall be deemed severable and the validity of the remainder of the Agreement or the application of such provision to the other Parties, or to any other person or circumstance shall not be affected thereby. Each Party hereby declares that it would have entered into this Agreement and each section, subsection, sentence, clause, phrase and work thereof irrespective of the fact that one or more section, subsection, sentence, clause, phrase or word, or the application thereof to any Party or any other person or circumstance be held invalid.

SECTION 24. COUNTERPARTS

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

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SECTION 25. TERM

The term of this Agreement will be effective for a period of twenty (20) years from the date first above written. The Agreement may be extended for two (2) additional ten (10) year periods or parts thereof. The Parties will prepare a written amendment indicating the effective date and length of the extended Agreement.

IN WITNESS WHEREOF, each Party hereto has pursuant to resolution duly passed and adopted by its respective governing body this AGREEMENT and caused it to be executed and be effective on the date first above written.

CITY OF VISTA:

By: _____
EDWIN W. ESTES, Mayor

ATTEST:

By: _____
JO SEIBERT, City Clerk

APPROVED AS TO FORM:

J. WAYNE DERNETZ, City Attorney

BY: _____
Assistant City Attorney

CITY OF CARLSBAD, a municipal corporation of the State of California

By: _____
CLAUDE A. LEWIS, Mayor

ATTEST:

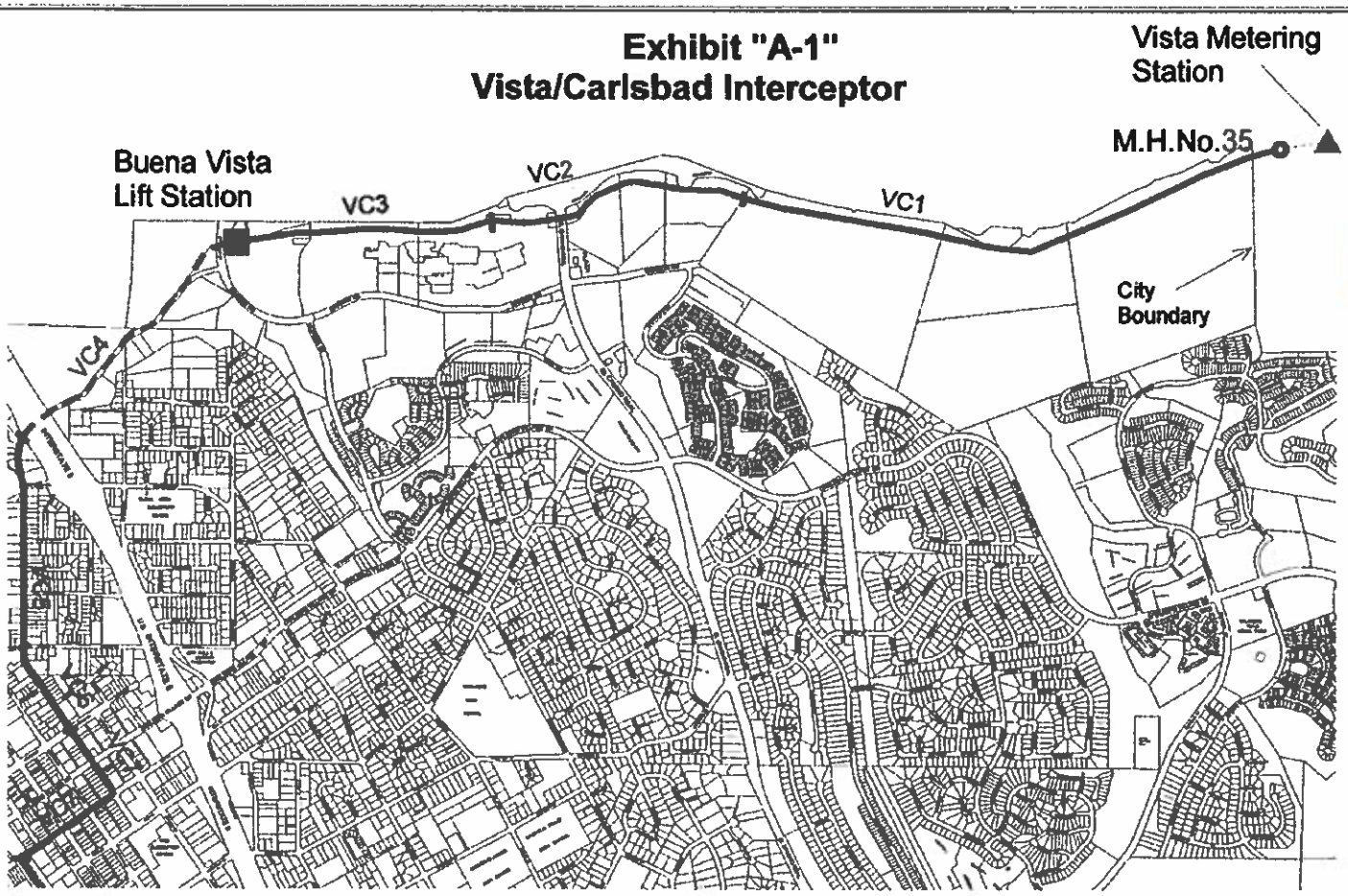
_____
LORRAINE M. WOOD, City Clerk

APPROVED AS TO FORM:

RONALD R. BALL, City Attorney

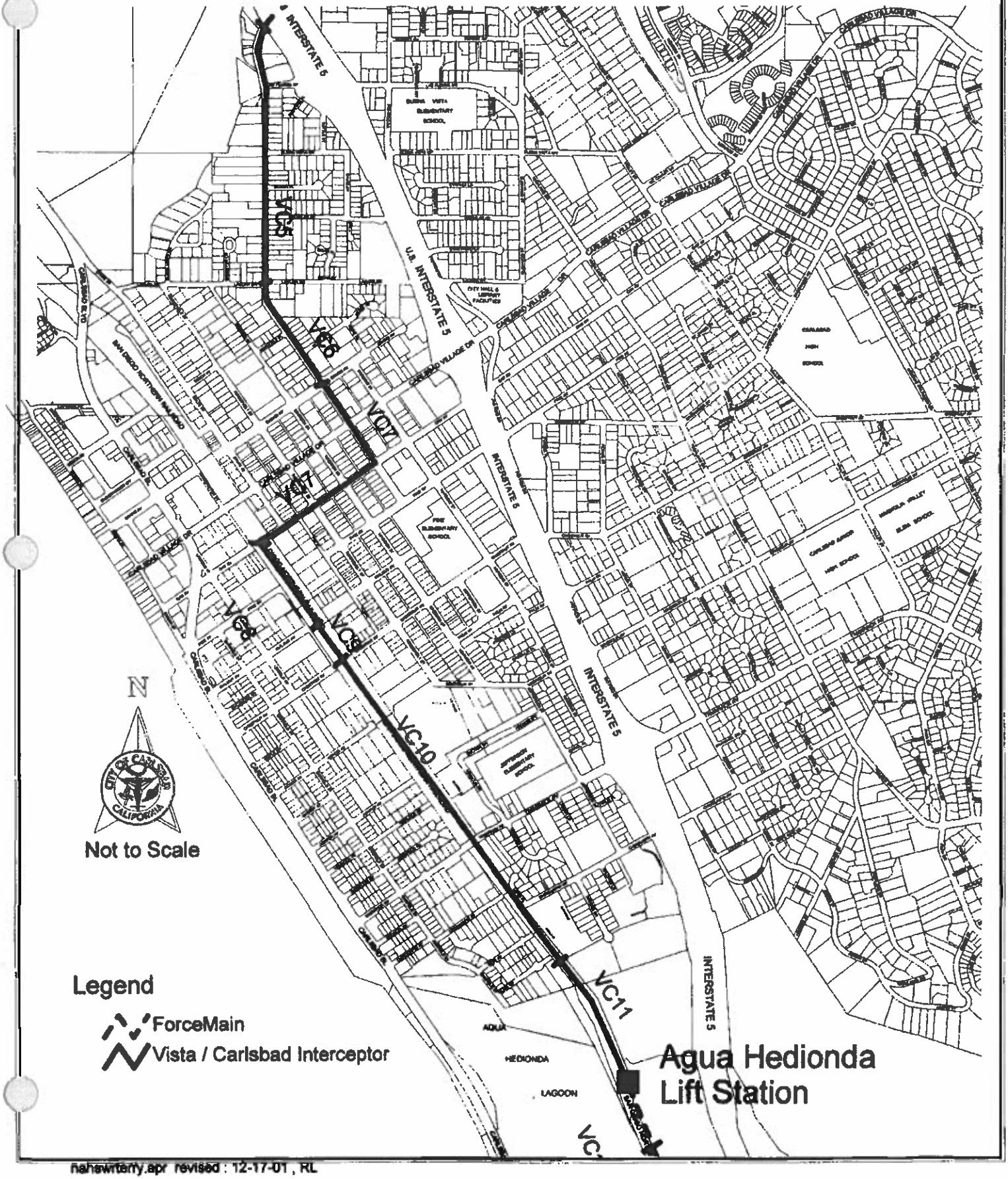
BY: _____
Deputy City Attorney

Exhibit "A-1"
Vista/Carlsbad Interceptor



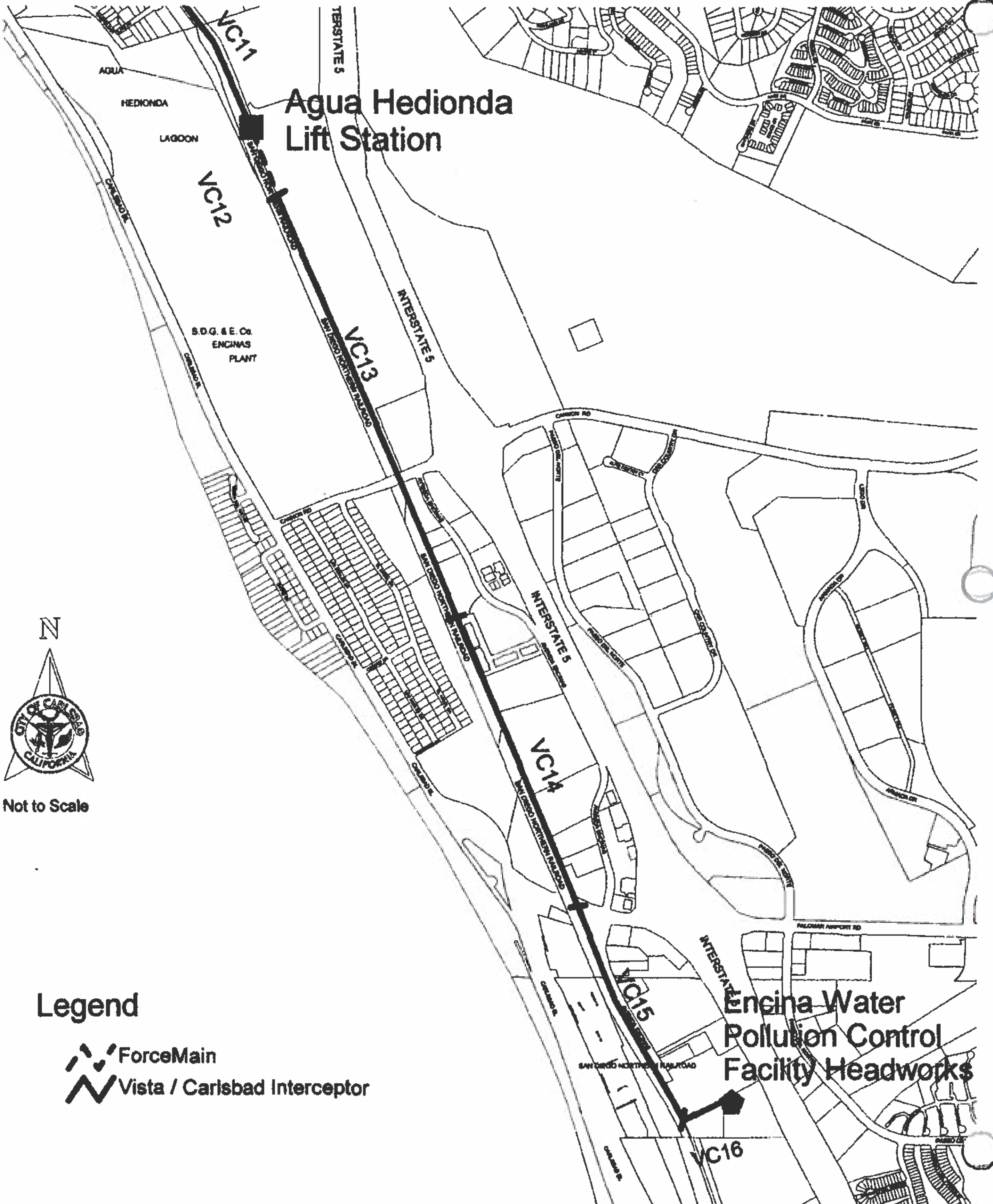
nahawrtarry.apr revised 12-17-01,RL

Exhibit "A-2"
Vista/Carlsbad Interceptor



nahswrterry.apr revised : 12-17-01 , RL

Exhibit "A-3"
Vista/Carlsbad Interceptor



nahswrterry.apr revised: 12-17-01 - RL

EXHIBIT "B"

VISTA/CARLSBAD INTERCEPTOR SEWER SYSTEM
Capacity Rights

Pipeline Reach	Pipe Size (Inches)	Pipe Capacity (mgd) (a)	Capacity Rights					
			Vista			Carlsbad		
			Average Flow (mgd) (b)	Percent Capacity (c)	Capacity Rights (mgd)	Average Flow (mgd) (b)	Percent Capacity (c)	Capacity Rights (mgd)
VC1	36	30.0	10.38	100	30.0	--	--	0
VC2	42	34.0	10.38	93.4	31.8	0.73	6.6	2.2
VC3	36	19.5	10.38	89.6	17.5	1.20	10.4	2.0
Buena Vista Pump Sta.	--	23.1	10.38	89.6	20.7	1.20	10.4	2.4
VC4 (Force Main)	24	23.1	10.38	89.6	20.7	1.20	10.4	2.4
VC5*	42	31.5	10.38	89.6	28.2	1.2	10.4	3.3
VC6*	42	31.5	10.38	81.9	25.8	2.29	18.1	5.7
VC7*	42	31.5	10.38	79.4	25.0	2.69	20.6	6.5
VC8*	42	31.5	10.38	79.4	25.0	2.69	20.6	6.5
VC9*	48	28.5	10.38	75.5	21.5	3.37	24.5	7.0
VC10*	48	28.5	10.38	74.7	21.3	3.51	25.3	7.2
VC11	42	20.5	10.38	69.1	14.2	4.65	30.9	6.3
Agua Hedionda Pump Sta.	--	23.0	10.38	69.1	15.9	4.65	30.9	7.1
VC12 (Force Main)	2-18	23.0	10.38	69.1	15.9	4.65	30.9	7.1
VC13	42	20.5	10.38	69.1	14.1	4.65	30.9	6.4
VC14	42	20.5	10.38	56.1	11.5	8.11	43.9	9.0
VC15	42	22.8	10.38	56.1	12.8	8.13	43.9	10.0
VC16	54	67.4	10.38	50.2	33.8	10.28	49.8	33.6

a) Pipe capacity is based on a depth of flow (D) to pipe diameter (d) ratio of one (i.e., D/d = 1) and Manning's "n" value of 0.013, except where noted with an *, n=0.012 for pvc lined pipe.

b) Average flow rates are obtained from the October 1997 Sewer Master Plan Update for the City of Carlsbad. The Master Plan Update used a peaking factor of 2.0 for the Vista/Carlsbad Interceptor Sewer System.

c) The percent capacity for each pipeline reach is based on the ratio of average flow to total flow times 100 percent.

EXHIBIT "C"

VISTA/CARLSBAD INTERCEPTOR SEWER
ANNUAL OPERATION & MAINTENANCE BUDGET

ITEM	MAN-HOURS/YEAR
1. Manhole Inspections (approximately 85) (twice per year)	120
2. Clear Vegetation Around Manholes	80
3. Maintain Access Road East of Haymar Drive (twice per year)	40
4. Replace Corroded Manhole Lids (approximately three per year)	40
TOTAL	**280 HOURS**

ANNUAL O&M COST		
Labor 280 hours x $28/hr	=	$7,840
Vehicles/Equipment 280 hours x $10/hr	=	$2,800
Subtotal	=	$10,640
15% Administration & Overhead	=	$1,596
Materials	=	$1,764
TOTAL	=	**$14,000**

Approximate length of gravity sewer, 7-miles
Cost per mile, $14,000/7-miles = $2,000 per mile

NOTES:

1. Annual O&M costs do not include special inspections such as the Agua Hedionda Trestle or pipeline cleaning which can be expected to occur every 3-5 years.

2. O&M costs will be increased 3% per year to adjust for inflation.

A.11. Agreement for Sewage Flows between the City of Carlsbad and Buena Sanitation District, February 2003.

AGREEMENT FOR SEWAGE FLOWS BETWEEN THE CITY OF CARLSBAD AND BUENA SANITATION DISTRICT

THIS SEWAGE FLOW AGREEMENT (the "Agreement") is entered into on this 11th day of February, 2003 by and between the CITY OF CARLSBAD ("CARLSBAD") a municipal corporation of the State of California, and the BUENA SANITATION DISTRICT ("BUENA") organized and existing pursuant to California Health and Safety Code § 4700 et seq.

RECITALS

WHEREAS, CARLSBAD and BUENA are members of the Encina Water Pollution Control Facility ("ENCINA") through which the member agencies own and operate facilities for the disposal and treatment of sewage and effluent; and

WHEREAS, CARLSBAD and BUENA have, from time to time entered into sewage flow agreements, whereby BUENA agrees to allow a sewer sanitation customer of CARLSBAD to discharge sewage into the BUENA sanitation collection system on the condition that CARLSBAD reimburse BUENA the reasonable cost for the use of its sewage collection system; and

WHEREAS, Government Code section 56133(e), (Cortese-Knox Reorganization Act of 1985), allows two public agencies to enter into an agreement to provide a public service outside the jurisdictional boundaries of one of the public entities without first obtaining LAFCO approval under certain conditions; and

WHEREAS, two prospective sewer sanitation customers of CARLSBAD, commonly known as the Carlsbad Raceway (CT 98-10) and the Palomar Forum (CT 99-06) industrial developments, own certain property within the City of Carlsbad, as described in Exhibit A and illustrated in Exhibit B, which are attached and incorporated herein, and desire to develop their property ("Project"); and

WHEREAS, CARLSBAD cannot now efficiently provide sewer service to the area within which the Project is located; and

WHEREAS, as of November 22, 2002, LAFCO's records indicate that there are no special districts in CARLSBAD that can currently provide sewer service to the area within which the Project is located; and

WHEREAS, the Project is within the Raceway Basin Assessment District served by BUENA; and

WHEREAS, CARLSBAD desires to have the Project temporarily connect to the BUENA sanitation collection system for approximately six years, until the South Agua Hedionda Interceptor sewer line is completed in Carlsbad; and

WHEREAS, the public service to be provided temporarily by BUENA to the Project is an alternate to or substitute for the public service that CARLSBAD would normally provide to the area within which the Project is located, consistent with Government Code section 56133(e); and

WHEREAS, CARLSBAD and BUENA desire to enter into this Sewage Flow Agreement ("Agreement") in order to allow sewage to be temporarily discharged from the Project into the BUENA sanitation collection system.

COVENANTS

1. TERM. This AGREEMENT shall begin upon the date first listed above and continue for a period of one (1) year. The parties intend that this Agreement will continue until CARLSBAD completes construction of the South Agua Hedionda Interceptor. Barring unforeseeable events, CARLSBAD anticipates that the South Agua Hedionda Interceptor will be completed by approximately December 2008. This Agreement shall renew annually, without further action of either CARLSBAD or BUENA, unless terminated as set forth in Section 10 below.

2. FLOW AREA. Sewage flows from the Project, as more fully described in Exhibit "A" and illustrated in Exhibit "B," attached hereto and incorporated herein, may be discharged into BUENA sewage collection system during the term of this Agreement.

3. CARLSBAD CAPITAL CHARGES. CARLSBAD shall be entitled to collect capital facility fees from the Project owners within Exhibit "A" service area.

4. DISCHARGE STANDARDS. CARLSBAD shall ensure all transferred sewage flows from the Project shall meet federal, state, and local discharge requirements, including BUENA discharge standards, which shall include all industrial waste discharge limitations. If any conflicts exist between BUENA standards or CARLSBAD standards, discharges from the Project shall be required to meet the most stringent standard. BUENA may, but is not required to, enforce any and all federal, state and local standards for any discharges from the Project.

5. COMPENSATION. CARLSBAD shall pay BUENA an Annual Service Charge which shall be equal to BUENA'S operational and maintenance costs associated with the total volume of sewage generated from the Project into the BUENA sewage sanitation system. The Annual Sewer Service Charge shall be based on the same factors as those applied to any other BUENA customer as determined from time to time by the Buena Sanitation District Board of Directors.

6. PAYMENT OF COMPENSATION. BUENA shall submit an invoice to CARLSBAD detailing the operational and maintenance costs associated with the total volume of sewage generated from the Project into the BUENA sanitation system by April 1 of each year for the previous fiscal year after any of the properties within the Project are connected to the BUENA sanitation collection system. The first payment shall be made to BUENA by CARLSBAD by May 1, of each year for the previous fiscal year after any of the properties within the Project are connected to the BUENA sanitation collection system.

7. MAINTENANCE OF FACILITIES. It shall be the responsibility of CARLSBAD to maintain its sewer system within the Project of Exhibit "A" in a state of repair that will prevent excessive infiltration and inflow from entering downstream sewers. It shall be BUENA's responsibility to maintain its sewer system in a state of repair and maintenance to accommodate the Project's temporary sewage flows and infiltration during the term of this Agreement, and any amendments thereto.

8. CHARGE AGAINST CAPACITY RIGHTS. Sewage flows and strengths from the Project in Exhibit "A" shall be assigned against CARLSBAD for purposes of capacity and treatment charges at ENCINA TREATMENT PLANT AND OCEAN OUTFALL. Flow and all infiltration from the Project in Exhibit "A" shall be charged against CARLSBAD'S capacity rights at ENCINA.

9. FLOW DETERMINATION. CARLSBAD may construct a metering system at the point of main line connection to the Raceway Basin Assessment District facility. In the event the metering system is not constructed, the Project's flows may be determined by multiplying the total number of EDU's allocated to the Project by 230 gallons per day.

10. TERMINATION. The parties intend that this Agreement will remain in full force and effect until the South Agua Hedionda Sewer Interceptor in Carlsbad is complete. However, if necessary, for unforeseen circumstances, this agreement may be terminated for good cause by giving 120 days advance written notice to the other party, so long as the Project is provided with an alternative sewage collection system. Unless otherwise mutually agreed upon, this Agreement and CARLSBAD's authorization to discharge sewage from the Project into BUENA's sewage collection system shall terminate no later than 180 days after construction of the South Agua Hedionda Interceptor in Carlsbad is complete. The South Agua Hedionda Interceptor project shall be deemed completed when it is capable of accepting sewage flow, whether or not CARLSBAD has formally accepted the Project as complete.

11. VENUE. In the event of any legal or equitable proceeding to enforce or interpret the terms or conditions of this Agreement the parties agree that venue shall lie only in the federal or state courts in or nearest to the North County Judicial District, County of San Diego, State of California.

12. MODIFICATION. This Agreement may not be altered in whole or in part except by modification, in writing, executed by all the parties to this Agreement.

13. INCORPORATION OF SERVICE AGREEMENT. This Agreement and its terms and conditions shall be incorporated by reference as an exhibit to the service agreement entered into by the agencies and the Project receiving the exchange of sewage flows.

14. NOTICES. All notices required or provided for under this agreement shall be in writing and delivered in person or sent by mail, postage prepaid and addressed as provided in this paragraph. Notice shall be effective on the date it is delivered in person, or, if mailed, on the date of deposit in the United States Mail. Notices shall be addressed as follows unless a written change of address is filed with the City:

Notice to City: City Engineer
1635 Faraday Avenue
Carlsbad, CA 92008

Notice to District: Buena Sanitation District
600 Eucalyptus Avenue
Vista, CA 92084

15. ENTIRE AGREEMENT. This Agreement contains all representations and the entire understanding between the parties with respect to the subject matter of this Agreement. Any prior correspondence, memoranda, or agreements, whether or not such correspondence, memoranda, or agreements are in conflict with this Agreement, are intended to be replaced in total by this Agreement.

16. INDEMNIFICATON. Pursuant to Section 895.4 of the California Government Code, CARLSBAD and BUENA agree that each will assume the full liability imposed upon it or any of its officers, agents, or employees for injury caused by a negligent or wrongful act or omission occurring in the performance of this Agreement and each party agrees to indemnify and hold harmless the other parties for any loss, costs or expense that may be imposed upon such other party by virtue of Section 895.2 and 895.6 of the California Government Code.

The signature page follows as page five of this Agreement.

Signature Page

AGREEMENT FOR SEWAGE FLOWS BETWEEN THE CITY OF CARLSBAD AND BUENA SANITATION DISTRICT

CITY OF CARLSBAD

By: _____
Claude A. Lewis, Mayor

ATTEST:
Lorraine Wood, City Clerk

By: _____

APPROVED AS TO FORM:
Ronald R. Ball,
City Attorney

By: _____
Deputy City Attorney

BUENA SANITATION DISTRICT

By: _____
Morris B. Vance, Chairperson

ATTEST:
Jo Seibert, District Clerk

By: _____

APPROVED AS TO FORM:
J. Wayne Dernetz,
District Counsel

By: _____

EXHIBIT A
LEGAL DESCRIPTION
PALOMAR FORUM, C.T. 99-06

All that portion of Section 13, Township 12 South, Range 4 West, San Bernardino Meridian and all that portion of Section 18, Township 12 South, Range 3 West, San Bernardino Meridian, in the City of Carlsbad, County of San Diego, State of California, according to official Plat thereof, described as follows:

Beginning at the Northwest corner of Record of Survey Map No. 9112, being the True Point of Beginning said map on file in the Office of the County Recorder of San Diego County, said State; thence along the Westerly line thereof South 2E36'40" East 384.39 feet to a point on the Northerly sideline of Palomar Airport Road per Road Survey No. 757; thence South 2E38'00" East 28.51 feet to a point on the centerline of said Palomar Airport Road and on the arc of a 1200.00 foot radius curve, concave Southerly, a radial line to said point Bears North 2E03'04" East; thence leaving said Westerly line, Easterly along the arc of said curve, through a central angle of 20E13'34", a distance of 423.62 feet; thence south 67E43'22" East 1328.80 feet to the beginning of a tangent 1000.00 foot radius curve, concave Northerly; thence Easterly along the arc of said curve, through a central angle of 3E09'32", a distance of 55.13 feet to a point on the arc of a non-tangent 2263.00 foot radius curve, concave Northerly, a radial line to said point bears South 8E33'46" West; thence Easterly along the arc of said curve, through a central angle of 16E17'25", a distance of 643.41 feet to a point on the arc of a non-tangent 1000.00 foot radius curve, concave Northeasterly, a radial line to said point bears South 18E16'59" East; thence Easterly along the arc of said curve, through a central angle of 3E09'32", a distance of 55.13 feet; thence North 68E33'29" East 1525.56 feet to the beginning of a tangent 6000 foot radius curve, concave Southerly; thence Easterly along the arc of said curve, through a central angle of 5E39'05", a distance of 591.81 feet; thence North 74E12'34" East, a distance of 454.40 feet to the beginning of a tangent 3000 foot radius curve, concave Southerly; thence Easterly along the arc of said curve, through a central angle of 0E52'58", a distance of 46.22 feet; thence leaving said curve and centerline North 0E39'50" East 76.25 feet to the Northeast corner of said Record of Survey Map No. 9112; thence Westerly along the North 89E27'55" West 4435.96 feet; thence North 88E37'38" West 432.70 feet to the point of beginning.

LEGAL DESCRIPTION
CARLSBAD RACEWAY, C.T. 98-10

THE LAND REFERRED TO HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF SAN DIEGO, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1:

THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 18, TOWNSHIP 12 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

EXCEPTING THEREFROM ONE-HALF OF ALL MINERALS IN, ON OR UNDER SAID LAND AS RESERVED BY BURTON D. HIGHTOWER, A WIDOWER, IN DEED RECORDED MAY 19, 1959 IN BOOK 7669, PAGE 361 OF OFFICIAL RECORDS.

PARCEL 2:

THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 18, TOWNSHIP 12 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

EXCEPTING THEREFROM ONE-HALF OF ALL MINERALS IN, ON OR UNDER SAID LAND AS RESERVED BY BURTON D. HIGHTOWER, A WIDOWER, IN DEED RECORDED MAY 19, 1959 IN BOOK 7669, PAGE 361 OF OFFICIAL RECORDS.

PARCEL 3:

LOT 2, SECTION 13, TOWNSHIP 12 SOUTH, RANGE 4 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

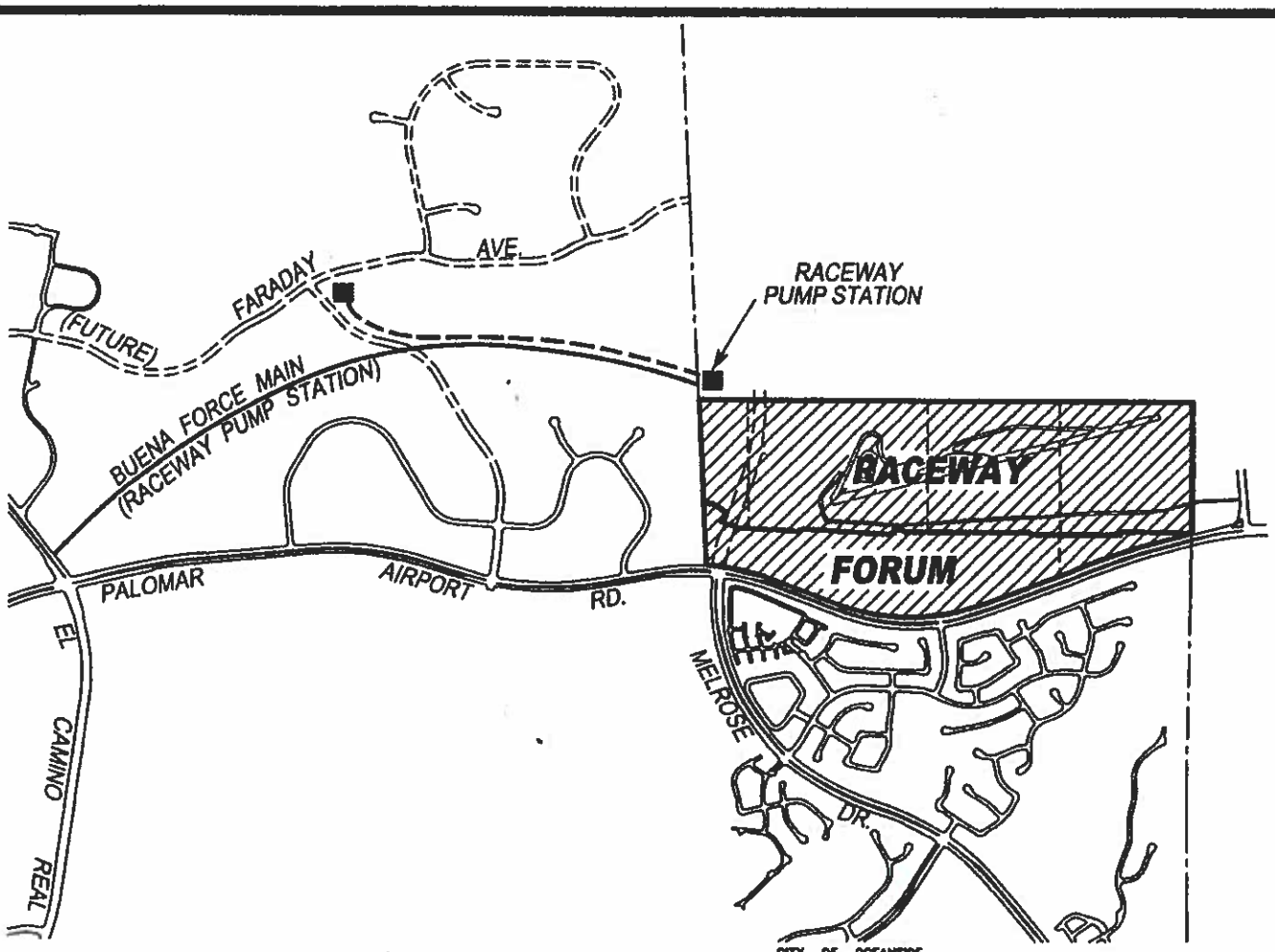
PARCEL 4:

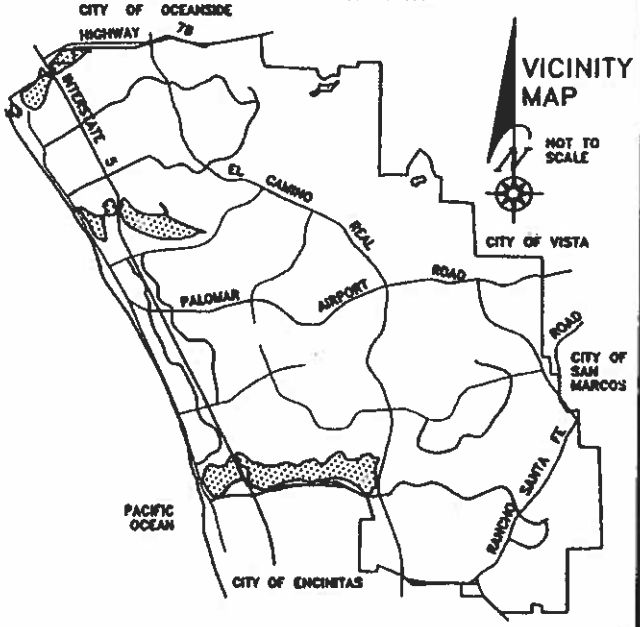
THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 18, TOWNSHIP 12 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

EXCEPTING THEREFROM ONE-HALF OF ALL MINERALS IN, ON OR UNDER SAID LAND AS RESERVED BY BURTON D. HIGHTOWER, A WIDOWER, IN DEED RECORDED MAY 19, 1959 IN BOOK 7669, PAGE 361 OF OFFICIAL RECORDS.

EXHIBIT B

LOCATION MAP





VICINITY MAP

NOT TO SCALE

LEGEND:

======= FUTURE ROADS

– – – – FUTURE SEWER LINES

——— EXISTING SEWER LINES

N

NOT TO SCALE

PROJECT NAME	PROJECT NUMBER	EXHIBIT
PALOMAR FORUM AND CARLSBAD RACEWAY SEWER AGREEMENT	CT98-10 CT99-06	1

DRAWN BY: SCOTT EVANS, CARLSBAD ENGINEERING DEPT. 1/10/03 C:\DEVELOPMENT PROJECTS\FORUM-RACEWAY SEWER AGREEMENT.DWG

A-12. Agreement between City of Carlsbad and City of Vista for Planning and Design Phase Services for the Aqua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B-VC15, October 2011.

12

CITY OF CARLSBAD – AGENDA BILL

AB# 20,704 MTG. 10/11/11 DEPT. UTIL	APPROVAL OF AGREEMENT WITH THE CITY OF VISTA FOR THE PLANNING AND DESIGN OF REACHES VC11B – VC15 OF THE VISTA-CARLSBAD INTERCEPTOR SEWER SYSTEM, PROJECT NO. 3492, 3886, AND 3949	DEPT. DIRECTOR CITY ATTORNEY CITY MANAGER	

RECOMMENDED ACTION:

Adopt Resolution No. 2011-243 to approve and authorize a Project Agreement between the City of Carlsbad and the City of Vista for funding of planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15, Project No. 3492, 3886, and 3949.

ITEM EXPLANATION:

Background

The Vista/Carlsbad Interceptor Sewer was constructed in the early 1960's and extends northeasterly from the Encina Water Pollution Control Facility to the City of Vista (see Exhibit 1). This interceptor sewer is identified as pipeline Reaches VC1 through VC15 and includes the Buena Vista and Agua Hedionda sewer lift stations. On February 26, 2002, the City of Vista and the City of Carlsbad entered into an agreement for the ownership, operation, and maintenance of the Vista/Carlsbad Interceptor Sewer. The ownership agreement requires the preparation of a project agreement each time a portion of the interceptor sewer system is in need of rehabilitation, replacement or upsizing.

Project Description

This project includes improvements to reaches VC11B through VC15 of the Vista/Carlsbad interceptor sewer system that includes the Agua Hedionda Sewer Lift Station, an adjacent wood trestle bridge supporting the sewer across Agua Hedionda Lagoon and approximately 2-miles of sewer pipeline. The Agua Hedionda Sewer Lift Station is the City's largest sewer lift station and is located adjacent to the lagoon and railroad tracks on property owned by NRG Energy. This portion of the interceptor sewer has been identified for replacement in the sewer master plans for both Carlsbad and Vista.

A Project Agreement has been prepared that identifies the role of each agency during the project and also includes estimated project costs and payment provisions (see Exhibit 3). Because of the significant size and complexity of the project, this project agreement addresses only those activities performed prior to construction. A second project agreement will be prepared at a later date to address construction activities and costs once these costs are better defined.

ENVIRONMENTAL IMPACT:

Pursuant to Public Resources Code Section 21065, the action to approve and authorize a Project Agreement between the City of Carlsbad and the City of Vista for funding of planning and design phase services will not result in a commitment to approve the sewer project nor authorize its development.

DEPARTMENT CONTACT: Terry Smith, (760) 602-2765, terry.smith@carlsbadca.gov

FOR CITY CLERKS USE ONLY

COUNCIL ACTION:	APPROVED	☐	CONTINUED TO DATE SPECIFIC	☐ _____
	DENIED	☐	CONTINUED TO DATE UNKNOWN	☐
	CONTINUED	☐	RETURNED TO STAFF	☐
	WITHDRAWN	☐	OTHER – SEE MINUTES	☐
	AMENDED	☐		

Accordingly, it does not constitute a "project" within the meaning of CEQA in that it has no potential to cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and therefore does not require environmental review.

Actual approval of plans to construct the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15, Project No. 3492, 3886, and 3949 will be subject to the adoption of a proposed Mitigated Negative Declaration (MND) and Mitigation Monitoring and Reporting Program (MMRP). Review of these CEQA documents by the Planning Commission, Housing and Redevelopment Commission, and City Council for the project identified as the Agua Hedionda Sewer Lift Station, Force Main and Gravity Sewer Replacement project (PDP 00-02(C)/SP 144(L)/RP 10-26/CDP 10-17/HDP 10-05/SUP 10-02/HMP 10-03) is pending and will be reviewed in compliance with the California Environmental Quality Act (CEQA) Guidelines, Section 15074.

FISCAL IMPACT:

The City of Vista and the City of Carlsbad entered into an agreement for the ownership, operation, and maintenance of the Vista/Carlsbad Interceptor Sewer on February 26, 2002. In accordance with the terms of the ownership agreement, a Project Agreement has been developed for the planning and design phase of the project that identifies the roles for both Carlsbad and Vista, an estimate of project costs and the provisions for payment. As identified in the ownership agreement, project costs will be shared by each city in accordance with their percentage ownership, which varies by reach. Carlsbad's share of the project costs are 30.9% for reaches VC11B to VC13 and 43.9% for reaches VC14 and VC15, while Vista is responsible for 69.1% and 56.1% respectively.

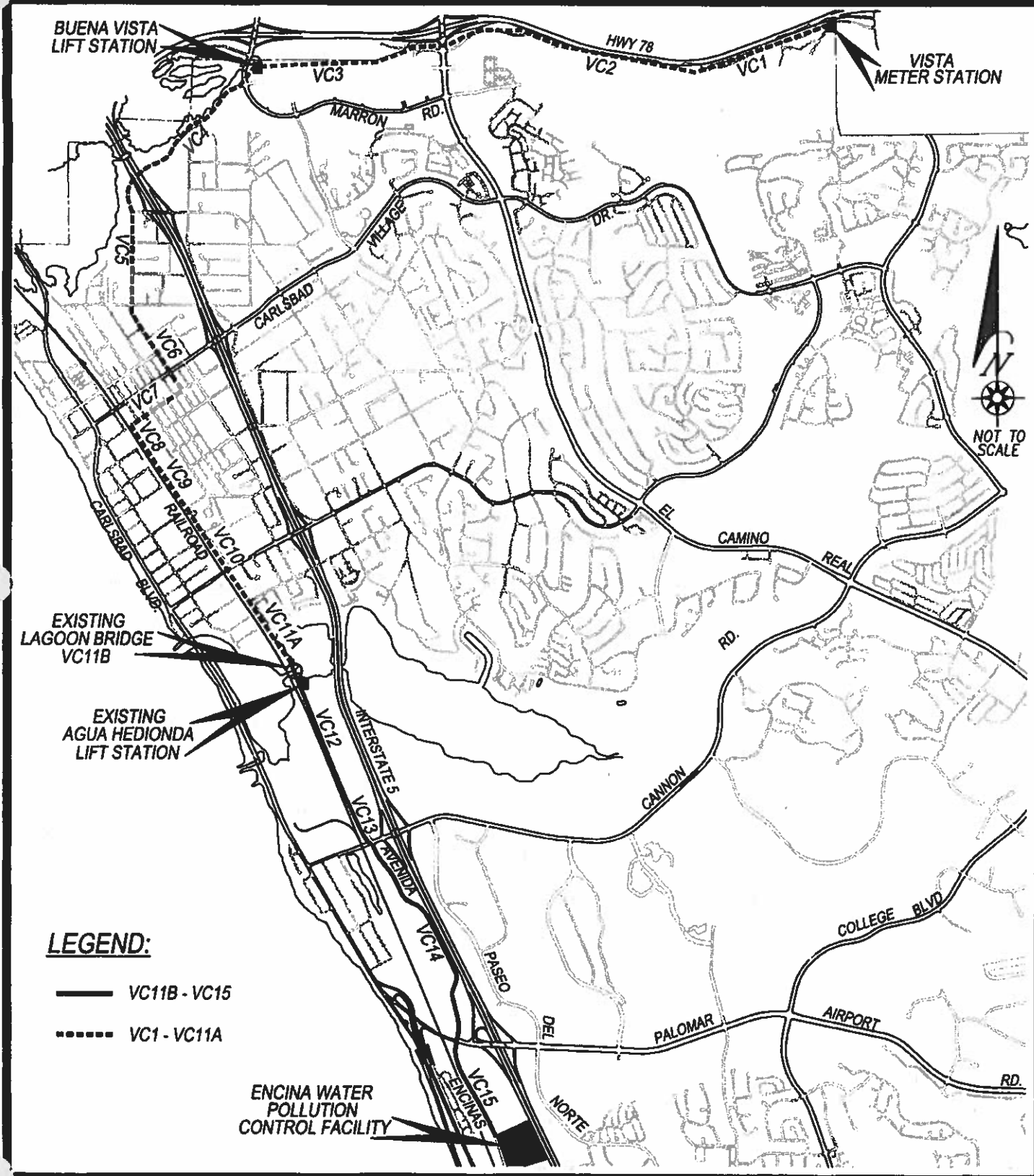
Carlsbad has appropriated 100% of the funding for the project, which is listed in the current Capital Improvement Program as $46,230,000. Of this amount, the project budget for planning and design phase services is $4,000,000. As agreed upon in the Project Agreement, Vista will make an initial payment to Carlsbad in the amount of $2,366,060 within 30 days of receipt of invoice from Carlsbad for work already performed. Staff will invoice the City of Vista upon Council approval of the project agreement. Subsequent to the initial payment, Carlsbad will invoice Vista quarterly for their share of on-going expenses through the completion of the planning and design phase.

On September 13, 2011, the Project Agreement was approved and accepted by Vista's City Council.

EXHIBITS:

1. Location Map.
2. Resolution No. _____ to approve and authorize a Project Agreement between the City of Carlsbad and the City of Vista for funding of planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15, Project No. 3492, 3886 and 3949.
3. Letter and Resolution from City of Vista approving agreement.
4. Agreement for Planning and Design Phase Services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15, Project No. 3492, 3886, and 3949.

LOCATION MAP



PROJECT NAME	PROJECT NUMBER	EXHIBIT
AGUA HEDIONDA LIFT STATION & VISTA/CARLSBAD INTECEPTOR SEWER REACHES VC11B THROUGH VC15	CP3492, 3886 & 3949	1

DRAWN BY: SCOTT EVANS: CARLSBAD UTILITIES DEPT. 1/13/11 C:\UTILITIES DEPARTMENT\DESIGN DIVISION\SMITH\VC SEWER LOCATION MAP.DWG

Exhibit 2

RESOLUTION NO. 2011-243

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CARLSBAD, CALIFORNIA, TO APPROVE AND AUTHORIZE A PROJECT AGREEMENT BETWEEN THE CITY OF CARLSBAD AND THE CITY OF VISTA FOR FUNDING OF PLANNING AND DESIGN PHASE SERVICES FOR THE AGUA HEDIONDA SEWER LIFT STATION AND VISTA/CARLSBAD INTERCEPTOR SEWER, REACHES VC11B – VC15, PROJECT NO. 3492, 3886, AND 3949.

WHEREAS, the Agua Hedionda Sewer Lift Station and Reaches VC11B through VC15 of the Vista Carlsbad Interceptor Sewer have been identified for replacement in the current sewer master plan; and

WHEREAS, on February 26, 2002, the Carlsbad City Council entered into an agreement with the City of Vista titled "Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer"; and

WHEREAS, the Cities of Carlsbad and Vista jointly own the Agua Hedionda Lift Station and the Vista Carlsbad Interceptor Sewer and the February 26, 2002 agreement requires a separate project agreement to be prepared and executed by Vista and Carlsbad for all future improvements to the Vista Carlsbad Interceptor Sewer; and

WHEREAS, the Vista City Council approved the Project Agreement at their meeting held on September 13, 2011; and

WHEREAS, the City Council of the City of Carlsbad, California, has determined it necessary and in the public interest for the City of Carlsbad to enter into a Project Agreement between the City of Carlsbad and the City of Vista for the planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15, Project No. 3492, 3886 and 3949;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Carlsbad, California, as follows:

1. That the above recitations are true and correct.

2. That the Mayor of the City of Carlsbad is hereby authorized and directed to execute the Project Agreement with the City of Vista for planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15.

PASSED, APPROVED AND ADOPTED at a Regular Meeting of the City Council of the City of Carlsbad on the _____ day of _____, 2011, by the following vote, to wit:

AYES:

NOES:

ABSENT:

_____
MATT HALL, Mayor

ATTEST:

_____
LORRAINE M. WOOD, City Clerk
(SEAL)

Exhibit 3

CITY OF VISTA
CALIFORNIA

RECEIVED
SEP 1[illegible] 201[illegible]
UTILITIES DEPARTMENT

September 14, 2011

Terry L. Smith
Senior Civil Engineer
City of Carlsbad
1635 Faraday Avenue
Carlsbad, CA 92008

RE: Agreement between the City of Vista and City of Carlsbad for Planning and Design Phase Services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B-VC15

Dear Mr. Smith:

At its September 13, 2011 meeting, the City Council adopted Resolution No. 2011-145, approving the above-referenced agreement. Attached is a copy of the resolution for your file.

Enclosed are two (2) originals of the agreement for counter-signature. As soon as the document is fully executed, please keep one original for your file, and return one original to:

City Clerk
City of Vista
200 Civic Center Drive
Vista, CA 92084

Thank you for your attention to the above. Should you have any questions, please contact Steve Jepsen, Sanitation Program Manager, at (760) 639-6111.

Sincerely,

Rita Turnbull

Rita R. Turnbull
Administrative Secretary
Office of the City Clerk
rturnbull@cityofvista.com

enc.

c: Steve Jepsen, Engineering Department

RESOLUTION NO. 2011-145

A RESOLUTION OF THE CITY COUNCIL OF THE CHARTERED CITY OF VISTA, CALIFORNIA, APPROVING AN AGREEMENT FOR PLANNING AND DESIGN PHASE SERVICES FOR THE AGUA HEDIONDA SEWER LIFT STATION AND VISTA/CARLSBAD SEWER INTERCEPTOR REACHES VC11B-VC15

The City Council of the chartered City of Vista does resolve as follows:

1. **Findings.** The City Council hereby finds and declares the following:

A. On July 13, 1961, the Vista Sanitation District and the City of Carlsbad entered into a Basic Agreement pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code to acquire, construct and operate a Joint Sewer System; and

B. On February 26, 2002, the City Council entered into an agreement for ownership operation and maintenance of the Vista/Carlsbad Interceptor Sewer, pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code; and

C. The Cities of Vista and Carlsbad jointly own the Vista/Carlsbad Interceptor Sewer and the February 26, 2002 agreement requires a separate project agreement to be prepared and executed by Vista and Carlsbad for all future improvements to the Vista/Carlsbad Interceptor Sewer; and

D. The Cities of Vista and Carlsbad desire to enter into a project agreement for the planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer Reaches VC11B-VC15.

2. **Action.**

A. The Project Agreement between Vista and Carlsbad for planning and design phase services for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer Reaches VC11B-VC15, is hereby approved.

B. The City Manager is authorized to disburse funds from CIP No. 8125 to reimburse Carlsbad for design expenses they have incurred and to make progress reimbursement payments to Carlsbad for the balance of the design phase services, including easement acquisition.

C. The Mayor is hereby authorized to execute the Agreement on behalf of the City.

(Continued on next page.)

3. Adoption.

PASSED AND ADOPTED by the City Council of the City of Vista at a meeting held on September 13, 2011, by the following vote:

AYES: MAYOR RITTER, AGUILERA, GRONKE, LOPEZ, COWLES

NOES: NONE

ABSTAIN: NONE

JUDY RITTER, MAYOR

APPROVED AS TO FORM:
DAROLD PIEPER, CITY ATTORNEY

By: _____

ATTEST:
MARCI KILIAN, CITY CLERK

By: _____

APPROVED
Martin A. Grover
1026 090211

Exhibit 4

AGREEMENT FOR PLANNING AND DESIGN PHASE SERVICES FOR THE AGUA HEDIONDA SEWER LIFT STATION AND VISTA/CARLSBAD INTERCEPTOR SEWER, REACHES VC11B – VC15

THIS AGREEMENT for the Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15 ("Agreement") is made and entered into as of the _____ day of _____, 20___, by and between the City of Vista, a charter city ("Vista"), and the City of Carlsbad, a charter city ("Carlsbad"), collectively, ("the Parties").

RECITALS

WHEREAS, on February 26, 2002, the Parties entered into an agreement for the ownership, operation and maintenance of the Vista/Carlsbad Interceptor Sewer ("Ownership Agreement"), the terms of which are incorporated herein by this reference; and

WHEREAS, the existing Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer was built in the early 1960's and does not have adequate capacity to convey the sewage flows projected for this basin; and

WHEREAS, the Sewer Master Plans for the Parties include a recommendation that pipeline reaches VC11B – VC15 of the Vista/Carlsbad Interceptor Sewer and Agua Hedionda Sewer Lift Station be replaced with larger pipelines and pumps, respectively, to increase the capacity necessary to convey future sewer flows; and

WHEREAS, Carlsbad has completed a Preliminary Design Report dated September 2008, a copy of which has been provided to Vista, and has selected a consultant to prepare the final design for the replacement of the Agua Hedionda Sewer Lift Station and pipeline reaches VC11B – VC15 of the Vista/Carlsbad Interceptor Sewer; and

WHEREAS, Carlsbad is in the process of obtaining environmental clearance through the California Environmental Quality Act (CEQA) process and plans, specifications and cost estimates for the Project have been prepared and are approximately 90% complete; and

WHEREAS, the Parties are entering into this Agreement in order to establish the roles and responsibilities of each Party during the planning and design phase of the Project and to define the cost share, accounting procedures and payment schedule for the Parties. The phrase "Planning and Design Phase", as used throughout this Agreement, shall be considered to include all Project activities occurring prior to the Award of the construction contract; and

WHEREAS, the Parties intend to execute a subsequent project agreement prior to soliciting bids for construction to address responsibilities and cost sharing for construction of the Project .

NOW THEREFORE, THE PARTIES HERETO AGREE TO THE FOLLOWING:

SECTION 1. PROJECT DESCRIPTION

The Agua Hedionda Sewer Lift Station and Vista/Carlsbad Interceptor Sewer, Reaches VC11B – VC15 (the "Project") is a sewer project that will replace existing facilities to increase the capacity and improve the reliability within the lower portion of the Vista/Carlsbad Interceptor Sewer System. The Project begins at the north shore of the Agua Hedionda Lagoon and extends southerly a distance of approximately 2.3-miles to the Encina Water Pollution Control Facility, as shown on Exhibit "A". The major elements of the Project are defined in the September 2008 Preliminary Design Report and are summarized as follows:

A. Replace the existing wood trestle sewer bridge across Agua Hedionda Lagoon with a new steel support bridge that will clear span the existing channel, being approximately 140-feet in length. The new sewer support bridge will be designed to allow lightweight maintenance vehicles to pass over the bridge to allow for access to the interceptor sewer north of the lagoon, which will allow for improved inspection and maintenance capabilities as well as improved emergency response. In addition, the Project will replace approximately 1400 linear feet of existing 42-inch diameter sewer pipe with a 54-inch diameter pipe. The Project will relocate a portion of an existing 12-inch diameter high pressure gas line that conflicts with the proposed northerly abutment of the new bridge. The existing wood trestle sewer support structure will be removed as part of the project.

B. Construct a new sewer lift station at a location adjacent to the existing lift station on the south shore of Agua Hedionda Lagoon. The lift station will be capable of pumping the ultimate peak wet weather sewage flows for the basin, estimated at 33 million gallons per day (mgd) in the current master plans. In addition to the structure containing the pumps and motors, the lift station will also have standby pumps, an emergency generator, a grinder installed in a vault, an electrical control building and odor control facilities. The facility will be designed to comply with local and resource agency permit requirements, including the California Coastal Commission. The existing lift station facility will be removed at the completion of the project.

C. Construct a new force main and gravity sewer that will operate in parallel to the existing 42-inch diameter gravity flow sewer, providing increased system reliability. The new force main will be approximately 4000 linear feet of 30-inch diameter pipe and will be manufactured from High Density Polyethylene (HDPE). The force main will discharge into a new 54-inch diameter gravity sewer that will be constructed in Avenida Encinas, being approximately 7000-feet in length, extending from Cannon Road to the Encina Water Pollution Control Facility. These pipelines will be installed using several different methods of construction, including open-trench excavation with shoring, horizontal directional drilling (HDD) and microtunneling. The existing interceptor has been inspected and found to be in good condition; however, the manholes were determined to need rehabilitation, and the rehabilitation work was performed separate from this project in 2009.

SECTION 2. RESPONSIBILITIES OF CARLSBAD

Carlsbad shall be the Lead Agency for the Planning and Design Phase of the Project and will be responsible for studies, design, permitting, property acquisition, environmental compliance, bidding and administration of the project. As Lead Agency, Carlsbad shall have authority to approve contracts and agreements in accordance with this agreement, Carlsbad's policies and applicable law. Carlsbad's purchasing policies shall apply to implementation and performance of construction contracts, professional services agreements and any other activity under this agreement. Carlsbad shall provide Vista the opportunity to review and comment on any proposal for services that exceeds $30,000.

Carlsbad shall have authority to acquire all necessary easements and permits required to construct and maintain the facility. At a minimum, easements for Project facilities will be acquired from the North County Transit District, Cabrillo Power (a.k.a., NRG Energy) and San Diego Gas & Electric. The City of Carlsbad and the City of Vista shall be named as Grantee on all easements acquired for the project.

Carlsbad staff shall notify Vista of milestone design review meetings and submittals and shall keep Vista staff informed about any significant project developments, particularly those that may lead to amendments.

SECTION 3. RESPONSIBILITIES OF VISTA

Vista shall provide an engineering representative to attend milestone design review meetings and shall provide written comments to Carlsbad within 10-days of the meeting. Vista agrees to make payment to Carlsbad for completed work, as agreed to in Section 4 herein, within 30 days of the invoice date.

Vista agrees to perform additional services, if any, at Vista's expense as necessary to comply with funding requirements as a result of Vista's selected method of financing the Project. Anticipated costs may be, but are not limited to, site investigations, permitting, environmental review and additional project administration / reporting.

SECTION 4. ALLOCATION OF COSTS

Allocation of Project costs between the Parties varies by reach as defined in the Ownership Agreement. Furthermore, an estimate of all Project costs is shown in Table 1 of Exhibit "B", which has been developed from plans that are considered to be approximately 90% complete.

Vista acknowledges that Carlsbad has incurred significant expenses to-date during the preparation of studies, design and environmental compliance for the Project as shown in Table 2 of Exhibit "B". Additionally, the allocation of these expenditures between the Parties is shown in Table 3 of Exhibit "B" and identifies Vista's share of Project costs incurred through the end of calendar year 2010 as $2,366,060. Upon execution of this agreement by the Parties, Vista agrees to pay to Carlsbad this amount in full within 30-days of the invoice date. Subsequent to the first invoice, Carlsbad shall invoice Vista for all work performed during the first half of calendar year 2011 and shall then submit invoices to Vista quarterly thereafter for ongoing Project activities performed until work is deemed complete in accordance with Section 5 herein.

Vista shall pay Carlsbad within 30-days of the date of the invoice on all amounts not in dispute. All invoices shall include backup documentation to support each line item on the invoice.

It is understood that Carlsbad's cost for project management and administration shall be included in the overall cost of the Project and shall be paid by each Party as defined in Section 5 herein. Allowable costs shall be actual costs for work performed by Carlsbad Engineering Department staff and reasonable expenses. Carlsbad staff costs will be billed at their hourly fully burdened rate.

SECTION 5. COST ACCOUNTING

Carlsbad shall be responsible for the administration and accounting of all expenditures related to the Project. The Parties agree that Vista will pay to Carlsbad its allocated portion of actual and estimated costs as shown in Tables 1, 2 and 3 of Exhibit "B" and stated in Section 4 herein. Final accounting of Planning and Design Phase costs will be made after the Award of the construction contract by the Carlsbad City Council. Carlsbad will issue a final invoice for Planning and Design Phase work to Vista within 30-days of Award.

The Parties acknowledge that the Planning and Design Phase work activities and related costs are typically spread throughout multiple reaches at any given time, making it difficult to allocate costs to specific reaches with different ownership percentages. Therefore, the Parties agree to distribute the total of all Planning and Design Phase costs for the Project to each respective ownership reach by utilizing the ratio of the estimated total project costs for each reach divided by the overall total Project cost. These cost percentages are calculated and shown in Table 1 of Exhibit "B" and result in 65% of the Planning and Design Phase costs being distributed to Reaches VC11B through VC13 and the remaining 35% of the costs being allocated to Reaches VC14 and VC15. The costs shall then be shared by each Party in accordance with the terms of Section 4 herein.

SECTION 6. COUNTERPARTS

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

(Continued on Next Page)

SECTION 7. ENTIRE AGREEMENT

This Agreement, together with any other written document referred to, embody the entire agreement and understanding between the Parties relating to the subject matter hereof. In case of conflict between this Agreement and the Ownership Agreement, the terms of the Ownership Agreement shall prevail.

IN WITNESS WHEREOF, each Party hereto has pursuant to resolution duly passed and adopted by its respective governing body this AGREEMENT and caused it to be executed and be effective on the date first above written.

CITY OF VISTA, a chartered municipal corporation.

By: _____
JUDY RITTER, Mayor

ATTEST:
MARCI KILIAN, City Clerk

By: _____

APPROVED AS TO FORM:
DAROLD PIEPER, City Attorney

BY: _____

CITY OF CARLSBAD, a chartered municipal corporation

By: _____
MATT HALL, Mayor

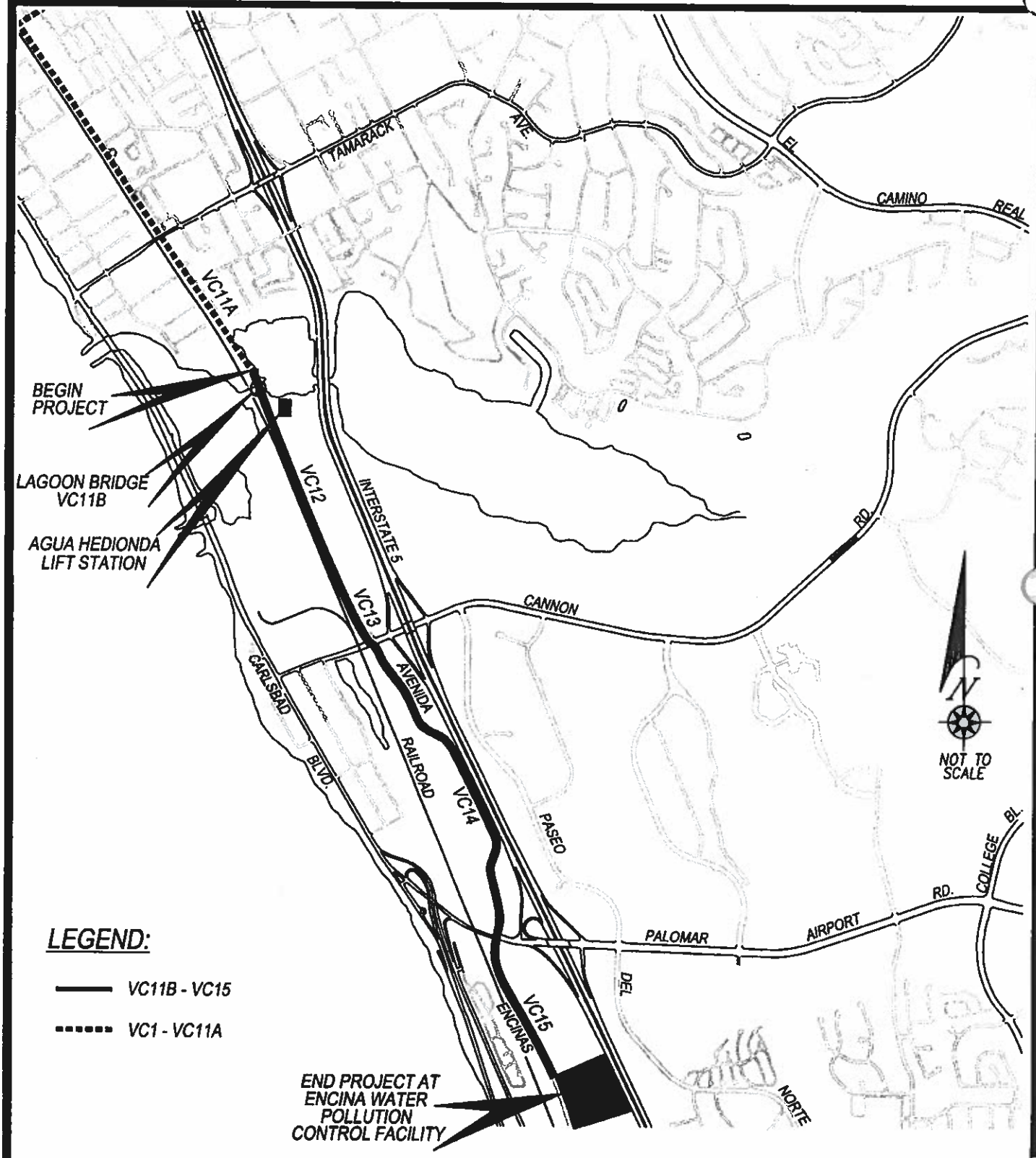
ATTEST:
LORRAINE M. WOOD, City Clerk

By: _____

APPROVED AS TO FORM:
RONALD R. BALL, City Attorney

BY: _____

EXHIBIT A



PROJECT NAME	PROJECT NUMBER	EXHIBIT
AGUA HEDIONDA LIFT STATION & VISTA/CARLSBAD INTECEPTOR SEWER REACHES VC11B THROUGH VC15	CP3492, 3886 & 3949	A

DRAWN BY: SCOTT EVANS: CARLSBAD UTILITIES DEPT. 1/13/11 C:\UTILITIES DEPARTMENT\DESIGN DIVISION\SMITH\VC11-15 LOCATION MAP.DWG

EXHIBIT "B"

TABLE 1
AGUA HEDIONDA LIFT STATION AND V/C INTERCEPTOR REPLACEMENT PROJECT, REACHES VC11B - VC15
ESTIMATED PROJECT COSTS

Phase	Pre-Construction Phase Costs	Construction Management	Sub-Total of Soft Costs	Construction Cost	Change Order Budget	Outside Costs (1)	Total	Vista's Ownership Percentage	Vista's Cost Share	Carlsbad's Cost Share
Reach 11B	$700,000	$600,000	$1,300,000	$3,935,000	$393,500	$500,000	$6,128,500	69.1%	$4,234,794	$1,893,707
AHLS & Reach 12-13	$1,900,000	$1,500,000	$3,400,000	$17,824,000	$1,425,920	$1,050,000	$23,699,920	69.1%	$16,376,645	$7,323,275
Reaches 14-15	$1,400,000	$1,300,000	$2,700,000	$12,400,000	$992,000	$0	$16,092,000	56.1%	$9,027,612	$7,064,388
	$4,000,000	$3,400,000	$7,400,000	$34,159,000	$2,811,420	$1,550,000	**$45,920,420**		$29,639,050	$16,281,370

	Total Est. Cost	Percentage of Overall Project	% of Project Cost by Ownership Reach	Vista's Ownership Percentage	Carlsbad's Ownership Percentage
Reach 11B	$6,128,500	13%	65.0%	69.1%	30.9%
AHLS & Reach 12-13	$23,699,920	52%			
Reaches 14-15	$16,092,000	35%	35.0%	56.1%	43.9%
Total	$45,920,420	100.0%	100.0%		

(1) Outside Costs:

SDGE Gas Line Relocation Costs	$300,000	Reach 11B
Electrical Feed to Lift Station	$200,000	AHLS
NRG Property Acquisition	$750,000	AHLS
SDGE Property Acquisition	$100,000	AHLS
NCTD Flagging Costs	$200,000	Reach 11B
TOTAL	**$1,550,000**	

EXHIBIT "B"

TABLE 2
AGUA HEDIONDA LIFT STATION & V/C INTERCEPTOR REPLACEMENT PROJECT, REACHES VC11B - VC15

EXISTING PROJECT EXPENDITURES THRU DEC. 31, 2010

	Description	TOTAL COST
A	**DESIGN CONSULTANTS**	
	Krieger and Stewart Study - March 2000	$ 83,000
	Dokken Engineering - Bridge Alignment Support	$ 2,984
	Brown & Caldwell Alignment & Site Study - June 2006	$ 99,960
	Brown & Caldwell Preliminary Design Report - Sept. 2008	$ 294,641
	Brown & Caldwell Preliminary Design Amendment No. 1	$ 36,058
	Brown & Caldwell Preliminary Design Amendment No. 2	$ 37,600
	Brown & Caldwell Final Design (PS&E and Environmental)	$ 2,382,281
	Brown & Caldwell Final Design Amendment No. 1	$ 98,230
	Brown & Caldwell Final Design Amendment No. 2 (time extention)	$ -
	Subtotal	**$ 3,034,754**
B	**MANHOLE REHAB CONSTRUCTION CONTRACT**	
	Socal Pacific Contractors	$ 290,465
	Construction Inspection	$ 25,704
	Misc. Costs	$ 28,730
	Subtotal	**$ 344,899**
C	**CARLSBAD PROJECT MGMT. STAFF (2005 - 12/31/10)**	**$ 269,707**
D	**MISC. EXPENDITURES**	**$ 16,108**
	TOTAL	**$ 3,665,468**

EXHIBIT "B"

TABLE 3
AGUA HEDIONDA LIFT STATION AND V/C INTERCEPTOR REPLACEMENT PROJECT, REACHES VC11B -VC15
DISTRIBUTION OF PROJECT COSTS
(Inception through 12/31/2010)

Project No.	Project Phase	Actual Expenditures Reported	Percentage of Overall Project *	Corrected Expenditure Amount	Vista Ownership Percentage	Carlsbad Ownership Percentage	Vista Cost Share	Carlsbad Cost Share
3886	Reach VC11B	$735,687	13%	$476,511	69.1%	30.9%	$329,269	$147,242
3492	AHLS and Reach VC12 & VC13	$1,920,583	52%	$1,906,043	69.1%	30.9%	$1,317,076	$588,967
3949	Reach VC14 & VC15	$1,009,198	35%	$1,282,914	56.1%	43.9%	$719,715	$563,199
	TOTAL	$3,665,468	100%	$3,665,468			**$2,366,060**	**$1,299,408**

* Percentage Developed from Table 1

A-13. Amended and Restated Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, June 2013.

AMENDED AND RESTATED AGREEMENT FOR OWNERSHIP, OPERATION, AND MAINTENANCE OF THE VISTA/CARLSBAD INTERCEPTOR SEWER

THIS AMENDED AND RESTATED AGREEMENT is made and entered into as of the 11th day of June, 2013 by and between the City of Vista, a chartered municipal corporation ("Vista"), and the City of Carlsbad, a chartered city ("Carlsbad"), collectively, ("the Parties").

RECITALS

WHEREAS, the Parties are responsible for providing sewage collection and transmission in their respective service areas and are authorized to contract with others for the provision of such services; and

WHEREAS, on July 13, 1961, Vista Sanitation District and Carlsbad entered into an agreement pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code to acquire, construct and operate a Joint Sewer System and allocated ownership and capacity rights to Vista Sanitation District and Carlsbad in an interceptor sewer system, sewage treatment facility, and ocean outfall (the "Basic Agreement"). The joint sewer system components were divided into pipeline reaches and pumping stations referenced by Units A, B, C, D, E, F, G, and H; and

WHEREAS, on August 17, 1971, Vista Sanitation District and Carlsbad entered into an agreement whereby Vista Sanitation District agreed to bear all cost of maintenance and operation of Unit "A", a trunk sewer pipeline paralleling 1-78 and extending from Vista to the Carlsbad city limit; and

WHEREAS, on September 3, 1975, Vista and Carlsbad entered into an agreement whereby Unit C (Buena Vista Pump Station), Unit D (Buena Vista Force Main), and Unit G (Agua Hedionda Pumping Station) were increased in capacity and Carlsbad's capacity rights in

Units C and D increased from 5.5 percent to 15.5 percent and Carlsbad's capacity rights in Unit G were reduced from 40.5 percent to 38.5 percent; and

WHEREAS, on or about September 14, 1983, the Vista Sanitation District was dissolved, and Vista assumed the District's rights and obligations, including those contained in the Basic Agreement; and

WHEREAS, the Parties by written agreement dated December 27, 1983, deleted Unit A and a portion of Unit B from the Joint System and released them to Vista as sole owner with complete responsibility for maintenance thereof; and

WHEREAS, on October 24, 1984, the City of Vista and the City of Oceanside entered into an agreement to transfer sewage flow between the agencies; and

WHEREAS, on May 22, 1987, a "Letter of Understanding for Upgrading of the Vista/Carlsbad Interceptor" was prepared by Carlsbad and submitted to Vista designating a "trigger mechanism" to start construction of replacement pipelines on the Vista/Carlsbad Interceptor; and

WHEREAS, pursuant to Article 1, Chapter 5, Division 7, Title 1 of the California Government Code, the Parties have entered into a Revised Basic Agreement, as may be amended from time to time, with the other member agencies of the Encina Wastewater Authority for the purpose of operating and maintaining a sewage treatment facility (Unit I) and ocean outfall (Unit J) (the "Revised Basic Agreement"); and

WHEREAS, Section 12.1.2 of the Revised Basic Agreement stipulates that the Administrator of the Encina Wastewater Authority shall operate and maintain, at the expense of Vista and Carlsbad, the Buena Vista and Agua Hedionda Pumping Stations (formerly Units C and G, respectively, in the Basic Agreement); and

WHEREAS, Units B, D, E, F, and H of the Basic Agreement were not incorporated into the Revised Basic Agreement with regard to operation, maintenance, or construction of the Vista/Carlsbad Interceptor; and

WHEREAS, on February 26, 2002, the Parties entered into an agreement for ownership, operation, and maintenance of the Vista/Carlsbad Interceptor, described herein as VC1 through VC16, the Buena Vista Pump Station and the Agua Hedionda Pump Station; and

WHEREAS, on June 14, 2011, the Parties amended the agreement to extend the term until December 31, 2032 with an option to extend it for an additional ten year period; and

WHEREAS, the Parties desire to amend and restate that Agreement to allow Carlsbad to connect a sewer line into VC-1 at Carlsbad's sole expense and to allow Vista to sell capacity to Carlsbad into VC-1, and to revise the maintenance responsibilities for VC1.

THEREFORE, THE PARTIES HERETO AGREE TO THE FOLLOWING:

SECTION 1. DEFINITIONS

For the purposes of this agreement, the following terms shall have the meanings indicated:

1.1 Vista/Carlsbad Interceptor. An interceptor sewer pipeline, jointly owned by Vista and Carlsbad, beginning at Manhole No. 35 (according to City of Vista Drawing No. 1981, As-Built 2/27/87) located near the northeasterly City boundary of Carlsbad and extending to the Encina Water Pollution Control Facility and includes the Buena Vista Pumping Station and force main and the Agua Hedionda Pumping Station and force main, and any future improvements, and replacements, all as shown on Exhibits "A-1", "A-2" and "A-3".

1.2 Preliminary Design Report. A report that investigates a proposed improvement or enlargement to the Vista/Carlsbad Interceptor and provides information on the need for the improvement or enlargement, a description of facilities, materials, and design criteria, and a detailed cost estimate for the improvements or enlargement including engineering, right-of-way, legal, administrative, construction and inspection, and a tentative schedule for final design and construction. The Preliminary Design Report may be prepared for any component needing upgrading when the peak dry weather flow rate reaches sixty (60) percent of full pipe capacity.

1.3. Administrator. The Administrator shall be the individuals designated to administer the functions of the sewer system for that City. For Vista and Carlsbad, the Administrator is each City's City Manager or his/her designated representative.

1.4 Lead Agency. The Party to Project Agreements given responsibility for planning, design, and construction of a given component of the Vista/Carlsbad Interceptor.

1.5 Pipeline Reach. A portion or segment of the Vista/Carlsbad Interceptor sewer. A Pipeline Reach designates a change in pipe capacity or capacity ownership by the Parties. The unit designation contained in the Basic Agreement for Pipeline Reaches and pumping stations is hereby replaced with Pipeline Reaches designated VC1 through VC16, the Buena Vista Pumping Station and the Agua Hedionda Pumping Station, all as shown on Exhibits "A-1", "A-2" and "A-3".

1.6 Inflow and Infiltration. The sewer pipeline shall be maintained to exclude excessive inflow of surface water and infiltration of groundwater through manhole risers, covers and pipeline joints. Allowable infiltration shall not exceed 500 gpd per inch-diameter per mile.

1.7 Wastewater. Wastewater shall be construed to mean domestic sewage, authorized industrial discharges that are in compliance with the Encina Wastewater Authority's Source Control Program, and Inflow/Infiltration.

1.8 Improvement or Enlargement Costs. The cost of land, easements and rights-of-way, engineering, construction management, construction inspection, and construction.

1.9 Project Agreement. A separate agreement between Vista and Carlsbad which defines the project-specific requirements of each Party, cost sharing for design and construction, the method of cost accounting and the payment schedule for the improvement or enlargement of any portion of the Vista/Carlsbad Interceptor.

1.10 Service Area. The Service Area shall be the sanitation sewer area served by the City of Vista or the City of Carlsbad. It shall not include the sanitation sewer area of Buena Sanitation District unless approved by the Parties in writing.

1.11 Capacity. Capacity, as defined herein, shall be construed to be the sewage flowrate that may be conveyed through a pipeline when flowing full and is based on a depth of flow (D) to pipe diameter (d) ratio of one (i.e., D/d = 1.0).

SECTION 2. JOINT PARTICIPATION

The Parties shall participate jointly in the proportions hereinafter specified in the acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor, including the parts thereof which may be subsequently acquired or constructed for the improvement or enlargement thereof. Further, the Parties shall pay for such acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor in the proportions hereinafter shown in Exhibits "B" and "C".

SECTION 3. CAPACITY RIGHTS

3.1 For the duration of this Agreement, each Party shall own and enjoy the right to use eighty percent (80%) of the Capacity of the Vista/Carlsbad Interceptor in the proportions set forth in the table identified as "Vista/Carlsbad Interceptor Sewer System - Capacity Rights" which is attached hereto and incorporated herein by reference as Exhibit "B". No Party shall use the Vista/Carlsbad Interceptor, or any part thereof, to a greater percentage of its capacity and shall not in any way grant, encumber, limit or restrict its interest in any part of the Vista/Carlsbad Interceptor, or partition or seek to partition the same or have the use of any part thereof for any purpose other than the disposal of sewage, without the prior written notification of the other Party.

3.2 If responsibility for the disposal of the sewage from a particular area regulated by this Agreement is to be transferred from one Party to the other, or a third Party, the capacity service shall be transferred accordingly on the effective date of the transfer of such responsibility, and the charges against the Parties amended to correspond therewith. Any Party proposing such transfer shall notify the other Party in advance of the transfer. No such transfer

shall affect the capacity rights or obligations of the Parties in or to the Vista/Carlsbad Interceptor until the Parties shall have executed appropriate amendments to this Agreement.

3.3 Neither Party shall exceed their capacity rights in the Vista/Carlsbad Interceptor. In the event a Party temporarily exceeds its capacity rights, it shall reimburse the other party the value of the excess capacity rights used. If the capacity used is one year or less, the value of the capacity used shall be determined on a percentage of the overall O&M Budget unless the Parties agree to transfer its respective percentage of ownership of the Vista/Carlsbad Interceptor permanently.

SECTION 4. ACQUISITION OF ADDITIONAL CAPACITY

4.1 In the event either Party requires capacity in the Vista/Carlsbad Interceptor in excess of the proportionate capacity allocated under this Agreement, and the Vista/Carlsbad Interceptor is not being used by the other Party to the full percentage of the total capacity to which they are entitled, the Party requiring additional capacity may lease or purchase such additional capacity from the other Party. Such lease or purchase shall be accomplished by written agreement.

4.2 Vista agrees to sell capacity in Reach VC1 to Carlsbad at the percentage listed in the table of "Capacity Rights", included herein as Exhibit "B", and Carlsbad agrees to pay Vista $26,961 for the purchase of this ownership capacity. Carlsbad has not previously held capacity ownership in this line, but now requires capacity to accommodate the future Quarry Creek development to be located in the northeast corner of Carlsbad. Carlsbad's ownership in Reach VC1 shall begin at Manhole No. 32 according to City of Vista Drawing No. 1981.

SECTION 5. RESPONSIBILITIES OF LEAD AGENCY

Carlsbad shall be the Lead Agency with responsibility for reaches VC2-VC16 of the Vista/Carlsbad Interceptor and Vista shall be the Lead Agency with Responsibility for reach VC1 of the Vista/Carlsbad Interceptor, unless agreed upon otherwise by a separate Project Agreement; and therefore, Carlsbad and Vista shall mutually agree on all recommendations for

improvements and enlargements to the Vista/Carlsbad Interceptor. A separate Project Agreement shall be prepared and executed by the Parties for all future improvements and enlargements to the Vista/Carlsbad Interceptor and to determine the Lead Agency for the Project Agreement.

SECTION 6. IMPROVEMENTS OR ENLARGEMENTS OF THE VISTA/ CARLSBAD INTERCEPTOR

6.1 As deemed necessary, the Parties shall meet to discuss future improvements or enlargements of the Vista/Carlsbad Interceptor. Once it is agreed between the Parties that an improvement or enlargement is necessary, a Preliminary Design Report for the improvement or enlargement of the Vista/Carlsbad Interceptor shall be prepared. Upon completion and acceptance by the Parties of a Preliminary Design Report detailing an improvement or enlargement, a Lead Agency will be designated that will prepare a Project Agreement which will identify the project specific requirements of each Party including the cost sharing of the Preliminary Design Report.

6.2 When the Project Agreement has been accepted by the City Council of each Party, the Lead Agency under the Project Agreement shall engage the services of a consultant or consultants to prepare plans, specifications, and related materials necessary for the acquisition and construction of the improvements or enlargements. The specifications shall contain all appropriate hold harmless clauses, insurance requirements and indemnifications for those agencies affected by the project.

6.3 Upon completion of the plans, specifications, and related materials, their approval by the other Party, the acquisition of the necessary lands and rights-of-way, and at such time as the Parties are prepared to finance their proportionate shares of the acquisition and construction cost, the Lead Agency under the Project Agreement shall advertise for bids for the construction of the improvements or enlargements or such portion thereof as may be hereafter agreed to by the Parties. The decision to accept bids and award the construction contract shall

be the sole responsibility of the Lead Agency. The Lead Agency shall cause the work to be inspected, administer the execution of the contract, and approve necessary change orders.

6.4 The Parties may, at their sole cost and expense, enlarge any pipeline reach or pumping station or portion thereof of the Vista/Carlsbad Interceptor in which it is the owner of capacity rights and any increased capacity in such pipeline reach or portion resulting from the enlargement shall belong to such Party paying the cost and expense thereof. The enlargement shall be performed in accordance with the requirements of this Section and by separate agreement.

SECTION 7. LANDS AND RIGHTS-OF-WAY

7.1 Any land or rights-of-way acquired for the improvement or enlargement of the Vista/Carlsbad Interceptor shall be acquired in the name of Carlsbad and Vista as joint tenants.

7.2 At such time as the plans specifying the location of the necessary lands and rights-of-way for improvement or enlargement of the Vista/Carlsbad Interceptor have been prepared and approved by the Parties and the respective funds of the Parties are available for the acquisition thereof, the Lead Agency shall proceed to acquire the necessary land and rights-of-way. The Lead Agency shall notify the other Party of the amount to be deposited by the other Party with the Lead Agency to pay its proportionate share of the acquisition costs. The other Party shall deposit its share with the Lead Agency prior to recording acquisition documents.

SECTION 8. COST SHARING OF IMPROVEMENTS OR ENLARGEMENTS

8.1 All improvement or enlargement costs of the Vista/Carlsbad Interceptor which are deemed necessary and beneficial to both Parties under any Project Agreement shall be borne and paid by the Parties in proportion to each Party's capacity rights for each Pipeline Reach listed in the table attached as Exhibit "B", except as otherwise required by Section 6.4 of this Agreement. Under this section "necessary and beneficial" shall mean those expenses that are necessary for the completion of the improvement or enlargement of the Vista/Carlsbad Interceptor and benefit both Parties to the Project Agreement.

8.2 Cost sharing shall be based on percentage of capacity owned after improvements are constructed.

SECTION 9. OPERATION AND MAINTENANCE

9.1 Operation and maintenance of the Vista/Carlsbad Interceptor shall include the labor, equipment and materials required for daily operation and routine maintenance. Routine annual maintenance activities typically include visual inspections of all manholes, clearing around manholes, grading and maintaining access roads and replacement of severely corroded or damaged manhole frames and lids. Cleaning and special inspections, such as the inspection of the trestle crossing of the Agua Hedionda Lagoon, will be performed every three to five years or as necessary to maintain the intended function of the Vista/Carlsbad Interceptor. Cleaning and special inspections shall not be considered to be routine annual maintenance.

9.2 Carlsbad shall operate and maintain pipeline reaches VC2-VC16 of the Vista/Carlsbad Interceptor and Vista shall operate and maintain pipeline reach VC1, except for that portion specifically excluded in Section 9.3 below, in good repair and working order in accordance with recognized sound engineering practice. Carlsbad and Vista shall maintain accurate records and accounts in connection with the operation and maintenance of the Vista/Carlsbad Interceptor. These records and accounts shall be available for inspection by the other Party upon request by written notice.

9.3 Operation and maintenance of the Buena Vista and Agua Hedionda Pump Stations and force mains of the Vista/Carlsbad Interceptor shall be the responsibility of the Administrator/Operator of the Encina Wastewater Authority as identified in Section 12.1.2 of the Revised Basic Agreement with the Encina Joint Powers Authority, as may be amended from time to time, a copy of which is on file with the Administrator of each Party.

SECTION 10. BUDGETING AND ACCOUNTING FOR OPERATION AND MAINTENANCE

10.1 Annual expenses for routine operation and maintenance of the Vista/Carlsbad Interceptor shall be based on a rate of $2,700 per mile of gravity sewer as detailed in Exhibit "C", for a total annual cost of $16,200. Based on the proportionate share of the facility each party is responsible for maintaining, Vista shall pay Carlsbad $12,150 per year and Carlsbad shall pay Vista $675 per year (for base year 2013). An inflation rate equal to the Federal Consumer Price Index (CPI) shall be applied annually to these expenses. These expenses, hereinafter referred to as O&M expenses, include the labor, equipment, materials and administration necessary to maintain the daily operation of the Vista/Carlsbad Interceptor as identified in Section 9.1.

10.2 Carlsbad and Vista shall share in the operation and maintenance expenses of the Vista/Carlsbad Interceptor, except as stated otherwise in Section 10.3, based on the approximate ownership of each Party at the mid-point of the sewer. Vista shall be responsible for seventy-five percent (75%) and Carlsbad shall be responsible for twenty-five percent (25%) of all O&M expenses. Annually, on or around July 1 of each year, Carlsbad shall invoice Vista and Vista shall invoice Carlsbad for the applicable share of the operation and maintenance costs identified in Section 10.1 for the forthcoming fiscal year. Special inspections and cleaning, not included as part of routine annual maintenance, will be performed as necessary by Carlsbad, Vista, or a qualified contractor, as agreed by both Parties, and invoiced to Vista or Carlsbad on a time and material basis in proportion to the percentage identified herein.

10.3 The budget for the operation and maintenance of the Buena Vista and Agua Hedionda Pump Stations and force mains shall be prepared by the Administrator/Operator of the Encina Wastewater Authority in accordance with the Revised Basic Agreement.

SECTION 11. EMERGENCY REPAIRS OR RECONSTRUCTION

11.1 Carlsbad shall be allowed to perform emergency repairs or reconstruction for pipeline reaches VC2-VC16 of the Vista/Carlsbad Interceptor, in whole or in part, without prior approval from Vista as necessary to maintain the continuous operation of the system such that the need for repair or reconstruction is necessary to prevent property damage or imminent danger to health and safety. Vista shall be allowed to perform emergency repairs or reconstruction for pipeline reach VC1 of the Vista/Carlsbad Interceptor, in whole or in part, without prior approval from Carlsbad as necessary to maintain the continuous operation of the system such that the need for repair or reconstruction is necessary to prevent property damage or imminent danger to health and safety.

11.2 The Parties shall each pay all costs of reconstruction of the Vista/Carlsbad Interceptor, or portion thereof, in the same proportion as the Parties own capacity in the Vista/Carlsbad Interceptor as provided in attached Exhibit "B".

SECTION 12. MEASUREMENT OF SEWAGE FLOW/CAPACITY MONITORING

Flows in the Vista/Carlsbad Interceptor shall be monitored in accordance with Section 7 of the Revised Basic Agreement with the Encina Joint Powers Authority, as may be amended from time to time. A copy of which is on file with the Administrator of each Party.

Additional flow monitoring may be performed by either Party as may be needed to monitor the capacity in selected reaches of the interceptor. The Party's proposed flow monitoring program shall be presented to the other Party for their review and approval prior to initiation of the activity. The cost of a temporary flow monitoring program shall be shared by the Parties in proportion to their respective capacity ownership rights identified in Exhibit "B". Either Party may conduct a flow monitoring program at its own expense without prior approval of the other Party.

SECTION 13. PROTECTION OF THE VISTA/CARLSBAD INTERCEPTOR/ SOURCE CONTROL

13.1 The Vista/Carlsbad Interceptor shall not be used by any Party to this Agreement for any purpose other than the conveyance of wastewater unless mutually agreed to by separate written agreement.

13.2 Each Party to this Agreement shall take reasonable steps to prevent excessive inflow of any surface or storm waters or excessive infiltration of groundwater, as defined by Section 1.6, to be discharged into the Vista/Carlsbad Interceptor, either directly or indirectly. When wet weather flow exceeds 160% of the 30-day average maximum day dry weather flow as determined by flow monitoring, an Infiltration and Inflow Study shall be initiated. The Lead Agency shall perform all studies on the Vista/Carlsbad Interceptor with cost for the study being shared equally between the Parties.

Should the results of the study identify upstream collector or trunk sewers as the source of inflow or infiltration, Each Party shall be responsible for the cost to repair the sewer system within its Service Area to reduce Inflow and Infiltration to acceptable levels.

13.3 No Party to this Agreement shall allow cooling water or other unpolluted industrial wastewater to be discharged directly or indirectly into the Vista/Carlsbad Interceptor without the consent of the Parties to this Agreement and Encina Wastewater Authority.

SECTION 14. RULES AND REGULATIONS CONCERNING USE OF SEWERS

Each Party shall adopt and enforce ordinances, resolutions, rules and regulations, concerning the type and condition of sewage and waste permitted to be discharged directly or indirectly into the Vista/Carlsbad Interceptor and shall prohibit persons and users of every kind and nature, including but not limited to, other public agencies from discharging into such sewers any sewage or waste which would be detrimental to the Vista/Carlsbad Interceptor or any part thereof. Such ordinances, resolutions and rules shall comply with the "Pre-Treatment Ordinance

for the Encina Wastewater Authority", amended March 28, 2001, as may be amended from time to time.

Each Party shall also comply with the applicable statutes, ordinances, rules and regulations of agencies of the United States, State of California, County of San Diego, California Regional Water Quality Control Board-San Diego Region, the Encina Water Pollution Control Facility, and any city having jurisdiction over the collection, transmission, treatment and disposal of sewage and wastes.

SECTION 15. CONNECTION TO VISTA/CARLSBAD INTERCEPTOR

Connections to the Vista/Carlsbad Interceptor shall be made only at manholes. Only collection or trunk sewer lines may be connected to the Vista/Carlsbad Interceptor or any part thereof, and no Party to this Agreement shall approve or permit the direct connection of any premises to the Vista/Carlsbad Interceptor without issuing advance written notice to the other Party.

SECTION 16. BUDGETING AND ACCOUNTING

Each Party shall be strictly accountable for all funds received and shall maintain adequate records of all receipts and disbursements pursuant to this Agreement. In addition, each Party shall maintain such additional records relating to the acquisition, construction, ownership, maintenance, operation and use of the Vista/Carlsbad Interceptor as is appropriate. Each of the Parties, with reasonable notice, has the right to inspect and examine the records of the other Party insofar as such records relate to the Vista/Carlsbad Interceptor.

SECTION 17. INSURANCE

Each Party shall maintain for the duration of the Agreement, and any and all amendments, liability insurance against claims for injuries to persons or damage to property which may arise out of or in connection with performance of the services of each Party, their agents, representatives, employees or subcontractors. Each Party shall maintain worker's compensation coverage and limits as required by the California Labor Code.

SECTION 18. SEWAGE SPILLS

Except as otherwise provided below, any sewage spill which occurs as a result of an unforeseen condition, and said sewage spill could not have been prevented with normal and routine maintenance, then each Party shall be responsible for the costs for cleanup and payment of any legal fines and expenses incurred in proportion to each Party's Capacity Ownership in the Vista/Carlsbad Interceptor. Any Party, who by its sole negligence or willful misconduct, causes a sewage spill shall be solely responsible for all costs for cleanup and payment of any legal fines and expenses incurred.

SECTION 19. HOLD HARMLESS

Except for the other Party's sole negligence or willful misconduct, if the Lead Agency constructs any facility, pipeline, or improvement, the other Party, its officers and employees shall not be liable for any claims, liabilities, penalties, fines, or any damage to goods, properties, or effects of any person whatever, nor for personal injuries or death caused by, or resulting from, any intentional or negligent acts, errors or omissions of the Lead Agency or its agents, employees or representatives in connection with said construction. The Lead Agency shall defend, indemnify, and hold free and harmless the other Party and its officers and employees against any of the foregoing claims, liabilities, penalties or fines, including liabilities or claims by reason of alleged defects in any plans and specifications, and any cost, expense or attorney's fees which are incurred by the other Party on account of any of the foregoing.

Where loss occurs from the negligent operation or maintenance of the Lead Agency, the Lead Agency shall indemnify the other agency for all liabilities, lawsuits, and/or fines by Regulatory Agencies incurred therefrom. In addition, where construction work is performed by the Lead Agency, the Lead Agency shall indemnify the other Party for all liabilities arising out of the construction work as a result of negligence, lawsuits, and/or fines by Regulatory Agencies.

SECTION 20. NOTICE

Notice required or permitted under this Agreement shall be provided in writing, either served personally upon or mailed by registered or certified mail to the Administrator of the other Party.

SECTION 21. SETTLEMENT OF DISPUTE OR CONTROVERSY

21.1 Should any dispute or controversy arise in connection with the books, records or accounts of any Party to this Agreement or in connection with the acquisition, construction, maintenance, operation, repair, reconstruction or enlargement of the Vista/Carlsbad Interceptor or in connection with any of the affairs or operation thereof, or the execution of the term of this Agreement, the Parties shall make reasonable efforts to resolve the dispute. In the event that the Parties are unable to reach a resolution to the dispute, the Parties shall select a disinterested mediator to assist in the resolution of the dispute. Each party shall share equally in the cost of the mediator.

21.2 In the event that the Parties are unable to resolve the dispute with a disinterested mediator, the Parties shall submit to non-binding arbitration. In the event of such election, each Party shall appoint or designate one disinterested person as an arbitrator and said arbitrators so chosen, if an even number shall designate an additional disinterested person to make an odd number of arbitrators and said arbitrators so chosen shall act as a Board of Arbitrators in connection with any such dispute or controversy. The decision of the arbitrators shall be binding unless a Party files a legal action for a trial de-novo. If the Party seeking trial de-novo fails to obtain a judgment better than the arbitrator's decision, that Party shall be liable for all cost, including attorney's fees of the other Party.

SECTION 22. MODIFICATION OF AGREEMENT

Agreement shall contain all the terms and conditions made between the Parties hereto and shall not be amended except by an agreement in writing signed by all Parties.

SECTION 23. SEVERABILITY

If any section, subsection, sentence, clause, phrase or work of this Agreement, or the application thereof, to any Party, or to any other person or circumstance is for any reason held invalid, it shall be deemed severable and the validity of the remainder of the Agreement or the application of such provision to the other Parties, or to any other person or circumstance shall not be affected thereby. Each Party hereby declares that it would have entered into this Agreement and each section, subsection, sentence, clause, phrase and work thereof irrespective of the fact that one or more section, subsection, sentence, clause, phrase or word, or the application thereof to any Party or any other person or circumstance be held invalid.

SECTION 24. COUNTERPARTS

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

SECTION 25. TERM

The term of this Agreement shall be in effect until December 31, 2032. The Agreement may be extended for one (1) additional ten (10) year period or parts thereof. The Parties will prepare a written amendment indication the effective date and length of any extended Agreement.

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IN WITNESS WHEREOF, each Party hereto has pursuant to resolution duly passed and adopted by its respective governing body this AGREEMENT and caused it to be executed and be effective on the date first above written.

CITY OF VISTA,
a chartered municipal corporation

By: _____
Judy Ritter, Mayor

ATTEST:

By: _____
Marci Kilian, City Clerk

APPROVED AS TO FORM:
Darold Pieper, City Attorney

By: _____

RISK MANAGEMENT REVIEW:
Dolores Gascon, Risk Manager

By: _____

CITY OF CARLSBAD, a municipal corporation
of the State of California

By: _____
Matt Hall, Mayor

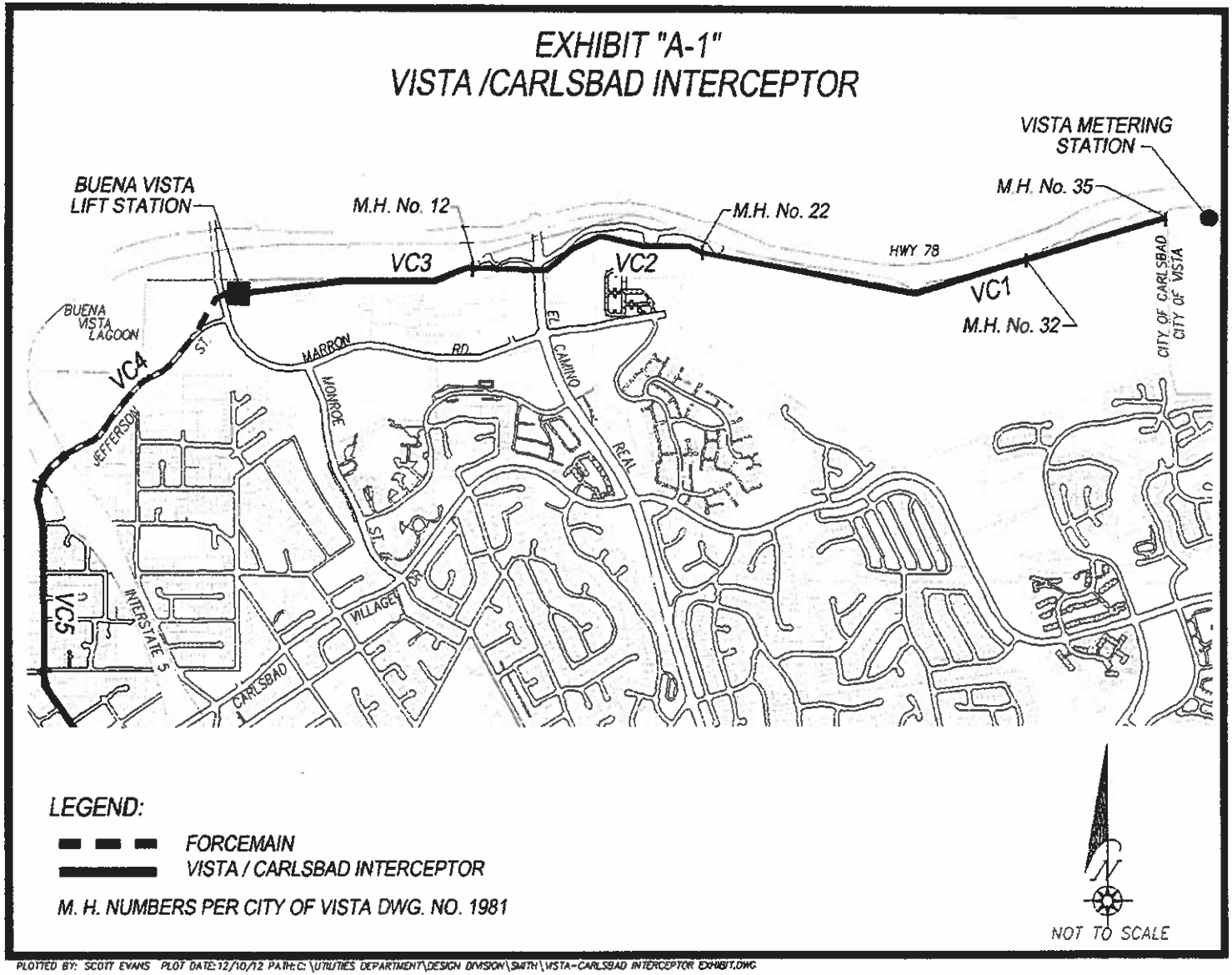
ATTEST:

By: _____
Barbara Engleson, City Clerk

APPROVED AS TO FORM:
Celia A. Brewer, City Attorney

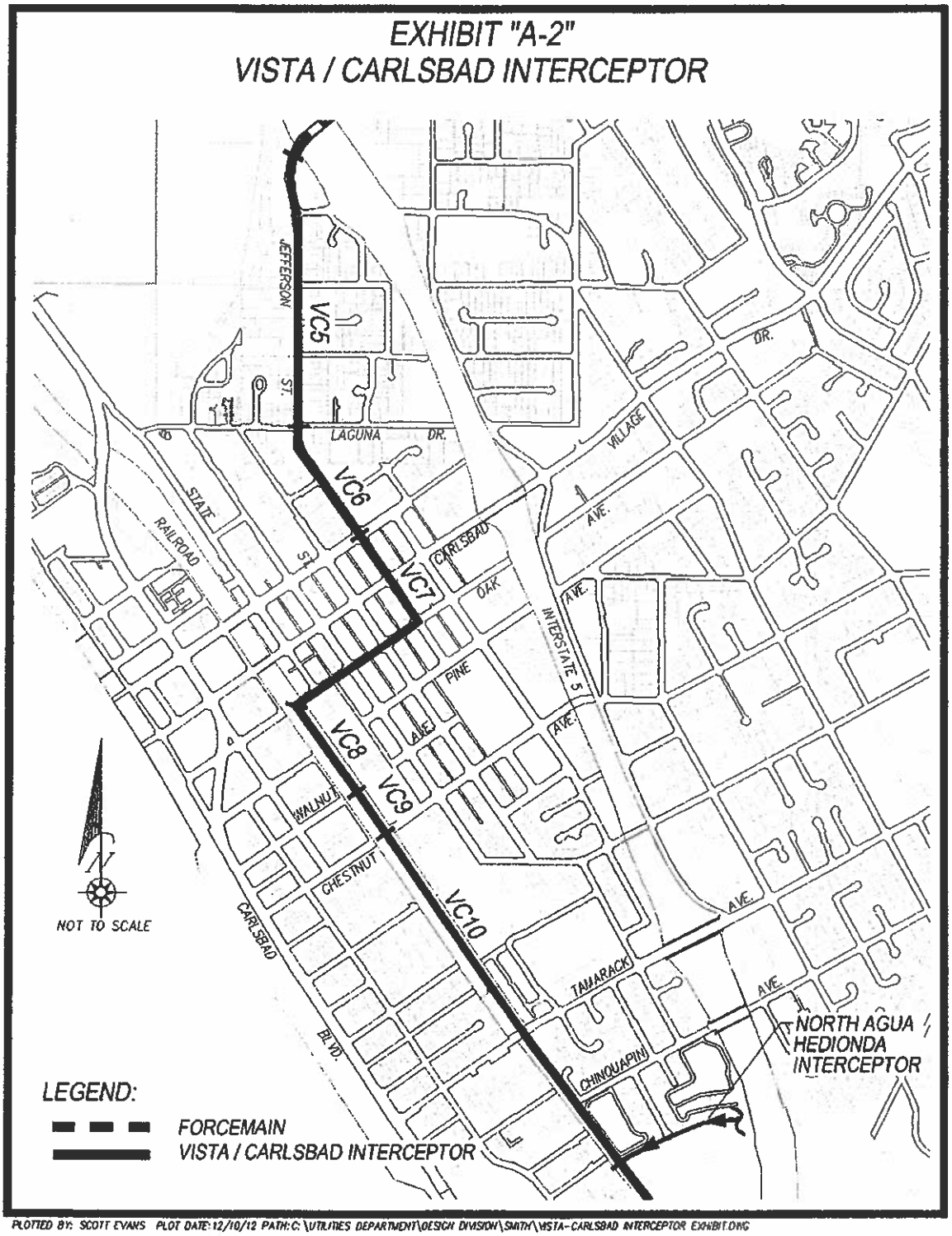
By: _____

EXHIBIT "A-1"
VISTA /CARLSBAD INTERCEPTOR



PLOTTED BY: SCOTT EVANS PLOT DATE:12/10/12 PATH:C:\UTILITIES DEPARTMENT\DESIGN DIVISION\SMITH\VISTA-CARLSBAD INTERCEPTOR EXHIBIT.DWG

EXHIBIT "A-2"
VISTA / CARLSBAD INTERCEPTOR



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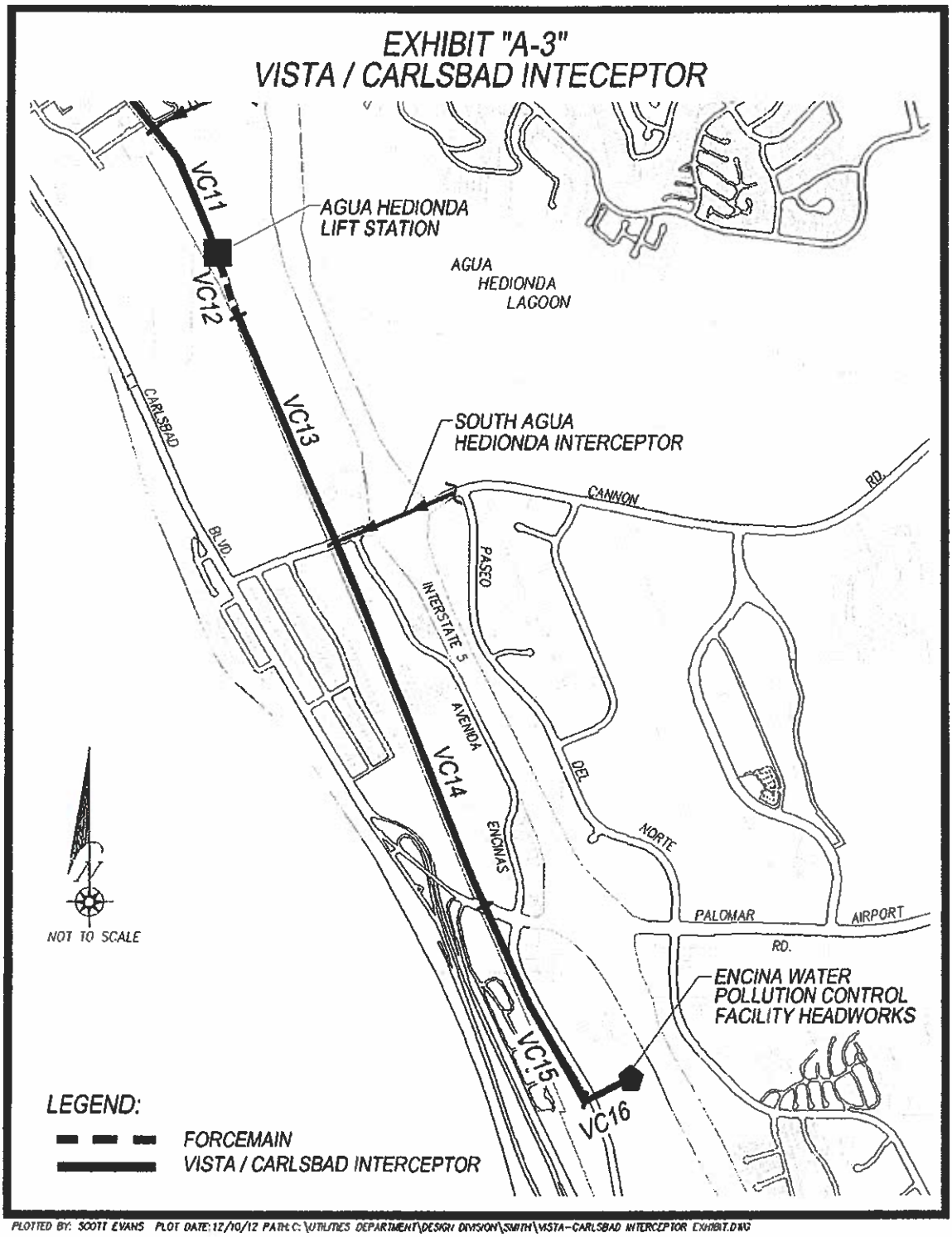

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EXHIBIT "B"
VISTA/CARLSBAD INTERCEPTOR SEWER SYSTEM
Capacity Rights

			Capacity Rights					
			Vista			Carlsbad		
Pipeline Reach	Pipe Size (inches)	Pipe Capacity (mgd) (a)	Average Flow (mgd) (a)	Percent Capacity (c)	Capacity Rights (mgd)	Average Flow (mgd) (a)	Percent Capacity (c)	Capacity Rights (mgd)
VC1	36	30.0	10.38	96.6	27.37	0.37	3.4	0.93
VC2	42	34.0	10.38	93.4	31.80	0.73	6.6	2.20
VC3	36	19.5	10.38	89.6	14.50	1.20	10.4	2.00
Buena Vista Pump Sta.	--	23.1	10.38	89.6	20.70	1.20	10.4	2.40
VC4 (Force Main)	24	23.1	10.38	8.6	20.70	1.20	10.4	2.40
VC5*	42	31.5	10.38	89.6	28.20	1.20	10.4	3.30
VC6*	42	31.5	10.38	81.9	25.80	2.29	18.1	5.70
VC7*	42	31.5	10.38	79.4	25.00	2.39	20.6	6.50
VC8*	42	31.5	10.38	79.4	25.00	2.69	20.6	6.50
VC9*	48	28.5	10.38	79.4	21.50	3.37	24.5	7.00
VC10*	48	28.5	10.38	75.5	21.30	3.51	25.3	7.20
VC11	42	20.5	10.38	74.7	14.20	4.65	30.9	6.30
Agua Hedionda Pump Sta.	--	23.0	10.38	69.1	15.90	4.65	30.9	7.10
VC12 (Force Main)	2-18	23.0	10.38	69.1	15.90	4.65	30.9	7.10
VC13	42	20.5	10.38	69.1	14.10	4.65	30.9	6.40
VC14	42	20.5	10.38	56.1	11.50	8.11	43.9	9.00
VC15	42	22.8	10.38	56.1	12.80	8.13	43.9	10.00
VC16	54	67.4	10.38	50.2	33.80	10.28	49.8	33.60

a) Pipe capacity is based on a depth of flow (D) to pipe diameter (d) ratio of one (i.e., D/d = 1) and Manning's "n" value of 0.013, except where noted with an*, n=0.012 for pvc lined pipe.

b) Average flow rates are obtained from the October 1997 Sewer Master Plan Update for the City of Carlsbad. The Master Plan Update used a peaking factor of 2.0 for the Vista/Carlsbad Interceptor Sewer System.

c) The percent capacity for each pipeline reach is based on the ratio of average flow to total flow times 100 percent.

EXHIBIT "C"
VISTA/CARLSBAD INTERCEPTOR SEWER
Annual Operation & Maintenance Budget

Maintenance Cost per mile	$2,700
Length of Interceptor Pipeline Maintained by Carlsbad (VC2-16)	approx. 6 miles
Cost of Maintenance by Carlsbad	$16,200
2013 Cost Sharing (75% Vista/25% Carlsbad)	$12,150/$4,050
Length of Interceptor Pipeline Maintained by Vista (VC1)	approx. 1 mile
Cost of Maintenance by Vista	$2,700
2013 Cost Sharing (75% Vista/25% Carlsbad)	$2,025/$675

NOTES:

1. Annual O&M costs do not include special inspections such as the Agua Hedionda Trestle or pipeline cleaning which can be expected to occur every 3-5 years.

2. O&M costs will be increased by the Federal Consumer Price Index (CPI) each year to adjust for inflation.

3. Carlsbad will invoice Vista for Vista's share of the maintenance for VC2-16.

4. Vista will invoice Carlsbad for Carlsbad's share of the maintenance for VC1.

A-14. First Amendment to the Amended and Restated Agreement for Ownership, Operation and Maintenance of the Vista/Carlsbad Interceptor Sewer, May 2014.

FIRST AMENDMENT
TO THE
AMENDED AND RESTATED AGREEMENT FOR
OWNERSHIP, OPERATION, AND MAINTENANCE
OF THE VISTA/CARLSBAD INTERCEPTOR SEWER

THIS FIRST AMENDMENT to the Amended and Restated Agreement for Ownership, Operation, and Maintenance of the Vista/Carlsbad Interceptor Sewer dated June 11, 2013 ("2013 Agreement"), is made and entered into as of May 20, 2014 by and between the City of Vista, a chartered municipal corporation ("Vista"), and the City of Carlsbad, a chartered municipal corporation ("Carlsbad"), collectively, ("the Parties").

RECITALS

WHEREAS, the Parties have entered into the 2013 Agreement; and

WHEREAS, the Parties desire to exercise the ten year extension currently provided for in Section 25 of the 2013 Agreement to extend the term of the 2013 Agreement to December 31, 2042.

THEREFORE, THE PARTIES HERETO AGREE TO THE FOLLOWING:

1. Section 25 of the 2013 Agreement is amended to read as follows:

"**SECTION 25. TERM**

"The term of this Agreement shall be in effect until December 31, 2042."

2. All other terms and conditions of the 2013 Agreement shall continue in full force and effect.

[Continued on page 2.]

IN WITNESS WHEREOF, each Party hereto has, pursuant to resolution duly passed and adopted by its respective governing body, approved this First Amendment and caused it to be executed and be effective on the date first above written.

CITY OF VISTA,
a chartered municipal corporation

By: _____
Judy Ritter, Mayor

ATTEST:

By: _____
Marci Kilian, City Clerk

APPROVED AS TO FORM:

Darold Pieper, City Attorney

By: _____

RISK MANAGEMENT REVIEW:

Dolores Gascon, Risk Manager

By: _____

APPROVED
Darold Pieper
1555 043014

CITY OF CARLSBAD, a municipal
corporation of the State of California

By: _____
Matt Hall, Mayor

ATTEST:

By: _____
Barbara Engleson, City Clerk

APPROVED AS TO FORM:

Celia A. Brewer, City Attorney

By: _____

IN WITNESS WHEREOF, each Party hereto has, pursuant to resolution duly passed and adopted by its respective governing body, approved this First Amendment and caused it to be executed and be effective on the date first above written.

CITY OF VISTA,
a chartered municipal corporation

By: _____
Judy Ritter, Mayor

ATTEST:

By: _____
Marci Kilian, City Clerk

APPROVED AS TO FORM:

Darold Pieper, City Attorney

By: _____

RISK MANAGEMENT REVIEW:

Dolores Gascon, Risk Manager

By: _____

APPROVED
Darold Pieper
1555 043014

CITY OF CARLSBAD, a municipal corporation of the State of California

By: _____
Matt Hall, Mayor

ATTEST:

By: _____
Barbara Engleson, City Clerk

APPROVED AS TO FORM:

Celia A. Brewer, City Attorney

By: _____

A-15. Agreement for the Ownership, Operation and Maintenance of the West Influent Pipeline, March 2015.

AGENDA REPORT
City Council

MEETING DATE: March 25, 2015

PREPARED BY: Glenn Pruim **DEPT. DIRECTOR:** Glenn Pruim

DEPARTMENT: Public Works **CITY MANAGER:** Lawrence A. Watt

SUBJECT:

APPROVAL OF AN AGREEMENT FOR THE OWNERSHIP, OPERATION, AND MAINTENANCE OF THE WEST INFLUENT PIPELINE

RECOMMENDED ACTION:

Staff recommends that the City Council approve the Agreement for the Ownership, Operation, And Maintenance of the West Influent Pipeline

STRATEGIC PLAN:

This item relates to the Organizational Effectiveness and Efficiency element of the strategic plan.

FISCAL CONSIDERATIONS:

There are no direct costs associated with the recommended action. The ongoing costs of ownership, operation and maintenance of the West Influent Pipeline have already been incorporated into the Encinitas Sanitation Division budget.

BACKGROUND:

The Encinitas Sanitary Division of the City of Encinitas is responsible for the collection and transmission of wastewater flows within its service area. These flows are then conveyed to the Encina Water Pollution Control Facility (EWPCF), located in the City of Carlsbad, for treatment and disposal. The City of Encinitas is a member of the Encina Wastewater Authority (EWA), a Joint Powers Authority established to operate the facilities needed to beneficially treat wastewater flows generated within all or a portion of the cities of Encinitas, Carlsbad, Vista and San Marcos. The EWA is comprised of six agencies: the City of Encinitas; the City of Carlsbad; the Leucadia Wastewater District (LWD); the Buena Sanitation District; the City of Vista; and, the Vallecitos Water District. Each of those agencies appoints representatives to sit on the Board of the EWA.

All wastewater flows generated within the Encinitas Sanitary Division service area are conveyed to the EWPCF via sewer pipelines that run northerly along Highway 101. Prior to reaching the EWPCF, these flows join the LWD system at the Batiquitos Lift Station, which is located along the east side of Highway 101 north of La Costa Avenue. After combining with flows from the LWD, the wastewater is pumped to the north through a wastewater system owned and operated by the LWD. Before reaching the EWPCF, a portion of Carlsbad wastewater flows also join this line, named the Occidental Pipeline. The Occidental Pipeline then flows through Carlsbad along Avenida Encinas on its way to the EWPCF. Just before reaching the EWPCF, the Occidental Pipeline joins with the Vista/Carlsbad Sewer Interceptor, which conveys combined wastewater from the cities of Vista and Carlsbad. At this point, which occurs in a wastewater confluence structure located within Avenida Encinas just outside the limits of the EWPCF, the wastewater system contains wastewater generated with the service areas of the City of Vista, the City of Carlsbad, the Leucadia Wastewater District, and the City of Encinitas. These combined flows then enter the EWPCF boundaries via a pipeline named the West Influent Pipeline. These flows continue into the Influent Junction Structure within the EWPCF boundaries, where they are joined by flows from the Vallecitos Water District and the Buena Sanitation District. Exhibit 'A' of Attachment 'A' provides a diagram of the wastewater influent pipelines in the vicinity of the EWPCF.

DISCUSSION:

The EWA responsibility is to treat the wastewater of its member agencies. It is not responsible for the collection and transmission of those flows to the treatment plant. The beginning of the treatment system has been interpreted by the general managers of the member agencies to be the Influent Junction Structure.

In October 2010, the West Influent Pipeline collapsed, causing a significant wastewater spill at the EWPCF site. The pipeline was repaired as part of an emergency project. During that emergency, it was discovered that the ownership of the West Influent Pipeline had never been formally established. In response, the four agencies that contribute flow to that line; including the Leucadia Wastewater District and the cities of Vista, Carlsbad and Encinitas, began discussions to develop an agreement to address the ownership, operation and maintenance of the pipeline. That agreement is the subject of this item.

The West Influent Pipeline is a short segment of 60-inch diameter pipe, approximately 330 feet in length. The four agencies have agreed that the financial and legal responsibility for the pipeline should be shared in proportion to the amount of flow each agency is allowed to contribute to the pipeline. The Agreement establishes the following ownership percentages:

Agency	Ownership Percentage
City of Carlsbad	34.8%
City of Encinitas	6.7%
Leucadia Wastewater District	26.1%
City of Vista	32.4%
Total	100.0%

The Agreement identifies the City of Carlsbad as the lead agency responsible for maintenance of the pipeline. Maintenance costs incurred by Carlsbad will be allocated to the agencies based on the above listed percentages.

The costs of the emergency replacement project were paid by the four agencies in accordance with the ownership percentages shown above. Being a new line, maintenance costs of this line will be minimal and have been included in the ESD operating budget.

ENVIRONMENTAL CONSIDERATIONS:

Approval of this agreement is exempt from the California Environmental Quality Act (CEQA) because it is not a "project" per Section 15378(b)(5) of the CEQA Guidelines.

ATTACHMENTS:

Attachment A – Agreement for the Ownership, Operation, and Maintenance of the West Influent Pipeline

AGREEMENT FOR THE OWNERSHIP, OPERATION, AND MAINTENANCE OF THE WEST INFLUENT PIPELINE

THIS AGREEMENT is made and entered into as of December 9, 2014, by and between the City of Vista, a chartered municipal corporation ("Vista"); the City of Carlsbad, a chartered municipal corporation ("Carlsbad"); the Leucadia Wastewater District, a county water district ("LWD"); the City of Encinitas, a general law city ("Encinitas"), and the Encina Wastewater Authority, a public agency ("EWA"). These entities are also individually referred to as a "Party" and collectively as "Parties."

RECITALS

A. EWA is responsible for the operation, maintenance and administration of the Encina Water Pollution Control Facility.

B. Vista, Carlsbad, LWD, and Encinitas are four of the six members of the Encina Joint Powers Authority that own the Encina Water Pollution Control Facility, and each sends wastewater to that facility for treatment.

C. On February 26, 2002, Carlsbad and Vista entered into an agreement for the ownership, operation, and maintenance of the Vista/Carlsbad Interceptor. An interceptor sewer pipeline jointly owned by Vista and Carlsbad which extends to the Encina Water Pollution Control Facility. The individual pipeline segments of the Vista/Carlsbad Interceptor have been commonly referred to as VC1 through VC16. This agreement was amended and restated on June 11, 2013.

D. The segment formerly known as VC16 has been reconstructed by EWA and paid for by Vista, Carlsbad, LWD, and Encinitas and is now known as the West Influent Pipeline. It receives flows from both the Vista/Carlsbad Interceptor and the Occidental line which serves and is owned, operated, and maintained by Carlsbad, LWD, and Encinitas.

E. The West Influent Pipeline begins at the confluence junction structure of the V/C Intercepter Sewer and the Occidental Sewer as shown on the City of Carlsbad Drawing Number 474-8 and terminates at the influent junction structure of the Encina Water Pollution Control Facility. The West Influent Pipeline includes the confluence junction structure but excludes all sewer pipeline connections to that structure. A schematic drawing of the West Influent Pipeline is attached as Exhibit A.

F. The Parties desire to enter into an agreement for the ownership, operation, and maintenance of the West Influent Pipeline.

NOW, THEREFORE, in consideration of these recitals and the mutual covenants contained herein, the Parties agree as follows:

Section 1 DEFINITIONS

For the purposes of this Agreement, the following terms shall have the meanings indicated:

1.1 Administrator. The Administrator shall be the individuals designated to administer the functions of the sewer system for that Party. For Vista, Carlsbad, and Encinitas the

Administrator is each City's City Manager or his or her designated representative. For LWD and EWA, the Administrator is the General Manager or his or her designated representative.

1.2 Capacity. Capacity is identified in Exhibit B.

1.3 Improvement or Enlargement Costs. These include the cost of land, easements, rights-of-way, engineering, construction management, construction inspection, and construction.

1.4 Lead Agency. The Party identified in a Project Agreement as responsible for the planning, design, and construction of a given component of the West Influent Pipeline.

1.5 Ownership Interest. Vista, Carlsbad, LWD, and Encinitas jointly own the West Influent Pipeline, and their respective ownership interests in the West Influent Pipeline is set forth in Exhibit B. For purposes of this Agreement, Vista, Carlsbad, LWD, and Encinitas are referred to collectively as the "Owners."

1.6 Project Agreement. A separate agreement between Owners that defines project-specific requirements of each Owner, cost sharing for design and construction, the method of cost accounting and the payment schedule for the improvement or enlargement of the West Influent Pipeline.

1.7 Wastewater. Wastewater shall be construed to mean domestic sewage, authorized industrial discharges that are in compliance with the EWA's Source Control Program, and Inflow/Infiltration.

Section 2 JOINT PARTICIPATION

The Owners shall participate jointly in the construction, ownership, maintenance, operation, and use of the West Influent Pipeline, including the parts thereof which may be subsequently acquired or constructed for the improvement or enlargement thereof. The Owners shall pay for such construction, ownership, maintenance, operation, and use of the West Influent Pipeline in proportion to their respective Ownership Interests or as otherwise provided below.

Section 3 CAPACITY RIGHTS

3.1 Each Owner has heretofore paid for its Ownership Interest.

3.2 No Owner may grant, encumber, limit, or restrict its interest in any part of the West Influent Pipeline for any purpose other than the disposal of wastewater, without the prior written approval of all the other Owners.

3.3 None of the Owners shall exceed their Capacity rights in the West Influent Pipeline. Any use of Capacity in excess of an Owner's Ownership Interest shall be considered a trespass. Any Owner is hereby authorized to specifically enforce the terms of this section against another Owner, including through commencement of a proceeding at law or equity. The Owners agree that specific enforcement is a proper remedy in that payment of damages is not an adequate remedy for the potential losses to any Owner resulting from the loss of Capacity. For example, replacement of Capacity may be impractical and the consequences for the economic development of an Owner are not readily subject to quantification. Each Owner hereby consents to the commencement of such action or actions and waives any right it may

have to further approval of such actions under this Agreement. In addition to any injunctive relief, any Owner may seek consequential damages. In any such action, the prevailing party shall be entitled to attorney's fees and costs.

Section 4 ACQUISITION OF ADDITIONAL CAPACITY

In the event any Owner requires capacity in the West Influent Pipeline in excess of the proportionate capacity allowed under this Agreement, and the West Influent Pipeline is not being used by the other Owners to the full percentage of the total capacity to which they are entitled, the Owner requiring additional capacity may license, lease, or purchase such additional capacity from the other parties. Such license, lease, or purchase shall be accomplished by written agreement, a copy of which shall be provided to each Owner, and Exhibit B will be deemed amended to conform to the new percentages. The value of the West Influent Pipeline as of April 2011 is $678,395. The replacement value of the West Influent Pipeline shall be calculated by multiplying the value as of April 2011, by the percentage change in the Engineering News Record Construction Cost Index for Los Angeles (ENRLA) for each calendar year starting with 2012, then adding the resulting products to the original value of the subject facility.

Section 5 RESPONSIBILTY OF LEAD AGENCY

Carlsbad shall be the Lead Agency with maintenance responsibility for the West Influent Pipeline, unless agreed upon otherwise by a separate Project Agreement. The Owners shall mutually agree on all recommendations for improvements and enlargements to the West Influent Pipeline; however, a separate Project Agreement shall be prepared and executed by the Owners for all future improvements and enlargements to the West Influent Pipeline and to determine the Lead Agency for that project.

Section 6 IMPROVEMENTS OR ENLARGEMENTS OF THE WEST INFLUENT PIPELINE

6.1 As deemed necessary, the Owners shall meet to discuss future improvements or enlargements of the West Influent Pipeline. Once it is agreed between the Owners that an improvement or enlargement is necessary, planning and design work for the improvement or enlargement of the West Influent Pipeline shall be prepared. Upon completion and acceptance by the Owners of the planning and design work schematically detailing an improvement or enlargement, a Lead Agency will be designated that will prepare a Project Agreement which will identify the project specific requirements of each Owner including the cost sharing for design and construction.

6.2 When the Project Agreement has been accepted by the legislative body of each Owner, the Lead Agency under the Project Agreement shall engage the services of a consultant or consultants to prepare plans, specifications, and related materials necessary for the acquisition and construction of the improvements or enlargements. The specifications shall contain all appropriate hold harmless clauses, insurance requirements, and indemnifications for those agencies involved in the project.

6.3 Upon completion of the plans, specifications, and related materials, their approval by the other Owners, the acquisition of necessary lands and right-of-way, and at such time as the Owners are prepared to finance their proportionate shares of the acquisition and construction cost, including determining any maximum funding commitments, the Lead Agency

under the Project Agreement shall advertise for bids for the construction of the improvements or enlargements or such portion thereof as may be hereafter agreed to by the Owners. The decision to accept bids and award the construction contract shall be the sole responsibility of the Lead Agency. The Lead Agency shall cause the work to be inspected, administer the execution of the contract, and approve necessary change orders. All records for improvements or enlargements shall be permanently retained.

Section 7 COST SHARING OF IMPROVEMENTS OR ENLARGEMENTS

All improvement or enlargement costs of the West Influent Pipeline shall be borne and paid by the Owners in proportion to each Owner's Ownership Interest or as otherwise provided in the Project Agreement. Should the percentage of capacity to be owned after improvements are constructed vary from Exhibit B, then Exhibit B shall be amended accordingly upon completion of construction.

Section 8 OPERATIONS, MAINTENANCE, AND ACCESS

8.1 Carlsbad shall be the Lead Agency for the operation and maintenance of the West Influent Pipeline and shall maintain it in good repair and working order in accordance with recognized sound engineering practice. Carlsbad shall maintain accurate records and accounts in connection with the operation and maintenance of the West Influent Pipeline for a minimum period of five years. These records and accounts shall be available for inspection by any other Party upon written request.

8.2 Operation and maintenance of the West Influent Pipeline shall include the labor, equipment, and materials required for daily operation and routine maintenance. Routine maintenance activities typically include annual visual inspections of the confluence junction structure, clearing around the structure, and replacement of corroded or damaged confluence junction structure appurtenances. Cleaning and CCTV inspections of the West Influent Pipeline will be performed at least every five years or as necessary to maintain the intended function of the West Influent Pipeline.

8.3 EWA shall provide the Owners with access and any other cooperation reasonably necessary for the operation, maintenance, improvement and/or enlargement of the West Influent Pipeline in accordance with the terms of this Agreement.

Section 9 BUDGETING AND ACCOUNTING FOR OPERATION AND MAINTENANCE

9.1 The Owners shall share in the operation and maintenance expenses of the West Influent Pipeline in proportion to their respective Ownership Interests. Special inspections and cleaning not included as part of routine maintenance will be performed as necessary by Carlsbad or a qualified contractor, as agreed by all Owners, and invoiced to each Owner on a time and materials basis in proportion to each Owner's Ownership Interest.

Section 10 EMERGENCY REPAIRS OR RECONSTRUCTION

10.1 Carlsbad shall be allowed to perform emergency repairs or reconstruction of the West Influent Pipeline, in whole or in part, without prior approval from the other Owners, as necessary to maintain the continuous operation of the system such that the need for repair or

reconstruction is necessary to prevent property damage or imminent danger to health and safety.

10.2 The Owners shall each pay all cost of emergency repair or reconstruction of the West Influent Pipeline, or portion thereof, in proportion to their Ownership Interests.

Section 11 BUDGETING AND ACCOUNTING

11.1 Each Owner shall be strictly accountable for all funds received and shall maintain adequate records of all receipts and disbursements pursuant to this Agreement. In addition, each Owner shall maintain such additional records relating to the acquisition, construction, ownership, maintenance, operation, and use of the West Influent Pipeline as is appropriate. Each of the Owners, with reasonable notice, has the right to inspect and examine the records of the other Owner insofar as such records relate to the West Influent Pipeline.

11.2 Each Owner shall maintain all records relating to the West Influent Pipeline for a minimum of five years, except records for improvements or enlargements. Records for improvements or enlargements shall be kept permanently.

Section 12 INSURANCE

Each Owner shall maintain for the duration of the Agreement, and any and all amendments, liability insurance against claims for injuries to persons or damage to property which may arise out of or in connection with performance of the services of each Owner, their agents, representatives, employees, or subcontractors. Each Party shall maintain workers' compensation coverage and limits as required by the California Labor Code.

Section 13 WASTEWATER SPILLS

13.1 In the event of a wastewater spill from the West Influent Pipeline that occurs as a result of an unforeseen condition, where such wastewater spill could not have been prevented with normal and routine maintenance, then each Owner shall be responsible for the costs for cleanup and payment of any legal fines and expenses incurred in proportion to each Owner's Ownership Interest in the West Influent Pipeline.

13.2 An Owner, which by its sole negligence or willful misconduct, causes a wastewater spill shall be solely responsible for all costs for cleanup and payment of any legal fines and expenses incurred.

Section 14 APPORTIONMENT OF LIABILITY

14.1 Any liability incurred by the Owners, which liability arises out of or in connection with the construction, operation, or maintenance of the West Influent Pipeline, shall be discharged by payment by each Owner in proportion to its Ownership Interest.

14.2. Notwithstanding the provisions of Government Code Section 895.2, Owners shall, to the fullest extent allowed by law, indemnify, defend, and hold EWA and the member agencies of EWA which have no ownership interest in the West Influent Pipeline, their officers, directors, agents, and employees harmless from any and all claims, demands, liens, actions, liabilities, costs, and expenses, including attorney's fees, based upon or arising out of, or

claimed to have arisen out of, any act or omission by EWA related to this Agreement, other than actual intentional or willful misconduct of an EWA employee, officer, or agent.

14.3. Owners also agree to hold harmless and defend such agencies and EWA, their directors, officers, agents, and employees with respect to claims or legal proceedings or judgments made, filed, or presented against the foregoing, by reason of Owners', or their officers', agents', or employees' negligence, intentional or willful misconduct regarding the West Influent Pipeline during the term of this Agreement.

Section 15 NOTICE

Any notice or demand which may or must be given or made by a Party under the terms of this Agreement or any statute or ordinance shall be in writing; and shall be deemed received on: (a) the day of delivery if delivered by hand (including overnight courier service) during receiving Party's regular business hours or by facsimile before or during receiving Party's regular business hours; or (b) the day of delivery shown on a return receipt for registered or certified United States mail.

Section 16 SETTLEMENT OF DISPUTES OR CONTROVERSIES

Should any dispute or controversy arise in connection with this Agreement or in connection with the acquisition, construction, maintenance, operation, repair, reconstruction, or enlargement of the West Influent Pipeline or in connection with any of the affairs or operation thereof, or the execution of the term of this Agreement, the Parties shall make reasonable efforts to resolve the dispute. In the event that the Parties are unable to reach a resolution to the dispute and prior to initiating any legal action, the Parties shall select a neutral mediator to assist in the resolution of the dispute. Each Party shall share equally in the cost of the mediator.

Section 17 MODIFICATION OF AGREEMENT

This Agreement shall contain all of the terms and conditions made between the Parties hereto and shall not be amended except by an agreement in writing signed by all Parties.

Section 18 SEVERABILITY

If any section, subsection, sentence, clause, phrase, or word of this Agreement, or the application thereof, to any Party, to any other person or circumstance is for any reason held invalid, it shall be deemed severable and the validity of the remainder of the Agreement or the application of such provision to the other Parties, or to any other person or circumstance shall not be affected thereby. Each Party hereby declares that it would have entered into this Agreement and each section, subsection, sentence, clause, phrase, and word thereof irrespective of the fact that one or more section, subsection, sentence, clause, phrase, or word, or the application thereof to any Party or any other person or circumstance be held invalid.

Section 18 COUNTERPARTS AND EXHIBITS

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument. All documents referenced as exhibits in this Agreement are hereby incorporated in this Agreement. In the event of any material discrepancy between the express provisions of this Agreement and the provisions of any exhibit, the provisions of this Agreement shall prevail.

Section 19 TERM

The initial Termination Date of this Agreement will be 20 years from the date first above written. This Agreement shall automatically renew as provided below unless a Party gives written notice of non-renewal at least 12 calendar months prior to the initial Termination Date or any succeeding Termination Date. Unless such notice of non-renewal is timely given, this Agreement shall automatically renew for an additional 10 years, and a new Termination Date shall be accordingly established.

IN WITNESS WHEREOF, each Party has, pursuant to resolution duly passed and adopted by its respective governing body, approved this Agreement and caused it to be executed and be effective as of the date first above written.

CITY OF VISTA, a chartered municipal corporation

By: _____
JUDY RITTER, Mayor

ATTEST:
Marci Killian, City Clerk

By: _____

APPROVED AS TO FORM:
Darold Pieper, City Attorney

By: _____
APPROVED
Darold Pieper
1704 111214

CITY OF CARLSBAD, a chartered municipal corporation

By: _____
MATT HALL, Mayor

ATTEST:
Lorraine M. Wood, City Clerk

By: _____

APPROVED AS TO FORM:
Celia A. Brewer, City Attorney

By: _____

CITY OF ENCINITAS, a general law city

By: _____
KRISTIN GASPAR, Mayor

ATTEST:
Kathy Hollywood, City Clerk

By: _____

APPROVED AS TO FORM:
Glenn Sabine, City Attorney

By: _____

LEUCADIA WASTEWATER DISTRICT, a county sanitation district

By: _____
DAVID KULCHIN, President

ATTEST:
Paul J. Bushee, Secretary

By: _____

APPROVED AS TO FORM:
Wayne Brechtel, District Counsel

By: _____

ENCINA WASTEWATER AUTHORITY

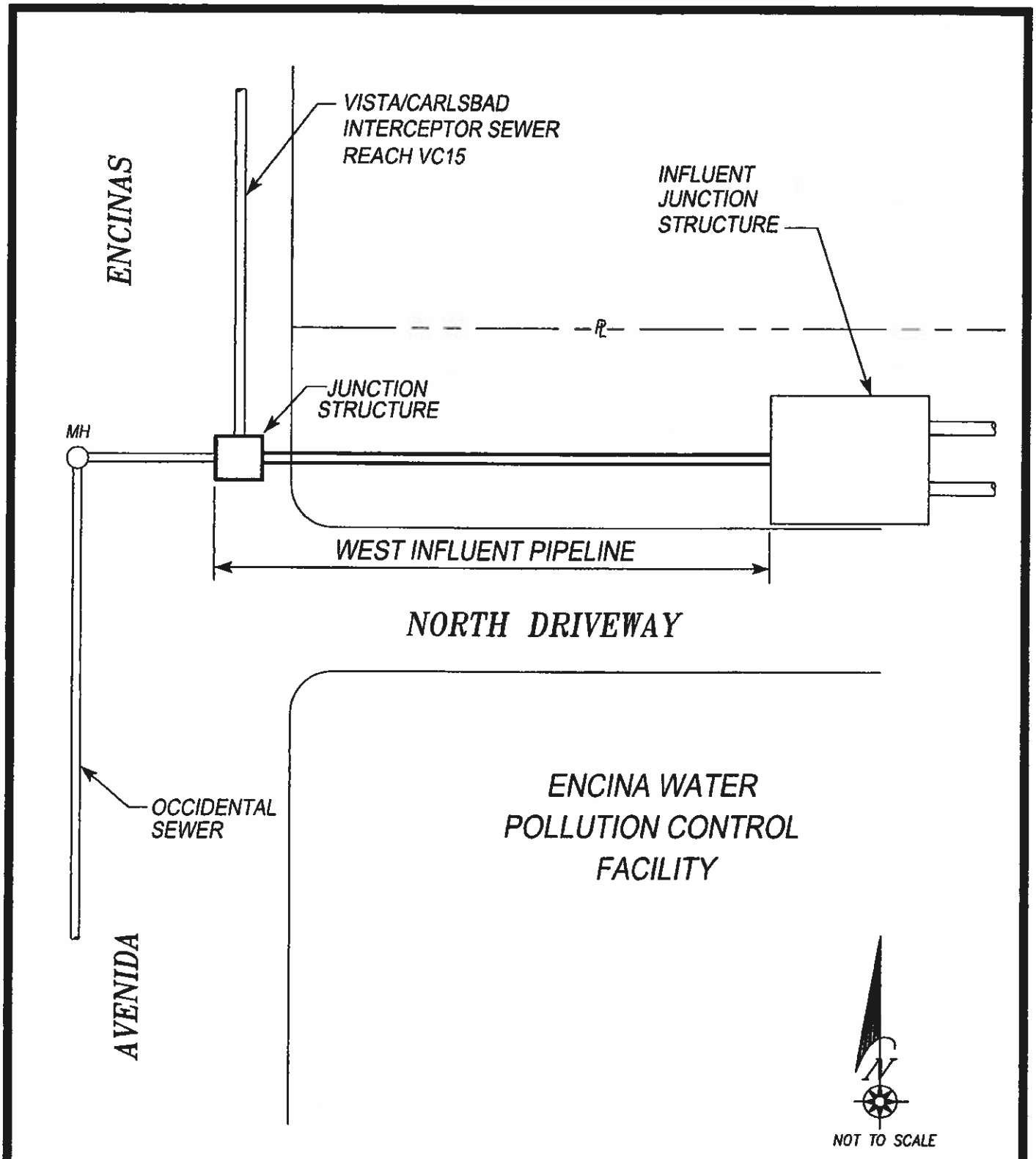
By: _____

ATTEST:

By: _____

APPROVED AS TO FORM:
Gregory Moser, General Counsel

By: _____



PROJECT NAME	EXHIBIT
AGREEMENT FOR OWNERSHIP, OPERATION, AND MAINTENANCE OF THE WEST INFLUENT PIPELINE	A

PLOTTED BY: SCOTT EVANS PLOT DATE: 11/6/14 PATH: O: \UTILITIES DEPARTMENT\DESIGN DIVISION\SMITH\WEST INFLUENT PIPELINE EXHIBIT.DWG

PIPELINE CAPACITY

EXHIBIT B

The Capacity of West Influent Pipeline is 76.961 MGD.

The percentage ownership and capacity ownership of each of the Owners is shown below:

	Percentage Ownership	Capacity Ownership
City of Carlsbad	34.8%	26.7824 MGD
City of Encinitas	6.7%	5.1564 MGD
Leucadia Wastewater District	26.1%	20.0868 MGD
City of Vista	32.4%	24.9354 MGD
Total	**100.0%**	**76.9610 MGD**

PROJECT NAME
AGREEMENT FOR OWNERSHIP, OPERATION, AND MAINTENANCE OF THE WEST INFLUENT PIPELINE

EXHIBIT
B

A-16. Joint Agreement for Construction, Operation and Maintenance of the Buena Outfall Odor Control Unit, June 2015.

JOINT AGREEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF THE BUENA OUTFALL ODOR CONTROL UNIT

THIS AGREEMENT for the Buena Outfall Odor Control Unit ("Agreement") is made and entered into as of June 11, 2015 ("Agreement Date"), by and between the Buena Sanitation District, a County Sanitation District, a special district ("District"), and the City of Carlsbad, a chartered municipal corporation ("Carlsbad"), collectively, ("the Parties").

RECITALS

A. Upon completion of the Buena Outfall Force Main Extension project (District CIP 8131) the District will no longer have flow entering the Buena Outfall or be responsible for odor control for the Buena Outfall; and

B. Until such time the Buena Outfall Force Main Extension project is complete the District and Carlsbad desire to enter into a joint agreement for procurement, installation, and maintenance of the Buena Outfall odor control active bio-filter units for odor treatment; and

C. On June 11, 2013, the District adopted Resolution No. 2013-006, approving its Five Year Capital Improvement Program (CIP) and FY 2013/14 Capital Project Budget and authorizing appropriations for FY 2013/14 Capital Projects; and

D. The District FY 2013/14 Capital Project Budget included an appropriation from the Buena Sewer Replacement Fund (506) for Buena Outfall Odor Control (CIP 8261) located along Palomar Airport Road; and

E. The program for Buena Outfall Odor Control included purchase and installation of odor control media in FY 2013/14 and replacement of spent odor control media in FY 2014/15 as temporary control until the Buena Outfall Force Main Extension project (CIP 8131) is complete; and

F. On November 4, 2013, a purchase agreement for installation of manhole odor control inserts and filter media was executed with Southland Water Technologies, LLC, but the installed have proven to provide insufficient odor control; and

G. On February 10, 2015, the District adopted Resolution No. 2015-002, amending its Capital Improvement Program (CIP) Budget to appropriate an additional $150,000 for Buena Outfall Odor Control (CIP 8261) for the 2014/15 fiscal year.

NOW THEREFORE, the Parties agree as follows:

1. PROJECT DESCRIPTION

A. The Buena Outfall currently receives 2.1 million gallons per day of flow from the Buena Sanitation District and 0.1 million gallons per day of flow from the City of Carlsbad. The purpose of odor control for the Buena Outfall located along Palomar Airport Road is to mitigate sewer gas odor, primarily hydrogen sulfide gas, from escaping manholes and becoming a potential malodor. Odor control units are pan-like filters inserted into each manhole which attach to the rim and frame of the manhole. Once the manhole lid is placed over the unit it can filter and treat gas as it travels past the lid. The District has installed 31 units along Palomar Airport Road

and have found that the pan-like filter units are insufficient and that an active odor control unit is needed.

2. JOINT RESPONSIBILITIES OF THE PARTIES

A. Carlsbad and the District shall mutually agree on the scope of the construction contract and the maintenance agreement through a subsequently-executed staff memorandum attached to this Agreement. Maintenance and operation shall include at a minimum servicing cost, water cost, electrical cost, and filter maintenance.

3. RESPONSIBILITIES OF CARLSBAD

A. Carlsbad shall procure, install, and maintain a new active odor control unit ("Unit") for the Buena Outfall located along Palomar Airport Road.

B. Carlsbad shall obtain permission to enter and construct the Unit at the Palomar Commons development.

C. Carlsbad shall enter into a maintenance agreement with a contractor authorized to maintain the Unit.

4. RESPONSIBILITIES OF DISTRICT

A. District shall pay Carlsbad for its share of procurement, installation, and maintenance costs for the Unit.

B. Payment to Carlsbad for procurement and installation of the Unit shall be made within 30 days from the receipt of an invoice from Carlsbad at the completion of installation.

C. District shall pay Carlsbad for the maintenance and operation costs of the Unit on an annual (fiscal year) basis no later than October 31st annually.

5. ALLOCATION OF COSTS

A. District shall be responsible for 95 percent of the installation, maintenance and operating costs of the Unit.

B. Carlsbad shall be responsible for 5 percent of the installation, maintenance and operating costs of the Unit.

6. TERM

A. The District is currently designing the Buena Outfall Force Main Extension project (District CIP 8131). The new Buena Outfall will start upstream of the Palomar Commons at El Camino Real just north of Palomar Airport Road. Upon completion of the new Buena Outfall and removal of District's flow from the old Buena Outfall, this Agreement shall terminate and Carlsbad shall assume all costs associated with the operation and maintenance of the Unit pending the execution of an agreement between the Parties for the transfer of the old Buena Outfall.

7. TRANSFER AGREEMENT

A. Following the completion of the new Buena Outfall and the removal of the District's flow from the old Buena Outfall, the Parties shall execute an agreement transferring the District's interest in the old Buena Outfall to Carlsbad at a price that reflects the District's capital investment in the old Buena Outfall, including the Unit, less appropriate depreciation.

IN WITNESS WHEREOF, each Party has, pursuant to resolution duly passed and adopted by its respective governing body, approved this Agreement and caused it to be executed and be effective as of the Agreement Date.

BUENA SANITATION DISTRICT, a county sanitation district

By: _____
JUDY RITTER, CHAIRPERSON

ATTEST:
MARCI KILIAN, CLERK OF THE BOARD

By: _____

APPROVED AS TO FORM:
DAROLD PIEPER, DISTRICT COUNSEL

By _____

RISK MANAGEMENT REVIEW:
DOLORES GASCON, RISK MANAGER

By: _____

APPROVED
Darold Pieper
1439031215

CITY OF CARLSBAD, a chartered municipal corporation

By: _____
MATT HALL, MAYOR

ATTEST:
BARBARA ENGLESON, CITY CLERK

By: _____

APPROVED AS TO FORM:
CELIA A. BREWER, CITY ATTORNEY

By: _____

A-17. Revised Establishment Document for Encina Wastewater Authority JPA effective November 9, 1994 and Revised Basic Agreement for Ownership, Operation and Maintenance of the Joint Sewage System as amended October 22, 2014, January 2017.

ENCINA WASTEWATER AUTHORITY

A Public Agency

6200 Avenida Encinas
Carlsbad, CA 92011-1095
Telephone (760) 438-3941
FAX (760) 438-3861 (Plant)
(760) 431-7493 (Admin)

January 23, 2017

Dear San Diego LAFCO,

In accordance with Senate Bill No. 1266, Encina Wastewater Authority is providing you with the full text our joint powers agreements. This includes two items which operate in conjunction with each other: 1) the Revised Establishment Document which formally created the joint powers authority and 2) the Revised Basic Agreement which governs the ownership, operation and maintenance of the joint sewage system. There are not any amendments to either of these documents at this time.

If you have any questions or concerns, please feel free to reach out to me or Joseph Spence at jspence@encinajpa.com at any time.

Sincerely,

Michl Stilicht

Michael Steinlicht
General Manager

Attachment 1: Revised Establishment Document Effective November 9, 1994
Attachment 2: Revised Basic Agreement Amended October 22, 2014

ATTACHMENT 1

REVISED ESTABLISHMENT DOCUMENT EFFECTIVE NOVEMBER 9, 1994

January 23, 2017

REVISED ESTABLISHMENT DOCUMENT
FOR THE
ENCINA WASTEWATER AUTHORITY
AS AMENDED
EFFECTIVE November 9, 1994

Ref: Admin.02-7081

THIS AGREEMENT (hereinafter the Revised Establishment Document, "RED") is made and entered into this 17th day of December 1990, by and among the CITY OF VISTA, (hereafter VISTA), the CITY OF CARLSBAD, (hereafter CARLSBAD), the BUENA SANITATION DISTRICT, (hereafter BUENA), the VALLECITOS WATER DISTRICT, a County Water District (hereafter VALLECITOS), the LEUCADIA COUNTY WATER DISTRICT, a County Water District (hereafter LEUCADIA), and the ENCINITAS SANITARY DISTRICT (hereafter ENCINITAS), herein called the "member agencies", for the operation, maintenance, and administration of their jointly owned sewerage system.

RECITALS

WHEREAS, each of the member agencies is a public agency authorized and empowered to contract for the joint exercise of powers under the Government code of the State of California; and

WHEREAS, each of the member agencies has the authority and power to collect, transmit, treat and dispose or reuse wastewater and wastewater treatment byproducts, and to construct and operate facilities for such purposes; and

WHEREAS, the member agencies recognize the need to operate, maintain and administer the Encina Joint System on a cooperative basis for the collection, transmission, treatment, and disposal of wastewater, and the management of wastewater treatment byproducts; and

WHEREAS, on August 1, 1988, the member agencies entered into a Joint Exercise of Powers Agreement, which this RED is to replace, pursuant to the provisions of Article 1, Chapter 5, division 7, title 1 of the California Government Code, creating a public agency then known as the Encina Administrative Agency (now Operator/Administrator of the Encina Joint System; and

WHEREAS, the Joint Exercise of Powers Agreement establishing the EWA was adopted as a supplement to the "Basic Agreement" establishing the Encina Joint Powers; and

WHEREAS, the member agencies desire to revise and condense the Basic Agreement and have drafted legal documents known collectively as the Revised Basic Agreement that are to be considered concurrently with this Agreement; and

WHEREAS, the member agencies desire to (a) retain the EWA as the Operator/Administrator of the Encina Joint Powers and (b) reestablish the organization, administration, rules, and specific powers of the EWA by entering into a revised agreement, to be known as the "Revised Establishment Document" ("RED"), separate from the Revised Basic Agreement ("RBA"), pursuant to Article 1, Chapter 5, Division 7, Title 1 of the California Government Code relating to the joint exercise of powers.

NOW THEREFORE, THE PARTIES HERETO COVENANT WITH EACH OTHER AS FOLLOWS:

Section 1. DEFINITIONS

For the purposes of this RED and the RBA, the following terms shall have the meanings indicated below:

1.1 Basic Agreement. That agreement by and among Vista, Carlsbad, Buena, Vallecitos, Leucadia, and Encinitas including all supplements and amendments thereto entered into beginning July 13, 1961.

1.2 Joint Advisory Committee. The Joint Advisory Committee (JAC) as defined in the Revised Basic Agreement.

1.3 Joint System. The Encina Joint System as defined in the Revised Basic Agreement.

1.4 Revised Basic Agreement. That agreement by and among Vista, Carlsbad, Buena, Vallecitos, Leucadia, and Encinitas including all amendments thereto entered into beginning December 17, 1990 and superseding the Basic Agreement.

Section 2. TERMS

2.1 Establishment of Agency: There is hereby established a public agency known as the Encina Wastewater Authority, herein called EWA (formerly known as the Encina Administrative Agency). For the purposes of this agreement, EWA is a public agency separate from the parties hereto, but it is the intent of these parties that EWA be subordinate to and dependent upon the member agencies in all matters.

2.2 General Duties of the EWA. The EWA shall operate, maintain, and administer the Encina Joint System utilizing funds contributed by the member agencies and grants received from the Federal and State governments.

2.3 Powers. The EWA shall have the following powers as needed to fulfill its duties:

2.3.1 To operate, maintain, administer and manage the Joint System, including any buildings, works or improvements comprising part of the Joint System and located either inside or outside the boundaries of the member agencies, in

accordance with sound engineering and accounting practices with local, state and federal laws and regulations;

2.3.2 To make and enter contracts in connection with the administration, management, maintenance and operation of the Joint System;

2.3.3 To employ agents and employees to operate, maintain, administer and manage the Joint System;

2.3.4 To incur debts, liabilities or obligations in connection with the operation, maintenance, administration and management of the Joint System;

2.3.5 To sue and be sued in its own name, provided that the EWA shall not commence or intervene in any lawsuit without the approval of all of its member agencies, except pursuant to paragraph 2.3.10 hereof;

2.3.6 To acquire, hold, and dispose of such equipment as may be reasonably necessary to the property operation, maintenance, administration and management of wastewater treatment and disposal facilities;

2.3.7 To file reports associated with the operation, maintenance, administration and management of the Joint System;

2.3.8 In an emergency, to reconstruct or cause to be reconstructed such portions of the Joint system when reconstruction is immediately required to permit the Joint System to continue to function;

2.3.9 To maintain at all times with a responsible insurer or insurers sufficient insurance against loss or damage to the Joint System or portion thereof, workers' compensation insurance, and insurance against public liability and property damage;

2.3.10 To adopt industrial pretreatment regulations that comply with federal and state pretreatment regulations. The regulations shall include technically based local limits, shall be followed by each member agency, shall apply to industrial connections and groundwater cleanup sites that discharge or have the potential to discharge into the Joint System, and shall allow EWA to take enforcement action against dischargers that violate the regulation;

2.3.11 To review and amend the industrial pretreatment regulations from time to time as the need arises;

2.3.12 To implement all requirements of the pretreatment regulations and all aspects of the Encina service area pretreatment program, including permitting, inspection, monitoring, reporting, and enforcement activities, except that industrial pretreatment permits shall be jointly issued by the member agency in whose jurisdiction the discharge is located and EWA;

2.3.13 To charge and bill the industrial dischargers for their respective share of the EWA's cost to implement the pretreatment regulations, including application review, permit issuance, sampling, monitoring, inspection and enforcement costs;

2.3.14 To purchase, lease or condemn real property upon such terms and conditions as approved unanimously by the member agencies;

2.3.15 To operate and maintain other facilities outside the Joint System as recommended by JAC and in accordance with EWA executed operation agreements, or as authorized in the Revised Basic Agreement, which may include budgeting responsibilities.

2.3.16 The powers enumerated herein shall be exercised subject to the restrictions upon the manner of exercising the powers of the Leucadia County Water District pursuant to the County Water District Law (Water Code §30000 et seq.).

2.4 Board of Directors. The EWA shall be administered by the governing body of the EWA which shall be known as the Board of Directors of the EWA, herein called the Board. Members of the JAC shall serve as the Board.

2.5 Officers of the Board. The Board shall elect its own officers, which shall include a Chairman, Vice-chairman, Secretary, Treasurer, and Auditor. The Chairman and Vice-Chairman shall be members of the Board and the Secretary may, but need not, be a member of the Board.

2.5.1 Treasurer. The Treasurer shall be appointed by the Board of Directors to serve at the Board's pleasure. The Treasurer shall be the depository and have custody of all money of the EWA from whatever source. The Board shall appoint the Treasurer from among the officers and employees of the Authority. The Board may appoint one or more persons to act as assistants to the Treasurer from among the officers and employees of the Authority. Upon appointment, an assistant shall be considered an "other officer" of the EWA under Section 2.5.3 of this RED. The person appointed as Treasurer may simultaneously hold the office of Auditor.

2.5.2 Auditor. The Auditor shall be appointed by the Board of Directors to serve at the Board's pleasure. The Auditor shall draw all warrants to pay demands against the EWA approved by the Board of Directors. The Board shall appoint the Auditor from among the officers and employees of the Authority. The Board may appoint one or more persons to act as assistants to the Auditor from among the officers and employees of the Authority. Upon appointment, an assistant shall be considered an "other officer" of the EWA under Section 2.5.3 of the RED. The person appointed as Auditor may simultaneously hold the office of Treasurer.

2.5.3 Other Officers. The General Manager and Attorney for the EWA shall be appointed by the Board. Subject to the limits of the EWA's approved

budget, the Board shall also have the power to appoint and employ such other officers, consultants, advisors, and independent contractors as it may deem necessary or convenient for the business of the EWA, who shall serve at the pleasure of the Board. The public officer, officers, or persons who have charge of, handle, or have access to any substantial property of the EWA shall file an official bond in an amount to be fixed by the Board. The General Manager shall have the power to appoint, promote, demote and remove employees of the EWA subject to the provisions of the personnel policy of the EWA and the EWA's approved budget.

2.6 Meetings of the Board.

2.6.1 Regular Meetings. The Board shall provide for its regular meetings; provided, however, it shall hold at least one regular meeting per month. The dates, hour, and place of the regular meetings shall be fixed by resolution, and a copy of such resolution shall be furnished to each member agency.

2.6.2 Ralph M. Brown Act. All meetings of the Board, including, without limitations, regular, adjourned regular, and special meetings, shall be called, noticed, held, and conducted in accordance with the provisions of the Ralph M. Brown Act (commencing with Section 54950 of the California Government Code).

2.6.3 Minutes. The Secretary of the EWA shall cause to be kept minutes of all meetings of the Board, and shall cause a copy of the minutes to be forwarded to each member of the Board and to each of the parties hereto.

2.6.4 Quorum and Vote. A majority of the Board or their alternates shall constitute a quorum for the transaction of business; except that less than a quorum for the transaction of business; except that less than a quorum may adjourn from time to time. The affirmative vote of a majority of a quorum shall be required for the approval of any action. However, when voting on a matter involving the treatment plant (Unit I) or the ocean outfall (Unit J), any member of the Board may call for a weighted vote. In such case, the affirmative vote of members representing a majority of the capacity of the Unit involved shall be required for the approval of any action, to be calculated as follows:

The total vote of all members of the Board shall be 100 percent. Each regularly appointed member shall have a percentage of vote equal to one-half of the percentage of capacity of the member agency he represents in the Unit involved. Where only one member is present, said member shall have a percentage of vote equal to the total percentage of capacity of the agency he represents. At any meeting where no regularly appointed member is represented, each alternative of such regularly appointed member is represented, each alternative of such regularly appointed member shall have a percentage of vote equal to one-half of the percentage of capacity of the agency he represents. Provided, however, at any meeting where any agency is represented by only one alternate, said alternate shall have a percentage of vote equal to the total percentage of the capacity of the agency he represents.

2.7 Rules. The Board shall adopt rules and regulations, including a conflict of interest code and a purchasing procedure. The Board may, from time to time, review and revise these rules and regulations as needed.

2.8 Budgeting. Annually, the EWA shall prepare an operation, maintenance, and administration budget (hereafter referred to as the O&M budget) and a capital improvement program budget (hereafter referred to as the capital budget). The budgets shall be prepared in accordance with the RBA and generally accepted accounting principles.

2.9 Accounting and Audits.

2.9.1 Fiscal Year. The fiscal year of the EWA shall be from July 1 to June 30.

2.9.2 Accounting Procedures and Audit. Full books and accounts shall be maintained for the EWA in accordance with practices established by or consistent with those utilized by the Controller of the State of California for like public agencies. The Auditor of the EWA shall either make or contract with a certified public accountant to make an annual audit of the accounts and records of the EWA. The minimum requirements of the audit shall be those prescribed by the State Controller for special districts under Section 26909 of the California Government Code and the audit shall conform to generally accepted accounting principles. A report of the audit shall be filed as a public record with each of the member agencies and with the San Diego County Auditor within 30 days of its completion. Such report shall be filed within 12 months of the end of the fiscal year under examination.

2.10 Liabilities. Except as provided hereinabove, the debts, liabilities and obligations of the EWA shall be the debts, liabilities and obligations of the EWA alone, and not the member agencies.

2.11 Withdrawal or Dissolution. Upon withdrawal of a member from the EWA or upon dissolution of the EWA, there shall be a partial or complete distribution of assets and discharge of liabilities as follows. The distribution of assets may be made in kind or assets may be sold and the proceeds thereof distributed to a member agency at the time of withdrawal or to the member agencies at the time of dissolution; provided that, all property and rights in property assigned or transferred by any member agency to the EWA shall be reconveyed to said member agency free and clear of all encumbrances and liens of any kind.

2.11.1 Withdrawal. Upon withdrawal of any member agency from the EWA, the withdrawing member shall receive its proportionate or otherwise defined share of any assets of the EWA and shall contribute its proportionate or otherwise defined share toward discharge of any enforceable liability incurred by the EWA.

2.11.2 Dissolution. Upon dissolution of the EWA, each member agency shall receive its proportionate or otherwise defined share toward discharges of any enforceable liabilities incurred by the EWA.

2.12 Rescission or Termination. The EWA shall continue as Operator/Administrator until such time as EWA is terminated by written consent of a majority of the member agencies, evidenced by certified copies of resolutions by their governing bodies. Upon termination of the EWA and replacement with another Operator/Administrator, employees of the EWA shall become the employees of the new Operator/Administrator subject to existing employment contracts, seniority, retirement rights and any other employee benefits or rights now enjoyed by those employees.

2.13 Notices. All notices, statements, demands, requests, consents, approvals, authorizations, agreements, appointments or designations hereunder shall be given in writing and addressed to the principal office of the EWA.

2.14 Severability. If any one or more of the terms, provisions, promises, covenants or conditions of this agreement shall by any extent be adjudged invalid, unenforceable, void or voidable for any reason whatsoever by a court of competent jurisdiction, each and all of the remaining terms, provisions, promises, covenants and conditions of this agreement shall not be affected thereby and shall be valid and enforceable to the fullest extent permitted by law.

2.15 Modification of Agreement. This agreement shall contain all of the terms and conditions made between the parties hereto and shall not be amended except by an agreement in writing signed by all the member agencies.

2.16 Succession. The provisions of this agreement shall be binding upon and shall inure to the benefit of the successors of the parties thereto.

2.17 Approval. This agreement shall be approved as of the date that all of the member agencies have approved this agreement and the Revised Basic Agreement.

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by their respective governing bodies caused this Revised Establishment Document to be executed effective as of the day and year first above written.

ATTEST:

_____

City Clerk

LEUCADIA COUNTY WATER DISTRICT

BY: _____
PRESIDENT

VALLECITOS WATER DISTRICT
BY: _____
PRESIDENT

CITY OF VISTA
BY: _____
PRESIDENT

BUENA SANITATION DISTRICT
BY: _____
PRESIDENT

ENCINITAS SANITARY DISTRICT
BY: _____
PRESIDENT

CITY OF CARLSBAD
BY: _____
PRESIDENT

APPROVED AS TO FORM:
BY: _____
EWA COUNSEL

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD

By _____

Attest: _____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By Gloria E. McClellan
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

CITY OF VISTA

By _____

Attest:

_____
City Clerk

CITY OF CARLSBAD,

By _____

Attest:

_____
City Clerk

LEUCADIA COUNTY WATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
President

ENCINITAS SANITARY DISTRICT

By _____
President

Approved as to Form:

By _____
EWA Counsel

ATTACHMENT 2

REVISED BASIC AGREEMENT AMENDED OCTOBER 22, 2014

January 23, 2017

RESOLUTION 2014-64
EXHIBIT A

REVISED BASIC AGREEMENT
FOR
OWNERSHIP, OPERATION AND MAINTENANCE OF A JOINT SEWAGE SYSTEM

AS AMENDED OCTOBER 22, 2014

Ref: Admin.14-10934

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REVISED BASIC AGREEMENT
FOR
OWNERSHIP, OPERATION AND MAINTENANCE OF A JOINT SEWAGE SYSTEM
AS AMENDED
EFFECTIVE OCTOBER 22, 2014

THIS AGREEMENT (hereinafter referred to as the Revised Basic Agreement), is made and entered into as of the 22nd day of October 2014, by and among the CITY OF VISTA, a charter city (hereafter VISTA), the CITY OF CARLSBAD, a charter city (hereafter CARLSBAD), the BUENA SANITATION DISTRICT, a County Sanitation District (hereafter BUENA), the VALLECITOS WATER DISTRICT, a County Water District (hereafter VALLECITOS), the LEUCADIA WASTEWATER DISTRICT, a County Water District (hereafter LEUCADIA), and the CITY OF ENCINITAS, a general law city (hereafter ENCINITAS).

RECITALS

WHEREAS, the parties hereto are responsible for providing sewage collection, transmission, treatment and disposal services in their respective service areas and are authorized to contract with other parties for the provision of such services; and,

WHEREAS, on July 13, 1961, VISTA and CARLSBAD entered into a Basic Agreement pursuant to Chapter 5 of Division 7 of Title 1 of the California Government Code to acquire, construct and operate a Joint Sewer System; and,

WHEREAS, the Basic Agreement provided that other municipal corporations and public districts or agencies may become parties to the Basic Agreement, thereby becoming members of the joint powers authority; and,

WHEREAS, on January 6, 1964, BUENA became a member of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, on March 22, 1965, VALLECITOS (then San Marcos) became a member of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, on August 17, 1971, LEUCADIA and ENCINITAS (then Encinitas Sanitary District) became members of the joint powers authority and acquired certain interests and capacity rights in the Joint System; and,

WHEREAS, it is the desire of the parties hereto to (a) continue functioning through a joint powers authority and (b) modify and condense the enabling legal documents for the joint powers authority by entering into a Revised Basic Agreement pursuant to Article 1, Chapter 5, Division 7, Title 1 of California Government Code relating to the joint exercise of powers, for the purposes of planning, designing, owning, operating, and maintaining a joint sewer system and concurrently establishing, by separate agreement, the Encina Wastewater Authority ("EWA").

NOW THEREFORE, THE PARTIES HERETO COVENANT WITH EACH OTHER AS FOLLOWS:

Section 1 DEFINITIONS

For the purposes of this agreement the following terms shall have the meanings indicated:

1.1 Joint Advisory Committee (JAC). A committee composed of representatives of the member agencies that advises both the member agencies and the Operator/Administrator on issues relating to the Joint System.

1.2 Joint System. The Encina Water Pollution Control Facility (Unit I), and the Encina Ocean Outfall (Unit J) including all related land, rights of way, and appurtenances (collectively, "Encina").

1.3 Member Agencies. The six members of the Encina Wastewater Authority: Vista, Carlsbad, Buena, Vallecitos, Leucadia, and Encinitas.

1.4 Operator/Administrator. The public agency designated by the member agencies as being responsible for operating, maintaining, and administering the Encina Joint System. Since August 1, 1988, the Operator/Administrator has been the Encina Wastewater Authority.

1.5 Biosolids. Primarily organic solid product, produced by the wastewater treatment processes, which can be beneficially recycled.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 2 JOINT PARTICIPATION

The member agencies shall participate jointly in the planning, design, acquisition, construction, ownership, operation, maintenance and use of the Joint System (including any future expansions thereof), and shall pay for such activities as hereinafter specified.

History: Adopted December 17, 1990.

Section 3 AREA TO BE SERVED BY THE JOINT SYSTEM

3.1 Existing Service Area. The area to be served by the Joint System is shown on Exhibit A, which is attached hereto and made a part of this Revised Basic Agreement by reference. Areas lying outside a member agency's legal boundary but inside that member agency's Exhibit A service area may be served by the member agency, providing the member agency provides assurance in the form of a legally binding agreement that these discharges will meet all applicable rules and regulations. Any wastewater or biosolids received from outside a member agency's legal boundary pursuant to such agreement shall be regarded as the wastewater or biosolids of the member agency for the purposes of billing, capacity, and source control.

3.2 Revisions to the Service Area. Areas lying outside the Exhibit A service areas of the member agencies may be served, provided such areas are annexed by a member agency. Notification of such annexations must be made in writing to the Joint Advisory Committee so that Exhibit A can be modified as appropriate. Member agencies can also request alteration of their Exhibit A service areas; such modifications must be approved in writing by all member agencies, as evidenced by receipt of resolutions from the governing bodies of all member agencies.

Member agencies whose Exhibit A service areas are enlarged shall be responsible for providing adequate capacity.

3.3 Prohibition on Discharges from Outside the Exhibit A Service Area. Each member agency agrees that it will neither permit nor knowingly countenance the use of the Joint System, directly or indirectly, for the disposal of wastewater or biosolids originating outside of its legal boundary except in the above manner, extent and conditions.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 4 ENLARGEMENT OF THE JOINT SYSTEM

Any member agency having first obtained the consent of Carlsbad and Vista, may at its sole cost and expense enlarge any portion of Unit I or J of the Joint System in which it is the owner of capacity rights and any increased capacity in such unit or portion resulting from such enlargement shall belong to the member agency paying the cost and expense thereof. No member agency shall unreasonably withhold consent to such enlargement. Any such enlargement shall be constructed in accordance with plans and specifications approved by Carlsbad and Vista.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 5 PROTECTION OF THE JOINT SYSTEM/SOURCE CONTROL

5.1 Protection of the Joint System. The Joint System shall not be used by any member agency for any purpose other than the conveyance, treatment, reuse, or disposal of wastewater and its by-products. Wastewater shall be construed to mean domestic sewage and trade wastewaters. Each member agency shall adopt and enforce ordinances, resolutions, rules and regulations, concerning the type and condition of wastewater permitted to be discharged into the sewers under its control and shall prohibit the discharge of any wastewater which would be detrimental to the Joint System, or to the use of by-products generated by the Joint System. Such ordinances, resolutions, rules and regulations shall reflect the applicable federal and state statutes and regulations and shall be consistent with the Operator/Administrator's industrial pretreatment regulations.

5.2 Prohibitions. No member agency shall allow excessive infiltration of any surface or storm waters to be discharged directly or indirectly into the Joint System. No member agency shall allow cooling water or other unpolluted industrial wastewater to be discharged directly or indirectly into the Joint System without the consent of all other member agencies. No member agency shall authorize a discharge from any groundwater cleanup site unless the discharge is authorized in advance by the Operator/Administrator.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 6 CAPACITY AND USE OF CAPACITY (CAPACITY INFRINGEMENT)

Each member agency shall own and enjoy a perpetual right to use its Joint System capacity in the proportions set forth immediately below herein. No member agency shall in any way grant, encumber, limit or restrict its interest in any part of the Joint System for any purpose other than the treatment and disposal or reuse of wastewater and the management of wastewater treatment byproducts, or use the Joint System or any part thereof to a greater percentage than its capacity rights, except as set forth in Section 9 herein, without the prior written consent of the

other member agencies, provided that no such excessive use without written consent shall be construed as a waiver of capacity rights by any member agency.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 7 CAPACITY MONITORING

Each member agency shall participate in a joint flow metering system, operated and administered by the Operator/Administrator, and facilitate such measurements of flow into the Joint System as needed for billing purposes and to verify that each agency is within its capacity rights. This metering system shall be maintained according to a separate agreement executed by the Operator/Administrator and the member agencies.

History: Adopted December 17, 1990.

Section 8 ACQUISITION/SALE OF EXCESS CAPACITY

In the event that any member agency hereafter requires additional capacity in the Joint System and capacity is available from another member agency, the capacity may be licensed, leased or purchased as necessary. Such lease or purchase shall be on terms as are hereafter agreed upon by the member agencies involved. In the event an inter-agency capacity agreement is adopted, the Joint Advisory Committee shall be notified in writing. Licensing, lease or purchase shall be subject to the terms and conditions established in Section 9 herein.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 9 CAPACITY RIGHTS IN UNITS

9.1 Unit I and Unit J Capacity. Capacity rights shall be as follows:

Member Agency	Unit I Liquid		Unit I Solids		Unit J Disposal	
	MGD	Percentage	MGD	Percentage	MGD	Percentage
Vista	10.67	26.34%	10.67	24.63%	10.67	24.63%
Carlsbad	10.26	25.33%	10.26	23.69%	10.26	23.69%
Buena	3.00	7.41%	3.00	6.93%	3.00	6.93%
Vallecitos	7.67	18.93%	10.47	24.17%	10.47	24.17%
Leucadia	7.11	17.55%	7.11	16.42%	7.11	16.42%
Encinitas	1.80	4.44%	1.80	4.16%	1.80	4.16%
Total	40.51	100.00%	43.31	100.00%	43.31	100.00%

The total disposal capacity of Unit J shall be 43.31 MGD average daily flow. This capacity rating assumes that the wet weather peaking factor on the flows to Unit J shall continue to be less than 2.76, and all the parties hereto agree to make good faith efforts to ensure that the wet weather peaking factor on the flows to Unit J remains below 2.76.

History: Adopted December 17, 1990; Amended effective October 22, 2014.

9.2 Unit I Capacity Infringement. The member agencies agree to make available up to 5 percent of their respective shares of total capacities, as set forth in Section 9.1 through a reserve capacity pool, in accordance with the following terms and conditions:

9.2.1. Flow Calculation. For the purposes of calculating payments due for licensing under this section, flows shall be based on measured (ADS) flows, to the maximum extent feasible. Solids loading flows shall be based on the total flow originating within each member agency. Voting rights, as described in Section 11 shall be in no way affected by temporary use of reserve capacity under this section. Total Reserve Capacity is the total capacity shown in paragraph 9.2.7. below.

9.2.2. Monitoring of Capacity Demand. Each agency shall provide monthly reports to EWA regarding future capacity committed, based upon its acceptance of applications for or issuance of any building permits, letters of availability, certificates or other entitlements for use which represent that sewer capacity is available to the applicant or project, or which enforceable or practically commit the agency to provide future sewer service. Reports shall be submitted in such form as the Board of EWA may require. Before the measured and committed flows reach 75% of Encina's total capacity (per Section 9.1), the EWA shall initiate a program to ensure adequate capacity to meet projected needs.

9.2.3. Excess Use a Trespass. Any use of capacity in excess of 95% of their respective share of Encina's total capacity (per Section 9.1) plus 50% of the Total Reserve Capacity, or otherwise in violation of this section, shall be considered a trespass. At the request of any member agency, EWA shall, and is hereby authorized to specifically enforce the terms of this section (Section 9.2) against a member agency or agencies on behalf of the remaining member agencies, including through commencement of a proceeding at law or equity. The parties agree that specific enforcement is a proper remedy in that payment of damages is not an adequate remedy for the potential losses to any member agency resulting from the loss of capacity. For example, replacement of capacity may be impractical and the consequences for the economic development of the members are not readily subject to quantification. Each member agency hereby consents to the commencement of such action or actions by EWA, and waives any right it may have to further approval of such actions under the joint powers agreement creating and establishing EWA. In addition to any injunctive relief, EWA may seek consequential damages on behalf of the remaining member agencies. In any such action, the prevailing party shall be entitled to attorney's fees and costs.

9.2.4. Indemnity and Hold Harmless. In addition to payment of the amount specified herein, each agency agrees to indemnify, defend and hold harmless the EWA and the other member agencies for any claim, demand, cost, penalty, fine or damage (including reasonable attorney's fees and costs of investigation), arising out of its violation of this section, whether resulting from the agency's active or passive, negligent or intentional act or failure to act to prevent a violation, and notwithstanding the active or passive negligence of those member agencies which are in compliance with the provisions of this section.

9.2.5. License Payments. When any member agency's flows exceed 100% of its capacity allocation for the treatment of solids, and/or treatment and/or disposal of liquids, for any continuous three-month period, such member agency shall pay for the use of such capacity from the reserve capacity pool in accord with the schedule of values, as adjusted each July 1 (commencing in July 2013) by updating the facility spreadsheet to include any additional and changed capital project costs, and to reflect the current Engineering News Record – Los Angeles ("ENRLA") construction cost index, as follows (see Exhibit C):

(a) Any portion of reserve up to 50% of Total Reserve Capacity:

$203,824	per MGD of Unit I liquid capacity per year
$400,986	per MGD of Unit I solids capacity per year
$73,753	per MGD of Unit J capacity per year

(b) The use of reserve amounts over 50% of Total Reserve Capacity shall be a violation of this section. In addition to any other remedy provided herein, or available to EWA or the member agencies, an agency shall pay for such use:

$339,706	per MGD of Unit I liquid capacity per year
$668,311	per MGD of Unit I solids capacity per year
$122,922	per MGD of Unit J capacity per year

(c) Payments to member agencies with unused reserve shall be made annually. Payments from member agencies shall be made quarterly to the EWA and held in a special account.

History: Adopted December 17, 1990; Amended effective October 22, 2014.

9.2.6. Restrictions on Use Over 40% of Reserve. If at any time any agency shall have enforceable or practically committed to provide future sewer service which, when added to its then existing actual flows, equals 95% of its allocated capacity (per Section 9.1) plus 40% of the Total Reserve Capacity, such agency shall:

(a) Immediately halt the acceptance or issuance of any building permits, letters of availability, certificates or other entitlements for use which represent that sewer capacity is the agency to provide future sewer service.

(b) Immediately inform EWA, in writing, that it has reached this threshold, of the actions it has taken to implement 9.2.6(a) above, and of its intention to present a plan to EWA, within 30 days, for capacity management to prevent the agency from exceeding use of 50% of the Total Reserve Capacity.

9.2.7. Reserve Capacity. Reserve capacity shall be as follows:

Member Agency	Unit I Liquid		Unit I Solids		Unit J Disposal	
	MGD	Percentage	MGD	Percentage	MGD	Percentage
Vista	0.54	26.34%	0.54	24.65%	0.54	24.63%
Carlsbad	0.51	25.33%	0.51	23.69%	0.51	23.69%
Buena	0.15	7.41%	0.15	6.93%	0.15	6.93%
Vallecitos	0.38	18.93%	0.52	24.17%	0.52	24.17%
Leucadia	0.36	17.55%	0.36	16.42%	0.36	16.42%
Encinitas	0.09	4.44%	0.09	4.16%	0.09	4.16%
Total	2.03	100.00%	2.17	100.00%	2.17	100.00%

History: Adopted December 17, 1990; Amended effective October 22, 2014.

9.2.8. Sole Method of Allocation. No agency shall provide capacity to any other member agency except pursuant to this section without the unanimous consent of the member agencies; provided that an agency may agree to provide additional capacity on a temporary basis to an agency which has used the maximum reserve capacity authorized by this section if: (1)

such arrangement provides for payments at rates not less than the maximum reserve capacity rate per paragraph 9.2.5(b), above; and (2) the capacity so provided does not reduce the Total Reserve Capacity available.

History: Adopted December 17, 1990; Amended effective November 18, 1992; January 14, 1997.

Section 10 CAPACITY RIGHTS FOR RECLAMATION

10.1 Future Reclamation. Any member agency, at its own expense, may, and shall have the right to, reclaim water from any wastewater in the Joint System which emanates within the jurisdiction of the respective member agency. And, subject to the following limitations, each member agency shall have the right to install facilities for the reclamation of water from wastewater. Any proposed reclamation shall require the approval of all the member agencies in the event that the proposed reclamation facility is designed and/or constructed such that (i) any solids or non-treated effluent from any such facility may be discharged into Unit I of the Joint System and/or (ii) any reclaimed water may be discharged into Unit J of the Joint System. Such approval shall not be withheld unless the use of the proposed reclamation facility would adversely affect one or more of the member agencies and the reclaiming member cannot reasonably mitigate the adverse impact. Nothing in this section shall be construed so as to require approval by the member agencies as to the geographic location of a reclamation facility constructed solely within the boundaries of any member agency.

10.2 Existing Reclamation. Section 10.1 above pertains to all future reclamation facilities. Currently constructed facilities may be operated to their capacity without further action by owners. The current reclamation facilities and capacities are as follows:

MEMBER AGENCY	RECLAMATION FACILITY	CAPACITY IN MGD
Carlsbad	Carlsbad Water Recycling Facility	4.00 MGD
Leucadia	Gafner	1.00 MGD
Vallecitos	Meadowlark	5.00 MGD

History: Adopted December 17, 1990; Amended effective November 18, 1992; October 22, 2014.

Section 11 JOINT ADVISORY COMMITTEE

The member agencies have created a Joint Advisory Committee (JAC) to advise the member agencies and the Operator/Administrator. JAC shall continue in this advisory role.

11.1 Powers. Recommendations of JAC shall be advisory only. The JAC shall have the following responsibilities:

11.1.1 To review the operation and maintenance of the Joint System, including the cost thereof, and make reports and recommendations to the governing bodies of the member agencies;

11.1.2 To review and make recommendations regarding proposed expansion, enlargements or modifications of the Joint System to the governing bodies of the member agencies; and,

11.1.3 To review and make recommendations regarding contracts, budget matters, regulations, policies, permits and other documents and issues as appropriate to the

Operator/Administrator. Each report and recommendation of the JAC permitted by this Section shall be considered as having been made by all the member agencies when made to the Operator/Administrator and made in accordance with the voting rights and percentages set forth below in Section 11.4.4.

11.2 Representation on JAC. JAC shall be constituted by two appointed representatives from each member agency, with one alternate for each appointed representative. JAC representatives may, but need not, be members of the governing bodies of the member agencies.

11.3 Officers of JAC. JAC shall elect its own officers, which shall include a Chairman, Vice-Chairman, and Secretary. The Chairman and Vice-Chairman shall be JAC representatives and the Secretary may, but need not, be a JAC representative.

11.4 Meetings of the JAC.

11.4.1 Regular Meetings. The JAC shall provide for its regular meetings; provided, however, it shall hold at least one regular meeting per year. The dates, hour, and place of the regular meetings shall be established by JAC.

11.4.2 Ralph M. Brown Act. All meetings of the JAC, including, without limitations, regular, adjourned regular, and special meetings, shall be called, noticed, held, and conducted in accordance with the provisions of the Ralph M. Brown Act (commencing with Section 54950 of the California Government Code).

11.4.3 Minutes. The JAC Secretary shall cause to be kept minutes of all meetings of the JAC, and shall cause a copy of the minutes to be forwarded to each JAC representative.

11.4.4 Vote. The total vote of all members of the JAC shall equal 100%. When voting on a matter involving the Treatment Plant (Unit I) or Ocean Outfall (Unit J) each JAC representative's percentage vote shall equal one-half of the percentage of that unit's capacity owned by the representative's agency. If only one of an agency's representatives is present, this representative's percentage vote shall equal the total percentage of that unit' s capacity owned by the representative's agency. If both representatives are absent, each alternate shall have a percentage vote equal to one-half of the percentage capacity of the alternate's member agency; provided, however, at any JAC meeting where any member agency is represented by only one alternate, the alternate shall have a percentage of vote equal to the total percentage of the capacity of the agency he/she represents.

11.5 Rules. JAC shall adopt rules and regulations for the place, time and conduct of JAC meetings.

11.6 Payment for Attendance. The Operator/Administrator (or, if requested by the appointing member agency, that member agency as to its representatives) shall pay each representative (or alternate who attends a meeting by reason of the absence of a representative) an attendance fee of twenty-five ($25) for each JAC meeting, provided that such payment does not exceed fifty dollars ($50) per calendar month. Attendance fees shall be paid monthly. [This fee waived per legal counsel opinion.]

11.7 Assistance from the Operator/Administrator. The Operator/Administrator shall provide supplies and clerical and secretarial help for JAC. The cost of such supplies and assistance shall be considered part of the expense of operating and maintaining the Joint System.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994; February 8, 2000.

Section 12 OPERATOR/ADMINISTRATOR

The Joint System shall be maintained and operated by any one of the parties hereto, or by another Public Agency, which party or other public agency shall be known as the Operator/ Administrator.

12.1 General Duties.

12.1.1 Joint System. The Operator/ Administrator shall maintain and operate the Joint System, and shall preserve it in good repair and working order, all in accordance with recognized sound engineering and accounting practices and local, state, and federal laws and regulations.

12.1.2 Pump Stations. The Operator/Administrator also shall operate and maintain, at the expense of the Cities of Vista and Carlsbad, the Agua Hedionda and Buena Vista Pump Stations (formerly Units G and C of the Joint System) within an annual budget prepared by the Operator/Administrator and approved by Vista and Carlsbad.

12.1.3 Other Facilities. The Operator/Administrator shall have the authority to operate and maintain other facilities outside the Joint System as recommended unanimously by JAC and in accordance with Operator/Administrator executed operation agreements, which may include budgeting responsibilities.

12.2 Designation and Specific Powers. Effective August 1, 1988, the member agencies created a public agency known as the Encina Wastewater Authority (EWA) to serve as the Operator/Administrator of the Encina Joint System. The EWA shall continue to serve as the Operator/Administrator until such time as EWA is terminated by written consent of a majority of the member agencies, evidenced by certified copies of resolutions by their governing bodies. The organization, administration, rules, and specific powers of the EWA shall be as set forth in the Revised Establishment Document establishing the EWA. Upon termination of the EWA and replacement with another Operator/Administrator, employees of the EWA shall become the employees of the new Operator/Administrator subject to existing employment contracts, seniority, retirement rights and any other employee benefits or rights now enjoyed by those employees.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 13 BUDGETING AND ACCOUNTING

13.1 Annual Budgets. Annually, the Operator/ Administrator shall prepare an operation, maintenance, and administration budget (hereafter referred to as the O & M budget) and a capital improvement program budget (hereafter referred to as the capital budget.) The budgets shall be prepared in accordance with generally accepted accounting principles.

13.1.1 Preparation of Estimated O & M Budget. No later than May 1 of each year, the Operator/Administrator shall prepare an estimated budget of the (a) amount of money required to operate, maintain and administer the Joint System during the ensuing fiscal year, and (b) the proportionate amount to be paid by each member agency. Such estimate shall be based on the total operation, maintenance, and administration costs during the current fiscal year as such costs are set forth in the current approved budget for the Joint System.

13.1.2 Approval of Estimated O & M Budget. Each estimated O & M budget adopted by the Operator/Administrator shall be forwarded to the JAC for consideration and for submission to the member agencies for approval. The Operator/Administrator's estimated O & M budget shall be deemed effective upon unanimous approval by the member agencies and upon the receipt by the Operator/Administrator of certified copies of approving resolutions or minute orders from the governing bodies of each of the member agencies. Until such time as formal approval has been received from each member agency, the estimated O & M budget shall constitute merely a proposed budget, subject to consideration or revisions. The O & M budget shall be considered separately from the capital budget and may be approved independently. In the event a proposed budget is not approved, the Operator/Administrator shall continue to operate using the O & M budget figures from the previous fiscal year.

13.1.3 O & M Contributions. Each member agency shall pay its estimated portion of the budgeted operation, maintenance, and administration costs and shall pay its actual portion of the costs as determined pursuant to Section 16 of this Revised Basic Agreement. Quarterly on October 15, January 15, April 15 and July 15, the Operator/ Administrator shall bill the member agencies and the member agencies shall deposit with the Operator/Administrator approximately one fourth of the annual cost of operation, maintenance, and administration for the preceding quarter as described herein. Provided, however, that each invoice shall be increased or decreased to adjust the estimated amount payable based upon the estimated total expenses incurred in the preceding quarter and the estimated total amount and strength of wastewater received from each member agency during the preceding quarter. In the event that at the end of any fiscal year the amount paid by a member agency exceeds the amount that should have been charged, the excess shall be credited to the member agency the following fiscal year. In case of an underpayment, the member agency shall be assessed the amount that should have been charged in the following fiscal year. Each member agency shall make quarterly contribution payments to the Operator/Administrator promptly at the time they become due.

13.1.4 Actual O & M Contributions. The member agencies agree to contribute from their treasuries the actual annual costs of the Joint System as divided among the member agencies pursuant to Section 16 of this Revised Basic Agreement. Such costs shall include the actual costs of (1) all materials and supplies used or purchased for the operation, maintenance, or administration of the Joint System, (2) all contracts let by the Operator/Administrator for the performance of budgeted O & M work, and (3) the salaries and wages of all Operator/ Administrator employees providing such services, including vacations and sick leave benefits, workers' compensation, social security and retirement payments, and health insurance. Such costs shall be paid out of the funds deposited with the Operator/Administrator by the member agencies; provided however, the failure of any member agency to pay the Operator/Administrator shall not relieve the other member agencies of their obligation to pay their proportionate shares of operation, maintenance, and administration of the Joint System.

13.1.5 Preparation of Estimated Capital Budget. No later than May 1 of each year, the Operator/Administrator shall prepare an estimated budget of the amount of money required for capital improvement projects during each of the next five fiscal years and over the next twenty years. The estimated capital budget shall show the estimated amount to be paid by each member agency. Such estimate shall be based on existing and/or projected ownership as appropriate.

13.1.6 Approval of Estimated Capital Budget. Each estimated capital budget adopted by the Operator/Administrator shall be forwarded to the JAC for consideration and for submittal to the member agencies for approval. The Operator/Administrator's estimated capital budget shall be deemed effective upon unanimous approval by the member agencies and upon the receipt by the Operator/Administrator of certified copies of approving resolutions or minute orders from the governing bodies of each of the member agencies. Until such time as formal approval has been received from each member agency, the estimated capital budget shall constitute merely a proposed budget, subject to consideration or revisions. The capital budget shall be considered separately from the O & M budget and may be approved independently.

13.1.7 Capital Contributions. Each member agency shall pay its actual portion of the capital costs except as noted in Section 17 of this Revised Basic Agreement. Quarterly on October 15, January 15, April 15 and July 15, the Operator/Administrator shall bill the member agencies and the member agencies shall deposit with the Operator/Administrator approximately one fourth of the actual estimated capital costs incurred in the preceding quarter, except as otherwise specified in Section 18. Any capital funds remaining at the end of the fiscal year shall be retained and credited toward the member agencies for the following fiscal year. Any capital expenses unfunded at the end of the fiscal year shall be debited and charged to the member agencies in the following fiscal year. Each member agency shall make quarterly contribution payments to the Operator/Administrator promptly at the time they become due.

13.1.8 Actual Capital Contributions. The member agencies agree to contribute their actual capital costs pursuant to Section 17 of this Revised Basic Agreement. Such costs shall include the actual costs of (1) all materials and supplies used or purchased for capital improvement of the Joint System and (2) all contracts let by the Operator/Administrator for the performance of capital improvement projects. Provided however, the failure of any member agency to pay the Operator/Administrator shall not relieve the other member agencies of their obligation to pay their proportionate shares of the capital expenses of the Joint System.

13.1.9 Audit. Annually the Operator/Administrator shall cause the preparation of an independent accountant audit of the financial statements.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994; August 12, 1998.

Section 14 ASSISTANCE TO OPERATOR/ADMINISTRATOR

When requested by the Operator/Administrator, the EWA shall provide assistance, and make recommendations to said Operator/Administrator relative to all services and duties it is to perform under the terms of this Revised Basic Agreement.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 15 RIGHTS OF WAY AND LAND ACQUISITIONS

The Operator/Administrator and/or any of the member agencies may, as agreed upon in writing by all the member agencies, act on behalf of the member agencies in acquiring lands and rights of way necessary for the operation, maintenance, ownership, and use of the Joint System.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 16 PAYMENT OF OPERATION AND MAINTENANCE EXPENSES

16.1 Allocation of Expenses. All operation, maintenance and administration expenses for Units I and J of the Joint System, hereafter referred to as O & M expenses, shall be paid by each member agency based on each member agency's percentage of ownership and usage in these units. For the purpose of this section, the following definitions shall apply: "usage" shall mean the costs for power, chemicals, maintenance, and other sewage treatment, solids handling, and disposal processes which result from wastewater entering Unit I or Unit J; "ownership" shall mean the costs for insurance, administration expenses, laboratory expenses, plant operations, services and maintenance, and other wastewater collection and treatment, solids handling and effluent disposal costs which are incurred irrespective of the amount of wastewater which enters Unit I or Unit J.

16.2 Payment Schedule. Each member agency shall pay its proportionate share of the operation, maintenance and administration expenses in accordance with Section 13.1 of this Revised Basic Agreement.

16.3 Revenue from By-Products. Any revenue received from the sale of by-products arising out of the operation of the Joint System shall be apportioned to each member agency in the same proportion as their share of the O & M expenses for the Joint System in the year in which the revenue is received.

History: Adopted December 17, 1990; Amended effective November 18, 1992; November 9, 1994.

Section 17 PAYMENT OF CAPITAL EXPENSES

17.1 Allocation of Expenses. Unless otherwise specified herein, capital expenses shall be allocated based on existing or projected Unit I or Unit J ownership as appropriate. Exceptions are as follows:

17.1.1 Phase IV Expansion. Phase IV capacity and costs are allocated according to the methodology shown in Exhibit B, attached hereto and made part of this Revised Basic Agreement by reference.

17.1.2 Phase V Expansion. Phase V capacity and costs are allocated according to the methodology shown in Exhibit D, attached hereto and made part of this Revised Basic Agreement by reference.

17.1.3 Joint Flow Metering System. Each member agency is responsible for the capital expenses of meters and monitors serving its respective service area. Capital expenses for the monitors serving the entire Exhibit A service area shall be paid on the basis of Unit J flow.

17.1.4 Additional Land/Right of Way Acquisition. All expenses shall be allocated in accordance with the terms of a separate agreement to be adopted unanimously by the member agencies.

17.2 Payment Schedule. Unless otherwise specified herein, capital expenses shall be paid on a quarterly basis. Exceptions are as follows:

17.2.1 Additional Land/Right of Way Acquisition. All expenses shall be paid in accordance with the terms of a separate agreement to be adopted unanimously by the member agencies.

17.2.2 Other Capital Expenses. On occasion, capital expenses may occur earlier in the fiscal year than would allow for regular quarterly billing. If regular quarterly billings do not provide needed capital early enough during the fiscal year, supplemental capital billings shall be sent to the member agencies. In such cases, the Operator/Administrator will notify the member agency financial representatives as far in advance as possible.

History: Adopted December 17, 1990; Amended effective November 18, 1992; August 12, 1998; October 22, 2014.

Section 18 SETTLEMENT OF DISPUTE OR CONTROVERSY

18.1 Right to Arbitration. Should any dispute or controversy arise in connection with the books, records or accounts of any member agency or in connection with the acquisition, construction, maintenance, operation repair, reconstruction or enlargement of the Joint System or in connection with any of the affairs or operation thereof, or the execution of this agreement, the governing bodies of member agencies that are affected by such dispute may elect to arbitrate the dispute or controversy in accordance with this section. In the event of such election, the governing body of each member agency affected shall appoint or designate one disinterested person as an arbitrator. Said arbitrators so chosen, if an even number, shall designate an additional disinterested person to make an odd number of arbitrators. Said arbitrators so chosen shall act as a Board of Arbitrators in connection with any such dispute or controversy. The findings of fact approved by a vote of the majority of the members of the Board of Arbitrators shall be binding upon the affected member agencies.

18.2 Right of Observation. The parties to any arbitration proceedings held under the provisions of this agreement shall notify every other member agency not a party thereto of such arbitration proceedings and any other member agency shall have the right to be represented at such proceedings by a member agency designated observer.

18.3 Right to Expert Arbitration. Any controversy which can be determined by an engineer's or other expert's findings and which under this section could be submitted to arbitration may, if the parties thereto agree in writing to do so, be submitted to a named engineer or expert who shall be the sole arbitrator. Any such engineer shall be a Registered Engineer in the State of California. Any such engineer or expert shall be disinterested as required of arbitrators on an arbitration board. He shall proceed in the same manner provided herein for an arbitration board.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 19 APPORTIONMENT OF LIABILITY

Any liability incurred by the member agencies, which liability arises out of or in connection with the operation and/or maintenance of the Joint System, except for costs of improvements to such facilities and operating and maintenance costs, shall be discharged by payment by each member hereof in proportion to their respective ownership in the facilities at the time of the incident which results in the liability.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 20 NOTICES

Notices required or permitted under this Revised Basic Agreement shall be sufficiently given if in writing and if either served personally or mailed by certified mail to the member agencies.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 21 SEVERABILITY

If any one or more of the terms, provisions, promises, covenants or conditions of this agreement shall by any extent by adjudged invalid, unenforceable, void or voidable for any reason whatsoever by a court of competent jurisdiction, each and all of the remaining terms, provisions, promises, covenants and conditions of this agreement shall not be affected thereby and shall be valid and enforceable to the fullest extent permitted by law.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 22 MODIFICATION OF AGREEMENT

This agreement shall contain all the terms and conditions made between the parties hereto and shall not be amended except by an agreement in writing signed by all the member agencies.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

Section 23 SUCCESSION

The provisions of this agreement shall be binding upon and shall inure to the benefit of the successors of the parties hereto.

History: Adopted December 17, 1990; Amended effective November 18, 1992.

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by their respective governing bodies caused this Revised Basic Agreement to be approved, has authorized its execution by the officeholder set forth below, to become effective as of the day and year first above written. This Revised Basic Agreement may be executed in counterparts, each of which may be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

CITY OF VISTA

By _____
Mayor Judy Ritter

Attest:

_____
City Clerk Marci Kilian

CITY OF CARLSBAD

By _____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By _____
President

VALLECITOS WATER DISTRICT

By _____
President

BUENA SANITATION DISTRICT

By _____
Chairperson Judy Ritter

CITY OF ENCINITAS

By _____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By _____
JAC Counsel

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by their respective governing bodies caused this Revised Basic Agreement to be approved, has authorized its execution by the officeholder set forth below, to become effective as of the day and year first above written. This Revised Basic Agreement may be executed in counterparts, each of which may be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By Matt Hall
Mayor

Attest:

City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

21

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CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

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CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By Kelly D Evans
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

IN WITNESS WHEREOF, each party hereto has pursuant to resolution duly passed and adopted by their respective governing bodies caused this Revised Basic Agreement to be approved, has authorized its execution by the officeholder set forth below, to become effective as of the day and year first above written. This Revised Basic Agreement may be executed in counterparts, each of which may be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

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CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

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CITY OF VISTA

By_____
Mayor

Attest:

_____
City Clerk

CITY OF CARLSBAD

By_____
Mayor

Attest:

_____
City Clerk

LEUCADIA WASTEWATER DISTRICT

By_____
President

VALLECITOS WATER DISTRICT

By_____
President

BUENA SANITATION DISTRICT

By_____
Chairperson

CITY OF ENCINITAS

By_____
Mayor

Attest:

_____
City Clerk

Approved as to form:

By_____
JAC Counsel

<INSERT SERVICE AREA MAP>

EXHIBIT B
PHASE IV COST ALLOCATION

1. Phase IV cost shall be allocated as follows:

a. All costs shall be allocated by unit process and among flow, BOD, and suspended solids in the manner recommended for revenue programs by the State Water Resources Control Board.

b. The replacement value of the existing Unit I and Unit J facilities at the mid-point of construction (projected ENRLA of 6465) shall be determined. In determining replacement value, grant funding shall be included except for the grant funding used to pay for the "oversized" portion of "oversized" items (i.e., items sized or undertaken for the ultimate site capacity, such as site grading and paving, piping, etc.).

c. Dollar ownership of the existing facilities shall be determined by multiplying existing ownership percentages times the replacement values determined in step b.

d. The cost of the proposed Phase IV facilities at the midpoint of construction (projected ENRLA of 6465) shall be estimated by the design engineer.

e. The total value of the EWPCF following construction of Phase IV shall be estimated by adding the replacement value of the existing facilities (determined in step b) to the estimated cost of the Phase IV project (determined in step d).

f. Needed dollar ownership of the EWPCF following construction of Phase IV shall be determined by multiplying the revised Unit I liquid and solids and Unit J ownership's (determined in Exhibit A of the Thirty-Ninth Supplement) by the total value of the EWPCF following construction of Phase IV (determined in step e).

g. Phase IV cost allocations shall be calculated by subtracting existing dollar ownership's (determined in step c) from needed dollar ownership's following construction of Phase IV (determined in step f). Credits and buy-ins for existing facilities are automatically included in this calculation and need not be calculated separately; however, the dollar values of each are included below for background.

Estimated Phase IV cost allocations in dollars and percent of total are as follows:

Agency	Existing Ownership	Projected Ownership Following Phase IV	Estimated Phase IV Cost	Effective	Credit/Buyin
Vista	22,739,000	28,938,000	6,199,000	11.44	(5,455,000)
Carlsbad	20,585,000	33,216,000	12,631,000	23.31	(745,000)
Leucadia	13,314,000	27,297,000	13,983,000	25.81	2,916,000
San Marcos	14,099,000	27,105,000	13,006,000	24.01	2,091,000
Buena	4,436,000	11,020,500	6,584,500	12.15	2,023,000
Encinitas	4,694,000	6,470,500	1,776,500	3.28	(830,000)
Total	79,867,000	134,047,000	54,180,000	100.00	0

Final Phase IV cost allocations will be determined following completion of Phase IV construction and will use the actual project costs spread according to the final engineer's estimate instead of the current engineer's estimate in steps d through g above. Actual ENRLA at mid-point of construction will be substituted for the projected value in step b.

EXHIBIT C
LICENSE PAYMENTS & SCHEDULE OF VALUES

(1) Any portion of reserve up to 50% of Total Reserve Capacity:

The license payment shall be 8% of the current replacement value of the facilities, without grants deducted, adjusted each July 1 (commencing in July 2013) by updating the asset allocation spreadsheet to include any additional and changed capital project costs, and to reflect the current ENRLA construction cost index. Unit I and J license payments shall be based on a flow rate of 43.31 MGD. Unit I liquid license payments shall be proportioned based on the percentage of the Flow value of the total replacement value. Unit I solids license payments shall be proportioned based on the percentage of the sum of the BOD and SS replacement values, as compared to the total replacement value.

(1) 2013 - Example calculations:

Unit I - Total replacement value of Unit I (treatment facilities) without grant deducted, July 2013 at ENRLA of 10306.93 = $327,429,000, Flow value = $110,345,000, BOD value = $122,548,000, SS value = $94,536,000. Utilizing an interest rate of 8% yields a license payment of $604,810 per MGD ($327,429,000 times .08 divided by 43.31 MGD).

Split between liquid and solids payments:

Liquid portion = $604,810 times 110,345,000 / 327,429,000 = $203,824
Solid portion = $604,810 times (122,548,000 + 94,536,000) / 327,429,000 = $400,986

Unit J total replacement value = $39,928,000.

$39,928,000 times .08 divided by 43.31 MGD = $73,753

July 1, 2013 license payments

$203,824 per MGD of Unit I liquid capacity per year
$400,986 per MGD of Unit I solids capacity per year
$73,753 per MGD of Unit J capacity per year

(2) The use of reserve amounts over 50% of Total Reserve Capacity:

License payments shall be increased by 2/3.

(3) July 1, 2013 license payments:

$339,706 per MGD of Unit I liquid capacity per year
$668,311 per MGD of Unit I solids capacity per year
$122,922 per MGD of Unit J capacity per year

Encina Wastewater Authority

Revised Basic Agreement

Exhibit D

Allocation of Phase V Capital Improvements

The cost of Phase V Capital Improvements shall be allocated by unit process and among flow, Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) in the manner recommended for revenue programs by the State Water Resources Control Board as amended by action of the Encina Wastewater Authority (EWA) member agencies, Joint Advisory Committee and Board of Directors and as follows:

1. The replacement value of the existing Unit I and Unit J facilities at the mid-point of construction shall be determined and, in addition, each member agency's share thereof shall be determined.
   a. Replacement value shall be calculated for all Unit I and Unit J facilities remaining in service at Phase V project acceptance including: Pre-Phase III; Phase III; Phase IV including interim flow equalization facilities transitioning from Unit J to Unit I; and, Post Phase IV including the Building Program and Joint Use Flow Equalization.
   b. The replacement value of each facility shall be calculated by multiplying the original cost of that facility by the percentage change in the Engineering News Record Construction Cost Index for Los Angeles (ENRLA) from the year that facility was placed in service then adding the resulting product to the original cost of the subject facility.
   c. Mid-Point of Construction shall be the date half-way between the date EWA issues a Notice to Proceed on the largest single Phase V Project construction contract and the date the EWA Board of Directors takes action to accept that contract as completed.
   d. Each member agency's current ownership percentage (COP) of the replacement values for existing facilities shall be calculated by multiplying total Unit I Flow, Unit I Solids and Unit J Disposal replacement values by each member agency's Unit I Liquid, Unit I Solids or Unit J Disposal percentage capacity rights as stated in Section 9.1 of the RBA.
2. Based upon wastewater flow projections developed and refined by the member agencies, required ownership percentages (ROP) shall be determined and, in addition, each member agency's share of existing facilities at replacement value determined in Step 1 shall be restated to conform to their respective ROP.
   a. Flow projections shall be provided by the member agencies and shall not be changed to alter the allocation of Phase V costs hereunder after the member agencies have unanimously approved this amendment to the Revised Basic Agreement (RBA).
   b. ROP shall be calculated by dividing a member agency's wastewater flow projection by the total of all member agencies wastewater flows.
   c. Each member agency's share of the replacement values for existing facilities shall be calculated by multiplying total Unit I Flow, Unit I Solids and Unit J Disposal replacement values by each member agency's ROP of Unit I Liquid, Unit I Solids or Unit J Disposal.
3. An estimated debit or credit shall be calculated for each member agency to pay for, or receive payment or credit for, investments in existing Unit I and Unit J facilities and thereby reallocate ownership of existing facilities at replacement value among the member agencies in conformance with their respective ROP as determined in Step 2.
   a. Where any member agency's ROP for Unit I Liquid, Unit I Solids or Unit J Disposal is greater than its COP for Unit I Liquid, Unit I Solids or Unit J Disposal, an estimated debit shall be calculated and assessed to that member agency's account for that unit process.

b. Where any member agency's ROP for Unit I Liquid, Unit I Solids or Unit J Disposal is less than its COP Unit I Liquid, Unit I Solids or Unit J Disposal, an estimated credit shall be calculated and credited to that member agency's account for that unit process.

c. The debit or credit shall be calculated by subtracting each member agency's share of the replacement values for existing facilities (determined in Step 1d) by unit process from that member agency's share of the ROP (determined in Step 2c) by unit process.

d. Upon conclusion of this step for each unit process, each member agency's estimated share of all Pre-Phase III, Phase III, Phase IV and Post-Phase IV Unit I and Unit J costs for facilities placed into, and remaining in, service as of the most recent fiscal year end prior to Phase V project acceptance shall be combined with the Phase V Project construction costs estimated in Step 4, to determine each member agency's estimated Phase V Project cash requirements.

4. The total cost of the Phase V facilities at mid-point of construction shall be estimated by the design engineer. As of July 1, 2004 Phase V facilities construction costs are estimated at $36.1 million. These costs shall be allocated to member agencies on the basis of each member agency's ROP.

5. Each member agency's share of the total cost of the Phase V Project shall be calculated by adding the member agency's debit or credit as determined in Step 3 with the member agency's share of Phase V costs as determined in Step 4. These amounts as of July 1, 2004 are as follows (amounts in thousands of dollars):

	Estimated Replacement Value of Existing Ownership	Estimated Existing Facilities Debit or (Credit)	Estimated Phase V Facilities Costs	Total Estimated Phase V Cash Required by Member Agency
Vista	$ 43,309	$ 7,270	$ 8,938	$ 16,209
Carlsbad	$ 49,724	$ (1,088)	$ 8,595	$ 7,507
Buena	$ 16,742	$ (2,521)	$ 2,513	$ (8)
Vallecitos	$ 40,565	$ 4,789	$ 8,590	$ 13,379
Leucadia	$ 40,998	$ (7,294)	$ 5,956	$ (1,338)
Encinitas	$ 9,689	$ (1,156)	$ 1,508	$ 352
Total	$ 201,026	$ 0	$ 36,100	$ 36,100

6. Final Phase V cost allocations shall be determined, and member agency accounts shall be adjusted following completion of Phase V construction and shall use the method described hereinabove except that actual figures shall be used including: existing facilities based on the most recently completed independent financial audit; project costs based on actual amounts paid according to EWA's financial records; and, actual ENRLA at the defined mid-point of construction.

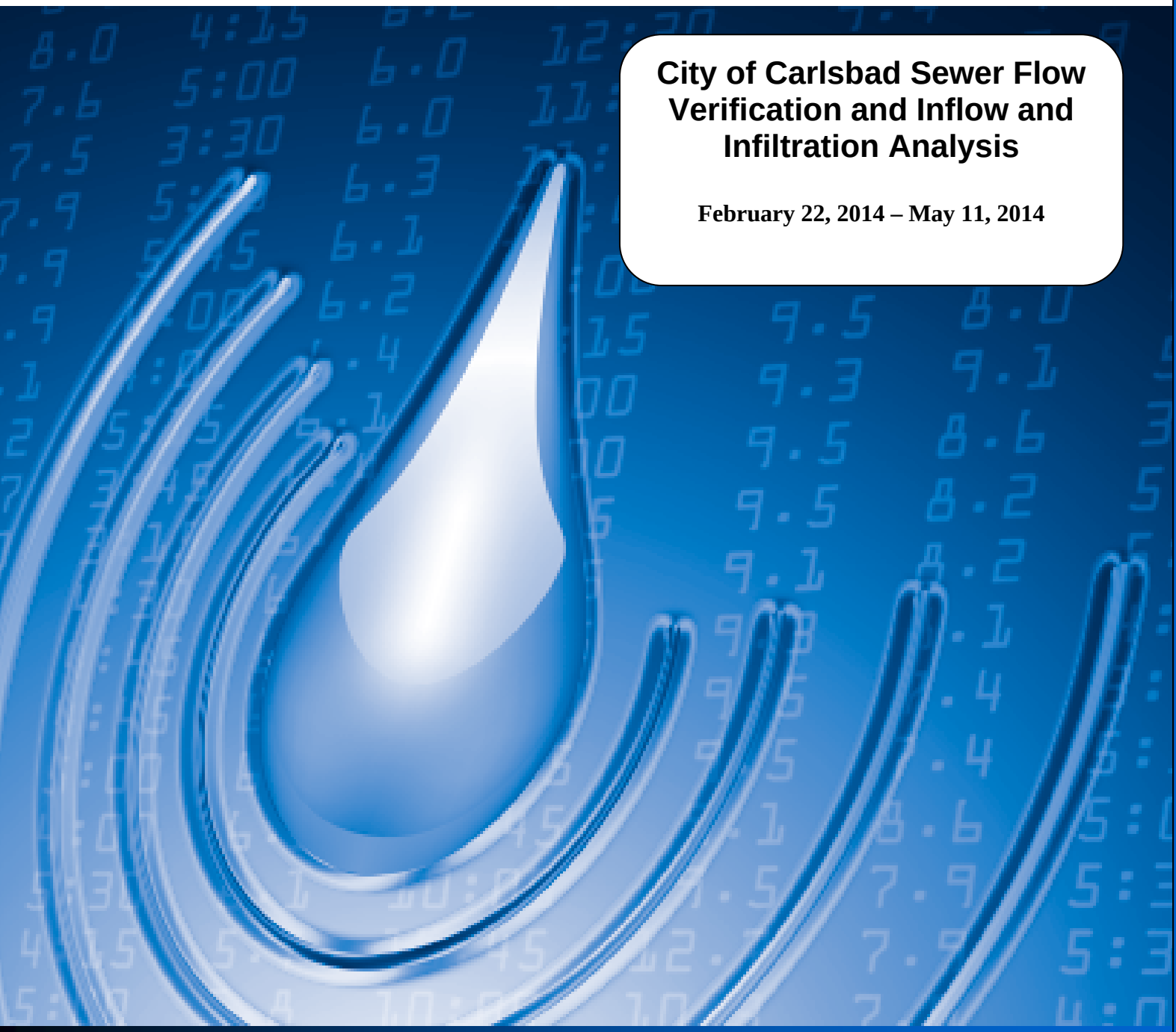
Appendix B. American Digital Systems Temporary Flow Meter Reports

FLOWVIEW™

UNDERGROUND INTELLIGENCE®

FOR ENHANCED COLLECTION SYSTEM PERFORMANCE

ADS ENVIRONMENTAL SERVICES®



City of Carlsbad Sewer Flow Verification and Inflow and Infiltration Analysis

February 22, 2014 – May 11, 2014

Table of Contents

Letter of Transmittal

A Division of ADS LLC

4820 Mercury Street, Suite C
San Diego, CA 92111

www.adsenv.com

June 10, 2014

City of Carlsbad
15600 Sand Canyon Avenue
Irvine, CA 92618

Dear Mr. Wasko,

ADS is pleased to submit the Report - City of Carlsbad Sewer Flow Verification and Inflow and Infiltration Analysis. Metering was performed at six (6) locations and one (1) rain gauge for the period of February 22, 2014 through May 11, 2014 . The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for the flow monitoring location in 5-minute format is also provided.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, I can be reached at (256) 759-2575. You may also contact the Project Manager, Neil Volk at (858) 571-0045.

Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

KaTonya Sledge

Sr. Data Analyst

City of Carlsbad Sewer Flow Verification and Inflow and Infiltration Analysis

February 22, 2014 - May 11, 2014

Prepared for:

Mr. Don Wasko
City of Carlsbad
5950 El Camino Real
Carlsbad, CA 92008-8802

Prepared by:

ADS Environmental Services, Inc.
4820 Mercury Street, Suite C
San Diego, CA 92111

Methodology

Introduction

Background

City of Carlsbad entered into agreement with ADS Environmental Services to conduct flow monitoring at (6) six locations and (1) one rain gauge locations in the City of Carlsbad, CA. Once installed the meters obtained flow data from each selected location to verify daily flow variations to aid the City of Carlsbad in sewer flow verification and inflow and infiltration analysis.

The study was originally for a (90) ninety day monitoring period. However, the equipment was removed early due to the lack of rainfall.

Project Scope

The scope of this study involved using a temporary flow monitor to quantify wastewater flow at the designated locations. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring site for adequate hydraulic conditions.
- Flow monitor installation.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was accomplished on February 21, 2014. The monitoring period began on February 22, 2013 and was completed on May 11, 2014.

Equipment and Methodology

Flow Quantification Methods

There are two main equations used to measure open channel flow: the Continuity Equation and the Manning Equation. The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

<u>Continuity Equation</u>

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow. Most modern flow monitoring equipment, including the ADS Models, measure both depth and velocity and therefore use the Continuity Equation to calculate flow quantities.

Flow Monitoring Equipment

The monitor selected for this project was the ADS Model 3600-flow monitor. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS Model 3600-flow monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

Three types of data acquisition sensors are available for the Model 3600 flow monitor. The primary depth measurement device is the ADS quad-redundant ultrasonic level sensor. This sensor uses four independent ultrasonic transceivers in pairs to measure the distance from the face of the transceiver housing to the water surface (air range) with up to four transceiver pairs, of the available ones, active at one time. The elapsed time between transmitting and receiving the ultrasonic waves is used to calculate the air range between the sensor and flow surface based on the speed of sound in air. Sensors in the transceiver housing measure temperature, which is used to compensate the ultrasonic signal travel time. The speed of sound will vary with temperature. Since the ultrasonic level sensor is mounted out of the flow, it creates no disturbance to normal flow patterns and does not affect site hydraulics.

Redundant flow depth data can be provided by a pressure depth sensor, and is independent from the ultrasonic level sensor. This sensor uses a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube. Pressure depth sensors are typically used in large size channels and applications where surcharging is anticipated. Its streamlined shape minimizes flow distortion.

Velocity is measured using the ADS V-3 digital Doppler velocity sensor. This sensor measures velocity in the cross-sectional area of flow. An ultrasonic carrier is transmitted upstream into the flow, and is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity. Collected peak velocity information is filtered and processed using field confirmation information and proprietary software to determine the average velocity, which is used to calculate flow quantities. The sensor's small profile, measuring 1.5 inches by 1.15 inches by 0.50 inches thick, minimizes the affects on flow patterns and site hydraulics.

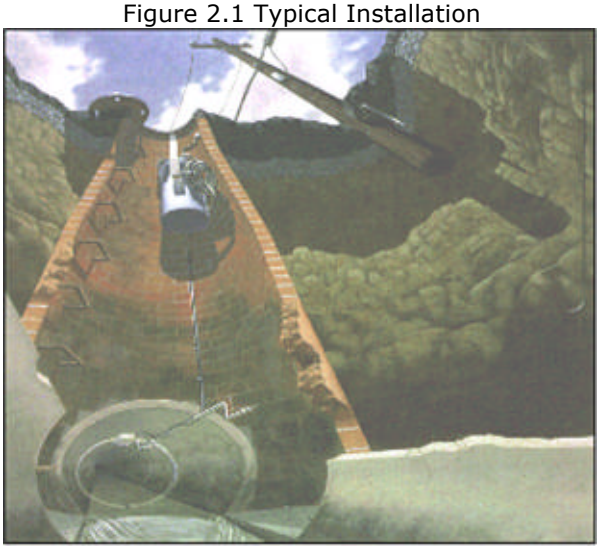
Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the

master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed. A typical flow monitor installation is shown in Figure 2.1.

The installations depicted in Figures 2.1 are typical for circular or oval pipes up to approximately 104-inches in diameter or height. In installations into pipes 42-inches or less in diameter, depth and velocity sensors are mounted on an expandable stainless steel ring and installed one to two pipe diameters upstream of the pipe/manhole connection in the incoming sewer pipe. This reduces the affects of turbulence and backwater caused by the connection. In pipes larger than 42 inches in diameter, a special installation is made using two sections of the ring installed one to two feet upstream of the pipe/manhole connection; one bolted to the crown of the pipe for the depth sensor, and the other bolted to the bottom of the pipe (bolts are usually placed just above the water line) to hold the velocity sensor.

Figure 2.1 Typical Installation



Large Pipe (> 42" Diameter)

Small Pipe (8" to 42" Diameter)

Data Collection, Confirmation, and Quality Assurance

During the monitoring period, field crews visit each monitoring location to retrieve data, verify proper monitor operation, and document field conditions. The following quality assurance steps

are taken to assure the integrity of the data collected:

- **Measure Power Supply:** The monitor is powered by a dry cell battery pack. Power levels are recorded and battery packs replaced, if necessary. A separate battery provides back-up power to memory, which allows the primary battery to be replaced without the loss of data.

- **Perform Pipe Line Confirmations and Confirm Depth and Velocity:** Once equipment and sensor installation is accomplished, a member of the field crew descends into the manhole to perform a field measurement of flow rate, depth and velocity to confirm they are in agreement with the monitor. Since the ADS V-3 velocity sensor measures peak velocity in the wetted cross-sectional area of flow, velocity profiles are also taken to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

- **Measure Silt Level:** During site confirmation, a member of the field crew descends into the manhole and measures and records the depth of silt at the bottom of the pipe. This data is used to compute the true area of flow.

- **Confirm Monitor Synchronization:** The field crew checks the flow monitor's clock for accuracy.

- **Upload and Review Data:** Data collected by the monitor is uploaded and reviewed for comparison with previous data. All readings are checked for consistency and screened for deviations in the flow patterns, which indicate system anomalies or equipment failure.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the air range (distance from sensor to top of flow) for each active ultrasonic depth sensor pair and (2) the peak velocity. If the monitor is equipped with a pressure sensor, then a depth reading from this sensor may also be stored. When the field personnel collects the data, the air range is converted to depth data based on the pipe height and physical offset (distance from the top of the pipe to the surface of the ultrasonic sensor). The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which ultrasonic pairs and/or depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate

review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. The data depicted on the hydrograph is based on hourly averaged data. The table is provided in daily average format. The table shows the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the table and hydrograph.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

10c-25	
Pipe Dimensions	8 "
Silt Level	0.00"

Overview

Site 10c-25 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 33.0% full at its recorded peak of 2.65 inches and approximately 17.0% full during its recorded average depth of 1.39 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.39	3.86	0.098
Minimum	0.73	0.91	0.022
Maximum	2.65	6.23	0.329
Time of Minimum	3/11/2014 2:35 PM	4/15/2014 3:20 AM	4/15/2014 4:20 AM
Time of Maximum	4/15/2014 11:30 AM	2/28/2014 4:05 PM	2/28/2014 4:05 PM

Data Quality

Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period. Depth and Quantity downtime was due to a malfunctioning depth sensor.

Percent Uptime	
Depth (in)	97
Velocity (ft/s)	100
Quantity (MGD)	97

ADS Site Report

Quality Form

Project Name:	Carlsbad Temp 2014	**City / State:**	Carlsbad, CA	**Date Installed:**	2/21/14
Site Name:	10C-25	**Monitor Series:**	3600	**Monitor S/N:**	2892
Address / Location:	945 Chestnut Ave under I-5			**Manhole #:**	10C-25
				Map Page #:	N/A
Access:	Drive	**Type of System:**	Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	8.00"
				Pipe Width:	8.00"
				IP Address:	N/A

Access Map N

Site Map N

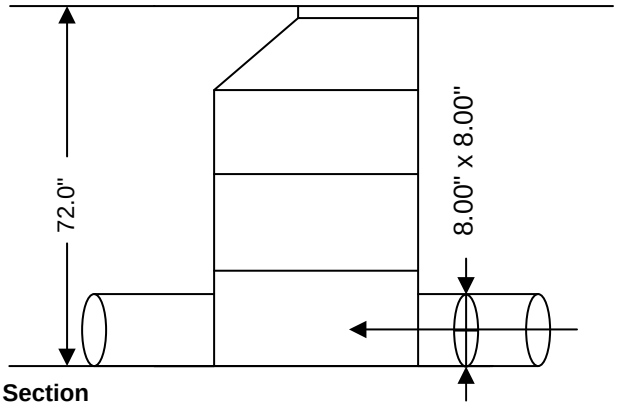
Investigation Information:

Date/Time of Investigation:	2/21/14 @ 1:00 p.m.		
Site Hydraulics:	Low depth with Fast velocity		
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.38"	**+/-**	.25
Range (Air Dof):		**+/-**	
Peak Velocity:	5.00	**Fps**	
Silt:	0.00"	**Inches**	

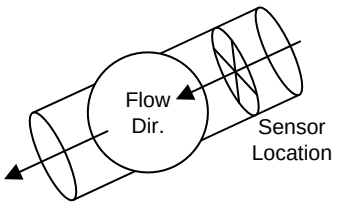
Manhole Information:

Manhole Depth:	72.0"	**Inches**			
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A	**Feet**			
Road Cut Length:	N/A	**Feet**			
Trench Length:	N/A	**Feet**			

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard installation	**Trunk**	[ ]	[ ]		
Sensors/ Devices:	Ultrasonic Sensor / Velocity Sensor	**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height:	No Evidence of Surcharge **Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:	RG 1	**Other**	[ ]	[ ]		

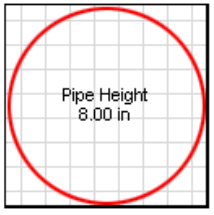
Additional Site Information / Comments:

SCATTERGRAPH REPORT

10c-25

Flow Monitor

10c-25

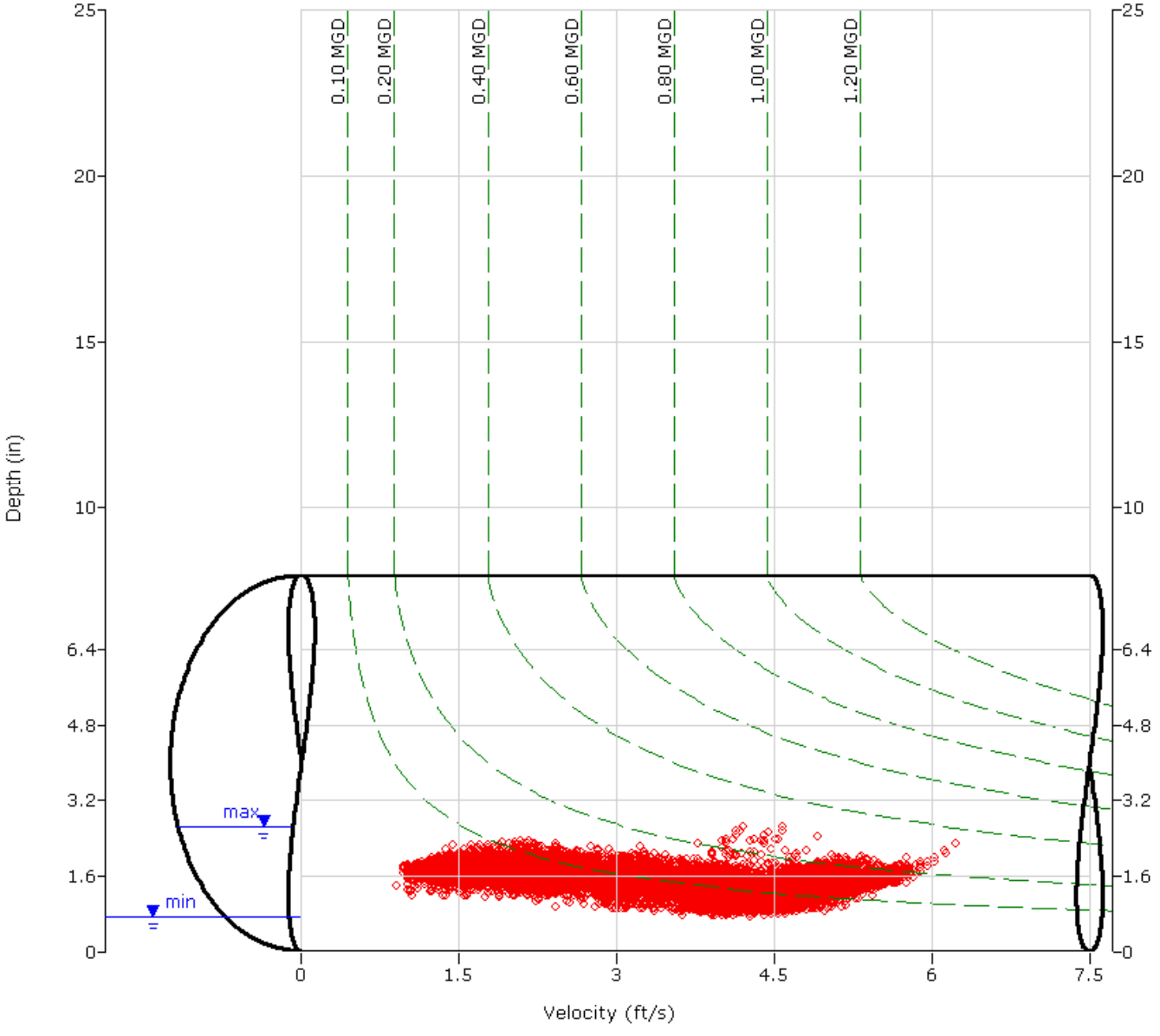


Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

10c-25

Flow Monitor

10c-25

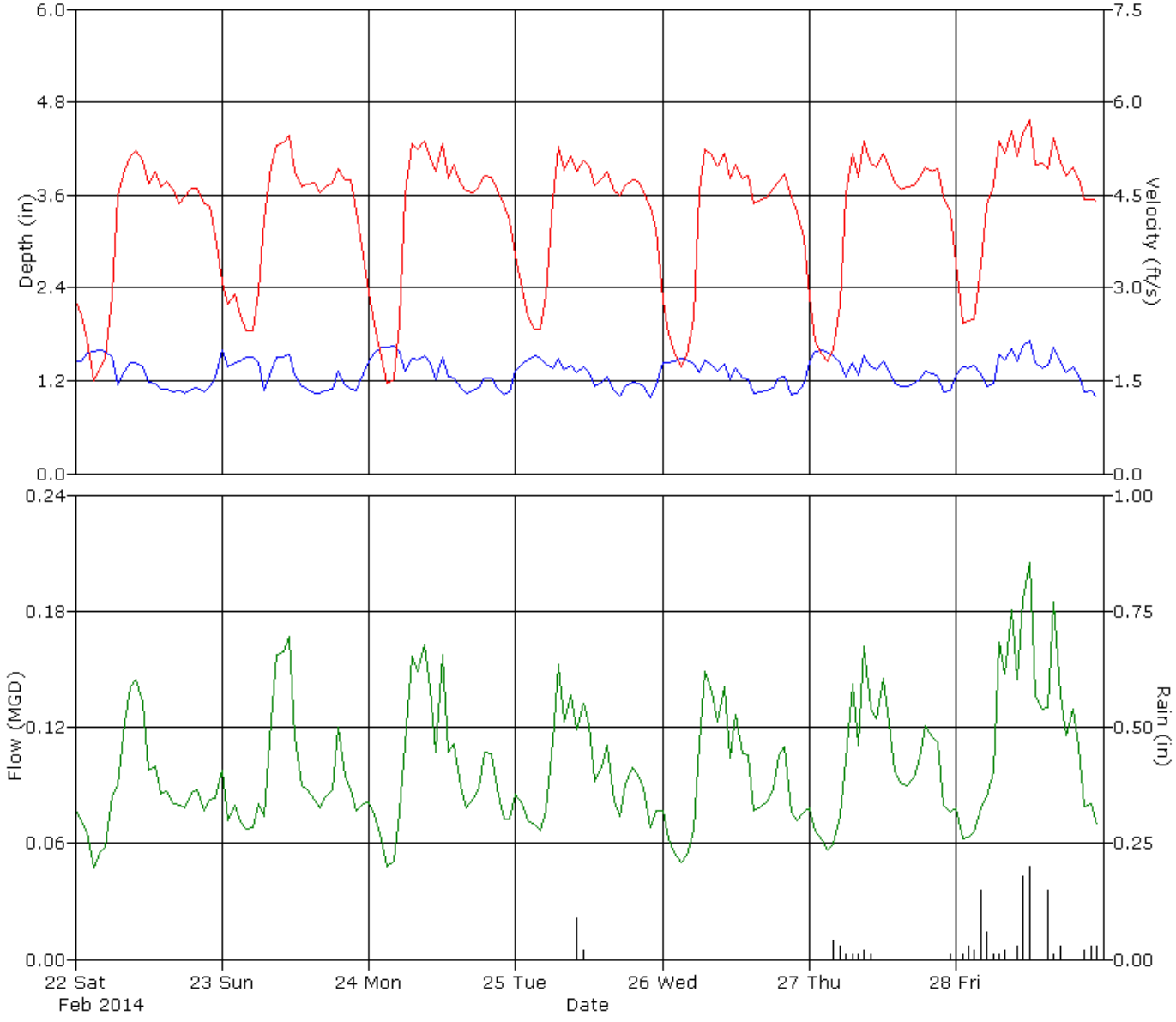
Pipe Height
8.00 in

Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

10c-25

Flow Monitor

10c-25

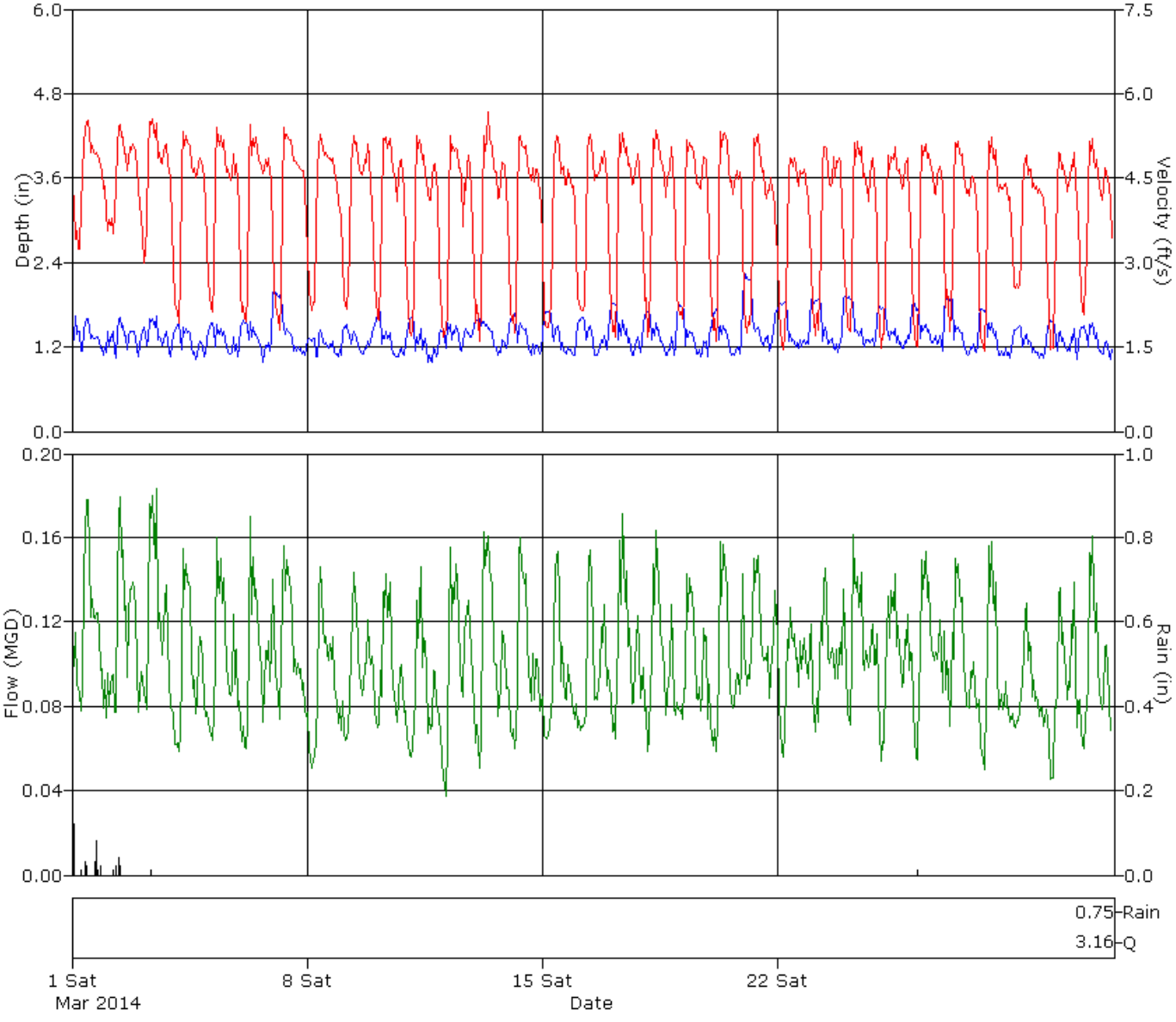
Pipe Height
8.00 in

Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

10c-25

Flow Monitor

10c-25

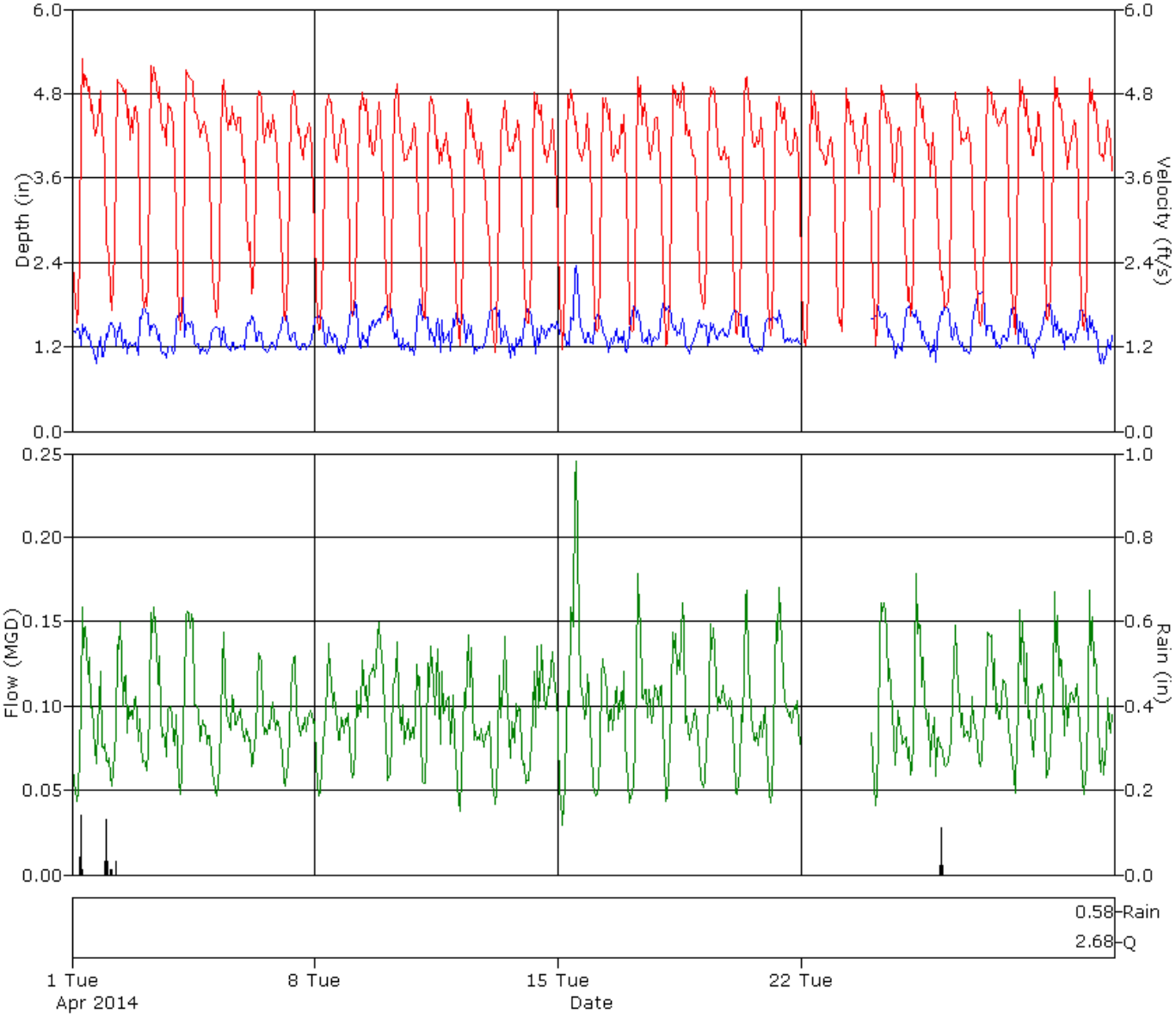
Pipe Height
8.00 in

Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

10c-25

Flow Monitor

10c-25

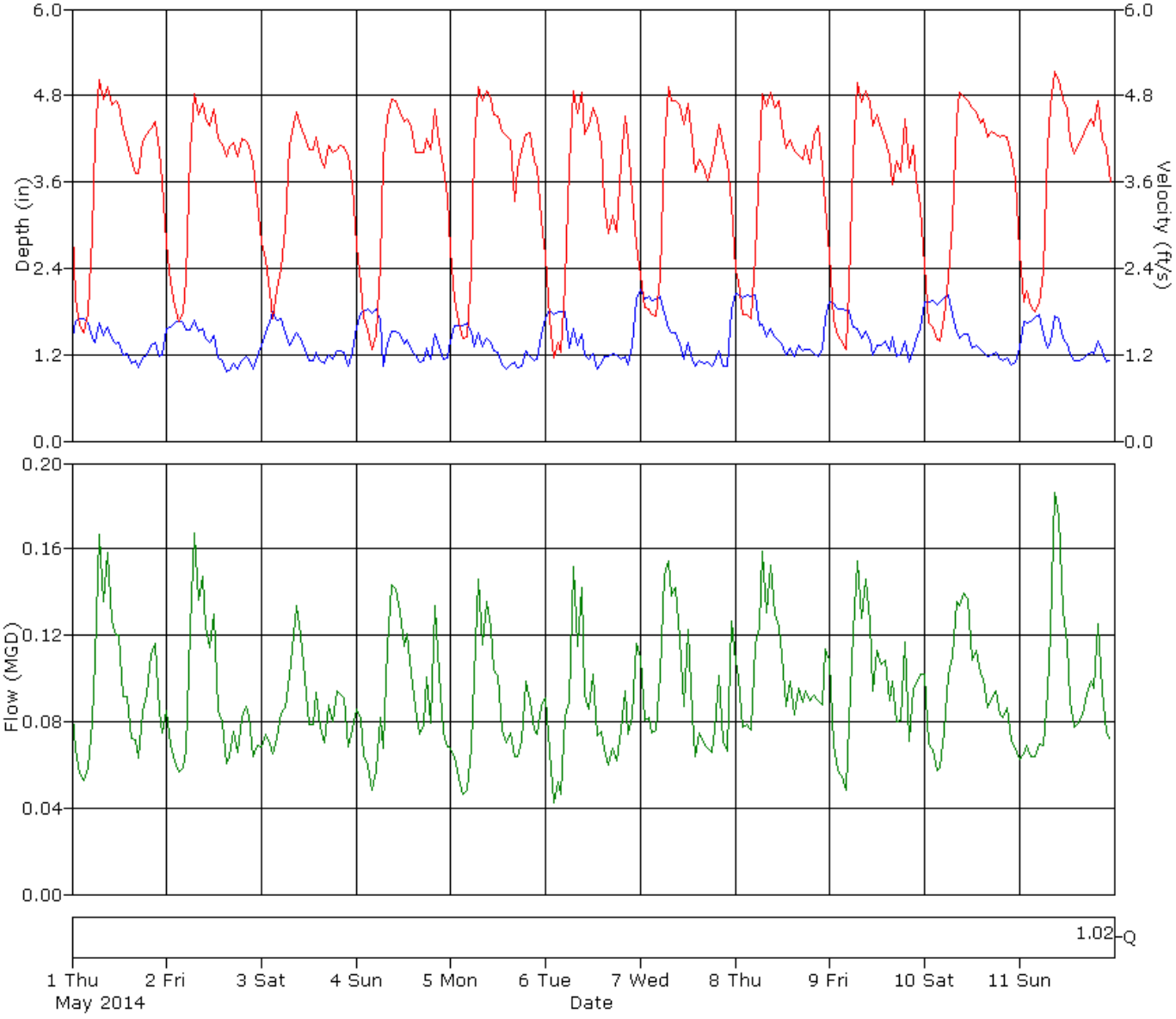
Pipe Height
8.00 in

Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

10c-25, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	23:00	0.87	04:55	1.63	1.28	03:55	1.14	10:40	5.47	3.93	03:55	0.037	09:45	0.176	0.088	0.088	
2/23/2014	23:10	0.84	00:15	2.17	1.29	04:40	1.88	10:20	5.62	4.12	23:10	0.050	11:00	0.190	0.096	0.096	
2/24/2014	23:15	0.78	05:15	1.71	1.33	04:35	1.21	09:50	5.77	4.13	04:35	0.039	09:50	0.201	0.099	0.099	
2/25/2014	22:25	0.83	07:20	1.72	1.27	03:40	1.92	09:50	5.72	4.23	22:25	0.054	09:50	0.197	0.097	0.097	0.11
2/26/2014	21:40	0.83	00:45	1.61	1.28	03:55	1.38	07:35	5.65	4.06	03:55	0.041	10:35	0.177	0.093	0.093	
2/27/2014	06:20	0.85	09:55	1.75	1.33	03:50	1.48	09:25	5.77	4.17	03:50	0.046	09:55	0.209	0.101	0.101	0.14
2/28/2014	06:00	0.80	16:05	2.27	1.37	04:00	2.15	16:05	6.23	4.53	06:00	0.050	16:05	0.329	0.119	0.119	1.01
3/1/2014	06:35	0.90	02:00	1.76	1.35	05:00	2.37	11:50	5.89	4.58	06:35	0.058	11:45	0.206	0.116	0.116	0.64
3/2/2014	07:00	0.81	09:30	1.72	1.34	02:45	2.81	10:15	5.67	4.60	07:00	0.049	10:15	0.200	0.116	0.116	0.09
3/3/2014	06:00	0.81	12:10	2.07	1.36	04:10	2.44	12:10	6.14	4.62	06:00	0.052	12:10	0.284	0.120	0.120	0.01
3/4/2014	16:05	0.79	07:30	1.67	1.30	04:00	1.62	07:50	5.69	4.19	16:05	0.050	09:55	0.190	0.098	0.098	
3/5/2014	00:10	0.84	10:35	1.74	1.31	04:45	1.88	12:25	5.82	4.23	00:10	0.046	12:25	0.208	0.101	0.101	
3/6/2014	16:35	0.79	23:25	2.09	1.37	04:05	1.62	09:50	5.71	4.13	03:15	0.047	09:50	0.220	0.104	0.104	
3/7/2014	23:15	0.76	00:15	2.09	1.45	03:55	1.38	07:20	5.65	4.15	23:15	0.043	09:55	0.197	0.108	0.108	
3/8/2014	06:55	0.75	09:10	1.61	1.23	03:40	1.99	09:00	5.55	4.14	06:55	0.044	09:10	0.179	0.092	0.092	
3/9/2014	00:05	0.83	03:40	1.60	1.30	02:45	1.92	09:30	5.55	4.14	00:05	0.047	19:10	0.174	0.097	0.097	
3/10/2014	16:00	0.81	03:55	1.87	1.31	03:10	1.48	08:35	5.76	4.09	16:00	0.048	08:50	0.190	0.095	0.095	
3/11/2014	14:35	0.73	03:55	1.74	1.28	02:00	1.25	08:55	5.62	3.92	00:45	0.042	09:25	0.186	0.088	0.088	
3/12/2014	13:40	0.95	04:05	1.74	1.38	01:55	1.31	08:50	5.65	3.95	03:05	0.028	06:15	0.170	0.103	0.103	
3/13/2014	17:15	0.84	03:05	1.77	1.38	02:55	1.26	10:00	5.72	4.15	03:15	0.039	06:15	0.188	0.106	0.106	
3/14/2014	22:15	0.88	04:50	1.74	1.36	04:10	1.55	12:25	5.59	4.06	04:10	0.053	08:45	0.199	0.101	0.101	
3/15/2014	15:20	0.84	04:00	1.78	1.35	02:40	1.45	10:05	5.67	3.88	04:15	0.052	10:05	0.182	0.094	0.094	
3/16/2014	14:50	0.88	23:50	1.71	1.36	03:30	1.85	10:15	5.59	3.99	00:20	0.051	09:15	0.184	0.098	0.098	
3/17/2014	17:35	0.94	09:55	1.99	1.43	02:40	1.23	09:55	6.02	4.08	02:40	0.044	09:55	0.264	0.107	0.107	
3/18/2014	16:05	0.76	05:10	1.77	1.37	04:50	1.41	09:55	5.62	4.12	16:05	0.044	07:45	0.185	0.103	0.103	
3/19/2014	23:25	0.88	06:00	1.88	1.38	04:25	1.57	11:15	5.57	4.04	23:05	0.052	11:15	0.174	0.100	0.100	
3/20/2014	15:55	0.82	23:40	2.09	1.38	04:00	1.30	07:25	5.76	4.01	04:15	0.048	07:25	0.209	0.101	0.101	
3/21/2014	18:00	0.97	01:00	2.34	1.59	02:30	1.38	09:50	5.79	3.86	04:35	0.065	06:25	0.230	0.113	0.113	
3/22/2014	17:50	0.97	04:35	2.00	1.45	04:20	0.98	12:15	5.30	3.76	04:20	0.037	09:25	0.149	0.098	0.098	
3/23/2014	19:10	0.93	04:40	2.02	1.50	03:00	1.38	10:15	5.42	3.83	03:00	0.052	23:10	0.178	0.105	0.105	
3/24/2014	14:30	1.04	06:35	2.10	1.51	02:45	1.35	09:50	5.62	4.00	02:45	0.053	06:35	0.203	0.112	0.112	
3/25/2014	22:15	1.00	01:50	1.88	1.44	02:20	1.18	09:50	5.57	3.93	02:20	0.043	12:40	0.198	0.103	0.103	
3/26/2014	22:45	0.77	01:35	1.89	1.47	02:40	1.18	12:25	5.86	3.96	03:40	0.043	12:25	0.196	0.108	0.108	0.01
3/27/2014	16:40	0.84	02:35	2.03	1.42	03:05	1.48	09:00	5.59	3.99	16:40	0.057	09:00	0.195	0.103	0.103	
3/28/2014	21:30	0.75	05:05	1.84	1.36	02:35	1.18	12:00	5.81	3.84	04:10	0.042	09:55	0.207	0.093	0.093	
3/29/2014	23:00	0.88	06:00	1.64	1.26	05:25	2.05	10:00	5.32	3.93	23:00	0.052	10:20	0.163	0.088	0.088	
3/30/2014	21:55	0.78	02:30	1.63	1.33	05:15	1.01	10:20	5.42	3.80	05:15	0.032	09:15	0.171	0.091	0.091	
3/31/2014	23:00	0.75	09:50	1.81	1.31	01:50	1.85	09:50	5.77	4.03	23:00	0.039	09:50	0.222	0.097	0.097	
4/1/2014	13:35	0.83	07:50	1.73	1.29	03:10	1.26	07:50	5.59	3.95	03:25	0.034	07:50	0.200	0.092	0.092	0.22
4/2/2014	22:55	0.91	23:25	1.84	1.33	04:00	1.11	10:50	5.54	3.97	04:00	0.035	07:55	0.189	0.096	0.096	0.21
4/3/2014	20:35	0.77	03:00	2.14	1.36	04:40	1.31	09:55	5.79	3.90	04:40	0.042	09:55	0.213	0.096	0.096	
4/4/2014	21:40	0.96	05:45	2.15	1.40	04:00	1.21	09:55	5.62	3.90	04:05	0.040	09:50	0.218	0.101	0.101	
4/5/2014	23:35	0.90	06:20	2.05	1.29	04:40	1.41	09:15	5.45	3.71	04:25	0.041	09:15	0.189	0.086	0.086	
4/6/2014	00:45	0.98	04:40	1.72	1.34	04:40	1.35	09:55	5.22	3.80	04:40	0.048	09:55	0.166	0.092	0.092	
4/7/2014	17:35	0.95	22:20	1.73	1.34	03:20	1.14	10:00	5.15	3.69	03:20	0.039	10:10	0.167	0.089	0.089	
4/8/2014	16:45	0.89	01:45	1.72	1.36	04:05	1.14	08:55	5.39	3.68	02:55	0.038	09:00	0.171	0.090	0.090	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014	12:10	0.92	04:50	1.97	1.52	03:00	1.16	21:00	5.12	3.72	03:00	0.039	20:20	0.176	0.107	0.107	
4/10/2014	13:50	0.90	01:55	1.97	1.40	02:55	1.18	09:25	5.50	3.63	02:55	0.038	09:30	0.181	0.092	0.092	
4/11/2014	19:15	0.87	00:40	2.16	1.46	04:25	1.18	09:30	5.39	3.60	04:25	0.036	09:30	0.231	0.099	0.099	
4/12/2014	16:25	0.98	09:55	1.92	1.38	04:20	1.01	10:05	4.98	3.42	04:20	0.027	10:05	0.196	0.086	0.086	
4/13/2014	15:10	0.85	05:45	2.02	1.41	04:00	0.98	11:15	5.03	3.44	05:50	0.034	11:25	0.192	0.087	0.087	
4/14/2014	07:05	0.97	05:30	2.02	1.46	03:40	1.11	09:25	5.15	3.64	03:40	0.038	09:50	0.198	0.100	0.100	
4/15/2014	18:40	0.96	11:30	2.65	1.51	03:20	0.91	09:50	5.20	3.61	04:20	0.022	11:25	0.296	0.110	0.110	
4/16/2014	12:05	0.94	16:35	2.04	1.37	04:55	1.11	09:50	5.35	3.61	04:55	0.035	16:35	0.188	0.090	0.090	
4/17/2014	14:25	1.02	05:15	2.06	1.45	01:35	1.18	09:50	5.37	3.64	01:20	0.032	07:55	0.209	0.100	0.100	
4/18/2014	19:45	1.01	05:35	1.94	1.47	02:55	1.01	14:55	5.42	3.74	02:55	0.036	09:50	0.208	0.102	0.102	
4/19/2014	20:40	0.91	11:35	1.86	1.43	03:15	1.55	11:35	5.33	3.61	02:45	0.045	11:35	0.212	0.098	0.098	
4/20/2014	17:00	0.98	09:55	1.82	1.40	04:45	1.11	09:55	5.49	3.65	03:40	0.037	09:55	0.211	0.093	0.093	
4/21/2014	17:05	1.14	09:45	1.89	1.43	03:35	1.04	10:00	5.25	3.62	04:00	0.030	07:45	0.204	0.098	0.097	
4/22/2014						04:25	0.98	09:50	5.18	3.50							
4/23/2014						04:35	1.25	07:40	5.05	3.60							
4/24/2014	20:40	0.86	04:45	1.88	1.45	03:30	1.01	07:55	5.25	3.62	03:40	0.031	07:55	0.182	0.100	0.100	
4/25/2014	16:10	0.86	07:40	1.94	1.44	03:30	1.25	10:00	5.39	3.58	17:10	0.043	07:15	0.218	0.097	0.097	
4/26/2014	17:20	0.86	22:15	1.95	1.41	05:20	1.40	10:20	5.08	3.53	17:20	0.050	10:20	0.202	0.091	0.091	0.15
4/27/2014	16:25	0.86	06:35	2.13	1.52	03:25	1.28	14:50	5.15	3.63	03:25	0.054	09:50	0.183	0.101	0.101	
4/28/2014	18:05	0.87	22:35	1.98	1.42	04:10	0.98	09:50	5.37	3.75	04:10	0.033	09:50	0.216	0.099	0.099	
4/29/2014	18:55	0.89	18:50	2.09	1.48	01:45	1.18	07:30	5.28	3.73	01:45	0.040	07:35	0.211	0.104	0.104	
4/30/2014	22:05	0.87	07:20	1.85	1.36	04:00	1.09	07:20	5.33	3.69	04:00	0.036	07:20	0.211	0.091	0.091	
5/1/2014	18:55	0.85	09:55	1.93	1.37	02:00	1.25	09:50	5.39	3.76	17:15	0.041	09:55	0.224	0.095	0.095	
5/2/2014	20:25	0.86	07:30	2.00	1.34	04:05	1.21	12:45	5.13	3.67	04:05	0.040	09:50	0.225	0.090	0.090	
5/3/2014	20:10	0.86	03:55	1.89	1.34	03:20	1.38	09:50	4.85	3.59	16:15	0.048	09:50	0.154	0.087	0.087	
5/4/2014	08:05	0.86	03:40	1.95	1.42	04:10	1.04	11:05	5.10	3.56	04:10	0.038	11:05	0.167	0.092	0.092	
5/5/2014	17:05	0.85	09:55	1.88	1.30	04:00	1.19	09:50	5.45	3.63	04:00	0.038	09:55	0.219	0.084	0.084	
5/6/2014	13:05	0.86	23:50	2.22	1.39	02:15	0.98	07:15	5.42	3.38	02:15	0.035	09:50	0.229	0.084	0.084	
5/7/2014	21:15	0.85	00:00	2.23	1.46	01:30	1.31	07:35	5.40	3.62	22:25	0.050	09:50	0.237	0.096	0.096	
5/8/2014	12:20	0.88	05:45	2.21	1.53	03:30	1.35	09:55	5.45	3.68	17:15	0.046	09:50	0.231	0.104	0.104	
5/9/2014	11:55	1.00	00:10	2.04	1.49	03:55	1.01	09:55	5.35	3.57	03:55	0.038	09:55	0.217	0.098	0.098	
5/10/2014	20:25	0.86	06:50	2.12	1.48	04:50	1.14	09:00	5.18	3.56	02:40	0.047	09:15	0.186	0.095	0.095	
5/11/2014	22:15	0.88	10:15	1.98	1.38	03:50	1.33	09:15	5.28	3.71	00:30	0.036	10:15	0.225	0.095	0.094	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			7.552	2.59
Avg	1.39	3.86	0.098	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.45	2.78	0.078		1.59	3.09	0.098		1.45	2.91	0.081		1.33	3.53	0.086		1.44	2.80	0.077		1.44	2.84	0.078		1.28	3.40	0.078	0.02
01:00	1.46	2.55	0.071		1.39	2.74	0.072		1.56	2.43	0.075		1.42	2.97	0.080		1.43	2.27	0.062		1.57	2.14	0.067		1.37	2.42	0.062	0.01
02:00	1.56	2.15	0.066		1.44	2.88	0.080		1.63	1.89	0.063		1.46	2.53	0.071		1.45	1.98	0.055		1.59	1.94	0.062		1.36	2.47	0.063	0.03
03:00	1.58	1.49	0.047		1.45	2.55	0.071		1.63	1.44	0.048		1.53	2.33	0.070		1.49	1.73	0.050		1.57	1.81	0.056		1.40	2.48	0.066	0.02
04:00	1.60	1.71	0.055		1.51	2.31	0.068		1.64	1.53	0.051		1.48	2.33	0.067		1.47	1.91	0.054		1.53	2.00	0.060	0.04	1.29	3.36	0.078	0.15
05:00	1.57	1.86	0.058		1.50	2.31	0.068		1.57	2.44	0.076		1.42	2.87	0.077		1.41	2.51	0.066		1.43	2.74	0.074	0.03	1.12	4.34	0.084	0.06
06:00	1.51	2.88	0.085		1.43	2.94	0.080		1.33	4.50	0.111		1.35	4.42	0.113		1.31	4.55	0.111		1.26	4.49	0.103	0.01	1.17	4.64	0.097	0.01
07:00	1.14	4.49	0.090		1.08	4.11	0.074		1.49	5.34	0.157		1.48	5.28	0.153		1.47	5.23	0.149		1.44	5.16	0.143	0.01	1.54	5.37	0.164	0.01
08:00	1.33	4.90	0.122		1.32	4.96	0.123		1.46	5.25	0.149		1.34	4.89	0.123		1.41	5.14	0.138		1.27	4.78	0.110	0.01	1.47	5.16	0.148	0.02
09:00	1.43	5.13	0.141		1.51	5.31	0.157		1.53	5.38	0.162		1.40	5.13	0.137		1.33	4.97	0.123		1.52	5.37	0.162	0.02	1.62	5.52	0.181	
10:00	1.44	5.22	0.145		1.51	5.34	0.159		1.43	5.11	0.140		1.31	4.87	0.118	0.09	1.42	5.17	0.141		1.38	5.00	0.130	0.01	1.45	5.13	0.144	0.03
11:00	1.39	5.06	0.133		1.54	5.46	0.167		1.22	4.87	0.107		1.39	5.05	0.132	0.02	1.22	4.77	0.104		1.35	4.95	0.124		1.65	5.51	0.186	0.18
12:00	1.18	4.68	0.098		1.28	4.88	0.115		1.51	5.33	0.157		1.31	4.97	0.121		1.35	5.00	0.127		1.45	5.16	0.145		1.73	5.71	0.205	0.20
13:00	1.16	4.88	0.100		1.13	4.64	0.090		1.24	4.77	0.107		1.13	4.66	0.092		1.24	4.76	0.106		1.33	4.94	0.122		1.43	4.99	0.137	
14:00	1.08	4.63	0.086		1.09	4.68	0.088		1.24	4.99	0.111		1.18	4.75	0.099		1.22	4.81	0.105		1.16	4.71	0.097		1.37	5.01	0.129	
15:00	1.08	4.73	0.087		1.04	4.69	0.082		1.11	4.68	0.089		1.25	4.88	0.110		1.04	4.36	0.077		1.13	4.59	0.090		1.39	4.93	0.130	0.15
16:00	1.05	4.58	0.080		1.04	4.53	0.078		1.04	4.56	0.078		1.07	4.56	0.082		1.06	4.43	0.079		1.12	4.63	0.090		1.63	5.42	0.185	0.01
17:00	1.08	4.35	0.079		1.07	4.63	0.084		1.08	4.54	0.083		1.01	4.49	0.074		1.07	4.46	0.081		1.16	4.65	0.094		1.42	5.03	0.137	0.03
18:00	1.04	4.48	0.078		1.09	4.70	0.088		1.10	4.62	0.089		1.12	4.65	0.090		1.11	4.60	0.088		1.22	4.79	0.104		1.31	4.81	0.116	
19:00	1.09	4.61	0.086		1.32	4.92	0.120		1.24	4.81	0.107		1.18	4.74	0.099		1.23	4.72	0.105		1.32	4.94	0.121		1.38	4.95	0.130	
20:00	1.10	4.61	0.087		1.15	4.75	0.095		1.23	4.78	0.106		1.15	4.72	0.095		1.25	4.83	0.110		1.29	4.88	0.115		1.27	4.76	0.110	
21:00	1.06	4.37	0.077		1.09	4.73	0.088		1.12	4.59	0.088		1.13	4.56	0.089		1.02	4.47	0.076		1.26	4.92	0.112		1.06	4.42	0.079	0.02
22:00	1.12	4.30	0.083		1.07	4.26	0.076		1.02	4.33	0.072		0.98	4.29	0.068		1.03	4.23	0.072		1.06	4.48	0.079		1.07	4.42	0.080	0.03
23:00	1.23	3.84	0.083		1.28	3.54	0.081		1.06	4.08	0.073		1.14	3.96	0.077		1.16	3.83	0.076		1.07	4.22	0.076	0.01	0.98	4.39	0.069	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.088				0.096				0.099				0.097	0.11			0.093				0.101	0.14			0.119	1.01
Avg	1.28	3.93	0.088		1.29	4.12	0.096		1.33	4.13	0.099		1.27	4.23	0.097		1.28	4.06	0.093		1.33	4.17	0.101		1.37	4.53	0.119	
Time	23:00	03:55	03:55		23:10	04:40	23:10		23:15	04:35	04:35		22:25	03:40	22:25		21:40	03:55	03:55		06:20	03:50	03:50		06:00	04:00	06:00	
Min	0.87	1.14	0.037		0.84	1.88	0.050		0.78	1.21	0.039		0.83	1.92	0.054		0.83	1.38	0.041		0.85	1.48	0.046		0.80	2.15	0.050	
Time	04:55	10:40	09:45		00:15	10:20	11:00		05:15	09:50	09:50		07:20	09:50	09:50		00:45	07:35	10:35		09:55	09:25	09:55		16:05	16:05	16:05	
Max	1.63	5.47	0.176		2.17	5.62	0.190		1.71	5.77	0.201		1.72	5.72	0.197		1.61	5.65	0.177		1.75	5.77	0.209		2.27	6.23	0.329	

	D	V	Q	Rain
Total			0.693	1.26
Avg	1.31	4.17	0.099	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.22	4.33	0.095	0.32	1.12	3.91	0.075		1.22	3.99	0.086		1.38	2.97	0.077		1.29	3.29	0.077		1.50	2.50	0.073		2.03	2.57	0.116	
01:00	1.34	4.06	0.101	0.12	1.41	3.56	0.095		1.35	3.86	0.096		1.43	2.29	0.062		1.42	2.72	0.073		1.52	2.13	0.063		1.95	2.30	0.098	
02:00	1.65	3.42	0.115		1.20	3.77	0.080		1.42	3.46	0.093		1.47	2.18	0.062		1.48	2.39	0.068		1.58	2.23	0.070		1.96	2.08	0.089	
03:00	1.37	3.55	0.091		1.34	3.66	0.090		1.48	2.99	0.086		1.50	2.15	0.063		1.53	2.23	0.067		1.54	2.03	0.061		1.92	2.05	0.086	
04:00	1.42	3.25	0.088		1.34	3.78	0.093		1.40	3.20	0.085		1.54	1.92	0.058		1.53	2.12	0.064		1.55	1.94	0.060		1.90	1.80	0.074	
05:00	1.42	3.25	0.087		1.42	3.53	0.095	0.01	1.21	3.70	0.078		1.37	2.72	0.067		1.46	2.69	0.076		1.50	2.45	0.071		1.98	2.38	0.104	
06:00	1.13	3.98	0.078	0.01	1.15	3.88	0.077		1.29	4.94	0.121		1.16	4.71	0.098		1.20	4.69	0.103		1.30	4.66	0.112		1.63	4.22	0.133	
07:00	1.14	4.52	0.090		1.05	4.34	0.077	0.02	1.59	5.50	0.176		1.49	5.32	0.155		1.51	5.40	0.160		1.56	5.46	0.170		1.48	5.41	0.156	
08:00	1.44	5.13	0.143		1.42	5.07	0.138		1.56	5.46	0.169	0.01	1.40	5.09	0.135		1.40	5.20	0.139		1.34	4.90	0.123		1.37	5.21	0.135	
09:00	1.53	5.34	0.162	0.03	1.57	5.39	0.169	0.04	1.60	5.56	0.180		1.45	5.25	0.148		1.39	5.09	0.134		1.48	5.21	0.151		1.46	5.27	0.149	
10:00	1.60	5.51	0.178	0.02	1.62	5.46	0.179	0.02	1.54	5.37	0.163		1.41	5.14	0.138		1.47	5.25	0.150		1.37	5.06	0.132		1.43	5.21	0.144	
11:00	1.60	5.52	0.178		1.48	5.22	0.151		1.47	5.24	0.150		1.42	5.09	0.139		1.36	5.07	0.129		1.37	5.23	0.136		1.41	5.18	0.139	
12:00	1.47	5.32	0.152		1.50	5.24	0.154		1.63	5.47	0.183		1.40	5.08	0.136		1.41	5.17	0.141		1.35	4.99	0.126		1.38	5.19	0.135	
13:00	1.32	4.96	0.122		1.36	4.93	0.125		1.31	4.85	0.117		1.20	4.74	0.101		1.32	4.84	0.119		1.28	4.82	0.113		1.31	5.02	0.122	
14:00	1.37	5.07	0.131		1.37	4.93	0.127		1.34	4.96	0.124		1.11	4.60	0.088		1.21	4.61	0.099		1.22	4.76	0.105		1.15	4.81	0.096	
15:00	1.32	4.97	0.122		1.16	4.62	0.094		1.32	4.80	0.117		1.13	4.68	0.092		1.15	4.64	0.094		1.18	4.72	0.099		1.19	4.80	0.103	
16:00	1.33	4.93	0.121	0.03	1.35	4.84	0.123		1.23	4.75	0.104		1.02	4.51	0.076		1.10	4.57	0.086		0.98	4.58	0.072		1.14	4.77	0.095	
17:00	1.35	4.94	0.124	0.08	1.41	5.05	0.136		1.28	4.95	0.116		1.08	4.56	0.083		1.11	4.45	0.085		1.11	4.62	0.088		1.20	4.72	0.100	
18:00	1.35	4.88	0.124	0.01	1.42	5.00	0.136		1.36	5.05	0.129		1.22	4.75	0.104		1.12	4.56	0.088		1.23	4.83	0.106		1.16	4.70	0.096	
19:00	1.29	4.85	0.115		1.42	5.10	0.139		1.41	5.09	0.137		1.28	4.85	0.113		1.34	4.92	0.124		1.21	4.71	0.102		1.18	4.66	0.097	
20:00	1.18	4.68	0.097	0.02	1.41	5.06	0.136		1.28	4.79	0.112		1.27	4.77	0.110		1.13	4.57	0.090		1.26	4.86	0.111		1.11	4.63	0.088	
21:00	1.18	4.66	0.097		1.35	4.98	0.125		1.14	4.62	0.092		1.21	4.70	0.101		1.24	4.77	0.107		1.14	4.61	0.092		1.13	4.64	0.091	
22:00	1.09	4.31	0.079		1.18	4.68	0.098		1.06	4.51	0.080		1.07	4.48	0.081		1.07	4.46	0.081		1.31	4.48	0.108		1.07	4.38	0.079	
23:00	1.20	4.35	0.093		1.06	4.36	0.077		1.21	3.67	0.078		1.11	4.00	0.075		1.20	3.95	0.082		1.91	3.40	0.140		1.18	3.67	0.074	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.116	0.64			0.116	0.09			0.120	0.01			0.098				0.101				0.104				0.108	
Avg	1.35	4.58	0.116		1.34	4.60	0.116		1.36	4.62	0.120		1.30	4.19	0.098		1.31	4.23	0.101		1.37	4.13	0.104		1.45	4.15	0.108	
Time	06:35	05:00	06:35		07:00	02:45	07:00		06:00	04:10	06:00		16:05	04:00	16:05		00:10	04:45	00:10		16:35	04:05	03:15		23:15	03:55	23:15	
Min	0.90	2.37	0.058		0.81	2.81	0.049		0.81	2.44	0.052		0.79	1.62	0.050		0.84	1.88	0.046		0.79	1.62	0.047		0.76	1.38	0.043	
Time	02:00	11:50	11:45		09:30	10:15	10:15		12:10	12:10	12:10		07:30	07:50	09:55		10:35	12:25	12:25		23:25	09:50	09:50		00:15	07:20	09:55	
Max	1.76	5.89	0.206		1.72	5.67	0.200		2.07	6.14	0.284		1.67	5.69	0.190		1.74	5.82	0.208		2.09	5.71	0.220		2.09	5.65	0.197	

	D	V	Q	Rain
Total			0.764	0.74
Avg	1.35	4.36	0.109	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.31	3.24	0.077		1.07	3.82	0.069		1.51	2.62	0.078		1.48	2.20	0.063		1.42	2.03	0.055		1.61	1.93	0.062		1.49	3.04	0.088	
01:00	1.32	2.47	0.060		1.41	3.10	0.083		1.57	2.35	0.073		1.60	1.78	0.057		1.42	1.68	0.045		1.58	2.26	0.071		1.59	2.18	0.069	
02:00	1.29	2.34	0.055		1.47	2.36	0.067		1.68	2.03	0.070		1.62	1.71	0.056		1.33	1.76	0.044		1.57	1.98	0.062		1.65	1.98	0.066	
03:00	1.29	2.16	0.051		1.48	2.24	0.064		1.74	1.98	0.072		1.63	1.82	0.060		1.18	1.79	0.037		1.59	1.60	0.051		1.64	2.08	0.069	
04:00	1.31	2.30	0.056		1.52	2.17	0.065		1.70	2.78	0.097		1.50	2.50	0.072		1.55	2.11	0.064		1.49	2.24	0.065		1.67	1.75	0.060	
05:00	1.32	2.29	0.056		1.40	2.58	0.069		1.24	3.89	0.085		1.15	4.25	0.084		1.47	4.02	0.115		1.57	4.07	0.128		1.60	2.09	0.066	
06:00	1.07	3.66	0.064		1.37	3.23	0.083		1.36	5.21	0.134		1.34	5.25	0.130		1.51	5.24	0.155		1.56	5.25	0.162		1.27	3.99	0.089	
07:00	1.07	4.61	0.084		1.23	4.75	0.106		1.32	5.18	0.127		1.24	5.04	0.112		1.31	4.99	0.120		1.50	4.98	0.147		1.49	5.22	0.151	
08:00	1.36	5.06	0.130		1.33	4.97	0.124		1.42	5.24	0.143		1.32	5.17	0.126		1.41	5.07	0.136		1.51	5.20	0.154		1.54	5.25	0.160	
09:00	1.44	5.28	0.146		1.43	5.24	0.143		1.31	5.02	0.123		1.47	5.09	0.146		1.39	4.98	0.131		1.46	5.67	0.160		1.47	5.09	0.145	
10:00	1.39	5.16	0.136		1.37	5.10	0.131		1.34	5.13	0.128		1.16	4.83	0.098		1.50	5.03	0.147		1.45	5.19	0.147		1.46	5.05	0.142	
11:00	1.28	5.05	0.118		1.34	5.12	0.128		1.40	5.21	0.139		1.26	4.91	0.112		1.45	5.00	0.139		1.43	5.12	0.140		1.43	5.02	0.138	
12:00	1.24	4.91	0.110		1.23	4.84	0.106		1.21	4.94	0.106		1.31	4.55	0.111		1.38	4.69	0.122		1.43	5.06	0.139		1.45	5.08	0.143	
13:00	1.26	4.95	0.113		1.16	4.66	0.094		1.11	4.64	0.088		1.20	4.45	0.095		1.19	4.67	0.098		1.22	4.68	0.102		1.28	4.77	0.111	
14:00	1.22	4.87	0.106		1.14	4.62	0.091		1.10	4.58	0.086		0.98	4.25	0.067		1.15	4.51	0.090		1.21	4.62	0.100		1.19	4.64	0.097	
15:00	1.18	4.84	0.101		1.10	4.56	0.085		1.06	4.44	0.079		1.08	4.10	0.075		1.29	3.64	0.085		1.21	4.60	0.100		1.15	4.54	0.091	
16:00	1.25	4.87	0.110		1.11	4.64	0.089		1.06	4.08	0.073		1.03	4.11	0.069		1.39	4.40	0.115		1.08	4.12	0.075		1.09	4.45	0.083	
17:00	1.20	4.81	0.102		1.18	4.82	0.100		1.07	4.59	0.084		0.97	4.50	0.071		1.46	4.28	0.121		1.15	4.16	0.083		1.24	4.68	0.105	
18:00	1.27	4.86	0.113		1.19	4.78	0.100		1.15	4.81	0.097		1.18	4.71	0.097		1.40	4.73	0.125		1.13	4.48	0.088		1.10	4.43	0.083	
19:00	1.13	4.65	0.091		1.29	5.10	0.121		1.18	4.82	0.100		1.16	4.75	0.096		1.39	4.91	0.130		1.30	4.78	0.116		1.22	4.66	0.102	
20:00	1.10	4.52	0.084		1.21	4.87	0.105		1.11	4.58	0.088		1.06	4.48	0.080		1.34	4.67	0.117		1.29	4.75	0.113		1.23	4.65	0.102	
21:00	1.11	4.38	0.083		1.26	4.38	0.100		1.08	4.25	0.077		1.10	4.26	0.079		1.35	4.29	0.108		1.25	4.72	0.108		1.18	4.52	0.095	
22:00	1.06	4.07	0.072		1.37	4.00	0.103		1.26	3.42	0.078		1.36	2.99	0.075		1.38	3.52	0.092		1.18	4.28	0.089		1.10	4.16	0.078	
23:00	1.15	3.97	0.080		1.47	3.44	0.097		1.39	2.46	0.065		1.44	2.46	0.068		1.49	2.81	0.081		1.27	3.91	0.089		1.15	4.11	0.082	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.092				0.097				0.095				0.088				0.103				0.106				0.101	
Avg	1.23	4.14	0.092		1.30	4.14	0.097		1.31	4.09	0.095		1.28	3.92	0.088		1.38	3.95	0.103		1.38	4.15	0.106		1.36	4.06	0.101	
Time	06:55	03:40	06:55		00:05	02:45	00:05		16:00	03:10	16:00		14:35	02:00	00:45		13:40	01:55	03:05		17:15	02:55	03:15		22:15	04:10	04:10	
Min	0.75	1.99	0.044		0.83	1.92	0.047		0.81	1.48	0.048		0.73	1.25	0.042		0.95	1.31	0.028		0.84	1.26	0.039		0.88	1.55	0.053	
Time	09:10	09:00	09:10		03:40	09:30	19:10		03:55	08:35	08:50		03:55	08:55	09:25		04:05	08:50	06:15		03:05	10:00	06:15		04:50	12:25	08:45	
Max	1.61	5.55	0.179		1.60	5.55	0.174		1.87	5.76	0.190		1.74	5.62	0.186		1.74	5.65	0.170		1.77	5.72	0.188		1.74	5.59	0.199	

	D	V	Q	Rain
Total			0.681	
Avg	1.32	4.07	0.097	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.38	3.28	0.084		1.34	3.34	0.081		1.67	2.64	0.089		1.52	3.32	0.098		1.66	2.42	0.082		1.48	2.52	0.073		2.09	2.22	0.104	
01:00	1.62	2.04	0.067		1.52	2.35	0.070		1.80	2.23	0.084		1.65	2.33	0.078		1.73	2.21	0.079		1.49	2.27	0.066		2.24	1.92	0.100	
02:00	1.69	1.89	0.066		1.58	2.31	0.073		1.81	1.77	0.068		1.66	2.37	0.080		1.79	2.06	0.078		1.67	1.79	0.061		2.20	1.76	0.089	
03:00	1.69	1.85	0.064		1.58	2.18	0.069		1.82	1.87	0.072		1.69	1.68	0.059		1.77	2.12	0.078		1.69	2.00	0.069		2.16	1.94	0.095	
04:00	1.71	1.86	0.066		1.63	2.14	0.070		1.80	1.68	0.064		1.70	1.85	0.065		1.76	2.00	0.074		1.75	1.61	0.059		2.16	1.89	0.093	
05:00	1.69	2.02	0.070		1.63	2.15	0.071		1.79	2.59	0.097		1.64	2.75	0.090		1.75	2.43	0.088		1.69	2.08	0.072		2.14	2.20	0.106	
06:00	1.67	2.28	0.078		1.58	2.27	0.072		1.31	4.46	0.108		1.29	4.19	0.098		1.21	4.18	0.089		1.31	4.15	0.098		1.64	3.67	0.119	
07:00	1.38	3.46	0.085		1.31	3.40	0.077		1.52	5.27	0.158		1.46	5.20	0.148		1.44	5.17	0.143		1.51	5.33	0.158		1.48	5.21	0.150	
08:00	1.29	4.81	0.114		1.37	4.99	0.128		1.37	4.96	0.128		1.36	5.02	0.128		1.35	4.98	0.125		1.38	5.05	0.132		1.42	5.09	0.138	
09:00	1.47	5.08	0.145		1.48	5.18	0.149		1.59	5.31	0.171		1.54	5.35	0.164		1.43	5.14	0.141		1.51	5.29	0.157		1.46	5.17	0.147	
10:00	1.47	5.26	0.150		1.49	5.27	0.154		1.49	5.16	0.151		1.45	5.25	0.146		1.40	5.05	0.134		1.45	5.31	0.148		1.47	5.27	0.151	
11:00	1.50	5.22	0.153		1.42	5.10	0.139		1.38	4.94	0.129		1.44	5.15	0.142		1.39	5.06	0.134		1.44	5.24	0.145		1.42	4.98	0.135	
12:00	1.38	5.00	0.130		1.29	4.85	0.115		1.46	5.05	0.144		1.27	4.86	0.114		1.32	4.96	0.121		1.37	5.17	0.133		1.28	4.82	0.113	
13:00	1.15	4.57	0.092		1.09	4.45	0.083		1.26	4.73	0.108		1.29	4.77	0.113		1.24	4.73	0.106		1.26	4.69	0.108		1.26	4.60	0.105	
14:00	1.27	4.68	0.108		1.09	4.55	0.085		1.32	4.76	0.117		1.23	4.70	0.104		1.11	4.41	0.084		1.15	4.43	0.089		1.23	4.62	0.102	
15:00	1.14	4.70	0.093		1.08	4.54	0.083		1.21	4.63	0.101		1.21	4.55	0.098		1.10	4.41	0.083		1.09	4.46	0.082		1.31	4.26	0.103	
16:00	1.12	4.37	0.084		1.13	4.61	0.091		1.09	4.38	0.081		1.07	4.17	0.076		1.16	4.36	0.089		1.11	4.21	0.079		1.32	4.13	0.101	
17:00	1.11	4.39	0.083		1.18	4.63	0.096		1.08	4.42	0.082		1.09	4.52	0.083		1.07	4.31	0.077		1.08	4.43	0.081		1.36	4.29	0.108	
18:00	1.20	4.66	0.099		1.30	4.88	0.117		1.22	4.65	0.101		1.17	4.59	0.094		1.10	4.60	0.087		1.14	4.52	0.090		1.13	4.27	0.084	
19:00	1.16	4.54	0.092		1.26	4.77	0.110		1.28	4.72	0.110		1.15	4.66	0.095		1.29	4.88	0.117		1.18	4.63	0.096		1.19	4.51	0.094	
20:00	1.15	4.47	0.091		1.37	4.99	0.128		1.33	4.93	0.123		1.35	5.06	0.128		1.26	4.85	0.111		1.20	4.49	0.095		1.33	4.31	0.106	
21:00	1.10	4.34	0.082		1.26	4.75	0.108		1.24	4.72	0.106		1.25	4.73	0.107		1.28	4.83	0.113		1.10	4.62	0.086		1.40	4.23	0.110	
22:00	1.08	4.35	0.079		1.16	4.44	0.090		1.13	4.32	0.084		1.08	4.27	0.079		1.06	4.16	0.074		1.26	4.43	0.099		1.66	3.96	0.135	
23:00	1.08	4.03	0.074		1.41	3.67	0.097		1.30	3.82	0.090		1.20	3.67	0.076		1.35	3.60	0.091		1.91	3.45	0.143		1.72	3.43	0.123	

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.094				0.098				0.107				0.103				0.100				0.101				0.113	
Avg	1.35	3.88	0.094		1.36	3.99	0.098		1.43	4.08	0.107		1.37	4.12	0.103		1.38	4.04	0.100		1.38	4.01	0.101		1.59	3.86	0.113	
Time	15:20	02:40	04:15		14:50	03:30	00:20		17:35	02:40	02:40		16:05	04:50	16:05		23:25	04:25	23:05		15:55	04:00	04:15		18:00	02:30	04:35	
Min	0.84	1.45	0.052		0.88	1.85	0.051		0.94	1.23	0.044		0.76	1.41	0.044		0.88	1.57	0.052		0.82	1.30	0.048		0.97	1.38	0.065	
Time	04:00	10:05	10:05		23:50	10:15	09:15		09:55	09:55	09:55		05:10	09:55	07:45		06:00	11:15	11:15		23:40	07:25	07:25		01:00	09:50	06:25	
Max	1.78	5.67	0.182		1.71	5.59	0.184		1.99	6.02	0.264		1.77	5.62	0.185		1.88	5.57	0.174		2.09	5.76	0.209		2.34	5.79	0.230	

	D	V	Q	Rain
Total			0.715	
Avg	1.41	4.00	0.102	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.72	3.21	0.114		1.87	2.96	0.119		1.92	2.75	0.114		1.78	2.31	0.086		1.80	2.78	0.105		1.87	2.21	0.088		1.62	2.57	0.083	
01:00	1.82	2.15	0.083		1.83	2.20	0.085		1.93	2.36	0.100		1.79	1.86	0.070		1.78	2.11	0.079		1.88	2.51	0.102		1.75	1.70	0.062	
02:00	1.81	1.81	0.070		1.82	1.97	0.076		1.91	1.85	0.077		1.74	1.48	0.054		1.81	1.68	0.065		1.91	2.30	0.095		1.74	1.59	0.058	
03:00	1.79	1.57	0.059		1.86	1.71	0.068		1.91	1.81	0.075		1.75	1.73	0.063		1.72	1.56	0.055		1.86	1.77	0.071		1.71	1.54	0.054	
04:00	1.82	1.44	0.056		1.85	2.11	0.084		1.87	1.78	0.071		1.73	1.73	0.062		1.75	1.50	0.055	0.01	1.90	2.15	0.088		1.70	1.42	0.050	
05:00	1.84	1.72	0.068		1.88	1.79	0.073		1.89	2.58	0.105		1.75	2.61	0.095		1.70	2.66	0.091		1.87	2.87	0.115		1.75	2.35	0.085	
06:00	1.86	2.29	0.091		1.87	2.53	0.102		1.80	4.30	0.161		1.45	4.12	0.112		1.33	4.17	0.101		1.31	4.33	0.102		1.34	4.10	0.101	
07:00	1.61	3.50	0.112		1.81	3.16	0.120		1.42	5.14	0.140		1.41	4.91	0.132		1.50	5.08	0.149		1.49	5.14	0.150		1.53	5.14	0.156	
08:00	1.28	4.61	0.107		1.28	4.65	0.109		1.45	4.87	0.136		1.31	4.66	0.113		1.44	4.90	0.136		1.46	5.05	0.143		1.43	4.96	0.137	
09:00	1.38	4.85	0.127		1.42	5.04	0.136		1.43	5.16	0.141		1.43	4.88	0.135		1.48	5.00	0.144		1.47	5.14	0.148		1.53	5.22	0.158	
10:00	1.28	4.84	0.113		1.48	5.05	0.146		1.36	4.94	0.127		1.40	4.87	0.129		1.52	5.11	0.153		1.42	4.96	0.134		1.41	4.87	0.131	
11:00	1.29	4.70	0.111		1.40	5.03	0.134		1.41	4.90	0.131		1.38	4.83	0.126		1.42	4.85	0.131		1.40	4.90	0.130		1.37	4.84	0.125	
12:00	1.29	4.86	0.114		1.24	4.64	0.104		1.46	5.06	0.143		1.45	5.05	0.143		1.45	4.93	0.139		1.40	4.94	0.131		1.43	5.01	0.139	
13:00	1.21	4.77	0.102		1.26	4.38	0.101		1.26	4.51	0.102		1.27	4.68	0.108		1.34	4.78	0.119		1.21	4.54	0.098		1.22	4.47	0.098	
14:00	1.26	4.51	0.103		1.30	4.35	0.104		1.19	4.59	0.097		1.36	4.63	0.118		1.27	4.64	0.107		1.20	4.43	0.095		1.08	4.26	0.078	
15:00	1.18	4.35	0.089		1.31	4.43	0.108		1.31	4.41	0.106		1.25	4.65	0.105		1.27	4.57	0.105		1.10	4.23	0.080		1.09	4.38	0.081	
16:00	1.30	4.63	0.111		1.19	4.88	0.103		1.30	4.36	0.104		1.25	4.52	0.103		1.30	4.25	0.102		1.09	4.29	0.080		1.15	4.32	0.086	
17:00	1.19	4.59	0.098		1.17	4.50	0.093		1.31	4.09	0.099		1.18	4.30	0.089		1.36	4.21	0.105		1.10	4.19	0.079		1.07	4.31	0.078	
18:00	1.27	4.59	0.106		1.24	4.81	0.107		1.26	4.54	0.103		1.18	4.40	0.092		1.25	4.53	0.102		1.21	4.44	0.097		1.08	4.38	0.080	
19:00	1.31	4.65	0.113		1.12	4.79	0.093		1.31	4.76	0.115		1.29	4.72	0.111		1.27	4.64	0.108		1.18	4.53	0.094		1.18	4.41	0.091	
20:00	1.24	4.54	0.102		1.21	4.86	0.105		1.32	4.86	0.119		1.26	4.78	0.109		1.36	4.72	0.121		1.24	4.51	0.101		1.09	4.30	0.079	
21:00	1.27	4.25	0.098		1.27	4.78	0.111		1.23	4.53	0.100		1.35	4.86	0.124		1.26	4.61	0.106		1.16	4.35	0.089		1.11	4.12	0.079	
22:00	1.24	4.16	0.093		1.41	3.87	0.099		1.31	4.18	0.099		1.32	4.03	0.097		1.14	4.34	0.086		1.13	4.08	0.079		1.05	4.16	0.073	
23:00	1.56	3.56	0.109		1.87	3.36	0.135		1.59	3.63	0.114		1.46	3.76	0.105		1.68	3.40	0.116		1.20	3.79	0.080		1.16	3.64	0.073	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.098				0.105				0.112				0.103				0.108	0.01			0.103				0.093	
Avg	1.45	3.76	0.098		1.50	3.83	0.105		1.51	4.00	0.112		1.44	3.93	0.103		1.47	3.96	0.108		1.42	3.99	0.103		1.36	3.84	0.093	
Time	17:50	04:20	04:20		19:10	03:00	03:00		14:30	02:45	02:45		22:15	02:20	02:20		22:45	02:40	03:40		16:40	03:05	16:40		21:30	02:35	04:10	
Min	0.97	0.98	0.037		0.93	1.38	0.052		1.04	1.35	0.053		1.00	1.18	0.043		0.77	1.18	0.043		0.84	1.48	0.057		0.75	1.18	0.042	
Time	04:35	12:15	09:25		04:40	10:15	23:10		06:35	09:50	06:35		01:50	09:50	12:40		01:35	12:25	12:25		02:35	09:00	09:00		05:05	12:00	09:55	
Max	2.00	5.30	0.149		2.02	5.42	0.178		2.10	5.62	0.203		1.88	5.57	0.198		1.89	5.86	0.196		2.03	5.59	0.195		1.84	5.81	0.207	

	D	V	Q	Rain
Total			0.721	0.01
Avg	1.45	3.90	0.103	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.30	3.27	0.076		1.26	3.49	0.078		1.42	3.06	0.083		1.39	2.54	0.066		1.38	2.66	0.069	0.13	1.59	2.42	0.078		1.56	3.05	0.094	
01:00	1.43	2.59	0.071		1.50	2.53	0.074		1.48	2.44	0.070		1.41	2.00	0.054		1.35	2.64	0.066	0.03	1.68	1.93	0.066		1.64	2.14	0.071	
02:00	1.43	2.55	0.070		1.52	2.19	0.065		1.48	2.16	0.062		1.41	1.94	0.052		1.45	2.48	0.069		1.81	1.76	0.068		1.64	1.69	0.056	
03:00	1.46	2.62	0.073		1.58	1.44	0.045		1.49	2.06	0.060		1.46	1.55	0.044		1.54	1.96	0.059	0.01	1.70	1.89	0.067		1.63	1.44	0.047	
04:00	1.48	2.55	0.073		1.56	1.50	0.046		1.43	2.72	0.074		1.46	1.74	0.049		1.55	1.73	0.053	0.01	1.69	1.78	0.062		1.74	1.64	0.059	
05:00	1.51	2.61	0.077		1.56	1.49	0.046		1.38	3.14	0.080		1.42	2.60	0.071	0.04	1.45	2.58	0.072		1.67	2.15	0.073		1.99	2.16	0.094	
06:00	1.47	3.09	0.087		1.50	2.70	0.079		1.20	4.25	0.090		1.23	4.56	0.100	0.14	1.23	3.95	0.086	0.03	1.37	3.99	0.099		1.33	4.23	0.105	
07:00	1.21	4.21	0.090		1.30	3.36	0.079		1.51	5.14	0.153		1.52	5.29	0.158	0.01	1.42	5.00	0.137		1.51	5.20	0.155		1.52	5.13	0.153	
08:00	1.26	4.70	0.107		1.14	4.39	0.088		1.47	4.97	0.142		1.43	4.91	0.134		1.42	4.95	0.134		1.48	4.97	0.143		1.55	5.08	0.156	
09:00	1.36	4.82	0.124		1.41	4.94	0.133		1.55	5.20	0.161		1.49	5.05	0.147		1.53	4.94	0.149		1.53	5.18	0.158		1.54	5.05	0.155	
10:00	1.38	4.91	0.129		1.43	4.94	0.136		1.44	4.86	0.135		1.41	4.99	0.135		1.38	4.93	0.129		1.46	4.91	0.139		1.49	5.01	0.146	
11:00	1.23	4.57	0.102		1.28	4.65	0.110		1.32	4.68	0.115		1.32	4.84	0.119		1.17	4.85	0.100		1.30	4.73	0.113		1.55	5.00	0.154	
12:00	1.29	4.65	0.110		1.32	4.72	0.115		1.40	4.83	0.129		1.38	4.89	0.128		1.30	4.83	0.117		1.38	4.90	0.129		1.52	4.98	0.150	
13:00	1.26	4.66	0.107		1.23	4.55	0.102		1.23	4.58	0.102		1.19	4.56	0.099		1.31	4.86	0.118		1.19	4.46	0.094		1.23	4.53	0.101	
14:00	1.13	4.32	0.084		1.20	4.53	0.098		1.13	4.35	0.086		1.20	4.65	0.099		1.10	4.47	0.084		1.11	4.29	0.081		1.23	4.54	0.101	
15:00	1.18	4.41	0.092		1.13	4.26	0.083		1.13	4.25	0.084		1.14	4.38	0.086		1.22	4.59	0.100		1.12	4.33	0.083		1.24	4.40	0.098	
16:00	1.11	4.32	0.083		1.18	4.41	0.092		1.11	4.12	0.078		1.06	4.20	0.075		1.26	4.14	0.094		1.10	4.31	0.081		1.11	4.17	0.079	
17:00	1.12	4.35	0.084		1.14	4.48	0.089		1.11	4.32	0.083		0.97	4.23	0.066		1.22	4.47	0.097		1.04	4.06	0.070		1.14	4.27	0.085	
18:00	1.13	4.23	0.083		1.34	4.74	0.119		1.27	4.68	0.109		1.14	4.40	0.087		1.22	4.25	0.093		1.19	4.66	0.098		1.18	4.34	0.091	
19:00	1.05	4.32	0.075		1.30	4.70	0.112		1.28	4.63	0.109		1.23	4.59	0.102		1.24	4.60	0.103		1.20	4.60	0.099		1.15	4.40	0.088	
20:00	1.10	4.25	0.080		1.45	4.95	0.139		1.22	4.49	0.098		1.33	4.84	0.120		1.26	4.63	0.106		1.20	4.61	0.100		1.16	4.32	0.088	
21:00	1.10	4.22	0.079		1.21	4.43	0.097		1.10	4.36	0.082		1.06	4.23	0.075		1.18	4.50	0.094		1.18	4.52	0.094		1.10	4.14	0.077	
22:00	1.03	4.12	0.071		1.03	4.10	0.070		1.02	4.10	0.069		1.06	4.19	0.075		1.09	4.30	0.079		1.10	4.31	0.080		1.15	4.11	0.082	
23:00	1.11	3.85	0.073		1.22	3.75	0.082		1.18	3.42	0.070		1.18	3.75	0.078	0.03	1.61	2.89	0.093		1.17	3.76	0.077		1.20	3.86	0.083	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.088				0.091				0.097				0.092	0.22			0.096	0.21			0.096				0.101	
Avg	1.26	3.93	0.088		1.33	3.80	0.091		1.31	4.03	0.097		1.29	3.95	0.092		1.33	3.97	0.096		1.36	3.90	0.096		1.40	3.90	0.101	
Time	23:00	05:25	23:00		21:55	05:15	05:15		23:00	01:50	23:00		13:35	03:10	03:25		22:55	04:00	04:00		20:35	04:40	04:40		21:40	04:00	04:05	
Min	0.88	2.05	0.052		0.78	1.01	0.032		0.75	1.85	0.039		0.83	1.26	0.034		0.91	1.11	0.035		0.77	1.31	0.042		0.96	1.21	0.040	
Time	06:00	10:00	10:20		02:30	10:20	09:15		09:50	09:50	09:50		07:50	07:50	07:50		23:25	10:50	07:55		03:00	09:55	09:55		05:45	09:55	09:50	
Max	1.64	5.32	0.163		1.63	5.42	0.171		1.81	5.77	0.222		1.73	5.59	0.200		1.84	5.54	0.189		2.14	5.79	0.213		2.15	5.62	0.218	

	D	V	Q	Rain
Total			0.660	0.43
Avg	1.32	3.93	0.094	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.39	2.68	0.070		1.44	3.16	0.086		1.46	2.83	0.078		1.57	2.90	0.091		1.61	2.48	0.081		1.77	2.57	0.095		1.87	2.92	0.117	
01:00	1.43	2.22	0.060		1.54	2.79	0.085		1.60	2.26	0.072		1.62	2.05	0.067		1.71	1.79	0.063		1.78	2.31	0.087		1.74	2.33	0.084	
02:00	1.45	2.00	0.056		1.55	2.58	0.079		1.64	1.67	0.056		1.65	1.61	0.054		1.70	1.65	0.058		1.72	1.57	0.056		1.58	1.76	0.056	
03:00	1.48	1.76	0.050		1.52	2.68	0.080		1.64	1.57	0.053		1.62	1.44	0.047		1.66	1.78	0.060		1.70	1.64	0.058		1.62	1.66	0.054	
04:00	1.48	1.61	0.046		1.63	1.97	0.064		1.64	1.84	0.061		1.66	1.47	0.050		1.83	1.96	0.076		1.70	1.68	0.059		1.66	1.59	0.054	
05:00	1.47	1.83	0.052		1.62	2.07	0.067		1.47	2.31	0.064		1.55	2.55	0.078		1.77	2.96	0.109		1.73	2.23	0.080		1.62	2.35	0.078	
06:00	1.47	2.39	0.067		1.55	2.59	0.078		1.31	3.63	0.085		1.28	3.76	0.085		1.45	3.55	0.094		1.52	3.80	0.112		1.61	3.88	0.125	
07:00	1.22	4.07	0.089		1.28	3.56	0.081		1.28	4.59	0.107		1.19	4.58	0.097		1.22	4.61	0.101		1.32	4.65	0.114		1.30	4.62	0.111	
08:00	1.36	4.85	0.124		1.28	4.69	0.109		1.36	4.71	0.121		1.30	4.66	0.113		1.19	4.59	0.096		1.34	4.77	0.119		1.46	4.76	0.136	
09:00	1.48	4.99	0.144		1.42	4.83	0.132		1.39	4.84	0.128		1.47	4.78	0.137		1.39	4.82	0.127		1.44	4.93	0.138		1.38	4.70	0.124	
10:00	1.31	4.72	0.114		1.41	4.82	0.129		1.41	4.80	0.129		1.36	4.67	0.120		1.28	4.55	0.106		1.23	4.68	0.103		1.34	4.63	0.115	
11:00	1.20	4.51	0.096		1.40	4.75	0.126		1.21	4.49	0.096		1.34	4.68	0.117		1.29	4.71	0.112		1.22	4.29	0.094		1.20	4.42	0.094	
12:00	1.20	4.28	0.091		1.20	4.34	0.093		1.20	4.24	0.091		1.25	4.37	0.099		1.20	4.38	0.093		1.17	4.17	0.086		1.49	4.03	0.117	
13:00	1.15	4.41	0.089		1.16	4.10	0.083		1.16	4.31	0.088		1.39	4.12	0.108		1.49	4.05	0.118		1.31	4.09	0.100		1.60	4.14	0.134	
14:00	1.13	4.36	0.085		1.16	4.28	0.086		1.15	4.08	0.082		1.35	3.90	0.098		1.44	4.27	0.119		1.15	3.85	0.077		1.46	3.81	0.107	
15:00	1.26	4.62	0.106		1.12	4.34	0.083		1.24	3.97	0.088		1.29	3.82	0.090		1.55	3.94	0.121		1.25	3.87	0.087		1.13	4.02	0.077	
16:00	1.26	4.47	0.103		1.15	4.43	0.089		1.25	3.86	0.087		1.15	4.01	0.080		1.59	3.92	0.124		1.27	3.98	0.092		1.57	3.84	0.121	
17:00	1.15	4.41	0.089		1.18	4.18	0.087		1.24	4.20	0.093		1.10	4.18	0.080		1.49	4.02	0.117		1.14	4.05	0.080		1.27	4.08	0.096	
18:00	1.19	4.28	0.089		1.26	4.29	0.097		1.16	4.18	0.085		1.21	4.29	0.093		1.53	4.24	0.126		1.16	4.01	0.081		1.30	4.07	0.097	
19:00	1.18	4.46	0.093		1.25	4.51	0.102		1.21	4.27	0.092		1.18	4.44	0.092		1.58	4.46	0.141		1.18	4.23	0.087		1.32	4.24	0.103	
20:00	1.22	4.46	0.098		1.22	4.39	0.096		1.21	4.37	0.095		1.11	4.42	0.084		1.60	4.68	0.150		1.09	4.38	0.081		1.42	3.84	0.105	
21:00	1.21	4.01	0.087		1.16	4.22	0.086		1.25	4.31	0.097		1.22	4.22	0.092		1.53	4.47	0.135		1.22	4.29	0.094		1.14	3.90	0.077	
22:00	1.21	3.83	0.083		1.25	4.03	0.091		1.31	3.94	0.095		1.26	3.94	0.090		1.67	3.84	0.131		1.61	3.85	0.125		1.34	3.58	0.089	
23:00	1.17	3.87	0.079		1.35	3.62	0.091		1.44	3.31	0.090		1.41	3.59	0.096		1.65	3.55	0.119		1.69	3.23	0.112		1.59	3.34	0.107	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.086				0.092				0.089				0.090				0.107				0.092				0.099	
Avg	1.29	3.71	0.086		1.34	3.80	0.092		1.34	3.69	0.089		1.36	3.68	0.090		1.52	3.72	0.107		1.40	3.63	0.092		1.46	3.60	0.099	
Time	23:35	04:40	04:25		00:45	04:40	04:40		17:35	03:20	03:20		16:45	04:05	02:55		12:10	03:00	03:00		13:50	02:55	02:55		19:15	04:25	04:25	
Min	0.90	1.41	0.041		0.98	1.35	0.048		0.95	1.14	0.039		0.89	1.14	0.038		0.92	1.16	0.039		0.90	1.18	0.038		0.87	1.18	0.036	
Time	06:20	09:15	09:15		04:40	09:55	09:55		22:20	10:00	10:10		01:45	08:55	09:00		04:50	21:00	20:20		01:55	09:25	09:30		00:40	09:30	09:30	
Max	2.05	5.45	0.189		1.72	5.22	0.166		1.73	5.15	0.167		1.72	5.39	0.171		1.97	5.12	0.176		1.97	5.50	0.181		2.16	5.39	0.231	

	D	V	Q	Rain
Total			0.655	
Avg	1.39	3.69	0.094	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.49	2.76	0.080		1.64	2.72	0.090		1.39	2.50	0.065		1.52	2.91	0.089		1.24	2.40	0.053		1.20	2.68	0.056		1.80	2.33	0.088	
01:00	1.68	2.02	0.069		1.76	1.98	0.073		1.56	2.14	0.066		1.39	1.80	0.047		1.48	1.74	0.050		1.41	1.58	0.042		1.83	1.86	0.073	
02:00	1.67	1.62	0.055		1.70	1.48	0.053		1.64	1.62	0.054		1.46	1.66	0.047		1.61	1.46	0.047		1.57	1.47	0.046		1.72	1.22	0.044	
03:00	1.56	1.42	0.044		1.74	1.40	0.051		1.73	1.55	0.056		1.36	1.16	0.029		1.64	1.42	0.047		1.68	1.41	0.048		1.75	1.25	0.045	
04:00	1.55	1.22	0.037		1.76	1.13	0.042		1.74	1.54	0.056		1.43	1.51	0.042		1.69	1.48	0.052		1.77	1.44	0.053		1.77	1.59	0.059	
05:00	1.61	1.80	0.059		1.71	1.37	0.049		1.65	2.35	0.078		1.37	2.10	0.052		1.63	2.30	0.076		1.80	2.10	0.079		1.82	1.86	0.072	
06:00	1.66	2.54	0.086		1.64	2.31	0.077		1.37	3.79	0.096		1.23	4.06	0.091		1.57	3.76	0.117		1.63	3.66	0.118		1.59	3.45	0.106	
07:00	1.52	3.66	0.108		1.72	3.33	0.118		1.34	4.82	0.121		1.25	4.78	0.109		1.42	4.75	0.128		1.71	5.03	0.179		1.50	4.91	0.144	
08:00	1.26	4.34	0.099		1.23	4.20	0.093		1.11	4.58	0.087		1.22	4.60	0.101		1.38	4.60	0.120		1.61	4.75	0.155		1.44	4.82	0.135	
09:00	1.37	4.72	0.123		1.30	4.39	0.105		1.45	4.78	0.135		1.61	4.86	0.159		1.35	4.73	0.119		1.55	4.92	0.151		1.50	4.84	0.143	
10:00	1.53	4.67	0.142		1.34	4.53	0.113		1.22	4.55	0.099		1.58	4.65	0.147		1.26	4.63	0.105		1.30	4.36	0.106		1.36	4.64	0.119	
11:00	1.38	4.30	0.111		1.51	4.71	0.141		1.28	4.50	0.105		2.29	4.36	0.233		1.12	4.44	0.085		1.25	4.57	0.104		1.40	4.78	0.127	
12:00	1.49	4.59	0.135		1.38	4.43	0.115		1.50	4.64	0.136		2.36	4.41	0.246		1.20	4.57	0.098		1.29	4.65	0.109		1.38	4.61	0.121	
13:00	1.30	4.19	0.100		1.33	4.13	0.101		1.46	4.21	0.119		2.14	4.10	0.199		1.32	3.98	0.098		1.33	4.44	0.109		1.50	4.73	0.141	
14:00	1.11	4.23	0.080		1.17	3.98	0.082		1.44	3.94	0.108		1.75	3.94	0.146		1.23	3.84	0.085		1.23	4.23	0.093		1.61	4.96	0.161	
15:00	1.19	4.04	0.085		1.05	3.99	0.069		1.32	4.01	0.098		1.48	3.94	0.114		1.38	4.07	0.106		1.44	4.00	0.110		1.52	4.89	0.147	
16:00	1.15	3.98	0.080		1.24	4.05	0.090		1.38	3.82	0.100		1.46	3.85	0.109		1.45	3.96	0.112		1.37	3.87	0.099		1.20	4.22	0.090	
17:00	1.21	3.81	0.082		1.20	3.98	0.084		1.47	3.94	0.112		1.38	3.99	0.104		1.26	3.94	0.092		1.23	4.07	0.090		1.21	4.37	0.094	
18:00	1.17	3.90	0.080		1.09	4.22	0.078		1.43	4.04	0.111		1.26	4.01	0.092		1.31	4.06	0.099		1.30	4.08	0.097		1.17	4.21	0.086	
19:00	1.19	4.10	0.087		1.31	4.18	0.101		1.51	4.15	0.123		1.27	4.20	0.097		1.34	4.35	0.108		1.35	4.44	0.112		1.10	4.27	0.080	
20:00	1.19	3.91	0.082		1.20	4.43	0.094		1.52	4.44	0.132		1.39	4.51	0.119		1.27	4.25	0.098		1.31	4.46	0.108		1.19	4.12	0.087	
21:00	1.20	3.59	0.076		1.27	4.35	0.100		1.48	4.15	0.120		1.40	4.13	0.110		1.41	4.50	0.121		1.32	4.12	0.100		1.24	3.92	0.088	
22:00	1.29	3.57	0.083		1.35	3.91	0.098		1.47	3.85	0.109		1.26	3.86	0.088		1.17	4.00	0.082		1.50	3.82	0.111		1.30	3.93	0.094	
23:00	1.43	3.02	0.083		1.22	3.31	0.071		1.55	3.44	0.106		1.26	3.24	0.074		1.13	3.36	0.065		1.69	3.24	0.112		1.35	3.90	0.098	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.086				0.087				0.100				0.110				0.090				0.100				0.102	
Avg	1.38	3.42	0.086		1.41	3.44	0.087		1.46	3.64	0.100		1.51	3.61	0.110		1.37	3.61	0.090		1.45	3.64	0.100		1.47	3.74	0.102	
Time	16:25	04:20	04:20		15:10	04:00	05:50		07:05	03:40	03:40		18:40	03:20	04:20		12:05	04:55	04:55		14:25	01:35	01:20		19:45	02:55	02:55	
Min	0.98	1.01	0.027		0.85	0.98	0.034		0.97	1.11	0.038		0.96	0.91	0.022		0.94	1.11	0.035		1.02	1.18	0.032		1.01	1.01	0.036	
Time	09:55	10:05	10:05		05:45	11:15	11:25		05:30	09:25	09:50		11:30	09:50	11:25		16:35	09:50	16:35		05:15	09:50	07:55		05:35	14:55	09:50	
Max	1.92	4.98	0.196		2.02	5.03	0.192		2.02	5.15	0.198		2.65	5.20	0.296		2.04	5.35	0.188		2.06	5.37	0.209		1.94	5.42	0.208	

	D	V	Q	Rain
Total			0.674	
Avg	1.44	3.58	0.096	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.49	2.87	0.083		1.64	3.11	0.103		1.56	2.60	0.081		2.11				2.37				1.59	2.65	0.084		1.71	2.30	0.082	
01:00	1.58	2.26	0.071		1.67	2.47	0.084		1.59	1.92	0.061		1.57				1.72				1.61	2.11	0.068		1.77	1.86	0.069	
02:00	1.48	1.98	0.057		1.72	2.05	0.073		1.59	1.55	0.050		1.31				1.53				1.59	1.68	0.053		1.78	2.03	0.076	
03:00	1.48	1.92	0.055		1.68	1.40	0.048		1.57	1.36	0.043		1.23				1.57				1.64	1.22	0.041		1.74	1.64	0.059	
04:00	1.52	1.74	0.052		1.69	1.37	0.048		1.61	1.53	0.050		1.39				1.43				1.66	1.46	0.050		1.70	1.81	0.063	
05:00	1.51	1.87	0.055		1.67	1.78	0.060		1.62	2.43	0.079		2.22				2.07				1.77	2.16	0.081		1.66	2.31	0.078	
06:00	1.51	2.60	0.076		1.66	2.80	0.094		1.59	3.85	0.122		3.91				3.91				1.64	4.19	0.139		1.62	3.73	0.121	
07:00	1.22	3.94	0.085		1.35	3.67	0.090		1.59	4.68	0.150		4.84				4.88				1.62	4.92	0.161		1.73	4.94	0.179	
08:00	1.26	4.59	0.105		1.35	4.69	0.120		1.53	4.58	0.139		4.45				4.60				1.62	4.78	0.156		1.53	4.71	0.143	
09:00	1.53	4.89	0.148		1.62	5.00	0.165		1.72	4.76	0.170		4.80				4.68				1.65	4.80	0.161		1.55	4.78	0.149	
10:00	1.44	4.79	0.134		1.64	5.05	0.168		1.56	4.38	0.137		4.59				4.37				1.68	4.53	0.155		1.56	4.74	0.148	
11:00	1.52	4.87	0.146		1.36	4.75	0.122		1.37	4.47	0.116		4.12				4.39				1.61	4.38	0.143		1.33	4.47	0.111	
12:00	1.43	4.84	0.134		1.32	4.67	0.116		1.26	4.61	0.105		4.54				4.43				1.35	4.54	0.115		1.42	4.62	0.129	
13:00	1.32	4.52	0.113		1.20	4.40	0.094		1.28	4.28	0.099		4.01				4.10				1.44	4.39	0.122		1.31	4.18	0.102	
14:00	1.29	4.13	0.097		1.21	4.14	0.089		1.32	4.01	0.098		4.01				4.04				1.35	4.35	0.111		1.25	4.15	0.096	
15:00	1.40	3.96	0.105		1.14	4.03	0.079		1.29	3.99	0.094		3.92				4.01				1.35	3.83	0.097		1.20	4.05	0.088	
16:00	1.39	3.86	0.102		1.13	4.04	0.079		1.33	3.93	0.097		3.78				3.66				1.25	3.55	0.081		1.26	4.09	0.096	
17:00	1.44	3.86	0.106		1.16	4.19	0.084		1.26	3.94	0.089		3.81				3.98				1.05	3.68	0.065		1.07	3.62	0.064	
18:00	1.46	3.95	0.112		1.10	4.07	0.077		1.30	4.01	0.096		4.01				3.99				1.13	3.93	0.078		1.17	3.96	0.082	
19:00	1.36	4.04	0.103		1.18	4.12	0.086		1.27	4.31	0.100		4.10				4.31				1.24	4.29	0.097		1.14	4.25	0.084	
20:00	1.39	3.87	0.102		1.16	4.46	0.091		1.28	4.20	0.098		4.18				4.51				1.18	4.31	0.090		1.30	3.89	0.093	
21:00	1.35	3.88	0.098		1.14	4.17	0.082		1.33	4.17	0.103		4.04				4.22				1.18	4.24	0.088		0.98	3.67	0.058	
22:00	1.38	3.91	0.102		1.27	3.91	0.090		1.29	3.76	0.088		3.75				3.95				1.15	3.86	0.077		1.31	3.26	0.080	
23:00	1.49	3.58	0.104		1.54	3.27	0.099		1.21	3.42	0.077		3.28				3.62				1.39	3.11	0.079		1.51	2.78	0.082	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.098				0.093				0.097												0.100				0.097	
Avg	1.43	3.61	0.098		1.40	3.65	0.093		1.43	3.62	0.098		3.50				3.60				1.45	3.62	0.100		1.44	3.58	0.097	
Time	20:40	03:15	02:45		17:00	04:45	03:40		17:05	03:35	04:00		04:25				04:35				20:40	03:30	03:40		16:10	03:30	17:10	
Min	0.91	1.55	0.045		0.98	1.11	0.037		1.14	1.04	0.030		0.98				1.25				0.86	1.01	0.031		0.86	1.25	0.043	
Time	11:35	11:35	11:35		09:55	09:55	09:55		09:45	10:00	07:45		09:50				07:40				04:45	07:55	07:55		07:40	10:00	07:15	
Max	1.86	5.33	0.212		1.82	5.49	0.211		1.89	5.25	0.204		5.18				5.05				1.88	5.25	0.182		1.94	5.39	0.218	

	D	V	Q	Rain
Total			0.485	
Avg	1.43	3.60	0.097	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.57	2.41	0.075	0.02	1.75	2.44	0.089		1.56	2.64	0.081		1.70	2.55	0.089		1.69	2.56	0.089		1.45	2.95	0.082		1.57	2.74	0.085	
01:00	1.70	2.16	0.076	0.11	1.83	2.14	0.083		1.72	2.13	0.076		1.72	1.62	0.058		1.76	1.88	0.069		1.67	1.99	0.068		1.58	2.20	0.069	
02:00	1.66	2.20	0.074	0.02	1.91	1.88	0.078		1.77	1.78	0.066		1.79	1.58	0.060		1.72	1.56	0.056		1.69	1.61	0.056		1.63	1.87	0.062	
03:00	1.77	1.79	0.066		1.95	1.56	0.066		1.75	1.58	0.058		1.81	1.69	0.065		1.64	1.43	0.047		1.69	1.51	0.053		1.67	1.65	0.057	
04:00	1.75	1.76	0.064		1.95	1.51	0.064		1.69	1.38	0.048		1.80	1.96	0.074		1.68	1.67	0.058		1.63	1.78	0.058		1.64	1.77	0.059	
05:00	1.74	1.83	0.066		1.98	1.60	0.070		1.66	2.48	0.082		1.69	2.74	0.093		1.54	2.25	0.065		1.45	2.86	0.080		1.54	2.24	0.066	
06:00	1.65	2.20	0.073		2.00	2.00	0.088		1.24	4.22	0.094		1.34	4.34	0.107		1.30	4.29	0.103		1.36	4.19	0.108		1.54	4.03	0.123	
07:00	1.36	3.25	0.079		1.67	2.98	0.098		1.57	4.99	0.157		1.63	5.03	0.167		1.64	5.02	0.168		1.63	5.01	0.166		1.68	4.83	0.167	
08:00	1.29	4.45	0.107		1.36	4.12	0.103		1.40	4.71	0.125		1.45	4.73	0.132		1.47	4.65	0.133		1.47	4.75	0.135		1.53	4.52	0.136	
09:00	1.41	4.59	0.124		1.50	4.90	0.144		1.54	4.91	0.151		1.57	4.88	0.154		1.57	4.86	0.153		1.59	4.93	0.158		1.56	4.70	0.147	
10:00	1.54	4.82	0.148		1.50	4.80	0.141		1.41	4.71	0.127		1.36	4.61	0.118		1.41	4.57	0.124		1.42	4.66	0.127		1.43	4.49	0.124	
11:00	1.43	4.63	0.128		1.50	4.83	0.142		1.25	4.49	0.101		1.43	4.66	0.128		1.43	4.68	0.128		1.36	4.73	0.120		1.37	4.37	0.114	
12:00	1.31	4.51	0.110		1.31	4.50	0.109		1.43	4.73	0.131		1.45	4.52	0.127		1.41	4.51	0.122		1.37	4.67	0.120		1.46	4.60	0.130	
13:00	1.28	4.46	0.105		1.42	4.70	0.128		1.22	4.27	0.093		1.34	4.31	0.108		1.20	4.27	0.091		1.19	4.33	0.091		1.15	4.20	0.085	
14:00	1.20	4.09	0.087		1.20	4.49	0.096		1.25	4.31	0.097		1.15	4.10	0.082		1.05	3.97	0.071		1.22	4.15	0.092		1.12	4.12	0.080	
15:00	1.27	4.17	0.096		1.26	4.41	0.101		1.14	3.93	0.078		1.42	4.10	0.112		0.97	3.93	0.061		1.07	3.92	0.072		0.96	3.96	0.061	
16:00	1.14	4.13	0.082		1.19	4.34	0.092		1.05	3.92	0.070		1.29	3.72	0.088		1.10	3.95	0.075		1.12	3.73	0.072		0.97	4.08	0.064	
17:00	1.13	4.16	0.082		1.19	4.39	0.093		1.19	4.18	0.088		1.33	3.90	0.096		0.96	3.84	0.059		1.02	3.72	0.063		1.07	4.15	0.075	
18:00	1.17	4.15	0.085		1.28	4.41	0.102		1.28	4.11	0.097		1.38	4.07	0.107		1.04	4.00	0.069		1.15	4.16	0.084		1.00	3.95	0.066	
19:00	1.13	4.33	0.085		1.36	4.53	0.116		1.32	4.53	0.111		1.38	4.14	0.108		1.08	4.22	0.077		1.20	4.27	0.093		1.12	4.20	0.082	
20:00	1.11	4.15	0.079		1.36	4.51	0.114		1.30	4.47	0.107		1.27	4.41	0.102		1.29	4.42	0.105		1.34	4.35	0.111		1.17	4.16	0.087	
21:00	1.16	4.08	0.083		1.32	4.59	0.113		1.41	4.20	0.112		1.33	4.39	0.108		1.18	4.21	0.088		1.37	4.43	0.116		1.13	4.11	0.082	
22:00	1.51	3.53	0.105		1.29	4.17	0.098		1.45	4.04	0.113		1.47	3.98	0.113		1.16	4.15	0.084		1.18	4.02	0.084		1.01	3.85	0.064	
23:00	1.63	2.78	0.091		1.35	3.44	0.087		1.55	3.37	0.103		1.46	3.48	0.099		1.38	3.68	0.096		1.19	3.61	0.075		1.17	3.35	0.069	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.091	0.15			0.101				0.099				0.104				0.091				0.095				0.090	
Avg	1.41	3.53	0.091		1.52	3.63	0.101		1.42	3.75	0.099		1.48	3.73	0.104		1.36	3.69	0.091		1.37	3.76	0.095		1.34	3.67	0.090	
Time	17:20	05:20	17:20		16:25	03:25	03:25		18:05	04:10	04:10		18:55	01:45	01:45		22:05	04:00	04:00		18:55	02:00	17:15		20:25	04:05	04:05	
Min	0.86	1.40	0.050		0.86	1.28	0.054		0.87	0.98	0.033		0.89	1.18	0.040		0.87	1.09	0.036		0.85	1.25	0.041		0.86	1.21	0.040	
Time	22:15	10:20	10:20		06:35	14:50	09:50		22:35	09:50	09:50		18:50	07:30	07:35		07:20	07:20	07:20		09:55	09:50	09:55		07:30	12:45	09:50	
Max	1.95	5.08	0.202		2.13	5.15	0.183		1.98	5.37	0.216		2.09	5.28	0.211		1.85	5.33	0.211		1.93	5.39	0.224		2.00	5.13	0.225	

	D	V	Q	Rain
Total			0.670	0.15
Avg	1.41	3.68	0.096	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.34	2.75	0.068		1.59	2.72	0.086		1.39	2.65	0.067		1.72	2.57	0.091		2.11	2.30	0.109		2.05	2.38	0.108		1.93	2.59	0.109	
01:00	1.51	2.54	0.074		1.78	2.18	0.081		1.61	1.97	0.064		1.82	1.71	0.066		1.98	1.85	0.080		2.04	2.21	0.101		1.91	1.69	0.070	
02:00	1.66	2.07	0.069		1.80	1.71	0.065		1.61	1.66	0.054		1.76	1.16	0.042		2.01	1.83	0.082		1.99	1.76	0.077		1.83	1.47	0.057	
03:00	1.80	1.71	0.065		1.84	1.53	0.060		1.61	1.42	0.046		1.79	1.37	0.052		1.95	1.76	0.075		2.02	1.75	0.079		1.83	1.39	0.054	
04:00	1.67	2.10	0.072		1.78	1.28	0.048		1.64	1.45	0.048		1.79	1.23	0.046		1.98	1.74	0.076		2.02	1.71	0.076		1.81	1.27	0.048	
05:00	1.71	2.40	0.084		1.83	1.47	0.057		1.52	2.36	0.069		1.80	2.19	0.082		2.01	2.28	0.102		2.02	2.57	0.116		1.81	2.15	0.080	
06:00	1.50	2.95	0.087		1.68	2.45	0.082		1.32	4.08	0.100		1.29	3.81	0.089		1.78	4.09	0.148		1.59	3.95	0.124		1.58	3.95	0.122	
07:00	1.33	4.10	0.101		1.04	3.90	0.068		1.51	4.92	0.146		1.56	4.87	0.152		1.57	4.91	0.154		1.62	4.83	0.159		1.56	4.97	0.154	
08:00	1.43	4.41	0.120		1.35	4.49	0.114		1.31	4.73	0.115		1.34	4.55	0.115		1.50	4.73	0.138		1.45	4.66	0.130		1.42	4.70	0.128	
09:00	1.50	4.57	0.133		1.53	4.75	0.143		1.44	4.87	0.136		1.49	4.84	0.142		1.50	4.73	0.142		1.56	4.84	0.152		1.52	4.86	0.146	
10:00	1.43	4.39	0.120		1.52	4.74	0.142		1.36	4.77	0.123		1.18	4.26	0.092		1.34	4.67	0.119		1.45	4.62	0.130		1.41	4.72	0.127	
11:00	1.28	4.21	0.100		1.48	4.57	0.131		1.26	4.54	0.104		1.13	4.37	0.086		1.14	4.40	0.087		1.38	4.73	0.124		1.20	4.38	0.094	
12:00	1.12	4.05	0.078		1.36	4.44	0.115		1.23	4.51	0.101		1.22	4.63	0.102		1.36	4.69	0.122		1.34	4.39	0.111		1.34	4.54	0.113	
13:00	1.12	4.04	0.079		1.41	4.47	0.120		1.06	4.29	0.076		1.01	4.48	0.074		1.14	4.19	0.083		1.20	4.07	0.087		1.33	4.34	0.107	
14:00	1.22	4.23	0.094		1.28	4.37	0.103		1.00	4.25	0.070		1.08	4.13	0.075		1.04	3.73	0.064		1.29	4.19	0.099		1.38	4.16	0.108	
15:00	1.12	3.96	0.077		1.20	4.01	0.087		1.07	4.18	0.075		1.18	3.31	0.068		1.12	3.91	0.075		1.17	4.03	0.083		1.25	3.98	0.090	
16:00	1.09	3.80	0.070		1.09	4.01	0.074		1.10	3.32	0.063		1.18	2.88	0.060		1.09	3.81	0.070		1.32	3.97	0.095		1.44	3.57	0.099	
17:00	1.19	4.11	0.088		1.12	4.01	0.079		1.02	3.77	0.064		1.22	3.13	0.068		1.10	3.62	0.068		1.25	3.91	0.089		1.17	3.89	0.080	
18:00	1.15	4.01	0.080		1.29	4.21	0.101		1.04	4.05	0.071		1.19	2.91	0.061		1.03	3.84	0.066		1.26	4.11	0.094		1.22	3.74	0.080	
19:00	1.26	4.05	0.094		1.13	4.05	0.079		1.24	4.27	0.099		1.13	3.87	0.076		1.09	4.03	0.076		1.28	3.85	0.090		1.38	4.47	0.117	
20:00	1.24	4.11	0.093		1.49	4.61	0.134		1.17	4.28	0.089		1.17	4.51	0.094		1.25	4.40	0.101		1.22	4.23	0.092		1.09	3.80	0.071	
21:00	1.23	4.08	0.091		1.32	4.15	0.103		1.12	3.89	0.076		1.05	4.18	0.074		1.04	4.11	0.071		1.17	4.38	0.090		1.27	4.11	0.096	
22:00	1.04	3.98	0.068		1.14	3.81	0.075		1.13	3.81	0.074		1.33	3.42	0.082		1.03	3.88	0.066		1.27	3.81	0.087		1.41	3.65	0.098	
23:00	1.22	3.56	0.077		1.16	3.39	0.068		1.46	3.08	0.087		1.96	2.72	0.116		1.82	3.31	0.126		1.70	3.27	0.114		1.57	3.26	0.102	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.087				0.092				0.084				0.084				0.096				0.104				0.098	
Avg	1.34	3.59	0.087		1.42	3.56	0.092		1.30	3.63	0.084		1.39	3.38	0.084		1.46	3.62	0.096		1.53	3.68	0.104		1.49	3.57	0.098	
Time	20:10	03:20	16:15		08:05	04:10	04:10		17:05	04:00	04:00		13:05	02:15	02:15		21:15	01:30	22:25		12:20	03:30	17:15		11:55	03:55	03:55	
Min	0.86	1.38	0.048		0.86	1.04	0.038		0.85	1.19	0.038		0.86	0.98	0.035		0.85	1.31	0.050		0.88	1.35	0.046		1.00	1.01	0.038	
Time	03:55	09:50	09:50		03:40	11:05	11:05		09:55	09:50	09:55		23:50	07:15	09:50		00:00	07:35	09:50		05:45	09:55	09:50		00:10	09:55	09:55	
Max	1.89	4.85	0.154		1.95	5.10	0.167		1.88	5.45	0.219		2.22	5.42	0.229		2.23	5.40	0.237		2.21	5.45	0.231		2.04	5.35	0.217	

	D	V	Q	Rain
Total			0.645	
Avg	1.42	3.57	0.092	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	1.93	2.44	0.102		1.29	2.64	0.062	
01:00	1.94	1.65	0.070		1.66	1.93	0.065	
02:00	1.95	1.58	0.067		1.64	2.10	0.069	
03:00	1.90	1.41	0.058		1.67	1.87	0.064	
04:00	1.94	1.38	0.058		1.72	1.79	0.064	
05:00	1.99	1.73	0.076		1.75	1.91	0.069	
06:00	2.02	2.27	0.101		1.49	2.36	0.069	
07:00	1.76	3.04	0.111		1.29	4.06	0.094	
08:00	1.53	4.47	0.135		1.37	4.65	0.121	
09:00	1.43	4.84	0.134		1.74	5.14	0.186	
10:00	1.49	4.78	0.140		1.69	5.02	0.175	
11:00	1.48	4.73	0.137		1.43	4.76	0.131	
12:00	1.28	4.62	0.109		1.35	4.61	0.116	
13:00	1.33	4.57	0.113		1.21	4.18	0.090	
14:00	1.27	4.42	0.102		1.12	3.99	0.077	
15:00	1.24	4.47	0.100		1.12	4.11	0.079	
16:00	1.17	4.22	0.087		1.14	4.23	0.083	
17:00	1.18	4.31	0.090		1.20	4.38	0.093	
18:00	1.23	4.26	0.094		1.23	4.48	0.099	
19:00	1.13	4.23	0.083		1.22	4.39	0.096	
20:00	1.12	4.25	0.082		1.39	4.72	0.125	
21:00	1.16	4.23	0.087		1.25	4.20	0.095	
22:00	1.07	3.98	0.072		1.09	4.06	0.075	
23:00	1.10	3.63	0.068		1.14	3.58	0.071	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.095				0.095	
Avg	1.48	3.56	0.095		1.38	3.72	0.095	
Time	20:25	04:50	02:40		22:15	03:50	00:30	
Min	0.86	1.14	0.047		0.88	1.33	0.036	
Time	06:50	09:00	09:15		10:15	09:15	10:15	
Max	2.12	5.18	0.186		1.98	5.28	0.225	

	D	V	Q	Rain
Total			0.189	
Avg	1.43	3.64	0.095	

Site Commentary

Site Information

18C-3	
Pipe Dimensions	12 "
Silt Level	0.00"

Overview

Site 18C-3 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 25.3% full at its recorded peak of 3.05 inches and approximately 14.0% full during its recorded average depth of 1.66 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.66	1.25	0.059
Minimum	0.82	0.13	0.003
Maximum	3.05	2.98	0.294
Time of Minimum	5/10/2014 6:25 AM	5/11/2014 3:55 AM	5/11/2014 3:55 AM
Time of Maximum	3/15/2014 12:00 PM	3/16/2014 11:05 AM	3/15/2014 12:00 PM

Data Quality

Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad Temp 2014	**City / State:** Carlsbad, CA			**Date Installed:** 2/21/14	**FM Initials:** JG
Site Name: 18C-3	**Monitor Series:** 3600			**Monitor S/N:**	2813
Address / Location: On the East corner of the Intersection on El Camino Real and Cannon Rd				**Manhole #:**	18C-3
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 12.00"
					Pipe Width: 12.25"
					IP Address: N/A

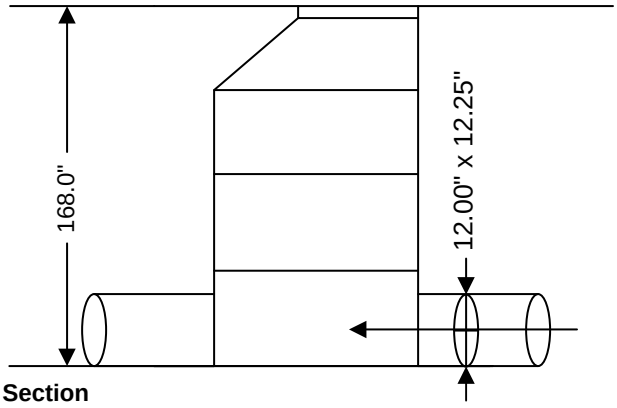
Investigation Information:

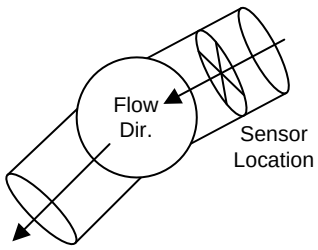
Date/Time of Investigation:	2/21/14 @ 9:00 a.m.
Site Hydraulics:	Low depth with moderate velocity
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	2.25" +/- .25
Range (Air Dof):	+/-
Peak Velocity:	2.30 Fps
Silt:	0.00" Inches

Manhole Information:

Manhole Depth:	168.0"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:





Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: Ultrasonic Sensor / Velocity Sensor		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: RG 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

18C-3

Flow Monitor

18C-3

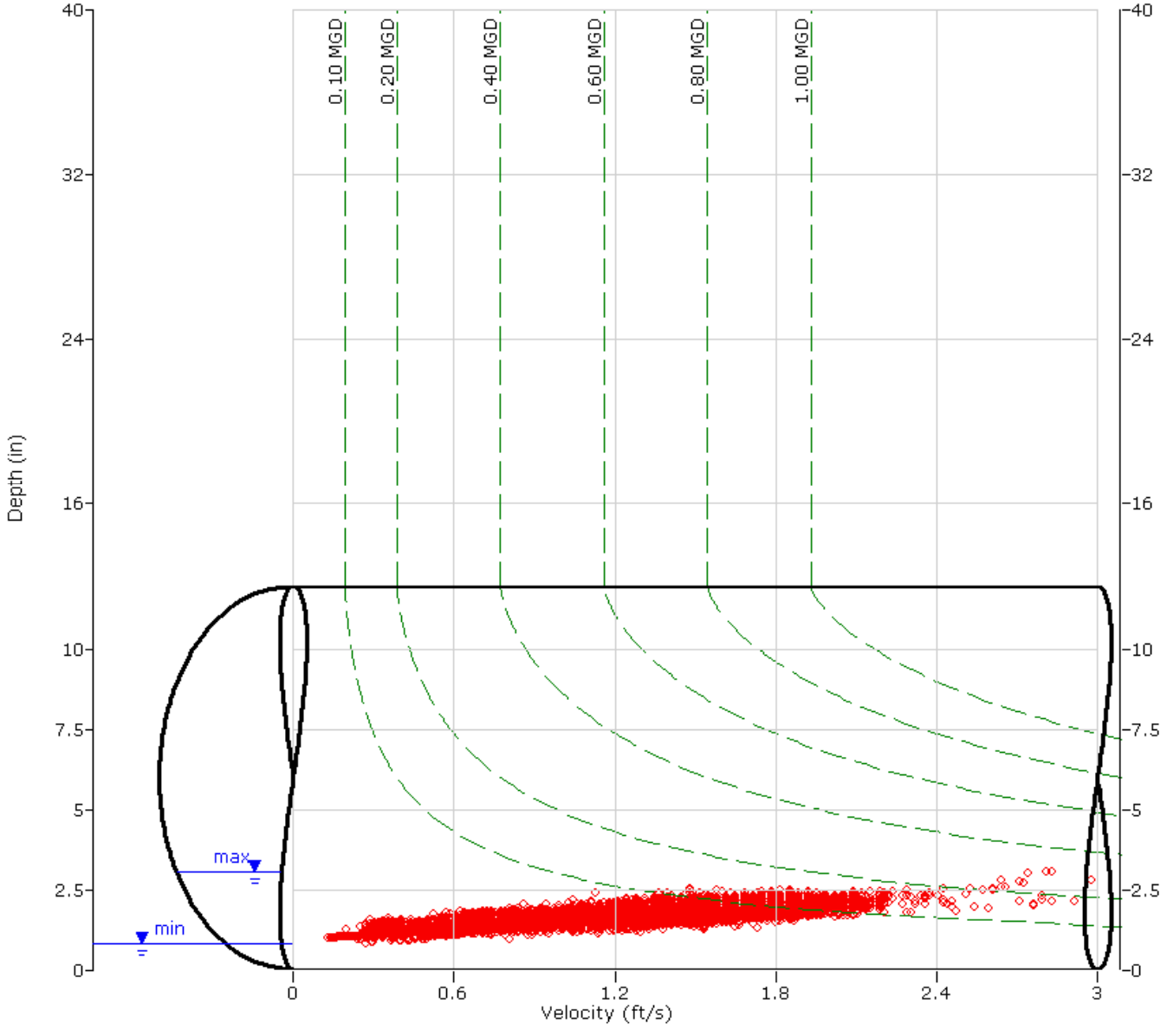
Pipe Height
12.00 in

Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



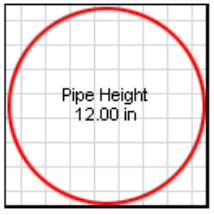
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

18C-3

Flow Monitor

18C-3

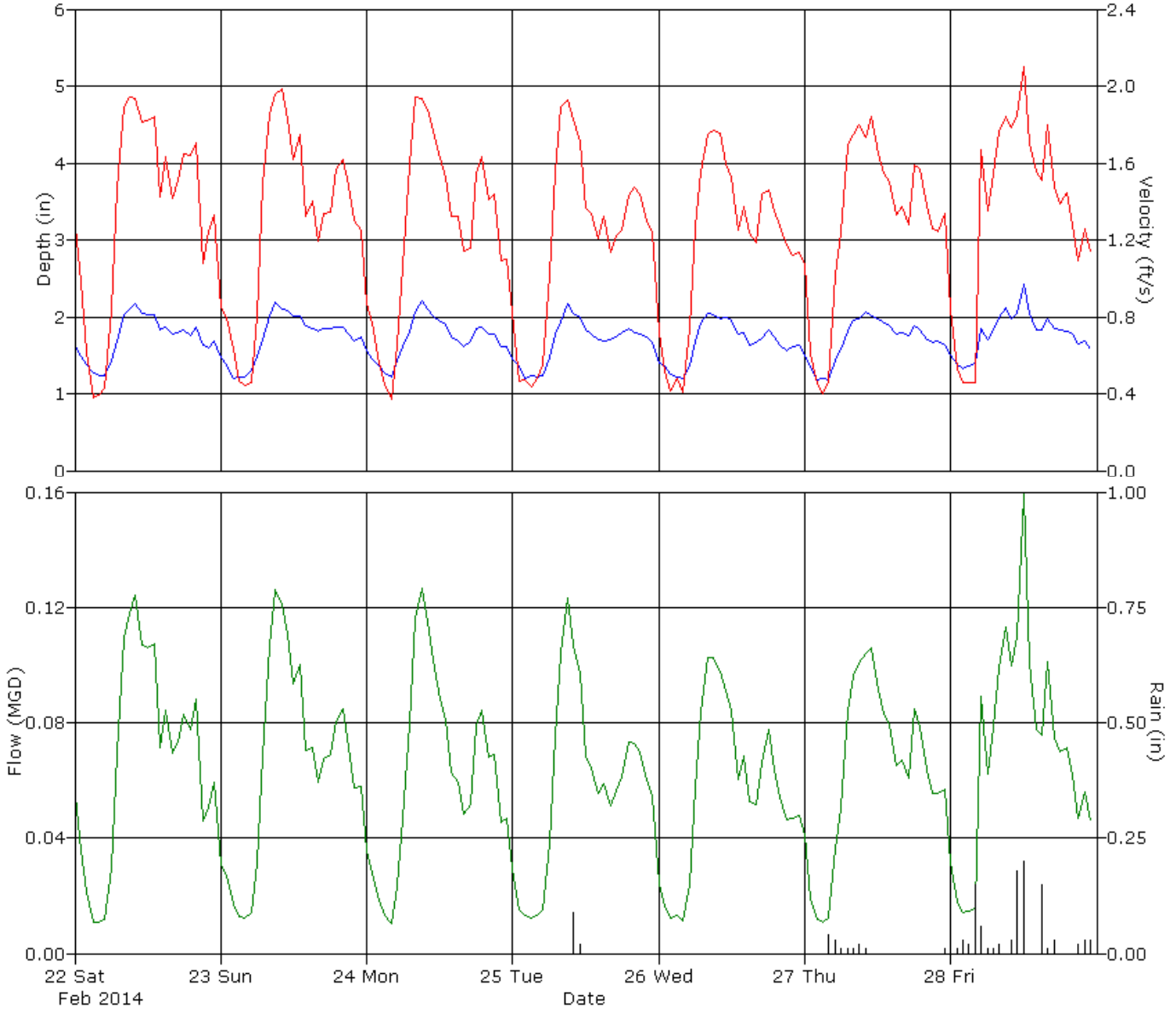


Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



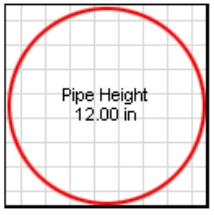
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

18C-3

Flow Monitor

18C-3

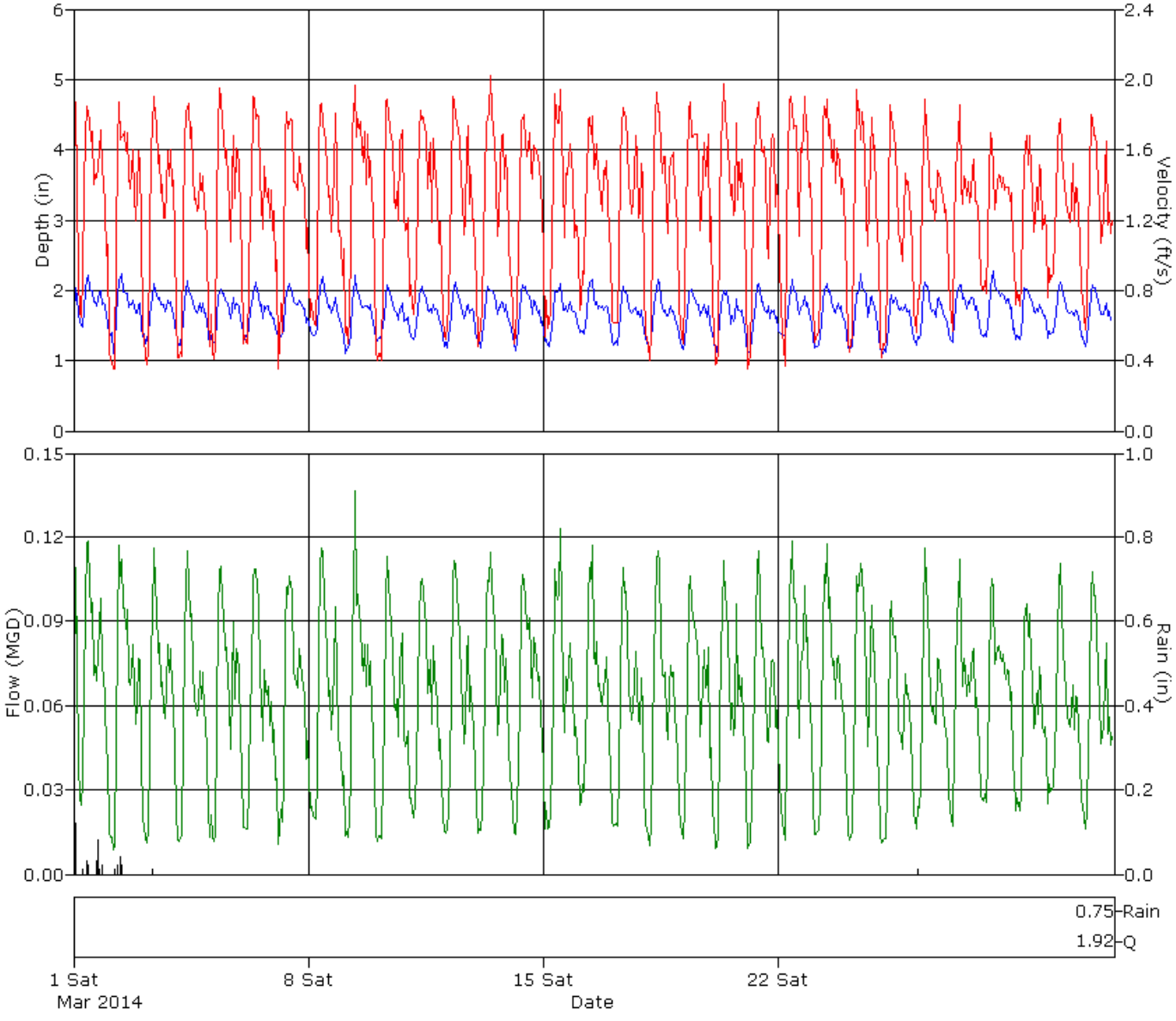


Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



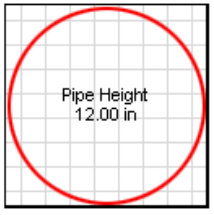
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

18C-3

Flow Monitor

18C-3

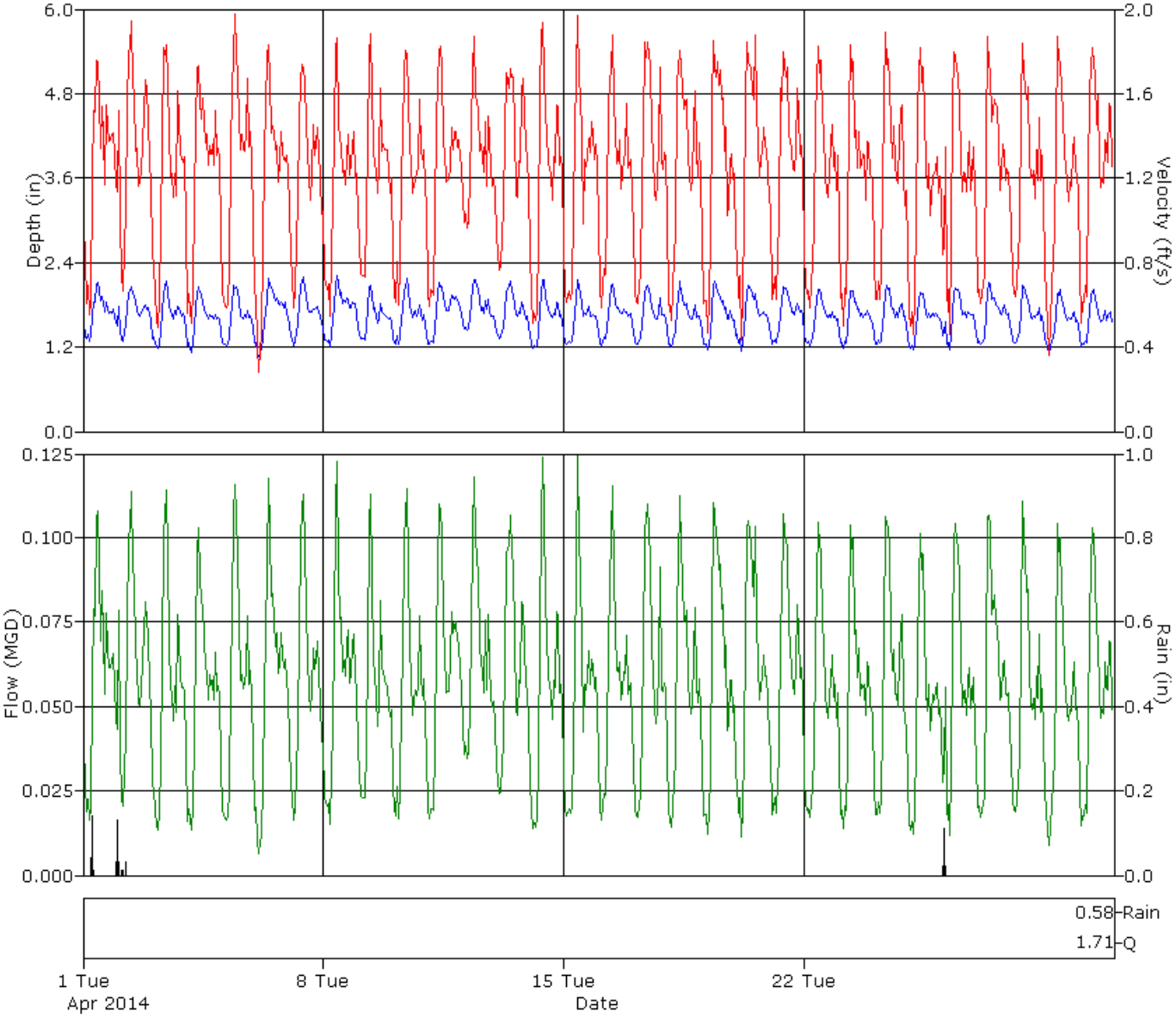


Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



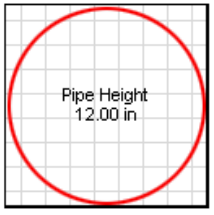
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

18C-3

Flow Monitor

18C-3

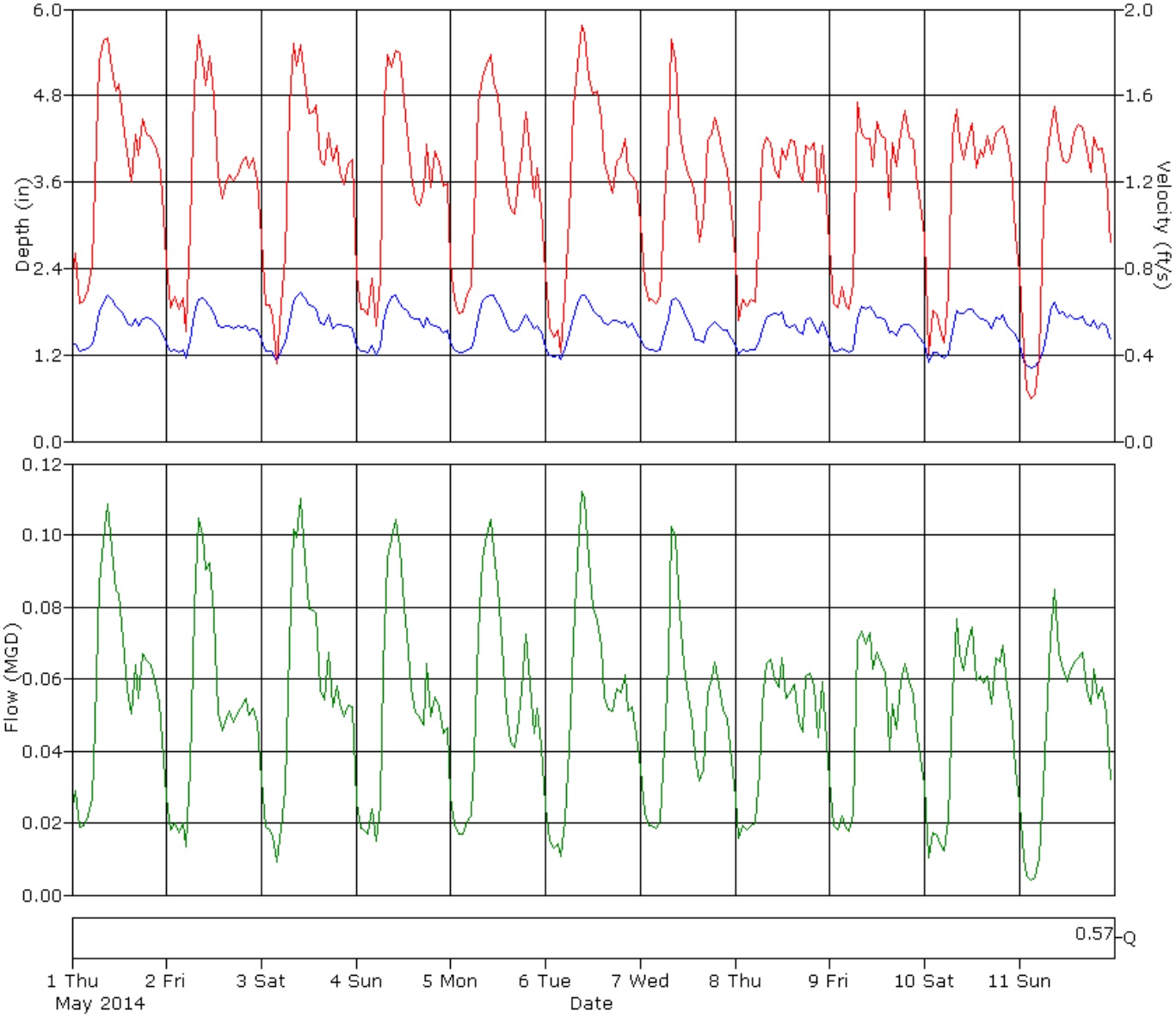


Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

18C-3, Pipe Height: 12 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	04:05	1.16	10:10	2.39	1.72	02:50	0.27	09:30	2.19	1.34	02:50	0.008	10:15	0.143	0.067	0.067	
2/23/2014	01:10	1.09	09:10	2.39	1.73	05:15	0.29	11:15	2.19	1.28	03:40	0.008	11:20	0.148	0.065	0.065	
2/24/2014	04:20	1.14	09:35	2.39	1.72	04:20	0.27	08:30	2.15	1.26	04:20	0.007	09:35	0.141	0.062	0.062	
2/25/2014	02:20	1.04	09:00	2.34	1.67	04:35	0.30	09:00	2.22	1.20	02:30	0.008	09:00	0.158	0.058	0.058	0.11
2/26/2014	03:35	1.10	18:40	2.50	1.67	04:00	0.30	18:40	2.57	1.19	04:00	0.008	18:40	0.202	0.057	0.057	
2/27/2014	04:10	1.00	18:45	2.40	1.70	02:45	0.34	18:45	2.12	1.30	04:10	0.007	18:45	0.156	0.063	0.063	0.14
2/28/2014	02:40	1.23	12:25	2.56	1.78	01:30	0.30	12:35	2.66	1.34	04:35	0.009	12:35	0.214	0.070	0.070	1.01
3/1/2014	05:40	1.36	10:35	2.38	1.85	04:35	0.47	09:00	2.37	1.41	04:35	0.017	09:00	0.164	0.074	0.074	0.64
3/2/2014	04:45	0.97	10:30	2.52	1.74	03:00	0.27	23:00	2.17	1.27	04:35	0.007	10:35	0.140	0.065	0.065	0.09
3/3/2014	03:50	1.04	09:15	2.38	1.71	01:20	0.34	09:10	2.09	1.27	03:50	0.007	09:10	0.141	0.062	0.062	0.01
3/4/2014	03:20	1.02	09:20	2.43	1.68	03:25	0.30	08:35	2.19	1.23	03:25	0.007	09:20	0.134	0.059	0.059	
3/5/2014	01:45	1.01	09:40	2.25	1.68	00:35	0.30	08:45	2.15	1.28	01:40	0.007	09:50	0.129	0.062	0.062	
3/6/2014	02:45	1.23	10:35	2.26	1.70	01:15	0.30	12:05	2.05	1.26	05:45	0.010	10:15	0.124	0.060	0.060	
3/7/2014	06:00	1.16	12:05	2.26	1.71	02:30	0.29	08:10	2.05	1.27	02:00	0.008	12:00	0.128	0.062	0.062	
3/8/2014	01:25	1.27	10:25	2.31	1.71	01:20	0.30	09:55	2.14	1.26	01:20	0.010	09:55	0.146	0.062	0.062	
3/9/2014	04:30	0.95	09:50	3.05	1.65	04:15	0.27	09:50	2.81	1.34	04:15	0.006	09:50	0.291	0.064	0.064	
3/10/2014	01:35	1.10	08:35	2.42	1.66	03:00	0.27	08:25	2.22	1.24	02:10	0.008	08:40	0.140	0.058	0.058	
3/11/2014	02:05	1.18	09:40	2.42	1.68	02:05	0.30	09:30	2.10	1.31	02:05	0.008	09:40	0.143	0.061	0.061	
3/12/2014	03:40	1.01	08:40	2.29	1.66	01:25	0.24	08:35	2.15	1.28	01:25	0.005	08:35	0.142	0.061	0.061	
3/13/2014	03:45	1.09	07:55	2.29	1.70	03:30	0.30	07:30	2.20	1.34	03:30	0.007	09:30	0.134	0.065	0.065	
3/14/2014	04:30	1.07	08:40	2.30	1.69	04:45	0.30	10:55	2.19	1.33	04:45	0.007	08:40	0.148	0.064	0.064	
3/15/2014	01:35	1.07	12:00	3.05	1.68	01:05	0.30	12:00	2.83	1.31	04:40	0.008	12:00	0.294	0.063	0.063	
3/16/2014	04:05	1.14	11:05	2.77	1.73	02:20	0.30	11:05	2.98	1.34	02:20	0.010	11:05	0.270	0.065	0.065	
3/17/2014	05:55	1.05	11:40	2.32	1.64	01:25	0.30	11:40	2.34	1.28	02:45	0.009	11:40	0.164	0.059	0.059	
3/18/2014	04:15	1.00	09:50	2.30	1.65	04:15	0.14	09:50	2.36	1.28	04:15	0.003	09:50	0.164	0.060	0.060	
3/19/2014	05:10	1.03	08:55	2.27	1.65	01:15	0.34	21:45	2.20	1.33	03:25	0.008	21:45	0.133	0.062	0.062	
3/20/2014	04:55	0.97	18:00	2.99	1.63	03:55	0.15	18:00	2.74	1.29	03:55	0.003	18:00	0.277	0.060	0.060	
3/21/2014	03:00	1.02	10:00	2.28	1.63	03:00	0.18	10:00	2.22	1.31	03:00	0.004	10:00	0.153	0.060	0.060	
3/22/2014	03:00	1.15	10:00	2.79	1.71	04:35	0.30	10:00	2.64	1.40	04:35	0.010	10:00	0.241	0.068	0.068	
3/23/2014	01:30	1.01	11:35	2.71	1.66	01:30	0.16	11:35	2.73	1.33	01:30	0.003	11:35	0.239	0.063	0.063	
3/24/2014	03:15	1.01	11:10	2.30	1.70	03:15	0.17	08:25	2.14	1.31	03:15	0.004	12:00	0.128	0.065	0.065	
3/25/2014	00:50	0.96	09:15	2.13	1.59	05:05	0.27	12:45	2.46	1.17	05:05	0.007	12:45	0.136	0.052	0.052	
3/26/2014	03:20	1.03	10:05	2.23	1.68	03:15	0.20	09:45	2.46	1.24	03:15	0.006	09:45	0.154	0.059	0.059	0.01
3/27/2014	05:35	1.10	10:05	2.25	1.74	04:55	0.27	10:00	2.42	1.29	05:05	0.007	10:05	0.159	0.063	0.063	
3/28/2014	03:00	1.16	09:55	2.52	1.79	03:00	0.46	09:55	2.42	1.27	03:00	0.012	09:55	0.191	0.065	0.065	
3/29/2014	06:00	1.15	08:45	2.25	1.68	06:00	0.43	10:10	2.76	1.23	06:00	0.011	10:10	0.161	0.058	0.058	
3/30/2014	01:55	1.08	10:40	2.42	1.69	01:55	0.31	10:40	2.19	1.27	01:55	0.007	10:40	0.163	0.059	0.059	
3/31/2014	04:45	1.00	08:40	2.44	1.66	03:30	0.37	08:40	2.24	1.24	04:45	0.009	08:40	0.169	0.058	0.058	
4/1/2014	04:45	1.10	13:30	2.39	1.69	01:30	0.30	13:35	2.47	1.25	01:30	0.009	10:40	0.130	0.060	0.060	0.22
4/2/2014	04:30	1.07	01:20	2.33	1.70	04:30	0.28	10:25	2.54	1.34	04:30	0.006	01:20	0.148	0.063	0.063	0.21
4/3/2014	04:45	0.98	10:40	2.38	1.63	04:45	0.28	10:25	2.91	1.21	04:45	0.006	10:25	0.182	0.055	0.055	
4/4/2014	03:40	0.86	10:20	2.19	1.61	03:10	0.17	08:40	2.17	1.22	03:10	0.004	08:40	0.130	0.055	0.055	
4/5/2014	02:40	1.13	10:05	2.41	1.61	02:40	0.39	10:00	2.83	1.25	02:40	0.010	10:00	0.174	0.057	0.057	
4/6/2014	02:00	0.98	09:45	2.37	1.67	01:50	0.17	09:00	2.19	1.15	01:50	0.004	09:55	0.137	0.056	0.056	
4/7/2014	02:25	1.19	10:15	2.31	1.69	02:25	0.51	11:50	2.44	1.23	02:25	0.014	11:50	0.142	0.058	0.058	
4/8/2014	04:10	1.15	10:55	2.29	1.73	04:10	0.43	08:45	2.14	1.21	04:10	0.011	10:55	0.139	0.060	0.060	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014	05:45	1.15	09:20	2.32	1.62	05:45	0.43	09:15	2.79	1.22	05:45	0.011	09:15	0.178	0.054	0.054	
4/10/2014	01:10	1.07	09:20	2.31	1.65	01:10	0.29	09:15	2.71	1.21	01:10	0.007	09:15	0.169	0.056	0.056	
4/11/2014	01:50	0.99	09:55	2.23	1.71	02:00	0.28	07:50	2.59	1.24	01:50	0.006	09:45	0.149	0.061	0.061	
4/12/2014	02:10	1.37	09:35	2.29	1.75	18:05	0.77	09:35	2.41	1.32	02:10	0.028	09:35	0.166	0.064	0.064	
4/13/2014	04:30	1.19	10:10	2.26	1.68	04:30	0.52	12:10	2.00	1.29	04:30	0.014	10:15	0.130	0.060	0.060	
4/14/2014	05:05	1.07	09:30	2.55	1.64	05:05	0.29	09:30	2.52	1.21	05:05	0.007	09:30	0.203	0.056	0.056	
4/15/2014	02:05	1.12	09:40	2.51	1.63	02:05	0.38	09:40	2.61	1.22	02:05	0.009	09:40	0.205	0.055	0.055	
4/16/2014	06:00	1.09	10:40	2.36	1.64	06:00	0.32	10:40	2.51	1.23	06:00	0.008	10:40	0.181	0.056	0.056	
4/17/2014	03:15	1.15	09:40	2.23	1.65	03:15	0.44	10:45	2.15	1.26	03:15	0.011	10:45	0.124	0.058	0.058	
4/18/2014	01:20	1.00	09:05	2.29	1.63	01:20	0.15	09:05	2.27	1.26	01:20	0.003	09:05	0.157	0.057	0.057	
4/19/2014	04:50	1.07	09:40	2.32	1.65	04:50	0.27	08:00	2.02	1.24	04:50	0.006	09:45	0.127	0.059	0.059	
4/20/2014	04:40	1.08	13:05	2.20	1.64	04:40	0.29	13:10	2.76	1.26	04:40	0.007	13:10	0.155	0.058	0.058	
4/21/2014	03:20	1.11	10:00	2.15	1.67	03:20	0.36	08:45	2.10	1.28	03:20	0.009	08:45	0.128	0.060	0.060	
4/22/2014	04:30	1.08	09:30	2.21	1.61	04:30	0.31	09:25	1.99	1.21	04:30	0.007	09:45	0.119	0.054	0.054	
4/23/2014	03:10	1.10	10:30	2.23	1.62	03:10	0.34	08:20	1.99	1.20	03:10	0.008	08:20	0.121	0.054	0.054	
4/24/2014	05:05	1.08	09:40	2.37	1.64	05:05	0.29	10:30	2.27	1.23	05:05	0.007	10:55	0.145	0.057	0.057	
4/25/2014	04:10	1.09	10:00	2.09	1.59	04:10	0.32	07:40	2.02	1.15	04:10	0.007	11:05	0.113	0.051	0.051	
4/26/2014	05:55	1.09	09:40	2.26	1.64	05:55	0.32	08:05	1.99	1.22	05:55	0.008	09:40	0.128	0.056	0.056	0.15
4/27/2014	01:05	1.06	09:15	2.34	1.64	01:05	0.25	08:50	2.02	1.21	01:05	0.006	08:45	0.131	0.056	0.056	
4/28/2014	00:50	1.18	08:15	2.26	1.63	00:50	0.50	08:15	2.31	1.21	00:50	0.013	08:15	0.156	0.055	0.055	
4/29/2014	03:50	1.04	10:20	2.10	1.58	03:50	0.22	08:15	2.07	1.16	03:50	0.005	08:20	0.120	0.051	0.051	
4/30/2014	01:10	1.05	10:40	2.20	1.60	01:10	0.24	11:10	2.02	1.24	01:10	0.005	10:40	0.118	0.055	0.055	
5/1/2014	06:00	1.12	10:00	2.23	1.62	06:00	0.38	08:55	2.05	1.29	06:00	0.009	09:05	0.116	0.058	0.058	
5/2/2014	05:35	0.85	10:25	2.08	1.57	05:30	0.19	08:25	2.02	1.20	05:30	0.004	08:25	0.120	0.052	0.052	
5/3/2014	04:15	1.05	10:30	2.40	1.62	04:15	0.25	10:30	2.37	1.23	04:15	0.006	10:30	0.175	0.056	0.056	
5/4/2014	06:10	0.91	10:05	2.11	1.60	05:35	0.18	08:55	2.02	1.18	05:35	0.004	09:05	0.119	0.053	0.053	
5/5/2014	06:25	1.05	10:25	2.19	1.61	06:25	0.23	07:35	2.05	1.20	06:25	0.005	08:05	0.119	0.054	0.054	
5/6/2014	01:35	1.00	09:20	2.14	1.60	01:35	0.15	09:10	2.05	1.22	01:35	0.003	10:35	0.124	0.055	0.055	
5/7/2014	00:25	1.15	09:05	2.11	1.54	05:30	0.46	08:00	2.09	1.17	05:30	0.012	08:00	0.124	0.049	0.049	
5/8/2014	05:50	1.05	11:55	2.04	1.54	05:50	0.25	09:15	1.65	1.14	05:50	0.006	08:20	0.091	0.046	0.046	
5/9/2014	05:55	0.95	10:45	2.12	1.54	01:10	0.24	07:05	1.85	1.17	01:10	0.005	10:45	0.096	0.048	0.048	
5/10/2014	06:25	0.82	12:45	2.15	1.55	05:50	0.14	12:45	1.82	1.14	05:50	0.003	12:45	0.114	0.048	0.048	
5/11/2014	01:20	0.92	09:30	2.11	1.53	03:55	0.13	10:00	1.92	1.09	03:55	0.003	09:25	0.109	0.047	0.047	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			4.634	2.59
Avg	1.66	1.25	0.059	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.64	1.27	0.054		1.47	0.84	0.031		1.57	0.87	0.036		1.45	0.83	0.030		1.40	0.72	0.024		1.50	1.08	0.041		1.50	0.84	0.031	0.02
01:00	1.48	0.98	0.036		1.38	0.80	0.027		1.45	0.77	0.027		1.35	0.47	0.015		1.36	0.51	0.017		1.35	0.61	0.019		1.39	0.53	0.018	0.01
02:00	1.37	0.61	0.021		1.21	0.63	0.017		1.37	0.56	0.019		1.20	0.47	0.013		1.26	0.41	0.012		1.18	0.45	0.012		1.33	0.46	0.014	0.03
03:00	1.27	0.38	0.011		1.21	0.46	0.013		1.27	0.45	0.013		1.23	0.43	0.012		1.21	0.48	0.013		1.19	0.40	0.011		1.36	0.46	0.015	0.02
04:00	1.23	0.39	0.011		1.22	0.44	0.012		1.21	0.37	0.010		1.22	0.48	0.013		1.21	0.41	0.011		1.18	0.47	0.012	0.04	1.40	0.46	0.016	0.15
05:00	1.23	0.43	0.012		1.30	0.46	0.014		1.44	0.65	0.023		1.23	0.55	0.015		1.35	0.74	0.024		1.42	1.02	0.036	0.03	1.85	1.67	0.089	0.06
06:00	1.43	0.84	0.030		1.49	0.81	0.031		1.62	1.06	0.047		1.47	1.02	0.038		1.68	1.27	0.058		1.58	1.24	0.050	0.01	1.70	1.35	0.062	0.01
07:00	1.69	1.47	0.070		1.70	1.49	0.068		1.82	1.59	0.079		1.78	1.56	0.075		1.92	1.55	0.084		1.81	1.69	0.084	0.01	1.84	1.54	0.079	0.01
08:00	2.02	1.89	0.109		2.01	1.86	0.106		2.06	1.94	0.116		1.94	1.89	0.104		2.04	1.75	0.103		1.96	1.75	0.097	0.01	1.99	1.76	0.099	0.02
09:00	2.10	1.94	0.118		2.18	1.96	0.126		2.21	1.94	0.127		2.16	1.93	0.123		2.02	1.77	0.103		1.98	1.80	0.101	0.02	2.12	1.84	0.113	
10:00	2.18	1.93	0.124		2.10	1.99	0.121		2.11	1.88	0.115		2.04	1.83	0.107	0.09	1.98	1.75	0.098		2.07	1.73	0.104	0.01	1.98	1.79	0.100	0.03
11:00	2.05	1.81	0.107		2.09	1.83	0.111		2.02	1.77	0.102		2.00	1.71	0.097	0.02	2.00	1.60	0.091		2.01	1.84	0.106		2.04	1.85	0.110	0.18
12:00	2.04	1.82	0.106		2.02	1.62	0.093		1.94	1.62	0.088		1.83	1.37	0.069		1.96	1.53	0.084		1.97	1.65	0.092		2.43	2.10	0.159	0.20
13:00	2.03	1.84	0.107		2.01	1.75	0.100		1.90	1.52	0.081		1.78	1.34	0.064		1.77	1.25	0.060		1.91	1.55	0.083		2.04	1.71	0.100	
14:00	1.83	1.42	0.071		1.89	1.32	0.070		1.75	1.32	0.063		1.71	1.20	0.056		1.80	1.37	0.068		1.89	1.51	0.079		1.82	1.55	0.078	
15:00	1.87	1.64	0.085		1.85	1.40	0.072		1.69	1.33	0.059		1.68	1.32	0.059		1.64	1.24	0.053		1.78	1.33	0.065		1.83	1.51	0.076	0.15
16:00	1.78	1.42	0.069		1.80	1.20	0.059		1.61	1.15	0.048		1.71	1.13	0.051		1.67	1.18	0.052		1.79	1.37	0.067		1.97	1.80	0.101	0.01
17:00	1.79	1.51	0.073		1.84	1.34	0.068		1.68	1.15	0.052		1.74	1.22	0.057		1.72	1.43	0.066		1.76	1.28	0.061		1.85	1.47	0.075	0.03
18:00	1.83	1.65	0.083		1.84	1.34	0.069		1.85	1.55	0.079		1.79	1.25	0.061		1.83	1.46	0.077		1.89	1.59	0.085		1.84	1.39	0.070	
19:00	1.76	1.64	0.077		1.86	1.57	0.080		1.87	1.63	0.084		1.85	1.43	0.073		1.73	1.35	0.064		1.83	1.57	0.079		1.82	1.45	0.072	
20:00	1.87	1.70	0.088		1.87	1.62	0.085		1.78	1.41	0.068		1.80	1.47	0.073		1.63	1.27	0.054		1.71	1.38	0.064		1.77	1.28	0.062	
21:00	1.63	1.08	0.046		1.78	1.48	0.071		1.77	1.44	0.069		1.78	1.44	0.070		1.56	1.17	0.047		1.67	1.26	0.055		1.64	1.09	0.047	0.02
22:00	1.59	1.24	0.051		1.68	1.30	0.057		1.61	1.10	0.046		1.74	1.30	0.060		1.61	1.12	0.047		1.69	1.25	0.056		1.69	1.26	0.056	0.03
23:00	1.69	1.33	0.059		1.74	1.25	0.058		1.61	1.10	0.047		1.67	1.24	0.054		1.63	1.14	0.048		1.64	1.33	0.057	0.01	1.58	1.13	0.046	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.067				0.065				0.062				0.058	0.11			0.057				0.063	0.14			0.070	1.01
Avg	1.72	1.34	0.067		1.73	1.28	0.065		1.72	1.26	0.062		1.67	1.20	0.058		1.67	1.19	0.057		1.70	1.30	0.063		1.78	1.34	0.070	
Time	04:05	02:50	02:50		01:10	05:15	03:40		04:20	04:20	04:20		02:20	04:35	02:30		03:35	04:00	04:00		04:10	02:45	04:10		02:40	01:30	04:35	
Min	1.16	0.27	0.008		1.09	0.29	0.008		1.14	0.27	0.007		1.04	0.30	0.008		1.10	0.30	0.008		1.00	0.34	0.007		1.23	0.30	0.009	
Time	10:10	09:30	10:15		09:10	11:15	11:20		09:35	08:30	09:35		09:00	09:00	09:00		18:40	18:40	18:40		18:45	18:45	18:45		12:25	12:35	12:35	
Max	2.39	2.19	0.143		2.39	2.19	0.148		2.39	2.15	0.141		2.34	2.22	0.158		2.50	2.57	0.202		2.40	2.12	0.156		2.56	2.66	0.214	

	D	V	Q	Rain
Total			0.443	1.26
Avg	1.71	1.27	0.063	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.66	1.37	0.061	0.32	1.56	1.06	0.042		1.49	1.18	0.044		1.51	1.09	0.041		1.38	0.66	0.022		1.52	0.96	0.037		1.45	0.91	0.033	
01:00	2.03	1.87	0.109	0.12	1.35	0.47	0.015		1.34	0.57	0.019		1.40	0.67	0.023		1.20	0.48	0.013		1.39	0.50	0.017		1.41	0.97	0.034	
02:00	1.92	1.39	0.075		1.36	0.40	0.013		1.38	0.53	0.018		1.31	0.42	0.013		1.36	0.66	0.021		1.31	0.54	0.017		1.32	0.35	0.011	
03:00	1.68	0.87	0.040		1.41	0.39	0.013		1.25	0.43	0.013		1.22	0.42	0.011		1.28	0.46	0.014		1.36	0.51	0.016		1.34	0.51	0.016	
04:00	1.57	0.67	0.027		1.10	0.36	0.008		1.28	0.38	0.011		1.22	0.45	0.012		1.25	0.41	0.012		1.37	0.49	0.016		1.34	0.73	0.023	
05:00	1.52	0.65	0.025		1.23	0.35	0.010	0.01	1.39	0.47	0.016		1.38	0.42	0.014		1.26	0.47	0.014		1.45	0.84	0.030		1.39	0.56	0.019	
06:00	1.49	0.89	0.033	0.01	1.62	1.05	0.048		1.57	1.10	0.045		1.55	1.18	0.048		1.61	1.25	0.055		1.74	1.30	0.062		1.45	0.89	0.032	
07:00	1.74	1.38	0.064		1.89	1.62	0.085	0.02	1.82	1.60	0.079		1.86	1.62	0.084		1.93	1.71	0.093		1.78	1.37	0.066		1.84	1.67	0.086	
08:00	1.99	1.68	0.096		2.13	1.87	0.117		1.88	1.73	0.090	0.01	1.98	1.82	0.102		1.96	1.95	0.108		1.95	1.91	0.105		1.98	1.81	0.102	
09:00	2.17	1.84	0.117	0.03	2.17	1.66	0.106	0.04	2.10	1.90	0.116		2.14	1.83	0.115		2.03	1.89	0.109		2.01	1.90	0.109		2.02	1.72	0.100	
10:00	2.21	1.81	0.118	0.02	2.24	1.67	0.112	0.02	2.01	1.79	0.102		1.97	1.86	0.103		1.95	1.77	0.097		2.11	1.77	0.109		2.09	1.75	0.106	
11:00	2.04	1.77	0.104		1.98	1.68	0.094		1.94	1.76	0.096		1.96	1.66	0.092		1.96	1.67	0.092		2.00	1.80	0.102		2.02	1.77	0.102	
12:00	1.99	1.65	0.093		1.97	1.70	0.094		1.87	1.52	0.079		1.92	1.73	0.093		1.86	1.55	0.080		1.94	1.80	0.098		2.01	1.77	0.102	
13:00	1.99	1.71	0.097		1.95	1.59	0.087		1.89	1.57	0.082		1.83	1.46	0.074		1.83	1.60	0.081		1.78	1.44	0.069		1.85	1.42	0.072	
14:00	1.83	1.40	0.071		1.97	1.70	0.094		1.80	1.35	0.067		1.74	1.32	0.061		1.82	1.42	0.070		1.80	1.31	0.064		1.81	1.42	0.070	
15:00	1.84	1.46	0.074		1.77	1.46	0.069		1.80	1.41	0.069		1.73	1.32	0.061		1.72	1.31	0.061		1.61	1.15	0.047		1.79	1.40	0.068	
16:00	1.78	1.44	0.069	0.03	1.80	1.38	0.067		1.79	1.21	0.059		1.69	1.25	0.056		1.60	1.08	0.044		1.77	1.50	0.073		1.79	1.37	0.066	
17:00	1.88	1.50	0.079	0.08	1.79	1.48	0.072		1.71	1.21	0.056		1.74	1.27	0.059		1.74	1.44	0.068		1.74	1.40	0.065		1.86	1.56	0.080	
18:00	1.96	1.60	0.088	0.01	1.85	1.60	0.081		1.76	1.37	0.066		1.82	1.46	0.072		1.91	1.68	0.090		1.78	1.33	0.064		1.84	1.50	0.076	
19:00	2.00	1.72	0.098		1.79	1.35	0.066		1.86	1.59	0.082		1.70	1.37	0.062		1.75	1.33	0.062		1.78	1.38	0.067		1.80	1.43	0.071	
20:00	1.80	1.49	0.073	0.02	1.67	1.20	0.053		1.81	1.45	0.072		1.81	1.45	0.072		1.82	1.61	0.080		1.67	1.21	0.053		1.74	1.41	0.067	
21:00	1.82	1.43	0.071		1.68	1.36	0.060		1.83	1.60	0.080		1.68	1.28	0.057		1.80	1.59	0.078		1.68	1.37	0.061		1.74	1.38	0.064	
22:00	1.80	1.28	0.062		1.78	1.59	0.077		1.70	1.40	0.065		1.69	1.24	0.056		1.78	1.51	0.072		1.60	1.14	0.047		1.54	1.04	0.041	
23:00	1.64	1.00	0.043		1.81	1.52	0.076		1.68	1.43	0.064		1.56	1.04	0.041		1.58	1.22	0.049		1.60	1.25	0.052		1.60	1.15	0.047	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.074	0.64			0.065	0.09			0.062	0.01			0.059				0.062				0.060				0.062	
Avg	1.85	1.41	0.074		1.74	1.27	0.065		1.71	1.27	0.062		1.68	1.23	0.059		1.68	1.28	0.062		1.70	1.26	0.060		1.71	1.27	0.062	
Time	05:40	04:35	04:35		04:45	03:00	04:35		03:50	01:20	03:50		03:20	03:25	03:25		01:45	00:35	01:40		02:45	01:15	05:45		06:00	02:30	02:00	
Min	1.36	0.47	0.017		0.97	0.27	0.007		1.04	0.34	0.007		1.02	0.30	0.007		1.01	0.30	0.007		1.23	0.30	0.010		1.16	0.29	0.008	
Time	10:35	09:00	09:00		10:30	23:00	10:35		09:15	09:10	09:10		09:20	08:35	09:20		09:40	08:45	09:50		10:35	12:05	10:15		12:05	08:10	12:00	
Max	2.38	2.37	0.164		2.52	2.17	0.140		2.38	2.09	0.141		2.43	2.19	0.134		2.25	2.15	0.129		2.26	2.05	0.124		2.26	2.05	0.128	

	D	V	Q	Rain
Total			0.445	0.74
Avg	1.72	1.29	0.064	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.57	0.87	0.035		1.43	0.88	0.032		1.32	0.47	0.015		1.42	0.77	0.027		1.36	0.64	0.021		1.33	0.83	0.026		1.52	0.90	0.035	
01:00	1.44	0.65	0.023		1.37	1.04	0.035		1.27	0.40	0.012		1.36	0.83	0.027		1.19	0.55	0.015		1.33	0.48	0.015		1.47	0.86	0.031	
02:00	1.39	0.73	0.024		1.11	0.56	0.014		1.33	0.44	0.014		1.33	0.72	0.023		1.26	0.52	0.015		1.28	0.54	0.016		1.33	0.67	0.021	
03:00	1.37	0.64	0.021		1.14	0.60	0.015		1.33	0.44	0.014		1.31	0.66	0.020		1.17	0.60	0.016		1.17	0.59	0.016		1.27	0.50	0.015	
04:00	1.36	0.62	0.020		1.18	0.50	0.013		1.35	0.40	0.013		1.36	0.78	0.025		1.36	0.71	0.023		1.35	0.69	0.022		1.15	0.55	0.014	
05:00	1.38	0.60	0.020		1.24	0.67	0.019		1.52	0.87	0.036		1.55	0.93	0.038		1.43	1.06	0.038		1.48	1.08	0.040		1.27	0.73	0.022	
06:00	1.49	0.90	0.034		1.39	1.05	0.037		1.62	1.31	0.056		1.71	1.40	0.064		1.69	1.40	0.064		1.68	1.42	0.065		1.48	1.04	0.040	
07:00	1.80	1.61	0.081		1.88	1.74	0.091		1.88	1.88	0.097		1.91	1.71	0.091		1.95	1.90	0.105		1.94	1.75	0.096		1.69	1.36	0.061	
08:00	2.05	1.85	0.110		1.91	1.77	0.094		2.08	1.89	0.113		2.00	1.82	0.103		2.05	1.88	0.111		2.05	1.77	0.104		1.97	1.76	0.099	
09:00	2.12	1.87	0.116		2.22	1.97	0.136		2.01	1.81	0.104		2.05	1.78	0.105		2.12	1.79	0.110		2.02	1.81	0.104		2.08	1.77	0.107	
10:00	2.19	1.77	0.114		2.00	1.67	0.096		1.99	1.72	0.097		1.98	1.78	0.100		2.00	1.75	0.100		2.00	2.02	0.114		2.03	1.80	0.105	
11:00	2.02	1.68	0.097		1.98	1.78	0.100		1.89	1.68	0.088		1.93	1.72	0.093		1.92	1.71	0.093		1.99	1.83	0.103		2.06	1.64	0.098	
12:00	1.94	1.67	0.091		1.93	1.72	0.093		1.82	1.64	0.081		1.89	1.69	0.089		1.86	1.65	0.085		1.98	1.71	0.095		1.98	1.57	0.087	
13:00	1.87	1.47	0.077		1.85	1.76	0.089		1.72	1.32	0.060		1.74	1.38	0.064		1.78	1.43	0.069		1.94	1.65	0.090		1.93	1.61	0.087	
14:00	1.76	1.33	0.063		1.76	1.60	0.076		1.69	1.27	0.058		1.70	1.53	0.069		1.69	1.34	0.060		1.80	1.42	0.070		1.91	1.70	0.091	
15:00	1.77	1.34	0.065		1.76	1.53	0.072		1.69	1.36	0.062		1.75	1.64	0.076		1.61	1.12	0.046		1.66	1.11	0.049		1.84	1.50	0.076	
16:00	1.68	1.13	0.052		1.78	1.70	0.082		1.59	1.20	0.049		1.69	1.19	0.053		1.64	1.21	0.052		1.75	1.21	0.057		1.66	1.43	0.063	
17:00	1.74	1.31	0.062		1.77	1.40	0.067		1.74	1.64	0.076		1.79	1.67	0.081		1.78	1.61	0.078		1.75	1.50	0.070		1.86	1.62	0.084	
18:00	1.80	1.46	0.072		1.78	1.69	0.082		1.76	1.67	0.079		1.73	1.54	0.071		1.80	1.74	0.085		1.84	1.68	0.085		1.84	1.60	0.081	
19:00	1.90	1.80	0.095		1.74	1.45	0.067		1.82	1.71	0.086		1.74	1.44	0.067		1.68	1.29	0.058		1.81	1.69	0.083		1.76	1.60	0.076	
20:00	1.75	1.49	0.070		1.79	1.54	0.076		1.55	1.23	0.049		1.73	1.33	0.061		1.72	1.46	0.067		1.70	1.44	0.065		1.67	1.54	0.069	
21:00	1.65	1.13	0.049		1.65	1.35	0.058		1.57	1.14	0.046		1.59	1.07	0.044		1.74	1.19	0.056		1.79	1.57	0.077		1.72	1.53	0.070	
22:00	1.57	1.14	0.046		1.56	1.25	0.050		1.59	1.15	0.047		1.56	1.19	0.048		1.68	1.20	0.053		1.65	1.43	0.062		1.54	1.39	0.054	
23:00	1.55	1.07	0.042		1.42	0.94	0.033		1.61	1.21	0.051		1.46	0.93	0.034		1.42	1.01	0.035		1.61	1.09	0.046		1.57	1.26	0.050	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.062				0.064				0.058				0.061				0.061				0.065				0.064	
Avg	1.71	1.26	0.062		1.65	1.34	0.064		1.66	1.24	0.058		1.68	1.31	0.061		1.66	1.28	0.061		1.70	1.34	0.065		1.69	1.33	0.064	
Time	01:25	01:20	01:20		04:30	04:15	04:15		01:35	03:00	02:10		02:05	02:05	02:05		03:40	01:25	01:25		03:45	03:30	03:30		04:30	04:45	04:45	
Min	1.27	0.30	0.010		0.95	0.27	0.006		1.10	0.27	0.008		1.18	0.30	0.008		1.01	0.24	0.005		1.09	0.30	0.007		1.07	0.30	0.007	
Time	10:25	09:55	09:55		09:50	09:50	09:50		08:35	08:25	08:40		09:40	09:30	09:40		08:40	08:35	08:35		07:55	07:30	09:30		08:40	10:55	08:40	
Max	2.31	2.14	0.146		3.05	2.81	0.291		2.42	2.22	0.140		2.42	2.10	0.143		2.29	2.15	0.142		2.29	2.20	0.134		2.30	2.19	0.148	

	D	V	Q	Rain
Total			0.435	
Avg	1.68	1.30	0.062	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.44	1.00	0.036		1.54	1.16	0.046		1.48	1.06	0.039		1.43	0.81	0.029		1.47	1.12	0.041		1.48	1.22	0.045		1.50	1.22	0.046	
01:00	1.28	0.53	0.016		1.51	1.04	0.039		1.30	0.63	0.019		1.33	0.56	0.018		1.37	0.72	0.024		1.34	0.68	0.022		1.31	0.86	0.028	
02:00	1.30	0.74	0.023		1.41	0.69	0.024		1.22	0.62	0.017		1.28	0.53	0.016		1.26	0.60	0.018		1.33	0.61	0.019		1.11	0.35	0.009	
03:00	1.23	0.58	0.016		1.42	0.73	0.025		1.24	0.62	0.018		1.18	0.49	0.014		1.20	0.54	0.015		1.11	0.38	0.009		1.13	0.40	0.010	
04:00	1.20	0.62	0.017		1.43	0.91	0.032		1.29	0.62	0.018		1.13	0.40	0.010		1.16	0.50	0.013		1.12	0.39	0.010		1.15	0.43	0.012	
05:00	1.33	0.69	0.022		1.38	0.89	0.030		1.22	0.62	0.017		1.30	0.56	0.017		1.26	0.79	0.024		1.30	0.46	0.014		1.30	0.81	0.025	
06:00	1.45	1.15	0.042		1.49	1.31	0.049		1.43	0.99	0.036		1.52	1.15	0.046		1.50	1.29	0.048		1.55	1.26	0.052		1.52	1.28	0.049	
07:00	1.66	1.41	0.062		1.66	1.39	0.061		1.66	1.51	0.067		1.78	1.58	0.076		1.66	1.48	0.065		1.77	1.63	0.079		1.65	1.51	0.065	
08:00	2.00	1.92	0.109		1.97	1.76	0.099		1.96	1.73	0.096		1.89	1.79	0.095		1.95	1.83	0.100		1.89	1.78	0.093		1.85	1.75	0.090	
09:00	1.98	1.80	0.101		2.11	1.79	0.109		2.06	1.84	0.109		2.02	1.93	0.111		2.00	1.87	0.106		1.99	1.98	0.112		2.08	1.81	0.109	
10:00	1.97	1.76	0.098		2.14	1.69	0.105		1.97	1.80	0.100		2.15	1.82	0.115		2.02	1.67	0.096		1.93	1.80	0.097		2.11	1.87	0.115	
11:00	2.00	1.75	0.099		2.15	1.79	0.117		1.97	1.79	0.101		2.11	1.81	0.111		1.93	1.67	0.090		1.99	1.72	0.097		2.01	1.73	0.099	
12:00	2.10	1.95	0.123		1.90	1.49	0.079		1.92	1.63	0.088		1.86	1.60	0.082		1.90	1.69	0.090		1.86	1.61	0.082		1.84	1.59	0.080	
13:00	1.94	1.70	0.093		1.80	1.53	0.075		1.75	1.41	0.066		1.78	1.47	0.071		1.83	1.69	0.085		1.78	1.48	0.071		1.84	1.59	0.080	
14:00	1.73	1.44	0.065		1.84	1.63	0.083		1.71	1.34	0.060		1.71	1.56	0.071		1.79	1.69	0.082		1.52	1.34	0.051		1.71	1.61	0.073	
15:00	1.71	1.10	0.050		1.73	1.45	0.067		1.68	1.23	0.055		1.72	1.57	0.072		1.80	1.53	0.074		1.65	1.40	0.061		1.69	1.50	0.067	
16:00	1.77	1.47	0.070		1.78	1.41	0.068		1.71	1.30	0.059		1.65	1.25	0.054		1.64	1.14	0.049		1.56	1.23	0.049		1.67	1.09	0.047	
17:00	1.70	1.46	0.066		1.76	1.32	0.063		1.74	1.45	0.068		1.63	1.12	0.048		1.71	1.24	0.057		1.61	1.26	0.053		1.77	0.98	0.047	
18:00	1.76	1.55	0.073		1.78	1.26	0.060		1.75	1.68	0.079		1.71	1.47	0.067		1.71	1.48	0.068		1.88	1.75	0.096		1.61	1.34	0.057	
19:00	1.83	1.64	0.082		1.71	1.48	0.067		1.66	1.56	0.068		1.78	1.55	0.074		1.79	1.64	0.080		1.71	1.32	0.060		1.73	1.65	0.076	
20:00	1.75	1.55	0.072		1.76	1.46	0.068		1.69	1.21	0.055		1.70	1.56	0.070		1.71	1.45	0.066		1.72	1.53	0.071		1.71	1.69	0.076	
21:00	1.70	1.43	0.065		1.78	1.54	0.077		1.63	1.24	0.053		1.71	1.59	0.072		1.63	1.55	0.068		1.70	1.39	0.064		1.71	1.65	0.075	
22:00	1.70	1.10	0.050		1.75	1.33	0.062		1.71	1.52	0.070		1.60	1.33	0.055		1.77	1.69	0.081		1.71	1.54	0.070		1.59	1.27	0.053	
23:00	1.69	1.17	0.053		1.60	1.10	0.046		1.54	1.44	0.057		1.56	1.32	0.052		1.52	1.07	0.041		1.57	1.29	0.052		1.61	1.40	0.058	

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.063				0.065				0.059				0.060				0.062				0.060				0.060	
Avg	1.68	1.31	0.063		1.73	1.34	0.065		1.64	1.28	0.059		1.65	1.28	0.060		1.65	1.33	0.062		1.63	1.29	0.060		1.63	1.31	0.060	
Time	01:35	01:05	04:40		04:05	02:20	02:20		05:55	01:25	02:45		04:15	04:15	04:15		05:10	01:15	03:25		04:55	03:55	03:55		03:00	03:00	03:00	
Min	1.07	0.30	0.008		1.14	0.30	0.010		1.05	0.30	0.009		1.00	0.14	0.003		1.03	0.34	0.008		0.97	0.15	0.003		1.02	0.18	0.004	
Time	12:00	12:00	12:00		11:05	11:05	11:05		11:40	11:40	11:40		09:50	09:50	09:50		08:55	21:45	21:45		18:00	18:00	18:00		10:00	10:00	10:00	
Max	3.05	2.83	0.294		2.77	2.98	0.270		2.32	2.34	0.164		2.30	2.36	0.164		2.27	2.20	0.133		2.99	2.74	0.277		2.28	2.22	0.153	

	D	V	Q	Rain
Total			0.428	
Avg	1.66	1.31	0.061	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.44	1.28	0.045		1.51	1.25	0.047		1.54	1.13	0.044		1.34	1.07	0.035		1.45	1.04	0.037		1.60	1.26	0.052		1.54	1.12	0.044	
01:00	1.40	0.97	0.033		1.33	0.76	0.025		1.36	0.82	0.027		1.16	0.53	0.014		1.31	0.67	0.021		1.55	1.14	0.045		1.38	0.85	0.029	
02:00	1.39	0.73	0.025		1.19	0.51	0.014		1.20	0.52	0.015		1.17	0.42	0.011		1.28	0.64	0.020		1.40	0.88	0.030		1.36	0.81	0.026	
03:00	1.36	0.57	0.019		1.20	0.53	0.014		1.16	0.45	0.012		1.10	0.49	0.012		1.22	0.56	0.016		1.30	0.71	0.022		1.35	0.80	0.026	
04:00	1.35	0.49	0.016		1.21	0.55	0.015		1.19	0.50	0.013		1.15	0.49	0.013		1.34	0.75	0.024	0.01	1.28	0.66	0.020		1.38	0.86	0.028	
05:00	1.39	0.37	0.012		1.22	0.56	0.015		1.21	0.55	0.015		1.13	0.51	0.012		1.32	0.75	0.023		1.26	0.57	0.017		1.34	0.78	0.025	
06:00	1.53	1.20	0.047		1.35	0.81	0.026		1.48	1.10	0.042		1.30	0.92	0.031		1.38	0.91	0.031		1.57	1.17	0.048		1.51	1.07	0.041	
07:00	1.63	1.54	0.066		1.54	1.26	0.051		1.65	1.49	0.065		1.49	1.25	0.047		1.65	1.43	0.063		1.75	1.43	0.069		1.69	1.45	0.067	
08:00	1.92	1.88	0.101		1.81	1.73	0.087		1.95	1.94	0.106		1.81	1.85	0.091		2.02	1.59	0.092		2.00	1.62	0.093		2.05	1.70	0.099	
09:00	1.97	1.90	0.106		2.01	1.85	0.106		1.96	1.82	0.101		1.94	1.79	0.097		2.11	1.89	0.116		2.02	1.66	0.096		2.15	1.65	0.105	
10:00	2.15	1.84	0.119		2.03	1.78	0.104		2.00	1.83	0.104		1.82	1.74	0.086		2.06	1.72	0.102		2.08	1.85	0.112		2.27	1.49	0.102	
11:00	2.00	1.72	0.098		2.09	1.89	0.117		2.23	1.66	0.110		1.83	1.69	0.084		2.05	1.63	0.096		2.08	1.41	0.085		2.05	1.26	0.075	
12:00	1.99	1.74	0.098		1.98	1.68	0.094		2.05	1.82	0.107		1.89	1.61	0.085		1.92	1.46	0.079		1.87	1.29	0.067		2.03	1.33	0.077	
13:00	1.94	1.73	0.095		1.99	1.74	0.098		2.01	1.71	0.098		1.86	1.42	0.073		1.75	1.31	0.062		1.90	1.45	0.077		2.00	1.41	0.081	
14:00	1.78	1.45	0.069		1.85	1.58	0.080		1.99	1.57	0.089		1.74	1.12	0.052		1.69	1.30	0.058		1.84	1.43	0.072		1.97	1.46	0.081	
15:00	1.65	1.11	0.048		1.78	1.53	0.074		1.93	1.22	0.067		1.71	1.10	0.050		1.71	1.31	0.059		1.75	1.34	0.063		1.92	1.45	0.078	
16:00	1.75	1.61	0.076		1.72	1.66	0.076		1.62	1.05	0.045		1.76	1.04	0.049		1.70	1.19	0.054		1.83	1.42	0.071		1.95	1.39	0.076	
17:00	1.77	1.59	0.076		1.67	1.41	0.062		1.70	1.29	0.059		1.73	0.97	0.045		1.62	1.27	0.053		1.82	1.30	0.065		1.93	1.45	0.078	
18:00	1.80	1.69	0.083		1.76	1.61	0.076		1.87	1.57	0.081		1.73	1.22	0.056		1.87	1.49	0.077		1.90	1.35	0.072		1.92	1.37	0.073	
19:00	1.92	1.91	0.102		1.82	1.55	0.078		1.92	1.78	0.095		1.80	1.46	0.071		1.89	1.46	0.076		1.90	1.49	0.079		1.82	1.38	0.069	
20:00	1.79	1.70	0.083		1.73	1.55	0.072		1.80	1.60	0.079		1.71	1.40	0.064		1.80	1.44	0.070		1.87	1.55	0.080		1.88	1.39	0.073	
21:00	1.81	1.71	0.084		1.77	1.35	0.064		1.79	1.62	0.079		1.71	1.42	0.064		1.80	1.35	0.066		1.71	1.31	0.059		1.88	1.39	0.072	
22:00	1.68	1.39	0.062		1.62	1.44	0.060		1.64	1.34	0.057		1.72	1.32	0.060		1.67	1.35	0.060		1.78	1.30	0.063		1.74	1.31	0.062	
23:00	1.62	1.41	0.060		1.61	1.33	0.055		1.53	1.08	0.042		1.57	1.20	0.048		1.61	1.24	0.052		1.65	1.27	0.055		1.77	1.36	0.065	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.068				0.063				0.065				0.052				0.059	0.01			0.063				0.065	
Avg	1.71	1.40	0.068		1.66	1.33	0.063		1.70	1.31	0.065		1.59	1.17	0.052		1.68	1.24	0.059		1.74	1.29	0.063		1.79	1.27	0.065	
Time	03:00	04:35	04:35		01:30	01:30	01:30		03:15	03:15	03:15		00:50	05:05	05:05		03:20	03:15	03:15		05:35	04:55	05:05		03:00	03:00	03:00	
Min	1.15	0.30	0.010		1.01	0.16	0.003		1.01	0.17	0.004		0.96	0.27	0.007		1.03	0.20	0.006		1.10	0.27	0.007		1.16	0.46	0.012	
Time	10:00	10:00	10:00		11:35	11:35	11:35		11:10	08:25	12:00		09:15	12:45	12:45		10:05	09:45	09:45		10:05	10:00	10:05		09:55	09:55	09:55	
Max	2.79	2.64	0.241		2.71	2.73	0.239		2.30	2.14	0.128		2.13	2.46	0.136		2.23	2.46	0.154		2.25	2.42	0.159		2.52	2.42	0.191	

	D	V	Q	Rain
Total			0.434	0.01
Avg	1.69	1.29	0.062	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.44	1.05	0.038		1.54	1.13	0.045		1.53	1.10	0.043		1.56	0.98	0.040		1.50	1.13	0.043	0.13	1.32	0.84	0.027		1.46	0.99	0.037	
01:00	1.46	0.99	0.036		1.33	0.76	0.025		1.34	0.79	0.026		1.35	0.82	0.027		1.78	1.52	0.078	0.03	1.34	0.79	0.025		1.22	0.56	0.016	
02:00	1.30	0.72	0.023		1.42	0.92	0.032		1.33	0.77	0.025		1.33	0.60	0.019		1.42	1.00	0.037		1.27	0.66	0.020		1.26	0.65	0.020	
03:00	1.35	0.79	0.027		1.39	0.86	0.030		1.27	0.66	0.020		1.38	0.69	0.023		1.31	0.74	0.023	0.01	1.20	0.54	0.015		1.19	0.58	0.017	
04:00	1.34	0.78	0.025		1.39	0.88	0.030		1.21	0.57	0.016		1.28	0.56	0.016		1.28	0.67	0.020	0.01	1.17	0.49	0.013		1.13	0.51	0.013	
05:00	1.30	0.71	0.023		1.41	0.90	0.031		1.30	0.71	0.023		1.37	0.60	0.020	0.04	1.39	0.87	0.031		1.25	0.62	0.019		1.27	0.68	0.020	
06:00	1.38	0.84	0.029		1.54	1.12	0.044		1.55	1.13	0.045		1.63	1.20	0.057	0.14	1.51	1.05	0.041	0.03	1.42	0.96	0.034		1.48	1.09	0.042	
07:00	1.69	1.21	0.055		1.66	1.31	0.057		1.71	1.43	0.065		1.85	1.52	0.079	0.01	1.76	1.54	0.074		1.70	1.38	0.063		1.78	1.45	0.070	
08:00	2.04	1.53	0.091		1.89	1.62	0.086		1.95	1.80	0.100		1.84	1.51	0.077		1.97	1.80	0.100		1.97	1.82	0.101		1.96	1.72	0.096	
09:00	2.01	1.62	0.093		2.06	1.74	0.103		2.07	1.79	0.107		2.07	1.76	0.105		1.99	1.82	0.103		2.06	1.78	0.106		2.06	1.73	0.103	
10:00	2.01	1.68	0.096		2.12	1.78	0.110		2.04	1.68	0.099		2.11	1.75	0.108		2.05	1.94	0.114		2.13	1.83	0.114		1.99	1.57	0.089	
11:00	1.98	1.51	0.085		2.06	1.61	0.096		2.04	1.68	0.099		2.02	1.58	0.092		1.97	1.65	0.092		1.99	1.67	0.095		1.95	1.48	0.081	
12:00	1.94	1.68	0.092		1.93	1.47	0.079		1.91	1.63	0.087		1.87	1.34	0.069		1.94	1.59	0.087		1.78	1.41	0.068		1.84	1.58	0.079	
13:00	1.86	1.47	0.076		1.90	1.40	0.073		1.87	1.35	0.071		1.91	1.54	0.084		1.83	1.33	0.066		1.72	1.21	0.056		1.69	1.37	0.061	
14:00	1.84	1.36	0.069		1.77	1.33	0.064		1.75	1.34	0.063		1.83	1.41	0.071		1.74	1.34	0.062		1.67	1.22	0.054		1.65	1.41	0.061	
15:00	1.72	1.13	0.052		1.69	1.25	0.056		1.66	1.07	0.046		1.70	1.17	0.054		1.66	1.16	0.051		1.60	1.11	0.046		1.60	1.26	0.052	
16:00	1.68	1.21	0.054		1.67	1.23	0.054		1.66	1.14	0.050		1.83	1.55	0.078		1.63	1.19	0.050		1.72	1.22	0.056		1.66	1.35	0.059	
17:00	1.74	1.38	0.064		1.68	1.19	0.052		1.66	1.21	0.053		1.74	1.45	0.067		1.68	1.24	0.055		1.65	1.11	0.048		1.64	1.32	0.056	
18:00	1.70	1.26	0.057		1.70	1.31	0.059		1.75	1.50	0.070		1.68	1.38	0.062		1.74	1.36	0.064		1.77	1.62	0.077		1.63	1.36	0.058	
19:00	1.80	1.51	0.074		1.68	1.52	0.068		1.82	1.65	0.082		1.69	1.38	0.062		1.79	1.67	0.081		1.76	1.50	0.071		1.60	1.26	0.052	
20:00	1.73	1.49	0.069		1.64	1.20	0.051		1.63	1.17	0.050		1.68	1.41	0.063		1.75	1.62	0.076		1.69	1.32	0.059		1.66	1.52	0.066	
21:00	1.71	1.15	0.053		1.72	1.38	0.064		1.69	1.25	0.056		1.73	1.42	0.065		1.76	1.48	0.071		1.64	1.30	0.056		1.61	1.31	0.054	
22:00	1.63	1.19	0.050		1.70	1.38	0.063		1.58	1.12	0.046		1.63	1.31	0.056		1.67	1.27	0.056		1.67	1.27	0.056		1.62	1.34	0.056	
23:00	1.64	1.22	0.052		1.62	1.23	0.051		1.59	1.20	0.049		1.55	1.17	0.047	0.03	1.60	1.18	0.049		1.62	1.30	0.055		1.61	1.30	0.054	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.058				0.059				0.058				0.060	0.22			0.063	0.21			0.055				0.055	
Avg	1.68	1.23	0.058		1.69	1.27	0.059		1.66	1.24	0.058		1.69	1.25	0.060		1.70	1.34	0.063		1.63	1.21	0.055		1.61	1.22	0.055	
Time	06:00	06:00	06:00		01:55	01:55	01:55		04:45	03:30	04:45		04:45	01:30	01:30		04:30	04:30	04:30		04:45	04:45	04:45		03:40	03:10	03:10	
Min	1.15	0.43	0.011		1.08	0.31	0.007		1.00	0.37	0.009		1.10	0.30	0.009		1.07	0.28	0.006		0.98	0.28	0.006		0.86	0.17	0.004	
Time	08:45	10:10	10:10		10:40	10:40	10:40		08:40	08:40	08:40		13:30	13:35	10:40		01:20	10:25	01:20		10:40	10:25	10:25		10:20	08:40	08:40	
Max	2.25	2.76	0.161		2.42	2.19	0.163		2.44	2.24	0.169		2.39	2.47	0.130		2.33	2.54	0.148		2.38	2.91	0.182		2.19	2.17	0.130	

	D	V	Q	Rain
Total			0.408	0.43
Avg	1.67	1.25	0.058	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.41	0.95	0.033		1.27	0.65	0.019		1.50	1.06	0.040		1.48	1.04	0.039		1.46	1.02	0.037		1.35	0.80	0.027		1.38	1.07	0.036	
01:00	1.27	0.66	0.020		1.27	0.65	0.020		1.36	0.83	0.027		1.31	0.73	0.023		1.41	0.90	0.031		1.27	0.65	0.020		1.25	0.65	0.019	
02:00	1.25	0.62	0.018		1.13	0.42	0.011		1.31	0.74	0.023		1.28	0.68	0.021		1.32	0.74	0.023		1.25	0.62	0.018		1.23	0.59	0.017	
03:00	1.23	0.59	0.017		1.07	0.28	0.007		1.23	0.58	0.016		1.29	0.70	0.021		1.31	0.74	0.023		1.35	0.81	0.026		1.27	0.67	0.020	
04:00	1.23	0.59	0.016		1.12	0.39	0.010		1.27	0.67	0.020		1.21	0.55	0.015		1.31	0.74	0.023		1.23	0.60	0.017		1.27	0.66	0.020	
05:00	1.24	0.61	0.017		1.16	0.45	0.012		1.40	0.89	0.030		1.39	0.86	0.030		1.31	0.73	0.023		1.34	0.79	0.025		1.26	0.64	0.019	
06:00	1.34	0.78	0.025		1.32	0.86	0.027		1.54	1.11	0.043		1.58	1.06	0.044		1.47	1.03	0.038		1.62	1.22	0.053		1.46	1.02	0.039	
07:00	1.62	1.33	0.057		1.55	1.31	0.054		1.82	1.46	0.072		1.79	1.44	0.071		1.77	1.37	0.066		1.70	1.38	0.064		1.72	1.47	0.069	
08:00	1.79	1.62	0.078		1.86	1.78	0.091		2.06	1.66	0.099		2.06	1.82	0.109		2.03	1.79	0.104		2.01	1.72	0.099		1.95	1.65	0.091	
09:00	2.08	1.78	0.107		2.18	1.83	0.118		2.13	1.74	0.109		2.21	1.87	0.123		2.07	1.88	0.113		2.04	1.81	0.107		2.11	1.80	0.110	
10:00	2.03	1.98	0.116		2.10	1.67	0.102		2.20	1.73	0.113		2.11	1.45	0.090		1.95	1.62	0.089		2.17	1.79	0.114		2.06	1.83	0.108	
11:00	2.06	1.80	0.107		2.04	1.41	0.083		2.04	1.65	0.097		1.94	1.39	0.076		1.75	1.34	0.064		2.04	1.57	0.092		2.05	1.72	0.101	
12:00	1.99	1.67	0.094		2.02	1.45	0.084		1.94	1.46	0.080		1.98	1.36	0.076		1.76	1.25	0.060		1.81	1.35	0.067		1.93	1.36	0.074	
13:00	1.86	1.49	0.076		1.92	1.42	0.076		1.79	1.32	0.064		1.81	1.23	0.060		1.63	1.25	0.053		1.72	1.27	0.059		1.83	1.34	0.067	
14:00	1.64	1.34	0.058		1.85	1.33	0.068		1.70	1.21	0.054		1.87	1.23	0.063		1.53	1.13	0.044		1.62	1.13	0.047		1.71	1.18	0.054	
15:00	1.62	1.41	0.059		1.90	1.35	0.072		1.69	1.09	0.049		1.84	1.17	0.059		1.58	1.25	0.052		1.68	1.17	0.052		1.71	1.19	0.054	
16:00	1.60	1.33	0.055		1.85	1.19	0.060		1.69	1.22	0.054		1.90	1.31	0.069		1.82	1.63	0.081		1.72	1.19	0.055		1.85	1.25	0.064	
17:00	1.65	1.33	0.058		1.80	1.28	0.063		1.73	1.45	0.067		1.87	1.41	0.073		1.72	1.33	0.061		1.65	1.24	0.053		1.93	1.44	0.078	
18:00	1.63	1.42	0.060		1.84	1.42	0.072		1.74	1.31	0.061		1.76	1.21	0.057		1.68	1.36	0.061		1.70	1.24	0.056		1.93	1.34	0.072	
19:00	1.71	1.67	0.077		1.81	1.32	0.065		1.75	1.37	0.064		1.75	1.27	0.060		1.65	1.34	0.058		1.80	1.57	0.077		1.88	1.42	0.074	
20:00	1.62	1.35	0.057		1.77	1.30	0.062		1.77	1.44	0.069		1.85	1.35	0.068		1.62	1.34	0.056		1.69	1.34	0.060		1.91	1.42	0.075	
21:00	1.64	1.42	0.060		1.83	1.28	0.064		1.71	1.34	0.060		1.82	1.42	0.071		1.59	1.23	0.050		1.59	1.29	0.053		1.87	1.35	0.069	
22:00	1.60	1.29	0.053		1.68	1.31	0.058		1.65	1.19	0.051		1.82	1.20	0.060		1.61	1.13	0.047		1.66	1.33	0.058		1.83	1.38	0.069	
23:00	1.49	1.00	0.037		1.64	1.23	0.053		1.54	1.03	0.040		1.68	1.22	0.054		1.59	1.20	0.049		1.54	1.16	0.045		1.74	1.30	0.060	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.057				0.056				0.058				0.060				0.054				0.056				0.061	
Avg	1.61	1.25	0.057		1.67	1.15	0.056		1.69	1.23	0.058		1.73	1.21	0.060		1.62	1.22	0.054		1.65	1.21	0.056		1.71	1.24	0.061	
Time	02:40	02:40	02:40		02:00	01:50	01:50		02:25	02:25	02:25		04:10	04:10	04:10		05:45	05:45	05:45		01:10	01:10	01:10		01:50	02:00	01:50	
Min	1.13	0.39	0.010		0.98	0.17	0.004		1.19	0.51	0.014		1.15	0.43	0.011		1.15	0.43	0.011		1.07	0.29	0.007		0.99	0.28	0.006	
Time	10:05	10:00	10:00		09:45	09:00	09:55		10:15	11:50	11:50		10:55	08:45	10:55		09:20	09:15	09:15		09:20	09:15	09:15		09:55	07:50	09:45	
Max	2.41	2.83	0.174		2.37	2.19	0.137		2.31	2.44	0.142		2.29	2.14	0.139		2.32	2.79	0.178		2.31	2.71	0.169		2.23	2.59	0.149	

	D	V	Q	Rain
Total			0.402	
Avg	1.67	1.22	0.057	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.69	1.26	0.056		1.55	1.13	0.044		1.36	0.86	0.028		1.39	0.88	0.030		1.42	0.98	0.035		1.43	0.98	0.034		1.46	1.03	0.037	
01:00	1.54	1.11	0.043		1.43	0.93	0.033		1.26	0.65	0.019		1.27	0.66	0.020		1.27	0.70	0.021		1.27	0.67	0.020		1.24	0.60	0.019	
02:00	1.46	0.99	0.036		1.38	0.85	0.028		1.19	0.51	0.014		1.24	0.61	0.018		1.23	0.58	0.016		1.24	0.61	0.018		1.23	0.60	0.017	
03:00	1.48	1.03	0.038		1.33	0.77	0.024		1.22	0.56	0.016		1.27	0.67	0.020		1.29	0.69	0.021		1.24	0.61	0.017		1.20	0.53	0.014	
04:00	1.45	0.97	0.034		1.33	0.78	0.025		1.20	0.53	0.014		1.25	0.63	0.018		1.33	0.77	0.024		1.28	0.68	0.020		1.27	0.66	0.020	
05:00	1.46	0.99	0.036		1.42	0.93	0.033		1.22	0.57	0.017		1.28	0.67	0.020		1.32	0.74	0.024		1.32	0.75	0.024		1.38	0.85	0.029	
06:00	1.61	1.21	0.051		1.49	1.06	0.039		1.40	0.93	0.034		1.46	1.05	0.039		1.46	1.08	0.041		1.52	1.17	0.045		1.40	0.92	0.034	
07:00	1.83	1.43	0.072		1.69	1.42	0.064		1.71	1.60	0.073		1.68	1.41	0.063		1.65	1.54	0.067		1.74	1.42	0.066		1.78	1.65	0.081	
08:00	2.05	1.72	0.101		1.97	1.70	0.095		1.97	1.87	0.105		1.91	1.70	0.091		1.87	1.65	0.086		1.96	1.84	0.102		1.88	1.72	0.090	
09:00	2.15	1.87	0.118		2.08	1.63	0.098		2.15	1.94	0.124		2.15	1.97	0.125		2.05	1.72	0.101		2.06	1.77	0.105		2.13	1.80	0.112	
10:00	2.15	1.59	0.100		2.13	1.72	0.107		2.16	1.70	0.108		2.09	1.66	0.100		2.10	1.88	0.115		2.07	1.85	0.110		1.98	1.73	0.097	
11:00	2.07	1.57	0.094		2.00	1.68	0.096		1.93	1.50	0.081		1.95	1.61	0.089		1.99	1.57	0.089		2.01	1.79	0.103		1.92	1.63	0.087	
12:00	2.03	1.52	0.089		1.94	1.68	0.092		1.84	1.42	0.071		1.83	1.39	0.070		1.85	1.42	0.073		1.92	1.74	0.093		1.79	1.53	0.075	
13:00	1.85	1.33	0.069		1.81	1.44	0.071		1.74	1.27	0.059		1.65	0.98	0.042		1.76	1.27	0.061		1.75	1.41	0.067		1.79	1.56	0.076	
14:00	1.72	1.36	0.062		1.66	1.12	0.049		1.70	1.25	0.056		1.67	1.29	0.057		1.75	1.28	0.060		1.72	1.32	0.060		1.81	1.57	0.078	
15:00	1.76	1.31	0.062		1.64	1.11	0.047		1.67	1.22	0.054		1.66	1.26	0.055		1.70	1.38	0.063		1.64	1.14	0.049		1.65	1.29	0.057	
16:00	1.67	1.23	0.054		1.70	1.28	0.058		1.63	1.10	0.046		1.71	1.30	0.059		1.69	1.15	0.052		1.60	1.09	0.045		1.61	1.14	0.048	
17:00	1.85	1.47	0.075		1.68	1.27	0.057		1.69	1.30	0.058		1.78	1.38	0.066		1.69	1.22	0.055		1.60	1.18	0.049		1.61	1.20	0.050	
18:00	1.74	1.16	0.055		1.84	1.61	0.081		1.67	1.27	0.056		1.64	1.32	0.057		1.73	1.29	0.060		1.69	1.36	0.062		1.70	1.45	0.065	
19:00	1.87	1.50	0.077		1.77	1.67	0.080		1.83	1.55	0.078		1.65	1.47	0.064		1.70	1.32	0.060		1.90	1.73	0.091		1.80	1.61	0.079	
20:00	1.71	1.39	0.063		1.70	1.50	0.068		1.83	1.54	0.077		1.67	1.41	0.062		1.71	1.55	0.071		1.65	1.29	0.055		1.63	1.34	0.057	
21:00	1.64	1.24	0.053		1.60	1.35	0.056		1.64	1.26	0.054		1.64	1.29	0.055		1.64	1.25	0.054		1.66	1.24	0.054		1.63	1.20	0.051	
22:00	1.65	1.16	0.050		1.63	1.30	0.055		1.66	1.30	0.057		1.64	1.36	0.059		1.68	1.29	0.057		1.65	1.32	0.057		1.64	1.37	0.058	
23:00	1.65	1.20	0.052		1.52	1.15	0.044		1.59	1.24	0.051		1.54	1.27	0.050		1.55	1.11	0.044		1.62	1.30	0.055		1.56	1.20	0.048	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.064				0.060				0.056				0.055				0.056				0.058				0.057	
Avg	1.75	1.32	0.064		1.68	1.29	0.060		1.64	1.21	0.056		1.63	1.22	0.055		1.64	1.23	0.056		1.65	1.26	0.058		1.63	1.26	0.057	
Time	02:10	18:05	02:10		04:30	04:30	04:30		05:05	05:05	05:05		02:05	02:05	02:05		06:00	06:00	06:00		03:15	03:15	03:15		01:20	01:20	01:20	
Min	1.37	0.77	0.028		1.19	0.52	0.014		1.07	0.29	0.007		1.12	0.38	0.009		1.09	0.32	0.008		1.15	0.44	0.011		1.00	0.15	0.003	
Time	09:35	09:35	09:35		10:10	12:10	10:15		09:30	09:30	09:30		09:40	09:40	09:40		10:40	10:40	10:40		09:40	10:45	10:45		09:05	09:05	09:05	
Max	2.29	2.41	0.166		2.26	2.00	0.130		2.55	2.52	0.203		2.51	2.61	0.205		2.36	2.51	0.181		2.23	2.15	0.124		2.29	2.27	0.157	

	D	V	Q	Rain
Total			0.408	
Avg	1.66	1.25	0.058	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.42	0.92	0.033		1.36	0.89	0.029		1.40	1.07	0.037		1.37	0.85	0.028		1.40	0.97	0.034		1.35	0.80	0.026		1.34	0.86	0.028	
01:00	1.24	0.60	0.018		1.37	0.84	0.028		1.25	0.62	0.018		1.29	0.70	0.022		1.25	0.63	0.018		1.25	0.62	0.018		1.22	0.57	0.016	
02:00	1.25	0.62	0.018		1.25	0.63	0.018		1.27	0.67	0.020		1.27	0.65	0.019		1.27	0.65	0.019		1.25	0.62	0.018		1.18	0.50	0.013	
03:00	1.25	0.62	0.018		1.31	0.74	0.023		1.31	0.73	0.023		1.27	0.66	0.020		1.18	0.50	0.014		1.30	0.71	0.022		1.22	0.57	0.016	
04:00	1.17	0.46	0.012		1.15	0.44	0.011		1.25	0.63	0.019		1.23	0.59	0.017		1.28	0.68	0.020		1.25	0.63	0.018		1.16	0.46	0.012	
05:00	1.26	0.63	0.019		1.26	0.63	0.019		1.38	0.85	0.029		1.35	0.80	0.026		1.27	0.65	0.019		1.28	0.76	0.023		1.26	0.64	0.019	
06:00	1.36	0.89	0.029		1.44	1.02	0.037		1.41	0.99	0.034		1.45	0.97	0.036		1.42	0.96	0.036		1.52	1.15	0.045		1.47	1.03	0.039	
07:00	1.71	1.54	0.072		1.70	1.57	0.071		1.72	1.63	0.075		1.70	1.48	0.067		1.78	1.49	0.073		1.70	1.57	0.071		1.66	1.51	0.066	
08:00	2.07	1.85	0.110		1.97	1.84	0.102		1.83	1.57	0.079		1.87	1.66	0.086		2.00	1.83	0.104		1.98	1.89	0.106		1.85	1.70	0.087	
09:00	2.13	1.73	0.108		2.07	1.75	0.105		2.06	1.80	0.107		2.01	1.82	0.105		2.00	1.71	0.097		2.08	1.74	0.104		1.98	1.81	0.101	
10:00	2.07	1.68	0.100		2.01	1.72	0.099		2.04	1.74	0.102		2.01	1.70	0.098		2.01	1.75	0.100		2.02	1.77	0.103		1.95	1.65	0.091	
11:00	2.00	1.75	0.100		1.95	1.60	0.088		2.05	1.68	0.099		1.95	1.76	0.097		1.84	1.39	0.071		2.03	1.66	0.096		1.95	1.73	0.095	
12:00	1.96	1.64	0.091		1.88	1.57	0.082		2.00	1.72	0.098		1.81	1.48	0.073		1.83	1.43	0.073		1.81	1.44	0.071		1.82	1.50	0.074	
13:00	1.92	1.71	0.092		1.95	1.88	0.103		1.86	1.40	0.072		1.79	1.43	0.070		1.74	1.25	0.058		1.74	1.29	0.061		1.68	1.25	0.055	
14:00	1.83	1.57	0.079		1.80	1.54	0.075		1.83	1.38	0.069		1.67	1.20	0.053		1.73	1.42	0.067		1.73	1.44	0.067		1.63	1.16	0.049	
15:00	1.85	1.58	0.080		1.72	1.35	0.062		1.69	1.33	0.059		1.66	1.14	0.049		1.64	1.25	0.053		1.62	1.27	0.054		1.68	1.27	0.056	
16:00	1.74	1.33	0.061		1.64	1.20	0.052		1.70	1.25	0.056		1.62	1.11	0.046		1.68	1.27	0.056		1.69	1.19	0.054		1.61	1.03	0.043	
17:00	1.76	1.44	0.068		1.65	1.30	0.056		1.66	1.23	0.054		1.66	1.23	0.054		1.63	1.32	0.055		1.63	1.18	0.050		1.67	1.22	0.054	
18:00	1.61	1.03	0.043		1.68	1.31	0.058		1.73	1.33	0.062		1.62	1.36	0.057		1.65	1.31	0.056		1.73	1.39	0.065		1.64	1.22	0.052	
19:00	1.61	1.07	0.045		1.70	1.44	0.065		1.81	1.63	0.080		1.69	1.46	0.065		1.66	1.10	0.047		1.78	1.52	0.073		1.68	1.24	0.055	
20:00	1.71	1.27	0.058		1.66	1.36	0.059		1.77	1.51	0.072		1.63	1.25	0.053		1.71	1.37	0.063		1.83	1.55	0.077		1.67	1.30	0.057	
21:00	1.65	1.32	0.058		1.67	1.34	0.059		1.70	1.31	0.059		1.64	1.32	0.057		1.69	1.37	0.061		1.63	1.21	0.052		1.63	1.13	0.048	
22:00	1.57	1.20	0.048		1.62	1.24	0.052		1.71	1.36	0.062		1.58	1.14	0.047		1.61	1.22	0.051		1.64	1.07	0.046		1.59	1.21	0.050	
23:00	1.59	1.22	0.050		1.48	1.09	0.040		1.65	1.25	0.054		1.60	1.31	0.054		1.54	1.19	0.047		1.53	1.14	0.044		1.55	1.10	0.044	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.059				0.058				0.060				0.054				0.054				0.057				0.051	
Avg	1.65	1.24	0.059		1.64	1.26	0.058		1.67	1.28	0.060		1.61	1.21	0.054		1.62	1.20	0.054		1.64	1.23	0.057		1.59	1.15	0.051	
Time	04:50	04:50	04:50		04:40	04:40	04:40		03:20	03:20	03:20		04:30	04:30	04:30		03:10	03:10	03:10		05:05	05:05	05:05		04:10	04:10	04:10	
Min	1.07	0.27	0.006		1.08	0.29	0.007		1.11	0.36	0.009		1.08	0.31	0.007		1.10	0.34	0.008		1.08	0.29	0.007		1.09	0.32	0.007	
Time	09:40	08:00	09:45		13:05	13:10	13:10		10:00	08:45	08:45		09:30	09:25	09:45		10:30	08:20	08:20		09:40	10:30	10:55		10:00	07:40	11:05	
Max	2.32	2.02	0.127		2.20	2.76	0.155		2.15	2.10	0.128		2.21	1.99	0.119		2.23	1.99	0.121		2.37	2.27	0.145		2.09	2.02	0.113	

	D	V	Q	Rain
Total			0.392	
Avg	1.63	1.22	0.056	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.36	0.84	0.028	0.02	1.41	1.00	0.034		1.44	0.97	0.035		1.35	0.80	0.026		1.34	0.78	0.025		1.33	0.78	0.025		1.37	0.83	0.028	
01:00	1.39	0.89	0.031	0.11	1.27	0.66	0.020		1.31	0.72	0.023		1.25	0.63	0.018		1.19	0.51	0.015		1.36	0.87	0.029		1.25	0.62	0.018	
02:00	1.57	1.34	0.056	0.02	1.28	0.67	0.020		1.27	0.66	0.019		1.19	0.52	0.014		1.24	0.61	0.018		1.26	0.64	0.019		1.28	0.67	0.020	
03:00	1.25	0.62	0.018		1.24	0.60	0.017		1.26	0.64	0.019		1.11	0.36	0.009		1.24	0.61	0.018		1.27	0.65	0.019		1.24	0.61	0.017	
04:00	1.27	0.67	0.021		1.27	0.65	0.019		1.29	0.70	0.021		1.20	0.52	0.014		1.29	0.69	0.021		1.28	0.70	0.022		1.27	0.67	0.020	
05:00	1.16	0.46	0.012		1.29	0.69	0.021		1.37	0.83	0.028		1.28	0.69	0.021		1.26	0.64	0.019		1.36	0.82	0.027		1.15	0.51	0.014	
06:00	1.39	0.91	0.031		1.31	0.75	0.024		1.43	0.95	0.035		1.42	0.95	0.034		1.51	1.21	0.047		1.49	1.20	0.047		1.38	0.99	0.035	
07:00	1.67	1.55	0.068		1.69	1.37	0.061		1.70	1.54	0.070		1.66	1.38	0.062		1.72	1.60	0.074		1.80	1.76	0.086		1.78	1.64	0.079	
08:00	1.95	1.80	0.099		1.98	1.87	0.106		2.08	1.84	0.111		1.97	1.87	0.104		1.93	1.73	0.093		1.91	1.86	0.098		1.97	1.88	0.105	
09:00	2.04	1.78	0.104		2.11	1.73	0.107		2.07	1.69	0.101		1.94	1.77	0.096		2.00	1.81	0.103		2.03	1.87	0.109		1.99	1.76	0.100	
10:00	2.02	1.72	0.099		2.09	1.72	0.104		2.01	1.64	0.094		2.01	1.75	0.100		2.01	1.75	0.100		1.97	1.73	0.096		1.95	1.65	0.090	
11:00	2.03	1.69	0.098		1.89	1.47	0.077		1.90	1.57	0.084		1.86	1.62	0.083		1.89	1.69	0.089		1.88	1.62	0.084		1.87	1.78	0.092	
12:00	1.97	1.56	0.087		1.90	1.57	0.083		1.87	1.63	0.084		1.83	1.51	0.077		1.81	1.45	0.072		1.84	1.66	0.084		1.78	1.59	0.077	
13:00	1.80	1.30	0.064		1.80	1.55	0.075		1.74	1.29	0.060		1.69	1.31	0.059		1.69	1.59	0.071		1.78	1.48	0.071		1.61	1.23	0.051	
14:00	1.67	1.14	0.050		1.78	1.54	0.074		1.63	1.20	0.051		1.64	1.27	0.054		1.61	1.26	0.053		1.64	1.34	0.057		1.58	1.12	0.045	
15:00	1.67	1.23	0.054		1.76	1.38	0.066		1.59	1.20	0.049		1.57	1.17	0.048		1.57	1.16	0.046		1.61	1.20	0.050		1.60	1.20	0.049	
16:00	1.69	1.22	0.055		1.71	1.14	0.052		1.63	1.23	0.052		1.62	1.09	0.046		1.59	1.20	0.049		1.69	1.42	0.064		1.59	1.23	0.051	
17:00	1.61	1.14	0.047		1.65	1.23	0.053		1.62	1.10	0.046		1.61	1.18	0.049		1.60	1.17	0.048		1.61	1.32	0.055		1.56	1.21	0.048	
18:00	1.69	1.27	0.057		1.71	1.36	0.062		1.67	1.33	0.059		1.61	1.16	0.049		1.72	1.38	0.063		1.70	1.49	0.067		1.60	1.23	0.051	
19:00	1.68	1.37	0.061		1.79	1.32	0.064		1.66	1.19	0.052		1.66	1.33	0.058		1.59	1.36	0.055		1.72	1.42	0.065		1.58	1.29	0.052	
20:00	1.65	1.14	0.049		1.70	1.19	0.054		1.76	1.49	0.072		1.71	1.40	0.063		1.64	1.28	0.055		1.69	1.41	0.064		1.60	1.32	0.054	
21:00	1.66	1.23	0.054		1.65	1.24	0.053		1.59	1.19	0.048		1.57	1.23	0.049		1.69	1.55	0.069		1.64	1.37	0.059		1.55	1.27	0.050	
22:00	1.67	1.35	0.059		1.68	1.22	0.054		1.63	1.31	0.055		1.58	1.22	0.049		1.69	1.54	0.069		1.59	1.31	0.053		1.56	1.31	0.052	
23:00	1.52	1.13	0.043		1.52	1.11	0.043		1.51	1.09	0.042		1.51	1.13	0.043		1.54	1.25	0.049		1.50	1.15	0.043		1.56	1.21	0.048	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.056	0.15			0.056				0.055				0.051				0.055				0.058				0.052	
Avg	1.64	1.22	0.056		1.64	1.21	0.056		1.63	1.21	0.055		1.58	1.16	0.051		1.60	1.24	0.055		1.62	1.29	0.058		1.57	1.20	0.052	
Time	05:55	05:55	05:55		01:05	01:05	01:05		00:50	00:50	00:50		03:50	03:50	03:50		01:10	01:10	01:10		06:00	06:00	06:00		05:35	05:30	05:30	
Min	1.09	0.32	0.008		1.06	0.25	0.006		1.18	0.50	0.013		1.04	0.22	0.005		1.05	0.24	0.005		1.12	0.38	0.009		0.85	0.19	0.004	
Time	09:40	08:05	09:40		09:15	08:50	08:45		08:15	08:15	08:15		10:20	08:15	08:20		10:40	11:10	10:40		10:00	08:55	09:05		10:25	08:25	08:25	
Max	2.26	1.99	0.128		2.34	2.02	0.131		2.26	2.31	0.156		2.10	2.07	0.120		2.20	2.02	0.118		2.23	2.05	0.116		2.08	2.02	0.120	

	D	V	Q	Rain
Total			0.383	0.15
Avg	1.61	1.22	0.055	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.40	0.94	0.032		1.34	0.77	0.026		1.36	0.83	0.027		1.32	0.78	0.025		1.42	1.01	0.035		1.33	0.83	0.027		1.41	0.91	0.032	
01:00	1.25	0.63	0.019		1.25	0.61	0.018		1.27	0.66	0.019		1.20	0.52	0.015		1.30	0.74	0.023		1.22	0.56	0.016		1.25	0.64	0.019	
02:00	1.25	0.63	0.018		1.25	0.61	0.018		1.23	0.59	0.017		1.18	0.48	0.013		1.26	0.65	0.019		1.27	0.66	0.019		1.25	0.62	0.018	
03:00	1.23	0.58	0.016		1.23	0.59	0.017		1.24	0.60	0.017		1.19	0.52	0.014		1.27	0.66	0.019		1.25	0.62	0.018		1.30	0.71	0.022	
04:00	1.11	0.36	0.009		1.32	0.75	0.024		1.28	0.68	0.021		1.14	0.41	0.011		1.26	0.64	0.019		1.27	0.66	0.019		1.25	0.62	0.018	
05:00	1.25	0.63	0.018		1.20	0.54	0.015		1.30	0.71	0.022		1.28	0.69	0.021		1.28	0.67	0.020		1.27	0.65	0.020		1.23	0.61	0.018	
06:00	1.37	0.86	0.030		1.31	0.75	0.025		1.40	1.04	0.038		1.48	1.04	0.041		1.50	1.09	0.042		1.38	1.04	0.034		1.28	0.73	0.022	
07:00	1.66	1.55	0.069		1.64	1.46	0.063		1.72	1.56	0.073		1.71	1.54	0.071		1.70	1.42	0.065		1.54	1.34	0.053		1.70	1.57	0.070	
08:00	1.95	1.84	0.101		1.88	1.79	0.093		1.96	1.69	0.093		1.92	1.75	0.094		1.95	1.86	0.102		1.71	1.41	0.064		1.87	1.43	0.073	
09:00	2.01	1.74	0.099		2.00	1.73	0.099		2.01	1.75	0.100		2.04	1.92	0.112		1.98	1.77	0.100		1.76	1.38	0.065		1.83	1.40	0.070	
10:00	2.07	1.83	0.110		2.02	1.81	0.104		2.04	1.79	0.104		2.03	1.89	0.110		1.94	1.44	0.079		1.77	1.25	0.060		1.87	1.40	0.073	
11:00	1.98	1.67	0.094		1.92	1.80	0.096		2.02	1.66	0.096		1.96	1.68	0.093		1.80	1.31	0.064		1.76	1.22	0.058		1.82	1.27	0.063	
12:00	1.89	1.52	0.079		1.84	1.57	0.080		1.91	1.60	0.086		1.82	1.61	0.080		1.69	1.24	0.055		1.80	1.35	0.066		1.72	1.48	0.067	
13:00	1.87	1.52	0.079		1.83	1.45	0.073		1.82	1.40	0.069		1.75	1.62	0.076		1.57	1.19	0.048		1.61	1.31	0.054		1.71	1.42	0.064	
14:00	1.84	1.55	0.078		1.72	1.24	0.057		1.66	1.20	0.052		1.72	1.49	0.069		1.40	1.13	0.039		1.57	1.40	0.056		1.67	1.40	0.062	
15:00	1.65	1.30	0.057		1.71	1.11	0.051		1.55	1.08	0.042		1.63	1.29	0.055		1.41	0.92	0.032		1.62	1.39	0.059		1.50	1.07	0.040	
16:00	1.63	1.28	0.054		1.70	1.09	0.050		1.53	1.05	0.041		1.62	1.22	0.051		1.37	1.04	0.035		1.53	1.25	0.048		1.53	1.38	0.053	
17:00	1.76	1.43	0.067		1.59	1.16	0.047		1.55	1.16	0.046		1.68	1.15	0.051		1.57	1.40	0.056		1.49	1.20	0.045		1.46	1.27	0.046	
18:00	1.57	1.30	0.052		1.73	1.38	0.064		1.63	1.33	0.057		1.68	1.30	0.057		1.63	1.42	0.060		1.68	1.37	0.061		1.60	1.43	0.059	
19:00	1.62	1.37	0.058		1.63	1.18	0.050		1.76	1.52	0.073		1.64	1.32	0.056		1.66	1.50	0.065		1.72	1.35	0.061		1.62	1.53	0.064	
20:00	1.63	1.25	0.053		1.60	1.34	0.055		1.66	1.34	0.059		1.66	1.40	0.061		1.59	1.43	0.058		1.61	1.38	0.058		1.63	1.41	0.059	
21:00	1.60	1.19	0.049		1.58	1.29	0.052		1.56	1.13	0.045		1.59	1.25	0.051		1.54	1.32	0.052		1.50	1.15	0.044		1.56	1.40	0.056	
22:00	1.60	1.28	0.053		1.51	1.18	0.045		1.59	1.27	0.052		1.64	1.22	0.052		1.54	1.26	0.049		1.65	1.37	0.059		1.50	1.23	0.046	
23:00	1.57	1.31	0.052		1.55	1.19	0.046		1.53	1.08	0.041		1.50	1.19	0.045		1.43	1.06	0.037		1.56	1.20	0.048		1.43	1.10	0.038	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.056				0.053				0.054				0.055				0.049				0.046				0.048	
Avg	1.62	1.23	0.056		1.60	1.18	0.053		1.61	1.20	0.054		1.60	1.22	0.055		1.54	1.17	0.049		1.54	1.14	0.046		1.54	1.17	0.048	
Time	04:15	04:15	04:15		06:10	05:35	05:35		06:25	06:25	06:25		01:35	01:35	01:35		00:25	05:30	05:30		05:50	05:50	05:50		05:55	01:10	01:10	
Min	1.05	0.25	0.006		0.91	0.18	0.004		1.05	0.23	0.005		1.00	0.15	0.003		1.15	0.46	0.012		1.05	0.25	0.006		0.95	0.24	0.005	
Time	10:30	10:30	10:30		10:05	08:55	09:05		10:25	07:35	08:05		09:20	09:10	10:35		09:05	08:00	08:00		11:55	09:15	08:20		10:45	07:05	10:45	
Max	2.40	2.37	0.175		2.11	2.02	0.119		2.19	2.05	0.119		2.14	2.05	0.124		2.11	2.09	0.124		2.04	1.65	0.091		2.12	1.85	0.096	

	D	V	Q	Rain
Total			0.361	
Avg	1.58	1.19	0.052	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	1.34	0.95	0.030		1.34	0.78	0.025	
01:00	1.10	0.40	0.010		1.10	0.42	0.010	
02:00	1.24	0.61	0.017		1.05	0.24	0.005	
03:00	1.23	0.58	0.016		1.03	0.20	0.004	
04:00	1.19	0.52	0.014		1.04	0.22	0.005	
05:00	1.16	0.46	0.012		1.11	0.39	0.010	
06:00	1.22	0.68	0.021		1.27	1.05	0.031	
07:00	1.53	1.41	0.055		1.57	1.34	0.055	
08:00	1.82	1.54	0.077		1.82	1.43	0.071	
09:00	1.78	1.40	0.067		1.94	1.55	0.085	
10:00	1.77	1.31	0.062		1.77	1.40	0.067	
11:00	1.83	1.40	0.070		1.79	1.30	0.063	
12:00	1.83	1.47	0.074		1.73	1.29	0.059	
13:00	1.76	1.27	0.060		1.76	1.31	0.062	
14:00	1.71	1.35	0.061		1.71	1.43	0.065	
15:00	1.69	1.31	0.059		1.70	1.47	0.066	
16:00	1.65	1.41	0.061		1.73	1.45	0.067	
17:00	1.57	1.33	0.053		1.63	1.35	0.057	
18:00	1.72	1.42	0.066		1.61	1.25	0.053	
19:00	1.70	1.45	0.065		1.69	1.41	0.063	
20:00	1.76	1.46	0.069		1.57	1.35	0.054	
21:00	1.61	1.40	0.058		1.64	1.36	0.058	
22:00	1.55	1.28	0.051		1.61	1.22	0.051	
23:00	1.48	0.95	0.035		1.40	0.91	0.031	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.048				0.047	
Avg	1.55	1.14	0.048		1.53	1.09	0.047	
Time	06:25	05:50	05:50		01:20	03:55	03:55	
Min	0.82	0.14	0.003		0.92	0.13	0.003	
Time	12:45	12:45	12:45		09:30	10:00	09:25	
Max	2.15	1.82	0.114		2.11	1.92	0.109	

	D	V	Q	Rain
Total			0.095	
Avg	1.54	1.11	0.048	

Site Commentary

Site Information

5D-28	
Pipe Dimensions	8 "
Silt Level	0.00"

Overview

Site 5D-28 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 29.5% full at its recorded peak of 2.36 inches and approximately 10.6% full during its recorded average depth of 0.85 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.85	1.88	0.025
Minimum	0.39	0.61	0.006
Maximum	2.36	5.67	0.245
Time of Minimum	5/6/2014 11:25 PM	3/25/2014 3:35 AM	5/6/2014 11:25 PM
Time of Maximum	5/8/2014 8:30 AM	3/8/2014 8:20 AM	2/28/2014 12:00 PM

Data Quality

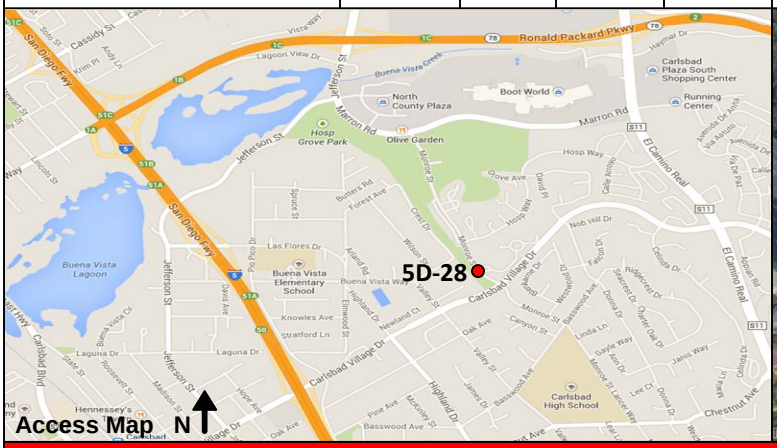
Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad Temp 2014	**City / State:** Carlsbad, CA			**Date Installed:** 2/21/14	**FM Initials:** JG
Site Name: 5D-28	**Monitor Series:** 3600			**Monitor S/N:**	2832
Address / Location: 2004 Avenue of the Trees				**Manhole #:**	5D-28
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 8.00"
					Pipe Width: 8.00"
					IP Address: N/A



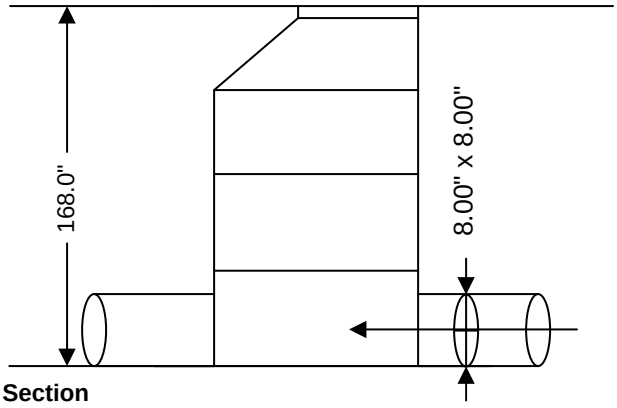
Investigation Information:

Date/Time of Investigation:	2/21/14 @ 11:00 a.m.
Site Hydraulics: Low depth with moderate velocity	
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	0.88" +/- .25
Range (Air Dof):	+/-
Peak Velocity:	2.30 Fps
Silt:	0.00" Inches

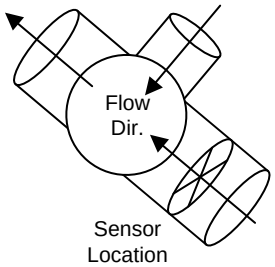
Manhole Information:

Manhole Depth:	168.0"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard installation	**Trunk**	[ ]	[ ]		
Sensors/ Devices: Ultrasonic Sensor / Velocity Sensor	**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge **Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: RG 1	**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

5D-28

Flow Monitor

5D-28

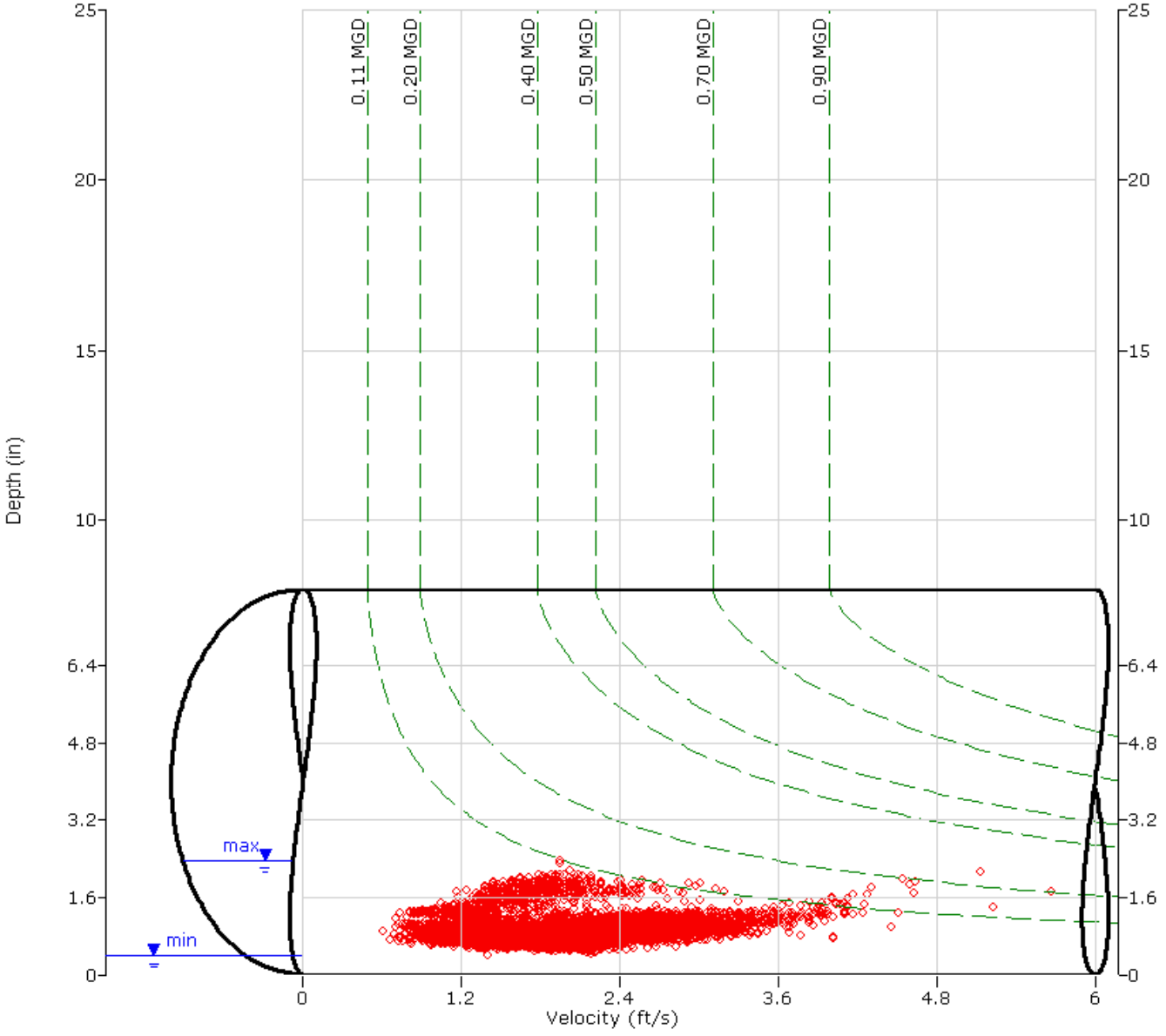
Pipe Height
8.00 in

Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



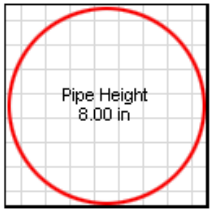
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

5D-28

Flow Monitor

5D-28

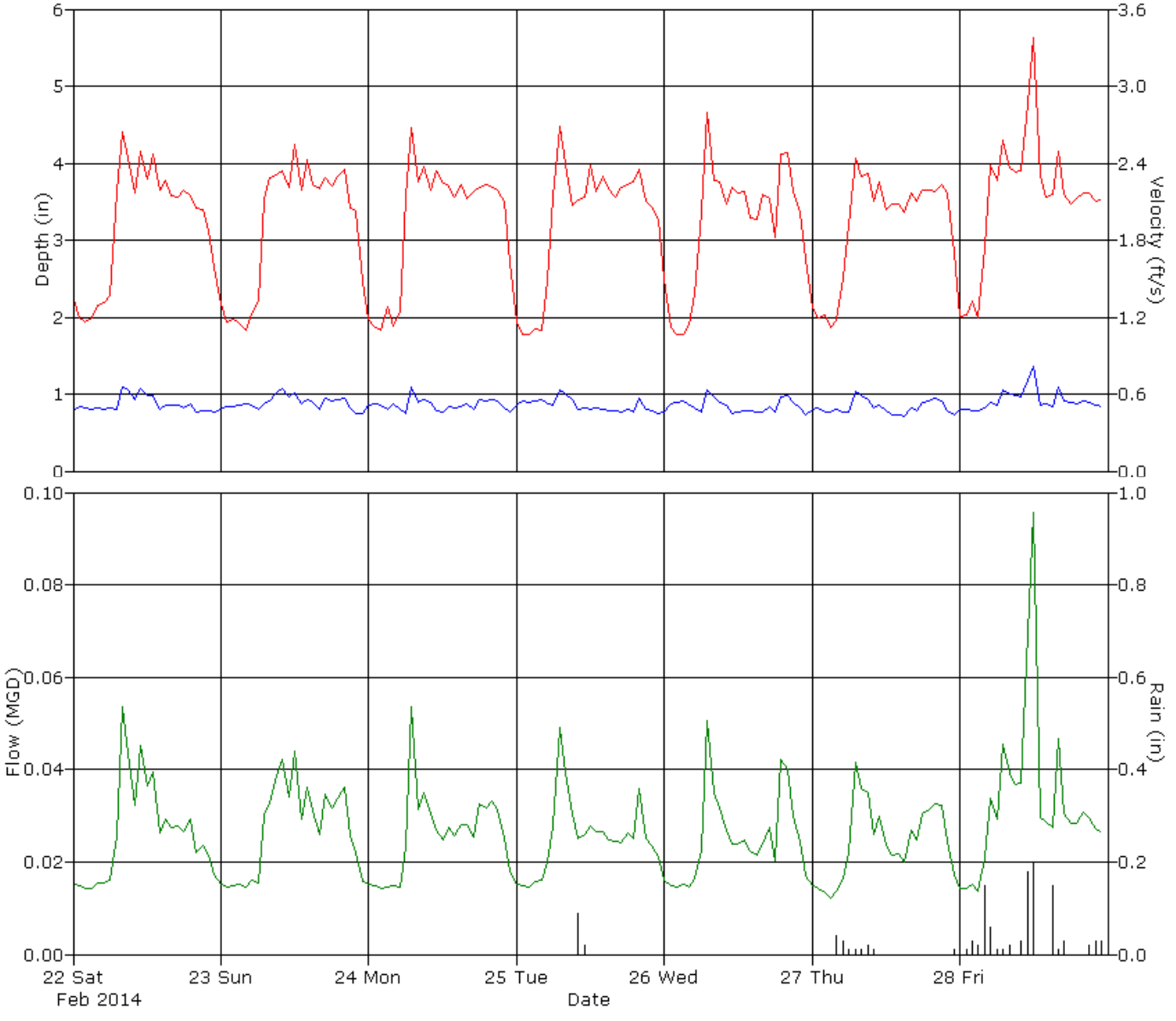


Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



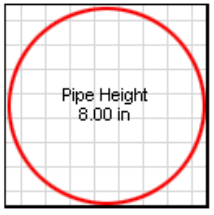
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

5D-28

Flow Monitor

5D-28

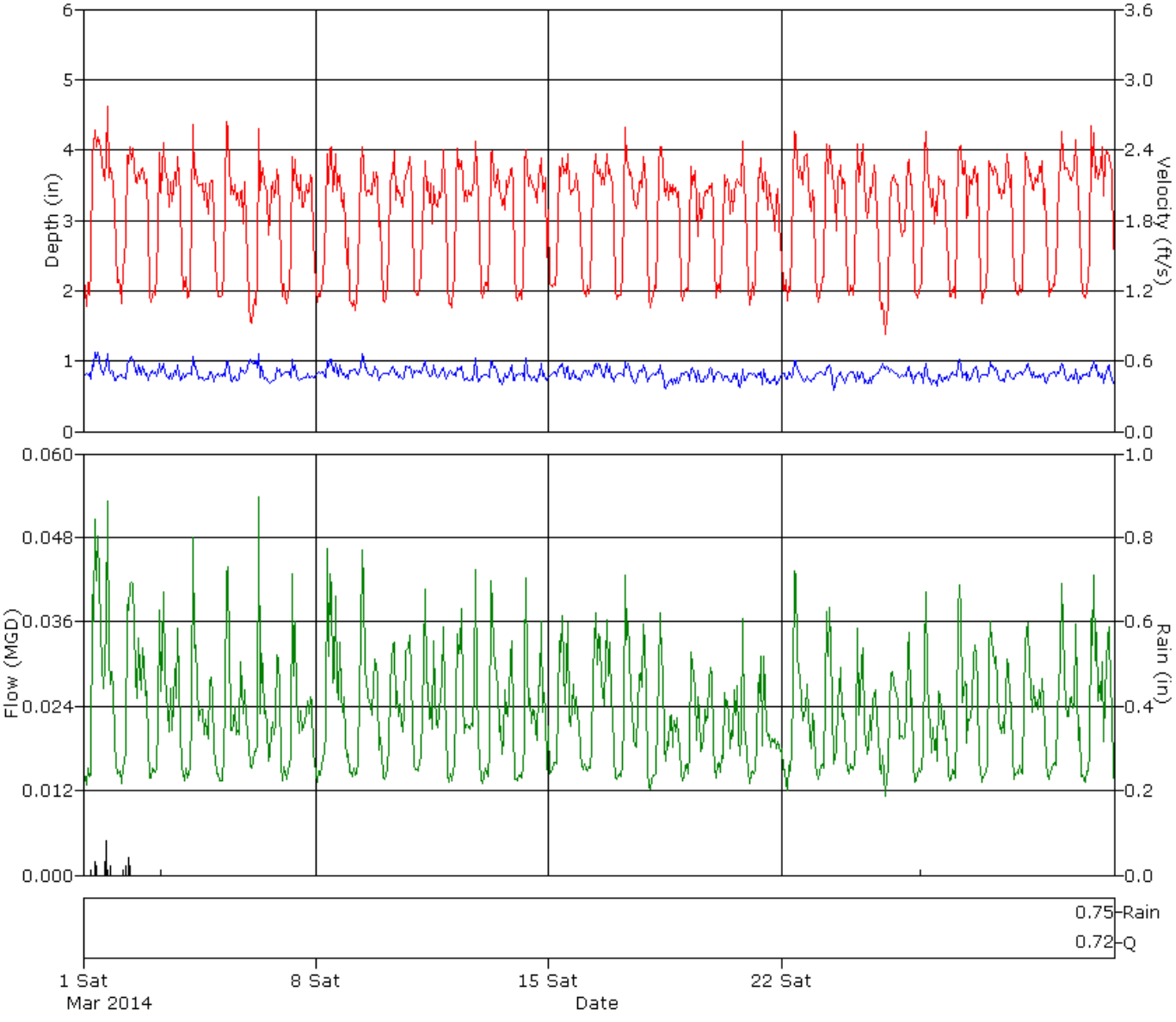


Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



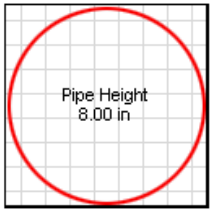
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

5D-28

Flow Monitor

5D-28

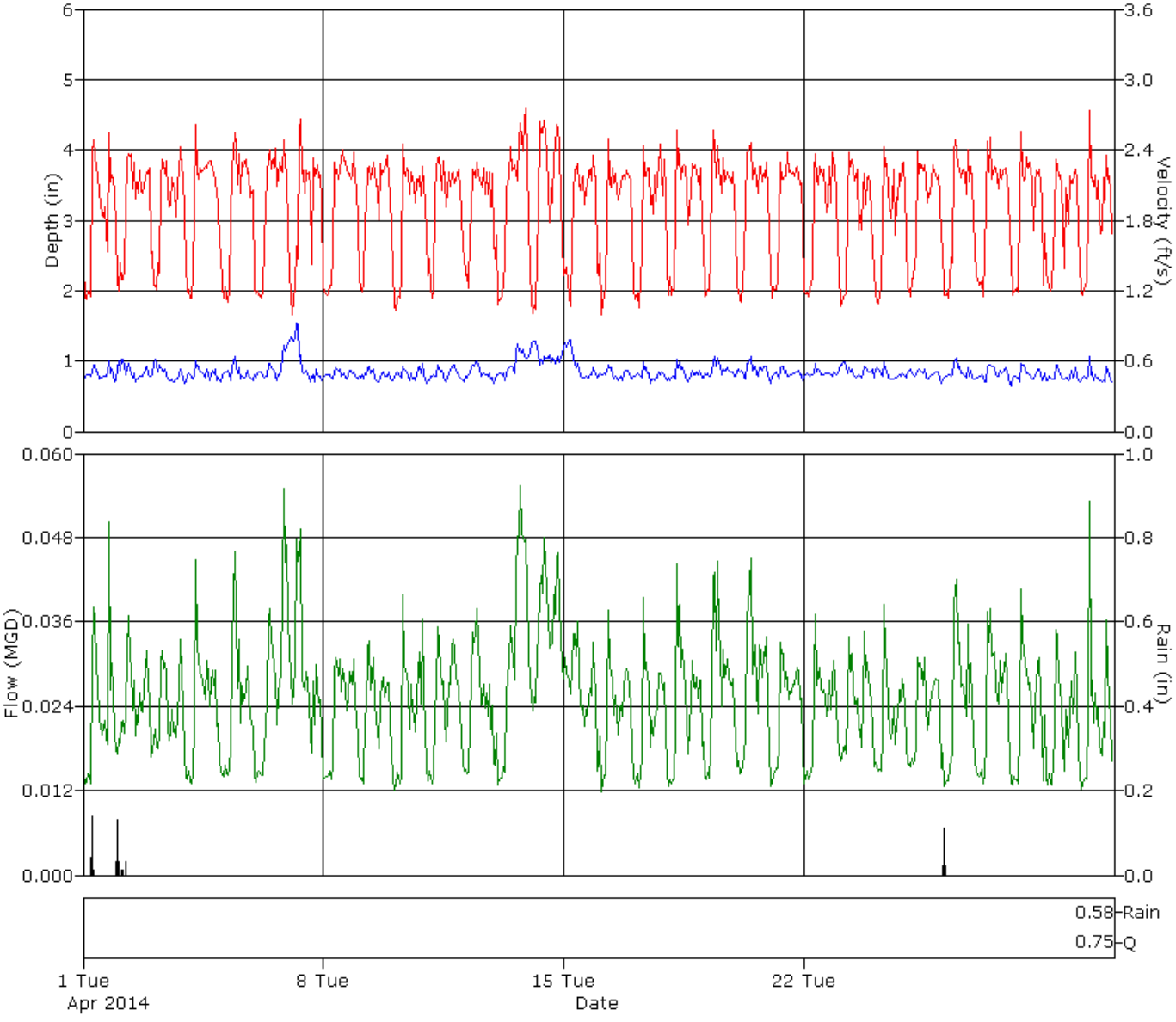


Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

5D-28

Flow Monitor

5D-28

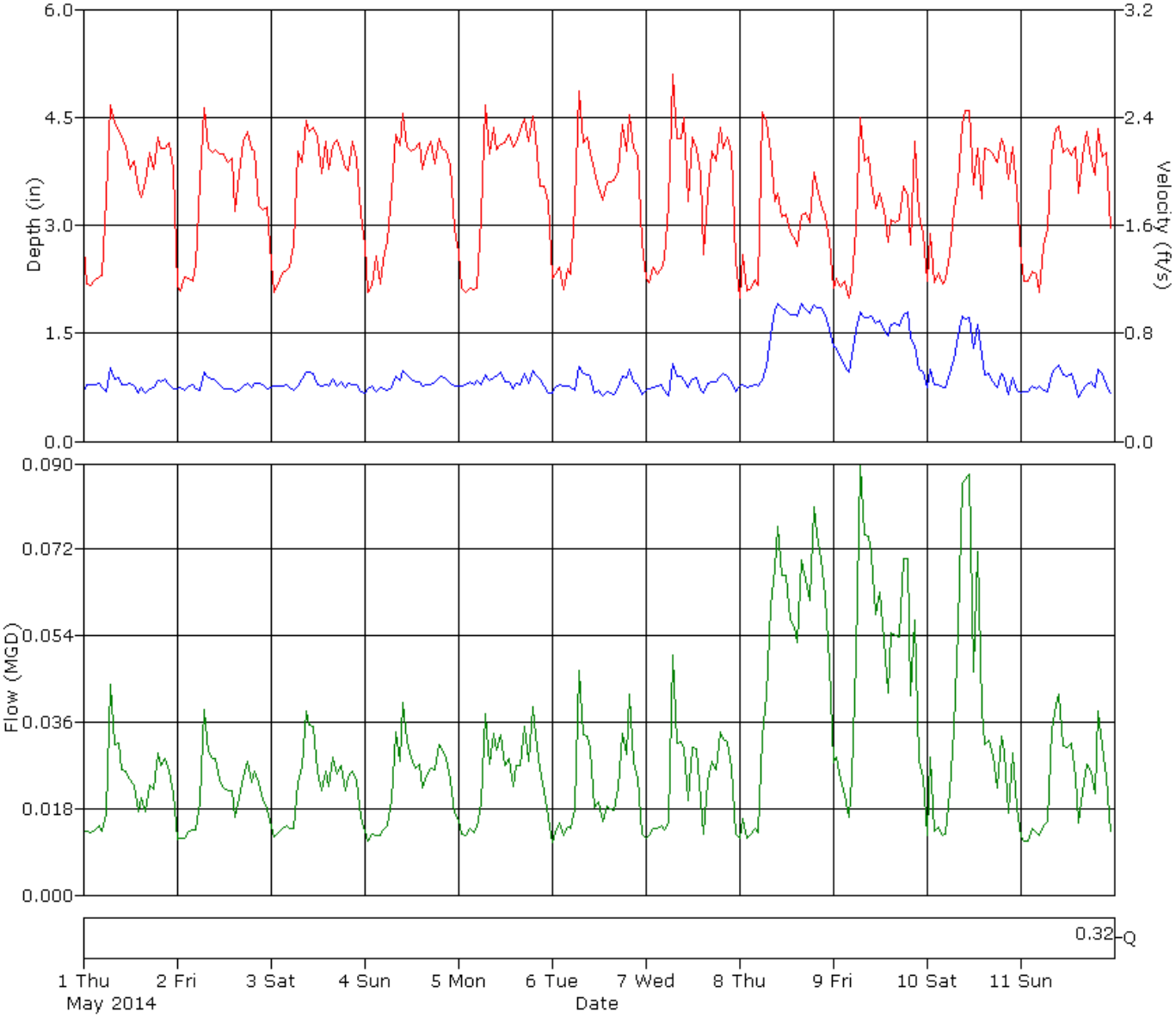
Pipe Height
8.00 in

Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

5D-28, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	06:50	0.59	08:15	1.69	0.86	02:30	0.96	08:15	4.63	1.92	02:35	0.012	08:15	0.160	0.026	0.026	
2/23/2014	06:05	0.60	12:30	1.37	0.89	04:00	0.91	07:30	3.84	1.92	04:35	0.012	12:30	0.090	0.027	0.027	
2/24/2014	05:45	0.60	07:15	1.47	0.86	00:55	0.98	07:10	4.26	1.95	04:55	0.012	07:10	0.121	0.026	0.026	
2/25/2014	23:50	0.69	07:35	1.29	0.85	01:40	0.94	07:35	4.11	1.95	00:05	0.013	07:35	0.097	0.025	0.025	0.11
2/26/2014	14:35	0.65	19:10	1.43	0.84	03:05	0.94	07:10	4.24	1.92	23:25	0.012	19:10	0.113	0.025	0.025	
2/27/2014	00:50	0.61	07:15	1.16	0.83	03:15	0.94	09:15	3.69	1.91	03:15	0.010	09:15	0.068	0.024	0.024	0.14
2/28/2014	00:20	0.68	12:00	2.11	0.92	00:40	0.98	12:00	5.13	2.13	00:40	0.011	12:00	0.245	0.033	0.033	1.01
3/1/2014	06:20	0.62	18:05	1.31	0.89	05:25	0.94	12:35	3.72	2.04	05:50	0.010	18:05	0.082	0.029	0.029	0.64
3/2/2014	05:20	0.64	08:40	1.29	0.86	04:35	0.88	08:40	3.97	1.93	04:35	0.010	08:40	0.094	0.026	0.026	0.09
3/3/2014	22:45	0.63	10:05	1.28	0.83	01:40	0.91	12:25	3.15	1.87	22:45	0.012	10:05	0.069	0.024	0.024	0.01
3/4/2014	15:40	0.61	07:20	1.32	0.81	02:00	0.98	07:20	3.57	1.84	02:00	0.010	07:20	0.087	0.022	0.022	
3/5/2014	06:10	0.63	08:10	1.16	0.82	03:40	0.94	08:10	3.74	1.84	03:40	0.011	08:10	0.075	0.023	0.023	
3/6/2014	16:10	0.61	07:20	1.64	0.85	04:20	0.71	07:20	4.17	1.76	04:20	0.011	07:20	0.139	0.023	0.023	
3/7/2014	06:25	0.62	07:05	1.66	0.80	02:05	0.94	07:05	4.27	1.80	01:20	0.012	07:05	0.144	0.022	0.022	
3/8/2014	23:00	0.62	08:20	1.72	0.86	05:10	0.84	08:20	5.67	1.81	05:10	0.011	08:20	0.203	0.025	0.025	
3/9/2014	22:25	0.64	09:05	1.23	0.87	04:50	0.84	07:50	3.77	1.80	04:50	0.011	07:50	0.080	0.024	0.024	
3/10/2014	15:00	0.67	08:30	1.15	0.84	03:10	0.84	09:40	3.70	1.87	03:10	0.011	09:40	0.069	0.024	0.024	
3/11/2014	16:45	0.68	13:20	1.67	0.84	02:40	0.94	20:35	4.46	1.83	23:50	0.012	07:15	0.114	0.024	0.024	
3/12/2014	03:30	0.63	09:25	1.61	0.81	00:30	0.91	09:25	4.01	1.87	00:15	0.011	09:25	0.130	0.023	0.023	
3/13/2014	14:35	0.61	06:15	1.47	0.81	04:30	0.98	06:15	3.94	1.89	00:55	0.010	06:15	0.113	0.023	0.023	
3/14/2014	17:20	0.62	08:10	1.15	0.80	01:55	0.94	19:15	3.32	1.87	04:50	0.012	19:15	0.061	0.023	0.023	
3/15/2014	06:35	0.65	14:35	1.28	0.82	01:25	1.01	08:55	3.95	1.89	01:25	0.011	14:35	0.087	0.023	0.023	
3/16/2014	23:40	0.64	08:30	1.16	0.85	03:05	1.01	08:30	3.37	1.88	00:45	0.013	08:30	0.068	0.025	0.025	
3/17/2014	23:55	0.60	21:20	1.26	0.83	04:20	0.98	07:25	3.26	1.88	03:20	0.012	21:20	0.068	0.024	0.024	
3/18/2014	20:55	0.50	10:20	1.21	0.76	00:40	0.86	10:20	3.33	1.85	00:40	0.010	10:20	0.071	0.020	0.020	
3/19/2014	02:10	0.58	12:50	1.52	0.80	01:00	0.88	12:50	3.30	1.79	01:00	0.011	12:50	0.098	0.022	0.022	
3/20/2014	18:55	0.45	20:35	1.40	0.76	01:30	1.01	20:35	4.12	1.85	11:05	0.011	20:35	0.109	0.020	0.020	
3/21/2014	20:55	0.50	11:35	1.53	0.77	03:10	0.91	09:10	3.18	1.79	03:10	0.011	11:35	0.091	0.020	0.020	
3/22/2014	21:30	0.43	08:45	1.27	0.80	04:00	0.66	10:00	3.47	1.90	04:00	0.006	09:00	0.076	0.023	0.023	
3/23/2014	14:15	0.45	09:50	1.36	0.80	01:35	0.94	09:50	3.90	1.83	14:15	0.011	09:50	0.099	0.022	0.022	
3/24/2014	09:20	0.52	07:35	1.39	0.78	01:05	0.96	07:30	3.85	1.84	01:05	0.012	07:35	0.094	0.021	0.021	
3/25/2014	18:50	0.60	08:10	1.09	0.84	03:35	0.61	09:30	3.20	1.75	03:35	0.008	08:10	0.047	0.022	0.022	
3/26/2014	10:30	0.60	08:00	1.11	0.77	23:10	0.93	08:10	3.69	1.84	23:15	0.010	08:10	0.057	0.021	0.021	0.01
3/27/2014	14:45	0.59	07:50	1.15	0.82	05:00	0.98	07:55	3.69	1.90	01:30	0.011	07:55	0.071	0.024	0.024	
3/28/2014	05:50	0.60	06:25	1.15	0.81	01:50	0.98	06:50	3.52	1.92	03:05	0.012	06:50	0.069	0.024	0.024	
3/29/2014	23:25	0.61	21:45	1.17	0.81	03:20	1.01	07:45	3.84	1.87	07:15	0.011	07:45	0.076	0.023	0.023	
3/30/2014	22:45	0.60	20:25	1.21	0.81	06:20	0.93	20:25	3.57	1.92	01:30	0.011	20:25	0.076	0.023	0.023	
3/31/2014	05:15	0.59	09:05	1.19	0.82	00:15	0.89	07:25	4.02	1.97	00:15	0.009	09:35	0.063	0.025	0.025	
4/1/2014	22:35	0.53	18:40	1.97	0.82	02:35	1.01	18:40	4.54	1.85	04:25	0.011	18:40	0.196	0.023	0.023	0.22
4/2/2014	15:10	0.61	01:40	1.40	0.85	01:35	0.71	08:10	3.52	1.93	01:35	0.014	08:10	0.062	0.025	0.025	0.21
4/3/2014	21:05	0.55	21:10	1.12	0.82	04:10	0.91	06:50	3.33	1.93	21:05	0.012	06:55	0.054	0.023	0.023	
4/4/2014	05:25	0.59	07:10	1.29	0.82	04:20	0.98	07:15	3.69	1.94	22:20	0.012	07:15	0.086	0.024	0.024	
4/5/2014	21:20	0.60	10:00	1.14	0.83	02:00	0.94	11:15	3.87	1.92	21:20	0.010	09:40	0.070	0.024	0.024	
4/6/2014	15:05	0.61	19:45	1.44	0.91	05:00	0.94	10:35	3.58	1.90	01:50	0.011	22:15	0.074	0.028	0.028	
4/7/2014	15:00	0.56	06:10	1.68	0.99	02:55	0.81	07:30	3.37	1.92	16:35	0.011	08:30	0.064	0.029	0.029	
4/8/2014	15:15	0.63	21:45	1.07	0.81	02:45	0.93	21:45	3.42	1.95	02:45	0.010	21:45	0.062	0.024	0.024	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014	05:15	0.59	07:25	1.08	0.80	04:15	0.74	08:05	3.64	1.96	04:15	0.008	08:05	0.065	0.023	0.023	
4/10/2014	23:55	0.55	07:25	1.38	0.82	03:25	0.91	07:25	5.23	1.86	00:55	0.010	07:25	0.136	0.023	0.023	
4/11/2014	15:05	0.61	07:50	1.10	0.82	04:30	0.94	08:45	3.30	1.96	04:35	0.011	08:45	0.056	0.024	0.024	
4/12/2014	04:25	0.58	07:25	1.29	0.82	05:10	1.08	08:35	3.35	1.93	04:25	0.009	09:50	0.063	0.024	0.024	
4/13/2014	00:15	0.58	18:55	1.42	0.95	02:40	0.94	10:15	3.30	1.98	00:25	0.011	17:15	0.073	0.032	0.032	
4/14/2014	07:50	0.72	05:25	1.33	1.09	02:35	0.74	16:15	3.28	2.01	02:35	0.017	10:15	0.064	0.035	0.035	
4/15/2014	15:20	0.66	04:55	1.34	0.94	05:00	0.88	05:35	3.52	1.92	23:35	0.011	09:20	0.063	0.027	0.027	
4/16/2014	14:30	0.57	15:05	1.14	0.81	03:00	0.81	06:50	3.11	1.89	03:00	0.009	01:05	0.055	0.023	0.023	
4/17/2014	14:10	0.54	07:00	1.21	0.80	02:55	0.88	07:00	3.57	1.88	01:15	0.010	07:00	0.077	0.023	0.023	
4/18/2014	06:15	0.63	09:50	1.27	0.82	03:25	1.01	07:35	3.37	1.95	02:00	0.011	07:35	0.072	0.025	0.025	
4/19/2014	01:45	0.60	11:15	1.47	0.87	01:00	1.01	11:15	3.69	1.97	01:00	0.012	11:15	0.105	0.027	0.027	
4/20/2014	06:30	0.62	10:30	1.25	0.87	03:05	0.98	09:55	3.84	1.92	06:00	0.012	09:55	0.079	0.026	0.026	
4/21/2014	23:05	0.57	07:15	1.26	0.82	01:10	0.98	07:15	4.11	1.92	00:05	0.010	07:15	0.093	0.024	0.024	
4/22/2014	00:15	0.56	20:40	1.24	0.82	04:35	0.72	06:40	4.02	1.90	04:35	0.008	20:40	0.066	0.024	0.024	
4/23/2014	18:20	0.60	18:45	1.55	0.86	01:15	0.89	18:30	3.64	1.84	19:20	0.013	18:30	0.099	0.024	0.024	
4/24/2014	23:00	0.60	07:30	1.12	0.81	03:00	0.91	07:30	3.08	1.84	05:55	0.012	07:30	0.059	0.022	0.022	
4/25/2014	04:20	0.61	16:50	1.09	0.82	02:10	1.04	12:30	3.28	1.90	04:20	0.010	12:30	0.054	0.023	0.023	
4/26/2014	00:40	0.57	08:05	1.25	0.83	03:45	0.91	18:15	4.17	1.89	04:35	0.011	18:15	0.094	0.024	0.024	0.15
4/27/2014	23:50	0.58	08:15	1.15	0.82	01:40	0.94	08:15	3.64	1.92	05:05	0.010	08:15	0.073	0.024	0.024	
4/28/2014	06:45	0.53	07:35	1.23	0.81	01:10	0.94	07:30	3.70	1.90	16:25	0.009	07:30	0.079	0.023	0.023	
4/29/2014	15:20	0.61	21:35	1.18	0.79	05:30	0.98	10:55	2.89	1.86	04:35	0.010	21:35	0.054	0.022	0.022	
4/30/2014	13:30	0.58	07:00	1.56	0.78	02:30	0.94	07:00	4.12	1.86	05:00	0.011	07:00	0.128	0.022	0.022	
5/1/2014	14:15	0.53	07:05	1.27	0.78	02:35	0.94	07:05	4.51	1.89	14:15	0.009	07:05	0.104	0.022	0.022	
5/2/2014	12:55	0.54	21:50	1.36	0.77	03:20	0.96	07:20	3.48	1.84	22:30	0.009	21:50	0.078	0.021	0.021	
5/3/2014	23:35	0.60	09:35	1.25	0.80	01:50	0.98	11:00	3.37	1.88	23:35	0.010	09:35	0.067	0.023	0.023	
5/4/2014	05:25	0.57	10:30	1.24	0.81	03:05	0.81	08:30	4.02	1.88	03:05	0.008	08:30	0.083	0.023	0.023	
5/5/2014	22:45	0.55	19:10	1.26	0.83	02:50	0.88	19:10	3.87	1.92	02:50	0.010	19:10	0.088	0.025	0.025	
5/6/2014	23:25	0.39	20:40	1.27	0.79	03:35	0.98	20:35	4.11	1.85	23:25	0.006	20:35	0.095	0.022	0.022	
5/7/2014	23:55	0.50	07:10	1.27	0.81	01:30	0.98	07:10	3.92	1.86	15:20	0.009	07:10	0.090	0.024	0.024	
5/8/2014	02:00	0.58	08:30	2.36	1.46	01:45	0.72	06:40	3.69	1.63	01:45	0.007	19:00	0.110	0.050	0.050	
5/9/2014	23:50	0.80	19:15	2.02	1.46	00:15	0.88	21:10	3.32	1.64	03:55	0.013	21:05	0.117	0.049	0.049	
5/10/2014	21:50	0.53	09:00	1.90	1.05	03:55	0.94	17:40	3.57	1.86	06:00	0.009	10:55	0.121	0.036	0.036	
5/11/2014	15:35	0.47	08:10	1.29	0.81	05:15	0.88	08:10	3.92	1.84	04:30	0.007	08:10	0.092	0.023	0.023	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			1.966	2.59
Avg	0.85	1.88	0.025	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.79	1.33	0.015		0.80	1.31	0.015		0.85	1.19	0.015		0.86	1.16	0.015		0.76	1.50	0.016		0.81	1.27	0.015		0.80	1.21	0.014	0.02
01:00	0.83	1.20	0.015		0.84	1.16	0.015		0.87	1.12	0.015		0.90	1.07	0.015		0.86	1.12	0.015		0.81	1.19	0.014		0.81	1.21	0.014	0.01
02:00	0.83	1.16	0.014		0.84	1.19	0.015		0.86	1.09	0.014		0.90	1.06	0.015		0.89	1.06	0.015		0.76	1.22	0.013		0.79	1.32	0.015	0.03
03:00	0.81	1.20	0.014		0.86	1.15	0.015		0.80	1.29	0.015		0.91	1.11	0.016		0.91	1.07	0.015		0.77	1.11	0.012		0.78	1.20	0.014	0.02
04:00	0.81	1.30	0.016		0.87	1.10	0.015		0.87	1.13	0.015		0.93	1.10	0.016		0.85	1.14	0.015		0.79	1.17	0.014	0.04	0.81	1.75	0.021	0.15
05:00	0.80	1.32	0.015		0.86	1.23	0.016		0.80	1.25	0.015		0.88	1.48	0.020		0.83	1.37	0.016		0.77	1.51	0.016	0.03	0.90	2.38	0.034	0.06
06:00	0.82	1.36	0.016		0.81	1.33	0.016		0.75	2.13	0.023		0.86	2.14	0.028		0.77	2.01	0.023		0.77	1.92	0.022	0.01	0.85	2.27	0.029	0.01
07:00	0.80	2.18	0.026		0.88	2.11	0.030		1.09	2.68	0.054		1.05	2.69	0.049		1.06	2.80	0.051		1.03	2.44	0.042	0.01	1.05	2.58	0.045	0.01
08:00	1.09	2.65	0.054		0.91	2.28	0.033		0.90	2.25	0.031		0.99	2.39	0.039		0.96	2.27	0.035		0.97	2.30	0.036	0.01	1.00	2.36	0.039	0.02
09:00	1.05	2.44	0.044		1.02	2.30	0.039		0.93	2.37	0.035		0.93	2.07	0.030		0.90	2.26	0.032		0.93	2.32	0.035	0.02	0.98	2.34	0.037	
10:00	0.93	2.17	0.032		1.07	2.34	0.042		0.89	2.19	0.030		0.81	2.11	0.025	0.09	0.85	2.08	0.027		0.82	2.10	0.026	0.01	0.97	2.34	0.037	0.03
11:00	1.07	2.49	0.045		0.96	2.21	0.034		0.79	2.34	0.027		0.82	2.14	0.026	0.02	0.76	2.21	0.024		0.85	2.25	0.030		1.19	2.86	0.069	0.18
12:00	0.99	2.28	0.037		1.01	2.54	0.044		0.77	2.24	0.025		0.80	2.39	0.028		0.77	2.17	0.024		0.78	2.04	0.024		1.36	3.38	0.096	0.20
13:00	0.98	2.47	0.039		0.87	2.19	0.029		0.83	2.22	0.028		0.82	2.18	0.027		0.78	2.18	0.025		0.73	2.08	0.022		0.85	2.30	0.030	
14:00	0.81	2.19	0.026		0.94	2.42	0.036		0.81	2.13	0.026		0.79	2.30	0.027		0.78	1.97	0.022		0.74	2.09	0.022		0.88	2.13	0.029	
15:00	0.85	2.26	0.029		0.90	2.24	0.031		0.84	2.24	0.028		0.78	2.20	0.025		0.77	1.96	0.022		0.71	2.02	0.020		0.84	2.16	0.027	0.15
16:00	0.85	2.14	0.028		0.80	2.19	0.026		0.87	2.12	0.028		0.78	2.14	0.025		0.77	2.16	0.024		0.82	2.17	0.027		1.09	2.49	0.047	0.01
17:00	0.86	2.13	0.028		0.94	2.28	0.035		0.80	2.18	0.026		0.76	2.21	0.024		0.85	2.13	0.027		0.79	2.10	0.025		0.91	2.15	0.031	0.03
18:00	0.82	2.19	0.027		0.90	2.23	0.032		0.93	2.21	0.033		0.80	2.23	0.026		0.77	1.82	0.020		0.90	2.19	0.031		0.89	2.08	0.028	
19:00	0.88	2.15	0.029		0.93	2.30	0.034		0.91	2.23	0.032		0.77	2.25	0.025		0.96	2.47	0.042		0.91	2.19	0.031		0.87	2.13	0.028	
20:00	0.76	2.04	0.022		0.95	2.35	0.036		0.94	2.21	0.033		0.95	2.36	0.036		0.99	2.48	0.040		0.95	2.18	0.033		0.91	2.17	0.031	
21:00	0.79	2.04	0.023		0.83	2.05	0.026		0.91	2.19	0.031		0.81	2.10	0.025		0.89	2.17	0.030		0.92	2.23	0.032		0.88	2.16	0.029	0.02
22:00	0.79	1.87	0.022		0.76	2.03	0.022		0.81	2.11	0.025		0.78	2.06	0.023		0.81	2.02	0.025		0.78	2.16	0.024		0.85	2.10	0.027	0.03
23:00	0.77	1.59	0.017		0.76	1.48	0.016		0.77	1.63	0.018		0.75	1.96	0.021		0.73	1.65	0.017		0.73	1.70	0.017	0.01	0.83	2.11	0.026	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.026				0.027				0.026				0.025	0.11			0.025				0.024	0.14			0.033	1.01
Avg	0.86	1.92	0.026		0.89	1.92	0.027		0.86	1.95	0.026		0.85	1.95	0.025		0.84	1.92	0.025		0.83	1.91	0.024		0.92	2.13	0.033	
Time	06:50	02:30	02:35		06:05	04:00	04:35		05:45	00:55	04:55		23:50	01:40	00:05		14:35	03:05	23:25		00:50	03:15	03:15		00:20	00:40	00:40	
Min	0.59	0.96	0.012		0.60	0.91	0.012		0.60	0.98	0.012		0.69	0.94	0.013		0.65	0.94	0.012		0.61	0.94	0.010		0.68	0.98	0.011	
Time	08:15	08:15	08:15		12:30	07:30	12:30		07:15	07:10	07:10		07:35	07:35	07:35		19:10	07:10	19:10		07:15	09:15	09:15		12:00	12:00	12:00	
Max	1.69	4.63	0.160		1.37	3.84	0.090		1.47	4.26	0.121		1.29	4.11	0.097		1.43	4.24	0.113		1.16	3.69	0.068		2.11	5.13	0.245	

	D	V	Q	Rain
Total			0.187	1.26
Avg	0.86	1.96	0.027	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.74	2.01	0.021	0.32	0.73	1.55	0.016		0.81	1.16	0.014		0.82	1.20	0.015		0.80	1.25	0.014		1.01	1.10	0.018		0.80	1.15	0.013	
01:00	0.76	1.31	0.014	0.12	0.78	1.27	0.014		0.83	1.11	0.014		0.76	1.24	0.013		0.83	1.15	0.014		1.02	0.93	0.016		0.82	1.26	0.015	
02:00	0.80	1.21	0.014		0.78	1.29	0.015		0.86	1.15	0.015		0.79	1.32	0.015		0.79	1.15	0.013		1.01	0.93	0.015		0.84	1.16	0.015	
03:00	0.81	1.07	0.013		0.81	1.25	0.015		0.83	1.20	0.015		0.82	1.14	0.014		0.80	1.15	0.013		0.97	1.04	0.016		0.84	1.09	0.014	
04:00	0.81	1.27	0.015		0.81	1.09	0.013		0.84	1.16	0.015		0.83	1.15	0.014		0.79	1.17	0.013		0.97	1.12	0.018		0.85	1.17	0.015	
05:00	0.82	1.16	0.014		0.77	1.40	0.015	0.01	0.79	1.34	0.015		0.82	1.25	0.015		0.83	1.38	0.017		1.00	1.08	0.018		0.85	1.21	0.015	
06:00	0.74	1.38	0.014	0.01	0.77	1.45	0.016		0.82	1.69	0.022		0.80	1.87	0.023		0.78	2.03	0.025		0.91	1.31	0.018		0.77	1.56	0.017	
07:00	0.94	2.37	0.040		0.75	1.66	0.018	0.02	0.97	2.37	0.038		1.07	2.62	0.048		0.99	2.64	0.043		1.11	2.57	0.054		1.01	2.35	0.043	
08:00	0.93	2.43	0.036		0.93	2.35	0.038		0.85	2.04	0.026	0.01	0.92	2.15	0.032		1.01	2.58	0.044		0.76	2.06	0.023		0.86	2.14	0.028	
09:00	1.12	2.57	0.051	0.03	1.00	2.28	0.038	0.04	0.91	2.23	0.032		0.92	2.23	0.033		0.88	2.25	0.031		0.91	2.17	0.031		0.94	2.32	0.036	
10:00	1.03	2.42	0.042	0.02	1.03	2.42	0.041	0.02	0.97	2.47	0.040		0.85	2.14	0.028		0.77	2.10	0.023		0.82	2.24	0.029		0.80	2.08	0.024	
11:00	1.11	2.51	0.048		1.06	2.32	0.042		0.84	2.23	0.029		0.74	2.10	0.022		0.72	2.02	0.021		0.75	2.11	0.023		0.76	2.11	0.023	
12:00	1.03	2.47	0.042		1.03	2.41	0.041		0.79	2.19	0.026		0.77	2.10	0.023		0.71	2.09	0.021		0.77	2.09	0.023		0.72	1.99	0.020	
13:00	0.91	2.42	0.035		0.98	2.27	0.036		0.76	2.13	0.023		0.77	2.10	0.024		0.74	2.02	0.021		0.74	2.03	0.021		0.75	2.19	0.023	
14:00	0.86	2.28	0.030		0.86	2.13	0.028		0.75	1.92	0.020		0.77	2.11	0.024		0.78	2.10	0.024		0.70	1.68	0.016		0.75	1.91	0.021	
15:00	0.81	2.20	0.027		0.80	2.11	0.025		0.82	2.13	0.027		0.72	1.97	0.020		0.72	1.97	0.020		0.68	1.82	0.017		0.76	1.92	0.021	
16:00	0.89	2.14	0.030	0.03	0.95	2.21	0.034		0.74	1.96	0.021		0.74	2.12	0.022		0.72	2.03	0.021		0.71	2.06	0.020		0.76	1.98	0.022	
17:00	0.95	2.33	0.036	0.08	0.88	2.15	0.029		0.79	2.07	0.024		0.74	1.97	0.021		0.74	1.92	0.020		0.72	2.13	0.022		0.76	2.10	0.023	
18:00	1.10	2.77	0.053	0.01	0.80	2.22	0.026		0.86	2.22	0.029		0.74	1.85	0.019		0.91	2.03	0.030		0.72	1.99	0.020		0.82	2.03	0.025	
19:00	0.91	2.17	0.031		0.92	2.24	0.032		0.81	2.10	0.025		0.85	2.10	0.027		0.86	2.06	0.027		0.74	2.06	0.022		0.77	2.05	0.023	
20:00	0.82	2.24	0.027	0.02	0.88	2.18	0.030		0.94	2.34	0.035		0.85	2.14	0.028		0.85	1.77	0.023		0.90	2.23	0.031		0.77	2.19	0.025	
21:00	0.86	2.19	0.029		0.81	2.11	0.025		0.82	2.17	0.027		0.81	2.14	0.026		0.83	2.13	0.026		0.86	2.15	0.031		0.78	2.16	0.025	
22:00	0.84	2.10	0.027		0.82	2.16	0.026		0.73	2.03	0.021		0.71	1.79	0.018		0.85	1.73	0.022		0.88	1.88	0.027		0.76	1.59	0.017	
23:00	0.72	1.90	0.019		0.72	1.82	0.019		0.74	1.45	0.015		0.78	1.47	0.017		0.90	1.46	0.020		0.78	1.39	0.016		0.77	1.50	0.016	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.029	0.64			0.026	0.09			0.024	0.01			0.022				0.023				0.023				0.022	
Avg	0.89	2.04	0.029		0.86	1.93	0.026		0.83	1.87	0.024		0.81	1.84	0.022		0.82	1.84	0.023		0.85	1.76	0.023		0.80	1.80	0.022	
Time	06:20	05:25	05:50		05:20	04:35	04:35		22:45	01:40	22:45		15:40	02:00	02:00		06:10	03:40	03:40		16:10	04:20	04:20		06:25	02:05	01:20	
Min	0.62	0.94	0.010		0.64	0.88	0.010		0.63	0.91	0.012		0.61	0.98	0.010		0.63	0.94	0.011		0.61	0.71	0.011		0.62	0.94	0.012	
Time	18:05	12:35	18:05		08:40	08:40	08:40		10:05	12:25	10:05		07:20	07:20	07:20		08:10	08:10	08:10		07:20	07:20	07:20		07:05	07:05	07:05	
Max	1.31	3.72	0.082		1.29	3.97	0.094		1.28	3.15	0.069		1.32	3.57	0.087		1.16	3.74	0.075		1.64	4.17	0.139		1.66	4.27	0.144	

	D	V	Q	Rain
Total			0.169	0.74
Avg	0.84	1.87	0.024	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.80	1.21	0.014		0.86	1.13	0.015		0.81	1.47	0.018		0.84	1.19	0.015		0.82	1.09	0.013		0.79	1.14	0.013		0.80	1.16	0.014	
01:00	0.82	1.10	0.013		0.87	1.10	0.015		0.83	1.12	0.014		0.86	1.16	0.015		0.87	1.09	0.014		0.80	1.20	0.014		0.81	1.12	0.013	
02:00	0.84	1.18	0.015		0.87	1.06	0.014		0.82	1.10	0.014		0.84	1.17	0.015		0.85	1.05	0.013		0.81	1.27	0.015		0.82	1.16	0.014	
03:00	0.82	1.15	0.014		0.88	1.11	0.015		0.83	1.13	0.014		0.86	1.24	0.016		0.81	1.22	0.015		0.80	1.27	0.015		0.81	1.19	0.014	
04:00	0.84	1.22	0.016		0.89	1.04	0.014		0.83	1.24	0.015		0.83	1.36	0.017		0.82	1.32	0.016		0.79	1.21	0.014		0.82	1.12	0.014	
05:00	0.85	1.27	0.016		0.85	1.14	0.015		0.80	1.60	0.018		0.87	1.74	0.023		0.79	2.09	0.024		0.77	1.62	0.018		0.82	1.29	0.016	
06:00	0.79	1.56	0.018		0.81	1.37	0.016		0.84	2.09	0.027		0.94	2.04	0.031		0.90	2.41	0.034		1.01	2.38	0.042		0.72	1.84	0.019	
07:00	0.77	1.83	0.020		0.86	1.82	0.026		0.88	2.20	0.030		1.01	2.31	0.041		0.89	2.23	0.031		0.98	2.39	0.039		0.86	2.30	0.031	
08:00	1.00	2.36	0.046		0.93	2.24	0.034		0.93	2.20	0.033		0.87	2.06	0.027		0.89	2.27	0.032		0.91	2.19	0.032		1.04	2.40	0.042	
09:00	0.92	2.12	0.031		1.11	2.43	0.046		0.87	2.39	0.033		0.84	2.13	0.027		0.92	2.31	0.038		0.92	2.08	0.030		0.86	2.26	0.030	
10:00	1.02	2.40	0.043		1.06	2.30	0.041		0.81	1.97	0.024		0.78	1.95	0.022		0.79	2.15	0.025		0.87	2.14	0.028		0.78	2.10	0.024	
11:00	1.01	2.42	0.041		0.90	2.09	0.029		0.84	2.09	0.026		0.78	2.11	0.024		0.73	1.96	0.020		0.81	2.23	0.027		0.79	2.19	0.025	
12:00	0.87	2.04	0.027		0.90	2.01	0.028		0.77	2.04	0.023		0.81	1.77	0.021		0.74	2.05	0.021		0.71	2.06	0.020		0.73	2.11	0.022	
13:00	0.85	2.15	0.028		0.82	2.06	0.025		0.81	2.03	0.024		0.94	2.10	0.033		0.76	1.96	0.021		0.73	2.03	0.021		0.77	2.10	0.024	
14:00	0.96	2.36	0.040		0.81	2.05	0.025		0.76	1.97	0.022		0.85	1.98	0.026		0.73	2.05	0.021		0.66	1.93	0.017		0.78	2.05	0.023	
15:00	0.86	2.05	0.027		0.81	2.02	0.024		0.75	1.92	0.020		0.78	1.93	0.022		0.73	2.02	0.021		0.70	1.99	0.019		0.72	2.04	0.021	
16:00	0.78	2.18	0.025		0.78	2.02	0.023		0.77	2.09	0.023		0.76	1.92	0.021		0.75	2.01	0.022		0.82	1.88	0.026		0.71	1.95	0.019	
17:00	0.94	2.18	0.033		0.83	2.21	0.027		0.92	2.19	0.032		0.78	2.04	0.023		0.72	2.09	0.021		0.76	2.14	0.023		0.80	2.20	0.027	
18:00	0.86	1.99	0.026		0.93	2.09	0.031		0.92	2.20	0.032		0.85	2.00	0.026		0.84	2.12	0.027		0.76	2.07	0.022		0.80	2.21	0.027	
19:00	0.81	1.92	0.023		0.88	2.21	0.030		0.91	2.24	0.032		0.87	2.08	0.028		1.05	2.47	0.044		0.80	2.13	0.025		0.96	2.33	0.036	
20:00	0.83	2.03	0.025		0.86	2.15	0.028		0.92	2.34	0.034		0.91	2.40	0.035		0.82	2.23	0.027		0.89	2.22	0.031		0.78	2.04	0.023	
21:00	0.77	1.72	0.019		0.82	2.14	0.026		0.86	2.18	0.029		0.82	2.08	0.026		0.72	1.99	0.020		0.94	2.24	0.033		0.83	2.07	0.026	
22:00	0.80	1.43	0.017		0.73	1.74	0.018		0.77	1.91	0.021		0.75	1.99	0.021		0.72	1.62	0.016		0.73	2.11	0.021		0.75	2.17	0.023	
23:00	0.74	1.65	0.017		0.77	1.79	0.020		0.86	1.21	0.016		0.79	1.25	0.014		0.78	1.20	0.014		0.73	1.34	0.014		0.73	1.49	0.015	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.025				0.024				0.024				0.024				0.023				0.023				0.023	
Avg	0.86	1.81	0.025		0.87	1.80	0.024		0.84	1.87	0.024		0.84	1.83	0.024		0.81	1.87	0.023		0.81	1.89	0.023		0.80	1.87	0.023	
Time	23:00	05:10	05:10		22:25	04:50	04:50		15:00	03:10	03:10		16:45	02:40	23:50		03:30	00:30	00:15		14:35	04:30	00:55		17:20	01:55	04:50	
Min	0.62	0.84	0.011		0.64	0.84	0.011		0.67	0.84	0.011		0.68	0.94	0.012		0.63	0.91	0.011		0.61	0.98	0.010		0.62	0.94	0.012	
Time	08:20	08:20	08:20		09:05	07:50	07:50		08:30	09:40	09:40		13:20	20:35	07:15		09:25	09:25	09:25		06:15	06:15	06:15		08:10	19:15	19:15	
Max	1.72	5.67	0.203		1.23	3.77	0.080		1.15	3.70	0.069		1.67	4.46	0.114		1.61	4.01	0.130		1.47	3.94	0.113		1.15	3.32	0.061	

	D	V	Q	Rain
Total			0.166	
Avg	0.83	1.85	0.024	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.77	1.89	0.021		0.79	1.41	0.016		0.79	1.22	0.014		0.77	1.15	0.013		0.82	1.19	0.014		0.76	1.41	0.015		0.82	1.23	0.015	
01:00	0.79	1.25	0.014		0.84	1.20	0.015		0.81	1.13	0.014		0.79	1.06	0.012		0.82	1.11	0.013		0.82	1.14	0.014		0.82	1.08	0.013	
02:00	0.80	1.24	0.015		0.86	1.19	0.016		0.82	1.16	0.014		0.81	1.13	0.014		0.81	1.18	0.014		0.85	1.23	0.016		0.83	1.16	0.014	
03:00	0.82	1.23	0.015		0.87	1.15	0.015		0.83	1.16	0.014		0.83	1.15	0.014		0.85	1.19	0.015		0.85	1.25	0.016		0.79	1.27	0.015	
04:00	0.84	1.26	0.016		0.81	1.24	0.015		0.82	1.16	0.014		0.80	1.24	0.014		0.85	1.22	0.016		0.82	1.19	0.015		0.83	1.16	0.014	
05:00	0.85	1.25	0.016		0.86	1.18	0.015		0.80	1.35	0.016		0.81	1.22	0.014		0.82	1.20	0.014		0.80	1.47	0.017		0.80	1.32	0.015	
06:00	0.78	1.40	0.016		0.83	1.24	0.015		0.78	1.96	0.022		0.85	1.66	0.023		0.72	1.69	0.017		0.72	1.69	0.017		0.76	1.75	0.019	
07:00	0.86	1.80	0.024		0.78	1.65	0.018		0.99	2.59	0.043		0.82	2.27	0.028		0.89	2.26	0.032		0.79	2.19	0.026		0.83	2.16	0.027	
08:00	0.92	2.26	0.033		0.83	2.15	0.028		0.91	2.31	0.034		0.94	2.43	0.037		0.91	2.10	0.030		0.78	2.10	0.024		0.80	2.16	0.026	
09:00	0.92	2.18	0.032		0.92	2.26	0.033		0.96	2.29	0.036		0.83	2.43	0.030		0.87	2.16	0.029		0.78	2.15	0.025		0.85	2.33	0.031	
10:00	0.96	2.34	0.037		0.97	2.36	0.037		0.93	2.18	0.032		0.81	2.25	0.029		0.80	2.22	0.026		0.75	2.09	0.022		0.66	2.08	0.018	
11:00	0.87	2.20	0.030		0.88	2.20	0.030		0.78	2.21	0.025		0.65	2.08	0.018		0.71	1.93	0.019		0.71	1.85	0.018		0.89	2.04	0.031	
12:00	0.76	2.23	0.024		0.96	2.19	0.034		0.78	2.13	0.024		0.61	2.01	0.016		0.87	1.66	0.025		0.71	2.05	0.021		0.80	2.21	0.026	
13:00	0.88	2.20	0.030		0.95	2.24	0.034		0.70	2.01	0.019		0.66	2.13	0.019		0.78	2.03	0.023		0.74	1.88	0.020		0.71	2.08	0.021	
14:00	0.93	2.36	0.036		0.85	2.11	0.027		0.69	1.94	0.018		0.69	1.97	0.018		0.70	1.80	0.018		0.83	2.02	0.026		0.74	1.89	0.020	
15:00	0.74	2.10	0.022		0.80	2.19	0.026		0.70	1.91	0.018		0.73	2.10	0.022		0.71	1.83	0.018		0.74	2.12	0.023		0.69	2.11	0.020	
16:00	0.74	2.02	0.021		0.77	2.11	0.024		0.80	1.95	0.024		0.75	2.06	0.023		0.71	1.94	0.019		0.83	2.15	0.027		0.68	1.97	0.018	
17:00	0.78	2.05	0.024		0.89	2.22	0.030		0.87	2.13	0.029		0.66	2.02	0.018		0.79	2.04	0.024		0.67	2.13	0.020		0.73	1.91	0.019	
18:00	0.86	2.06	0.027		0.95	2.36	0.036		0.87	2.13	0.029		0.68	2.11	0.020		0.75	2.05	0.022		0.62	2.10	0.017		0.72	1.89	0.019	
19:00	0.76	2.09	0.023		0.84	2.20	0.028		0.84	2.08	0.027		0.75	2.06	0.022		0.77	2.03	0.023		0.70	2.09	0.020		0.78	1.71	0.019	
20:00	0.78	2.20	0.025		0.93	2.24	0.033		0.94	2.34	0.036		0.69	2.08	0.020		0.86	2.10	0.028		0.88	2.48	0.036		0.67	1.97	0.018	
21:00	0.75	2.11	0.022		0.77	2.14	0.024		0.91	2.24	0.033		0.77	2.00	0.022		0.90	2.08	0.029		0.72	2.07	0.021		0.68	2.06	0.019	
22:00	0.76	1.99	0.022		0.77	2.12	0.024		0.83	2.08	0.026		0.69	2.04	0.019		0.88	2.11	0.029		0.72	1.98	0.020		0.73	1.82	0.018	
23:00	0.72	1.75	0.017		0.70	1.77	0.017		0.71	1.51	0.015		0.73	1.79	0.018		0.71	1.88	0.018		0.77	1.58	0.017		0.78	1.56	0.018	

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.023				0.025				0.024				0.020				0.022				0.020				0.020	
Avg	0.82	1.89	0.023		0.85	1.88	0.025		0.83	1.88	0.024		0.76	1.85	0.020		0.80	1.79	0.022		0.76	1.85	0.020		0.77	1.79	0.020	
Time	06:35	01:25	01:25		23:40	03:05	00:45		23:55	04:20	03:20		20:55	00:40	00:40		02:10	01:00	01:00		18:55	01:30	11:05		20:55	03:10	03:10	
Min	0.65	1.01	0.011		0.64	1.01	0.013		0.60	0.98	0.012		0.50	0.86	0.010		0.58	0.88	0.011		0.45	1.01	0.011		0.50	0.91	0.011	
Time	14:35	08:55	14:35		08:30	08:30	08:30		21:20	07:25	21:20		10:20	10:20	10:20		12:50	12:50	12:50		20:35	20:35	20:35		11:35	09:10	11:35	
Max	1.28	3.95	0.087		1.16	3.37	0.068		1.26	3.26	0.068		1.21	3.33	0.071		1.52	3.30	0.098		1.40	4.12	0.109		1.53	3.18	0.091	

	D	V	Q	Rain
Total			0.154	
Avg	0.80	1.85	0.022	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.81	1.51	0.018		0.79	1.34	0.016		0.81	1.26	0.015		0.90	1.04	0.014		0.78	1.18	0.013		0.72	1.44	0.014		0.78	1.31	0.015	
01:00	0.82	1.23	0.015		0.83	1.19	0.015		0.83	1.16	0.014		0.97	1.09	0.017		0.79	1.17	0.013		0.79	1.15	0.013		0.81	1.09	0.013	
02:00	0.83	1.20	0.015		0.82	1.11	0.014		0.85	1.24	0.016		0.92	0.99	0.014		0.83	1.14	0.014		0.81	1.14	0.014		0.81	1.17	0.014	
03:00	0.74	1.29	0.013		0.84	1.16	0.015		0.84	1.22	0.015		0.88	0.83	0.011		0.85	1.19	0.015		0.84	1.19	0.015		0.81	1.19	0.014	
04:00	0.75	1.11	0.012		0.84	1.19	0.015		0.85	1.16	0.015		0.92	0.97	0.014		0.81	1.23	0.015	0.01	0.81	1.23	0.015		0.81	1.23	0.015	
05:00	0.84	1.23	0.016		0.84	1.21	0.015		0.81	1.34	0.016		0.90	1.08	0.015		0.82	1.26	0.015		0.81	1.14	0.014		0.78	1.45	0.016	
06:00	0.83	1.20	0.015		0.82	1.31	0.016		0.70	2.01	0.019		0.84	1.90	0.024		0.69	1.88	0.018		0.79	1.78	0.021		0.85	2.31	0.031	
07:00	0.77	1.60	0.017		0.80	1.32	0.015		0.85	2.44	0.035		0.88	2.10	0.029		0.86	2.36	0.031		0.94	2.39	0.038		0.97	2.27	0.036	
08:00	0.82	2.08	0.027		0.80	2.14	0.025		0.75	2.13	0.023		0.87	2.16	0.029		0.97	2.56	0.040		1.02	2.42	0.041		0.93	2.25	0.033	
09:00	1.01	2.56	0.043		0.90	2.45	0.038		0.76	2.22	0.025		0.84	2.19	0.028		0.82	2.30	0.029		0.94	2.44	0.038		0.92	2.19	0.032	
10:00	1.01	2.54	0.043		0.90	2.20	0.031		0.84	2.31	0.030		0.82	2.14	0.026		0.75	2.10	0.023		0.77	2.20	0.025		0.87	2.26	0.030	
11:00	0.89	2.29	0.032		0.95	2.44	0.038		0.83	2.45	0.032		0.83	2.11	0.026		0.74	2.06	0.022		0.81	2.19	0.026		0.90	2.23	0.031	
12:00	0.86	2.17	0.029		0.89	2.36	0.033		0.68	2.15	0.020		0.80	2.11	0.025		0.67	1.91	0.017		0.81	2.30	0.028		0.84	2.18	0.028	
13:00	0.83	2.25	0.028		0.75	2.20	0.024		0.72	1.94	0.020		0.76	1.82	0.019		0.72	2.07	0.021		0.85	2.09	0.027		0.74	2.03	0.022	
14:00	0.76	2.18	0.025		0.59	2.10	0.016		0.69	1.82	0.017		0.79	1.73	0.020		0.72	1.77	0.018		0.72	1.82	0.019		0.73	2.07	0.021	
15:00	0.74	2.10	0.022		0.63	2.02	0.017		0.69	1.89	0.018		0.81	1.67	0.020		0.70	1.96	0.019		0.80	1.85	0.022		0.72	1.98	0.020	
16:00	0.70	2.33	0.023		0.74	1.71	0.018		0.76	2.08	0.023		0.79	1.71	0.019		0.65	1.84	0.016		0.72	2.17	0.022		0.74	2.06	0.022	
17:00	0.72	2.35	0.023		0.78	2.17	0.025		0.69	2.03	0.019		0.80	1.71	0.020		0.80	2.17	0.026		0.74	2.12	0.022		0.71	2.03	0.020	
18:00	0.78	2.37	0.027		0.81	2.19	0.026		0.79	2.12	0.025		0.78	2.08	0.024		0.80	2.16	0.025		0.79	2.11	0.025		0.78	2.20	0.025	
19:00	0.74	2.14	0.023		0.85	2.27	0.029		0.78	2.27	0.026		0.89	2.28	0.032		0.75	2.14	0.023		0.89	2.22	0.031		0.86	2.36	0.031	
20:00	0.73	1.94	0.020		0.76	2.06	0.022		0.81	2.16	0.026		0.93	2.32	0.034		0.71	2.10	0.021		0.91	2.26	0.033		0.87	2.24	0.030	
21:00	0.70	1.87	0.018		0.74	2.15	0.023		0.82	1.77	0.021		0.79	2.10	0.024		0.76	2.14	0.023		0.93	2.13	0.031		0.80	2.07	0.025	
22:00	0.75	2.06	0.023		0.69	2.13	0.021		0.83	1.70	0.021		0.81	2.10	0.025		0.74	1.83	0.019		0.82	2.19	0.027		0.77	2.19	0.024	
23:00	0.74	1.95	0.021		0.75	1.56	0.017		0.86	1.19	0.015		0.69	1.67	0.016		0.79	1.65	0.019		0.70	1.66	0.016		0.74	1.64	0.017	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.023				0.022				0.021				0.022				0.021	0.01			0.024				0.024	
Avg	0.80	1.90	0.023		0.80	1.83	0.022		0.78	1.84	0.021		0.84	1.75	0.022		0.77	1.84	0.021		0.82	1.90	0.024		0.81	1.92	0.024	
Time	21:30	04:00	04:00		14:15	01:35	14:15		09:20	01:05	01:05		18:50	03:35	03:35		10:30	23:10	23:15		14:45	05:00	01:30		05:50	01:50	03:05	
Min	0.43	0.66	0.006		0.45	0.94	0.011		0.52	0.96	0.012		0.60	0.61	0.008		0.60	0.93	0.010		0.59	0.98	0.011		0.60	0.98	0.012	
Time	08:45	10:00	09:00		09:50	09:50	09:50		07:35	07:30	07:35		08:10	09:30	08:10		08:00	08:10	08:10		07:50	07:55	07:55		06:25	06:50	06:50	
Max	1.27	3.47	0.076		1.36	3.90	0.099		1.39	3.85	0.094		1.09	3.20	0.047		1.11	3.69	0.057		1.15	3.69	0.071		1.15	3.52	0.069	

	D	V	Q	Rain
Total			0.156	0.01
Avg	0.80	1.85	0.022	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.74	1.33	0.014		0.72	1.43	0.014		0.74	1.35	0.014		0.73	1.42	0.014		0.88	1.28	0.017	0.13	0.80	1.53	0.018		0.70	1.45	0.014	
01:00	0.80	1.22	0.014		0.80	1.16	0.014		0.80	1.20	0.014		0.79	1.14	0.013		1.01	1.19	0.019	0.03	0.96	1.25	0.019		0.79	1.19	0.014	
02:00	0.82	1.19	0.015		0.82	1.21	0.015		0.80	1.14	0.014		0.80	1.13	0.013		0.87	1.43	0.019		1.02	1.24	0.021		0.82	1.21	0.015	
03:00	0.83	1.16	0.014		0.83	1.20	0.015		0.80	1.14	0.013		0.81	1.20	0.014		1.02	1.29	0.022	0.01	0.97	1.21	0.018		0.80	1.14	0.013	
04:00	0.83	1.24	0.016		0.84	1.26	0.016		0.83	1.18	0.015		0.81	1.19	0.014		1.03	1.29	0.022	0.01	0.84	1.43	0.018		0.79	1.13	0.013	
05:00	0.84	1.18	0.015		0.85	1.24	0.016		0.78	1.34	0.015		0.78	1.16	0.013	0.04	0.95	1.38	0.020		0.95	1.35	0.020		0.75	1.32	0.014	
06:00	0.81	1.21	0.014		0.78	1.41	0.016		0.78	1.46	0.017		0.83	2.38	0.030	0.14	0.81	1.90	0.023	0.03	0.90	2.14	0.030		0.78	1.91	0.022	
07:00	0.84	1.82	0.025		0.85	1.71	0.023		0.91	2.60	0.036		0.95	2.48	0.038	0.01	0.88	2.32	0.032		0.89	2.31	0.032		1.01	2.62	0.045	
08:00	0.87	2.38	0.033		0.82	2.19	0.027		0.91	2.26	0.033		0.94	2.36	0.037		0.96	2.37	0.037		0.85	2.28	0.029		0.93	2.21	0.032	
09:00	0.93	2.33	0.035		0.88	2.23	0.031		1.01	2.55	0.043		0.85	2.25	0.029		0.86	2.34	0.031		0.89	2.20	0.030		0.92	2.15	0.031	
10:00	0.96	2.30	0.036		0.97	2.56	0.041		0.90	2.17	0.031		0.84	2.19	0.028		0.84	2.36	0.030		0.83	2.31	0.029		0.84	2.25	0.029	
11:00	0.88	2.18	0.030		0.94	2.36	0.036		0.95	2.26	0.035		0.75	2.03	0.022		0.77	2.07	0.023		0.74	2.03	0.021		0.85	2.21	0.028	
12:00	0.82	2.19	0.027		0.84	2.23	0.028		0.78	2.16	0.025		0.76	1.97	0.022		0.81	2.29	0.028		0.72	1.91	0.019		0.83	2.22	0.028	
13:00	0.77	2.08	0.023		0.76	2.24	0.025		0.82	2.20	0.027		0.76	1.85	0.020		0.71	1.98	0.020		0.72	1.92	0.020		0.77	2.26	0.025	
14:00	0.85	2.06	0.027		0.72	2.24	0.023		0.76	2.27	0.025		0.78	1.83	0.021		0.75	2.12	0.023		0.75	2.16	0.023		0.88	2.24	0.030	
15:00	0.76	2.17	0.024		0.72	2.21	0.023		0.83	2.42	0.030		0.79	1.91	0.022		0.75	2.03	0.022		0.70	2.10	0.020		0.82	2.29	0.028	
16:00	0.78	2.16	0.024		0.79	2.16	0.025		0.69	2.00	0.019		0.78	1.72	0.020		0.79	2.23	0.026		0.71	2.08	0.021		0.73	2.30	0.024	
17:00	0.76	2.13	0.023		0.81	2.14	0.025		0.76	2.33	0.025		0.83	1.53	0.019		0.78	2.06	0.023		0.75	1.83	0.020		0.80	2.30	0.027	
18:00	0.80	2.26	0.026		0.75	2.20	0.024		0.84	2.39	0.030		1.00	2.54	0.050		0.78	2.03	0.023		0.75	2.12	0.023		0.86	2.24	0.029	
19:00	0.76	2.21	0.024		0.75	2.24	0.024		0.90	2.38	0.034		0.82	2.13	0.026		0.89	2.16	0.029		0.80	2.20	0.026		0.82	2.21	0.027	
20:00	0.81	2.31	0.028		0.89	2.48	0.036		0.94	2.35	0.035		0.89	2.19	0.030		0.92	2.21	0.032		0.89	2.42	0.033		0.89	2.13	0.029	
21:00	0.82	1.93	0.025		0.81	2.21	0.027		0.79	2.26	0.026		0.82	2.15	0.026		0.82	2.19	0.027		0.84	2.23	0.029		0.73	2.05	0.021	
22:00	0.72	2.07	0.021		0.69	1.99	0.019		0.76	2.24	0.024		0.70	2.05	0.020		0.78	2.25	0.025		0.75	2.21	0.024		0.77	1.93	0.021	
23:00	0.68	1.71	0.016		0.78	1.79	0.021		0.66	1.54	0.014		0.73	1.72	0.018	0.03	0.77	1.51	0.017		0.69	1.83	0.017		0.73	1.60	0.016	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.023				0.023				0.025				0.023	0.22			0.025	0.21			0.023				0.024	
Avg	0.81	1.87	0.023		0.81	1.92	0.023		0.82	1.97	0.025		0.82	1.85	0.023		0.85	1.93	0.025		0.82	1.93	0.023		0.82	1.94	0.024	
Time	23:25	03:20	07:15		22:45	06:20	01:30		05:15	00:15	00:15		22:35	02:35	04:25		15:10	01:35	01:35		21:05	04:10	21:05		05:25	04:20	22:20	
Min	0.61	1.01	0.011		0.60	0.93	0.011		0.59	0.89	0.009		0.53	1.01	0.011		0.61	0.71	0.014		0.55	0.91	0.012		0.59	0.98	0.012	
Time	21:45	07:45	07:45		20:25	20:25	20:25		09:05	07:25	09:35		18:40	18:40	18:40		01:40	08:10	08:10		21:10	06:50	06:55		07:10	07:15	07:15	
Max	1.17	3.84	0.076		1.21	3.57	0.076		1.19	4.02	0.063		1.97	4.54	0.196		1.40	3.52	0.062		1.12	3.33	0.054		1.29	3.69	0.086	

	D	V	Q	Rain
Total			0.166	0.43
Avg	0.82	1.91	0.024	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.70	1.54	0.015		0.80	1.21	0.014		1.28	1.37	0.032		0.76	1.26	0.014		0.74	1.77	0.019		0.73	1.38	0.014		0.68	1.68	0.015	
01:00	0.79	1.24	0.014		0.77	1.18	0.013		1.34	1.16	0.029		0.79	1.19	0.014		0.77	1.30	0.014		0.77	1.08	0.012		0.72	1.33	0.013	
02:00	0.83	1.14	0.014		0.82	1.19	0.015		1.33	0.99	0.024		0.81	1.16	0.014		0.77	1.22	0.014		0.83	1.03	0.013		0.73	1.47	0.015	
03:00	0.85	1.23	0.016		0.85	1.16	0.015		1.28	1.12	0.026		0.81	1.18	0.014		0.80	1.19	0.014		0.85	1.14	0.015		0.78	1.23	0.014	
04:00	0.85	1.14	0.015		0.84	1.16	0.015		1.32	1.22	0.030		0.81	1.24	0.015		0.74	1.27	0.013		0.82	1.14	0.014		0.79	1.13	0.013	
05:00	0.86	1.10	0.014		0.84	1.13	0.014		1.54	1.58	0.048		0.76	1.25	0.014		0.83	1.79	0.023		0.79	1.14	0.013		0.80	1.20	0.014	
06:00	0.83	1.21	0.015		0.81	1.20	0.014		1.53	1.48	0.045		0.74	1.52	0.016		0.81	1.95	0.023		0.76	1.31	0.014		0.79	2.02	0.023	
07:00	0.72	1.79	0.018		0.77	1.62	0.018		1.07	2.58	0.046		0.83	2.29	0.029		0.91	2.25	0.032		0.93	2.44	0.040		0.78	2.23	0.026	
08:00	0.91	2.22	0.032		0.78	2.19	0.025		1.09	2.66	0.049		0.90	2.19	0.031		0.92	2.25	0.033		0.88	2.22	0.030		0.94	2.33	0.035	
09:00	1.00	2.39	0.040		0.96	2.34	0.036		0.84	2.19	0.028		0.88	2.24	0.030		0.82	2.15	0.026		0.87	2.18	0.029		0.90	2.35	0.033	
10:00	1.07	2.54	0.046		0.97	2.40	0.038		0.82	2.22	0.027		0.87	2.15	0.028		0.84	2.21	0.028		0.84	2.25	0.028		0.85	2.21	0.029	
11:00	0.95	2.46	0.038		0.93	2.24	0.033		0.84	2.03	0.026		0.89	2.23	0.031		0.88	2.30	0.031		0.81	2.22	0.027		0.87	2.05	0.027	
12:00	0.83	2.10	0.026		0.89	2.32	0.033		0.86	2.22	0.029		0.78	2.31	0.026		0.77	2.22	0.025		0.73	2.02	0.021		0.81	2.31	0.028	
13:00	0.89	2.36	0.034		0.85	2.24	0.029		0.83	2.20	0.027		0.81	2.40	0.029		0.73	2.09	0.022		0.82	2.21	0.027		0.73	2.14	0.022	
14:00	0.74	2.03	0.021		0.80	2.41	0.029		0.77	2.21	0.025		0.83	2.31	0.029		0.71	2.09	0.021		0.75	2.17	0.023		0.71	1.91	0.019	
15:00	0.79	2.30	0.027		0.72	2.10	0.021		0.70	2.08	0.020		0.78	2.31	0.026		0.71	1.80	0.018		0.76	2.10	0.023		0.82	2.22	0.027	
16:00	0.76	2.26	0.025		0.80	2.17	0.026		0.79	1.42	0.017		0.74	2.23	0.023		0.77	2.28	0.025		0.72	1.95	0.020		0.85	2.09	0.027	
17:00	0.76	2.30	0.025		0.81	2.30	0.027		0.80	2.33	0.028		0.79	2.20	0.026		0.83	2.19	0.027		0.80	2.15	0.025		0.93	2.18	0.032	
18:00	0.78	2.31	0.026		0.84	2.23	0.029		0.70	2.17	0.021		0.86	2.20	0.029		0.84	2.23	0.028		0.89	2.13	0.029		0.95	2.21	0.033	
19:00	0.87	2.20	0.030		1.08	2.21	0.040		0.88	2.20	0.030		0.85	2.15	0.028		0.78	2.23	0.025		0.93	2.17	0.032		0.95	2.12	0.032	
20:00	0.79	2.21	0.026		1.23	2.48	0.055		0.80	2.27	0.027		0.83	2.19	0.027		0.79	2.35	0.027		0.81	2.01	0.024		0.86	2.15	0.028	
21:00	0.77	1.99	0.023		1.13	2.27	0.044		0.78	2.16	0.025		0.84	2.38	0.031		0.84	2.16	0.027		0.97	2.26	0.036		0.84	2.19	0.028	
22:00	0.74	2.04	0.021		1.20	2.23	0.047		0.78	2.19	0.025		0.78	2.13	0.024		0.76	2.02	0.022		0.83	2.10	0.026		0.81	2.24	0.027	
23:00	0.73	2.05	0.021		1.24	1.67	0.037		0.72	1.96	0.020		0.76	2.11	0.023		0.73	1.71	0.018		0.75	1.95	0.021		0.77	2.06	0.023	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.024				0.028				0.029				0.024				0.023				0.023				0.024	
Avg	0.83	1.92	0.024		0.91	1.90	0.028		0.99	1.92	0.029		0.81	1.95	0.024		0.80	1.96	0.023		0.82	1.86	0.023		0.82	1.96	0.024	
Time	21:20	02:00	21:20		15:05	05:00	01:50		15:00	02:55	16:35		15:15	02:45	02:45		05:15	04:15	04:15		23:55	03:25	00:55		15:05	04:30	04:35	
Min	0.60	0.94	0.010		0.61	0.94	0.011		0.56	0.81	0.011		0.63	0.93	0.010		0.59	0.74	0.008		0.55	0.91	0.010		0.61	0.94	0.011	
Time	10:00	11:15	09:40		19:45	10:35	22:15		06:10	07:30	08:30		21:45	21:45	21:45		07:25	08:05	08:05		07:25	07:25	07:25		07:50	08:45	08:45	
Max	1.14	3.87	0.070		1.44	3.58	0.074		1.68	3.37	0.064		1.07	3.42	0.062		1.08	3.64	0.065		1.38	5.23	0.136		1.10	3.30	0.056	

	D	V	Q	Rain
Total			0.176	
Avg	0.85	1.93	0.025	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.74	1.88	0.020		0.75	1.47	0.016		1.13	1.41	0.027		1.20	1.33	0.028		0.78	1.34	0.016		0.79	1.22	0.014		0.73	1.42	0.014	
01:00	0.73	1.55	0.016		0.80	1.67	0.020		1.27	1.11	0.026		1.25	1.37	0.031		0.82	1.52	0.020		0.79	1.13	0.013		0.76	1.16	0.013	
02:00	0.71	1.51	0.015		0.80	1.08	0.013		1.28	1.01	0.023		1.20	1.40	0.029		0.81	0.99	0.012		0.80	1.16	0.014		0.73	1.32	0.014	
03:00	0.78	1.32	0.015		0.82	1.12	0.014		1.28	1.08	0.025		1.30	1.16	0.028		0.81	1.09	0.013		0.82	1.18	0.014		0.77	1.16	0.013	
04:00	0.76	1.34	0.014		0.82	1.12	0.014		1.29	1.04	0.025		1.31	1.07	0.026		0.82	1.17	0.014		0.80	1.05	0.012		0.78	1.21	0.014	
05:00	0.81	1.22	0.015		0.81	1.16	0.014		1.21	1.49	0.031		1.15	1.60	0.029		0.80	1.21	0.014		0.78	1.30	0.015		0.78	1.21	0.014	
06:00	0.83	1.68	0.022		0.83	1.26	0.015		1.11	1.86	0.034		1.05	2.03	0.034		0.84	1.78	0.024		0.77	1.51	0.017		0.75	1.89	0.021	
07:00	0.92	1.87	0.028		0.73	1.44	0.015		0.95	2.64	0.040		0.96	2.24	0.034		0.95	2.49	0.038		0.98	2.43	0.039		1.03	2.57	0.044	
08:00	0.95	2.24	0.035		0.83	2.06	0.026		1.02	2.55	0.043		0.90	2.23	0.031		0.90	2.12	0.030		0.88	2.17	0.029		0.91	2.27	0.032	
09:00	0.93	2.21	0.033		0.90	2.17	0.030		0.97	2.54	0.040		0.97	2.29	0.036		0.90	2.08	0.029		0.90	2.18	0.030		0.99	2.36	0.038	
10:00	0.98	2.17	0.034		0.93	2.42	0.035		1.07	2.65	0.048		0.89	2.12	0.029		0.82	2.24	0.028		0.83	2.24	0.028		0.89	2.15	0.030	
11:00	1.01	2.30	0.038		0.91	2.22	0.032		1.04	2.54	0.044		0.80	2.06	0.024		0.75	2.12	0.023		0.82	2.24	0.027		0.91	2.25	0.032	
12:00	0.95	2.19	0.033		0.90	2.23	0.031		1.05	2.36	0.041		0.76	2.15	0.024		0.79	2.20	0.025		0.68	1.94	0.018		0.85	2.27	0.029	
13:00	0.88	2.16	0.029		0.82	2.27	0.028		1.05	2.10	0.037		0.76	2.17	0.024		0.77	2.06	0.023		0.75	2.01	0.022		0.78	2.26	0.026	
14:00	0.78	2.12	0.024		1.13	2.20	0.043		1.08	1.79	0.032		0.76	1.94	0.021		0.72	1.97	0.020		0.74	1.85	0.020		0.74	2.08	0.022	
15:00	0.80	2.08	0.024		1.25	2.14	0.048		0.99	2.08	0.033		0.78	2.07	0.024		0.77	2.04	0.024		0.72	2.19	0.022		0.70	1.76	0.017	
16:00	0.82	2.25	0.027		1.13	2.47	0.048		1.04	1.95	0.033		0.76	2.09	0.023		0.78	2.10	0.024		0.77	1.96	0.023		0.80	2.06	0.025	
17:00	0.80	2.02	0.024		1.19	2.62	0.055		1.03	2.37	0.040		0.77	2.22	0.025		0.73	2.17	0.023		0.77	2.17	0.024		0.87	2.29	0.031	
18:00	0.80	2.21	0.026		1.13	2.51	0.049		0.97	2.40	0.037		0.80	2.23	0.027		0.82	2.19	0.027		0.85	2.24	0.029		0.81	2.25	0.027	
19:00	0.78	2.02	0.023		1.16	2.39	0.048		1.04	2.62	0.045		0.81	2.14	0.026		0.87	2.15	0.029		0.80	2.45	0.029		0.80	2.27	0.027	
20:00	0.83	2.21	0.027		1.06	2.65	0.047		1.06	2.59	0.046		0.90	2.36	0.033		0.86	2.23	0.029		0.84	2.20	0.028		0.84	2.23	0.028	
21:00	0.75	1.91	0.021		1.04	2.76	0.048		0.98	2.45	0.038		0.84	2.18	0.028		0.85	2.19	0.029		0.83	2.00	0.026		0.80	2.15	0.025	
22:00	0.76	2.19	0.024		1.04	2.32	0.040		1.07	1.94	0.034		0.83	2.18	0.027		0.78	2.15	0.024		0.80	2.32	0.027		0.86	2.10	0.028	
23:00	0.69	1.62	0.016		1.07	1.78	0.032		1.09	1.64	0.030		0.76	1.36	0.015		0.75	1.67	0.018		0.74	2.02	0.021		0.83	2.24	0.028	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.024				0.032				0.035				0.027				0.023				0.023				0.025	
Avg	0.82	1.93	0.024		0.95	1.98	0.032		1.09	2.01	0.035		0.94	1.92	0.027		0.81	1.89	0.023		0.80	1.88	0.023		0.82	1.95	0.025	
Time	04:25	05:10	04:25		00:15	02:40	00:25		07:50	02:35	02:35		15:20	05:00	23:35		14:30	03:00	03:00		14:10	02:55	01:15		06:15	03:25	02:00	
Min	0.58	1.08	0.009		0.58	0.94	0.011		0.72	0.74	0.017		0.66	0.88	0.011		0.57	0.81	0.009		0.54	0.88	0.010		0.63	1.01	0.011	
Time	07:25	08:35	09:50		18:55	10:15	17:15		05:25	16:15	10:15		04:55	05:35	09:20		15:05	06:50	01:05		07:00	07:00	07:00		09:50	07:35	07:35	
Max	1.29	3.35	0.063		1.42	3.30	0.073		1.33	3.28	0.064		1.34	3.52	0.063		1.14	3.11	0.055		1.21	3.57	0.077		1.27	3.37	0.072	

	D	V	Q	Rain
Total			0.189	
Avg	0.89	1.94	0.027	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.76	1.69	0.018		0.78	1.75	0.020		0.69	1.34	0.013		0.77	1.19	0.013		0.86	1.38	0.018		0.77	1.39	0.015		0.85	1.23	0.016	
01:00	0.77	1.66	0.019		0.84	1.22	0.015		0.78	1.14	0.013		0.80	1.18	0.014		0.95	1.07	0.016		0.89	1.18	0.016		0.86	1.21	0.016	
02:00	0.82	1.15	0.014		0.88	1.20	0.016		0.80	1.23	0.014		0.83	1.19	0.015		0.95	1.09	0.017		0.90	1.12	0.016		0.88	1.15	0.015	
03:00	0.80	1.17	0.014		0.85	1.13	0.014		0.82	1.21	0.015		0.80	1.15	0.014		0.99	1.14	0.018		0.88	1.09	0.015		0.85	1.30	0.017	
04:00	0.82	1.21	0.015		0.87	1.11	0.015		0.84	1.21	0.015		0.79	1.21	0.014		0.98	1.16	0.018		0.86	1.16	0.015		0.81	1.30	0.016	
05:00	0.79	1.20	0.014		0.84	1.25	0.016		0.80	1.29	0.015		0.81	1.32	0.016		0.93	1.17	0.017		0.81	1.24	0.015		0.79	1.42	0.016	
06:00	0.78	1.50	0.017		0.78	1.48	0.017		0.75	1.75	0.018		0.83	2.24	0.028		0.83	1.97	0.024		0.78	1.76	0.020		0.81	1.53	0.019	
07:00	0.83	2.22	0.028		0.74	1.92	0.020		0.88	2.29	0.033		0.97	2.36	0.037		0.90	2.38	0.034		0.97	2.42	0.038		0.85	2.38	0.031	
08:00	0.98	2.57	0.042		0.96	2.37	0.037		0.92	2.15	0.032		0.84	2.16	0.027		0.85	2.26	0.029		0.91	2.26	0.032		0.88	2.20	0.030	
09:00	1.06	2.41	0.043		0.96	2.39	0.038		0.92	2.15	0.032		0.88	2.11	0.028		0.88	2.32	0.032		0.85	2.29	0.030		0.86	2.28	0.030	
10:00	0.93	2.16	0.032		1.07	2.46	0.045		0.83	2.17	0.027		0.86	2.26	0.030		0.81	2.24	0.027		0.79	2.05	0.024		0.84	2.27	0.029	
11:00	1.05	2.43	0.045		0.87	2.15	0.028		0.87	2.18	0.029		0.81	2.24	0.026		0.79	2.14	0.024		0.75	1.94	0.021		0.82	2.22	0.027	
12:00	0.96	2.22	0.034		0.89	2.22	0.031		0.79	2.37	0.028		0.81	2.18	0.026		0.77	2.17	0.024		0.74	1.82	0.019		0.88	2.27	0.031	
13:00	0.94	2.16	0.032		0.92	2.24	0.033		0.78	2.21	0.025		0.80	2.24	0.026		0.78	2.24	0.025		0.74	1.96	0.021		0.78	2.16	0.024	
14:00	0.80	2.03	0.024		0.83	2.14	0.027		0.80	2.22	0.026		0.83	2.04	0.025		0.81	1.73	0.021		0.74	2.24	0.024		0.74	1.95	0.021	
15:00	0.89	2.33	0.032		0.78	2.03	0.023		0.80	2.20	0.026		0.82	1.86	0.023		0.78	1.84	0.021		0.77	1.68	0.019		0.75	2.03	0.022	
16:00	0.86	2.13	0.028		0.91	2.26	0.033		0.82	2.21	0.027		0.82	1.95	0.024		0.76	1.72	0.018		0.76	1.99	0.022		0.79	2.02	0.024	
17:00	0.87	2.15	0.029		0.90	2.26	0.032		0.83	2.18	0.027		0.83	2.25	0.028		0.81	2.05	0.025		0.78	1.97	0.022		0.80	2.27	0.027	
18:00	0.89	2.22	0.031		0.86	2.13	0.028		0.84	2.24	0.028		0.81	1.95	0.024		0.92	2.20	0.035		0.81	2.19	0.026		0.83	2.23	0.027	
19:00	0.86	2.17	0.028		0.92	2.19	0.032		0.85	2.26	0.030		0.78	2.38	0.027		0.90	1.93	0.028		0.79	2.14	0.025		0.84	2.19	0.028	
20:00	0.84	2.15	0.027		0.92	2.16	0.031		0.87	2.19	0.029		0.85	2.29	0.031		0.89	2.17	0.030		0.83	2.27	0.028		0.85	2.15	0.028	
21:00	0.84	2.12	0.027		0.93	2.29	0.034		0.81	2.10	0.025		0.83	2.26	0.028		0.85	2.18	0.028		0.80	2.29	0.027		0.84	2.19	0.028	
22:00	0.84	2.21	0.028		0.80	2.05	0.024		0.81	2.11	0.025		0.81	2.02	0.024		0.84	2.11	0.027		0.79	2.06	0.024		0.77	2.00	0.022	
23:00	0.78	2.01	0.023		0.75	1.69	0.018		0.72	1.77	0.018		0.83	1.61	0.020		0.88	1.54	0.021		0.77	1.67	0.018		0.69	1.62	0.015	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.027				0.026				0.024				0.024				0.024				0.022				0.023	
Avg	0.87	1.97	0.027		0.87	1.92	0.026		0.82	1.92	0.024		0.82	1.90	0.024		0.86	1.84	0.024		0.81	1.84	0.022		0.82	1.90	0.023	
Time	01:45	01:00	01:00		06:30	03:05	06:00		23:05	01:10	00:05		00:15	04:35	04:35		18:20	01:15	19:20		23:00	03:00	05:55		04:20	02:10	04:20	
Min	0.60	1.01	0.012		0.62	0.98	0.012		0.57	0.98	0.010		0.56	0.72	0.008		0.60	0.89	0.013		0.60	0.91	0.012		0.61	1.04	0.010	
Time	11:15	11:15	11:15		10:30	09:55	09:55		07:15	07:15	07:15		20:40	06:40	20:40		18:45	18:30	18:30		07:30	07:30	07:30		16:50	12:30	12:30	
Max	1.47	3.69	0.105		1.25	3.84	0.079		1.26	4.11	0.093		1.24	4.02	0.066		1.55	3.64	0.099		1.12	3.08	0.059		1.09	3.28	0.054	

	D	V	Q	Rain
Total			0.170	
Avg	0.84	1.90	0.024	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.75	1.60	0.017	0.02	0.77	1.32	0.015		0.65	1.50	0.013		0.83	1.69	0.023		0.71	1.44	0.014		0.68	1.43	0.013		0.72	1.14	0.011	
01:00	0.76	1.16	0.013	0.11	0.77	1.30	0.014		0.76	1.16	0.013		0.72	1.38	0.014		0.73	1.18	0.012		0.78	1.16	0.013		0.75	1.11	0.012	
02:00	0.78	1.16	0.013	0.02	0.78	1.25	0.014		0.79	1.20	0.014		0.72	1.28	0.013		0.77	1.16	0.013		0.78	1.15	0.013		0.71	1.21	0.012	
03:00	0.79	1.18	0.013		0.78	1.25	0.014		0.78	1.19	0.014		0.79	1.25	0.014		0.78	1.21	0.014		0.78	1.19	0.014		0.76	1.21	0.013	
04:00	0.80	1.14	0.013		0.80	1.28	0.015		0.77	1.22	0.014		0.76	1.19	0.013		0.77	1.25	0.014		0.80	1.21	0.014		0.78	1.19	0.013	
05:00	0.80	1.28	0.015		0.78	1.16	0.013		0.76	1.18	0.013		0.74	1.22	0.013		0.75	1.28	0.014		0.76	1.23	0.013		0.73	1.31	0.014	
06:00	0.78	1.48	0.017		0.70	1.49	0.014		0.71	2.03	0.021		0.75	1.81	0.020		0.79	1.92	0.023		0.69	1.81	0.017		0.72	1.92	0.019	
07:00	0.81	1.44	0.017		0.70	1.96	0.019		0.95	2.56	0.041		0.94	2.32	0.035		1.05	2.74	0.053		1.02	2.49	0.044		0.96	2.47	0.039	
08:00	0.97	2.37	0.038		0.92	2.47	0.037		0.94	2.21	0.033		0.93	2.27	0.034		0.80	2.16	0.026		0.86	2.37	0.031		0.88	2.17	0.030	
09:00	1.00	2.48	0.040		0.94	2.21	0.033		0.95	2.14	0.032		0.84	2.17	0.027		0.84	2.17	0.028		0.89	2.30	0.032		0.87	2.14	0.028	
10:00	1.05	2.40	0.042		0.94	2.50	0.038		0.89	2.16	0.030		0.82	2.18	0.027		0.73	2.09	0.022		0.79	2.27	0.026		0.84	2.16	0.028	
11:00	0.91	2.26	0.033		0.92	2.15	0.031		0.83	2.34	0.029		0.78	2.11	0.024		0.80	2.18	0.026		0.79	2.18	0.026		0.78	2.13	0.024	
12:00	0.93	2.24	0.033		0.90	2.26	0.032		0.81	2.24	0.027		0.74	1.77	0.018		0.77	1.98	0.022		0.80	2.02	0.024		0.73	2.13	0.022	
13:00	0.83	2.16	0.027		0.81	2.25	0.027		0.81	2.29	0.027		0.75	1.39	0.015		0.76	2.14	0.024		0.76	2.08	0.023		0.73	2.07	0.022	
14:00	0.82	2.23	0.027		0.79	2.16	0.025		0.78	2.22	0.025		0.77	2.08	0.024		0.72	1.81	0.018		0.67	1.87	0.017		0.73	2.10	0.022	
15:00	0.80	2.23	0.026		0.79	2.07	0.024		0.75	2.13	0.023		0.76	1.99	0.022		0.73	1.69	0.018		0.76	1.81	0.020		0.68	1.71	0.016	
16:00	0.78	2.19	0.025		0.87	2.23	0.030		0.74	1.71	0.018		0.73	1.77	0.018		0.71	1.71	0.017		0.67	1.92	0.017		0.72	1.98	0.020	
17:00	0.77	2.02	0.023		0.82	2.15	0.026		0.80	2.10	0.025		0.75	2.18	0.023		0.72	2.16	0.022		0.74	2.14	0.023		0.77	2.22	0.025	
18:00	0.91	2.41	0.036		0.85	2.21	0.028		0.82	2.22	0.027		0.86	2.12	0.027		0.70	1.98	0.020		0.74	2.02	0.022		0.80	2.29	0.028	
19:00	0.79	2.13	0.025		0.86	2.24	0.029		0.89	2.19	0.030		0.76	2.11	0.023		0.92	2.35	0.036		0.84	2.25	0.030		0.75	2.16	0.023	
20:00	0.87	2.26	0.030		0.90	2.25	0.032		0.89	2.24	0.031		0.79	2.20	0.025		0.88	2.15	0.029		0.83	2.17	0.027		0.80	2.15	0.026	
21:00	0.78	2.15	0.025		0.86	2.15	0.028		0.82	2.11	0.026		0.90	2.23	0.032		0.78	2.17	0.025		0.86	2.17	0.028		0.81	1.75	0.023	
22:00	0.75	1.81	0.020		0.76	2.02	0.022		0.72	1.98	0.020		0.80	2.17	0.025		0.77	2.06	0.023		0.80	2.21	0.026		0.78	1.72	0.020	
23:00	0.74	1.58	0.017		0.68	1.69	0.016		0.75	1.24	0.013		0.73	1.72	0.018		0.69	1.67	0.016		0.73	2.01	0.021		0.73	1.74	0.018	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.024	0.15			0.024				0.023				0.022				0.022				0.022				0.021	
Avg	0.83	1.89	0.024		0.82	1.92	0.024		0.81	1.90	0.023		0.79	1.86	0.022		0.78	1.86	0.022		0.78	1.89	0.022		0.77	1.84	0.021	
Time	00:40	03:45	04:35		23:50	01:40	05:05		06:45	01:10	16:25		15:20	05:30	04:35		13:30	02:30	05:00		14:15	02:35	14:15		12:55	03:20	22:30	
Min	0.57	0.91	0.011		0.58	0.94	0.010		0.53	0.94	0.009		0.61	0.98	0.010		0.58	0.94	0.011		0.53	0.94	0.009		0.54	0.96	0.009	
Time	08:05	18:15	18:15		08:15	08:15	08:15		07:35	07:30	07:30		21:35	10:55	21:35		07:00	07:00	07:00		07:05	07:05	07:05		21:50	07:20	21:50	
Max	1.25	4.17	0.094		1.15	3.64	0.073		1.23	3.70	0.079		1.18	2.89	0.054		1.56	4.12	0.128		1.27	4.51	0.104		1.36	3.48	0.078	

	D	V	Q	Rain
Total			0.159	0.15
Avg	0.80	1.88	0.023	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.75	1.32	0.014		0.67	1.46	0.013		0.78	1.40	0.016		0.67	1.21	0.011		0.70	1.21	0.012		0.77	1.06	0.012		1.32	1.13	0.028	
01:00	0.77	1.10	0.012		0.72	1.10	0.011		0.78	1.14	0.013		0.74	1.24	0.013		0.73	1.18	0.012		0.78	1.38	0.016		1.29	1.21	0.029	
02:00	0.77	1.16	0.013		0.76	1.15	0.013		0.78	1.11	0.012		0.79	1.29	0.015		0.75	1.29	0.014		0.74	1.11	0.012		1.18	1.14	0.024	
03:00	0.77	1.25	0.014		0.69	1.37	0.013		0.82	1.14	0.014		0.76	1.12	0.012		0.77	1.24	0.014		0.77	1.14	0.013		1.04	1.19	0.021	
04:00	0.78	1.27	0.014		0.75	1.16	0.013		0.79	1.13	0.013		0.77	1.28	0.014		0.78	1.28	0.014		0.79	1.19	0.014		0.95	1.07	0.016	
05:00	0.75	1.29	0.014		0.73	1.34	0.013		0.84	1.14	0.014		0.75	1.24	0.014		0.71	1.35	0.014		0.77	1.15	0.013		1.17	1.17	0.024	
06:00	0.70	1.46	0.014		0.71	1.49	0.015		0.79	1.66	0.019		0.72	1.75	0.018		0.63	1.76	0.015		0.85	2.43	0.033		1.54	1.58	0.049	
07:00	0.76	2.14	0.024		0.75	1.84	0.020		0.93	2.49	0.038		1.05	2.59	0.047		1.07	2.71	0.050		1.04	2.37	0.042		1.79	2.40	0.090	
08:00	0.86	2.06	0.027		0.89	2.27	0.034		0.85	2.13	0.027		0.94	2.21	0.033		0.90	2.24	0.032		1.46	2.14	0.060		1.73	2.07	0.075	
09:00	0.97	2.38	0.038		0.84	2.19	0.028		0.89	2.32	0.034		0.93	2.25	0.033		0.90	2.25	0.032		1.81	1.78	0.068		1.71	2.11	0.075	
10:00	0.96	2.29	0.035		0.99	2.42	0.040		0.89	2.16	0.030		0.90	2.14	0.031		0.85	2.39	0.031		1.92	1.83	0.077		1.74	1.92	0.071	
11:00	0.94	2.33	0.035		0.93	2.19	0.032		0.96	2.20	0.033		0.67	2.00	0.018		0.74	1.77	0.020		1.86	1.67	0.067		1.64	1.73	0.058	
12:00	0.78	2.25	0.026		0.87	2.15	0.029		0.82	2.21	0.027		0.72	1.88	0.019		0.87	2.25	0.031		1.81	1.69	0.067		1.67	1.83	0.063	
13:00	0.77	1.99	0.022		0.82	2.17	0.026		0.83	2.27	0.028		0.64	1.78	0.015		0.88	2.17	0.030		1.75	1.55	0.057		1.55	1.71	0.053	
14:00	0.80	2.23	0.026		0.83	2.22	0.027		0.72	2.18	0.022		0.69	1.91	0.018		0.71	1.98	0.020		1.76	1.51	0.056		1.46	1.48	0.042	
15:00	0.76	2.01	0.022		0.77	2.02	0.022		0.81	2.21	0.027		0.67	1.92	0.018		0.68	1.39	0.013		1.75	1.45	0.053		1.62	1.64	0.055	
16:00	0.86	2.19	0.029		0.80	2.14	0.025		0.79	2.30	0.027		0.66	1.93	0.018		0.81	1.82	0.024		1.91	1.68	0.070		1.63	1.62	0.054	
17:00	0.77	2.24	0.025		0.79	2.22	0.026		0.93	2.39	0.035		0.75	2.01	0.022		0.83	2.15	0.028		1.83	1.70	0.066		1.59	1.64	0.054	
18:00	0.83	2.14	0.027		0.83	2.06	0.026		0.81	2.22	0.028		0.90	2.34	0.034		0.82	2.08	0.026		1.77	1.62	0.061		1.76	1.89	0.070	
19:00	0.74	2.02	0.022		0.89	2.25	0.031		0.97	2.41	0.039		0.89	2.15	0.029		0.91	2.33	0.034		1.88	1.99	0.081		1.79	1.82	0.070	
20:00	0.81	2.00	0.024		0.90	2.17	0.031		0.93	2.26	0.033		1.00	2.41	0.042		0.94	2.17	0.033		1.86	1.89	0.075		1.45	1.45	0.041	
21:00	0.79	2.22	0.026		0.86	2.15	0.028		0.87	1.88	0.026		0.83	2.17	0.028		0.91	2.25	0.032		1.85	1.75	0.070		1.34	2.22	0.057	
22:00	0.78	2.09	0.024		0.80	2.05	0.024		0.77	1.89	0.022		0.78	2.12	0.024		0.83	2.13	0.027		1.76	1.68	0.062		1.00	1.69	0.028	
23:00	0.69	1.69	0.016		0.76	1.57	0.017		0.66	1.78	0.016		0.64	1.47	0.013		0.68	1.34	0.013		1.57	1.49	0.048		0.97	1.55	0.024	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.023				0.023				0.025				0.022				0.024				0.050				0.049	
Avg	0.80	1.88	0.023		0.81	1.88	0.023		0.83	1.92	0.025		0.79	1.85	0.022		0.81	1.86	0.024		1.46	1.63	0.050		1.46	1.64	0.049	
Time	23:35	01:50	23:35		05:25	03:05	03:05		22:45	02:50	02:50		23:25	03:35	23:25		23:55	01:30	15:20		02:00	01:45	01:45		23:50	00:15	03:55	
Min	0.60	0.98	0.010		0.57	0.81	0.008		0.55	0.88	0.010		0.39	0.98	0.006		0.50	0.98	0.009		0.58	0.72	0.007		0.80	0.88	0.013	
Time	09:35	11:00	09:35		10:30	08:30	08:30		19:10	19:10	19:10		20:40	20:35	20:35		07:10	07:10	07:10		08:30	06:40	19:00		19:15	21:10	21:05	
Max	1.25	3.37	0.067		1.24	4.02	0.083		1.26	3.87	0.088		1.27	4.11	0.095		1.27	3.92	0.090		2.36	3.69	0.110		2.02	3.32	0.117	

	D	V	Q	Rain
Total			0.215	
Avg	0.99	1.81	0.031	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	0.74	1.18	0.012		0.68	1.36	0.012	
01:00	1.00	1.54	0.029		0.69	1.18	0.011	
02:00	0.78	1.18	0.013		0.69	1.18	0.011	
03:00	0.78	1.25	0.014		0.76	1.26	0.014	
04:00	0.75	1.17	0.012		0.73	1.24	0.013	
05:00	0.75	1.19	0.013		0.77	1.10	0.012	
06:00	0.93	1.38	0.021		0.70	1.44	0.014	
07:00	1.14	1.71	0.034		0.70	1.58	0.015	
08:00	1.47	1.91	0.056		0.94	2.14	0.035	
09:00	1.74	2.35	0.086		1.02	2.31	0.039	
10:00	1.71	2.45	0.087		1.06	2.33	0.042	
11:00	1.72	2.45	0.088		0.92	2.14	0.031	
12:00	1.30	1.90	0.047		0.91	2.17	0.031	
13:00	1.61	2.17	0.071		0.94	2.12	0.031	
14:00	1.20	1.80	0.039		0.76	2.18	0.025	
15:00	0.92	2.17	0.031		0.62	1.84	0.015	
16:00	0.94	2.16	0.032		0.71	2.11	0.021	
17:00	0.82	2.12	0.029		0.79	2.29	0.027	
18:00	0.75	2.07	0.022		0.82	2.09	0.026	
19:00	0.93	2.24	0.033		0.74	1.98	0.021	
20:00	0.88	2.18	0.030		0.99	2.32	0.038	
21:00	0.65	1.95	0.017		0.93	2.10	0.031	
22:00	0.88	2.19	0.030		0.78	2.13	0.025	
23:00	0.70	1.85	0.018		0.65	1.58	0.013	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.036				0.023	
Avg	1.05	1.86	0.036		0.81	1.84	0.023	
Time	21:50	03:55	06:00		15:35	05:15	04:30	
Min	0.53	0.94	0.009		0.47	0.88	0.007	
Time	09:00	17:40	10:55		08:10	08:10	08:10	
Max	1.90	3.57	0.121		1.29	3.92	0.092	

	D	V	Q	Rain
Total			0.059	
Avg	0.93	1.85	0.030	

Site Commentary

Site Information

6A-13	
Pipe Dimensions	8 "
Silt Level	0.00"

Overview

Site 6A-13 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 26.1% full at its recorded peak of 2.09 inches and approximately 15.5% full during its recorded average depth of 1.24 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.24	6.78	0.163
Minimum	0.44	3.30	0.020
Maximum	2.09	9.95	0.408
Time of Minimum	3/29/2014 4:25 AM	4/29/2014 2:45 AM	3/29/2014 4:25 AM
Time of Maximum	4/13/2014 10:35 AM	4/27/2014 10:25 AM	4/20/2014 10:15 AM

Data Quality

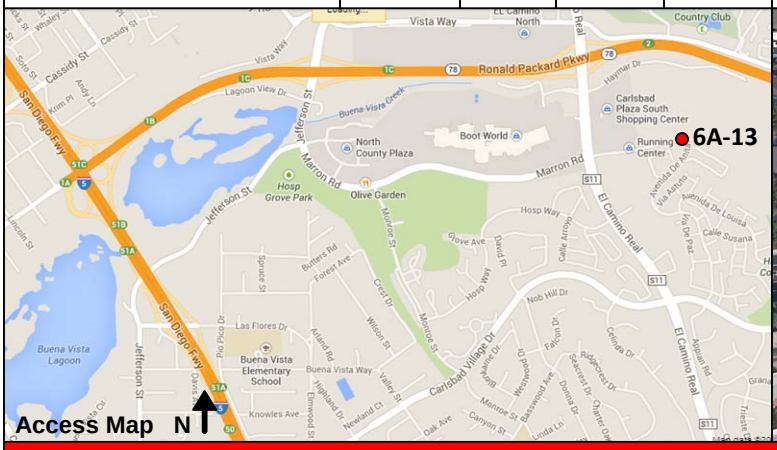
Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

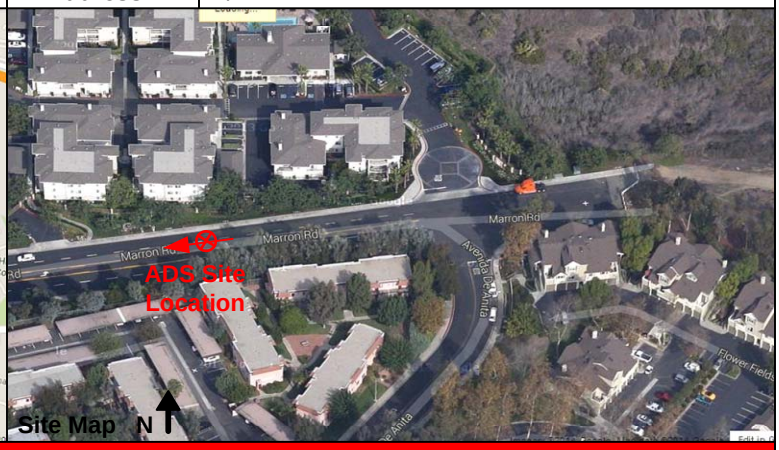
ADS Site Report

Quality Form

Project Name:	Carlsbad Temp 2014	**City / State:**	Carlsbad, CA	**Date Installed:** 2/20/14	**FM Initials:** JG
Site Name:	6A-13	**Monitor Series:**	3600	**Monitor S/N:**	1287
Address / Location:	2504-2508 Marron RD			**Manhole #:**	6A-13
				Map Page #:	N/A
Access:	Drive	**Type of System:**	Sanitary [X] Storm [ ] Combined [ ]	**Pipe Height:**	8.00"
				Pipe Width:	8.00"
				IP Address:	N/A



Access Map N



Site Map N

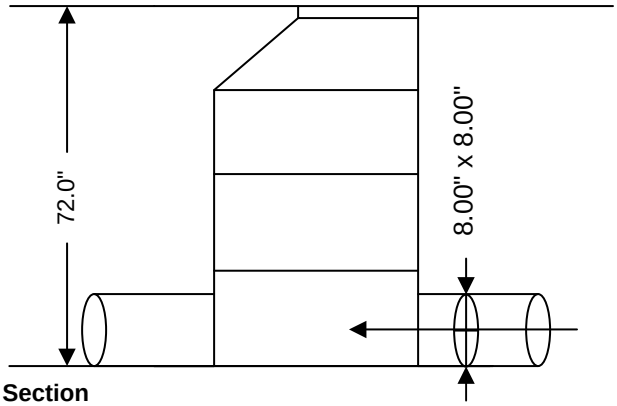
Investigation Information:

Date/Time of Investigation:	2/20/14 @ 11:00 a.m.		
Site Hydraulics:	Low depth with Fast velocity		
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.13"	**+/-**	.25
Range (Air Dof):		**+/-**	
Peak Velocity:	6.80	**Fps**	
Silt:	0.00"	**Inches**	

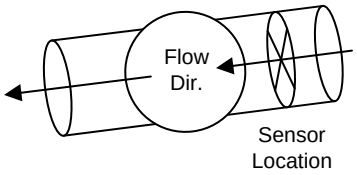
Manhole Information:

Manhole Depth:	72.0"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [X]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard installation	**Trunk**	[ ]	[ ]		
Sensors/ Devices:	Ultrasonic Sensor / Velocity Sensor	**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height:	No Evidence of Surcharge **Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:	RG 1	**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

6A-13

Flow Monitor

6A-13

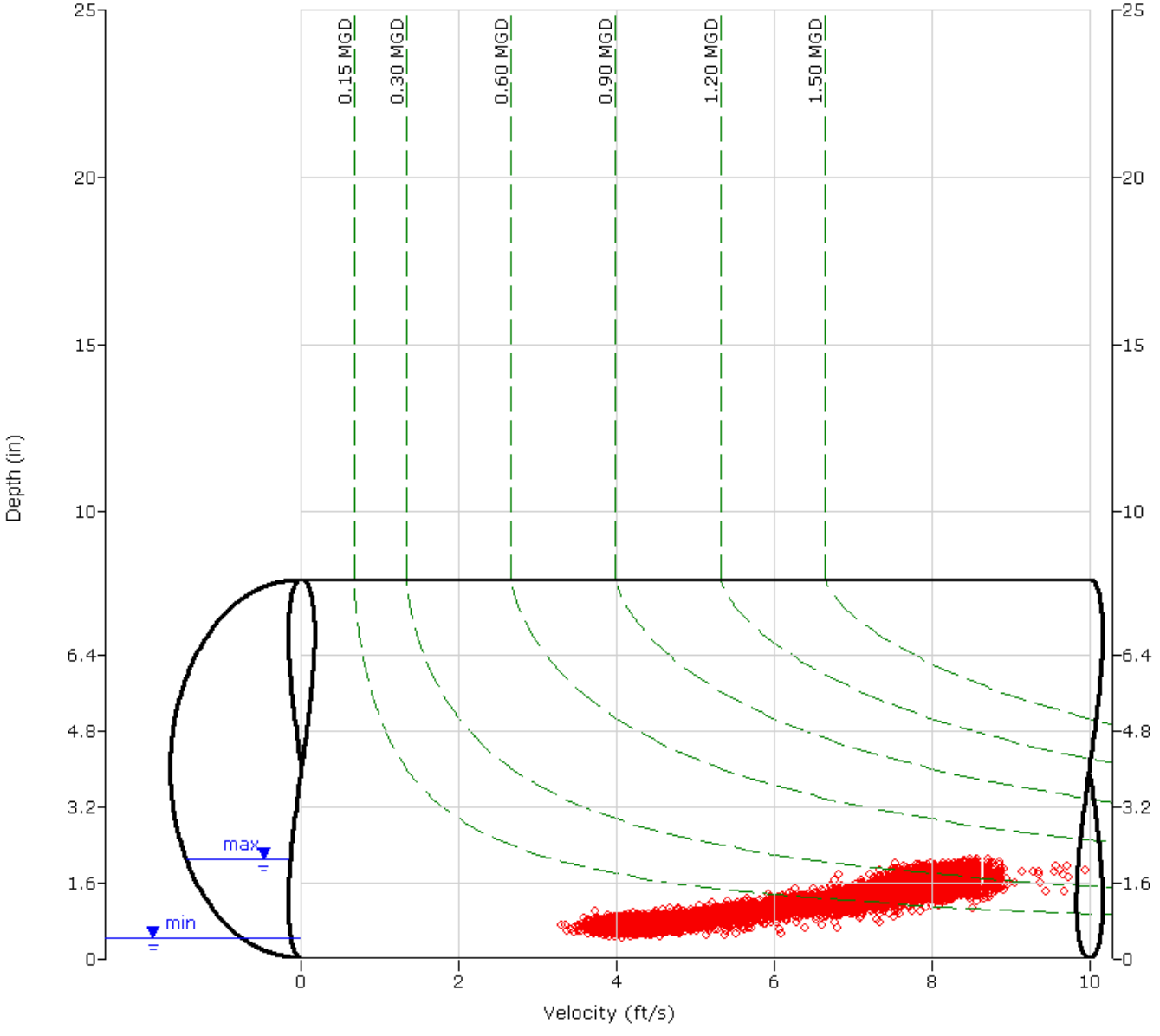
Pipe Height
8.00 in

Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



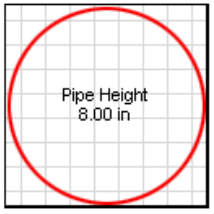
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

6A-13

Flow Monitor

6A-13

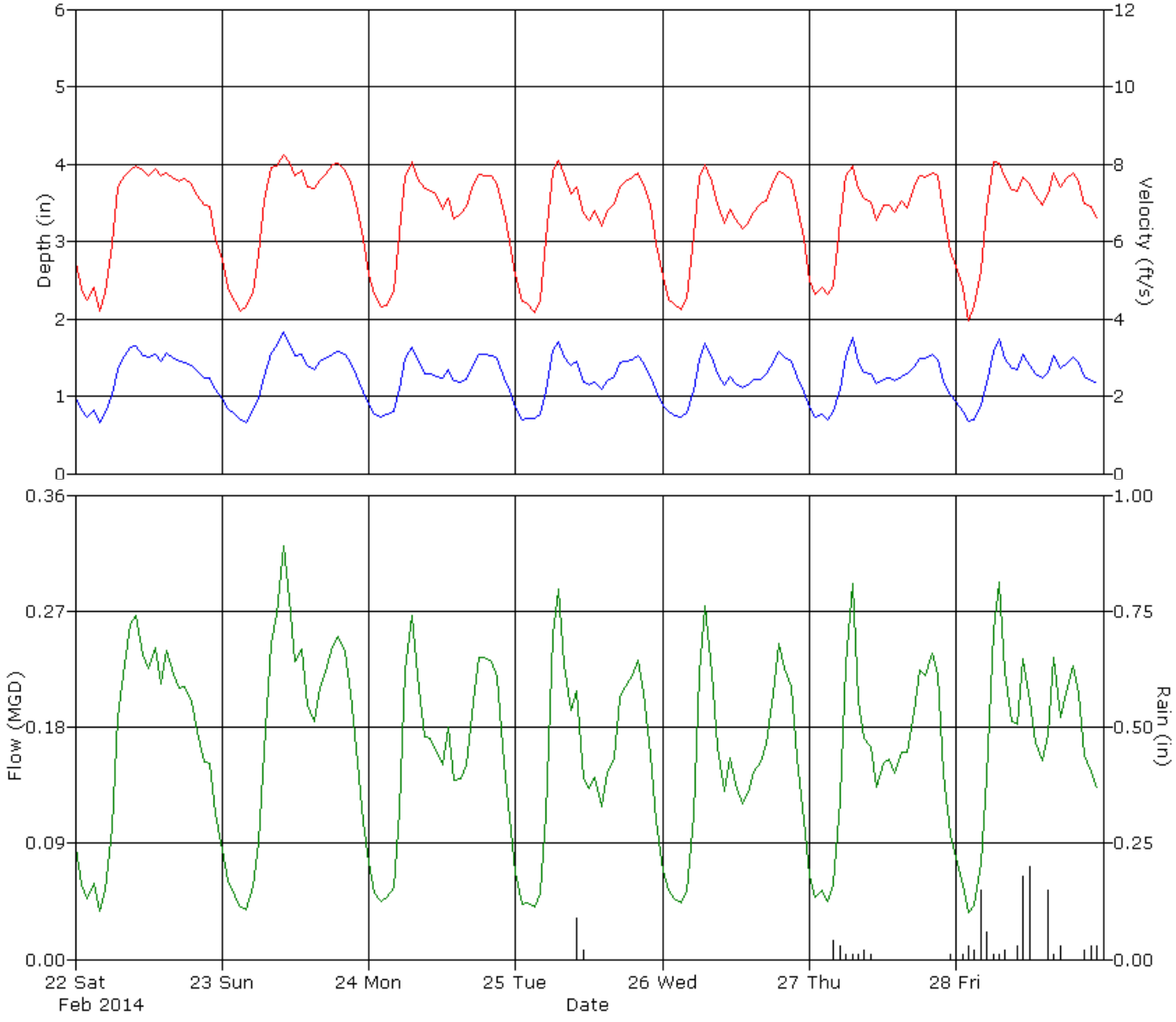


Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

6A-13

Flow Monitor

6A-13

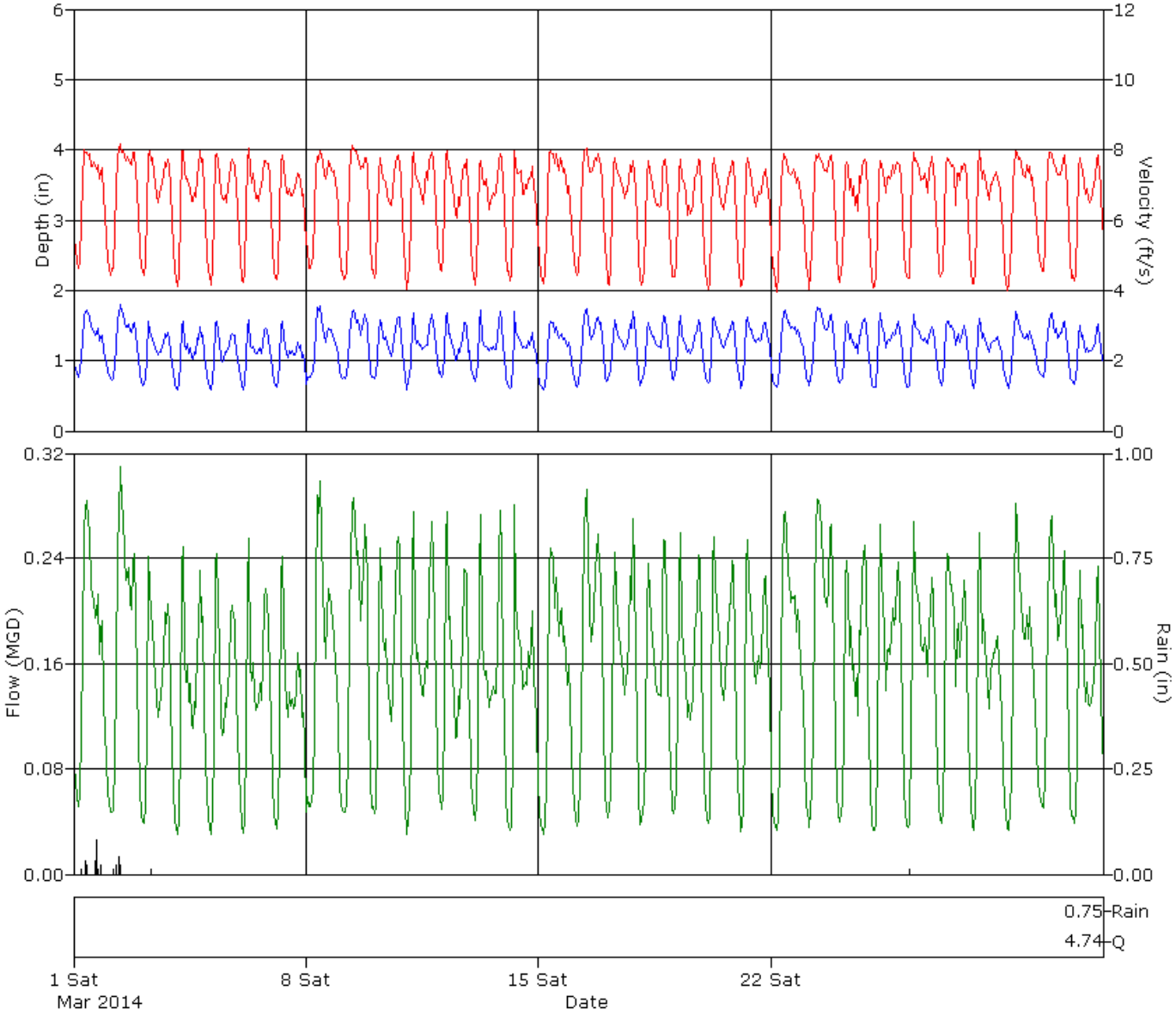
Pipe Height
8.00 in

Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

6A-13

Flow Monitor

6A-13

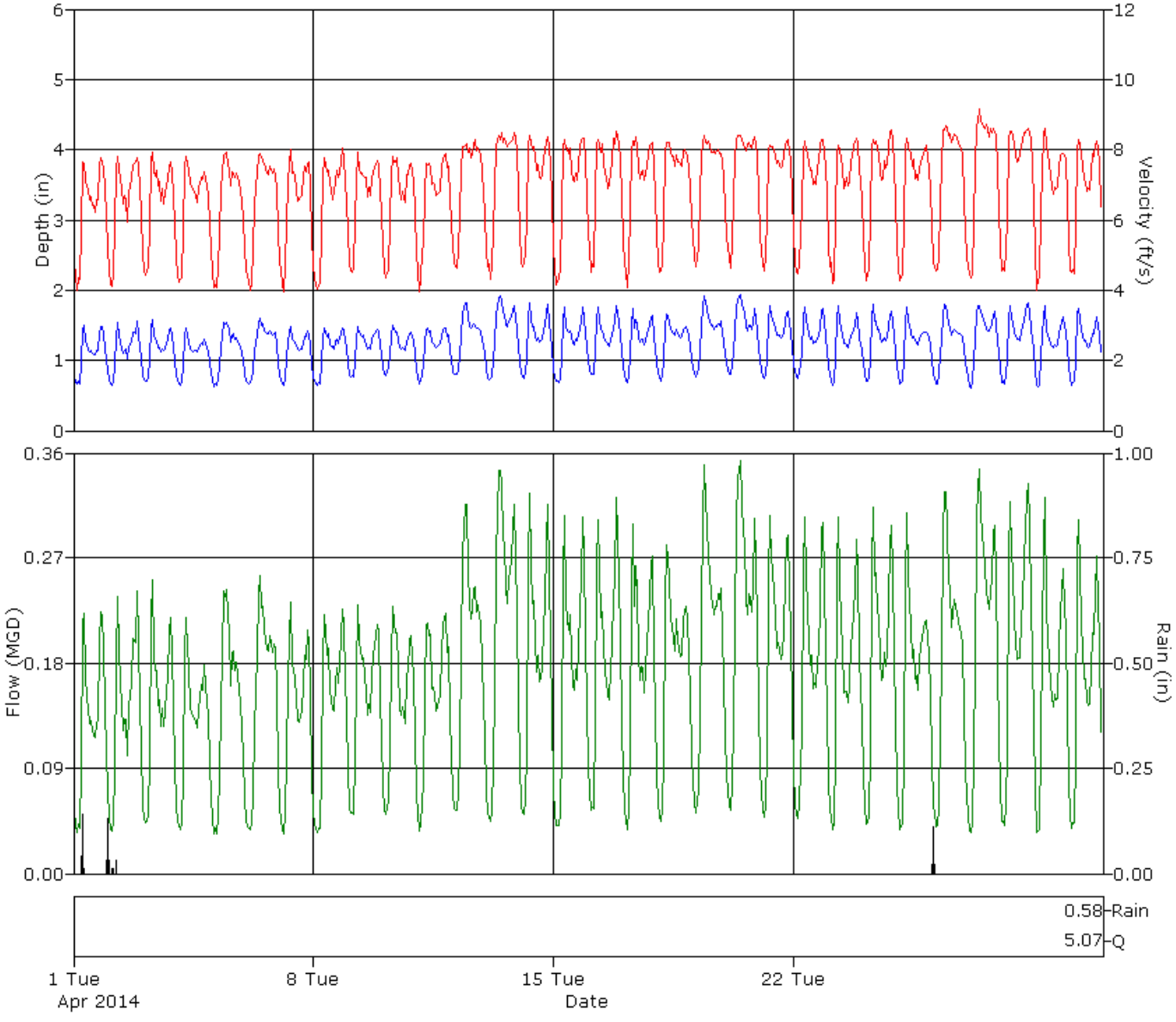
Pipe Height
8.00 in

Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

6A-13

Flow Monitor

6A-13

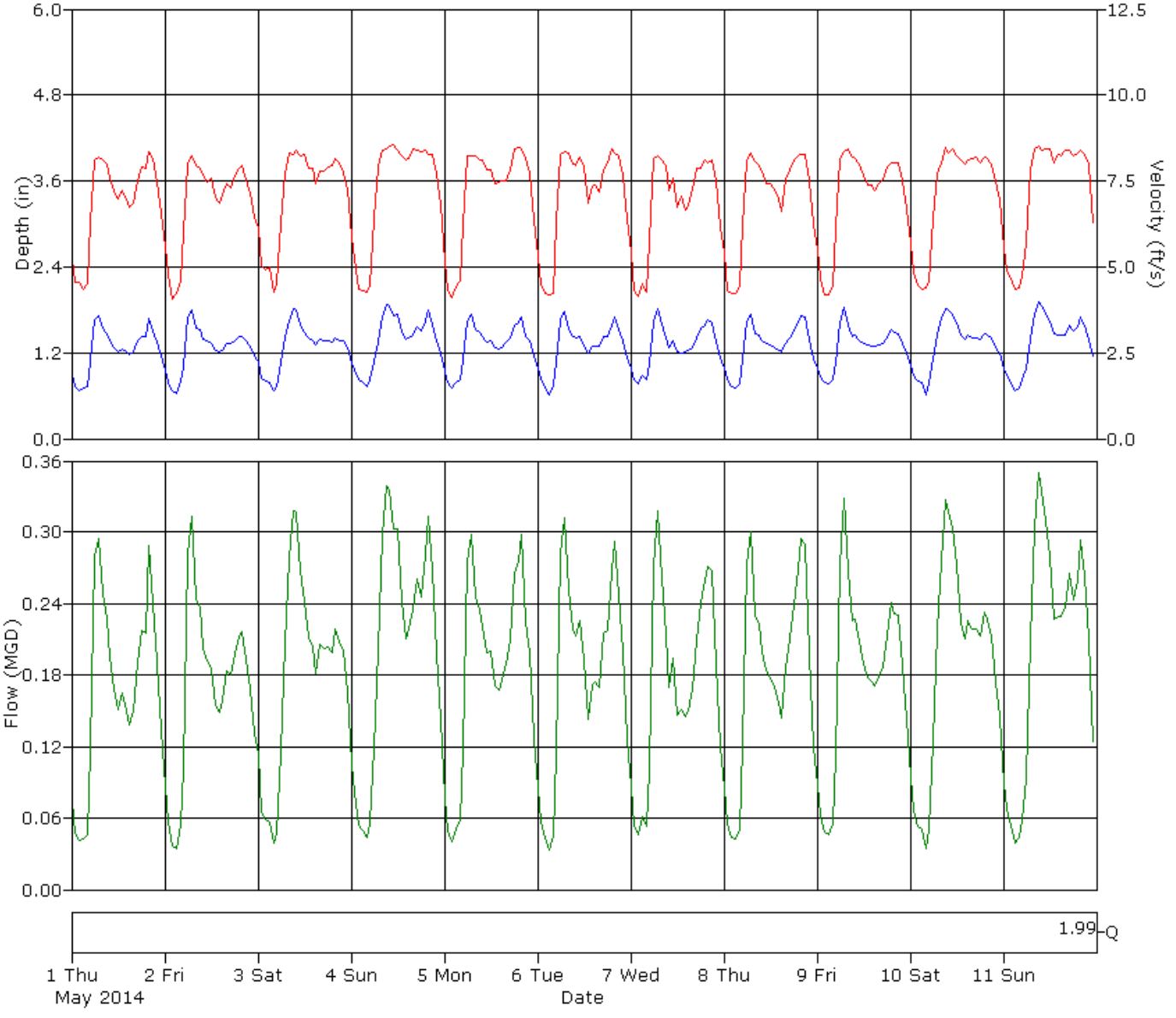
Pipe Height
8.00 in

Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

6A-13, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	04:40	0.56	10:25	1.81	1.26	04:15	3.60	13:30	8.72	6.73	04:50	0.029	13:30	0.322	0.166	0.166	
2/23/2014	04:50	0.48	10:15	2.02	1.28	03:55	3.77	10:25	8.52	6.78	04:50	0.024	10:15	0.379	0.175	0.175	
2/24/2014	02:55	0.69	13:40	1.77	1.23	02:55	3.97	07:20	8.45	6.64	02:55	0.038	07:20	0.299	0.156	0.156	
2/25/2014	01:45	0.59	07:10	1.88	1.21	03:40	3.75	07:15	8.48	6.58	02:00	0.034	07:10	0.330	0.154	0.154	0.11
2/26/2014	01:35	0.62	07:15	1.80	1.20	03:40	3.84	06:50	8.35	6.51	04:00	0.034	07:15	0.316	0.148	0.148	
2/27/2014	01:20	0.54	07:10	1.97	1.21	00:55	4.22	07:15	8.31	6.65	01:20	0.031	07:05	0.352	0.154	0.154	0.14
2/28/2014	03:00	0.55	07:25	1.85	1.26	02:25	3.53	06:35	8.52	6.83	02:50	0.028	07:45	0.322	0.166	0.166	1.01
3/1/2014	02:45	0.72	11:35	1.92	1.28	05:20	4.09	10:50	8.48	6.84	05:00	0.046	11:25	0.345	0.170	0.170	0.64
3/2/2014	02:10	0.62	10:10	2.05	1.29	03:50	3.94	11:05	8.72	6.82	03:50	0.035	10:10	0.384	0.176	0.176	0.09
3/3/2014	03:45	0.56	06:35	1.74	1.13	03:25	3.92	07:55	8.35	6.67	03:00	0.033	06:35	0.301	0.139	0.139	0.01
3/4/2014	03:10	0.48	19:45	1.77	1.10	04:05	3.74	07:10	8.58	6.58	03:05	0.023	07:10	0.317	0.134	0.134	
3/5/2014	03:35	0.51	06:55	1.78	1.10	03:30	3.47	07:10	8.52	6.57	03:30	0.023	06:55	0.304	0.134	0.134	
3/6/2014	03:25	0.51	07:15	1.74	1.13	02:55	3.72	07:20	8.45	6.64	02:50	0.025	07:15	0.294	0.139	0.139	
3/7/2014	03:30	0.55	07:55	1.71	1.08	02:30	3.55	06:25	8.15	6.47	02:30	0.026	07:55	0.281	0.125	0.125	
3/8/2014	00:10	0.48	08:40	1.96	1.25	02:50	4.29	16:25	8.53	6.75	00:10	0.029	10:50	0.345	0.165	0.165	
3/9/2014	04:15	0.52	10:55	1.95	1.28	03:50	3.87	09:30	8.55	6.70	04:15	0.025	10:55	0.359	0.173	0.173	
3/10/2014	02:50	0.60	06:05	1.91	1.22	03:25	3.97	18:35	8.79	6.58	02:00	0.033	06:05	0.331	0.154	0.154	
3/11/2014	01:20	0.48	06:15	1.91	1.22	01:45	3.74	18:55	8.53	6.64	01:15	0.021	06:15	0.337	0.156	0.156	
3/12/2014	02:55	0.52	06:20	1.96	1.19	03:10	4.14	06:20	8.52	6.59	02:55	0.028	06:20	0.365	0.148	0.148	
3/13/2014	01:00	0.54	20:30	1.98	1.20	02:10	3.64	20:40	8.43	6.59	02:05	0.028	20:30	0.350	0.150	0.150	
3/14/2014	03:00	0.52	07:10	1.88	1.14	03:35	3.79	07:15	8.28	6.57	03:35	0.024	07:10	0.327	0.140	0.140	
3/15/2014	02:50	0.51	11:00	1.88	1.16	03:00	3.84	17:00	8.63	6.68	04:35	0.025	11:00	0.337	0.150	0.150	
3/16/2014	04:00	0.54	12:10	1.93	1.26	05:25	4.17	11:15	8.48	6.75	04:00	0.028	10:50	0.331	0.168	0.168	
3/17/2014	00:30	0.53	20:25	2.01	1.23	02:45	3.64	07:55	8.28	6.59	00:30	0.027	20:25	0.354	0.156	0.156	
3/18/2014	00:40	0.55	20:50	1.80	1.22	03:15	3.69	07:55	8.11	6.40	00:40	0.029	20:50	0.303	0.150	0.150	
3/19/2014	02:25	0.61	06:40	1.89	1.21	03:50	3.77	07:15	8.04	6.42	02:25	0.032	06:40	0.327	0.147	0.147	
3/20/2014	02:35	0.57	07:15	1.90	1.24	04:00	3.74	21:10	8.41	6.44	02:35	0.027	07:15	0.324	0.155	0.155	
3/21/2014	02:40	0.51	06:55	1.76	1.24	03:15	3.52	09:05	8.33	6.44	03:20	0.023	06:55	0.284	0.155	0.155	
3/22/2014	03:50	0.55	10:30	1.97	1.25	04:55	3.77	09:20	8.21	6.50	03:50	0.027	10:30	0.337	0.161	0.161	
3/23/2014	02:30	0.55	12:25	1.94	1.29	05:05	3.67	09:50	8.40	6.60	04:10	0.027	11:05	0.329	0.173	0.173	
3/24/2014	03:10	0.56	18:35	1.83	1.22	02:45	3.69	19:55	8.18	6.52	03:05	0.029	18:35	0.312	0.153	0.153	
3/25/2014	03:30	0.52	07:30	1.85	1.22	02:40	3.74	06:50	8.25	6.63	03:30	0.025	07:30	0.311	0.157	0.157	
3/26/2014	03:10	0.52	07:10	1.91	1.21	04:05	3.74	07:40	8.21	6.69	04:05	0.025	07:10	0.329	0.156	0.156	0.01
3/27/2014	03:40	0.46	07:15	1.84	1.24	02:20	4.01	07:30	8.25	6.70	03:40	0.024	07:15	0.322	0.160	0.160	
3/28/2014	03:15	0.51	07:10	1.90	1.17	02:20	3.80	07:10	8.58	6.54	03:15	0.024	07:10	0.352	0.143	0.143	
3/29/2014	04:25	0.44	09:35	1.89	1.20	03:45	3.65	09:25	8.45	6.58	04:25	0.020	09:20	0.331	0.154	0.154	
3/30/2014	05:00	0.63	11:10	1.98	1.25	05:40	4.11	09:20	8.43	6.70	02:55	0.038	11:00	0.348	0.162	0.162	
3/31/2014	04:20	0.58	07:15	1.70	1.13	03:35	3.65	07:10	8.16	6.47	03:35	0.028	07:15	0.281	0.136	0.136	
4/1/2014	03:10	0.53	20:20	1.74	1.12	04:25	3.53	06:55	8.18	6.36	02:40	0.026	20:20	0.295	0.131	0.131	0.22
4/2/2014	03:25	0.55	20:20	1.74	1.14	03:15	3.62	07:55	8.21	6.48	03:25	0.025	20:20	0.292	0.137	0.137	0.21
4/3/2014	04:30	0.59	07:15	1.84	1.15	04:20	3.99	07:35	8.38	6.53	04:30	0.034	07:15	0.315	0.139	0.139	
4/4/2014	03:25	0.53	07:20	1.58	1.09	02:15	3.69	09:05	8.36	6.45	02:20	0.027	06:50	0.249	0.128	0.128	
4/5/2014	04:40	0.52	11:05	1.75	1.16	02:35	3.53	09:45	8.67	6.46	04:40	0.023	11:05	0.309	0.143	0.143	
4/6/2014	02:50	0.54	10:05	1.89	1.19	03:30	3.37	10:05	8.45	6.51	03:30	0.024	10:05	0.345	0.150	0.150	
4/7/2014	04:00	0.53	08:10	1.57	1.14	03:05	3.43	07:45	8.48	6.50	04:00	0.026	08:10	0.248	0.138	0.138	
4/8/2014	03:45	0.55	07:25	1.56	1.17	02:55	3.53	20:40	8.48	6.58	03:45	0.028	09:20	0.255	0.146	0.146	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014	02:25	0.62	07:20	1.65	1.19	02:20	4.04	07:15	8.53	6.65	02:25	0.034	07:20	0.280	0.147	0.147	
4/10/2014	01:50	0.61	07:20	1.63	1.19	02:15	3.99	21:10	8.43	6.61	01:50	0.034	07:20	0.262	0.147	0.147	
4/11/2014	02:55	0.53	20:20	1.60	1.19	03:55	3.75	20:40	8.47	6.64	02:55	0.025	20:20	0.258	0.150	0.150	
4/12/2014	03:00	0.62	09:25	1.94	1.33	02:30	4.27	09:00	8.58	7.11	04:00	0.037	09:25	0.362	0.189	0.189	
4/13/2014	04:20	0.61	10:35	2.09	1.39	04:40	3.65	14:05	9.05	7.21	04:20	0.035	10:35	0.397	0.208	0.208	
4/14/2014	03:20	0.62	07:05	1.92	1.31	01:45	4.21	06:55	8.58	7.13	03:20	0.037	07:05	0.358	0.185	0.185	
4/15/2014	02:40	0.57	07:00	2.00	1.28	02:55	3.67	06:30	8.58	7.03	02:40	0.027	07:00	0.371	0.177	0.177	
4/16/2014	04:45	0.71	20:15	1.95	1.30	02:50	4.02	20:20	8.85	7.13	04:45	0.042	20:15	0.360	0.182	0.182	
4/17/2014	03:00	0.57	06:55	1.89	1.27	03:05	3.35	06:50	8.58	7.02	03:15	0.029	06:55	0.337	0.175	0.175	
4/18/2014	02:50	0.60	07:15	1.83	1.28	03:25	3.69	08:45	8.58	7.11	02:50	0.035	07:15	0.331	0.178	0.178	
4/19/2014	03:15	0.64	09:45	2.08	1.37	01:55	4.33	09:45	8.58	7.23	03:15	0.037	09:45	0.401	0.200	0.200	
4/20/2014	03:35	0.71	10:15	2.09	1.40	04:45	4.33	09:55	8.72	7.32	03:35	0.044	10:15	0.408	0.209	0.209	
4/21/2014	03:15	0.70	19:55	1.86	1.33	02:25	4.29	19:15	8.75	7.17	03:15	0.043	07:20	0.329	0.190	0.190	
4/22/2014	02:15	0.59	19:45	1.94	1.30	04:50	4.02	18:55	8.58	7.01	03:55	0.032	19:55	0.353	0.178	0.178	
4/23/2014	03:50	0.54	06:40	1.93	1.26	03:55	3.77	20:10	8.58	6.92	03:50	0.025	06:40	0.353	0.171	0.171	
4/24/2014	03:55	0.58	06:45	2.00	1.29	02:45	3.77	20:35	8.89	7.10	03:55	0.031	06:45	0.377	0.182	0.182	
4/25/2014	04:00	0.53	07:05	1.88	1.24	02:35	3.69	06:30	8.75	6.98	02:10	0.028	07:05	0.339	0.168	0.168	
4/26/2014	02:50	0.53	10:15	2.02	1.28	03:20	3.90	16:45	9.74	7.30	03:30	0.027	10:15	0.395	0.186	0.186	0.15
4/27/2014	04:40	0.46	09:50	1.94	1.31	04:35	3.80	10:25	9.95	7.37	05:20	0.020	10:40	0.408	0.198	0.198	
4/28/2014	03:40	0.56	20:40	1.90	1.34	03:45	3.64	16:45	9.46	7.42	03:40	0.028	20:20	0.359	0.202	0.202	
4/29/2014	03:10	0.55	07:15	1.92	1.25	02:45	3.30	06:30	8.79	6.93	02:40	0.025	07:15	0.367	0.168	0.168	
4/30/2014	02:50	0.54	07:20	1.93	1.24	01:40	4.04	06:50	8.58	6.90	02:50	0.027	07:20	0.359	0.167	0.167	
5/1/2014	03:45	0.55	06:40	1.91	1.24	03:30	3.92	06:40	8.58	6.89	04:15	0.030	06:40	0.355	0.167	0.167	
5/2/2014	03:00	0.55	07:15	1.99	1.24	02:20	3.48	15:55	8.58	6.85	02:05	0.027	07:15	0.372	0.165	0.165	
5/3/2014	05:15	0.55	10:20	2.01	1.28	04:50	3.37	18:30	8.82	7.13	04:50	0.024	10:20	0.367	0.180	0.180	
5/4/2014	04:45	0.64	09:50	2.05	1.37	02:50	3.65	11:20	8.82	7.26	04:45	0.036	09:50	0.391	0.204	0.204	
5/5/2014	02:45	0.57	07:00	1.97	1.29	02:20	3.74	21:30	8.80	7.11	02:45	0.029	07:00	0.370	0.182	0.182	
5/6/2014	03:55	0.50	06:55	1.89	1.28	02:00	3.79	08:10	8.85	7.06	03:55	0.024	06:55	0.349	0.179	0.179	
5/7/2014	02:15	0.56	07:25	1.98	1.28	02:00	3.52	07:30	8.58	6.82	02:00	0.026	07:25	0.370	0.173	0.173	
5/8/2014	03:25	0.60	07:10	1.92	1.29	01:50	3.80	07:05	8.58	6.95	03:00	0.033	07:10	0.356	0.177	0.177	
5/9/2014	03:25	0.67	07:30	1.93	1.29	01:50	3.72	08:35	8.97	7.05	03:25	0.038	07:30	0.359	0.177	0.177	
5/10/2014	04:25	0.47	10:20	1.90	1.31	04:00	3.84	11:00	8.72	7.14	04:25	0.022	10:20	0.349	0.187	0.187	
5/11/2014	04:00	0.59	09:20	1.99	1.35	03:30	3.95	09:30	8.85	7.21	04:00	0.031	09:30	0.381	0.200	0.200	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			12.916	2.59
Avg	1.24	6.78	0.163	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.99	5.44	0.087		0.95	5.53	0.085		0.91	5.15	0.075		0.85	5.14	0.067		0.87	5.10	0.069		0.85	4.99	0.066		0.94	5.34	0.079	0.02
01:00	0.81	4.78	0.058		0.85	4.81	0.061		0.77	4.63	0.052		0.69	4.47	0.042		0.80	4.49	0.053		0.73	4.65	0.048		0.80	4.81	0.058	0.01
02:00	0.74	4.49	0.047		0.77	4.45	0.049		0.73	4.29	0.044		0.71	4.36	0.043		0.75	4.40	0.047		0.77	4.82	0.053		0.68	3.95	0.037	0.03
03:00	0.81	4.82	0.058		0.70	4.19	0.041		0.77	4.33	0.048		0.71	4.15	0.041		0.74	4.25	0.044		0.70	4.63	0.045		0.69	4.34	0.041	0.02
04:00	0.66	4.21	0.037		0.66	4.29	0.038		0.81	4.69	0.056		0.77	4.48	0.051		0.78	4.54	0.053		0.80	4.86	0.058	0.04	0.88	5.25	0.075	0.15
05:00	0.78	4.65	0.053		0.81	4.67	0.056		1.08	6.21	0.115		1.08	6.06	0.112		1.07	6.13	0.111		1.09	6.56	0.124	0.03	1.17	6.87	0.141	0.06
06:00	1.02	5.94	0.102		0.97	5.68	0.090		1.49	7.67	0.224		1.59	7.81	0.251		1.47	7.67	0.221		1.51	7.71	0.229	0.01	1.57	8.04	0.254	0.01
07:00	1.35	7.40	0.188		1.26	7.03	0.161		1.63	8.04	0.266		1.71	8.09	0.287		1.68	7.97	0.274		1.75	7.96	0.292	0.01	1.75	8.03	0.293	0.01
08:00	1.52	7.69	0.229		1.55	7.92	0.244		1.49	7.61	0.220		1.51	7.73	0.229		1.51	7.55	0.223		1.42	7.37	0.201	0.01	1.49	7.66	0.223	0.02
09:00	1.64	7.84	0.261		1.65	7.96	0.268		1.28	7.37	0.173		1.40	7.23	0.193		1.29	6.96	0.164		1.30	7.12	0.171	0.02	1.35	7.32	0.185	
10:00	1.65	7.94	0.266		1.83	8.23	0.321		1.28	7.30	0.171		1.45	7.41	0.208	0.09	1.15	6.47	0.130		1.28	7.00	0.165	0.01	1.34	7.31	0.182	0.03
11:00	1.53	7.83	0.236		1.69	8.05	0.279		1.25	7.21	0.162		1.18	6.71	0.140	0.02	1.26	6.84	0.156		1.17	6.54	0.134		1.53	7.66	0.233	0.18
12:00	1.50	7.71	0.225		1.52	7.69	0.230		1.23	6.84	0.150		1.15	6.55	0.132		1.17	6.59	0.135		1.22	6.94	0.152		1.40	7.48	0.200	0.20
13:00	1.55	7.88	0.242		1.55	7.84	0.240		1.34	7.11	0.180		1.18	6.80	0.141		1.10	6.32	0.120		1.24	6.95	0.155		1.28	7.20	0.168	
14:00	1.44	7.69	0.214		1.40	7.42	0.197		1.19	6.58	0.139		1.08	6.39	0.118		1.14	6.48	0.129		1.20	6.76	0.144		1.24	6.93	0.154	
15:00	1.55	7.77	0.239		1.34	7.36	0.184		1.18	6.71	0.139		1.19	6.80	0.144		1.22	6.75	0.146		1.25	7.06	0.160		1.31	7.21	0.175	0.15
16:00	1.49	7.63	0.221		1.44	7.58	0.211		1.22	6.91	0.151		1.25	6.97	0.157		1.22	6.98	0.153		1.28	6.85	0.160		1.52	7.78	0.234	0.01
17:00	1.45	7.56	0.211		1.49	7.72	0.224		1.40	7.48	0.200		1.43	7.39	0.203		1.29	7.04	0.167		1.38	7.41	0.192		1.35	7.40	0.187	0.03
18:00	1.44	7.63	0.211		1.54	7.98	0.243		1.53	7.72	0.234		1.45	7.54	0.212		1.43	7.56	0.206		1.49	7.71	0.224		1.42	7.62	0.207	
19:00	1.40	7.48	0.200		1.57	8.01	0.251		1.54	7.69	0.234		1.47	7.67	0.220		1.57	7.80	0.245		1.48	7.67	0.220		1.50	7.76	0.227	
20:00	1.32	7.18	0.177		1.54	7.82	0.239		1.52	7.68	0.231		1.53	7.75	0.232		1.50	7.72	0.226		1.54	7.76	0.237		1.42	7.56	0.206	
21:00	1.23	6.94	0.153		1.43	7.52	0.206		1.48	7.49	0.218		1.44	7.48	0.207		1.44	7.58	0.211		1.48	7.71	0.221		1.25	6.99	0.159	0.02
22:00	1.23	6.89	0.152		1.28	6.98	0.164		1.24	6.76	0.152		1.25	6.93	0.158		1.25	6.94	0.156		1.20	6.77	0.144		1.19	6.89	0.146	0.03
23:00	1.09	6.08	0.113		1.05	6.08	0.106		1.07	6.00	0.109		1.07	5.95	0.108		1.06	6.05	0.108		1.02	5.76	0.096	0.01	1.15	6.59	0.132	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.166				0.175				0.156				0.154	0.11			0.148				0.154	0.14			0.166	1.01
Avg	1.26	6.73	0.166		1.28	6.78	0.175		1.23	6.64	0.156		1.21	6.58	0.154		1.20	6.51	0.148		1.21	6.65	0.154		1.26	6.83	0.166	
Time	04:40	04:15	04:50		04:50	03:55	04:50		02:55	02:55	02:55		01:45	03:40	02:00		01:35	03:40	04:00		01:20	00:55	01:20		03:00	02:25	02:50	
Min	0.56	3.60	0.029		0.48	3.77	0.024		0.69	3.97	0.038		0.59	3.75	0.034		0.62	3.84	0.034		0.54	4.22	0.031		0.55	3.53	0.028	
Time	10:25	13:30	13:30		10:15	10:25	10:15		13:40	07:20	07:20		07:10	07:15	07:10		07:15	06:50	07:15		07:10	07:15	07:05		07:25	06:35	07:45	
Max	1.81	8.72	0.322		2.02	8.52	0.379		1.77	8.45	0.299		1.88	8.48	0.330		1.80	8.35	0.316		1.97	8.31	0.352		1.85	8.52	0.322	

	D	V	Q	Rain
Total			1.118	1.26
Avg	1.24	6.67	0.160	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.09	6.16	0.114	0.32	0.98	5.52	0.087		0.83	5.20	0.065		0.84	5.24	0.066		0.81	5.05	0.062		0.90	5.59	0.078		0.87	5.21	0.070	
01:00	0.94	5.49	0.082	0.12	0.84	4.86	0.062		0.70	4.64	0.045		0.67	4.56	0.041		0.68	4.51	0.042		0.79	4.97	0.058		0.70	4.60	0.045	
02:00	0.89	5.19	0.072		0.80	4.66	0.055		0.65	4.60	0.039		0.63	4.33	0.036		0.63	4.46	0.037		0.64	4.27	0.037		0.66	4.37	0.040	
03:00	0.82	4.84	0.059		0.75	4.44	0.047		0.66	4.43	0.039		0.58	4.11	0.030		0.58	4.14	0.031		0.59	4.22	0.032		0.62	4.29	0.035	
04:00	0.77	4.64	0.052		0.73	4.62	0.047		0.75	4.75	0.052		0.67	4.45	0.042		0.73	4.69	0.048		0.66	4.52	0.041		0.72	4.60	0.047	
05:00	0.84	4.77	0.061		0.74	4.63	0.048	0.01	1.04	6.34	0.113		0.99	6.29	0.102		0.96	6.20	0.098		1.02	6.25	0.106		0.98	6.19	0.099	
06:00	1.05	6.02	0.108	0.01	0.95	5.68	0.087		1.55	7.80	0.241		1.50	7.97	0.234		1.52	7.83	0.236		1.47	7.68	0.220		1.50	7.66	0.227	
07:00	1.29	7.11	0.169		1.20	6.88	0.147	0.02	1.43	7.95	0.219		1.56	7.97	0.249		1.56	7.90	0.244		1.59	8.03	0.255		1.55	7.84	0.241	
08:00	1.61	8.02	0.260		1.58	7.83	0.250		1.37	7.68	0.198	0.01	1.24	7.39	0.165		1.41	7.67	0.207		1.20	7.44	0.159		1.36	7.57	0.195	
09:00	1.71	7.91	0.278	0.03	1.65	8.00	0.269	0.04	1.32	7.77	0.189		1.16	7.18	0.146		1.26	7.26	0.167		1.18	7.04	0.146		1.17	7.09	0.146	
10:00	1.72	7.92	0.284	0.02	1.79	8.16	0.310	0.02	1.24	7.32	0.165		1.24	7.17	0.160		1.05	6.87	0.122		1.21	7.34	0.160		1.12	6.80	0.131	
11:00	1.67	7.84	0.269		1.71	7.93	0.281		1.19	7.05	0.149		1.09	7.00	0.131		1.02	6.83	0.115		1.13	6.95	0.137		1.05	6.74	0.119	
12:00	1.62	7.88	0.258		1.67	7.97	0.273		1.14	6.74	0.134		1.19	6.92	0.145		0.99	6.62	0.106		1.10	6.63	0.124		1.15	6.88	0.138	
13:00	1.49	7.55	0.219		1.56	7.83	0.242		1.08	6.51	0.120		1.04	6.53	0.114		1.00	6.58	0.108		1.11	6.69	0.128		1.11	6.69	0.127	
14:00	1.45	7.54	0.211		1.49	7.68	0.223		1.11	6.72	0.129		1.03	6.52	0.111		1.13	6.68	0.130		1.14	6.52	0.130		1.14	6.71	0.133	
15:00	1.42	7.66	0.208		1.49	7.79	0.226		1.12	6.91	0.133		1.12	6.77	0.131		1.12	6.50	0.126		1.18	6.91	0.144		1.09	6.80	0.125	
16:00	1.37	7.55	0.194	0.03	1.53	7.72	0.232		1.19	7.11	0.150		1.11	6.67	0.127		1.16	6.97	0.142		1.11	6.93	0.132		1.09	6.91	0.127	
17:00	1.39	7.45	0.196	0.08	1.41	7.65	0.207		1.24	7.25	0.162		1.31	7.24	0.177		1.22	7.14	0.156		1.23	7.29	0.161		1.15	7.13	0.142	
18:00	1.45	7.57	0.212	0.01	1.40	7.57	0.200		1.38	7.64	0.198		1.31	7.50	0.181		1.37	7.60	0.196		1.42	7.69	0.209		1.26	7.34	0.168	
19:00	1.28	7.16	0.167		1.51	7.92	0.234		1.35	7.51	0.190		1.48	7.95	0.230		1.39	7.74	0.204		1.46	7.69	0.217		1.17	7.28	0.150	
20:00	1.35	7.34	0.185	0.02	1.55	7.94	0.244		1.40	7.73	0.205		1.34	7.64	0.191		1.36	7.67	0.196		1.43	7.59	0.209		1.22	7.12	0.156	
21:00	1.36	7.50	0.193		1.41	7.44	0.200		1.33	7.58	0.187		1.35	7.73	0.196		1.36	7.53	0.193		1.33	7.60	0.187		1.05	6.68	0.119	
22:00	1.13	6.69	0.132		1.19	6.85	0.145		1.11	6.93	0.132		1.11	6.77	0.128		1.12	6.93	0.135		1.17	7.27	0.150		1.08	6.73	0.122	
23:00	1.04	6.23	0.108		1.03	6.10	0.105		0.96	5.99	0.094		0.94	5.92	0.088		1.02	6.36	0.108		1.04	6.33	0.113		1.01	6.01	0.100	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.170	0.64			0.176	0.09			0.139	0.01			0.134				0.134				0.139				0.125	
Avg	1.28	6.84	0.170		1.29	6.82	0.176		1.13	6.67	0.139		1.10	6.58	0.134		1.10	6.57	0.134		1.13	6.64	0.139		1.08	6.47	0.125	
Time	02:45	05:20	05:00		02:10	03:50	03:50		03:45	03:25	03:00		03:10	04:05	03:05		03:35	03:30	03:30		03:25	02:55	02:50		03:30	02:30	02:30	
Min	0.72	4.09	0.046		0.62	3.94	0.035		0.56	3.92	0.033		0.48	3.74	0.023		0.51	3.47	0.023		0.51	3.72	0.025		0.55	3.55	0.026	
Time	11:35	10:50	11:25		10:10	11:05	10:10		06:35	07:55	06:35		19:45	07:10	07:10		06:55	07:10	06:55		07:15	07:20	07:15		07:55	06:25	07:55	
Max	1.92	8.48	0.345		2.05	8.72	0.384		1.74	8.35	0.301		1.77	8.58	0.317		1.78	8.52	0.304		1.74	8.45	0.294		1.71	8.15	0.281	

	D	V	Q	Rain
Total			1.018	0.74
Avg	1.16	6.66	0.145	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.66	5.38	0.048		0.87	5.29	0.071		0.77	4.58	0.051		0.79	4.61	0.054		0.83	4.94	0.062		0.82	4.64	0.057		0.77	5.11	0.057	
01:00	0.77	5.21	0.058		0.78	4.56	0.052		0.77	4.58	0.051		0.59	4.02	0.030		0.85	4.62	0.059		0.77	4.43	0.050		0.68	4.55	0.042	
02:00	0.77	4.63	0.051		0.75	4.56	0.049		0.74	4.35	0.046		0.70	4.36	0.042		0.76	4.54	0.050		0.70	4.17	0.041		0.63	4.56	0.038	
03:00	0.77	4.61	0.051		0.76	4.31	0.047		0.78	4.52	0.051		0.78	4.69	0.053		0.81	5.00	0.061		0.81	4.54	0.054		0.61	4.26	0.034	
04:00	0.80	4.84	0.057		0.75	4.35	0.047		1.04	6.18	0.109		0.95	6.09	0.096		1.10	6.50	0.125		0.97	6.03	0.097		0.63	4.43	0.037	
05:00	0.84	4.90	0.063		0.80	4.51	0.053		1.40	7.33	0.196		1.53	7.67	0.236		1.61	7.79	0.256		1.53	7.54	0.229		0.95	5.99	0.094	
06:00	1.06	6.31	0.114		0.95	5.71	0.090		1.59	7.75	0.248		1.68	7.94	0.275		1.67	7.97	0.275		1.71	7.71	0.273		1.37	7.39	0.193	
07:00	1.45	7.39	0.208		1.39	7.31	0.193		1.52	7.42	0.222		1.36	7.32	0.187		1.37	7.48	0.193		1.32	7.34	0.181		1.70	7.97	0.280	
08:00	1.76	7.82	0.287		1.53	7.86	0.238		1.34	7.23	0.181		1.25	7.21	0.164		1.38	7.49	0.196		1.25	7.02	0.159		1.42	7.64	0.207	
09:00	1.71	7.72	0.274		1.68	8.11	0.280		1.29	7.14	0.170		1.29	7.13	0.168		1.25	7.10	0.162		1.21	7.01	0.151		1.38	7.33	0.192	
10:00	1.78	7.99	0.298		1.72	8.02	0.286		1.35	7.09	0.179		1.22	7.03	0.154		1.21	7.02	0.151		1.21	7.17	0.154		1.32	7.32	0.180	
11:00	1.63	7.87	0.260		1.65	7.96	0.268		1.24	6.72	0.150		1.23	6.79	0.149		1.16	6.54	0.134		1.18	6.72	0.140		1.30	7.36	0.176	
12:00	1.46	7.60	0.216		1.54	7.96	0.242		1.19	6.59	0.138		1.17	6.69	0.137		1.01	6.18	0.103		1.15	6.28	0.126		1.26	7.41	0.170	
13:00	1.37	7.33	0.190		1.57	7.82	0.245		1.12	6.51	0.126		1.18	6.47	0.135		1.02	6.06	0.104		1.18	6.56	0.135		1.18	6.75	0.140	
14:00	1.26	7.17	0.164		1.50	7.64	0.224		1.07	6.43	0.116		1.20	7.03	0.152		1.15	6.67	0.135		1.17	6.60	0.136		1.20	6.72	0.143	
15:00	1.40	7.34	0.196		1.37	7.46	0.192		1.16	6.79	0.137		1.23	7.36	0.162		1.13	6.41	0.125		1.19	6.78	0.142		1.18	7.01	0.146	
16:00	1.46	7.70	0.216		1.48	7.52	0.216		1.33	7.34	0.182		1.22	7.12	0.156		1.23	6.93	0.155		1.17	6.69	0.137		1.18	6.89	0.143	
17:00	1.44	7.60	0.210		1.54	7.49	0.229		1.43	7.59	0.211		1.52	7.68	0.231		1.29	7.37	0.176		1.15	6.82	0.137		1.28	7.18	0.169	
18:00	1.43	7.47	0.205		1.67	7.78	0.266		1.59	7.82	0.250		1.53	7.76	0.235		1.54	7.58	0.232		1.31	7.22	0.175		1.22	7.17	0.156	
19:00	1.37	7.36	0.190		1.59	7.78	0.247		1.61	7.87	0.256		1.65	7.92	0.267		1.54	7.51	0.230		1.56	7.65	0.237		1.31	7.24	0.176	
20:00	1.32	7.41	0.181		1.52	7.52	0.226		1.61	7.57	0.247		1.55	7.75	0.238		1.49	7.75	0.227		1.70	7.90	0.276		1.39	7.53	0.199	
21:00	1.24	7.10	0.158		1.35	7.23	0.183		1.32	7.25	0.177		1.41	7.12	0.191		1.11	6.86	0.133		1.57	7.75	0.244		1.19	6.91	0.146	
22:00	1.20	6.85	0.147		1.16	6.57	0.133		1.15	6.02	0.121		1.20	6.29	0.134		1.14	6.54	0.132		1.17	7.02	0.145		1.17	6.78	0.139	
23:00	1.07	6.36	0.114		0.85	5.44	0.072		0.93	5.28	0.080		1.00	5.42	0.089		0.89	5.31	0.073		1.10	6.53	0.123		1.08	6.22	0.114	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.165				0.173				0.154				0.156				0.148				0.150				0.140	
Avg	1.25	6.75	0.165		1.28	6.70	0.173		1.22	6.58	0.154		1.22	6.64	0.156		1.19	6.59	0.148		1.20	6.59	0.150		1.14	6.57	0.140	
Time	00:10	02:50	00:10		04:15	03:50	04:15		02:50	03:25	02:00		01:20	01:45	01:15		02:55	03:10	02:55		01:00	02:10	02:05		03:00	03:35	03:35	
Min	0.48	4.29	0.029		0.52	3.87	0.025		0.60	3.97	0.033		0.48	3.74	0.021		0.52	4.14	0.028		0.54	3.64	0.028		0.52	3.79	0.024	
Time	08:40	16:25	10:50		10:55	09:30	10:55		06:05	18:35	06:05		06:15	18:55	06:15		06:20	06:20	06:20		20:30	20:40	20:30		07:10	07:15	07:10	
Max	1.96	8.53	0.345		1.95	8.55	0.359		1.91	8.79	0.331		1.91	8.53	0.337		1.96	8.52	0.365		1.98	8.43	0.350		1.88	8.28	0.327	

	D	V	Q	Rain
Total			1.086	
Avg	1.22	6.63	0.155	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.83	5.52	0.070		0.98	5.87	0.094		0.79	5.13	0.061		0.80	4.94	0.060		0.94	5.06	0.078		0.89	4.99	0.069		0.86	4.94	0.066	
01:00	0.69	5.03	0.048		0.84	5.32	0.067		0.71	4.95	0.050		0.64	4.40	0.037		0.77	4.40	0.049		0.79	4.50	0.052		0.83	4.60	0.057	
02:00	0.64	4.41	0.037		0.77	4.86	0.055		0.72	4.24	0.043		0.71	4.15	0.041		0.73	4.40	0.046		0.71	4.25	0.043		0.61	4.09	0.033	
03:00	0.63	4.35	0.036		0.67	4.55	0.041		0.81	4.17	0.050		0.76	4.28	0.047		0.80	4.37	0.052		0.69	4.04	0.038		0.65	4.14	0.036	
04:00	0.58	4.17	0.031		0.63	4.44	0.037		0.84	4.65	0.060		0.82	4.61	0.056		0.89	4.82	0.067		0.71	4.21	0.042		0.76	4.43	0.049	
05:00	0.65	4.56	0.039		0.68	4.50	0.041		1.12	6.35	0.123		1.01	5.84	0.098		1.19	6.16	0.130		1.09	5.91	0.114		1.10	5.93	0.115	
06:00	0.82	5.49	0.068		0.85	5.41	0.071		1.36	7.59	0.194		1.42	7.23	0.199		1.51	7.39	0.222		1.57	7.47	0.236		1.55	7.51	0.233	
07:00	1.13	6.73	0.133		1.05	6.46	0.114		1.57	7.77	0.244		1.55	7.70	0.236		1.64	7.74	0.259		1.63	7.76	0.256		1.62	7.79	0.254	
08:00	1.49	7.94	0.231		1.38	7.42	0.194		1.48	7.53	0.217		1.46	7.46	0.211		1.38	7.19	0.187		1.52	7.44	0.222		1.50	7.59	0.224	
09:00	1.55	7.98	0.247		1.63	7.94	0.262		1.38	7.39	0.192		1.42	7.21	0.195		1.31	7.11	0.172		1.46	7.25	0.205		1.43	7.36	0.203	
10:00	1.55	7.91	0.243		1.69	8.00	0.280		1.35	7.31	0.184		1.34	7.03	0.175		1.26	7.04	0.162		1.41	7.13	0.192		1.43	7.15	0.197	
11:00	1.53	7.90	0.240		1.74	8.03	0.292		1.29	7.18	0.170		1.33	6.77	0.168		1.21	6.75	0.146		1.37	6.84	0.176		1.32	6.83	0.167	
12:00	1.40	7.61	0.201		1.58	7.65	0.243		1.28	7.01	0.163		1.25	6.55	0.148		1.13	6.13	0.120		1.25	6.44	0.145		1.29	6.56	0.156	
13:00	1.47	7.89	0.225		1.41	7.38	0.198		1.22	6.90	0.150		1.22	6.41	0.139		1.15	6.41	0.129		1.22	6.40	0.139		1.26	6.38	0.145	
14:00	1.40	7.64	0.203		1.30	7.38	0.176		1.17	6.61	0.136		1.20	6.44	0.136		1.11	6.18	0.117		1.19	6.30	0.132		1.30	6.62	0.157	
15:00	1.31	7.43	0.181		1.34	7.41	0.185		1.23	6.82	0.150		1.20	6.39	0.136		1.16	6.31	0.128		1.24	6.60	0.147		1.31	6.81	0.166	
16:00	1.37	7.76	0.199		1.38	7.60	0.197		1.25	6.82	0.153		1.19	6.42	0.135		1.18	6.41	0.132		1.32	6.87	0.168		1.28	6.75	0.157	
17:00	1.38	7.71	0.202		1.51	7.76	0.230		1.36	7.13	0.183		1.39	7.14	0.189		1.35	7.20	0.183		1.35	7.08	0.178		1.30	6.78	0.163	
18:00	1.30	7.35	0.176		1.58	7.69	0.243		1.52	7.56	0.226		1.46	7.40	0.209		1.39	7.23	0.191		1.45	7.37	0.205		1.46	7.17	0.201	
19:00	1.31	7.46	0.181		1.62	7.89	0.258		1.45	7.37	0.208		1.64	7.63	0.254		1.44	7.35	0.205		1.45	7.38	0.205		1.53	7.32	0.222	
20:00	1.26	7.20	0.164		1.52	7.71	0.230		1.70	7.70	0.270		1.61	7.74	0.253		1.57	7.72	0.242		1.55	7.70	0.238		1.53	7.47	0.226	
21:00	1.20	6.77	0.144		1.53	7.53	0.228		1.57	7.32	0.231		1.43	7.36	0.204		1.55	7.71	0.237		1.54	7.63	0.233		1.38	7.01	0.184	
22:00	1.25	6.96	0.158		1.35	7.13	0.180		1.32	6.82	0.167		1.30	6.73	0.161		1.28	6.90	0.162		1.32	6.93	0.170		1.28	6.83	0.159	
23:00	1.16	6.48	0.132		1.13	6.12	0.120		1.09	5.97	0.111		1.08	5.85	0.109		1.09	6.10	0.115		1.06	5.97	0.108		1.22	6.43	0.140	

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.150				0.168				0.156				0.150				0.147				0.155				0.155	
Avg	1.16	6.68	0.150		1.26	6.75	0.168		1.23	6.59	0.156		1.22	6.40	0.150		1.21	6.42	0.147		1.24	6.44	0.155		1.24	6.44	0.155	
Time	02:50	03:00	04:35		04:00	05:25	04:00		00:30	02:45	00:30		00:40	03:15	00:40		02:25	03:50	02:25		02:35	04:00	02:35		02:40	03:15	03:20	
Min	0.51	3.84	0.025		0.54	4.17	0.028		0.53	3.64	0.027		0.55	3.69	0.029		0.61	3.77	0.032		0.57	3.74	0.027		0.51	3.52	0.023	
Time	11:00	17:00	11:00		12:10	11:15	10:50		20:25	07:55	20:25		20:50	07:55	20:50		06:40	07:15	06:40		07:15	21:10	07:15		06:55	09:05	06:55	
Max	1.88	8.63	0.337		1.93	8.48	0.331		2.01	8.28	0.354		1.80	8.11	0.303		1.89	8.04	0.327		1.90	8.41	0.324		1.76	8.33	0.284	

	D	V	Q	Rain
Total			1.080	
Avg	1.22	6.53	0.154	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.90	5.31	0.075		0.97	5.44	0.086		0.82	5.05	0.063		0.86	4.96	0.066		0.84	5.07	0.065		0.94	5.57	0.084		0.94	5.18	0.079	
01:00	0.72	4.64	0.047		0.78	4.74	0.054		0.73	4.40	0.046		0.66	4.34	0.039		0.74	4.61	0.048		0.79	4.53	0.052		0.81	4.57	0.055	
02:00	0.66	4.64	0.041		0.71	4.45	0.045		0.69	4.21	0.040		0.63	4.07	0.033		0.64	4.40	0.037		0.70	4.40	0.042		0.66	4.19	0.038	
03:00	0.65	4.21	0.037		0.70	4.25	0.042		0.72	4.57	0.047		0.62	4.13	0.034		0.62	4.36	0.036		0.64	4.48	0.039		0.61	4.21	0.034	
04:00	0.63	3.96	0.033		0.66	4.02	0.035		0.75	4.82	0.054		0.63	4.45	0.037		0.65	4.36	0.038	0.01	0.74	4.56	0.048		0.74	4.51	0.048	
05:00	0.68	4.49	0.041		0.74	4.45	0.047		1.05	6.20	0.111		0.98	5.78	0.094		1.02	6.08	0.105		1.05	5.98	0.107		0.98	5.90	0.096	
06:00	0.94	5.78	0.089		0.82	5.24	0.064		1.51	7.50	0.223		1.43	7.25	0.201		1.36	7.38	0.190		1.47	7.54	0.216		1.41	7.46	0.202	
07:00	1.26	6.95	0.159		1.07	6.08	0.111		1.56	7.65	0.238		1.68	7.70	0.265		1.66	7.91	0.268		1.56	7.77	0.243		1.61	7.99	0.259	
08:00	1.54	7.55	0.231		1.45	7.51	0.211		1.50	7.53	0.220		1.49	7.59	0.222		1.48	7.70	0.222		1.57	7.72	0.241		1.49	7.62	0.222	
09:00	1.68	7.87	0.271		1.64	7.86	0.262		1.31	6.85	0.165		1.45	7.33	0.207		1.46	7.69	0.217		1.48	7.66	0.220		1.32	7.17	0.175	
10:00	1.71	7.75	0.275		1.76	7.75	0.285		1.39	7.17	0.188		1.36	7.18	0.183		1.44	7.57	0.211		1.49	7.53	0.219		1.38	7.41	0.193	
11:00	1.65	7.74	0.260		1.73	7.89	0.283		1.27	6.71	0.155		1.17	6.79	0.140		1.43	7.45	0.204		1.43	7.57	0.208		1.31	7.24	0.175	
12:00	1.55	7.40	0.227		1.73	7.72	0.279		1.25	6.99	0.158		1.29	7.19	0.169		1.33	7.13	0.176		1.41	7.43	0.200		1.25	6.98	0.158	
13:00	1.54	7.34	0.226		1.64	7.68	0.257		1.19	6.42	0.136		1.29	7.25	0.172		1.30	7.16	0.170		1.21	6.41	0.143		1.18	6.77	0.141	
14:00	1.46	7.28	0.206		1.57	7.58	0.237		1.24	6.70	0.149		1.28	7.17	0.167		1.29	7.16	0.169		1.22	6.57	0.143		1.11	6.58	0.126	
15:00	1.48	7.33	0.211		1.47	7.43	0.211		1.11	6.24	0.121		1.34	7.29	0.181		1.33	7.31	0.180		1.33	7.34	0.181		1.23	7.00	0.154	
16:00	1.46	7.44	0.210		1.45	7.40	0.208		1.36	7.25	0.185		1.40	7.58	0.202		1.29	7.09	0.168		1.38	7.34	0.190		1.25	7.00	0.159	
17:00	1.48	7.38	0.212		1.44	7.38	0.203		1.37	7.05	0.182		1.37	7.34	0.189		1.23	6.77	0.150		1.27	7.13	0.164		1.28	7.19	0.168	
18:00	1.39	7.04	0.184		1.47	7.62	0.217		1.52	7.47	0.226		1.39	7.50	0.197		1.36	7.44	0.190		1.35	7.52	0.189		1.27	7.25	0.168	
19:00	1.45	7.21	0.201		1.65	7.82	0.262		1.58	7.69	0.242		1.51	7.64	0.225		1.40	7.52	0.200		1.39	7.46	0.196		1.29	7.35	0.174	
20:00	1.39	7.01	0.186		1.66	7.85	0.265		1.61	7.72	0.250		1.55	7.62	0.236		1.48	7.79	0.225		1.50	7.61	0.223		1.34	7.22	0.180	
21:00	1.28	6.74	0.157		1.49	7.54	0.219		1.52	7.62	0.228		1.43	7.58	0.209		1.45	7.50	0.211		1.43	7.58	0.207		1.26	7.03	0.160	
22:00	1.22	6.49	0.144		1.30	6.82	0.164		1.22	6.72	0.147		1.31	7.16	0.174		1.27	7.07	0.165		1.29	7.17	0.170		1.18	6.86	0.142	
23:00	1.21	6.33	0.136		1.03	5.77	0.099		1.05	6.08	0.107		1.10	6.35	0.119		1.06	6.06	0.108		1.05	6.00	0.106		1.13	6.22	0.122	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.161				0.173				0.153				0.157				0.156	0.01			0.160				0.143	
Avg	1.25	6.50	0.161		1.29	6.60	0.173		1.22	6.52	0.153		1.22	6.63	0.157		1.21	6.69	0.156		1.24	6.70	0.160		1.17	6.54	0.143	
Time	03:50	04:55	03:50		02:30	05:05	04:10		03:10	02:45	03:05		03:30	02:40	03:30		03:10	04:05	04:05		03:40	02:20	03:40		03:15	02:20	03:15	
Min	0.55	3.77	0.027		0.55	3.67	0.027		0.56	3.69	0.029		0.52	3.74	0.025		0.52	3.74	0.025		0.46	4.01	0.024		0.51	3.80	0.024	
Time	10:30	09:20	10:30		12:25	09:50	11:05		18:35	19:55	18:35		07:30	06:50	07:30		07:10	07:40	07:10		07:15	07:30	07:15		07:10	07:10	07:10	
Max	1.97	8.21	0.337		1.94	8.40	0.329		1.83	8.18	0.312		1.85	8.25	0.311		1.91	8.21	0.329		1.84	8.25	0.322		1.90	8.58	0.352	

	D	V	Q	Rain
Total			1.102	0.01
Avg	1.23	6.60	0.157	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.91	5.58	0.080		0.99	5.90	0.095		0.77	4.89	0.054		0.78	4.83	0.054		0.87	5.24	0.071	0.13	0.79	5.03	0.059		0.80	4.99	0.059	
01:00	0.82	4.55	0.055		0.89	5.25	0.072		0.72	4.33	0.044		0.70	4.42	0.043		0.75	4.56	0.049	0.03	0.73	4.57	0.047		0.71	4.42	0.044	
02:00	0.73	4.29	0.045		0.82	4.87	0.060		0.71	4.44	0.044		0.66	4.00	0.035		0.66	4.20	0.037		0.71	4.42	0.044		0.69	4.24	0.041	
03:00	0.66	3.99	0.035		0.81	4.73	0.056		0.67	4.26	0.038		0.70	4.34	0.042		0.65	4.11	0.036	0.01	0.70	4.54	0.044		0.65	4.32	0.037	
04:00	0.61	4.17	0.034		0.79	4.55	0.052		0.74	4.48	0.047		0.66	4.30	0.039		0.71	4.48	0.045	0.01	0.74	4.62	0.049		0.70	4.37	0.042	
05:00	0.73	4.66	0.048		0.76	4.54	0.050		0.96	5.88	0.092		0.95	5.70	0.089	0.04	0.93	5.88	0.089		1.02	5.83	0.099		0.91	5.69	0.083	
06:00	0.87	5.39	0.075		0.90	5.27	0.074		1.35	7.44	0.189		1.44	7.65	0.214	0.14	1.32	7.41	0.182	0.03	1.47	7.67	0.219		1.33	7.51	0.187	
07:00	1.28	7.01	0.165		1.15	6.68	0.133		1.51	7.77	0.230		1.49	7.62	0.222	0.01	1.53	7.82	0.236		1.58	7.94	0.251		1.45	7.82	0.219	
08:00	1.43	7.49	0.205		1.39	7.52	0.198		1.34	7.51	0.187		1.29	7.19	0.170		1.36	7.47	0.191		1.35	7.39	0.187		1.36	7.59	0.193	
09:00	1.70	7.97	0.281		1.55	7.93	0.245		1.36	7.42	0.189		1.21	6.92	0.150		1.26	7.16	0.164		1.30	7.27	0.174		1.29	7.45	0.177	
10:00	1.65	7.94	0.266		1.65	7.93	0.267		1.22	7.04	0.153		1.16	6.91	0.141		1.18	6.93	0.145		1.28	7.39	0.174		1.15	7.02	0.142	
11:00	1.55	7.73	0.239		1.68	7.89	0.272		1.13	6.73	0.131		1.13	6.59	0.128		1.10	6.46	0.122		1.18	6.97	0.144		1.14	6.96	0.138	
12:00	1.46	7.75	0.219		1.53	7.63	0.230		1.19	6.90	0.146		1.14	6.65	0.131		1.14	6.71	0.131		1.18	7.09	0.148		1.13	6.88	0.134	
13:00	1.42	7.66	0.209		1.41	7.58	0.203		1.13	6.64	0.129		1.11	6.42	0.122		1.15	6.56	0.132		1.12	6.52	0.125		1.13	6.68	0.131	
14:00	1.37	7.30	0.188		1.46	7.46	0.212		1.14	6.50	0.128		1.08	6.43	0.118		1.03	5.94	0.101		1.17	6.89	0.142		1.12	6.50	0.125	
15:00	1.32	7.24	0.178		1.31	7.29	0.177		1.14	6.56	0.131		1.09	6.23	0.116		1.19	6.79	0.144		1.13	6.44	0.126		1.16	6.93	0.140	
16:00	1.33	7.23	0.179		1.34	7.31	0.183		1.17	6.76	0.139		1.13	6.60	0.129		1.22	6.94	0.151		1.17	6.77	0.138		1.21	7.02	0.151	
17:00	1.38	7.55	0.196		1.41	7.29	0.196		1.20	7.01	0.150		1.14	6.58	0.131		1.25	7.20	0.163		1.24	6.98	0.156		1.24	7.21	0.162	
18:00	1.31	7.38	0.179		1.40	7.48	0.199		1.26	7.17	0.166		1.39	7.53	0.197		1.40	7.55	0.200		1.27	7.14	0.166		1.22	7.16	0.157	
19:00	1.41	7.55	0.203		1.52	7.68	0.230		1.45	7.74	0.217		1.48	7.76	0.224		1.37	7.64	0.197		1.43	7.52	0.207		1.31	7.38	0.178	
20:00	1.31	7.12	0.173		1.56	7.83	0.245		1.52	7.83	0.234		1.47	7.64	0.220		1.56	7.76	0.242		1.47	7.67	0.219		1.25	7.16	0.162	
21:00	1.30	7.21	0.172		1.40	7.37	0.195		1.33	7.28	0.179		1.38	7.43	0.194		1.39	7.56	0.200		1.36	7.36	0.189		1.18	6.98	0.145	
22:00	1.17	6.75	0.139		1.21	6.97	0.150		1.20	6.99	0.149		1.18	6.91	0.143		1.19	6.91	0.145		1.19	6.69	0.142		1.15	6.74	0.135	
23:00	1.16	6.33	0.128		1.03	5.88	0.101		0.98	5.72	0.091		1.03	6.08	0.104	0.03	1.05	6.21	0.109		0.99	5.89	0.095		0.99	5.87	0.095	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.154				0.162				0.136				0.131	0.22			0.137	0.21			0.139				0.128	
Avg	1.20	6.58	0.154		1.25	6.70	0.162		1.13	6.47	0.136		1.12	6.36	0.131		1.14	6.48	0.137		1.15	6.53	0.139		1.09	6.45	0.128	
Time	04:25	03:45	04:25		05:00	05:40	02:55		04:20	03:35	03:35		03:10	04:25	02:40		03:25	03:15	03:25		04:30	04:20	04:30		03:25	02:15	02:20	
Min	0.44	3.65	0.020		0.63	4.11	0.038		0.58	3.65	0.028		0.53	3.53	0.026		0.55	3.62	0.025		0.59	3.99	0.034		0.53	3.69	0.027	
Time	09:35	09:25	09:20		11:10	09:20	11:00		07:15	07:10	07:15		20:20	06:55	20:20		20:20	07:55	20:20		07:15	07:35	07:15		07:20	09:05	06:50	
Max	1.89	8.45	0.331		1.98	8.43	0.348		1.70	8.16	0.281		1.74	8.18	0.295		1.74	8.21	0.292		1.84	8.38	0.315		1.58	8.36	0.249	

	D	V	Q	Rain
Total			0.987	0.43
Avg	1.15	6.51	0.141	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	0.82	5.20	0.065		0.82	5.17	0.064		0.80	4.80	0.057		0.78	4.79	0.055		0.97	5.67	0.089		0.90	5.29	0.075		0.85	5.05	0.067	
01:00	0.74	4.52	0.047		0.71	4.57	0.045		0.73	4.58	0.047		0.70	4.31	0.042		0.81	4.75	0.057		0.80	4.61	0.054		0.79	4.58	0.053	
02:00	0.63	4.06	0.034		0.68	4.38	0.041		0.66	4.21	0.038		0.65	4.03	0.035		0.77	4.57	0.051		0.79	4.36	0.050		0.67	3.95	0.036	
03:00	0.67	4.17	0.038		0.66	4.33	0.039		0.64	3.95	0.034		0.68	4.17	0.039		0.79	4.50	0.052		0.84	4.50	0.057		0.70	4.32	0.042	
04:00	0.64	4.06	0.034		0.69	4.00	0.038		0.75	4.70	0.050		0.67	4.20	0.038		0.76	4.61	0.051		0.89	4.55	0.062		0.79	5.09	0.060	
05:00	0.73	4.65	0.048		0.73	4.17	0.043		1.02	5.90	0.102		0.95	5.62	0.087		0.99	5.97	0.098		1.09	5.97	0.111		0.93	5.27	0.078	
06:00	0.93	5.58	0.085		0.84	5.18	0.066		1.26	7.03	0.162		1.33	7.26	0.180		1.29	7.09	0.169		1.34	7.25	0.181		1.25	6.79	0.157	
07:00	1.16	6.86	0.140		1.11	6.44	0.124		1.39	7.66	0.202		1.47	7.78	0.221		1.48	7.91	0.229		1.50	7.80	0.228		1.44	7.60	0.211	
08:00	1.35	7.34	0.188		1.35	7.37	0.188		1.49	8.00	0.231		1.43	7.56	0.207		1.39	7.44	0.197		1.46	7.64	0.216		1.46	7.56	0.214	
09:00	1.55	7.86	0.241		1.54	7.82	0.238		1.32	7.33	0.178		1.35	7.36	0.187		1.39	7.35	0.192		1.41	7.67	0.206		1.41	7.60	0.204	
10:00	1.53	7.87	0.237		1.60	7.88	0.255		1.29	7.37	0.175		1.38	7.41	0.192		1.34	7.34	0.183		1.39	7.76	0.206		1.42	7.53	0.205	
11:00	1.55	7.91	0.243		1.49	7.82	0.228		1.26	7.27	0.167		1.24	7.05	0.157		1.35	7.25	0.184		1.30	7.31	0.175		1.25	7.02	0.158	
12:00	1.50	7.57	0.222		1.51	7.71	0.229		1.22	6.87	0.150		1.21	6.85	0.149		1.28	7.22	0.168		1.18	6.86	0.142		1.25	7.06	0.159	
13:00	1.43	7.45	0.205		1.44	7.61	0.210		1.16	6.55	0.132		1.20	6.59	0.141		1.22	7.22	0.157		1.17	6.58	0.135		1.23	7.00	0.155	
14:00	1.26	6.99	0.160		1.39	7.50	0.198		1.14	6.58	0.130		1.17	6.83	0.139		1.16	6.64	0.135		1.19	6.80	0.142		1.18	6.70	0.139	
15:00	1.36	7.39	0.188		1.39	7.31	0.192		1.16	6.64	0.135		1.27	7.10	0.163		1.18	6.94	0.145		1.17	6.66	0.136		1.22	6.79	0.148	
16:00	1.38	7.32	0.191		1.38	7.30	0.190		1.17	6.70	0.137		1.29	7.39	0.175		1.17	6.70	0.137		1.14	6.51	0.129		1.24	6.80	0.153	
17:00	1.31	7.20	0.174		1.41	7.55	0.203		1.24	7.24	0.163		1.24	7.22	0.162		1.29	7.18	0.169		1.28	7.30	0.170		1.33	7.52	0.187	
18:00	1.32	7.31	0.181		1.40	7.45	0.197		1.33	7.55	0.187		1.32	7.30	0.179		1.35	7.37	0.186		1.29	7.31	0.174		1.44	7.71	0.213	
19:00	1.28	7.25	0.171		1.37	7.34	0.189		1.33	7.38	0.183		1.39	7.67	0.202		1.37	7.47	0.194		1.39	7.55	0.198		1.46	7.80	0.219	
20:00	1.24	7.07	0.157		1.38	7.47	0.196		1.43	7.59	0.208		1.46	8.03	0.225		1.43	7.71	0.213		1.41	7.62	0.204		1.46	7.87	0.222	
21:00	1.20	6.91	0.148		1.39	7.31	0.193		1.37	7.65	0.197		1.44	7.76	0.214		1.43	7.58	0.206		1.34	7.41	0.185		1.35	7.51	0.189	
22:00	1.11	6.48	0.124		1.24	6.88	0.155		1.23	6.99	0.155		1.28	7.11	0.166		1.22	6.86	0.150		1.29	7.10	0.168		1.37	7.55	0.194	
23:00	1.02	6.07	0.102		0.96	5.71	0.089		0.93	5.52	0.082		1.18	6.52	0.136		1.10	6.18	0.117		1.11	6.28	0.120		1.15	6.68	0.135	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.143				0.150				0.138				0.146				0.147				0.147				0.150	
Avg	1.16	6.46	0.143		1.19	6.51	0.150		1.14	6.50	0.138		1.17	6.58	0.146		1.19	6.65	0.147		1.19	6.61	0.147		1.19	6.64	0.150	
Time	04:40	02:35	04:40		02:50	03:30	03:30		04:00	03:05	04:00		03:45	02:55	03:45		02:25	02:20	02:25		01:50	02:15	01:50		02:55	03:55	02:55	
Min	0.52	3.53	0.023		0.54	3.37	0.024		0.53	3.43	0.026		0.55	3.53	0.028		0.62	4.04	0.034		0.61	3.99	0.034		0.53	3.75	0.025	
Time	11:05	09:45	11:05		10:05	10:05	10:05		08:10	07:45	08:10		07:25	20:40	09:20		07:20	07:15	07:20		07:20	21:10	07:20		20:20	20:40	20:20	
Max	1.75	8.67	0.309		1.89	8.45	0.345		1.57	8.48	0.248		1.56	8.48	0.255		1.65	8.53	0.280		1.63	8.43	0.262		1.60	8.47	0.258	

	D	V	Q	Rain
Total			1.020	
Avg	1.18	6.56	0.146	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.02	5.96	0.102		1.09	6.18	0.115		1.00	5.72	0.094		0.89	5.19	0.073		1.00	5.58	0.092		0.95	5.48	0.084		0.96	5.57	0.086	
01:00	0.84	5.26	0.067		0.90	5.12	0.072		0.81	4.84	0.058		0.77	4.65	0.052		0.88	5.21	0.071		0.78	4.75	0.054		0.83	4.84	0.061	
02:00	0.81	4.81	0.057		0.75	4.68	0.051		0.78	4.67	0.053		0.71	4.14	0.041		0.81	4.51	0.054		0.72	4.54	0.046		0.76	4.49	0.049	
03:00	0.80	4.68	0.055		0.73	4.75	0.049		0.74	4.79	0.051		0.69	4.30	0.041		0.80	4.73	0.056		0.68	4.06	0.038		0.70	4.55	0.045	
04:00	0.80	4.64	0.055		0.74	4.33	0.045		0.84	5.08	0.064		0.75	4.68	0.050		0.81	4.66	0.056		0.78	4.79	0.054		0.79	4.73	0.054	
05:00	0.86	5.10	0.069		0.76	4.73	0.052		1.03	6.07	0.105		1.05	6.22	0.111		1.14	6.70	0.135		1.06	6.21	0.112		1.00	5.98	0.100	
06:00	1.07	6.18	0.111		1.00	5.67	0.094		1.58	8.08	0.259		1.58	8.04	0.255		1.59	8.16	0.261		1.53	7.96	0.243		1.47	7.94	0.229	
07:00	1.33	7.41	0.185		1.23	6.91	0.155		1.82	8.41	0.325		1.76	8.29	0.306		1.75	8.28	0.303		1.74	8.23	0.298		1.67	8.21	0.280	
08:00	1.65	8.09	0.273		1.64	8.14	0.272		1.60	8.22	0.264		1.48	8.04	0.232		1.59	8.16	0.261		1.45	8.14	0.228		1.63	8.20	0.271	
09:00	1.74	8.09	0.294		1.90	8.39	0.345		1.48	8.04	0.231		1.42	8.06	0.218		1.44	7.93	0.219		1.57	8.36	0.263		1.55	8.22	0.251	
10:00	1.82	8.14	0.315		1.92	8.30	0.345		1.48	8.09	0.232		1.39	7.90	0.208		1.43	8.15	0.224		1.51	8.07	0.240		1.44	7.91	0.219	
11:00	1.82	8.17	0.315		1.85	8.48	0.335		1.37	7.84	0.201		1.43	8.06	0.221		1.36	7.70	0.195		1.34	7.48	0.187		1.41	7.83	0.211	
12:00	1.61	7.92	0.258		1.69	8.20	0.285		1.27	7.41	0.172		1.35	7.43	0.188		1.29	7.30	0.172		1.27	7.18	0.165		1.37	7.79	0.201	
13:00	1.47	8.05	0.230		1.67	8.31	0.283		1.33	7.58	0.187		1.24	7.14	0.160		1.25	7.27	0.165		1.30	7.39	0.178		1.35	7.53	0.191	
14:00	1.45	7.79	0.218		1.52	8.23	0.245		1.25	7.23	0.164		1.23	7.08	0.156		1.23	6.90	0.153		1.29	7.41	0.176		1.44	7.85	0.218	
15:00	1.48	7.88	0.226		1.47	8.08	0.231		1.28	7.18	0.168		1.29	7.34	0.175		1.20	7.00	0.148		1.22	7.14	0.155		1.37	7.65	0.198	
16:00	1.52	8.12	0.243		1.55	8.15	0.252		1.30	7.30	0.175		1.27	7.14	0.166		1.29	7.36	0.174		1.29	7.31	0.173		1.32	7.62	0.186	
17:00	1.51	8.27	0.245		1.57	8.22	0.258		1.44	7.76	0.214		1.35	7.55	0.191		1.36	7.60	0.194		1.39	7.56	0.198		1.33	7.53	0.187	
18:00	1.46	7.97	0.224		1.61	8.24	0.268		1.47	7.97	0.228		1.46	8.09	0.229		1.47	8.33	0.238		1.43	7.79	0.214		1.42	7.94	0.216	
19:00	1.47	8.05	0.229		1.71	8.30	0.294		1.68	8.25	0.286		1.53	8.27	0.251		1.53	8.18	0.248		1.49	8.13	0.237		1.45	8.00	0.224	
20:00	1.43	7.96	0.220		1.77	8.47	0.316		1.79	8.37	0.315		1.75	8.31	0.305		1.79	8.53	0.321		1.61	8.16	0.265		1.48	7.94	0.228	
21:00	1.42	7.89	0.214		1.61	8.35	0.272		1.56	8.14	0.254		1.62	8.34	0.273		1.69	8.42	0.292		1.63	8.22	0.272		1.45	7.82	0.218	
22:00	1.31	7.39	0.179		1.45	7.97	0.223		1.37	7.55	0.196		1.38	7.63	0.200		1.38	7.80	0.205		1.34	7.53	0.188		1.35	7.45	0.187	
23:00	1.22	6.79	0.149		1.21	6.80	0.146		1.18	6.64	0.138		1.20	6.74	0.144		1.12	6.60	0.127		1.18	6.73	0.139		1.23	6.94	0.153	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.189				0.208				0.185				0.177				0.182				0.175				0.178	
Avg	1.33	7.11	0.189		1.39	7.21	0.208		1.31	7.13	0.185		1.28	7.03	0.177		1.30	7.13	0.182		1.27	7.02	0.175		1.28	7.11	0.178	
Time	03:00	02:30	04:00		04:20	04:40	04:20		03:20	01:45	03:20		02:40	02:55	02:40		04:45	02:50	04:45		03:00	03:05	03:15		02:50	03:25	02:50	
Min	0.62	4.27	0.037		0.61	3.65	0.035		0.62	4.21	0.037		0.57	3.67	0.027		0.71	4.02	0.042		0.57	3.35	0.029		0.60	3.69	0.035	
Time	09:25	09:00	09:25		10:35	14:05	10:35		07:05	06:55	07:05		07:00	06:30	07:00		20:15	20:20	20:15		06:55	06:50	06:55		07:15	08:45	07:15	
Max	1.94	8.58	0.362		2.09	9.05	0.397		1.92	8.58	0.358		2.00	8.58	0.371		1.95	8.85	0.360		1.89	8.58	0.337		1.83	8.58	0.331	

	D	V	Q	Rain
Total			1.294	
Avg	1.31	7.11	0.185	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.03	6.03	0.103		1.10	6.36	0.120		1.00	5.60	0.092		0.96	5.63	0.087		0.95	5.28	0.081		0.97	5.46	0.085		0.91	5.28	0.075	
01:00	0.91	5.52	0.079		0.96	5.45	0.084		0.87	5.12	0.069		0.84	4.80	0.061		0.78	4.67	0.053		0.82	4.75	0.058		0.81	4.68	0.056	
02:00	0.82	4.98	0.061		0.88	5.30	0.071		0.79	4.80	0.055		0.78	4.50	0.051		0.74	4.77	0.050		0.70	4.29	0.042		0.66	4.28	0.038	
03:00	0.77	4.66	0.052		0.81	4.92	0.059		0.75	4.56	0.049		0.74	4.47	0.047		0.66	4.20	0.037		0.71	4.43	0.044		0.68	4.33	0.040	
04:00	0.83	4.93	0.062		0.80	4.64	0.054		0.79	4.99	0.059		0.83	4.73	0.059		0.71	4.33	0.044		0.74	4.65	0.049		0.70	4.48	0.044	
05:00	0.88	5.19	0.071		0.91	5.35	0.077		1.04	6.08	0.105		1.10	6.35	0.121		1.03	6.07	0.106		1.04	6.12	0.108		1.02	5.93	0.101	
06:00	1.15	6.72	0.134		1.12	6.56	0.127		1.56	7.96	0.249		1.60	7.99	0.259		1.61	7.91	0.259		1.60	8.06	0.261		1.53	8.00	0.244	
07:00	1.46	7.80	0.221		1.41	7.77	0.211		1.79	8.14	0.306		1.77	8.24	0.305		1.78	8.15	0.304		1.79	8.28	0.313		1.77	8.31	0.308	
08:00	1.77	8.20	0.304		1.74	8.26	0.301		1.63	8.10	0.268		1.58	8.02	0.254		1.58	7.99	0.252		1.57	8.15	0.254		1.58	8.12	0.256	
09:00	1.92	8.39	0.350		1.87	8.42	0.338		1.61	8.08	0.262		1.48	7.88	0.227		1.44	7.72	0.214		1.56	8.24	0.257		1.50	7.96	0.233	
10:00	1.82	8.22	0.318		1.93	8.41	0.353		1.51	8.00	0.238		1.37	7.62	0.197		1.38	7.53	0.195		1.45	8.04	0.224		1.40	7.93	0.211	
11:00	1.75	8.17	0.299		1.82	8.27	0.318		1.47	7.80	0.222		1.31	7.43	0.179		1.24	6.88	0.155		1.44	7.90	0.220		1.33	7.53	0.184	
12:00	1.61	8.23	0.267		1.71	8.16	0.290		1.36	7.61	0.193		1.35	7.40	0.187		1.24	7.00	0.156		1.35	7.36	0.185		1.34	7.72	0.192	
13:00	1.58	8.17	0.259		1.70	8.07	0.284		1.36	7.68	0.197		1.25	7.01	0.158		1.21	7.20	0.155		1.27	7.12	0.165		1.27	7.17	0.166	
14:00	1.50	7.93	0.234		1.51	7.95	0.235		1.35	7.57	0.191		1.27	7.10	0.163		1.19	6.96	0.145		1.28	7.19	0.168		1.27	7.30	0.169	
15:00	1.50	7.93	0.233		1.42	8.18	0.222		1.32	7.49	0.183		1.25	7.00	0.159		1.25	7.07	0.160		1.32	7.70	0.189		1.23	7.12	0.157	
16:00	1.45	7.95	0.222		1.49	8.21	0.239		1.34	7.52	0.189		1.31	7.48	0.180		1.36	7.70	0.197		1.29	7.48	0.177		1.32	7.46	0.183	
17:00	1.49	7.88	0.228		1.49	8.08	0.236		1.39	7.85	0.206		1.34	7.71	0.191		1.38	7.77	0.202		1.33	7.62	0.189		1.38	7.81	0.202	
18:00	1.47	7.98	0.228		1.44	8.06	0.224		1.56	8.10	0.253		1.45	8.11	0.227		1.44	8.14	0.226		1.47	8.05	0.230		1.40	7.84	0.208	
19:00	1.52	7.99	0.239		1.51	8.21	0.244		1.69	8.24	0.286		1.71	8.27	0.294		1.50	8.22	0.241		1.63	8.50	0.281		1.41	8.00	0.215	
20:00	1.51	7.90	0.234		1.74	8.36	0.303		1.69	8.28	0.289		1.74	8.30	0.300		1.67	8.33	0.285		1.69	8.56	0.298		1.40	8.13	0.216	
21:00	1.55	7.89	0.243		1.61	8.22	0.268		1.54	7.97	0.245		1.57	7.98	0.251		1.59	8.19	0.261		1.56	8.33	0.260		1.37	7.82	0.202	
22:00	1.40	7.72	0.205		1.41	7.79	0.210		1.40	7.69	0.204		1.34	7.49	0.187		1.32	7.49	0.184		1.33	7.53	0.188		1.34	7.47	0.187	
23:00	1.26	7.19	0.164		1.20	6.78	0.144		1.18	6.74	0.141		1.15	6.77	0.136		1.15	6.60	0.133		1.15	6.56	0.132		1.23	6.85	0.154	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.200				0.209				0.190				0.178				0.171				0.182				0.168	
Avg	1.37	7.23	0.200		1.40	7.32	0.209		1.33	7.17	0.190		1.30	7.01	0.178		1.26	6.92	0.171		1.29	7.10	0.182		1.24	6.98	0.168	
Time	03:15	01:55	03:15		03:35	04:45	03:35		03:15	02:25	03:15		02:15	04:50	03:55		03:50	03:55	03:50		03:55	02:45	03:55		04:00	02:35	02:10	
Min	0.64	4.33	0.037		0.71	4.33	0.044		0.70	4.29	0.043		0.59	4.02	0.032		0.54	3.77	0.025		0.58	3.77	0.031		0.53	3.69	0.028	
Time	09:45	09:45	09:45		10:15	09:55	10:15		19:55	19:15	07:20		19:45	18:55	19:55		06:40	20:10	06:40		06:45	20:35	06:45		07:05	06:30	07:05	
Max	2.08	8.58	0.401		2.09	8.72	0.408		1.86	8.75	0.329		1.94	8.58	0.353		1.93	8.58	0.353		2.00	8.89	0.377		1.88	8.75	0.339	

	D	V	Q	Rain
Total			1.298	
Avg	1.31	7.11	0.185	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.02	5.88	0.100	0.02	0.98	5.61	0.089		0.90	5.25	0.074		1.15	6.45	0.129		0.93	5.43	0.081		0.90	5.25	0.075		0.96	5.60	0.087	
01:00	0.80	4.85	0.057	0.11	0.86	5.03	0.066		0.70	4.56	0.044		0.88	5.18	0.072		0.76	4.54	0.049		0.73	4.57	0.047		0.80	4.80	0.057	
02:00	0.77	4.68	0.053	0.02	0.76	4.62	0.050		0.70	4.64	0.045		0.65	4.01	0.035		0.64	4.52	0.039		0.67	4.55	0.041		0.67	4.07	0.037	
03:00	0.66	4.53	0.040		0.62	4.50	0.037		0.66	4.54	0.041		0.63	4.32	0.036		0.69	4.60	0.043		0.70	4.36	0.042		0.62	4.21	0.034	
04:00	0.67	4.60	0.041		0.61	4.34	0.035		0.78	5.13	0.060		0.65	4.37	0.038		0.70	4.47	0.044		0.72	4.51	0.046		0.80	4.61	0.054	
05:00	0.79	4.89	0.057		0.68	4.48	0.042		1.03	6.06	0.105		1.06	6.23	0.113		1.01	5.89	0.102		1.09	6.30	0.118		1.01	6.02	0.101	
06:00	1.10	6.45	0.121		1.01	5.96	0.102		1.59	8.34	0.268		1.64	8.47	0.285		1.67	7.99	0.275		1.67	8.11	0.280		1.69	8.00	0.281	
07:00	1.28	7.57	0.180		1.28	7.54	0.179		1.77	8.54	0.317		1.78	8.59	0.321		1.75	8.30	0.303		1.73	8.20	0.295		1.80	8.24	0.313	
08:00	1.66	8.57	0.291		1.68	8.65	0.299		1.60	8.51	0.274		1.43	8.15	0.223		1.60	8.15	0.262		1.55	8.10	0.249		1.55	7.94	0.244	
09:00	1.80	8.56	0.326		1.78	8.79	0.331		1.55	8.44	0.259		1.37	7.94	0.204		1.43	7.84	0.214		1.47	7.99	0.227		1.53	7.88	0.237	
10:00	1.78	8.66	0.325		1.79	9.16	0.346		1.40	8.11	0.216		1.30	7.60	0.181		1.36	7.56	0.192		1.37	7.59	0.195		1.39	7.68	0.202	
11:00	1.67	8.63	0.296		1.69	8.79	0.307		1.35	7.89	0.200		1.24	7.24	0.163		1.28	7.14	0.167		1.27	7.23	0.168		1.37	7.45	0.192	
12:00	1.51	8.39	0.249		1.59	8.68	0.276		1.30	7.64	0.183		1.21	6.98	0.151		1.28	7.09	0.166		1.21	6.96	0.151		1.32	7.60	0.186	
13:00	1.48	8.43	0.243		1.54	8.59	0.263		1.30	7.67	0.184		1.19	6.75	0.142		1.22	6.82	0.148		1.26	7.23	0.165		1.23	7.00	0.155	
14:00	1.37	8.19	0.210		1.44	8.73	0.241		1.28	7.86	0.184		1.23	6.95	0.154		1.18	6.89	0.143		1.21	6.99	0.150		1.21	6.85	0.148	
15:00	1.41	8.34	0.223		1.43	8.59	0.234		1.41	8.10	0.218		1.21	6.91	0.148		1.19	6.86	0.145		1.17	6.74	0.138		1.24	7.11	0.159	
16:00	1.44	8.43	0.234		1.41	8.38	0.226		1.46	8.23	0.232		1.21	6.93	0.150		1.29	7.35	0.174		1.22	6.86	0.149		1.33	7.43	0.184	
17:00	1.42	8.42	0.228		1.46	8.61	0.242		1.58	8.49	0.268		1.38	7.48	0.194		1.39	7.87	0.206		1.36	7.49	0.191		1.33	7.31	0.179	
18:00	1.41	8.37	0.224		1.51	8.49	0.252		1.68	8.50	0.293		1.47	7.83	0.224		1.38	7.81	0.204		1.43	7.90	0.217		1.37	7.66	0.197	
19:00	1.39	8.20	0.215		1.65	8.62	0.290		1.79	8.56	0.323		1.54	7.90	0.241		1.51	8.11	0.241		1.42	7.89	0.215		1.42	7.85	0.213	
20:00	1.38	8.08	0.209		1.69	8.54	0.297		1.82	8.62	0.333		1.62	7.90	0.261		1.62	8.26	0.271		1.68	8.35	0.288		1.42	7.95	0.217	
21:00	1.37	8.04	0.206		1.53	8.46	0.255		1.71	8.50	0.299		1.48	7.84	0.226		1.48	8.06	0.231		1.50	8.16	0.241		1.37	7.53	0.193	
22:00	1.34	7.83	0.195		1.29	7.49	0.178		1.44	8.33	0.231		1.43	7.74	0.211		1.37	7.64	0.198		1.35	7.48	0.190		1.28	7.14	0.168	
23:00	1.18	6.65	0.139		1.10	6.27	0.118		1.32	7.61	0.186		1.18	6.60	0.138		1.10	6.32	0.119		1.16	6.56	0.134		1.16	6.47	0.131	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.186	0.15			0.198				0.202				0.168				0.167				0.167				0.165	
Avg	1.28	7.30	0.186		1.31	7.37	0.198		1.34	7.42	0.202		1.25	6.93	0.168		1.24	6.90	0.167		1.24	6.89	0.167		1.24	6.85	0.165	
Time	02:50	03:20	03:30		04:40	04:35	05:20		03:40	03:45	03:40		03:10	02:45	02:40		02:50	01:40	02:50		03:45	03:30	04:15		03:00	02:20	02:05	
Min	0.53	3.90	0.027		0.46	3.80	0.020		0.56	3.64	0.028		0.55	3.30	0.025		0.54	4.04	0.027		0.55	3.92	0.030		0.55	3.48	0.027	
Time	10:15	16:45	10:15		09:50	10:25	10:40		20:40	16:45	20:20		07:15	06:30	07:15		07:20	06:50	07:20		06:40	06:40	06:40		07:15	15:55	07:15	
Max	2.02	9.74	0.395		1.94	9.95	0.408		1.90	9.46	0.359		1.92	8.79	0.367		1.93	8.58	0.359		1.91	8.58	0.355		1.99	8.58	0.372	

	D	V	Q	Rain
Total			1.254	0.15
Avg	1.27	7.09	0.179	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.09	6.13	0.113		1.07	5.88	0.106		0.94	5.14	0.077		0.98	5.30	0.085		0.99	5.44	0.087		0.98	5.42	0.086		0.98	5.54	0.088	
01:00	0.85	5.05	0.065		0.96	5.24	0.081		0.79	4.32	0.050		0.84	4.53	0.058		0.83	4.29	0.054		0.85	4.32	0.055		0.86	4.67	0.062	
02:00	0.81	4.93	0.059		0.83	4.34	0.054		0.71	4.11	0.040		0.73	4.21	0.044		0.76	4.16	0.046		0.73	4.24	0.043		0.79	4.20	0.049	
03:00	0.78	4.98	0.056		0.79	4.32	0.050		0.78	4.45	0.051		0.61	4.20	0.033		0.88	4.53	0.061		0.72	4.24	0.043		0.76	4.18	0.046	
04:00	0.66	4.29	0.039		0.73	4.27	0.044		0.83	4.59	0.057		0.75	4.21	0.045		0.83	4.26	0.053		0.77	4.41	0.049		0.83	4.43	0.056	
05:00	0.73	4.51	0.048		0.83	4.42	0.055		1.09	6.21	0.117		1.06	6.30	0.114		1.04	5.73	0.101		1.11	6.23	0.121		1.06	6.11	0.111	
06:00	1.06	6.29	0.114		1.08	6.40	0.119		1.64	8.21	0.274		1.65	8.26	0.281		1.64	8.14	0.271		1.65	8.07	0.273		1.63	8.14	0.271	
07:00	1.40	7.71	0.206		1.36	7.89	0.201		1.73	8.22	0.297		1.77	8.36	0.311		1.81	8.25	0.317		1.73	8.32	0.300		1.84	8.35	0.328	
08:00	1.64	8.30	0.277		1.71	8.40	0.296		1.52	8.24	0.246		1.52	8.32	0.251		1.60	8.12	0.261		1.47	8.06	0.230		1.58	8.43	0.267	
09:00	1.81	8.28	0.318		1.87	8.43	0.339		1.49	8.11	0.235		1.43	7.99	0.218		1.41	7.94	0.214		1.45	7.94	0.222		1.43	8.18	0.225	
10:00	1.79	8.38	0.317		1.85	8.50	0.335		1.42	8.12	0.221		1.41	7.94	0.213		1.28	7.22	0.169		1.37	7.79	0.200		1.44	8.17	0.227	
11:00	1.61	8.24	0.268		1.71	8.55	0.302		1.36	7.82	0.198		1.44	8.18	0.225		1.36	7.58	0.194		1.33	7.42	0.184		1.38	7.98	0.207	
12:00	1.49	8.29	0.241		1.73	8.41	0.302		1.36	7.81	0.199		1.32	7.89	0.193		1.22	6.72	0.146		1.31	7.41	0.178		1.33	7.67	0.189	
13:00	1.41	7.87	0.212		1.50	8.24	0.242		1.26	7.43	0.171		1.19	6.85	0.143		1.20	7.05	0.151		1.28	7.24	0.169		1.31	7.38	0.178	
14:00	1.38	7.85	0.204		1.38	8.10	0.210		1.25	7.45	0.167		1.28	7.36	0.172		1.22	6.66	0.146		1.24	6.96	0.156		1.29	7.38	0.174	
15:00	1.32	7.42	0.181		1.41	8.15	0.218		1.28	7.49	0.176		1.29	7.39	0.175		1.23	6.76	0.149		1.21	6.62	0.144		1.29	7.24	0.170	
16:00	1.40	7.79	0.206		1.44	8.45	0.235		1.35	7.51	0.189		1.29	7.16	0.170		1.27	7.26	0.168		1.33	7.55	0.186		1.31	7.41	0.179	
17:00	1.38	7.77	0.202		1.56	8.40	0.261		1.41	7.81	0.209		1.43	7.83	0.215		1.40	7.87	0.209		1.41	7.84	0.210		1.34	7.53	0.188	
18:00	1.37	7.91	0.204		1.50	8.37	0.245		1.57	8.41	0.265		1.42	8.02	0.218		1.54	7.86	0.241		1.50	8.12	0.239		1.42	7.90	0.213	
19:00	1.34	7.93	0.198		1.64	8.39	0.280		1.61	8.46	0.275		1.58	8.44	0.267		1.59	8.12	0.259		1.61	8.23	0.268		1.52	8.03	0.240	
20:00	1.41	8.15	0.218		1.79	8.29	0.313		1.71	8.45	0.298		1.70	8.30	0.292		1.65	8.05	0.271		1.72	8.27	0.294		1.48	8.04	0.231	
21:00	1.38	8.04	0.209		1.60	8.28	0.267		1.43	8.14	0.224		1.52	8.24	0.246		1.62	8.11	0.267		1.70	8.26	0.289		1.48	8.03	0.230	
22:00	1.37	7.76	0.199		1.37	7.70	0.198		1.36	7.74	0.199		1.38	7.65	0.199		1.34	7.48	0.188		1.39	7.51	0.198		1.34	7.50	0.187	
23:00	1.26	7.25	0.166		1.19	6.80	0.143		1.15	6.37	0.128		1.13	6.38	0.126		1.13	6.18	0.120		1.11	6.26	0.119		1.19	6.72	0.143	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.180				0.204				0.182				0.179				0.173				0.177				0.177	
Avg	1.28	7.13	0.180		1.37	7.26	0.204		1.29	7.11	0.182		1.28	7.06	0.179		1.28	6.82	0.173		1.29	6.95	0.177		1.29	7.05	0.177	
Time	05:15	04:50	04:50		04:45	02:50	04:45		02:45	02:20	02:45		03:55	02:00	03:55		02:15	02:00	02:00		03:25	01:50	03:00		03:25	01:50	03:25	
Min	0.55	3.37	0.024		0.64	3.65	0.036		0.57	3.74	0.029		0.50	3.79	0.024		0.56	3.52	0.026		0.60	3.80	0.033		0.67	3.72	0.038	
Time	10:20	18:30	10:20		09:50	11:20	09:50		07:00	21:30	07:00		06:55	08:10	06:55		07:25	07:30	07:25		07:10	07:05	07:10		07:30	08:35	07:30	
Max	2.01	8.82	0.367		2.05	8.82	0.391		1.97	8.80	0.370		1.89	8.85	0.349		1.98	8.58	0.370		1.92	8.58	0.356		1.93	8.97	0.359	

	D	V	Q	Rain
Total			1.272	
Avg	1.30	7.05	0.182	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	1.02	5.68	0.095		0.98	5.57	0.089	
01:00	0.88	4.83	0.067		0.89	4.91	0.068	
02:00	0.80	4.45	0.053		0.78	4.66	0.054	
03:00	0.79	4.34	0.050		0.67	4.33	0.039	
04:00	0.61	4.40	0.035		0.71	4.38	0.044	
05:00	0.76	4.57	0.051		0.83	4.69	0.058	
06:00	1.11	6.43	0.124		0.99	5.73	0.093	
07:00	1.45	7.72	0.218		1.39	7.81	0.209	
08:00	1.67	8.05	0.276		1.73	8.41	0.303	
09:00	1.82	8.46	0.326		1.90	8.52	0.351	
10:00	1.80	8.31	0.317		1.85	8.41	0.333	
11:00	1.73	8.43	0.304		1.75	8.43	0.309	
12:00	1.63	8.23	0.272		1.63	8.42	0.279	
13:00	1.44	8.10	0.225		1.46	8.02	0.226	
14:00	1.39	7.97	0.210		1.44	8.28	0.229	
15:00	1.44	8.12	0.226		1.44	8.25	0.229	
16:00	1.41	8.15	0.218		1.46	8.39	0.236	
17:00	1.40	8.18	0.218		1.58	8.40	0.264	
18:00	1.40	8.04	0.213		1.51	8.21	0.243	
19:00	1.47	8.17	0.233		1.57	8.30	0.260	
20:00	1.44	8.17	0.227		1.69	8.39	0.293	
21:00	1.40	7.99	0.213		1.58	8.29	0.263	
22:00	1.27	7.49	0.174		1.39	8.00	0.211	
23:00	1.19	6.96	0.146		1.13	6.26	0.123	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.187				0.200	
Avg	1.31	7.14	0.187		1.35	7.21	0.200	
Time	04:25	04:00	04:25		04:00	03:30	04:00	
Min	0.47	3.84	0.022		0.59	3.95	0.031	
Time	10:20	11:00	10:20		09:20	09:30	09:30	
Max	1.90	8.72	0.349		1.99	8.85	0.381	

	D	V	Q	Rain
Total			0.387	
Avg	1.33	7.17	0.194	

Site Commentary

Site Information

9D-60	
Pipe Dimensions	9.38 "
Silt Level	0.00"

Overview

Site 9D-60 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that backwater conditions were experienced at depths greater than 2.5 inchesthroughout the study period.

A data gap is present from Saturday, March 15, 2014 through Tuesday, March 25, 2014.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based 5-minute data intervals. In regards to depth, this site flows at 66.5% full at its recorded peak of 6.24 inches and approximately 32.5% full during its recorded average depth of 3.05 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.05	1.42	0.122
Minimum	1.29	0.54	0.016
Maximum	6.24	2.29	0.263
Time of Minimum	5/7/2014 4:45 AM	4/25/2014 4:50 AM	5/7/2014 4:40 AM
Time of Maximum	3/30/2014 10:30 AM	2/26/2014 12:10 PM	3/15/2014 9:25 AM

Data Quality

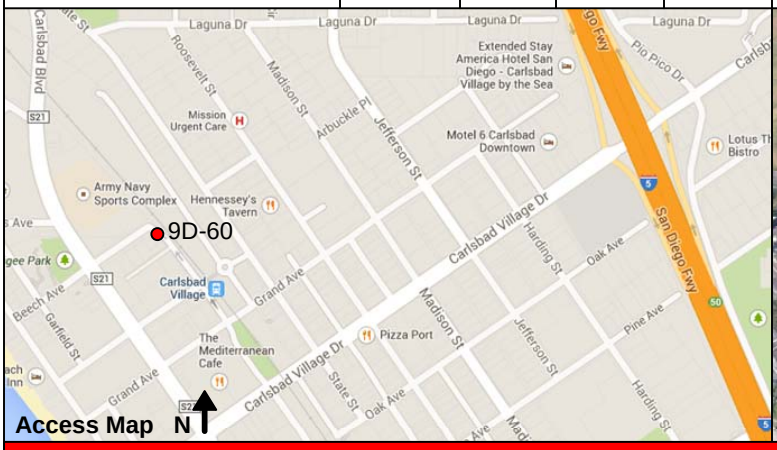
Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period. Downtime is due to a monitor malfunction from Saturday, March 15, 2014 through Tuesday, March 25, 2014.

Percent Uptime	
Depth (in)	87
Velocity (ft/s)	87
Quantity (MGD)	87

ADS Site Report

Quality Form

Project Name: Carlsbad Temp 2014	**City / State:** Carlsbad, CA		**Date Installed:** 2/20/14	**FM Initials:** JG	
Site Name: 9D-60	**Monitor Series:** 3600		**Monitor S/N:**	2813	
Address / Location: 2733 Washington ST			**Manhole #:**	9D-60	
			Map Page #:	N/A	
Access: Drive	**Type of System:**	Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	9.38"	
			Pipe Width:	9.25"	
			IP Address:	N/A	



Access Map N

Site Map N

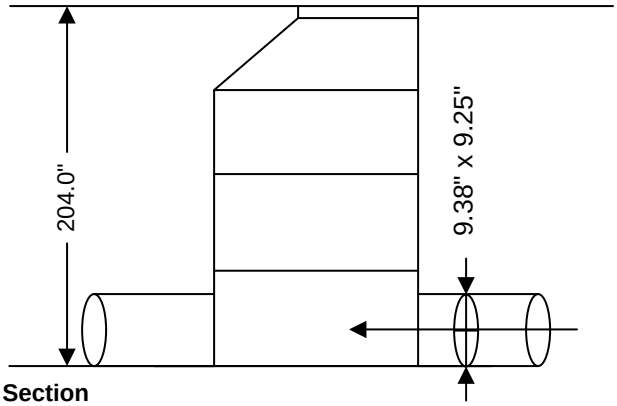
Investigation Information:

Date/Time of Investigation:	2/21/14 @ 1:00 p.m.		
Site Hydraulics: Low depth with low velocity			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	2.63"	**+/-**	.25
Range (Air Dof):		**+/-**	
Peak Velocity:	1.60	**Fps**	
Silt:	0.00"	**Inches**	

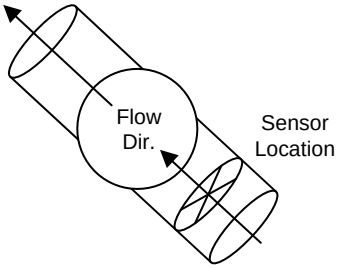
Manhole Information:

Manhole Depth:	204.0"	**Inches**			
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Lined / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A	**Feet**			
Road Cut Length:	N/A	**Feet**			
Trench Length:	N/A	**Feet**			

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: Ultrasonic Sensor / Velocity Sensor		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: RG 1		**Other**	[ ]	[ ]		

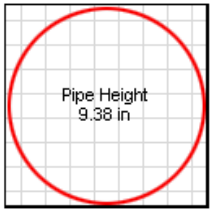
Additional Site Information / Comments:

SCATTERGRAPH REPORT

9D-60

Flow Monitor

9D-60

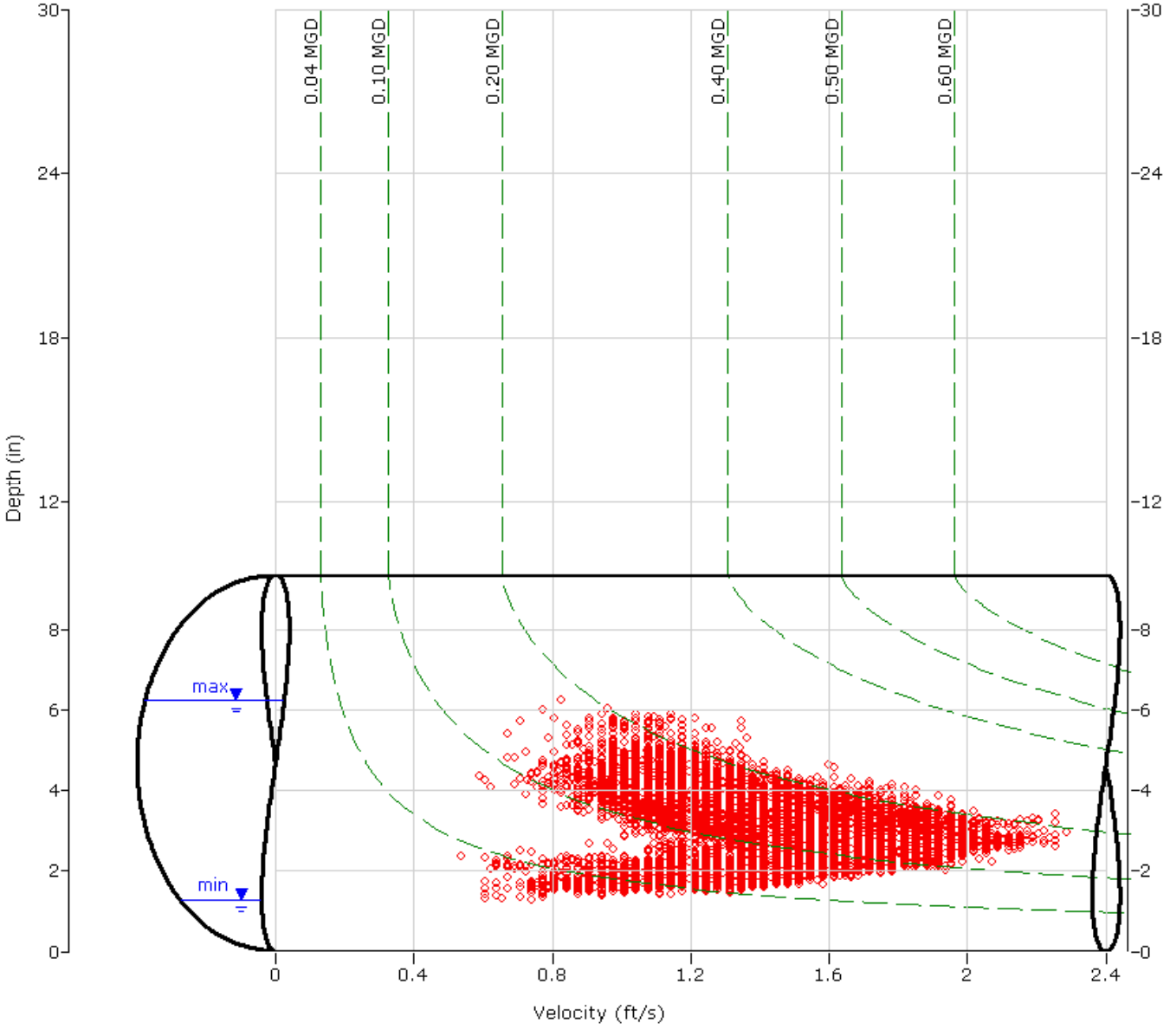


Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-60

Flow Monitor

9D-60

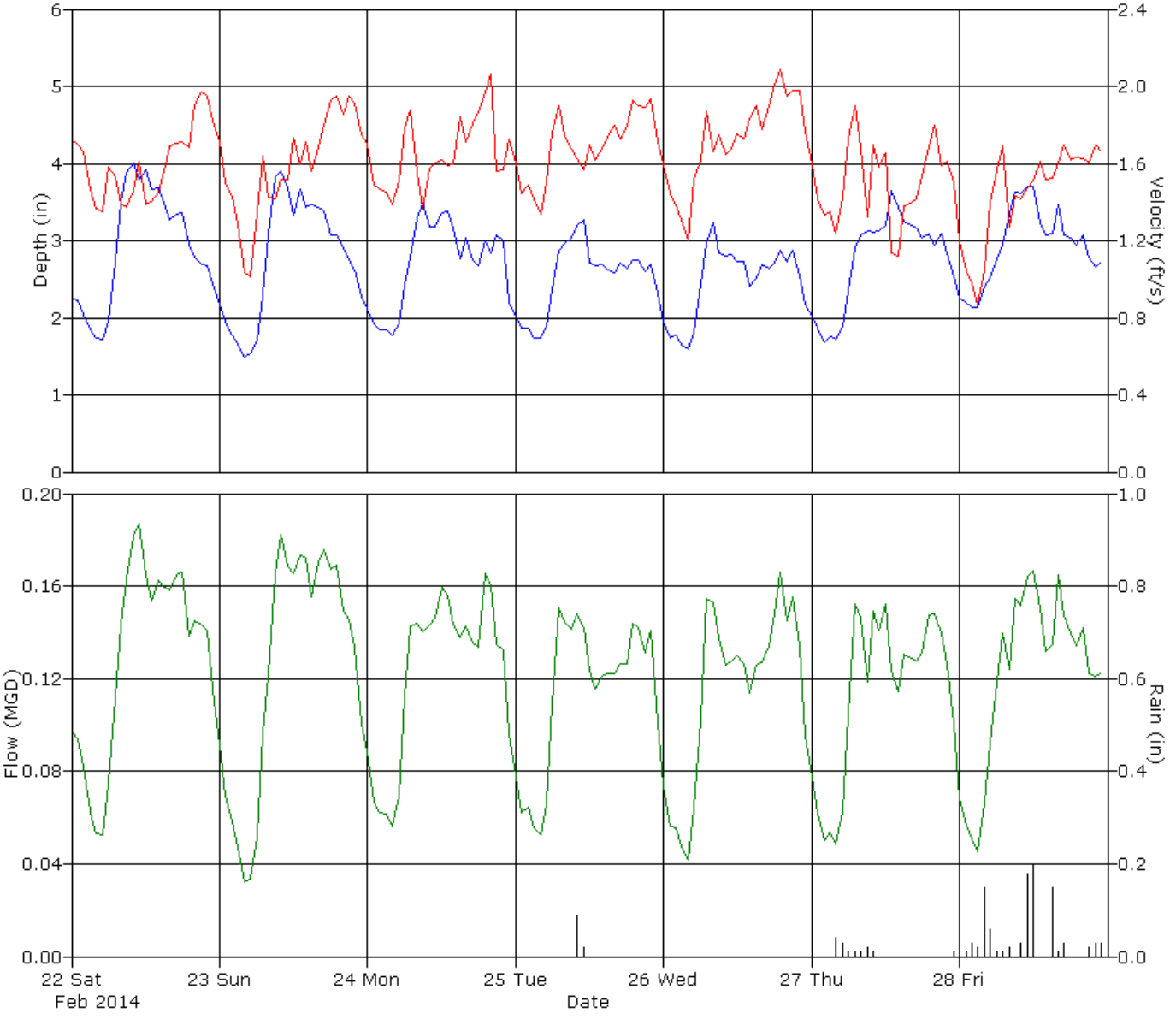
Pipe Height
9.38 in

Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



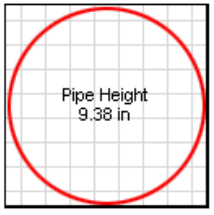
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-60

Flow Monitor

9D-60

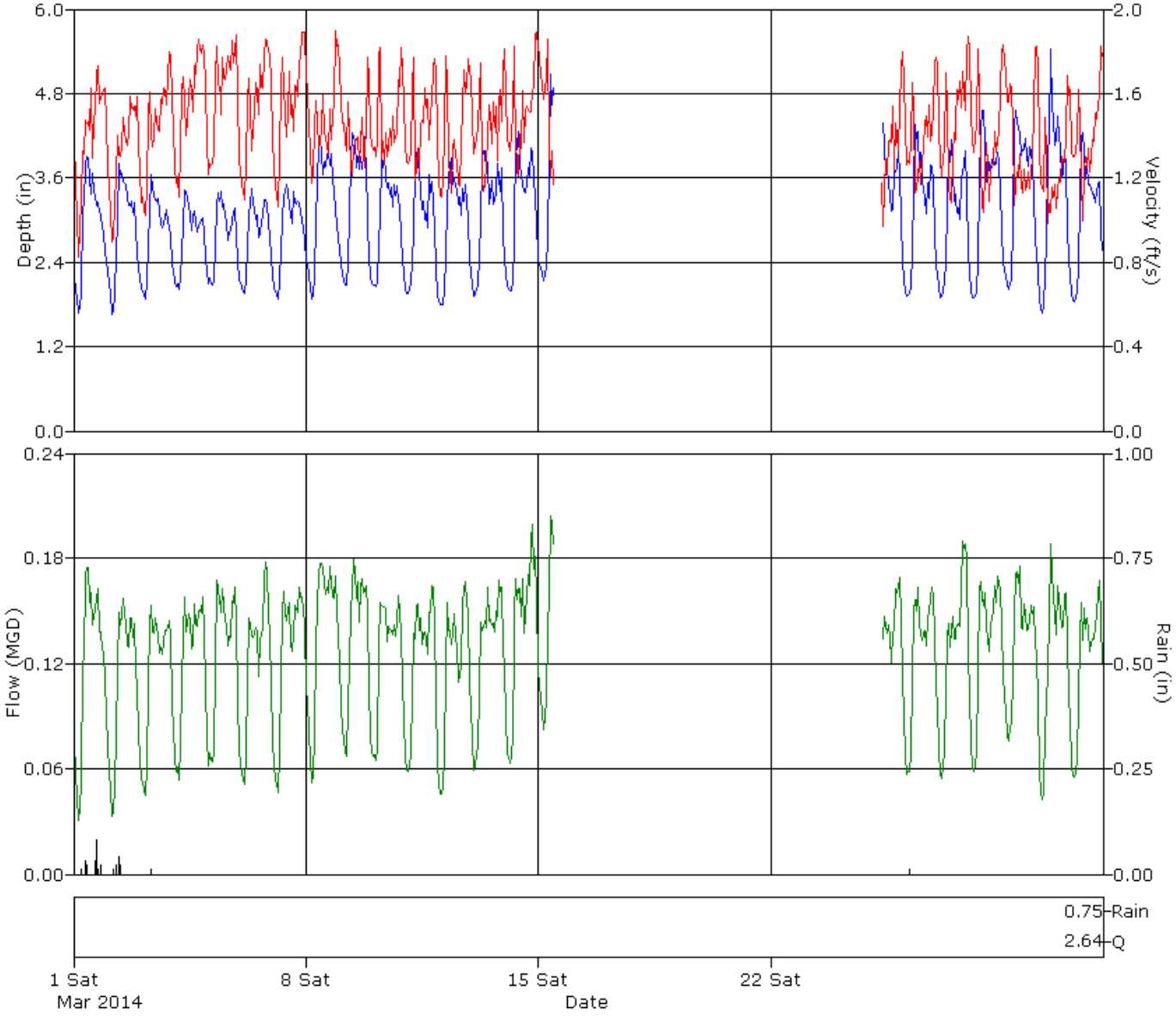


Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-60

Flow Monitor

9D-60

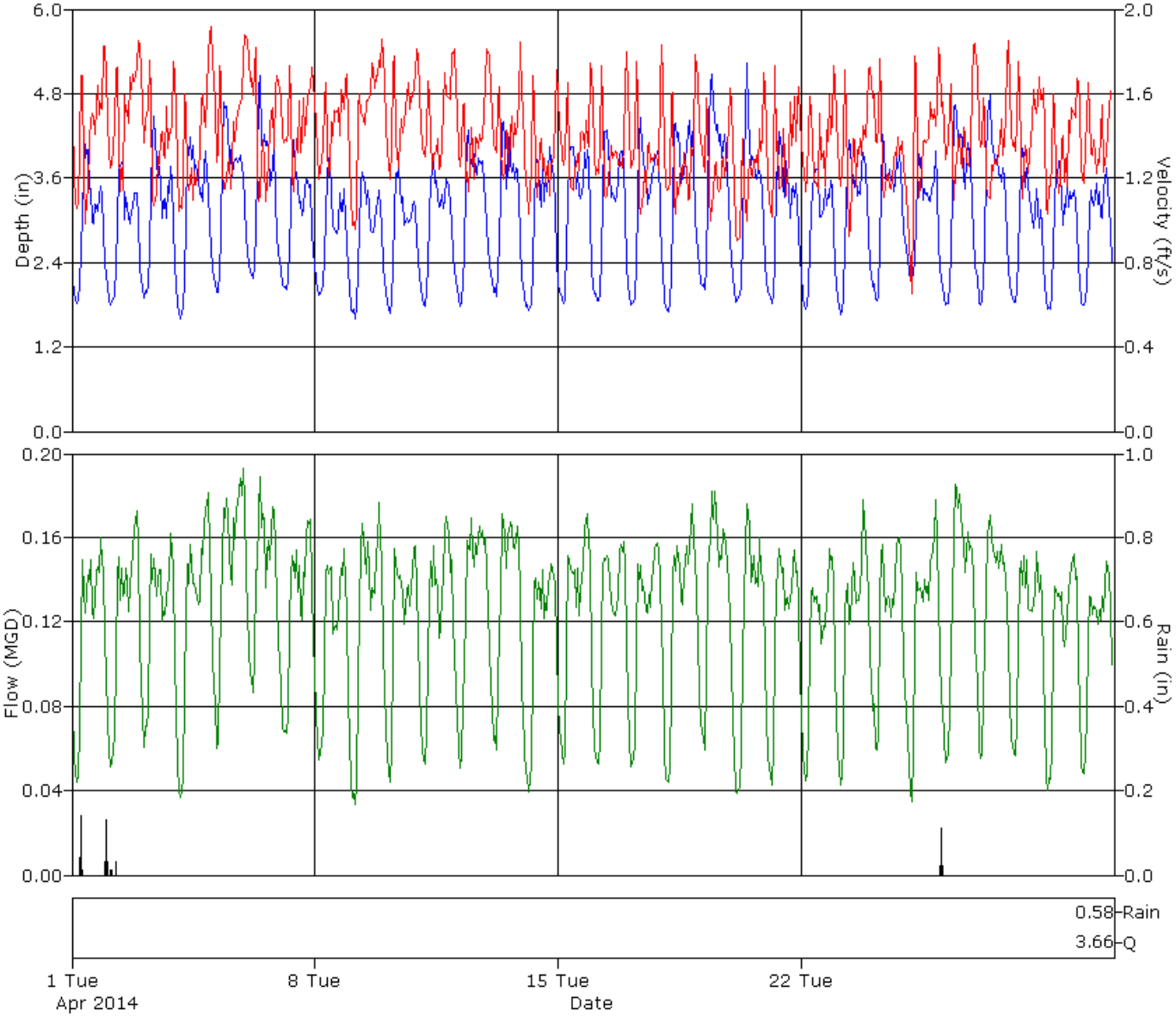
Pipe Height
9.38 in

Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-60

Flow Monitor

9D-60

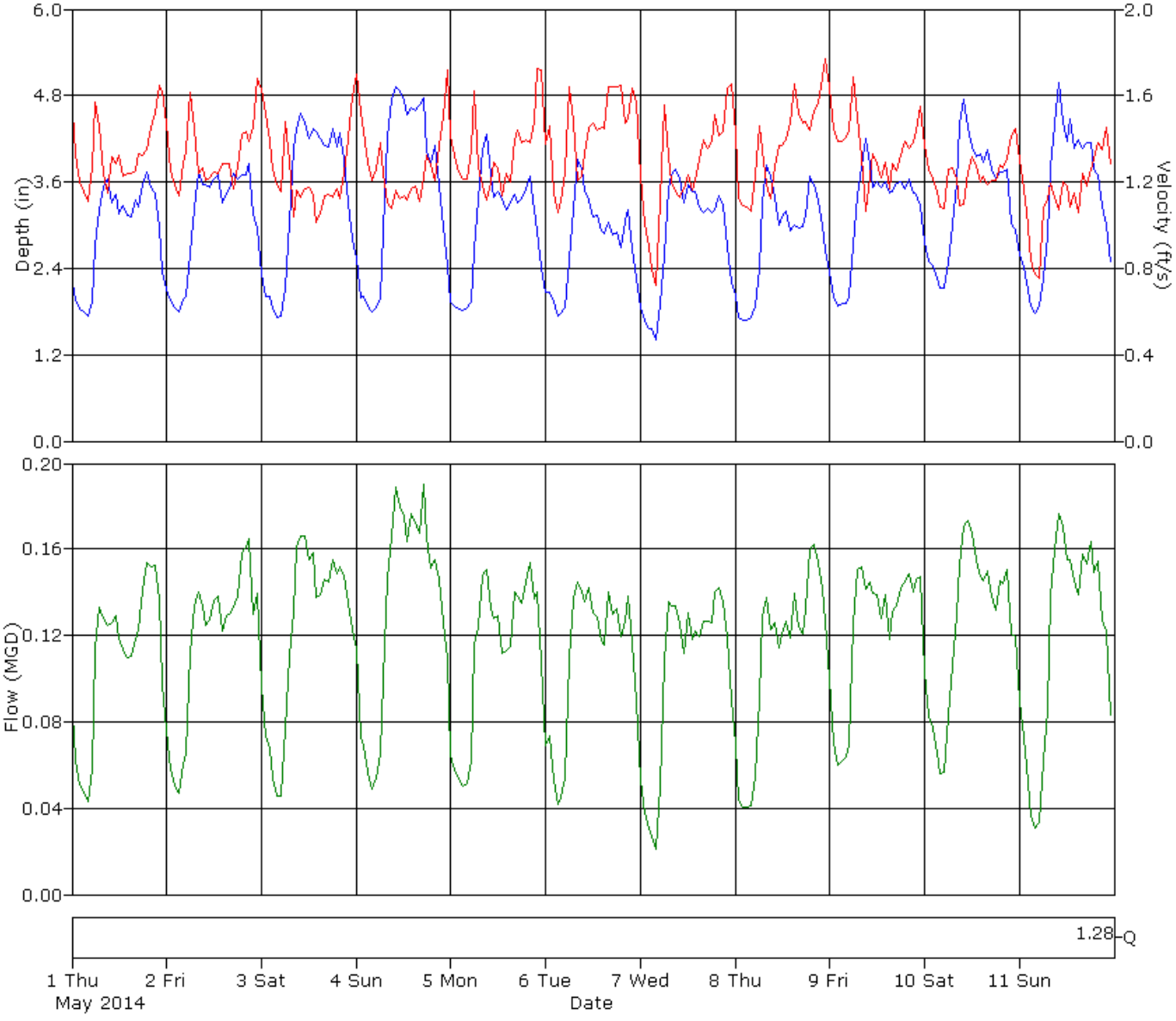
Pipe Height
9.38 in

Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

9D-60, Pipe Height: 9.38 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	05:25	1.63	12:10	5.13	2.92	12:10	0.86	16:55	2.19	1.60	05:25	0.044	09:55	0.218	0.130	0.130	
2/23/2014	04:25	1.42	09:40	4.57	2.77	04:30	0.88	17:55	2.26	1.59	04:30	0.026	19:00	0.227	0.125	0.125	
2/24/2014	04:05	1.65	13:50	4.44	2.71	08:40	0.94	20:40	2.26	1.65	05:10	0.045	12:25	0.223	0.122	0.122	
2/25/2014	04:15	1.59	11:20	4.25	2.52	11:20	0.96	16:30	2.14	1.69	04:15	0.043	08:55	0.204	0.114	0.114	0.11
2/26/2014	04:45	1.43	08:25	3.75	2.47	04:25	1.01	12:10	2.29	1.72	04:25	0.030	19:00	0.209	0.114	0.114	
2/27/2014	02:00	1.52	13:40	4.28	2.75	13:40	0.86	07:10	2.20	1.50	04:10	0.038	12:40	0.214	0.114	0.114	0.14
2/28/2014	02:10	1.96	12:10	4.94	2.94	04:15	0.77	23:05	1.94	1.45	03:50	0.043	12:10	0.214	0.121	0.121	1.01
3/1/2014	04:45	1.58	14:30	4.53	2.93	04:35	0.67	18:40	1.92	1.41	04:40	0.027	11:05	0.199	0.120	0.120	0.64
3/2/2014	05:15	1.55	09:30	4.79	2.85	04:40	0.74	21:05	1.94	1.33	04:40	0.027	09:45	0.186	0.109	0.109	0.09
3/3/2014	04:10	1.81	08:35	4.21	2.81	04:30	0.91	21:25	2.05	1.44	04:30	0.038	10:05	0.183	0.114	0.114	0.01
3/4/2014	04:10	1.96	09:20	4.06	2.78	02:15	1.01	18:25	2.14	1.57	04:25	0.048	21:30	0.189	0.122	0.122	
3/5/2014	04:35	1.94	11:05	4.22	2.81	03:00	1.08	12:10	2.05	1.60	03:00	0.054	12:00	0.200	0.126	0.126	
3/6/2014	04:00	1.84	18:00	4.01	2.79	03:55	0.94	18:35	2.02	1.53	03:55	0.040	19:15	0.209	0.120	0.120	
3/7/2014	04:25	1.79	15:25	4.56	2.87	15:25	0.81	22:55	2.05	1.54	04:25	0.035	11:30	0.197	0.125	0.125	
3/8/2014	04:55	1.77	10:30	4.85	3.19	16:25	0.98	21:55	2.12	1.49	04:55	0.043	17:50	0.220	0.137	0.137	
3/9/2014	05:20	1.93	18:05	5.25	3.21	09:00	0.88	21:40	2.02	1.44	05:20	0.050	10:05	0.204	0.131	0.131	
3/10/2014	03:10	1.95	09:40	4.68	3.03	18:50	0.88	06:00	2.17	1.46	01:40	0.058	07:25	0.209	0.124	0.124	
3/11/2014	01:50	1.79	07:45	4.82	2.93	07:45	0.91	21:35	2.07	1.46	23:55	0.046	20:00	0.229	0.120	0.120	
3/12/2014	02:05	1.59	09:15	4.89	2.96	09:25	0.77	06:00	2.09	1.40	02:05	0.027	17:50	0.194	0.117	0.117	
3/13/2014	02:15	1.86	21:25	4.83	3.11	08:10	0.77	22:50	2.04	1.45	03:00	0.045	20:15	0.210	0.127	0.127	
3/14/2014	02:00	1.85	10:05	4.81	3.21	10:25	0.98	22:00	2.07	1.51	03:00	0.053	20:20	0.227	0.140	0.140	
3/15/2014	03:55	2.07	09:40	6.02	3.00	09:40	0.96	01:10	2.05	1.58	04:40	0.076	09:25	0.263	0.128	0.060	
3/16/2014																	
3/17/2014																	
3/18/2014																	
3/19/2014																	
3/20/2014																	
3/21/2014																	
3/22/2014																	
3/23/2014																	
3/24/2014																	
3/25/2014	23:25	2.23	09:25	4.83	3.53	17:05	0.77	22:55	1.92	1.38	23:25	0.094	21:00	0.201	0.143	0.087	
3/26/2014	03:10	1.80	12:10	5.55	3.12	12:00	0.69	07:10	1.92	1.41	05:30	0.042	10:10	0.201	0.124	0.124	0.01
3/27/2014	03:05	1.83	08:20	4.62	3.07	10:55	0.74	07:20	2.12	1.47	03:00	0.046	22:25	0.232	0.128	0.128	
3/28/2014	04:40	1.76	10:45	5.41	3.31	17:45	0.77	06:25	2.05	1.39	05:25	0.043	10:45	0.197	0.131	0.131	
3/29/2014	03:50	1.91	16:25	5.14	3.40	07:55	0.59	00:50	1.99	1.38	03:50	0.065	22:40	0.242	0.132	0.132	
3/30/2014	04:40	1.59	10:30	6.24	3.36	08:00	0.61	00:50	1.95	1.28	04:10	0.029	10:10	0.225	0.124	0.124	
3/31/2014	03:15	1.71	10:00	4.66	3.06	14:40	0.72	23:20	1.92	1.40	03:10	0.045	21:10	0.198	0.120	0.120	
4/1/2014	03:00	1.70	09:15	4.47	2.96	09:05	0.79	07:05	1.92	1.41	03:25	0.035	20:30	0.185	0.117	0.117	0.22
4/2/2014	04:05	1.68	11:20	4.43	2.90	11:25	0.88	22:25	2.05	1.53	04:00	0.041	08:20	0.212	0.123	0.123	0.21
4/3/2014	04:45	1.83	09:10	5.50	3.07	07:50	0.84	06:25	1.95	1.43	05:10	0.047	13:10	0.203	0.121	0.121	
4/4/2014	04:00	1.52	20:00	5.18	3.11	03:10	0.79	22:50	2.04	1.35	03:10	0.028	20:20	0.210	0.122	0.122	
4/5/2014	04:45	1.88	10:10	5.73	3.41	09:55	0.91	23:40	2.05	1.47	04:05	0.045	11:15	0.229	0.144	0.144	
4/6/2014	05:30	2.11	09:45	5.80	3.39	09:45	0.91	07:25	2.09	1.49	05:25	0.079	10:30	0.235	0.142	0.142	
4/7/2014	05:05	1.86	08:45	4.75	3.05	09:20	0.81	22:05	1.92	1.46	05:05	0.055	18:45	0.201	0.126	0.126	
4/8/2014	04:35	1.82	10:50	4.96	2.84	09:20	0.84	13:20	1.92	1.46	03:50	0.048	18:50	0.180	0.115	0.115	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014	04:55	1.44	08:45	4.21	2.75	05:00	0.74	13:25	1.99	1.49	05:00	0.022	12:35	0.208	0.118	0.118	
4/10/2014	04:00	1.56	09:15	5.04	2.82	10:45	0.98	07:00	2.14	1.51	03:55	0.034	09:15	0.225	0.118	0.118	
4/11/2014	03:25	1.69	10:10	5.09	2.95	14:35	0.88	23:25	1.95	1.46	04:55	0.045	19:35	0.209	0.120	0.120	
4/12/2014	05:20	1.65	09:30	4.93	3.19	08:10	0.79	00:35	1.95	1.42	03:05	0.042	21:55	0.209	0.129	0.129	
4/13/2014	05:50	1.79	09:50	5.04	3.16	10:25	1.01	22:20	1.95	1.45	03:20	0.050	09:40	0.208	0.130	0.130	
4/14/2014	04:20	1.56	13:25	4.73	3.05	04:25	0.88	07:00	1.99	1.31	04:25	0.030	20:50	0.178	0.113	0.113	
4/15/2014	05:00	1.74	08:55	4.59	3.12	09:45	0.94	22:40	1.92	1.39	05:00	0.045	08:20	0.197	0.123	0.123	
4/16/2014	05:00	1.74	08:50	4.90	3.17	16:20	0.84	23:15	1.95	1.34	04:20	0.039	21:10	0.191	0.120	0.120	
4/17/2014	03:15	1.70	09:30	5.00	3.15	21:50	0.82	06:45	1.95	1.34	02:40	0.046	20:50	0.197	0.118	0.118	
4/18/2014	04:50	1.60	08:55	5.26	3.34	09:10	0.84	07:35	1.90	1.28	01:50	0.035	21:05	0.203	0.124	0.124	
4/19/2014	05:00	1.90	09:30	6.02	3.55	09:35	0.71	07:10	1.92	1.30	05:40	0.053	12:10	0.216	0.134	0.134	
4/20/2014	05:20	1.76	10:45	5.79	3.24	05:05	0.64	22:50	1.82	1.26	05:05	0.033	11:00	0.211	0.118	0.118	
4/21/2014	04:05	1.79	07:40	5.41	3.04	07:40	0.67	06:50	1.95	1.34	04:15	0.040	18:55	0.192	0.115	0.115	
4/22/2014	03:55	1.68	12:20	4.96	2.93	12:15	0.69	15:05	1.88	1.36	03:30	0.041	19:10	0.182	0.112	0.112	
4/23/2014	03:20	1.53	09:25	4.82	3.06	09:50	0.62	06:20	1.88	1.35	03:20	0.035	19:20	0.193	0.116	0.116	
4/24/2014	04:00	1.70	08:50	4.87	3.19	09:15	0.91	00:50	1.92	1.35	04:00	0.049	06:40	0.207	0.121	0.121	
4/25/2014	05:35	1.84	21:10	4.60	3.12	04:50	0.54	06:55	2.07	1.32	03:55	0.031	21:35	0.199	0.120	0.120	
4/26/2014	05:30	1.63	11:00	5.91	3.31	09:40	0.91	00:10	1.95	1.41	04:45	0.043	11:00	0.232	0.133	0.133	0.15
4/27/2014	03:25	1.70	10:20	5.76	3.18	10:15	0.84	23:15	1.99	1.43	04:45	0.048	10:25	0.202	0.126	0.126	
4/28/2014	04:15	1.68	09:15	4.90	2.92	09:30	0.77	06:25	2.12	1.46	04:10	0.048	12:00	0.188	0.117	0.117	
4/29/2014	02:35	1.53	10:35	4.36	2.91	14:30	0.77	06:30	1.85	1.34	03:05	0.032	19:35	0.173	0.110	0.110	
4/30/2014	01:45	1.63	19:25	4.32	2.89	14:10	0.84	06:20	1.82	1.38	01:45	0.037	19:25	0.176	0.111	0.111	
5/1/2014	04:45	1.65	21:10	4.52	2.92	16:00	0.84	22:30	1.82	1.34	04:45	0.034	19:30	0.184	0.109	0.109	
5/2/2014	03:15	1.58	13:40	4.51	3.09	16:20	0.76	23:40	1.82	1.33	03:15	0.036	20:35	0.199	0.117	0.117	
5/3/2014	05:10	1.57	10:55	5.12	3.42	14:25	0.76	00:00	1.78	1.24	05:00	0.037	10:05	0.193	0.122	0.122	
5/4/2014	03:50	1.58	15:45	5.91	3.52	09:45	0.81	23:10	1.87	1.29	03:45	0.042	10:30	0.238	0.132	0.132	
5/5/2014	02:45	1.64	09:00	4.98	2.99	13:30	0.89	22:55	1.95	1.34	02:45	0.040	20:50	0.177	0.113	0.113	
5/6/2014	03:15	1.66	08:40	4.32	2.77	02:25	0.94	06:40	1.99	1.43	03:25	0.035	08:55	0.181	0.110	0.110	
5/7/2014	04:45	1.29	10:05	4.44	2.86	04:20	0.61	06:50	1.82	1.25	04:40	0.016	19:35	0.168	0.103	0.103	
5/8/2014	03:30	1.51	08:10	4.51	2.83	08:20	0.82	23:00	1.85	1.38	03:30	0.029	19:25	0.191	0.110	0.110	
5/9/2014	03:05	1.77	09:55	4.68	3.16	14:55	0.84	06:25	1.88	1.37	02:05	0.051	07:05	0.173	0.122	0.122	
5/10/2014	04:55	1.87	10:45	5.18	3.39	07:00	0.77	23:00	1.62	1.24	04:55	0.044	11:00	0.218	0.124	0.124	
5/11/2014	05:15	1.54	10:00	5.71	3.37	05:10	0.61	22:15	1.55	1.15	05:15	0.020	11:50	0.213	0.117	0.117	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			8.414	2.59
Avg	3.05	1.42	0.122	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.24	1.72	0.097		2.17	1.71	0.092		2.12	1.70	0.089		2.03	1.60	0.078		1.96	1.59	0.074		2.03	1.60	0.078		2.26	1.20	0.068	0.02
01:00	2.22	1.69	0.094		1.95	1.50	0.069		1.92	1.49	0.067		1.86	1.44	0.062		1.74	1.44	0.056		1.87	1.41	0.062		2.19	1.04	0.057	0.01
02:00	2.05	1.66	0.082		1.78	1.43	0.058		1.84	1.46	0.062		1.87	1.49	0.065		1.77	1.39	0.056		1.69	1.33	0.050		2.13	0.98	0.051	0.03
03:00	1.84	1.47	0.063		1.67	1.28	0.047		1.84	1.45	0.062		1.75	1.41	0.056		1.63	1.29	0.046		1.76	1.35	0.054		2.14	0.87	0.045	0.02
04:00	1.73	1.36	0.053		1.48	1.03	0.032		1.77	1.39	0.056		1.74	1.34	0.052		1.60	1.20	0.042		1.73	1.23	0.048	0.04	2.41	1.05	0.066	0.15
05:00	1.73	1.35	0.053		1.55	1.01	0.033		1.92	1.51	0.070		1.88	1.50	0.066		1.81	1.52	0.064		1.88	1.42	0.063	0.03	2.51	1.40	0.092	0.06
06:00	1.96	1.58	0.075		1.71	1.34	0.052		2.42	1.78	0.112		2.37	1.76	0.109		2.44	1.62	0.103		2.35	1.73	0.104	0.01	2.77	1.57	0.118	0.01
07:00	2.73	1.53	0.112		2.30	1.64	0.096		2.78	1.88	0.143		2.88	1.90	0.151		2.96	1.87	0.155		2.91	1.90	0.152	0.01	2.95	1.69	0.139	0.01
08:00	3.51	1.39	0.143		3.08	1.42	0.122		3.29	1.56	0.144		2.96	1.74	0.144		3.23	1.66	0.153		3.08	1.68	0.146	0.01	3.34	1.27	0.124	0.02
09:00	3.87	1.37	0.163		3.83	1.41	0.166		3.49	1.37	0.141		3.03	1.68	0.141		2.84	1.75	0.137		3.13	1.32	0.119	0.02	3.63	1.43	0.155	
10:00	4.02	1.46	0.181		3.90	1.52	0.182		3.19	1.58	0.143		3.19	1.63	0.148	0.09	2.80	1.65	0.126		3.10	1.70	0.149	0.01	3.61	1.42	0.151	0.03
11:00	3.80	1.61	0.187		3.68	1.52	0.168		3.19	1.60	0.146		3.27	1.57	0.142	0.02	2.82	1.68	0.128		3.13	1.58	0.141		3.69	1.47	0.164	0.18
12:00	3.93	1.39	0.165		3.32	1.73	0.166		3.37	1.62	0.160		2.71	1.70	0.124		2.74	1.76	0.130		3.21	1.65	0.152		3.70	1.51	0.167	0.20
13:00	3.67	1.41	0.153		3.66	1.60	0.173		3.38	1.59	0.156		2.68	1.62	0.116		2.72	1.73	0.126		3.64	1.13	0.123		3.24	1.61	0.151	
14:00	3.68	1.46	0.162		3.43	1.71	0.172		3.16	1.59	0.143		2.69	1.67	0.121		2.40	1.83	0.114		3.44	1.12	0.114		3.07	1.52	0.132	
15:00	3.49	1.56	0.159		3.46	1.56	0.155		2.76	1.84	0.138		2.62	1.74	0.122		2.52	1.90	0.126		3.26	1.38	0.130		3.10	1.52	0.135	0.15
16:00	3.27	1.69	0.158		3.43	1.68	0.170		3.04	1.71	0.143		2.58	1.80	0.122		2.69	1.78	0.127		3.20	1.39	0.129		3.48	1.60	0.165	0.01
17:00	3.34	1.70	0.165		3.37	1.80	0.176		2.75	1.81	0.135		2.72	1.73	0.126		2.64	1.90	0.134		3.16	1.42	0.128		3.06	1.70	0.148	0.03
18:00	3.36	1.71	0.166		3.06	1.93	0.167		2.67	1.86	0.134		2.63	1.79	0.126		2.71	2.01	0.148		3.04	1.53	0.131		3.04	1.62	0.139	
19:00	2.95	1.68	0.139		3.07	1.95	0.169		3.00	1.97	0.165		2.74	1.93	0.144		2.88	2.08	0.166		3.09	1.69	0.148		2.95	1.63	0.134	
20:00	2.78	1.91	0.145		2.91	1.86	0.149		2.83	2.06	0.161		2.75	1.90	0.142		2.73	1.95	0.145		2.95	1.80	0.148		3.08	1.63	0.142	
21:00	2.70	1.97	0.143		2.74	1.95	0.146		3.06	1.56	0.135		2.60	1.89	0.131		2.87	1.98	0.156		3.09	1.59	0.140		2.79	1.60	0.122	0.02
22:00	2.68	1.95	0.141		2.62	1.91	0.134		3.01	1.57	0.133		2.69	1.94	0.141		2.55	1.98	0.135		2.84	1.61	0.126		2.66	1.70	0.121	0.03
23:00	2.44	1.82	0.116		2.27	1.75	0.101		2.21	1.73	0.096		2.32	1.72	0.101		2.17	1.77	0.095		2.53	1.50	0.101	0.01	2.73	1.66	0.122	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.130				0.125				0.122				0.114	0.11			0.114				0.114	0.14			0.121	1.01
Avg	2.92	1.60	0.130		2.77	1.59	0.125		2.71	1.65	0.122		2.52	1.69	0.114		2.47	1.72	0.114		2.75	1.50	0.114		2.94	1.45	0.121	
Time	05:25	12:10	05:25		04:25	04:30	04:30		04:05	08:40	05:10		04:15	11:20	04:15		04:45	04:25	04:25		02:00	13:40	04:10		02:10	04:15	03:50	
Min	1.63	0.86	0.044		1.42	0.88	0.026		1.65	0.94	0.045		1.59	0.96	0.043		1.43	1.01	0.030		1.52	0.86	0.038		1.96	0.77	0.043	
Time	12:10	16:55	09:55		09:40	17:55	19:00		13:50	20:40	12:25		11:20	16:30	08:55		08:25	12:10	19:00		13:40	07:10	12:40		12:10	23:05	12:10	
Max	5.13	2.19	0.218		4.57	2.26	0.227		4.44	2.26	0.223		4.25	2.14	0.204		3.75	2.29	0.209		4.28	2.20	0.214		4.94	1.94	0.214	

	D	V	Q	Rain
Total			0.840	1.26
Avg	2.73	1.60	0.120	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.53	1.51	0.101	0.32	2.42	1.46	0.092		2.18	1.24	0.067		2.28	1.44	0.083		2.27	1.37	0.078		2.16	1.29	0.069		2.21	1.39	0.076	
01:00	2.20	1.39	0.077	0.12	2.29	1.26	0.073		2.04	1.09	0.053		2.14	1.26	0.066		2.09	1.21	0.062		2.11	1.23	0.064		2.06	1.26	0.063	
02:00	2.01	1.17	0.057		2.11	1.15	0.059		2.00	1.11	0.053		2.05	1.18	0.058		2.19	1.27	0.069		2.06	1.17	0.058		1.97	1.15	0.054	
03:00	1.90	1.02	0.045		1.95	1.04	0.048		1.95	1.05	0.048		2.09	1.19	0.061		2.10	1.26	0.065		1.98	1.14	0.054		1.96	1.13	0.052	
04:00	1.68	0.82	0.031		1.65	0.90	0.033		1.88	1.02	0.045		2.01	1.11	0.053		2.08	1.27	0.064		1.96	1.09	0.051		1.87	1.07	0.046	
05:00	1.76	0.94	0.038		1.69	0.91	0.035	0.01	2.11	1.16	0.061		2.18	1.34	0.073		2.14	1.32	0.070		2.16	1.27	0.068		2.14	1.31	0.069	
06:00	1.98	1.11	0.053	0.01	1.97	1.08	0.050		2.64	1.50	0.107		2.56	1.61	0.109		2.63	1.69	0.119		2.62	1.57	0.111		2.58	1.63	0.113	
07:00	3.16	1.33	0.120		2.51	1.20	0.079	0.02	3.11	1.60	0.142		2.92	1.68	0.136		3.19	1.82	0.167		3.08	1.67	0.146		2.99	1.77	0.148	
08:00	3.23	1.31	0.122		3.02	1.40	0.118		3.65	1.41	0.153	0.01	3.43	1.57	0.158		3.38	1.66	0.164		3.23	1.53	0.143		3.37	1.64	0.161	
09:00	3.80	1.47	0.170	0.03	3.80	1.31	0.149	0.04	3.48	1.35	0.139		3.40	1.40	0.138		3.28	1.62	0.154		3.46	1.33	0.135		3.38	1.50	0.148	
10:00	3.90	1.46	0.174	0.02	3.64	1.30	0.142	0.02	3.36	1.39	0.137		3.31	1.48	0.142		3.34	1.60	0.155		3.25	1.44	0.134		3.50	1.39	0.144	
11:00	3.88	1.47	0.174		3.67	1.34	0.147		3.30	1.52	0.146		3.24	1.59	0.148		3.41	1.50	0.149		3.16	1.52	0.137		3.42	1.51	0.150	
12:00	3.61	1.43	0.155		3.55	1.49	0.157		3.28	1.48	0.141		3.06	1.67	0.145		3.20	1.77	0.163		3.02	1.65	0.141		3.19	1.70	0.155	
13:00	3.37	1.63	0.160		3.53	1.42	0.149		3.30	1.43	0.137		2.85	1.63	0.128		3.22	1.67	0.154		3.07	1.61	0.139		3.09	1.50	0.131	
14:00	3.66	1.29	0.142		3.50	1.37	0.142		3.16	1.42	0.126		3.06	1.51	0.130		3.07	1.67	0.144		2.76	1.50	0.112		2.94	1.55	0.127	
15:00	3.41	1.47	0.147		3.32	1.35	0.131		2.94	1.57	0.129		3.13	1.73	0.154		2.96	1.71	0.142		2.81	1.74	0.133		3.40	1.42	0.136	
16:00	3.36	1.53	0.151	0.03	3.21	1.41	0.129		2.90	1.55	0.125		3.00	1.69	0.142		2.71	1.78	0.130		2.98	1.64	0.137		3.25	1.64	0.153	
17:00	3.21	1.69	0.157	0.08	3.20	1.59	0.146		2.93	1.62	0.133		2.84	1.80	0.141		2.84	1.73	0.136		3.04	1.62	0.139		3.23	1.63	0.151	
18:00	3.25	1.73	0.162	0.01	3.28	1.53	0.146		3.05	1.62	0.139		2.91	1.86	0.150		2.85	1.72	0.135		3.29	1.78	0.168		3.26	1.59	0.149	
19:00	3.13	1.55	0.138		3.10	1.53	0.135		3.15	1.55	0.139		2.97	1.82	0.151		2.99	1.85	0.156		3.28	1.86	0.177		3.24	1.75	0.163	
20:00	3.07	1.58	0.138	0.02	3.24	1.54	0.143		2.99	1.68	0.140		2.98	1.79	0.149		3.11	1.74	0.154		3.22	1.85	0.172		3.14	1.76	0.158	
21:00	2.89	1.60	0.129		2.87	1.49	0.118		2.90	1.80	0.145		3.04	1.83	0.157		3.17	1.80	0.164		2.98	1.80	0.150		2.98	1.89	0.158	
22:00	2.84	1.62	0.127		2.53	1.58	0.106		2.79	1.79	0.136		2.82	1.79	0.139		2.79	1.88	0.144		2.76	1.79	0.135		2.89	1.89	0.151	
23:00	2.56	1.62	0.111		2.32	1.35	0.080		2.40	1.57	0.097		2.48	1.65	0.107		2.42	1.60	0.101		2.50	1.65	0.108		2.74	1.90	0.141	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.120	0.64			0.109	0.09			0.114	0.01			0.122				0.126				0.120				0.125	
Avg	2.93	1.41	0.120		2.85	1.33	0.109		2.81	1.44	0.114		2.78	1.57	0.122		2.81	1.60	0.126		2.79	1.53	0.120		2.87	1.54	0.125	
Time	04:45	04:35	04:40		05:15	04:40	04:40		04:10	04:30	04:30		04:10	02:15	04:25		04:35	03:00	03:00		04:00	03:55	03:55		04:25	15:25	04:25	
Min	1.58	0.67	0.027		1.55	0.74	0.027		1.81	0.91	0.038		1.96	1.01	0.048		1.94	1.08	0.054		1.84	0.94	0.040		1.79	0.81	0.035	
Time	14:30	18:40	11:05		09:30	21:05	09:45		08:35	21:25	10:05		09:20	18:25	21:30		11:05	12:10	12:00		18:00	18:35	19:15		15:25	22:55	11:30	
Max	4.53	1.92	0.199		4.79	1.94	0.186		4.21	2.05	0.183		4.06	2.14	0.189		4.22	2.05	0.200		4.01	2.02	0.209		4.56	2.05	0.197	

	D	V	Q	Rain
Total			0.836	0.74
Avg	2.83	1.49	0.119	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.40	1.68	0.104		2.61	1.73	0.120		2.12	1.36	0.071		2.02	1.35	0.066		1.86	1.19	0.051		2.10	1.49	0.076		2.23	1.60	0.090	
01:00	2.40	1.62	0.100		2.38	1.57	0.096		2.08	1.34	0.067		1.95	1.28	0.059		1.80	1.12	0.046		1.92	1.32	0.059		2.05	1.38	0.068	
02:00	2.22	1.45	0.080		2.25	1.46	0.082		2.08	1.35	0.068		1.95	1.27	0.059		1.80	1.11	0.046		1.93	1.35	0.061		2.04	1.37	0.067	
03:00	2.05	1.34	0.066		2.14	1.46	0.077		2.06	1.30	0.065		2.00	1.29	0.061		1.80	1.19	0.049		2.05	1.38	0.068		2.00	1.33	0.063	
04:00	1.88	1.18	0.052		2.07	1.38	0.069		2.10	1.38	0.071		2.11	1.32	0.069		2.01	1.41	0.069		2.05	1.45	0.072		2.01	1.41	0.068	
05:00	1.92	1.23	0.055		2.07	1.33	0.067		2.69	1.78	0.130		2.41	1.63	0.102		2.45	1.78	0.115		2.51	1.60	0.105		2.12	1.50	0.079	
06:00	2.21	1.44	0.080		2.40	1.56	0.096		3.04	1.82	0.155		2.83	1.77	0.137		3.27	1.65	0.155		2.95	1.75	0.143		2.65	1.82	0.130	
07:00	2.99	1.57	0.130		3.06	1.41	0.121		3.87	1.30	0.153		3.78	1.19	0.134		3.62	1.28	0.139		3.86	1.19	0.139		3.15	1.65	0.148	
08:00	3.52	1.47	0.152		3.87	1.26	0.150		3.74	1.37	0.153		3.97	1.25	0.153		3.77	1.21	0.139		3.99	1.14	0.140		3.89	1.41	0.168	
09:00	4.08	1.35	0.171		4.24	1.21	0.162		3.95	1.26	0.152		3.79	1.34	0.154		3.88	1.13	0.131		3.98	1.17	0.144		4.08	1.23	0.156	
10:00	4.16	1.36	0.177		4.20	1.36	0.179		3.61	1.42	0.151		3.71	1.24	0.139		3.51	1.34	0.137		3.71	1.26	0.141		4.27	1.21	0.163	
11:00	3.95	1.45	0.177		4.12	1.36	0.173		3.47	1.30	0.132		3.44	1.45	0.146		3.61	1.38	0.148		3.82	1.40	0.163		3.81	1.41	0.162	
12:00	3.64	1.60	0.175		3.74	1.39	0.157		3.52	1.35	0.141		3.15	1.47	0.131		3.49	1.30	0.135		3.23	1.55	0.144		3.65	1.34	0.147	
13:00	3.82	1.42	0.166		3.89	1.39	0.166		3.36	1.43	0.140		3.27	1.46	0.137		3.45	1.29	0.129		3.34	1.49	0.145		3.52	1.62	0.168	
14:00	3.76	1.40	0.160		3.73	1.28	0.144		3.47	1.35	0.139		3.02	1.63	0.138		3.23	1.17	0.109		3.57	1.36	0.142		3.43	1.37	0.137	
15:00	3.93	1.36	0.163		3.91	1.36	0.164		3.20	1.50	0.136		3.09	1.53	0.134		3.32	1.16	0.112		3.22	1.56	0.143		3.38	1.52	0.147	
16:00	3.98	1.31	0.160		3.73	1.49	0.168		3.51	1.37	0.142		2.89	1.57	0.125		3.08	1.36	0.119		3.29	1.44	0.138		3.52	1.54	0.159	
17:00	3.78	1.53	0.175		3.94	1.33	0.160		3.34	1.40	0.136		3.66	1.38	0.149		3.45	1.54	0.154		3.36	1.54	0.150		3.74	1.52	0.171	
18:00	3.94	1.38	0.166		4.18	1.25	0.161		3.49	1.41	0.144		3.38	1.52	0.149		3.27	1.71	0.161		3.81	1.28	0.147		3.63	1.51	0.164	
19:00	3.57	1.50	0.158		3.62	1.51	0.164		3.29	1.66	0.159		3.55	1.55	0.164		3.51	1.60	0.167		3.60	1.55	0.167		4.01	1.52	0.190	
20:00	3.44	1.55	0.157		3.18	1.65	0.150		3.20	1.63	0.150		3.25	1.73	0.163		3.27	1.64	0.156		3.40	1.62	0.161		3.97	1.62	0.199	
21:00	3.13	1.90	0.169		2.92	1.77	0.143		2.77	1.81	0.137		2.90	1.77	0.142		3.00	1.76	0.149		3.75	1.47	0.163		3.60	1.63	0.174	
22:00	2.96	1.82	0.151		2.50	1.67	0.110		2.44	1.72	0.109		2.34	1.71	0.102		2.46	1.70	0.108		2.76	1.71	0.128		3.30	1.88	0.181	
23:00	2.72	1.83	0.135		2.20	1.42	0.078		2.26	1.56	0.089		1.94	1.39	0.064		2.26	1.68	0.096		2.48	1.81	0.118		2.99	1.89	0.159	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.137				0.131				0.124				0.120				0.117				0.127				0.140	
Avg	3.19	1.49	0.137		3.21	1.44	0.131		3.03	1.46	0.124		2.93	1.46	0.120		2.96	1.40	0.117		3.11	1.45	0.127		3.21	1.51	0.140	
Time	04:55	16:25	04:55		05:20	09:00	05:20		03:10	18:50	01:40		01:50	07:45	23:55		02:05	09:25	02:05		02:15	08:10	03:00		02:00	10:25	03:00	
Min	1.77	0.98	0.043		1.93	0.88	0.050		1.95	0.88	0.058		1.79	0.91	0.046		1.59	0.77	0.027		1.86	0.77	0.045		1.85	0.98	0.053	
Time	10:30	21:55	17:50		18:05	21:40	10:05		09:40	06:00	07:25		07:45	21:35	20:00		09:15	06:00	17:50		21:25	22:50	20:15		10:05	22:00	20:20	
Max	4.85	2.12	0.220		5.25	2.02	0.204		4.68	2.17	0.209		4.82	2.07	0.229		4.89	2.09	0.194		4.83	2.04	0.210		4.81	2.07	0.227	

	D	V	Q	Rain
Total			0.897	
Avg	3.09	1.46	0.128	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.44	1.83	0.116																									
01:00	2.37	1.78	0.108																									
02:00	2.33	1.68	0.100																									
03:00	2.23	1.65	0.092																									
04:00	2.13	1.57	0.082																									
05:00	2.21	1.62	0.089																									
06:00	2.33	1.68	0.100																									
07:00	2.75	1.86	0.139																									
08:00	3.85	1.36	0.159																									
09:00	5.07	1.21	0.203																									
10:00	4.64	1.33	0.200																									
11:00	4.89	1.16	0.187																									
12:00																												
13:00																												
14:00																												
15:00																												
16:00																												
17:00																												
18:00																												
19:00																												
20:00																												
21:00																												
22:00																												
23:00																												

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.060																									
Avg	3.00	1.58	0.128																									
Time	03:55	09:40	04:40																									
Min	2.07	0.96	0.076																									
Time	09:40	01:10	09:25																									
Max	6.02	2.05	0.263																									

	D	V	Q	Rain
Total			0.060	
Avg	3.00	1.58	0.128	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																	2.18	1.67	0.090		2.23	1.74	0.097		2.25	1.82	0.103	
01:00																	1.98	1.45	0.068		2.05	1.44	0.071		2.02	1.51	0.073	
02:00																	1.92	1.26	0.057		1.91	1.28	0.057		1.90	1.38	0.061	
03:00																	1.93	1.28	0.058		1.91	1.21	0.054		1.90	1.32	0.059	
04:00																	1.95	1.27	0.059	0.01	1.97	1.30	0.061		1.91	1.39	0.062	
05:00																	2.03	1.38	0.068		2.16	1.33	0.071		1.97	1.46	0.069	
06:00																	2.55	1.65	0.111		2.38	1.70	0.105		2.42	1.81	0.114	
07:00																	3.44	1.53	0.151		3.24	1.53	0.135		3.51	1.58	0.161	
08:00														1.17			4.36	1.13	0.157		4.01	1.15	0.143		4.29	1.23	0.167	
09:00													4.37	0.97	0.134		4.17	1.14	0.150		3.82	1.11	0.129		4.56	1.08	0.157	
10:00													4.08	1.15	0.147		4.27	1.21	0.163		4.14	1.08	0.139		4.56	1.04	0.153	
11:00													3.64	1.29	0.141		3.70	1.28	0.143		3.70	1.31	0.147		4.13	1.24	0.160	
12:00													3.74	1.22	0.137		3.97	1.17	0.137		3.26	1.41	0.134		3.54	1.37	0.142	
13:00													3.52	1.37	0.142		3.53	1.27	0.133		3.36	1.38	0.134		3.57	1.25	0.134	
14:00													3.37	1.38	0.136		3.46	1.35	0.137		3.30	1.46	0.139		3.83	1.09	0.127	
15:00													3.13	1.37	0.120		3.30	1.45	0.138		3.10	1.62	0.142		3.75	1.24	0.141	
16:00													3.15	1.54	0.138		3.09	1.49	0.130		3.17	1.57	0.143		3.82	1.25	0.145	
17:00													3.72	1.24	0.138		3.53	1.40	0.146		3.01	1.66	0.141		3.90	1.27	0.150	
18:00													3.68	1.46	0.162		3.31	1.55	0.149		3.57	1.53	0.162		3.79	1.42	0.164	
19:00													3.74	1.41	0.160		3.78	1.38	0.158		3.68	1.71	0.190		3.81	1.32	0.154	
20:00													3.99	1.33	0.163		3.77	1.42	0.164		3.78	1.61	0.185		3.97	1.38	0.169	
21:00													3.67	1.53	0.169		3.55	1.51	0.159		3.97	1.52	0.188		3.85	1.41	0.165	
22:00													3.02	1.72	0.145		2.82	1.75	0.136		3.42	1.80	0.180		3.41	1.61	0.162	
23:00													2.40	1.80	0.112		2.33	1.77	0.105		2.55	1.87	0.126		2.88	1.79	0.142	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total															0.087				0.124	0.01			0.128				0.131	
Avg													3.53	1.38	0.143		3.12	1.41	0.124		3.07	1.47	0.128		3.31	1.39	0.131	
Time													23:25	17:05	23:25		03:10	12:00	05:30		03:05	10:55	03:00		04:40	17:45	05:25	
Min													2.23	0.77	0.094		1.80	0.69	0.042		1.83	0.74	0.046		1.76	0.77	0.043	
Time													09:25	22:55	21:00		12:10	07:10	10:10		08:20	07:20	22:25		10:45	06:25	10:45	
Max													4.83	1.92	0.201		5.55	1.92	0.201		4.62	2.12	0.232		5.41	2.05	0.197	

	D	V	Q	Rain
Total			0.470	0.01
Avg	3.23	1.41	0.130	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.39	1.83	0.112		2.57	1.83	0.125		2.22	1.62	0.090		2.17	1.49	0.080		2.23	1.69	0.095	0.13	2.18	1.71	0.092		2.12	1.50	0.078	
01:00	2.29	1.77	0.102		2.24	1.73	0.098		1.96	1.33	0.062		1.96	1.21	0.056		2.09	1.47	0.075	0.03	2.05	1.54	0.077		1.79	1.27	0.052	
02:00	2.20	1.70	0.093		1.89	1.34	0.059		1.87	1.30	0.056		1.90	1.09	0.049		1.89	1.33	0.059		1.90	1.37	0.061		1.72	1.04	0.040	
03:00	2.09	1.56	0.079		1.74	1.18	0.046		1.83	1.30	0.055		1.81	1.06	0.044		1.79	1.25	0.051	0.01	2.00	1.47	0.071		1.60	1.07	0.037	
04:00	2.02	1.56	0.076		1.67	1.16	0.043		1.89	1.31	0.058		1.87	1.08	0.047		1.83	1.26	0.053	0.01	1.98	1.50	0.071		1.67	1.06	0.040	
05:00	2.11	1.64	0.085		1.77	1.14	0.046		1.98	1.40	0.066		2.10	1.34	0.069	0.04	1.94	1.44	0.066		2.06	1.52	0.077		1.75	1.17	0.047	
06:00	2.13	1.64	0.085		2.26	1.49	0.085		2.36	1.62	0.098		2.55	1.69	0.114	0.14	2.36	1.72	0.104	0.03	2.60	1.76	0.123		2.17	1.60	0.086	
07:00	2.96	1.45	0.112		2.65	1.33	0.093		3.29	1.46	0.134		3.12	1.68	0.149	0.01	2.96	1.73	0.142		3.40	1.59	0.152		2.96	1.53	0.125	
08:00	4.32	1.07	0.147		3.95	0.99	0.119		4.17	1.19	0.155		3.67	1.22	0.134		3.70	1.35	0.151		4.08	1.10	0.140		3.96	1.21	0.147	
09:00	4.55	1.16	0.171		4.18	1.07	0.142		4.24	0.99	0.133		4.08	0.98	0.124		3.78	1.13	0.130		4.48	1.07	0.150		3.93	1.14	0.138	
10:00	4.39	1.23	0.172		5.43	1.04	0.188		3.99	1.23	0.152		3.94	1.10	0.134		3.81	1.25	0.145		3.83	1.13	0.132		4.19	1.19	0.157	
11:00	4.33	1.21	0.166		4.62	1.15	0.172		3.58	1.30	0.140		4.01	1.14	0.142		3.84	1.14	0.132		3.61	1.30	0.140		3.87	1.25	0.148	
12:00	4.24	1.31	0.175		4.46	1.11	0.158		3.83	1.25	0.146		3.45	1.38	0.140		3.00	1.59	0.134		3.77	1.27	0.145		4.06	1.09	0.138	
13:00	3.93	1.16	0.140		4.07	1.17	0.149		3.51	1.34	0.139		3.44	1.48	0.149		3.32	1.51	0.145		3.52	1.39	0.145		3.70	1.23	0.138	
14:00	4.00	1.13	0.139		4.14	1.06	0.136		3.51	1.23	0.127		2.99	1.50	0.125		3.19	1.52	0.140		3.02	1.42	0.120		3.79	1.17	0.135	
15:00	4.00	1.24	0.154		4.47	1.14	0.164		3.46	1.30	0.132		2.95	1.49	0.122		3.06	1.46	0.125		3.27	1.32	0.125		3.59	1.22	0.128	
16:00	4.15	1.14	0.148		4.20	1.19	0.158		3.37	1.38	0.134		3.22	1.41	0.131		2.95	1.68	0.138		3.30	1.30	0.124		3.37	1.34	0.130	
17:00	3.89	1.16	0.138		4.05	1.18	0.149		3.36	1.37	0.134		3.22	1.55	0.144		3.14	1.62	0.144		3.04	1.54	0.131		3.40	1.56	0.155	
18:00	3.76	1.23	0.140		3.60	1.30	0.140		3.24	1.50	0.141		3.14	1.64	0.146		3.16	1.69	0.153		3.49	1.34	0.138		3.28	1.60	0.152	
19:00	4.05	1.15	0.144		3.65	1.29	0.141		3.40	1.48	0.148		3.34	1.50	0.144		3.38	1.66	0.165		3.38	1.42	0.140		3.74	1.49	0.166	
20:00	3.99	1.23	0.153		4.00	1.28	0.159		3.51	1.55	0.160		3.48	1.55	0.160		3.39	1.68	0.167		3.76	1.42	0.162		3.98	1.44	0.174	
21:00	3.77	1.29	0.148		3.77	1.40	0.160		3.55	1.59	0.167		3.36	1.53	0.150		3.39	1.73	0.173		3.57	1.46	0.154		3.65	1.60	0.175	
22:00	3.40	1.52	0.152		2.88	1.69	0.134		2.87	1.82	0.145		2.86	1.82	0.144		3.02	1.85	0.158		2.97	1.75	0.146		3.44	1.79	0.181	
23:00	2.69	1.81	0.131		2.44	1.59	0.101		2.54	1.77	0.120		2.40	1.82	0.113	0.03	2.33	1.83	0.109		2.35	1.70	0.102		2.93	1.88	0.153	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.132				0.124				0.120				0.117	0.22			0.123	0.21			0.121				0.122	
Avg	3.40	1.38	0.132		3.36	1.28	0.124		3.06	1.40	0.120		2.96	1.41	0.117		2.90	1.53	0.123		3.07	1.43	0.121		3.11	1.35	0.122	
Time	03:50	07:55	03:50		04:40	08:00	04:10		03:15	14:40	03:10		03:00	09:05	03:25		04:05	11:25	04:00		04:45	07:50	05:10		04:00	03:10	03:10	
Min	1.91	0.59	0.065		1.59	0.61	0.029		1.71	0.72	0.045		1.70	0.79	0.035		1.68	0.88	0.041		1.83	0.84	0.047		1.52	0.79	0.028	
Time	16:25	00:50	22:40		10:30	00:50	10:10		10:00	23:20	21:10		09:15	07:05	20:30		11:20	22:25	08:20		09:10	06:25	13:10		20:00	22:50	20:20	
Max	5.14	1.99	0.242		6.24	1.95	0.225		4.66	1.92	0.198		4.47	1.92	0.185		4.43	2.05	0.212		5.50	1.95	0.203		5.18	2.04	0.210	

	D	V	Q	Rain
Total			0.859	0.43
Avg	3.12	1.40	0.123	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.61	1.92	0.133		2.77	1.87	0.141		2.28	1.57	0.091		2.40	1.56	0.097		2.07	1.29	0.065		2.18	1.65	0.090		2.21	1.60	0.088	
01:00	2.31	1.75	0.103		2.56	1.86	0.126		2.07	1.41	0.071		2.13	1.46	0.077		1.74	1.11	0.044		1.98	1.46	0.069		2.03	1.46	0.072	
02:00	2.17	1.67	0.089		2.37	1.76	0.107		2.06	1.37	0.068		2.03	1.32	0.064		1.70	0.98	0.037		1.86	1.33	0.058		1.90	1.35	0.060	
03:00	2.14	1.55	0.082		2.28	1.66	0.095		2.06	1.38	0.069		1.94	1.19	0.054		1.74	0.99	0.039		1.73	1.27	0.050		1.81	1.32	0.055	
04:00	1.97	1.27	0.060		2.24	1.67	0.094		2.03	1.38	0.067		1.95	1.23	0.057		1.61	0.96	0.033		1.67	1.19	0.044		1.78	1.30	0.052	
05:00	1.98	1.33	0.063		2.18	1.60	0.086		2.15	1.41	0.076		2.08	1.34	0.068		1.78	1.04	0.043		1.86	1.35	0.059		2.00	1.40	0.068	
06:00	2.28	1.73	0.100		2.35	1.71	0.103		2.59	1.73	0.120		2.49	1.56	0.102		2.30	1.53	0.091		2.36	1.72	0.106		2.38	1.66	0.101	
07:00	2.74	1.69	0.125		2.88	1.82	0.145		3.16	1.57	0.141		3.06	1.65	0.143		2.86	1.60	0.126		3.09	1.78	0.155		3.00	1.59	0.132	
08:00	3.99	1.23	0.150		3.71	1.29	0.145		4.08	1.20	0.151		3.63	1.35	0.147		3.49	1.51	0.155		3.66	1.37	0.148		3.61	1.40	0.149	
09:00	4.67	1.15	0.174		4.86	1.09	0.172		4.14	1.14	0.148		3.88	1.21	0.143		3.68	1.50	0.167		3.61	1.32	0.143		3.66	1.24	0.137	
10:00	4.60	1.15	0.169		5.06	1.12	0.189		3.67	1.28	0.141		3.82	1.26	0.145		3.53	1.45	0.152		3.76	1.25	0.141		3.91	1.31	0.156	
11:00	4.62	1.20	0.178		4.12	1.28	0.165		3.69	1.39	0.154		3.38	1.47	0.146		3.22	1.56	0.143		3.46	1.39	0.142		3.52	1.32	0.137	
12:00	4.29	1.26	0.170		4.01	1.38	0.171		3.47	1.32	0.134		2.94	1.40	0.114		3.44	1.57	0.158		3.25	1.48	0.137		3.56	1.33	0.140	
13:00	3.87	1.29	0.153		4.21	1.27	0.169		3.26	1.57	0.147		2.87	1.52	0.118		3.21	1.58	0.145		3.32	1.41	0.135		3.35	1.39	0.135	
14:00	4.01	1.15	0.142		4.05	1.09	0.136		3.28	1.32	0.125		2.85	1.52	0.118		2.85	1.60	0.125		2.93	1.47	0.119		3.18	1.24	0.112	
15:00	3.61	1.28	0.137		4.11	1.19	0.153		3.06	1.41	0.121		2.81	1.51	0.116		2.84	1.75	0.136		3.04	1.59	0.136		3.22	1.26	0.116	
16:00	3.80	1.47	0.169		4.00	1.28	0.159		3.18	1.58	0.144		2.91	1.53	0.123		2.84	1.72	0.134		2.98	1.65	0.137		3.37	1.36	0.133	
17:00	3.85	1.37	0.159		3.49	1.45	0.150		3.45	1.40	0.142		3.38	1.40	0.137		2.95	1.62	0.133		3.00	1.52	0.127		3.18	1.55	0.140	
18:00	3.88	1.47	0.175		3.62	1.50	0.163		3.58	1.50	0.160		3.14	1.62	0.146		3.19	1.69	0.154		3.05	1.58	0.136		3.32	1.70	0.163	
19:00	3.82	1.51	0.175		3.76	1.53	0.175		3.56	1.58	0.168		3.13	1.59	0.142		3.23	1.69	0.156		3.19	1.58	0.144		3.59	1.59	0.170	
20:00	3.93	1.57	0.188		4.11	1.34	0.172		3.48	1.62	0.167		3.44	1.53	0.155		3.42	1.76	0.177		3.27	1.64	0.155		3.48	1.58	0.162	
21:00	3.76	1.57	0.180		3.29	1.62	0.155		3.50	1.63	0.169		3.00	1.65	0.139		3.17	1.73	0.156		3.19	1.70	0.156		3.19	1.57	0.143	
22:00	3.63	1.78	0.193		2.79	1.68	0.128		2.88	1.73	0.138		2.72	1.69	0.125		2.93	1.86	0.151		2.75	1.81	0.136		2.97	1.79	0.149	
23:00	3.25	1.88	0.176		2.55	1.66	0.112		2.53	1.66	0.111		2.25	1.46	0.083		2.30	1.79	0.105		2.45	1.78	0.114		2.50	1.80	0.117	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.144				0.142				0.126				0.115				0.118				0.118				0.120	
Avg	3.41	1.47	0.144		3.39	1.49	0.142		3.05	1.46	0.126		2.84	1.46	0.115		2.75	1.49	0.118		2.82	1.51	0.118		2.95	1.46	0.120	
Time	04:45	09:55	04:05		05:30	09:45	05:25		05:05	09:20	05:05		04:35	09:20	03:50		04:55	05:00	05:00		04:00	10:45	03:55		03:25	14:35	04:55	
Min	1.88	0.91	0.045		2.11	0.91	0.079		1.86	0.81	0.055		1.82	0.84	0.048		1.44	0.74	0.022		1.56	0.98	0.034		1.69	0.88	0.045	
Time	10:10	23:40	11:15		09:45	07:25	10:30		08:45	22:05	18:45		10:50	13:20	18:50		08:45	13:25	12:35		09:15	07:00	09:15		10:10	23:25	19:35	
Max	5.73	2.05	0.229		5.80	2.09	0.235		4.75	1.92	0.201		4.96	1.92	0.180		4.21	1.99	0.208		5.04	2.14	0.225		5.09	1.95	0.209	

	D	V	Q	Rain
Total			0.883	
Avg	3.03	1.48	0.126	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.33	1.81	0.107		2.37	1.78	0.108		2.07	1.55	0.078		2.11	1.61	0.083		2.07	1.57	0.079		2.10	1.62	0.083		2.32	1.67	0.100	
01:00	2.13	1.63	0.086		2.23	1.61	0.090		1.93	1.31	0.060		1.99	1.43	0.068		1.95	1.30	0.060		1.94	1.41	0.064		1.88	1.32	0.058	
02:00	2.05	1.52	0.076		2.15	1.51	0.080		1.79	1.17	0.048		1.96	1.42	0.066		1.96	1.22	0.056		1.80	1.25	0.051		1.76	1.17	0.046	
03:00	1.89	1.32	0.059		1.97	1.36	0.064		1.80	1.15	0.047		1.89	1.30	0.057		1.85	1.24	0.053		1.82	1.26	0.053		1.73	1.14	0.044	
04:00	1.78	1.26	0.051		2.04	1.35	0.066		1.71	1.03	0.039		1.82	1.26	0.053		1.86	1.22	0.053		1.85	1.30	0.056		1.71	1.15	0.044	
05:00	1.83	1.34	0.057		1.92	1.32	0.060		1.80	1.25	0.052		1.88	1.31	0.058		1.96	1.36	0.064		1.90	1.38	0.062		1.84	1.18	0.051	
06:00	2.12	1.55	0.080		2.27	1.56	0.090		2.33	1.68	0.101		2.67	1.51	0.107		2.48	1.73	0.112		2.40	1.75	0.110		2.20	1.60	0.088	
07:00	2.51	1.55	0.100		2.66	1.63	0.116		3.18	1.55	0.138		3.20	1.65	0.151		3.33	1.54	0.147		3.25	1.59	0.147		3.12	1.61	0.141	
08:00	3.55	1.19	0.123		3.40	1.34	0.130		3.74	1.26	0.141		3.93	1.25	0.150		4.26	1.12	0.150		4.16	1.08	0.140		4.35	1.09	0.151	
09:00	4.12	1.23	0.159		4.36	1.23	0.171		3.87	1.11	0.131		4.03	1.15	0.145		4.27	1.11	0.150		4.46	1.03	0.147		4.38	1.03	0.144	
10:00	4.28	1.13	0.154		4.40	1.19	0.168		3.76	1.21	0.139		4.03	1.14	0.143		4.28	1.12	0.151		4.01	1.08	0.135		4.19	1.18	0.156	
11:00	3.92	1.28	0.154		4.15	1.24	0.161		3.39	1.35	0.134		3.80	1.26	0.145		4.04	1.20	0.150		3.96	1.13	0.137		4.25	1.12	0.151	
12:00	3.85	1.44	0.169		3.46	1.43	0.145		3.19	1.39	0.126		3.45	1.26	0.127		3.69	1.26	0.138		3.60	1.23	0.132		3.98	1.20	0.146	
13:00	3.77	1.34	0.153		3.75	1.41	0.161		3.82	1.25	0.145		3.69	1.31	0.145		3.33	1.36	0.131		3.69	1.13	0.125		3.53	1.25	0.130	
14:00	3.95	1.20	0.146		4.18	1.24	0.163		3.27	1.29	0.122		3.39	1.24	0.123		3.38	1.30	0.126		3.22	1.35	0.124		3.60	1.21	0.128	
15:00	3.71	1.39	0.157		3.85	1.42	0.167		3.68	1.17	0.129		3.31	1.41	0.135		3.26	1.33	0.123		3.35	1.37	0.132		3.64	1.32	0.143	
16:00	3.64	1.39	0.152		3.68	1.49	0.166		3.41	1.25	0.125		3.38	1.42	0.140		3.34	1.32	0.127		3.39	1.27	0.127		3.89	1.25	0.148	
17:00	3.88	1.34	0.160		3.81	1.35	0.155		3.66	1.27	0.140		3.51	1.41	0.147		3.58	1.26	0.133		3.65	1.29	0.142		4.02	1.25	0.156	
18:00	3.84	1.41	0.165		3.59	1.46	0.155		4.03	1.12	0.140		3.96	1.34	0.164		3.92	1.27	0.153		3.68	1.28	0.142		4.26	1.09	0.147	
19:00	3.80	1.37	0.160		3.74	1.41	0.160		3.85	1.26	0.147		3.75	1.47	0.168		3.99	1.27	0.157		3.86	1.32	0.155		4.42	1.10	0.155	
20:00	3.85	1.39	0.163		3.73	1.47	0.165		3.76	1.28	0.145		4.00	1.38	0.171		3.99	1.25	0.153		3.96	1.28	0.157		4.00	1.35	0.166	
21:00	3.51	1.51	0.157		3.36	1.57	0.154		3.60	1.31	0.141		3.83	1.35	0.158		3.80	1.36	0.158		4.03	1.23	0.154		4.25	1.31	0.176	
22:00	3.31	1.66	0.160		2.70	1.85	0.135		3.21	1.51	0.139		3.05	1.75	0.150		3.14	1.65	0.147		3.07	1.63	0.140		3.81	1.37	0.158	
23:00	2.89	1.81	0.145		2.19	1.58	0.087		2.43	1.71	0.107		2.29	1.70	0.098		2.38	1.80	0.110		2.46	1.83	0.117		3.03	1.79	0.152	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.129				0.130				0.113				0.123				0.120				0.118				0.124	
Avg	3.19	1.42	0.129		3.16	1.45	0.130		3.05	1.31	0.113		3.12	1.39	0.123		3.17	1.34	0.120		3.15	1.34	0.118		3.34	1.28	0.124	
Time	05:20	08:10	03:05		05:50	10:25	03:20		04:20	04:25	04:25		05:00	09:45	05:00		05:00	16:20	04:20		03:15	21:50	02:40		04:50	09:10	01:50	
Min	1.65	0.79	0.042		1.79	1.01	0.050		1.56	0.88	0.030		1.74	0.94	0.045		1.74	0.84	0.039		1.70	0.82	0.046		1.60	0.84	0.035	
Time	09:30	00:35	21:55		09:50	22:20	09:40		13:25	07:00	20:50		08:55	22:40	08:20		08:50	23:15	21:10		09:30	06:45	20:50		08:55	07:35	21:05	
Max	4.93	1.95	0.209		5.04	1.95	0.208		4.73	1.99	0.178		4.59	1.92	0.197		4.90	1.95	0.191		5.00	1.95	0.197		5.26	1.90	0.203	

	D	V	Q	Rain
Total			0.857	
Avg	3.17	1.36	0.122	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.56	1.68	0.114		2.47	1.56	0.101		2.13	1.42	0.074		2.27	1.38	0.079		2.09	1.48	0.076		2.24	1.65	0.093		2.59	1.13	0.078	
01:00	2.33	1.43	0.085		2.20	1.34	0.073		2.00	1.18	0.057		1.89	1.27	0.056		1.88	1.36	0.060		2.05	1.58	0.078		2.46	1.01	0.065	
02:00	2.11	1.39	0.073		2.02	1.20	0.059		1.95	1.10	0.051		1.80	1.24	0.051		1.79	1.23	0.050		2.09	1.59	0.081		2.27	0.91	0.052	
03:00	2.09	1.33	0.068		1.84	0.94	0.040		1.93	1.05	0.047		1.75	1.14	0.045		1.65	1.16	0.042		1.87	1.37	0.060		2.13	0.76	0.040	
04:00	2.09	1.28	0.065		1.85	0.91	0.039		1.83	1.02	0.043		1.77	1.20	0.048		1.70	1.23	0.047		1.86	1.37	0.059		2.16	0.65	0.035	
05:00	2.01	1.23	0.059		1.93	0.91	0.041		1.96	1.27	0.060		2.03	1.41	0.069		1.90	1.38	0.063		1.92	1.46	0.066		2.25	1.06	0.057	
06:00	2.34	1.58	0.095		2.06	1.18	0.059		2.42	1.73	0.109		2.61	1.59	0.110		2.69	1.71	0.125		2.71	1.76	0.130		2.44	1.78	0.113	
07:00	3.37	1.48	0.141		2.81	1.39	0.103		3.70	1.33	0.135		3.11	1.52	0.134		3.12	1.50	0.132		3.37	1.57	0.152		2.99	1.73	0.143	
08:00	4.33	1.13	0.155		3.80	1.14	0.129		3.60	1.37	0.145		3.44	1.35	0.136		3.82	1.19	0.138		4.23	1.18	0.156		3.59	1.26	0.135	
09:00	4.92	1.00	0.158		4.50	1.07	0.155		4.27	1.15	0.155		3.62	1.20	0.130		4.14	0.92	0.119		4.04	1.11	0.139		3.94	1.11	0.135	
10:00	5.08	1.08	0.182		5.24	1.00	0.176		4.02	1.16	0.144		3.72	1.17	0.132		4.04	0.96	0.120		3.58	1.17	0.125		3.85	1.16	0.136	
11:00	4.64	1.12	0.169		4.49	1.20	0.172		3.48	1.43	0.145		3.73	1.17	0.132		3.72	1.20	0.136		3.60	1.21	0.130		3.63	1.23	0.133	
12:00	4.49	1.26	0.182		4.11	1.29	0.165		3.34	1.29	0.126		3.71	1.15	0.125		3.59	1.39	0.148		3.62	1.22	0.132		3.28	1.37	0.129	
13:00	4.27	1.27	0.172		3.78	1.22	0.138		3.85	1.12	0.130		3.04	1.50	0.128		3.47	1.38	0.141		3.72	1.16	0.131		3.44	1.38	0.140	
14:00	4.35	1.16	0.161		3.90	1.20	0.143		3.62	1.22	0.131		3.04	1.29	0.109		3.67	1.17	0.129		3.56	1.15	0.122		3.38	1.37	0.134	
15:00	4.12	1.13	0.146		3.85	1.29	0.151		3.44	1.26	0.126		3.16	1.33	0.118		3.35	1.34	0.130		3.65	1.20	0.131		3.40	1.38	0.137	
16:00	4.21	1.15	0.152		3.63	1.27	0.138		3.02	1.56	0.132		3.44	1.16	0.118		3.40	1.31	0.130		3.41	1.28	0.128		3.28	1.38	0.130	
17:00	3.88	1.26	0.150		3.60	1.31	0.141		3.42	1.36	0.134		3.20	1.43	0.131		3.38	1.39	0.136		3.54	1.32	0.139		3.28	1.56	0.148	
18:00	4.04	1.30	0.164		3.73	1.24	0.137		3.49	1.42	0.147		3.36	1.38	0.135		3.74	1.31	0.147		3.89	1.30	0.156		3.43	1.50	0.151	
19:00	4.23	1.21	0.162		3.71	1.43	0.160		3.33	1.58	0.154		3.32	1.59	0.155		3.97	1.45	0.178		3.75	1.39	0.159		3.50	1.48	0.153	
20:00	4.02	1.26	0.156		3.61	1.33	0.143		3.52	1.37	0.143		3.56	1.41	0.149		3.76	1.39	0.159		3.93	1.32	0.160		3.54	1.53	0.162	
21:00	3.68	1.33	0.147		3.44	1.40	0.142		3.24	1.54	0.144		3.49	1.46	0.151		3.28	1.52	0.145		3.77	1.34	0.154		3.99	1.45	0.178	
22:00	3.28	1.46	0.138		2.90	1.70	0.136		2.87	1.63	0.130		2.89	1.73	0.139		2.84	1.71	0.133		3.30	1.37	0.132		3.49	1.54	0.159	
23:00	2.71	1.62	0.119		2.39	1.62	0.100		2.43	1.47	0.092		2.33	1.66	0.099		2.34	1.72	0.103		2.85	1.25	0.099		2.68	1.81	0.130	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.134				0.118				0.115				0.112				0.116				0.121				0.120	
Avg	3.55	1.30	0.134		3.24	1.26	0.118		3.04	1.34	0.115		2.93	1.36	0.112		3.06	1.35	0.116		3.19	1.35	0.121		3.12	1.32	0.120	
Time	05:00	09:35	05:40		05:20	05:05	05:05		04:05	07:40	04:15		03:55	12:15	03:30		03:20	09:50	03:20		04:00	09:15	04:00		05:35	04:50	03:55	
Min	1.90	0.71	0.053		1.76	0.64	0.033		1.79	0.67	0.040		1.68	0.69	0.041		1.53	0.62	0.035		1.70	0.91	0.049		1.84	0.54	0.031	
Time	09:30	07:10	12:10		10:45	22:50	11:00		07:40	06:50	18:55		12:20	15:05	19:10		09:25	06:20	19:20		08:50	00:50	06:40		21:10	06:55	21:35	
Max	6.02	1.92	0.216		5.79	1.82	0.211		5.41	1.95	0.192		4.96	1.88	0.182		4.82	1.88	0.193		4.87	1.92	0.207		4.60	2.07	0.199	

	D	V	Q	Rain
Total			0.836	
Avg	3.16	1.32	0.119	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.35	1.76	0.107	0.02	2.39	1.84	0.113		2.11	1.64	0.084		2.10	1.43	0.074		2.17	1.54	0.084		2.20	1.52	0.084		2.12	1.47	0.076	
01:00	2.15	1.54	0.082	0.11	2.23	1.74	0.097		1.93	1.42	0.065		1.88	1.06	0.046		1.82	1.25	0.052		1.97	1.33	0.063		1.95	1.25	0.058	
02:00	2.08	1.56	0.080	0.02	2.22	1.73	0.096		1.91	1.35	0.061		1.73	1.03	0.040		1.80	1.20	0.049		1.83	1.20	0.051		1.85	1.19	0.051	
03:00	1.92	1.44	0.066		1.83	1.42	0.060		1.83	1.37	0.058		1.76	1.16	0.046		1.80	1.18	0.048		1.79	1.16	0.047		1.79	1.14	0.047	
04:00	1.80	1.29	0.053		1.80	1.35	0.055		1.84	1.33	0.056		1.75	1.16	0.046		1.84	1.35	0.057		1.74	1.11	0.043		1.98	1.29	0.060	
05:00	1.82	1.37	0.057		1.83	1.36	0.057		2.02	1.47	0.072		1.96	1.27	0.059		2.08	1.48	0.076		1.93	1.27	0.058		2.01	1.34	0.065	
06:00	2.09	1.54	0.078		2.16	1.58	0.085		2.50	1.75	0.115		2.63	1.60	0.114		2.57	1.65	0.112		2.70	1.57	0.114		2.60	1.62	0.112	
07:00	2.55	1.64	0.109		2.66	1.51	0.108		3.13	1.62	0.142		3.17	1.52	0.137		3.12	1.50	0.132		3.20	1.46	0.133		3.22	1.44	0.134	
08:00	3.46	1.29	0.129		3.74	1.18	0.133		3.74	1.33	0.149		3.73	1.21	0.136		3.42	1.31	0.131		3.51	1.24	0.128		3.74	1.24	0.140	
09:00	4.63	1.09	0.163		4.50	1.11	0.161		4.03	1.10	0.138		3.61	1.22	0.132		3.27	1.31	0.124		3.64	1.15	0.125		3.56	1.26	0.134	
10:00	4.64	1.25	0.185		4.78	1.11	0.171		3.94	1.25	0.151		3.85	1.13	0.134		3.22	1.38	0.127		3.30	1.32	0.126		3.56	1.21	0.125	
11:00	4.52	1.28	0.183		4.10	1.26	0.161		3.46	1.35	0.136		3.65	1.18	0.130		3.33	1.31	0.127		3.43	1.28	0.129		3.52	1.22	0.127	
12:00	4.09	1.36	0.174		4.04	1.23	0.154		3.75	1.33	0.149		3.35	1.38	0.134		3.52	1.22	0.125		3.16	1.33	0.119		3.64	1.25	0.136	
13:00	4.11	1.41	0.180		3.87	1.29	0.153		3.51	1.22	0.126		2.92	1.40	0.113		3.22	1.29	0.119		3.27	1.23	0.114		3.70	1.24	0.138	
14:00	4.23	1.29	0.172		3.83	1.27	0.148		3.35	1.30	0.126		3.23	1.18	0.108		3.41	1.27	0.126		3.14	1.24	0.110		3.30	1.28	0.122	
15:00	4.15	1.25	0.162		3.92	1.27	0.153		3.02	1.47	0.125		3.19	1.29	0.115		3.05	1.41	0.121		3.11	1.24	0.110		3.44	1.29	0.129	
16:00	3.63	1.44	0.157		3.64	1.33	0.145		2.89	1.62	0.129		3.53	1.17	0.122		3.03	1.55	0.132		3.34	1.25	0.118		3.51	1.28	0.130	
17:00	3.45	1.41	0.144		3.65	1.38	0.151		3.11	1.54	0.134		3.18	1.47	0.135		3.45	1.23	0.125		3.24	1.33	0.123		3.72	1.17	0.133	
18:00	3.88	1.28	0.152		3.55	1.48	0.156		3.45	1.51	0.153		3.40	1.41	0.141		3.57	1.28	0.137		3.56	1.32	0.141		3.65	1.27	0.138	
19:00	4.11	1.27	0.162		3.74	1.31	0.148		3.20	1.56	0.143		3.30	1.53	0.147		3.75	1.31	0.149		3.74	1.35	0.154		3.69	1.42	0.158	
20:00	3.98	1.26	0.154		3.61	1.37	0.148		2.89	1.68	0.134		3.43	1.51	0.152		3.45	1.43	0.145		3.53	1.46	0.152		3.70	1.44	0.161	
21:00	3.80	1.34	0.156		3.26	1.49	0.140		3.15	1.57	0.142		3.26	1.48	0.140		3.23	1.53	0.142		3.44	1.52	0.152		3.86	1.39	0.165	
22:00	3.27	1.65	0.155		2.72	1.76	0.129		2.96	1.57	0.129		3.01	1.67	0.141		2.84	1.61	0.127		2.98	1.65	0.137		3.15	1.45	0.130	
23:00	2.80	1.82	0.140		2.31	1.85	0.108		2.36	1.62	0.098		2.31	1.66	0.097		2.39	1.61	0.099		2.35	1.62	0.097		2.97	1.68	0.140	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.133	0.15			0.126				0.117				0.110				0.111				0.109				0.117	
Avg	3.31	1.41	0.133		3.18	1.43	0.126		2.92	1.46	0.117		2.91	1.34	0.110		2.89	1.38	0.111		2.92	1.34	0.109		3.09	1.33	0.117	
Time	05:30	09:40	04:45		03:25	10:15	04:45		04:15	09:30	04:10		02:35	14:30	03:05		01:45	14:10	01:45		04:45	16:00	04:45		03:15	16:20	03:15	
Min	1.63	0.91	0.043		1.70	0.84	0.048		1.68	0.77	0.048		1.53	0.77	0.032		1.63	0.84	0.037		1.65	0.84	0.034		1.58	0.76	0.036	
Time	11:00	00:10	11:00		10:20	23:15	10:25		09:15	06:25	12:00		10:35	06:30	19:35		19:25	06:20	19:25		21:10	22:30	19:30		13:40	23:40	20:35	
Max	5.91	1.95	0.232		5.76	1.99	0.202		4.90	2.12	0.188		4.36	1.85	0.173		4.32	1.82	0.176		4.52	1.82	0.184		4.51	1.82	0.199	

	D	V	Q	Rain
Total			0.824	0.15
Avg	3.03	1.38	0.118	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	2.31	1.63	0.096		2.54	1.70	0.114		1.93	1.41	0.064		2.07	1.37	0.069		1.86	1.23	0.053		2.03	1.43	0.070		2.36	1.64	0.100	
01:00	2.02	1.52	0.074		2.00	1.52	0.073		1.87	1.32	0.058		2.07	1.46	0.073		1.69	1.01	0.038		1.72	1.12	0.043		2.02	1.44	0.070	
02:00	2.02	1.39	0.068		2.00	1.44	0.069		1.84	1.25	0.053		1.94	1.15	0.053		1.57	0.90	0.031		1.68	1.09	0.041		1.87	1.39	0.060	
03:00	1.85	1.26	0.054		1.87	1.29	0.057		1.82	1.21	0.050		1.74	1.06	0.042		1.56	0.80	0.027		1.69	1.08	0.041		1.91	1.39	0.062	
04:00	1.72	1.19	0.046		1.79	1.21	0.049		1.85	1.21	0.052		1.78	1.11	0.045		1.41	0.72	0.021		1.72	1.06	0.041		1.92	1.41	0.064	
05:00	1.74	1.16	0.045		1.85	1.26	0.054		1.93	1.35	0.062		1.85	1.25	0.054		1.91	1.11	0.050		1.87	1.23	0.054		2.01	1.44	0.070	
06:00	2.12	1.48	0.077		1.97	1.38	0.065		2.65	1.62	0.116		2.51	1.64	0.109		2.58	1.55	0.108		2.39	1.46	0.091		2.72	1.69	0.125	
07:00	3.04	1.30	0.110		2.93	1.24	0.099		3.36	1.27	0.124		3.23	1.48	0.137		3.50	1.32	0.136		3.31	1.35	0.128		3.41	1.50	0.150	
08:00	4.07	1.04	0.131		4.23	1.11	0.146		4.04	1.18	0.148		3.91	1.21	0.145		3.70	1.20	0.134		3.84	1.19	0.137		3.82	1.32	0.152	
09:00	4.34	1.16	0.161		4.74	1.08	0.166		4.27	1.12	0.151		3.78	1.23	0.141		3.78	1.16	0.133		3.67	1.12	0.123		4.21	1.06	0.141	
10:00	4.56	1.13	0.166		4.92	1.16	0.189		3.70	1.20	0.133		3.48	1.33	0.135		3.67	1.13	0.125		3.39	1.27	0.126		3.86	1.23	0.145	
11:00	4.44	1.17	0.166		4.86	1.12	0.179		3.39	1.29	0.128		3.34	1.45	0.142		3.31	1.17	0.112		3.00	1.37	0.114		3.53	1.33	0.140	
12:00	4.20	1.18	0.155		4.72	1.14	0.175		3.46	1.26	0.129		3.11	1.47	0.130		3.57	1.23	0.130		3.12	1.37	0.121		3.60	1.29	0.139	
13:00	4.34	1.14	0.158		4.54	1.12	0.164		3.37	1.14	0.111		3.14	1.44	0.128		3.47	1.16	0.118		3.20	1.40	0.126		3.53	1.22	0.128	
14:00	4.30	1.01	0.138		4.63	1.17	0.176		3.20	1.24	0.113		2.91	1.46	0.117		3.46	1.20	0.122		2.92	1.47	0.119		3.61	1.29	0.139	
15:00	4.20	1.05	0.139		4.58	1.18	0.172		3.32	1.20	0.115		2.89	1.45	0.115		3.24	1.30	0.120		3.01	1.65	0.139		3.45	1.17	0.118	
16:00	4.10	1.14	0.146		4.66	1.11	0.167		3.43	1.39	0.140		3.04	1.64	0.140		3.18	1.39	0.127		2.96	1.52	0.124		3.46	1.28	0.131	
17:00	4.08	1.14	0.145		4.77	1.22	0.190		3.31	1.44	0.138		2.87	1.64	0.130		3.24	1.35	0.126		2.97	1.47	0.121		3.58	1.25	0.134	
18:00	4.34	1.13	0.155		4.02	1.32	0.165		3.36	1.38	0.135		2.91	1.64	0.132		3.17	1.39	0.126		3.13	1.48	0.133		3.60	1.32	0.142	
19:00	4.08	1.17	0.148		3.85	1.28	0.151		3.51	1.39	0.145		2.69	1.65	0.119		3.21	1.51	0.140		3.67	1.44	0.160		3.51	1.39	0.144	
20:00	4.28	1.12	0.152		4.10	1.21	0.155		3.68	1.38	0.154		3.05	1.48	0.126		3.40	1.42	0.142		3.56	1.53	0.162		3.63	1.36	0.148	
21:00	3.91	1.24	0.148		3.57	1.37	0.146		3.21	1.48	0.137		3.21	1.49	0.138		3.28	1.43	0.136		3.36	1.57	0.154		3.45	1.38	0.140	
22:00	3.32	1.40	0.135		2.99	1.51	0.126		2.92	1.73	0.140		2.66	1.63	0.117		2.70	1.63	0.119		3.00	1.69	0.142		3.43	1.44	0.146	
23:00	2.81	1.60	0.123		2.44	1.72	0.109		2.42	1.72	0.108		2.26	1.57	0.090		2.20	1.65	0.091		2.66	1.77	0.127		3.28	1.55	0.148	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.122				0.132				0.113				0.110				0.103				0.110				0.122	
Avg	3.42	1.24	0.122		3.52	1.29	0.132		2.99	1.34	0.113		2.77	1.43	0.110		2.86	1.25	0.103		2.83	1.38	0.110		3.16	1.37	0.122	
Time	05:10	14:25	05:00		03:50	09:45	03:45		02:45	13:30	02:45		03:15	02:25	03:25		04:45	04:20	04:40		03:30	08:20	03:30		03:05	14:55	02:05	
Min	1.57	0.76	0.037		1.58	0.81	0.042		1.64	0.89	0.040		1.66	0.94	0.035		1.29	0.61	0.016		1.51	0.82	0.029		1.77	0.84	0.051	
Time	10:55	00:00	10:05		15:45	23:10	10:30		09:00	22:55	20:50		08:40	06:40	08:55		10:05	06:50	19:35		08:10	23:00	19:25		09:55	06:25	07:05	
Max	5.12	1.78	0.193		5.91	1.87	0.238		4.98	1.95	0.177		4.32	1.99	0.181		4.44	1.82	0.168		4.51	1.85	0.191		4.68	1.88	0.173	

	D	V	Q	Rain
Total			0.811	
Avg	3.08	1.33	0.116	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	2.77	1.37	0.103		2.59	1.30	0.089	
01:00	2.50	1.26	0.082		2.41	1.17	0.073	
02:00	2.44	1.21	0.077		2.20	1.07	0.059	
03:00	2.26	1.15	0.066		1.87	0.84	0.037	
04:00	2.12	1.08	0.056		1.77	0.77	0.031	
05:00	2.12	1.08	0.056		1.87	0.75	0.033	
06:00	2.48	1.26	0.082		2.26	1.08	0.062	
07:00	3.00	1.27	0.106		2.84	1.11	0.086	
08:00	3.58	1.21	0.129		3.79	1.19	0.138	
09:00	4.39	1.09	0.153		4.40	1.13	0.159	
10:00	4.75	1.10	0.171		4.99	1.07	0.176	
11:00	4.36	1.25	0.173		4.44	1.20	0.170	
12:00	4.09	1.32	0.167		4.17	1.18	0.155	
13:00	3.95	1.27	0.155		4.47	1.08	0.155	
14:00	3.98	1.20	0.148		4.07	1.15	0.146	
15:00	3.88	1.23	0.145		4.18	1.06	0.139	
16:00	4.05	1.19	0.150		4.08	1.24	0.158	
17:00	3.77	1.21	0.138		4.15	1.18	0.153	
18:00	3.65	1.21	0.132		4.15	1.26	0.163	
19:00	3.74	1.28	0.145		3.77	1.30	0.149	
20:00	3.75	1.27	0.144		3.69	1.38	0.155	
21:00	3.78	1.31	0.150		3.27	1.35	0.127	
22:00	3.02	1.42	0.121		3.00	1.45	0.122	
23:00	2.95	1.44	0.119		2.48	1.28	0.083	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.124				0.117	
Avg	3.39	1.24	0.124		3.37	1.15	0.117	
Time	04:55	07:00	04:55		05:15	05:10	05:15	
Min	1.87	0.77	0.044		1.54	0.61	0.020	
Time	10:45	23:00	11:00		10:00	22:15	11:50	
Max	5.18	1.62	0.218		5.71	1.55	0.213	

	D	V	Q	Rain
Total			0.241	
Avg	3.38	1.19	0.121	

Site Commentary

Site Information

9D-AH206	
Pipe Dimensions	11.63 "
Silt Level	0.00"

Overview

Site 9D-AH206 functioned under normal conditions during the period Saturday, February 22, 2014 to Sunday, May 11, 2014 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

A data gap is present from Tuesday, April 8, 2014 through Thursday, April 17, 2014.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Saturday, February 22, 2014 to Sunday, May 11, 2014 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 42.0% full at its recorded peak of 4.87 inches and approximately 17.3% full during its recorded average depth of 2.01 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.01	1.75	0.111
Minimum	0.59	0.37	0.006
Maximum	4.87	3.08	0.385
Time of Minimum	3/29/2014 12:40 AM	2/24/2014 3:40 AM	2/24/2014 3:40 AM
Time of Maximum	3/16/2014 10:40 AM	3/26/2014 7:50 AM	4/20/2014 8:30 AM

Data Quality

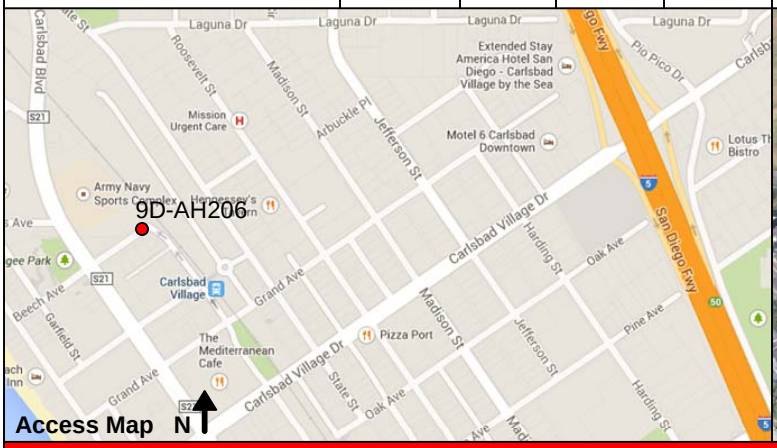
Data uptime observed during the Saturday, February 22, 2014 to the Sunday, May 11, 2014 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period. Downtime is due to a monitor malfunction from Tuesday, April 8, 2014 through Thursday, April 17, 2014.

Percent Uptime	
Depth (in)	89
Velocity (ft/s)	89
Quantity (MGD)	89

ADS Site Report

Quality Form

Project Name: Carlsbad Temp 2014	**City / State:** Carlsbad, CA			**Date Installed:** 2/20/14	**FM Initials:** JG
Site Name: 9D-AH206	**Monitor Series:** 3600		**Monitor S/N:**	1326	
Address / Location: 385 Beech AVE			**Manhole #:**	9D-AH206	
			Map Page #:	N/A	
Access: Drive	**Type of System:**	Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	11.63"	
			Pipe Width:	11.63"	
			IP Address:	N/A	



Access Map N

Site Map N

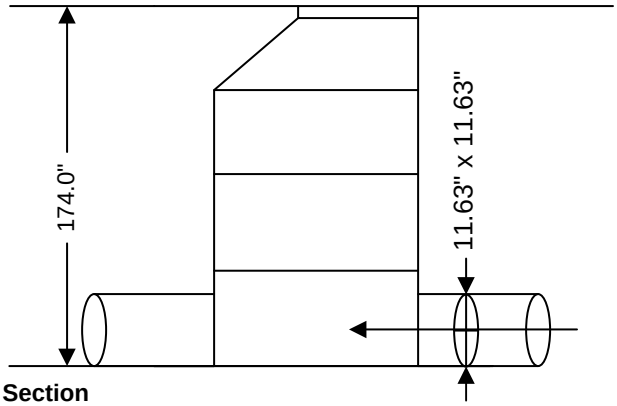
Investigation Information:

Date/Time of Investigation:	2/20/14 @ 11:00 a.m.		
Site Hydraulics: Low depth with moderate velocity			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	2.49"	**+/-**	.25
Range (Air Dof):		**+/-**	
Peak Velocity:	2.20	**Fps**	
Silt:	0.00"	**Inches**	

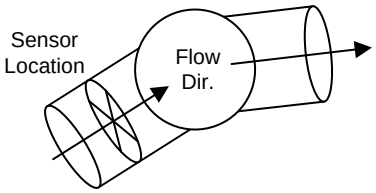
Manhole Information:

Manhole Depth:	204.0"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Lined / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard installation	**Trunk**	[ ]	[ ]		
Sensors/ Devices: Ultrasonic Sensor / Velocity Sensor	**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge **Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: RG 1	**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

9D-AH206

Flow Monitor

9D-AH206

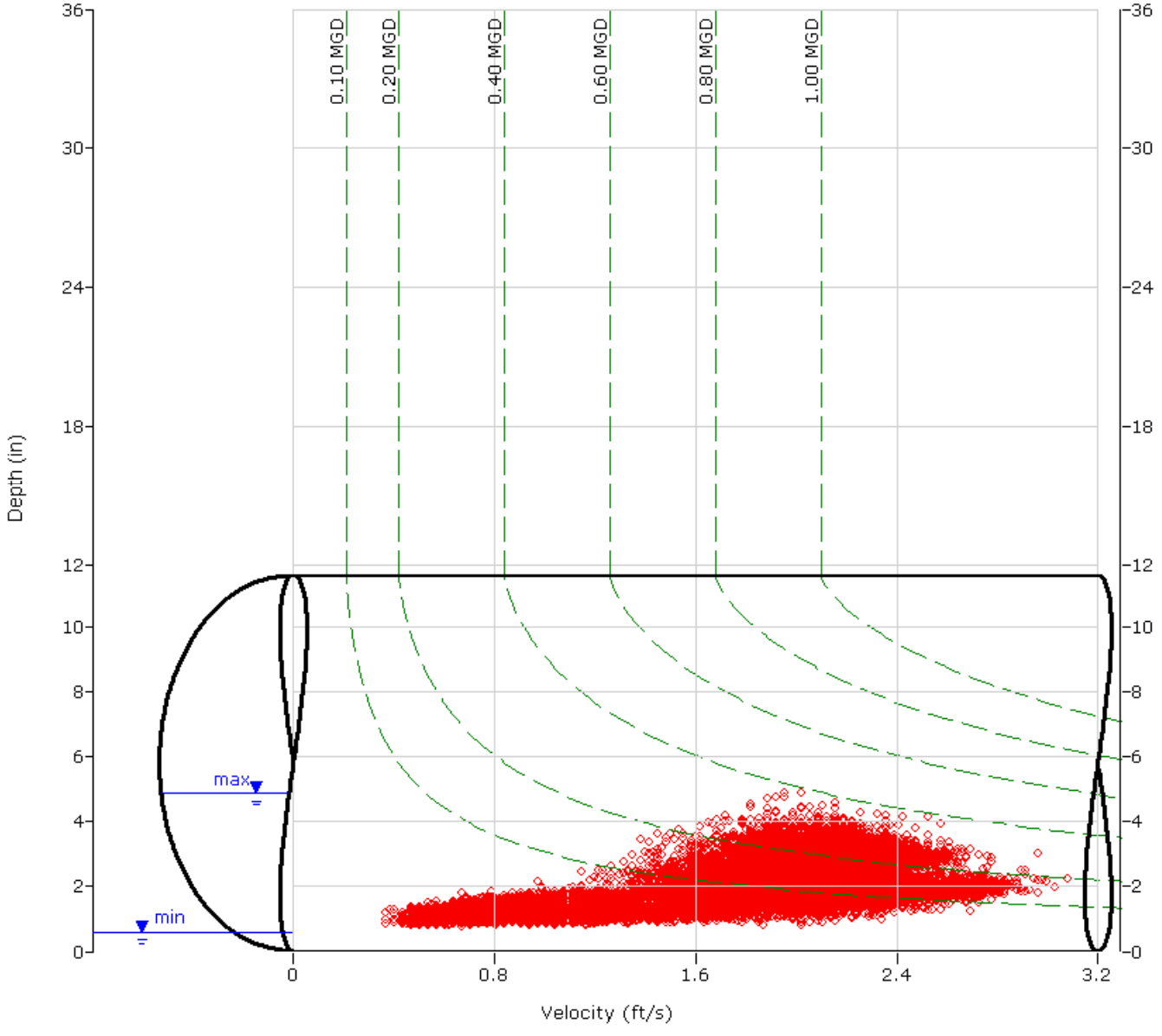
Pipe Height
11.63 in

Report Period

2/22/2014
To
5/11/2014

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-AH206

Flow Monitor

9D-AH206

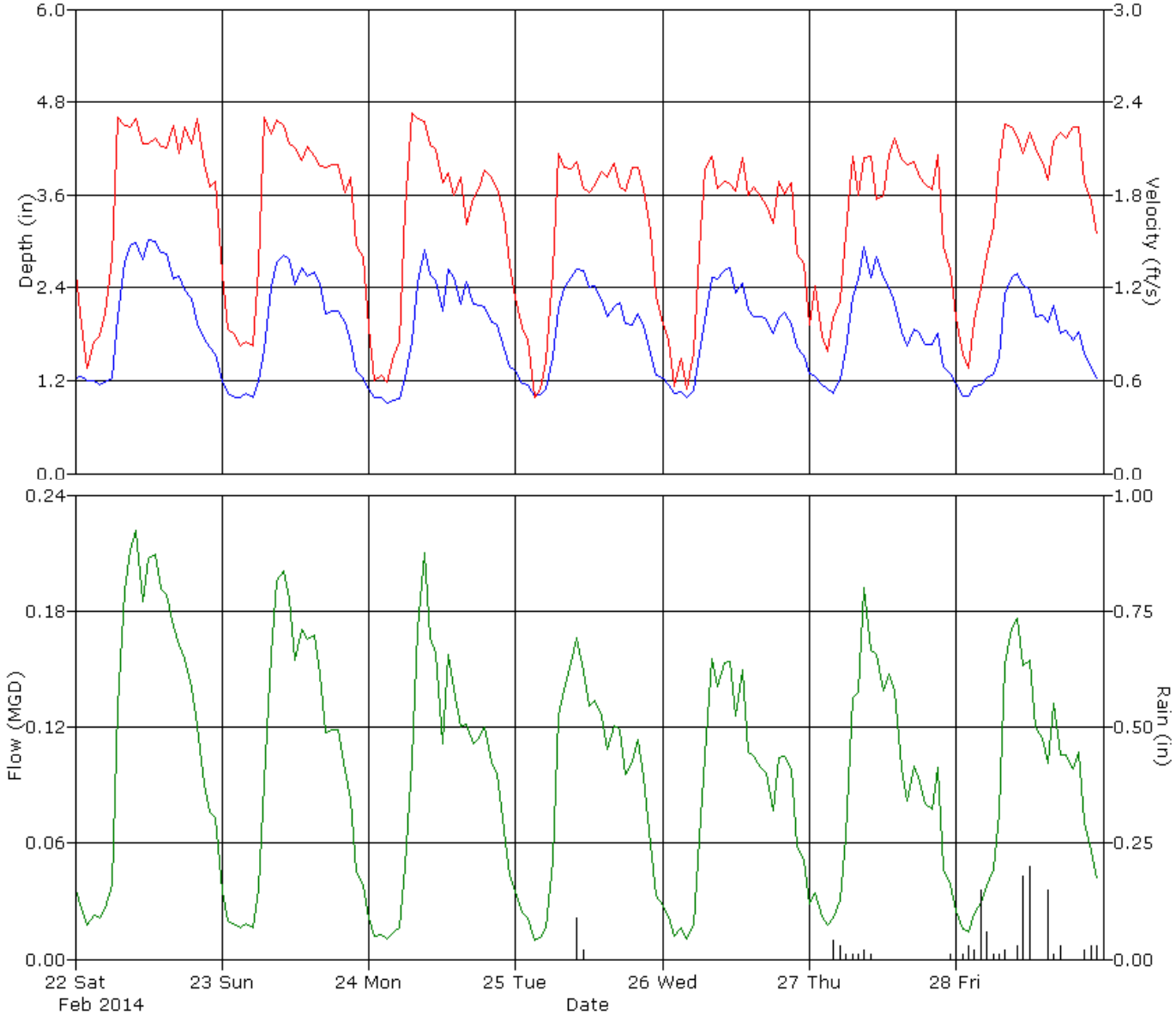
Pipe Height
11.63 in

Report Period

2/22/2014
To
2/28/2014

Legend

- Depth
- Velocity
- Quantity
- Rain



HYDROGRAPH REPORT

9D-AH206

Flow Monitor

9D-AH206

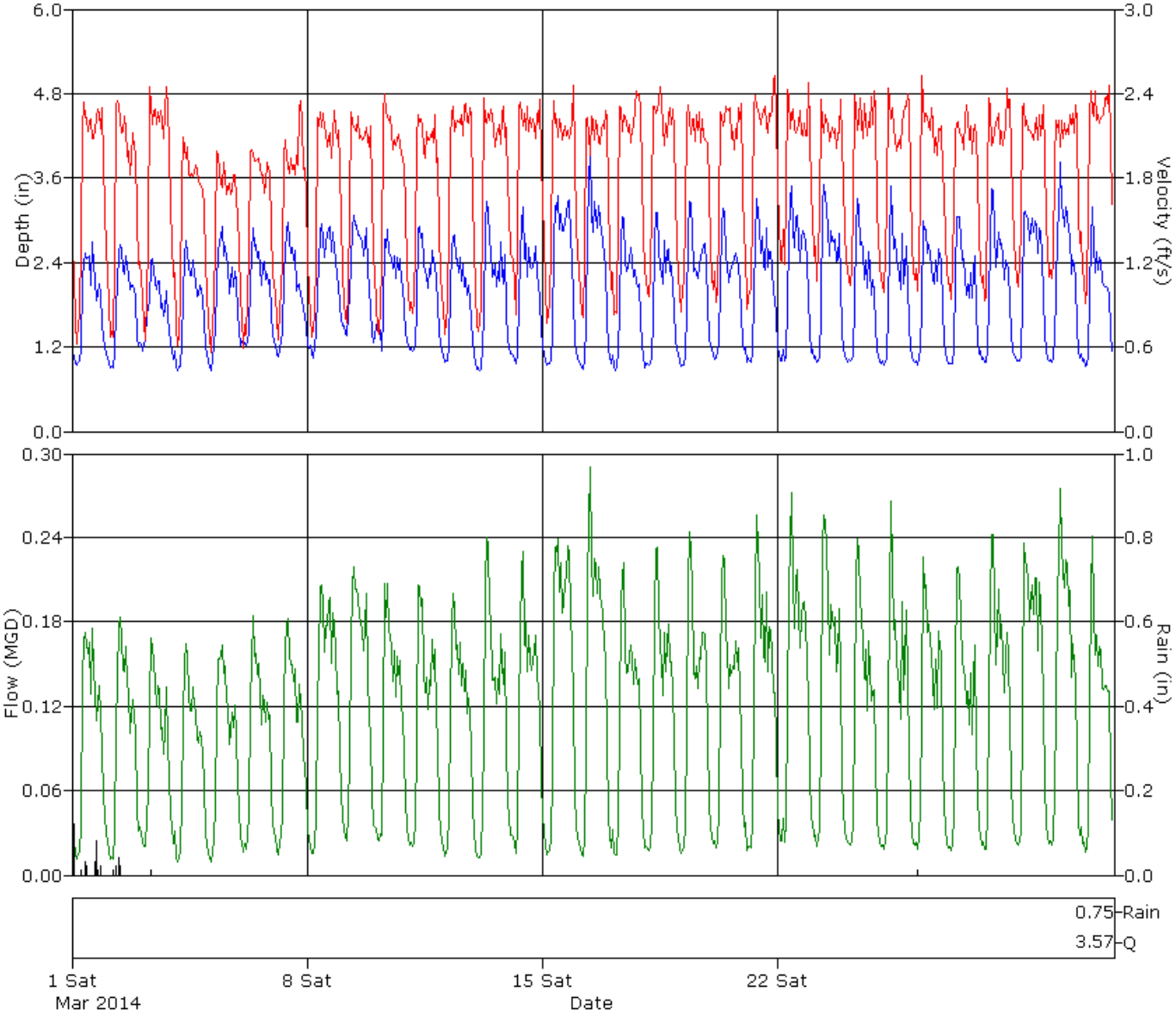
Pipe Height
11.63 in

Report Period

3/1/2014
To
3/31/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-AH206

Flow Monitor

9D-AH206

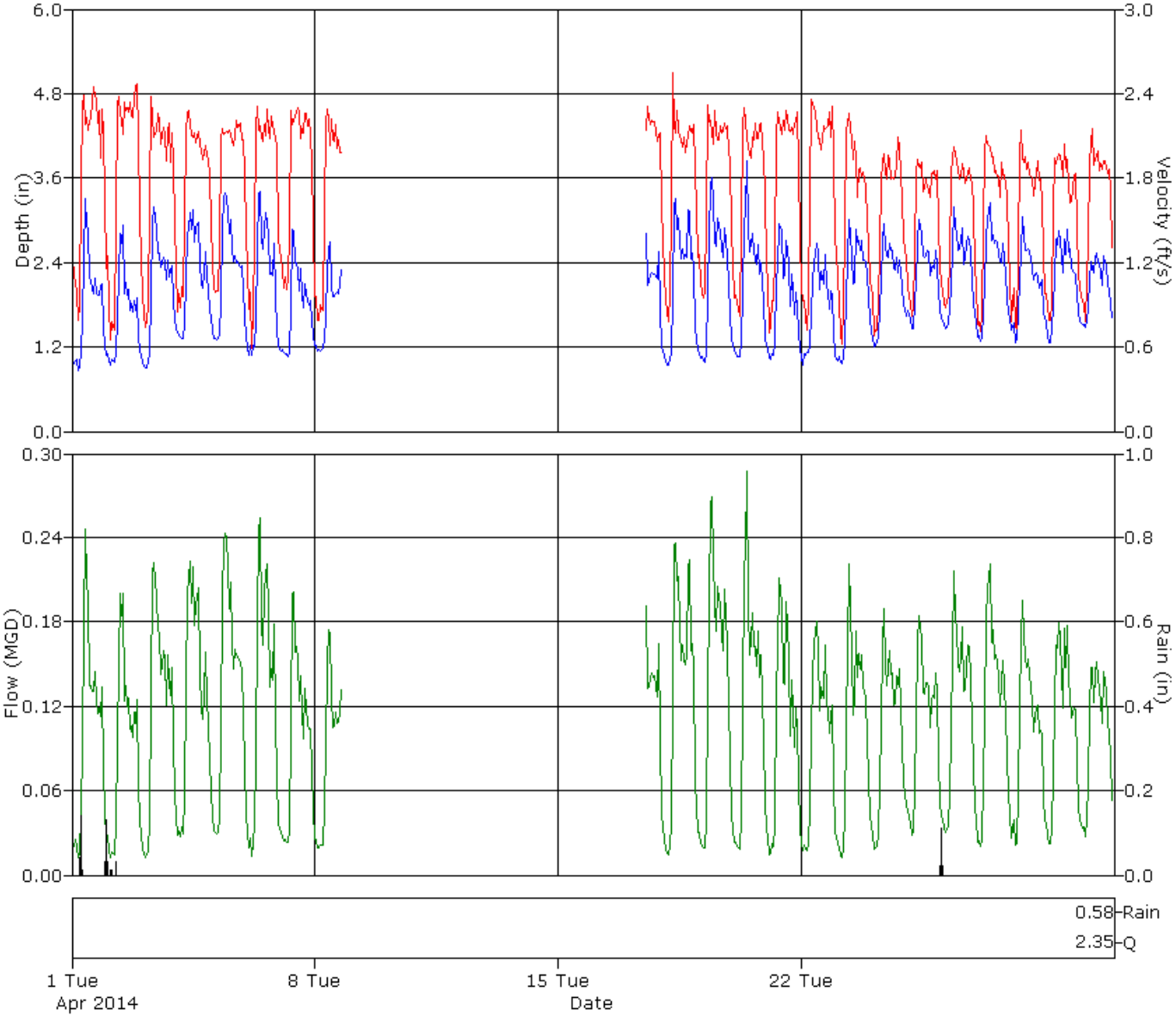
Pipe Height
11.63 in

Report Period

4/1/2014
To
4/30/2014

Legend

- Depth
- Silt
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

9D-AH206

Flow Monitor

9D-AH206

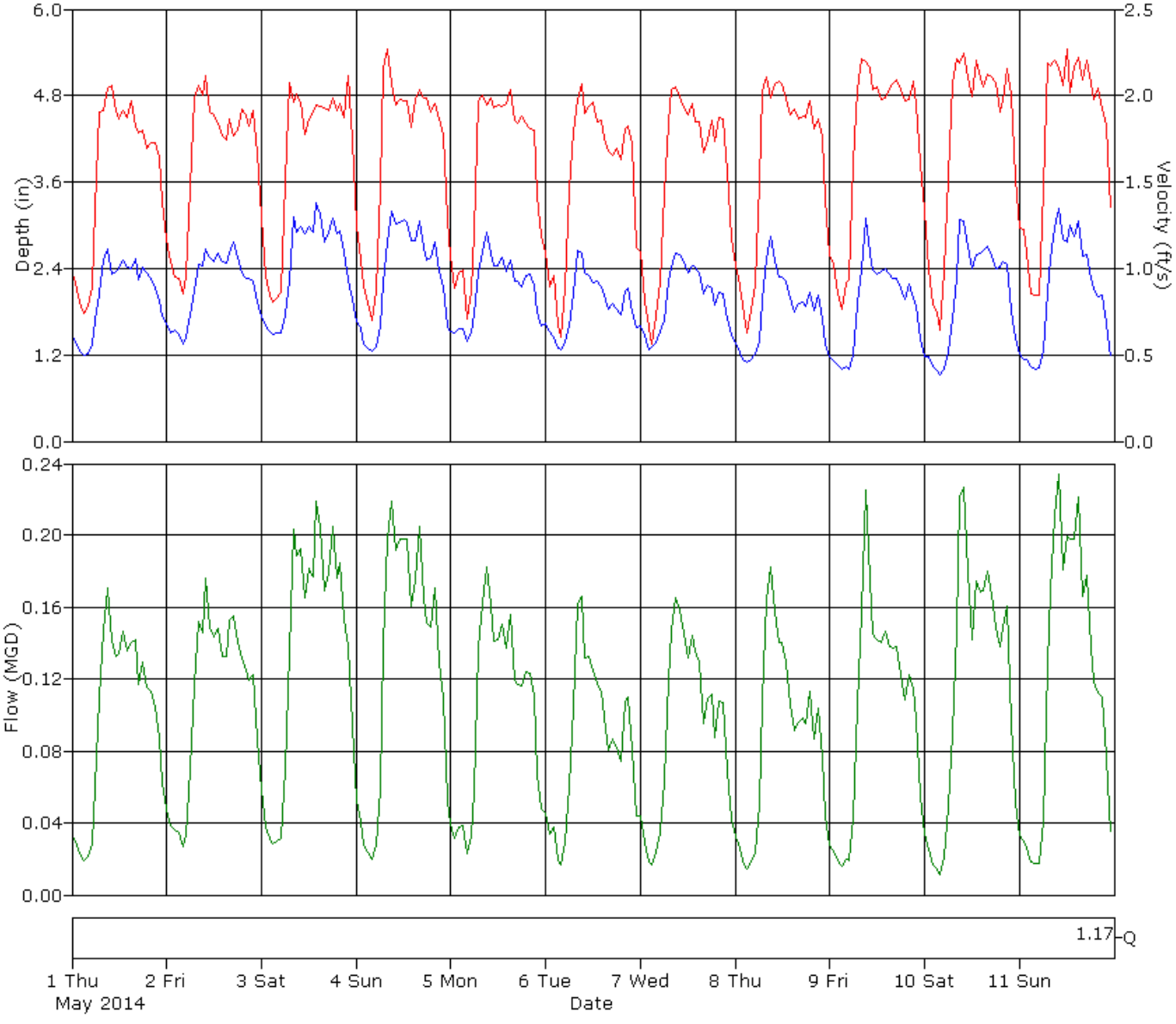
Pipe Height
11.63 in

Report Period

5/1/2014
To
5/11/2014

Legend

- Depth
- Silt
- Velocity
- Quantity



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

9D-AH206, Pipe Height: 11.63 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014	06:35	1.04	12:05	3.75	2.09	02:20	0.57	18:30	2.76	1.81	04:20	0.014	12:05	0.296	0.122	0.122	
2/23/2014	05:15	0.88	13:25	3.82	1.87	03:50	0.54	09:55	2.86	1.71	03:50	0.010	13:25	0.294	0.101	0.101	
2/24/2014	03:10	0.84	13:50	3.74	1.86	03:40	0.37	07:40	2.76	1.61	03:40	0.006	08:35	0.289	0.094	0.094	
2/25/2014	03:45	0.95	11:25	3.41	1.86	03:10	0.37	10:15	2.46	1.57	03:15	0.007	10:50	0.226	0.089	0.089	0.11
2/26/2014	04:25	0.86	08:55	3.31	1.85	04:10	0.40	08:20	2.47	1.52	04:10	0.007	11:20	0.224	0.085	0.085	
2/27/2014	04:05	0.96	09:15	3.48	1.83	03:25	0.44	21:00	2.69	1.66	04:05	0.009	13:50	0.242	0.089	0.089	0.14
2/28/2014	01:15	0.91	10:25	3.29	1.72	02:40	0.50	08:05	2.76	1.78	02:45	0.009	11:00	0.278	0.089	0.089	1.01
3/1/2014	03:05	0.87	14:35	3.37	1.80	03:45	0.44	07:25	2.83	1.81	04:00	0.008	14:35	0.251	0.099	0.099	0.64
3/2/2014	04:50	0.83	11:10	3.13	1.79	05:25	0.44	08:45	2.66	1.71	05:25	0.007	10:20	0.236	0.094	0.094	0.09
3/3/2014	23:25	1.01	08:35	3.20	1.73	03:35	0.37	07:45	2.89	1.82	03:35	0.010	09:35	0.233	0.089	0.089	0.01
3/4/2014	03:30	0.82	09:20	3.49	1.79	03:30	0.50	06:50	2.63	1.57	03:30	0.007	08:25	0.230	0.085	0.085	
3/5/2014	03:55	0.83	10:00	3.40	1.94	02:30	0.47	07:40	2.39	1.49	03:10	0.007	13:15	0.235	0.091	0.091	
3/6/2014	05:45	0.98	18:00	3.45	1.99	04:30	0.40	07:50	2.52	1.54	04:30	0.010	18:00	0.243	0.095	0.095	
3/7/2014	03:10	0.99	11:10	3.54	1.95	03:55	0.50	16:20	2.74	1.66	04:00	0.011	15:20	0.249	0.099	0.099	
3/8/2014	04:15	0.96	10:30	3.81	2.15	04:10	0.47	18:20	2.76	1.78	04:10	0.009	10:30	0.274	0.124	0.124	
3/9/2014	23:35	1.13	11:05	3.60	2.21	03:20	0.64	21:00	2.69	1.78	04:35	0.019	11:05	0.284	0.126	0.126	
3/10/2014	05:30	1.05	09:35	3.86	2.03	03:10	0.54	06:55	2.84	1.76	03:10	0.016	09:35	0.284	0.111	0.111	
3/11/2014	04:15	1.00	07:35	3.82	1.99	03:20	0.57	06:50	2.96	1.75	04:15	0.011	07:35	0.298	0.109	0.109	
3/12/2014	04:00	0.83	09:25	3.44	1.87	02:50	0.47	06:10	2.83	1.84	02:50	0.008	13:30	0.276	0.106	0.106	
3/13/2014	03:25	0.78	08:10	4.03	2.00	01:35	0.45	07:05	2.96	1.86	01:40	0.007	08:10	0.286	0.118	0.118	
3/14/2014	06:00	0.79	10:25	3.77	1.99	05:10	0.71	15:20	2.81	1.92	05:10	0.012	10:25	0.284	0.118	0.118	
3/15/2014	04:00	0.85	09:45	4.28	2.24	03:50	0.52	22:05	2.79	1.86	03:50	0.009	13:50	0.362	0.140	0.140	
3/16/2014	05:15	0.83	10:40	4.87	2.23	05:15	0.57	07:50	2.73	1.83	05:15	0.009	09:15	0.376	0.138	0.138	
3/17/2014	04:20	0.64	10:15	4.01	1.90	03:15	0.61	07:30	2.83	1.89	02:25	0.010	10:15	0.304	0.111	0.111	
3/18/2014	01:30	0.80	10:15	3.87	1.94	01:40	0.62	08:15	2.88	1.91	01:40	0.010	10:15	0.317	0.116	0.116	
3/19/2014	05:25	0.85	08:25	4.01	2.01	03:05	0.77	15:25	2.71	1.84	03:00	0.014	08:20	0.330	0.118	0.118	
3/20/2014	03:30	0.89	09:30	3.75	2.00	04:30	0.74	11:40	2.89	1.88	04:40	0.014	09:30	0.295	0.117	0.117	
3/21/2014	02:55	0.93	09:40	4.02	2.07	02:55	0.67	07:30	2.83	1.96	02:55	0.012	10:05	0.333	0.129	0.129	
3/22/2014	04:00	0.85	18:50	4.12	2.19	05:35	0.98	07:55	2.81	1.98	04:00	0.017	10:40	0.342	0.139	0.139	
3/23/2014	06:00	0.86	09:25	4.41	2.13	04:20	0.94	07:55	2.79	1.92	04:20	0.017	08:10	0.319	0.131	0.131	
3/24/2014	05:20	0.83	09:25	3.96	1.94	03:35	0.84	07:35	2.98	1.93	03:35	0.015	09:25	0.318	0.115	0.115	
3/25/2014	04:00	0.84	09:20	4.26	1.95	05:05	0.81	10:35	2.78	1.91	05:05	0.014	09:20	0.357	0.117	0.117	
3/26/2014	04:15	0.88	08:50	3.73	1.97	02:15	0.74	07:50	3.08	1.88	02:15	0.013	08:55	0.294	0.116	0.116	0.01
3/27/2014	03:25	0.85	07:45	3.96	1.93	02:30	0.81	14:10	2.83	1.85	04:35	0.015	07:45	0.294	0.110	0.110	
3/28/2014	02:20	0.88	09:55	4.18	2.08	05:00	0.74	20:40	2.91	1.89	05:00	0.014	09:15	0.318	0.125	0.125	
3/29/2014	00:40	0.59	14:40	4.03	2.21	03:10	0.81	19:25	2.95	1.91	03:10	0.015	14:40	0.316	0.138	0.138	
3/30/2014	04:10	0.86	10:30	4.87	2.18	05:25	0.84	21:55	2.88	1.90	05:25	0.015	10:30	0.382	0.135	0.135	
3/31/2014	04:05	0.88	09:35	3.93	1.86	04:50	0.71	11:40	2.79	1.94	04:50	0.012	09:35	0.320	0.110	0.110	
4/1/2014	04:05	0.78	09:10	4.19	1.80	04:40	0.54	07:50	2.83	1.90	04:40	0.008	09:05	0.369	0.103	0.103	0.22
4/2/2014	06:45	0.79	11:25	4.25	1.70	05:40	0.44	14:00	2.76	1.88	05:40	0.008	11:25	0.297	0.094	0.094	0.21
4/3/2014	03:00	0.82	09:30	3.84	1.98	02:50	0.54	07:45	2.89	1.77	02:50	0.009	08:40	0.291	0.112	0.112	
4/4/2014	04:15	1.11	15:10	4.01	2.19	04:25	0.61	07:45	2.59	1.77	04:25	0.015	15:05	0.301	0.124	0.124	
4/5/2014	02:35	1.16	10:10	3.99	2.25	02:35	0.67	20:20	3.03	1.82	02:35	0.017	11:10	0.333	0.132	0.132	
4/6/2014	02:20	0.98	09:50	4.18	2.10	04:15	0.45	07:45	2.69	1.79	04:50	0.010	10:45	0.334	0.122	0.122	
4/7/2014	06:20	0.95	08:40	3.60	1.79	02:10	0.84	09:10	2.96	1.85	03:10	0.017	09:10	0.292	0.097	0.097	
4/8/2014	05:00	1.01	10:50	3.41	1.74	04:05	0.54	08:20	2.91	1.67	04:05	0.011	09:20	0.244	0.086	0.063	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014																	
4/10/2014																	
4/11/2014																	
4/12/2014																	
4/13/2014																	
4/14/2014																	
4/15/2014																	
4/16/2014																	
4/17/2014	23:35	1.07	21:50	3.71	2.15	23:40	1.14	15:50	2.81	2.12	23:40	0.026	21:55	0.288	0.132	0.060	
4/18/2014	03:00	0.86	18:50	4.15	2.16	04:00	0.64	07:50	3.00	1.82	04:00	0.011	08:30	0.320	0.130	0.130	
4/19/2014	04:30	0.88	09:40	4.76	2.24	02:20	0.77	07:25	2.68	1.85	04:05	0.014	10:10	0.363	0.138	0.138	
4/20/2014	04:15	0.90	08:30	4.15	2.13	05:40	0.59	08:10	2.74	1.79	05:40	0.012	08:30	0.385	0.124	0.124	
4/21/2014	05:05	0.92	09:05	3.93	1.85	02:25	0.52	11:30	2.74	1.78	03:10	0.010	13:50	0.313	0.101	0.101	
4/22/2014	01:40	0.84	12:20	3.57	1.78	05:20	0.39	08:00	2.74	1.80	04:15	0.010	10:55	0.273	0.096	0.096	
4/23/2014	05:20	0.83	09:55	3.80	2.02	04:05	0.47	14:00	2.73	1.60	04:00	0.008	14:20	0.277	0.103	0.103	
4/24/2014	02:45	1.14	15:20	3.59	2.11	02:40	0.49	16:25	2.37	1.57	02:40	0.012	09:30	0.261	0.104	0.104	
4/25/2014	04:10	1.24	09:30	3.51	2.24	02:20	0.67	11:15	2.29	1.56	02:20	0.021	21:15	0.240	0.108	0.108	
4/26/2014	04:10	1.42	09:40	4.04	2.30	03:40	0.71	13:15	2.49	1.61	04:10	0.025	09:40	0.307	0.117	0.117	0.15
4/27/2014	04:45	1.16	10:15	4.26	2.22	03:15	0.50	07:45	2.47	1.59	03:15	0.015	10:20	0.333	0.113	0.113	
4/28/2014	05:00	1.12	09:15	3.48	2.10	04:15	0.54	08:35	2.44	1.56	05:00	0.013	09:25	0.264	0.101	0.101	
4/29/2014	03:55	1.15	15:50	3.69	2.16	02:55	0.57	16:25	2.39	1.56	03:50	0.014	15:50	0.271	0.106	0.106	
4/30/2014	03:20	1.36	17:50	3.07	2.04	04:45	0.56	06:30	2.51	1.62	04:45	0.020	12:55	0.209	0.099	0.099	
5/1/2014	05:15	1.04	16:00	3.63	2.03	02:30	0.57	08:00	2.52	1.56	05:15	0.012	16:00	0.290	0.098	0.098	
5/2/2014	05:10	1.19	16:20	3.71	2.17	03:30	0.71	10:20	2.47	1.64	05:05	0.019	16:20	0.269	0.109	0.109	
5/3/2014	05:10	1.35	08:20	4.12	2.46	04:10	0.61	22:05	2.57	1.67	04:10	0.020	18:20	0.327	0.135	0.135	
5/4/2014	04:15	1.16	09:45	4.28	2.32	04:05	0.54	08:40	2.57	1.67	04:50	0.013	09:45	0.306	0.127	0.127	
5/5/2014	04:20	1.27	10:35	3.56	2.10	04:20	0.54	14:05	2.46	1.59	04:20	0.015	10:35	0.254	0.102	0.102	
5/6/2014	04:00	1.11	09:55	3.36	1.90	04:00	0.44	11:40	2.52	1.53	04:00	0.010	09:55	0.257	0.086	0.086	
5/7/2014	02:45	1.18	09:45	3.27	1.98	03:50	0.40	08:50	2.36	1.54	02:40	0.012	09:45	0.251	0.093	0.093	
5/8/2014	04:10	0.99	09:40	3.55	1.82	03:10	0.50	07:25	2.57	1.63	03:40	0.011	09:40	0.261	0.088	0.088	
5/9/2014	04:05	0.86	09:50	3.73	1.89	03:15	0.57	08:40	2.74	1.74	03:20	0.010	09:50	0.288	0.102	0.102	
5/10/2014	04:00	0.88	09:35	4.16	2.04	04:55	0.50	06:55	2.91	1.75	04:55	0.009	09:35	0.319	0.116	0.116	
5/11/2014	04:05	0.88	13:05	3.83	2.06	03:55	0.49	12:00	2.64	1.77	04:00	0.009	10:05	0.302	0.119	0.119	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			7.759	2.59
Avg	2.01	1.75	0.111	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.24	1.29	0.035		1.21	1.29	0.035		1.08	0.95	0.021		1.33	1.14	0.035		1.24	0.97	0.027		1.29	0.96	0.028		1.15	1.00	0.025	0.02
01:00	1.25	0.96	0.027		1.03	0.93	0.020		0.98	0.60	0.012		1.17	0.94	0.024		1.15	0.86	0.022		1.25	1.21	0.034		1.00	0.77	0.015	0.01
02:00	1.20	0.68	0.018		0.98	0.90	0.018		0.99	0.63	0.012		1.14	0.87	0.021		1.03	0.57	0.012		1.15	0.88	0.022		1.00	0.68	0.014	0.03
03:00	1.21	0.85	0.022		0.98	0.82	0.016		0.91	0.59	0.011		1.00	0.49	0.010		1.06	0.75	0.016		1.09	0.79	0.018		1.13	0.99	0.024	0.02
04:00	1.14	0.88	0.021		1.04	0.85	0.018		0.95	0.76	0.014		1.02	0.54	0.011		0.97	0.54	0.011		1.04	1.01	0.022	0.04	1.15	1.20	0.029	0.15
05:00	1.18	1.04	0.026		0.98	0.82	0.016		0.97	0.86	0.016		1.09	0.72	0.016		1.08	0.78	0.017		1.22	1.11	0.030	0.03	1.23	1.40	0.038	0.06
06:00	1.23	1.39	0.039		1.20	1.33	0.036		1.24	1.71	0.048		1.51	1.31	0.051		1.55	1.44	0.063		1.59	1.55	0.063	0.01	1.29	1.60	0.047	0.01
07:00	2.04	2.30	0.130		1.59	2.30	0.091		1.71	2.33	0.103		2.13	2.07	0.126		1.97	1.96	0.105		2.27	2.05	0.135	0.01	1.50	2.01	0.075	0.01
08:00	2.73	2.25	0.191		2.41	2.19	0.158		2.46	2.29	0.170		2.38	1.98	0.139		2.53	2.05	0.155		2.52	1.80	0.138	0.01	2.32	2.26	0.153	0.02
09:00	2.94	2.24	0.212		2.73	2.29	0.196		2.89	2.27	0.210		2.54	1.97	0.153		2.52	1.84	0.141		2.93	2.04	0.192	0.02	2.54	2.24	0.171	
10:00	2.98	2.30	0.222		2.82	2.25	0.200		2.57	2.12	0.166		2.64	2.01	0.166	0.09	2.62	1.88	0.153		2.54	2.05	0.159	0.01	2.58	2.18	0.176	0.03
11:00	2.77	2.13	0.185		2.76	2.13	0.186		2.50	2.09	0.158		2.63	1.85	0.149	0.02	2.65	1.87	0.154		2.80	1.77	0.157		2.43	2.07	0.151	0.18
12:00	3.01	2.13	0.207		2.44	2.10	0.154		2.11	1.88	0.111		2.41	1.82	0.131		2.33	1.82	0.125		2.54	1.80	0.139		2.36	2.20	0.155	0.20
13:00	3.01	2.16	0.209		2.65	2.02	0.171		2.64	1.94	0.158		2.42	1.86	0.134		2.45	2.04	0.149		2.41	2.06	0.147		2.03	2.10	0.120	
14:00	2.86	2.11	0.191		2.55	2.11	0.165		2.53	1.80	0.140		2.24	1.95	0.126		2.11	1.80	0.107		2.21	2.17	0.139		2.04	2.01	0.115	
15:00	2.83	2.11	0.189		2.61	2.05	0.168		2.20	1.91	0.120		2.03	1.91	0.109		2.03	1.86	0.105		1.84	2.03	0.099		1.95	1.90	0.101	0.15
16:00	2.51	2.24	0.172		2.45	1.98	0.147		2.48	1.61	0.122		2.14	2.00	0.121		2.02	1.79	0.099		1.64	1.99	0.082		2.17	2.15	0.133	0.01
17:00	2.54	2.07	0.163		2.07	1.98	0.117		2.20	1.78	0.111		2.20	1.85	0.118		2.00	1.73	0.096		1.86	2.01	0.100		1.81	2.20	0.105	0.03
18:00	2.38	2.24	0.156		2.10	1.99	0.118		2.17	1.84	0.115		1.94	1.82	0.096		1.81	1.62	0.077		1.81	1.91	0.092		1.85	2.17	0.106	
19:00	2.27	2.13	0.140		2.09	1.99	0.118		2.16	1.96	0.120		1.91	1.97	0.102		2.01	1.88	0.104		1.67	1.87	0.080		1.71	2.24	0.098	
20:00	1.95	2.30	0.121		1.96	1.82	0.098		1.96	1.92	0.102		2.06	1.98	0.114		2.08	1.81	0.105		1.67	1.84	0.077		1.82	2.24	0.107	
21:00	1.75	2.01	0.091		1.70	1.91	0.082		1.92	1.84	0.096		1.91	1.84	0.094		1.94	1.88	0.099		1.80	2.06	0.099		1.56	1.89	0.071	0.02
22:00	1.64	1.85	0.076		1.33	1.48	0.045		1.61	1.67	0.067		1.55	1.56	0.059		1.63	1.42	0.058		1.37	1.46	0.047		1.37	1.76	0.056	0.03
23:00	1.55	1.89	0.073		1.23	1.40	0.039		1.38	1.35	0.044		1.28	1.14	0.033		1.53	1.36	0.052		1.29	1.32	0.039	0.01	1.22	1.55	0.041	0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.122				0.101				0.094				0.089	0.11			0.085				0.089	0.14			0.089	1.01
Avg	2.09	1.81	0.122		1.87	1.71	0.101		1.86	1.61	0.094		1.86	1.57	0.089		1.85	1.52	0.085		1.83	1.66	0.089		1.72	1.78	0.089	
Time	06:35	02:20	04:20		05:15	03:50	03:50		03:10	03:40	03:40		03:45	03:10	03:15		04:25	04:10	04:10		04:05	03:25	04:05		01:15	02:40	02:45	
Min	1.04	0.57	0.014		0.88	0.54	0.010		0.84	0.37	0.006		0.95	0.37	0.007		0.86	0.40	0.007		0.96	0.44	0.009		0.91	0.50	0.009	
Time	12:05	18:30	12:05		13:25	09:55	13:25		13:50	07:40	08:35		11:25	10:15	10:50		08:55	08:20	11:20		09:15	21:00	13:50		10:25	08:05	11:00	
Max	3.75	2.76	0.296		3.82	2.86	0.294		3.74	2.76	0.289		3.41	2.46	0.226		3.31	2.47	0.224		3.48	2.69	0.242		3.29	2.76	0.278	

	D	V	Q	Rain
Total			0.668	1.26
Avg	1.87	1.67	0.095	

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.14	1.31	0.032	0.32	1.11	1.29	0.030		1.27	1.21	0.034		1.02	1.10	0.023		1.11	0.97	0.023		1.23	0.96	0.026		1.27	1.05	0.030	
01:00	1.07	1.13	0.025	0.12	1.07	1.14	0.025		1.25	1.10	0.030		1.14	1.13	0.032		1.00	0.79	0.016		1.28	0.82	0.024		1.25	0.98	0.028	
02:00	0.98	0.77	0.015		0.98	0.90	0.018		1.14	0.95	0.023		0.94	0.74	0.013		0.93	0.67	0.012		1.24	0.59	0.016		1.11	0.80	0.019	
03:00	0.94	0.62	0.011		0.90	0.67	0.011		1.22	0.76	0.020		0.86	0.61	0.010		0.87	0.56	0.009		1.27	0.76	0.022		1.06	0.65	0.014	
04:00	0.99	0.78	0.015		0.92	0.71	0.013		1.33	0.65	0.020		0.92	0.67	0.012		1.01	0.79	0.017		1.23	0.69	0.019		1.16	0.87	0.022	
05:00	1.01	0.80	0.017		0.90	0.67	0.012	0.01	1.64	0.96	0.040		0.93	0.95	0.017		1.23	0.87	0.024		1.26	0.93	0.026		1.29	0.99	0.029	
06:00	1.18	1.38	0.036	0.01	1.12	1.22	0.029		1.77	1.33	0.059		1.27	1.75	0.052		1.47	1.42	0.051		1.42	1.29	0.045		1.41	1.23	0.042	
07:00	2.16	2.15	0.139		1.72	2.32	0.104	0.02	1.84	2.45	0.122		1.92	2.09	0.110		2.07	1.99	0.116		2.12	1.99	0.122		2.19	1.95	0.122	
08:00	2.39	2.34	0.167		2.12	2.35	0.139		2.42	2.33	0.169	0.01	2.49	2.02	0.152		2.56	1.97	0.154		2.50	2.00	0.151		2.55	2.07	0.162	
09:00	2.54	2.23	0.172	0.03	2.54	2.32	0.178	0.04	2.45	2.18	0.161		2.71	1.94	0.164		2.69	1.84	0.154		2.89	1.99	0.184		2.84	1.96	0.176	
10:00	2.45	2.23	0.164	0.02	2.66	2.21	0.183	0.02	2.29	2.28	0.153		2.54	2.02	0.156		2.77	1.77	0.155		2.63	1.92	0.156		2.98	1.89	0.182	
11:00	2.47	2.13	0.157		2.59	2.12	0.168		2.13	2.29	0.136		2.35	1.84	0.127		2.91	1.73	0.163		2.65	1.93	0.157		2.73	1.84	0.157	
12:00	2.49	2.21	0.166		2.32	2.13	0.146		2.01	2.18	0.120		2.22	1.82	0.117		2.49	1.92	0.143		2.47	1.93	0.143		2.53	1.95	0.150	
13:00	2.08	2.22	0.128		2.24	2.24	0.145		2.13	2.27	0.135		2.23	1.83	0.117		2.63	1.81	0.148		2.55	1.94	0.151		2.60	1.86	0.150	
14:00	2.69	2.08	0.176		2.49	2.16	0.162		2.13	2.20	0.133		2.43	1.82	0.134		2.45	1.68	0.123		2.35	1.88	0.130		2.43	1.90	0.138	
15:00	2.38	2.08	0.147		2.36	1.95	0.137		1.75	2.28	0.104		2.23	1.84	0.120		2.38	1.74	0.122		2.08	1.83	0.107		2.56	1.83	0.147	
16:00	2.15	2.14	0.130	0.03	2.23	1.99	0.131		1.81	2.22	0.105		2.15	1.89	0.116		1.95	1.76	0.093		2.37	1.82	0.128		1.99	1.96	0.108	
17:00	1.85	2.23	0.109	0.08	2.01	1.82	0.101		1.64	2.08	0.085		1.92	1.86	0.096		2.14	1.69	0.102		2.41	1.70	0.123		2.07	1.89	0.109	
18:00	1.96	2.29	0.121	0.01	2.07	1.94	0.115		1.75	2.26	0.103		1.95	1.78	0.094		2.32	1.71	0.116		2.16	1.76	0.109		2.10	2.29	0.135	
19:00	2.10	2.26	0.135		2.08	2.12	0.125		2.00	2.45	0.134		2.07	1.77	0.102		2.06	1.82	0.105		2.24	1.91	0.123		1.93	2.35	0.123	
20:00	1.97	2.15	0.115	0.02	2.03	2.01	0.113		1.61	2.31	0.093		2.03	1.73	0.097		2.28	1.82	0.121		2.10	1.88	0.111		1.90	2.20	0.113	
21:00	1.54	2.30	0.088		1.89	2.00	0.102		1.46	2.02	0.070		1.88	1.72	0.086		2.13	1.65	0.099		2.16	1.85	0.114		1.74	1.86	0.083	
22:00	1.32	1.91	0.057		1.35	1.53	0.048		1.23	1.59	0.043		1.60	1.60	0.065		1.67	1.54	0.066		1.66	1.44	0.061		1.66	1.87	0.078	
23:00	1.23	1.58	0.043		1.23	1.19	0.032		1.16	1.36	0.035		1.18	1.21	0.031		1.46	1.32	0.047		1.41	1.13	0.037		1.49	1.68	0.061	

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.099	0.64			0.094	0.09			0.089	0.01			0.085				0.091				0.095				0.099	
Avg	1.80	1.81	0.099		1.79	1.71	0.094		1.73	1.82	0.089		1.79	1.57	0.085		1.94	1.49	0.091		1.99	1.54	0.095		1.95	1.66	0.099	
Time	03:05	03:45	04:00		04:50	05:25	05:25		23:25	03:35	03:35		03:30	03:30	03:30		03:55	02:30	03:10		05:45	04:30	04:30		03:10	03:55	04:00	
Min	0.87	0.44	0.008		0.83	0.44	0.007		1.01	0.37	0.010		0.82	0.50	0.007		0.83	0.47	0.007		0.98	0.40	0.010		0.99	0.50	0.011	
Time	14:35	07:25	14:35		11:10	08:45	10:20		08:35	07:45	09:35		09:20	06:50	08:25		10:00	07:40	13:15		18:00	07:50	18:00		11:10	16:20	15:20	
Max	3.37	2.83	0.251		3.13	2.66	0.236		3.20	2.89	0.233		3.49	2.63	0.230		3.40	2.39	0.235		3.45	2.52	0.243		3.54	2.74	0.249	

	D	V	Q	Rain
Total			0.652	0.74
Avg	1.85	1.66	0.093	

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.23	1.23	0.034		1.59	1.49	0.058		1.34	1.11	0.034		1.21	0.99	0.026		1.15	0.95	0.023		0.98	0.99	0.019		1.20	1.59	0.042	
01:00	1.18	0.98	0.025		1.49	1.15	0.041		1.51	0.91	0.033		1.16	0.86	0.022		1.09	0.90	0.021		0.89	0.76	0.013		1.09	1.27	0.029	
02:00	1.21	0.82	0.022		1.50	0.91	0.033		1.49	0.73	0.027		1.19	0.92	0.024		0.99	0.69	0.014		0.90	0.71	0.012		1.10	1.24	0.029	
03:00	1.12	0.67	0.016		1.41	0.82	0.027		1.48	0.69	0.025		1.15	0.84	0.021		1.01	0.78	0.016		0.87	0.77	0.013		1.07	1.22	0.027	
04:00	1.04	0.74	0.016		1.36	0.77	0.024		1.44	0.88	0.030		1.16	0.93	0.024		1.01	0.89	0.018		0.89	0.91	0.015		1.05	1.04	0.022	
05:00	1.22	0.82	0.022		1.64	1.01	0.042		1.14	1.17	0.028		1.26	1.32	0.037		1.21	1.50	0.044		1.22	1.47	0.045		0.96	0.83	0.016	
06:00	1.40	1.25	0.041		1.95	1.59	0.087		1.68	2.26	0.102		1.69	2.08	0.093		1.99	2.08	0.115		1.63	2.37	0.101		1.10	1.40	0.033	
07:00	1.97	2.23	0.122		2.38	2.27	0.161		2.73	2.40	0.207		2.88	2.25	0.206		2.60	2.25	0.180		2.95	2.20	0.206		1.85	2.31	0.115	
08:00	2.38	2.17	0.153		2.90	2.20	0.205		2.61	2.27	0.183		2.91	2.20	0.206		2.76	2.31	0.200		3.27	2.19	0.240		2.45	2.34	0.171	
09:00	2.83	2.27	0.204		3.07	2.16	0.219		2.88	2.24	0.207		2.75	2.22	0.191		2.80	2.13	0.190		3.15	2.26	0.234		2.97	2.26	0.217	
10:00	2.96	2.16	0.206		2.93	2.15	0.204		2.55	2.21	0.172		2.82	2.18	0.196		2.45	2.17	0.160		2.73	2.21	0.189		3.19	2.17	0.230	
11:00	2.74	2.26	0.194		2.93	2.13	0.203		2.52	2.24	0.171		2.42	1.99	0.146		2.46	2.21	0.163		2.58	2.29	0.181		2.44	2.26	0.164	
12:00	2.46	2.15	0.159		2.80	2.24	0.198		2.47	2.13	0.161		2.25	1.94	0.130		2.25	2.20	0.142		2.19	2.24	0.139		2.67	2.14	0.179	
13:00	2.67	2.14	0.177		2.79	2.08	0.184		2.31	2.01	0.137		2.24	2.13	0.140		2.48	2.19	0.166		2.23	2.16	0.138		2.20	2.31	0.145	
14:00	2.80	2.02	0.177		2.74	2.10	0.179		2.50	2.08	0.159		2.03	2.07	0.118		2.14	2.25	0.134		2.37	2.02	0.140		2.60	2.13	0.171	
15:00	2.90	2.09	0.193		2.71	2.07	0.175		2.18	2.03	0.126		2.31	2.07	0.139		2.38	2.10	0.150		2.06	2.11	0.122		2.36	2.23	0.153	
16:00	2.91	2.12	0.197		2.50	2.08	0.159		2.46	2.07	0.155		2.23	2.11	0.135		2.06	2.31	0.131		2.28	2.13	0.140		2.32	2.16	0.146	
17:00	2.55	1.94	0.150		2.66	2.10	0.176		2.29	2.11	0.142		2.57	2.13	0.167		2.18	2.33	0.145		2.13	2.19	0.129		2.33	2.22	0.153	
18:00	2.83	2.11	0.186		2.89	2.16	0.200		2.45	2.05	0.153		2.40	2.06	0.147		1.94	2.20	0.115		2.69	2.05	0.171		2.43	2.18	0.159	
19:00	2.58	2.28	0.178		2.31	2.07	0.141		2.13	1.97	0.118		2.40	2.25	0.160		2.08	2.19	0.126		2.29	2.25	0.150		2.63	2.08	0.170	
20:00	2.48	2.16	0.161		2.03	2.02	0.115		2.10	1.94	0.115		2.13	1.91	0.115		1.87	2.30	0.114		2.10	2.31	0.136		2.21	2.26	0.143	
21:00	2.18	2.08	0.129		1.73	2.17	0.097		1.74	1.87	0.084		1.83	1.94	0.094		1.60	2.26	0.091		2.52	2.09	0.159		2.12	2.20	0.131	
22:00	2.14	2.14	0.130		1.42	1.71	0.058		1.42	1.61	0.054		1.38	1.40	0.045		1.28	1.65	0.048		1.73	2.16	0.096		1.87	2.36	0.117	
23:00	1.77	1.89	0.088		1.26	1.25	0.035		1.30	1.15	0.034		1.28	1.14	0.033		1.11	1.33	0.031		1.30	1.75	0.052		1.45	1.93	0.066	

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.124				0.126				0.111				0.109				0.106				0.118				0.118	
Avg	2.15	1.78	0.124		2.21	1.78	0.126		2.03	1.76	0.111		1.99	1.75	0.109		1.87	1.84	0.106		2.00	1.86	0.118		1.99	1.92	0.118	
Time	04:15	04:10	04:10		23:35	03:20	04:35		05:30	03:10	03:10		04:15	03:20	04:15		04:00	02:50	02:50		03:25	01:35	01:40		06:00	05:10	05:10	
Min	0.96	0.47	0.009		1.13	0.64	0.019		1.05	0.54	0.016		1.00	0.57	0.011		0.83	0.47	0.008		0.78	0.45	0.007		0.79	0.71	0.012	
Time	10:30	18:20	10:30		11:05	21:00	11:05		09:35	06:55	09:35		07:35	06:50	07:35		09:25	06:10	13:30		08:10	07:05	08:10		10:25	15:20	10:25	
Max	3.81	2.76	0.274		3.60	2.69	0.284		3.86	2.84	0.284		3.82	2.96	0.298		3.44	2.83	0.276		4.03	2.96	0.286		3.77	2.81	0.284	

	D	V	Q	Rain
Total			0.812	
Avg	2.03	1.81	0.116	

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.23	1.62	0.044		1.14	1.47	0.036		1.05	1.29	0.028		1.10	1.41	0.033		1.17	1.32	0.033		1.20	1.29	0.034		1.16	1.36	0.034	
01:00	1.07	1.38	0.031		1.03	1.27	0.027		0.97	1.01	0.019		0.90	1.14	0.020		1.12	1.11	0.026		1.18	1.10	0.028		1.21	1.32	0.037	
02:00	1.03	1.02	0.022		1.01	1.15	0.024		1.08	1.13	0.032		0.97	1.09	0.021		0.99	0.98	0.019		1.08	1.01	0.023		0.99	0.87	0.017	
03:00	0.94	0.77	0.014		0.97	0.97	0.019		0.94	0.83	0.015		0.97	0.99	0.019		0.93	0.85	0.015		1.03	1.14	0.024		1.04	0.94	0.020	
04:00	0.95	0.84	0.016		0.93	0.85	0.015		0.87	0.85	0.014		0.94	0.96	0.017		0.94	1.03	0.019		1.05	0.92	0.020		1.01	1.00	0.020	
05:00	0.97	0.91	0.018		0.89	0.81	0.014		0.92	0.84	0.015		0.95	1.12	0.021		0.94	1.05	0.019		1.14	1.01	0.024		0.99	1.01	0.020	
06:00	1.00	1.31	0.027		1.01	1.23	0.025		1.11	1.57	0.038		1.07	1.63	0.036		1.08	1.55	0.036		1.27	1.50	0.045		1.12	1.61	0.038	
07:00	1.39	2.08	0.070		1.55	2.22	0.090		1.75	2.31	0.110		1.58	2.31	0.096		1.72	2.23	0.106		2.07	2.27	0.135		1.92	2.30	0.128	
08:00	2.69	2.35	0.198		2.90	2.23	0.206		2.71	2.30	0.193		2.66	2.31	0.188		2.80	2.32	0.206		2.91	2.25	0.210		2.70	2.39	0.200	
09:00	3.22	2.19	0.233		3.47	2.11	0.252		3.05	2.13	0.212		3.11	2.26	0.231		3.27	2.23	0.244		3.17	2.17	0.227		3.30	2.30	0.256	
10:00	3.14	2.22	0.230		4.08	1.96	0.291		3.04	2.25	0.222		3.11	2.28	0.233		3.26	2.11	0.231		3.11	2.21	0.225		3.10	2.29	0.234	
11:00	3.35	2.09	0.239		3.08	2.24	0.226		2.41	2.24	0.158		2.63	2.34	0.187		2.86	2.22	0.202		2.47	2.31	0.170		2.92	2.25	0.211	
12:00	2.86	2.22	0.201		2.83	2.21	0.198		2.28	2.20	0.143		2.29	2.45	0.163		2.27	2.22	0.146		2.39	2.29	0.162		2.53	2.18	0.168	
13:00	3.08	2.19	0.222		3.27	2.07	0.225		2.34	2.13	0.144		2.28	2.34	0.152		2.31	2.07	0.139		2.11	2.28	0.133		2.78	2.26	0.199	
14:00	2.84	2.07	0.186		3.06	2.21	0.220		2.41	2.18	0.156		2.10	2.17	0.128		2.26	2.25	0.148		2.25	2.30	0.150		2.35	2.26	0.157	
15:00	2.84	2.12	0.194		2.89	2.17	0.201		2.61	2.05	0.164		2.72	2.03	0.172		2.18	2.14	0.133		2.35	2.09	0.144		2.29	2.31	0.152	
16:00	2.96	2.17	0.208		3.20	2.06	0.219		2.44	2.15	0.156		2.26	2.19	0.144		2.33	2.27	0.154		2.36	2.13	0.149		2.88	2.18	0.201	
17:00	3.09	2.10	0.212		3.04	2.04	0.202		2.20	2.16	0.136		2.57	2.09	0.165		2.49	2.05	0.153		2.44	2.00	0.146		2.34	2.12	0.144	
18:00	3.27	2.14	0.234		2.81	2.14	0.190		2.29	2.30	0.153		2.60	2.25	0.179		2.56	2.22	0.172		2.53	2.15	0.167		2.55	2.26	0.176	
19:00	3.30	2.08	0.230		2.75	2.19	0.190		2.13	2.42	0.144		2.27	2.30	0.152		2.63	2.10	0.172		2.44	2.08	0.152		2.56	2.24	0.175	
20:00	2.77	2.13	0.185		2.48	2.15	0.160		2.06	2.39	0.136		2.36	2.18	0.151		2.66	2.08	0.171		2.38	2.30	0.162		2.35	2.28	0.157	
21:00	2.46	2.20	0.162		2.37	2.28	0.159		2.10	2.39	0.139		2.07	2.29	0.131		2.40	2.06	0.148		2.09	2.22	0.129		1.94	2.49	0.130	
22:00	1.90	2.46	0.126		1.62	2.24	0.093		1.62	2.31	0.097		1.78	2.16	0.100		1.80	2.05	0.097		1.68	2.33	0.101		1.91	2.52	0.129	
23:00	1.29	1.95	0.057		1.19	1.65	0.043		1.20	1.81	0.047		1.31	1.67	0.050		1.33	1.75	0.053		1.28	1.76	0.051		1.63	2.29	0.095	

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.140				0.138				0.111				0.116				0.118				0.117				0.129	
Avg	2.24	1.86	0.140		2.23	1.83	0.138		1.90	1.89	0.111		1.94	1.91	0.116		2.01	1.84	0.118		2.00	1.88	0.117		2.07	1.96	0.129	
Time	04:00	03:50	03:50		05:15	05:15	05:15		04:20	03:15	02:25		01:30	01:40	01:40		05:25	03:05	03:00		03:30	04:30	04:40		02:55	02:55	02:55	
Min	0.85	0.52	0.009		0.83	0.57	0.009		0.64	0.61	0.010		0.80	0.62	0.010		0.85	0.77	0.014		0.89	0.74	0.014		0.93	0.67	0.012	
Time	09:45	22:05	13:50		10:40	07:50	09:15		10:15	07:30	10:15		10:15	08:15	10:15		08:25	15:25	08:20		09:30	11:40	09:30		09:40	07:30	10:05	
Max	4.28	2.79	0.362		4.87	2.73	0.376		4.01	2.83	0.304		3.87	2.88	0.317		4.01	2.71	0.330		3.75	2.89	0.295		4.02	2.83	0.333	

	D	V	Q	Rain
Total			0.870	
Avg	2.06	1.88	0.124	

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.20	1.73	0.046		1.13	1.69	0.041		1.09	1.43	0.032		1.07	1.40	0.031		1.08	1.34	0.030		1.13	1.34	0.032		1.11	1.41	0.033	
01:00	1.09	1.50	0.034		1.16	1.53	0.038		1.05	1.22	0.026		1.01	1.19	0.024		1.01	1.16	0.024		1.02	1.15	0.024		1.14	1.16	0.028	
02:00	0.99	1.23	0.024		1.05	1.25	0.027		0.99	1.15	0.023		0.97	1.08	0.021		0.99	1.08	0.021		0.96	1.05	0.019		1.02	1.06	0.022	
03:00	1.00	1.20	0.024		1.06	1.31	0.029		1.03	1.07	0.023		1.00	1.04	0.021		1.01	1.16	0.023		0.96	1.05	0.020		1.05	1.11	0.024	
04:00	1.17	1.44	0.040		0.98	1.06	0.020		1.01	1.04	0.021		0.95	0.98	0.018		0.95	1.00	0.019	0.01	0.96	0.94	0.018		0.98	0.93	0.018	
05:00	0.99	1.19	0.024		1.00	1.30	0.026		1.02	1.16	0.024		0.98	1.27	0.025		1.03	1.25	0.026		0.97	1.16	0.022		0.99	0.96	0.019	
06:00	1.07	1.70	0.038		1.04	1.52	0.032		1.08	1.63	0.036		1.03	1.59	0.033		1.20	1.67	0.048		1.18	1.62	0.043		1.16	1.74	0.044	
07:00	1.85	2.43	0.120		1.70	2.36	0.107		1.83	2.39	0.120		1.74	2.43	0.111		1.71	2.53	0.117		2.17	2.12	0.138		1.85	2.37	0.122	
08:00	2.72	2.38	0.199		3.20	2.19	0.234		2.86	2.30	0.209		2.65	2.36	0.193		2.99	2.34	0.226		3.04	2.19	0.218		2.70	2.30	0.192	
09:00	3.29	2.15	0.239		3.51	2.12	0.256		3.31	2.14	0.239		3.48	2.22	0.266		2.87	2.20	0.204		3.04	2.20	0.219		3.46	2.03	0.242	
10:00	3.49	2.26	0.271		3.33	2.25	0.252		3.16	2.21	0.230		2.96	2.30	0.220		2.87	2.26	0.206		3.05	2.12	0.210		3.42	2.06	0.241	
11:00	2.87	2.29	0.211		3.19	2.20	0.233		2.65	2.36	0.195		2.60	2.17	0.174		2.54	2.23	0.173		2.73	2.11	0.182		2.88	2.13	0.195	
12:00	2.62	2.16	0.176		2.87	2.19	0.200		2.69	2.20	0.186		2.74	2.08	0.181		2.65	2.18	0.178		2.42	2.09	0.152		2.33	2.20	0.150	
13:00	3.05	2.12	0.210		2.50	2.06	0.156		2.60	2.08	0.165		2.47	1.99	0.154		2.54	2.14	0.167		2.46	2.00	0.147		2.60	2.21	0.175	
14:00	3.07	2.15	0.217		2.84	2.11	0.192		2.15	2.33	0.140		2.32	2.03	0.142		2.33	2.30	0.156		2.21	2.22	0.141		2.84	2.26	0.203	
15:00	2.73	2.18	0.188		2.71	2.16	0.185		2.43	2.21	0.160		2.25	2.07	0.135		2.18	2.20	0.138		1.94	2.32	0.122		2.65	2.04	0.168	
16:00	2.40	2.28	0.161		2.70	2.12	0.177		2.03	2.10	0.116		2.01	2.01	0.110		2.10	1.98	0.118		2.10	2.24	0.131		2.67	2.13	0.178	
17:00	2.75	2.11	0.184		2.74	2.15	0.183		2.55	2.20	0.166		2.80	2.19	0.194		2.43	2.09	0.153		1.91	2.07	0.106		2.50	2.03	0.155	
18:00	2.85	2.11	0.193		2.41	2.02	0.145		2.33	2.16	0.147		2.09	2.25	0.132		2.13	1.96	0.119		2.25	2.17	0.143		2.16	2.12	0.129	
19:00	2.79	2.19	0.194		2.43	2.12	0.154		1.94	2.38	0.124		2.29	2.31	0.153		2.59	2.15	0.174		1.89	1.97	0.100		2.43	2.15	0.155	
20:00	2.72	2.10	0.181		2.81	2.12	0.189		2.15	2.18	0.129		2.64	2.31	0.188		2.49	2.14	0.162		2.26	2.13	0.140		2.39	2.44	0.172	
21:00	2.43	2.10	0.152		2.14	2.36	0.142		1.99	2.42	0.132		2.09	2.40	0.139		2.44	2.17	0.159		2.49	2.18	0.163		2.32	2.30	0.156	
22:00	1.90	2.48	0.126		1.42	2.07	0.070		1.49	2.29	0.083		1.53	2.34	0.087		1.73	1.84	0.082		1.71	2.09	0.092		1.82	2.36	0.113	
23:00	1.43	2.15	0.074		1.18	1.77	0.045		1.18	1.57	0.041		1.21	1.79	0.047		1.31	1.71	0.051		1.35	1.84	0.058		1.40	1.97	0.066	

	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.139				0.131				0.115				0.117				0.116	0.01			0.110				0.125	
Avg	2.19	1.98	0.139		2.13	1.92	0.131		1.94	1.93	0.115		1.95	1.91	0.117		1.97	1.88	0.116		1.93	1.85	0.110		2.08	1.89	0.125	
Time	04:00	05:35	04:00		06:00	04:20	04:20		05:20	03:35	03:35		04:00	05:05	05:05		04:15	02:15	02:15		03:25	02:30	04:35		02:20	05:00	05:00	
Min	0.85	0.98	0.017		0.86	0.94	0.017		0.83	0.84	0.015		0.84	0.81	0.014		0.88	0.74	0.013		0.85	0.81	0.015		0.88	0.74	0.014	
Time	18:50	07:55	10:40		09:25	07:55	08:10		09:25	07:35	09:25		09:20	10:35	09:20		08:50	07:50	08:55		07:45	14:10	07:45		09:55	20:40	09:15	
Max	4.12	2.81	0.342		4.41	2.79	0.319		3.96	2.98	0.318		4.26	2.78	0.357		3.73	3.08	0.294		3.96	2.83	0.294		4.18	2.91	0.318	

	D	V	Q	Rain
Total			0.852	0.01
Avg	2.03	1.91	0.122	

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.14	1.64	0.043		1.16	1.49	0.037		1.04	1.34	0.028		0.96	1.25	0.023		1.09	1.15	0.026	0.13	1.08	1.23	0.028		1.46	1.19	0.041	
01:00	1.08	1.35	0.031		1.04	1.30	0.027		1.11	1.42	0.035		0.96	1.10	0.021		1.10	1.25	0.029	0.03	0.99	0.98	0.019		1.40	0.85	0.028	
02:00	1.07	1.22	0.027		1.01	1.09	0.022		1.00	1.13	0.023		1.01	1.08	0.026		1.01	0.90	0.018		0.94	0.82	0.015		1.38	0.98	0.032	
03:00	1.00	1.08	0.022		1.03	1.15	0.024		1.02	1.09	0.023		1.01	0.98	0.020		0.95	0.65	0.012	0.01	0.90	0.74	0.013		1.35	0.88	0.027	
04:00	1.01	1.03	0.021		0.98	1.09	0.021		0.93	0.91	0.016		0.86	0.79	0.013		1.02	0.78	0.016	0.01	0.91	0.79	0.014		1.33	1.03	0.034	
05:00	1.01	1.22	0.025		1.02	1.20	0.025		0.95	1.02	0.019		0.91	0.90	0.016	0.04	0.99	0.72	0.014		0.98	0.90	0.018		1.33	0.95	0.029	
06:00	1.05	1.41	0.030		1.34	1.92	0.060		1.07	1.56	0.035		1.15	1.76	0.043	0.14	1.11	1.52	0.037	0.03	1.11	1.62	0.038		1.52	1.52	0.056	
07:00	1.86	2.29	0.118		1.94	2.21	0.116		1.98	2.24	0.125		1.59	2.32	0.093	0.01	1.60	2.32	0.094		1.91	2.38	0.127		2.17	2.11	0.134	
08:00	3.09	2.33	0.236		2.90	2.16	0.201		2.68	2.42	0.202		2.46	2.39	0.175		2.23	2.38	0.151		2.97	2.24	0.215		2.77	2.27	0.198	
09:00	3.13	2.17	0.224		3.08	2.21	0.223		3.19	2.27	0.241		3.31	2.18	0.246		2.80	2.25	0.200		3.19	2.10	0.222		2.90	2.28	0.212	
10:00	3.05	2.21	0.219		3.82	2.02	0.275		2.67	2.24	0.188		2.95	2.23	0.211		2.67	2.22	0.184		2.89	2.13	0.197		3.11	2.18	0.223	
11:00	3.03	2.14	0.211		3.19	2.21	0.235		2.26	2.42	0.156		2.86	2.14	0.195		2.93	2.11	0.200		2.54	2.26	0.175		2.87	2.11	0.193	
12:00	2.71	2.14	0.182		3.13	2.08	0.215		2.55	2.21	0.170		2.17	2.20	0.134		1.95	2.34	0.123		2.54	2.22	0.171		3.16	2.09	0.219	
13:00	2.90	2.13	0.196		2.90	2.19	0.204		2.29	2.25	0.149		2.15	2.22	0.135		2.12	2.28	0.135		2.34	2.04	0.143		2.70	2.12	0.177	
14:00	3.03	2.10	0.206		3.19	2.11	0.224		2.47	2.19	0.162		2.01	2.35	0.131		1.93	2.30	0.120		2.38	2.10	0.148		2.91	2.06	0.192	
15:00	2.82	2.07	0.185		3.12	2.15	0.221		2.43	2.23	0.161		1.96	2.45	0.130		2.02	2.27	0.126		2.46	2.16	0.159		2.98	2.13	0.205	
16:00	3.00	2.16	0.211		2.83	2.11	0.191		2.13	2.24	0.134		2.17	2.39	0.145		1.71	2.34	0.104		2.44	2.11	0.155		2.39	2.04	0.145	
17:00	2.94	2.23	0.211		2.82	2.25	0.202		2.10	2.25	0.132		1.96	2.36	0.124		1.81	2.24	0.105		2.15	1.93	0.120		2.10	2.01	0.119	
18:00	2.53	2.07	0.160		2.24	2.18	0.141		2.06	2.36	0.135		1.93	2.19	0.114		1.70	2.23	0.098		2.44	2.13	0.156		2.04	1.94	0.110	
19:00	2.90	2.25	0.208		2.44	2.26	0.164		2.07	2.38	0.135		1.93	2.28	0.119		1.85	2.37	0.116		2.19	2.19	0.137		2.23	1.98	0.129	
20:00	2.84	2.10	0.191		2.39	2.12	0.150		2.03	2.33	0.130		2.08	1.94	0.113		1.71	2.45	0.108		2.28	1.91	0.128		2.55	2.03	0.158	
21:00	2.49	2.19	0.165		2.15	2.32	0.139		1.96	2.46	0.130		2.09	2.29	0.134		1.89	2.47	0.125		2.35	2.12	0.147		2.20	1.97	0.125	
22:00	1.93	2.32	0.121		1.49	2.22	0.082		1.44	2.08	0.073		1.48	2.12	0.076		1.34	2.11	0.065		1.85	1.92	0.095		2.02	1.93	0.108	
23:00	1.39	1.97	0.065		1.15	1.52	0.038		1.13	1.61	0.039		1.24	1.67	0.046	0.03	1.17	1.54	0.039		1.62	1.45	0.059		1.72	1.82	0.080	

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.138				0.135				0.110				0.103	0.22			0.094	0.21			0.112				0.124	
Avg	2.21	1.91	0.138		2.18	1.90	0.135		1.86	1.94	0.110		1.80	1.90	0.103		1.70	1.88	0.094		1.98	1.77	0.112		2.19	1.77	0.124	
Time	00:40	03:10	03:10		04:10	05:25	05:25		04:05	04:50	04:50		04:05	04:40	04:40		06:45	05:40	05:40		03:00	02:50	02:50		04:15	04:25	04:25	
Min	0.59	0.81	0.015		0.86	0.84	0.015		0.88	0.71	0.012		0.78	0.54	0.008		0.79	0.44	0.008		0.82	0.54	0.009		1.11	0.61	0.015	
Time	14:40	19:25	14:40		10:30	21:55	10:30		09:35	11:40	09:35		09:10	07:50	09:05		11:25	14:00	11:25		09:30	07:45	08:40		15:10	07:45	15:05	
Max	4.03	2.95	0.316		4.87	2.88	0.382		3.93	2.79	0.320		4.19	2.83	0.369		4.25	2.76	0.297		3.84	2.89	0.291		4.01	2.59	0.301	

	D	V	Q	Rain
Total			0.816	0.43
Avg	1.99	1.87	0.117	

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.61	1.49	0.060		1.35	1.41	0.044		1.15	1.23	0.030		1.21	0.96	0.026													
01:00	1.44	1.21	0.042		1.20	1.16	0.031		1.16	1.16	0.029		1.22	0.96	0.026													
02:00	1.32	1.02	0.031		1.08	0.87	0.020		1.12	1.02	0.024		1.14	0.79	0.019													
03:00	1.33	0.99	0.030		1.22	0.99	0.026		1.09	1.10	0.025		1.16	0.79	0.020													
04:00	1.31	1.00	0.030		1.09	0.59	0.013		1.11	1.01	0.023		1.14	0.90	0.022													
05:00	1.32	1.00	0.030		1.22	0.85	0.023		1.06	1.10	0.024		1.17	0.86	0.022													
06:00	1.36	1.30	0.041		1.20	1.37	0.036		1.11	1.39	0.032		1.31	1.56	0.048													
07:00	1.85	2.07	0.102		1.56	2.16	0.085		1.74	2.28	0.105		1.65	2.19	0.092													
08:00	2.88	2.15	0.197		2.57	2.31	0.181		2.87	2.19	0.200		2.28	2.29	0.150													
09:00	3.32	2.11	0.235		3.38	2.14	0.244		2.85	2.20	0.201		2.59	2.23	0.174													
10:00	3.39	2.12	0.243		3.41	2.17	0.254		2.39	2.24	0.158		2.69	2.04	0.172													
11:00	3.34	2.13	0.241		2.73	2.09	0.178		2.40	2.26	0.162		2.08	2.22	0.128													
12:00	3.12	2.12	0.218		2.59	2.06	0.163		2.30	2.30	0.154		1.91	2.07	0.105													
13:00	2.82	2.14	0.190		2.89	2.19	0.202		2.00	2.27	0.124		1.92	2.06	0.106													
14:00	3.02	2.12	0.208		3.10	2.10	0.213		2.32	2.08	0.142		1.95	2.18	0.116													
15:00	2.60	2.06	0.166		2.99	2.29	0.221		1.95	2.15	0.116		1.97	2.01	0.108													
16:00	2.41	2.03	0.146		2.76	2.16	0.188		1.76	2.12	0.097		1.95	2.07	0.109													
17:00	2.50	2.10	0.160		2.23	2.08	0.134		2.10	2.26	0.133		2.09	1.98	0.115													
18:00	2.39	2.21	0.157		2.25	2.24	0.146		1.95	2.26	0.118		2.29	1.99	0.132													
19:00	2.42	2.16	0.156		2.22	2.17	0.138		1.87	2.17	0.108		2.29	1.99	0.132													
20:00	2.34	2.19	0.152		2.67	2.14	0.178		1.80	2.22	0.104																	
21:00	2.35	2.07	0.146		1.94	2.08	0.109		1.85	2.11	0.104																	
22:00	2.01	2.07	0.115		1.46	2.03	0.072		1.59	1.90	0.075																	
23:00	1.63	1.85	0.077		1.20	1.36	0.036		1.36	1.46	0.046																	

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.132				0.122				0.097				0.063													
Avg	2.25	1.82	0.132		2.10	1.79	0.122		1.79	1.85	0.097		1.74	1.67	0.086													
Time	02:35	02:35	02:35		02:20	04:15	04:50		06:20	02:10	03:10		05:00	04:05	04:05													
Min	1.16	0.67	0.017		0.98	0.45	0.010		0.95	0.84	0.017		1.01	0.54	0.011													
Time	10:10	20:20	11:10		09:50	07:45	10:45		08:40	09:10	09:10		10:50	08:20	09:20													
Max	3.99	3.03	0.333		4.18	2.69	0.334		3.60	2.96	0.292		3.41	2.91	0.244													

	D	V	Q	Rain
Total			0.415	
Avg	1.99	1.79	0.111	

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																									1.15	1.36	0.034	
01:00																									1.09	1.11	0.025	
02:00																									1.00	0.93	0.019	
03:00																									0.95	0.86	0.016	
04:00																									0.94	0.78	0.014	
05:00																									1.02	0.98	0.021	
06:00																									1.12	1.57	0.038	
07:00																									1.88	2.55	0.128	
08:00																									3.20	2.18	0.234	
09:00																									3.30	2.12	0.236	
10:00																									2.88	2.28	0.209	
11:00																									3.03	2.15	0.212	
12:00																									2.72	2.09	0.177	
13:00																					2.81	2.14	0.191		2.46	2.08	0.152	
14:00																					2.08	2.31	0.133		2.60	2.02	0.163	
15:00																					2.14	2.23	0.133		2.46	2.09	0.154	
16:00																					2.24	2.18	0.140		2.51	1.98	0.150	
17:00																					2.26	2.21	0.143		2.47	2.05	0.155	
18:00																					2.23	2.20	0.141		3.16	2.09	0.219	
19:00																					2.24	2.20	0.141		3.13	2.17	0.224	
20:00																					2.17	2.07	0.127		2.45	2.14	0.159	
21:00																					2.54	2.11	0.165		2.53	2.12	0.164	
22:00																					1.74	2.12	0.097		2.34	2.18	0.148	
23:00																					1.22	1.59	0.043		1.47	1.89	0.068	

	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																							0.060				0.130	
Avg																					2.15	2.12	0.132		2.16	1.82	0.130	
Time																					23:35	23:40	23:40		03:00	04:00	04:00	
Min																					1.07	1.14	0.026		0.86	0.64	0.011	
Time																					21:50	15:50	21:55		18:50	07:50	08:30	
Max																					3.71	2.81	0.288		4.15	3.00	0.320	

	D	V	Q	Rain
Total			0.190	
Avg	2.16	1.92	0.131	

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.16	1.24	0.031		1.32	1.42	0.043		1.23	1.18	0.032		1.06	1.03	0.022		1.04	1.30	0.028		1.41	1.02	0.034		1.64	1.22	0.051	
01:00	1.13	1.26	0.030		1.24	1.21	0.033		1.21	1.07	0.028		0.95	0.93	0.017		1.01	1.08	0.022		1.35	0.96	0.030		1.73	1.04	0.046	
02:00	1.05	1.05	0.023		1.15	0.95	0.023		1.04	0.70	0.015		1.11	0.93	0.022		1.07	0.93	0.020		1.21	0.68	0.018		1.66	0.96	0.041	
03:00	1.07	0.98	0.022		1.13	0.97	0.023		1.02	0.75	0.016		1.09	0.82	0.018		0.98	0.69	0.013		1.23	0.72	0.019		1.62	0.91	0.037	
04:00	1.00	0.95	0.019		1.07	0.92	0.020		1.10	0.93	0.022		1.12	0.72	0.017		0.97	0.63	0.012		1.27	0.72	0.020		1.45	0.82	0.028	
05:00	0.99	0.99	0.019		1.07	0.82	0.018		1.08	0.93	0.021		1.12	0.93	0.021		1.06	0.88	0.019		1.33	0.91	0.028		1.46	0.88	0.031	
06:00	1.10	1.53	0.037		1.25	1.44	0.041		1.25	1.25	0.034		1.22	1.68	0.048		1.29	1.44	0.042		1.76	1.31	0.065		1.84	1.25	0.063	
07:00	1.98	2.32	0.129		2.00	2.16	0.120		2.16	2.09	0.133		1.69	2.36	0.102		1.87	2.13	0.107		2.12	1.78	0.107		2.11	1.84	0.110	
08:00	2.80	2.20	0.194		2.92	2.30	0.217		2.34	2.27	0.157		2.12	2.33	0.141		2.44	2.19	0.161		2.74	1.91	0.164		2.70	1.94	0.164	
09:00	3.49	2.21	0.263		3.15	2.21	0.229		2.95	2.21	0.211		2.42	2.31	0.166		3.02	2.26	0.221		2.95	1.97	0.189		3.01	1.88	0.184	
10:00	3.60	2.13	0.269		3.84	2.09	0.287		2.87	2.11	0.193		2.50	2.26	0.172		2.81	2.15	0.191		2.62	1.85	0.150		2.93	1.87	0.177	
11:00	3.26	2.04	0.225		2.91	2.02	0.189		2.18	2.21	0.138		2.68	2.17	0.180		2.48	2.08	0.155		2.51	1.79	0.135		2.81	1.91	0.169	
12:00	2.71	2.28	0.192		2.56	1.99	0.157		2.22	2.14	0.135		2.53	2.08	0.161		2.09	1.93	0.114		2.48	1.96	0.147		2.49	1.71	0.129	
13:00	2.64	2.13	0.173		2.68	1.95	0.167		2.71	2.28	0.194		2.02	2.08	0.117		2.12	2.06	0.124		2.67	1.93	0.159		2.48	1.72	0.129	
14:00	3.03	2.08	0.205		2.81	2.09	0.186		2.59	2.24	0.178		2.27	2.00	0.134		2.87	1.94	0.174		2.58	1.80	0.143		2.50	1.79	0.136	
15:00	2.95	2.07	0.197		2.55	2.07	0.163		2.38	2.14	0.154		2.09	2.17	0.126		2.69	1.66	0.141		2.57	1.80	0.144		2.57	1.73	0.136	
16:00	2.84	2.17	0.193		2.46	2.19	0.162		1.78	2.13	0.099		2.52	2.15	0.164		2.71	1.86	0.158		2.31	1.80	0.121		2.55	1.72	0.134	
17:00	2.61	2.12	0.170		2.38	2.08	0.148		2.23	2.16	0.139		2.05	2.17	0.123		2.56	1.87	0.147		2.30	1.82	0.121		2.21	1.66	0.105	
18:00	2.47	2.13	0.160		2.65	2.08	0.173		2.04	2.11	0.118		2.00	2.18	0.119		2.72	1.82	0.157		2.47	1.90	0.142		2.32	1.83	0.124	
19:00	2.90	2.19	0.203		2.23	2.17	0.140		1.65	2.19	0.090		1.74	2.27	0.101		2.43	1.84	0.133		2.25	2.09	0.136		2.36	1.83	0.127	
20:00	2.73	2.15	0.185		2.39	2.19	0.156		1.98	2.20	0.118		1.99	2.09	0.114		2.42	1.75	0.127		2.43	2.02	0.146		2.32	1.85	0.126	
21:00	2.48	2.17	0.162		2.16	2.07	0.127		1.78	2.27	0.105		1.94	2.31	0.120		2.26	1.50	0.097		2.27	1.84	0.120		2.58	1.79	0.143	
22:00	2.13	1.99	0.121		1.83	1.93	0.095		1.42	1.89	0.066		1.42	1.99	0.067		1.88	1.34	0.068		2.05	1.65	0.094		2.35	1.85	0.129	
23:00	1.69	1.93	0.084		1.35	1.71	0.054		1.17	1.37	0.035		1.08	1.35	0.031		1.64	1.08	0.044		1.82	1.36	0.066		2.01	1.47	0.082	

	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.138				0.124				0.101				0.096				0.103				0.104				0.108	
Avg	2.24	1.85	0.138		2.13	1.79	0.124		1.85	1.78	0.101		1.78	1.80	0.096		2.02	1.60	0.103		2.11	1.57	0.104		2.24	1.56	0.108	
Time	04:30	02:20	04:05		04:15	05:40	05:40		05:05	02:25	03:10		01:40	05:20	04:15		05:20	04:05	04:00		02:45	02:40	02:40		04:10	02:20	02:20	
Min	0.88	0.77	0.014		0.90	0.59	0.012		0.92	0.52	0.010		0.84	0.39	0.010		0.83	0.47	0.008		1.14	0.49	0.012		1.24	0.67	0.021	
Time	09:40	07:25	10:10		08:30	08:10	08:30		09:05	11:30	13:50		12:20	08:00	10:55		09:55	14:00	14:20		15:20	16:25	09:30		09:30	11:15	21:15	
Max	4.76	2.68	0.363		4.15	2.74	0.385		3.93	2.74	0.313		3.57	2.74	0.273		3.80	2.73	0.277		3.59	2.37	0.261		3.51	2.29	0.240	

	D	V	Q	Rain
Total			0.774	
Avg	2.05	1.71	0.111	

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.73	1.18	0.052	0.02	1.64	1.15	0.047		1.62	1.09	0.044		1.61	0.97	0.039		1.57	1.03	0.040		1.45	0.96	0.033		1.63	1.17	0.048	
01:00	1.61	1.05	0.042	0.11	1.58	1.06	0.042		1.43	0.78	0.027		1.55	0.98	0.037		1.55	0.97	0.037		1.39	0.92	0.030		1.51	1.04	0.038	
02:00	1.58	1.00	0.039	0.02	1.35	0.76	0.023		1.49	0.92	0.033		1.36	0.90	0.029		1.51	0.91	0.033		1.26	0.81	0.023		1.55	0.95	0.036	
03:00	1.52	0.92	0.034		1.36	0.78	0.025		1.54	1.02	0.039		1.27	0.79	0.022		1.52	0.91	0.034		1.19	0.74	0.019		1.49	0.94	0.034	
04:00	1.46	0.88	0.030		1.27	0.71	0.020		1.26	0.75	0.021		1.27	0.79	0.022		1.47	0.78	0.028		1.22	0.78	0.021		1.36	0.85	0.027	
05:00	1.51	0.96	0.035		1.33	0.84	0.025		1.30	0.73	0.022		1.46	0.91	0.032		1.56	1.06	0.041		1.35	0.89	0.029		1.45	0.96	0.033	
06:00	1.78	1.23	0.057		1.70	1.46	0.065		1.72	1.28	0.059		1.78	1.58	0.073		1.76	1.36	0.065		1.68	1.34	0.060		1.77	1.47	0.069	
07:00	2.02	1.82	0.102		2.05	1.99	0.115		2.11	1.97	0.118		2.17	1.94	0.120		2.15	1.88	0.117		2.04	1.90	0.109		2.09	1.98	0.117	
08:00	2.61	1.94	0.159		2.73	2.10	0.181		2.54	2.14	0.167		2.73	1.90	0.164		2.41	2.06	0.147		2.51	1.92	0.147		2.46	2.06	0.152	
09:00	3.19	2.02	0.216		3.03	2.04	0.203		3.05	1.95	0.195		2.65	1.95	0.162		2.34	2.15	0.148		2.67	2.04	0.170		2.44	2.00	0.146	
10:00	2.89	1.98	0.183		3.25	2.02	0.221		2.80	1.91	0.172		2.85	1.97	0.179		2.25	1.89	0.123		2.33	2.06	0.141		2.68	2.11	0.176	
11:00	2.85	1.91	0.175		2.72	1.95	0.165		2.57	1.96	0.155		2.72	1.96	0.168		2.45	1.94	0.143		2.36	1.91	0.133		2.55	1.91	0.149	
12:00	2.58	1.87	0.149		2.79	1.96	0.174		2.57	1.86	0.147		2.48	1.90	0.144		2.54	1.96	0.152		2.40	1.86	0.134		2.50	1.89	0.143	
13:00	2.59	1.79	0.144		2.68	1.84	0.153		2.59	1.91	0.153		2.25	1.81	0.118		2.39	1.99	0.142		2.52	1.91	0.146		2.61	1.84	0.148	
14:00	2.71	1.81	0.155		2.72	1.85	0.157		2.56	1.82	0.144		2.74	2.04	0.176		2.39	1.85	0.131		2.41	1.87	0.136		2.49	1.77	0.133	
15:00	2.89	1.90	0.177		2.69	1.81	0.152		2.32	1.80	0.122		2.51	1.88	0.147		2.26	1.91	0.124		2.40	1.97	0.140		2.49	1.74	0.133	
16:00	2.37	1.86	0.131		2.53	1.81	0.139		2.15	1.67	0.102		2.87	1.94	0.177		2.07	1.86	0.108		2.53	1.82	0.142		2.62	1.87	0.153	
17:00	2.46	1.77	0.131		2.42	1.67	0.120		2.24	1.76	0.114		2.56	1.75	0.138		2.50	1.92	0.145		2.24	1.78	0.117		2.78	1.77	0.155	
18:00	2.67	1.78	0.148		2.39	1.91	0.137		2.26	1.82	0.119		2.59	1.62	0.129		2.41	1.92	0.138		2.42	1.80	0.130		2.55	1.80	0.141	
19:00	2.78	1.84	0.164		2.68	1.83	0.153		2.20	1.92	0.121		2.34	1.63	0.112		2.36	1.88	0.131		2.34	1.69	0.116		2.34	1.92	0.131	
20:00	2.74	1.87	0.163		2.46	1.82	0.134		2.04	1.79	0.101		2.26	1.82	0.119		2.10	1.84	0.108		2.25	1.73	0.113		2.27	1.89	0.125	
21:00	2.55	1.78	0.140		2.25	1.76	0.114		2.07	1.79	0.103		2.24	1.83	0.118		1.99	1.86	0.101		2.12	1.73	0.104		2.27	1.83	0.120	
22:00	2.14	1.78	0.107		1.90	1.68	0.085		2.16	1.63	0.101		1.96	1.47	0.080		1.85	1.71	0.085		1.94	1.65	0.087		2.23	1.91	0.123	
23:00	1.86	1.60	0.080		1.70	1.30	0.057		1.71	1.27	0.055		1.71	1.12	0.049		1.61	1.30	0.052		1.73	1.38	0.062		1.93	1.67	0.087	

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.117	0.15			0.113				0.101				0.106				0.099				0.098				0.109	
Avg	2.30	1.61	0.117		2.22	1.59	0.113		2.10	1.56	0.101		2.16	1.56	0.106		2.04	1.62	0.099		2.03	1.56	0.098		2.17	1.64	0.109	
Time	04:10	03:40	04:10		04:45	03:15	03:15		05:00	04:15	05:00		03:55	02:55	03:50		03:20	04:45	04:45		05:15	02:30	05:15		05:10	03:30	05:05	
Min	1.42	0.71	0.025		1.16	0.50	0.015		1.12	0.54	0.013		1.15	0.57	0.014		1.36	0.56	0.020		1.04	0.57	0.012		1.19	0.71	0.019	
Time	09:40	13:15	09:40		10:15	07:45	10:20		09:15	08:35	09:25		15:50	16:25	15:50		17:50	06:30	12:55		16:00	08:00	16:00		16:20	10:20	16:20	
Max	4.04	2.49	0.307		4.26	2.47	0.333		3.48	2.44	0.264		3.69	2.39	0.271		3.07	2.51	0.209		3.63	2.52	0.290		3.71	2.47	0.269	

	D	V	Q	Rain
Total			0.743	0.15
Avg	2.14	1.59	0.106	

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00	1.74	1.30	0.058		1.66	1.25	0.053		1.52	1.07	0.039		1.64	1.10	0.045		1.59	1.10	0.044		1.37	1.02	0.032		1.17	1.08	0.027	
01:00	1.60	0.96	0.038		1.59	1.05	0.041		1.50	0.88	0.032		1.53	0.89	0.034		1.47	0.82	0.029		1.30	0.95	0.029		1.11	1.03	0.024	
02:00	1.52	0.85	0.031		1.35	0.90	0.028		1.55	0.97	0.038		1.45	0.96	0.037		1.26	0.66	0.019		1.13	0.79	0.019		1.06	0.85	0.019	
03:00	1.48	0.81	0.029		1.29	0.81	0.024		1.57	0.99	0.039		1.29	0.68	0.020		1.30	0.56	0.017		1.10	0.63	0.014		1.00	0.77	0.016	
04:00	1.51	0.83	0.030		1.25	0.70	0.019		1.39	0.70	0.023		1.26	0.60	0.017		1.37	0.73	0.024		1.13	0.76	0.018		1.04	0.92	0.020	
05:00	1.50	0.86	0.032		1.32	0.87	0.028		1.51	0.87	0.032		1.37	0.89	0.029		1.52	0.91	0.034		1.21	0.91	0.024		1.01	0.94	0.019	
06:00	1.76	1.51	0.070		1.60	1.47	0.059		1.78	1.21	0.057		1.61	1.46	0.060		1.69	1.43	0.063		1.40	1.50	0.050		1.19	1.61	0.042	
07:00	2.23	2.08	0.135		2.21	2.15	0.138		2.34	1.97	0.137		2.04	1.79	0.105		2.22	1.84	0.119		1.95	2.03	0.107		1.90	2.04	0.105	
08:00	3.11	1.96	0.203		2.76	2.27	0.198		2.63	2.00	0.162		2.66	1.97	0.162		2.42	2.03	0.146		2.53	2.11	0.163		2.38	2.21	0.157	
09:00	2.91	2.01	0.188		3.18	2.07	0.219		2.90	1.95	0.182		2.60	2.07	0.166		2.61	2.05	0.165		2.85	1.99	0.182		3.10	2.19	0.225	
10:00	2.98	1.96	0.192		3.01	1.95	0.192		2.61	1.98	0.161		2.35	1.90	0.132		2.58	1.99	0.158		2.51	2.07	0.158		2.61	2.16	0.175	
11:00	2.88	1.78	0.165		3.04	1.98	0.198		2.43	1.93	0.141		2.31	1.94	0.132		2.49	1.93	0.146		2.27	2.08	0.140		2.38	2.03	0.145	
12:00	2.98	1.87	0.181		3.07	1.97	0.198		2.45	1.95	0.142		2.21	1.96	0.124		2.35	1.89	0.132		2.28	2.07	0.140		2.32	2.05	0.142	
13:00	2.90	1.90	0.177		3.05	1.97	0.198		2.55	1.94	0.150		2.22	1.85	0.118		2.44	1.95	0.144		2.23	1.99	0.129		2.36	1.98	0.140	
14:00	3.32	1.95	0.218		2.79	1.82	0.160		2.37	1.95	0.137		2.14	1.86	0.113		2.43	1.85	0.135		1.99	1.89	0.106		2.39	1.99	0.146	
15:00	3.16	1.94	0.204		2.79	1.98	0.176		2.52	2.03	0.155		2.04	1.75	0.099		2.34	1.85	0.130		1.80	1.92	0.091		2.31	2.03	0.138	
16:00	2.77	1.93	0.169		3.06	2.03	0.204		2.22	1.86	0.120		1.83	1.68	0.081		2.05	1.67	0.095		1.90	1.86	0.096		2.26	2.07	0.137	
17:00	2.90	1.92	0.179		2.68	1.99	0.165		2.22	1.84	0.117		1.91	1.66	0.086		2.17	1.74	0.109		1.93	1.88	0.098		2.27	2.09	0.138	
18:00	3.09	1.99	0.205		2.51	1.98	0.151		2.15	1.88	0.116		1.83	1.69	0.082		2.12	1.86	0.112		1.88	1.88	0.095		2.12	2.03	0.123	
19:00	2.88	1.91	0.176		2.56	1.90	0.149		2.30	1.84	0.124		1.75	1.63	0.074		1.88	1.73	0.087		2.06	1.97	0.113		1.97	1.97	0.108	
20:00	2.92	1.95	0.184		2.76	1.96	0.170		2.33	1.81	0.123		2.09	1.80	0.107		2.07	1.87	0.108		1.82	1.81	0.086		2.18	1.98	0.123	
21:00	2.63	1.88	0.153		2.36	1.86	0.129		2.16	1.80	0.111		2.13	1.82	0.110		2.06	1.86	0.107		2.02	1.86	0.104		1.99	2.08	0.114	
22:00	2.25	2.12	0.138		2.15	1.78	0.109		1.81	1.42	0.067		1.79	1.72	0.080		1.70	1.56	0.069		1.70	1.76	0.077		1.87	1.95	0.098	
23:00	1.98	1.74	0.094		1.60	1.28	0.052		1.60	1.20	0.048		1.58	1.12	0.044		1.49	1.18	0.042		1.34	1.41	0.044		1.44	1.61	0.055	

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total			0.135				0.127				0.102				0.086				0.093				0.088				0.102	
Avg	2.46	1.67	0.135		2.32	1.67	0.127		2.10	1.59	0.102		1.90	1.53	0.086		1.98	1.54	0.093		1.82	1.63	0.088		1.89	1.74	0.102	
Time	05:10	04:10	04:10		04:15	04:05	04:50		04:20	04:20	04:20		04:00	04:00	04:00		02:45	03:50	02:40		04:10	03:10	03:40		04:05	03:15	03:20	
Min	1.35	0.61	0.020		1.16	0.54	0.013		1.27	0.54	0.015		1.11	0.44	0.010		1.18	0.40	0.012		0.99	0.50	0.011		0.86	0.57	0.010	
Time	08:20	22:05	18:20		09:45	08:40	09:45		10:35	14:05	10:35		09:55	11:40	09:55		09:45	08:50	09:45		09:40	07:25	09:40		09:50	08:40	09:50	
Max	4.12	2.57	0.327		4.28	2.57	0.306		3.56	2.46	0.254		3.36	2.52	0.257		3.27	2.36	0.251		3.55	2.57	0.261		3.73	2.74	0.288	

	D	V	Q	Rain
Total			0.733	
Avg	2.07	1.62	0.105	

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00	1.17	1.34	0.034		1.21	1.23	0.033	
01:00	1.17	1.00	0.025		1.14	1.23	0.030	
02:00	1.04	0.79	0.017		1.14	1.09	0.026	
03:00	0.98	0.75	0.015		1.05	0.85	0.018	
04:00	0.92	0.65	0.011		1.00	0.84	0.017	
05:00	1.01	0.98	0.020		1.01	0.85	0.017	
06:00	1.24	1.53	0.050		1.25	1.46	0.041	
07:00	1.70	2.07	0.090		2.06	2.19	0.128	
08:00	2.27	2.21	0.147		2.53	2.17	0.169	
09:00	3.08	2.19	0.221		2.96	2.20	0.210	
10:00	3.07	2.25	0.226		3.23	2.17	0.234	
11:00	2.72	2.11	0.179		2.80	2.06	0.181	
12:00	2.39	1.99	0.142		2.77	2.27	0.199	
13:00	2.59	2.20	0.175		3.00	2.02	0.198	
14:00	2.60	2.10	0.168		2.85	2.16	0.198	
15:00	2.65	2.05	0.169		3.05	2.22	0.221	
16:00	2.70	2.13	0.180		2.57	2.10	0.166	
17:00	2.57	2.11	0.167		2.59	2.20	0.177	
18:00	2.40	2.08	0.149		2.26	2.08	0.138	
19:00	2.42	1.91	0.138		2.12	1.98	0.118	
20:00	2.49	1.97	0.149		2.00	2.04	0.112	
21:00	2.46	2.16	0.160		2.04	1.92	0.110	
22:00	1.81	2.01	0.096		1.65	1.83	0.077	
23:00	1.43	1.52	0.052		1.18	1.34	0.034	

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total			0.116				0.119	
Avg	2.04	1.75	0.116		2.06	1.77	0.119	
Time	04:00	04:55	04:55		04:05	03:55	04:00	
Min	0.88	0.50	0.009		0.88	0.49	0.009	
Time	09:35	06:55	09:35		13:05	12:00	10:05	
Max	4.16	2.91	0.319		3.83	2.64	0.302	

	D	V	Q	Rain
Total			0.235	
Avg	2.05	1.76	0.117	

Site Commentary

Overview

CARLSBAD_RG1	
Total Rainfall	2.59 "

A review of the hydrograph indicates that CARLSBAD_RG1 functioned under normal conditions during the period Saturday, February 22, 2014 through Sunday, May 11, 2014 .

ADS Site Report

Quality Form

Project Name: Carlsbad Temp 2014	**City / State:** Carlsbad, CA			**Date Installed:** 2/21/14	**FM Initials:** JG
Site Name: RG1	**Monitor Series:** 3600			**Monitor S/N:** 2890	
Address / Location: 2229 Cannon RD				**Manhole #:** N/A	
				Map Page #: N/A	
Access: Drive/ Call p.o.c. to make appointment	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** N/A
					Pipe Width: N/A
					IP Address: N/A

Access Map

Site Map

Investigation Information:		Manhole Information:				
Date/Time of Investigation:	2/21/14	**Manhole Depth:**	N/A			**Inches**
Site Hydraulics:		**Manhole Material / Condition:**	N/A			
Upstream Input: (L/S,P/S)	N/A	**Pipe Material / Condition:**	N/A			
Upstream Manhole:	DNI	**Mini System Character:**	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]
Downstream Manhole:	DNI	**Telephone Information:**	N/A			
Depth of Flow (Wet Dof):	**+/-**	**Access Pole #:**	N/A			
Range (Air Dof):	**+/-**	**Distance From Manhole:**	N/A			**Feet**
Peak Velocity:	**Fps**	**Road Cut Length:**	N/A			**Feet**
Silt:	**Inches**	**Trench Length:**	N/A			**Feet**

Other Information:

Cross Section

Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: 1 Meter and 1 Rain bucket		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: N/A	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: RG 1		**Other**	[ ]	[ ]		

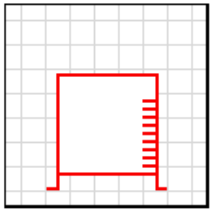
Additional Site Information / Comments:

HYDROGRAPH REPORT

CARLSBAD_RG1

Rain Gauge

CARLSBAD_RG1

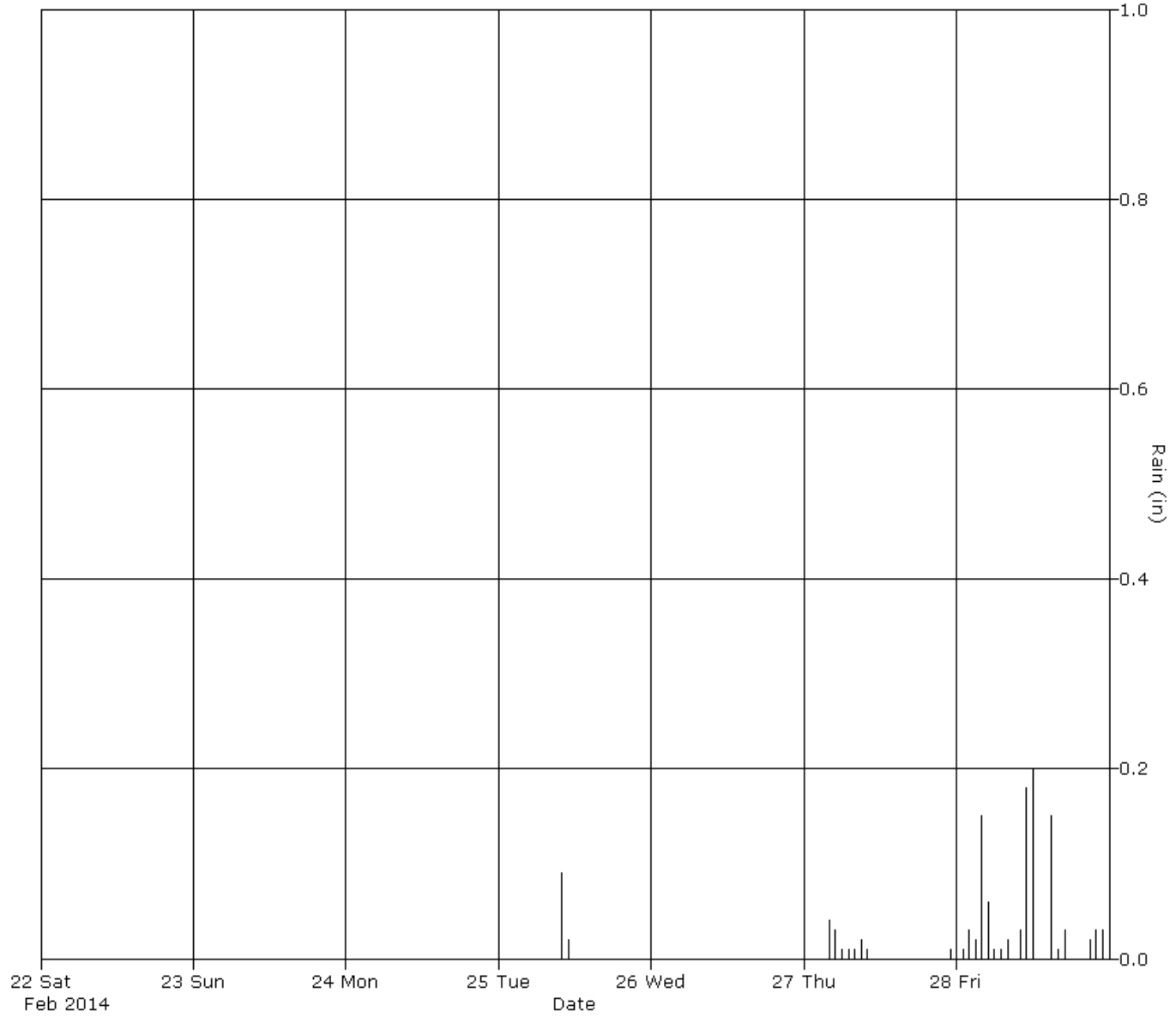


Report Period

2/22/2014
To
2/28/2014

Legend

Rain



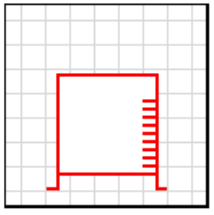
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

CARLSBAD_RG1

Rain Gauge

CARLSBAD_RG1

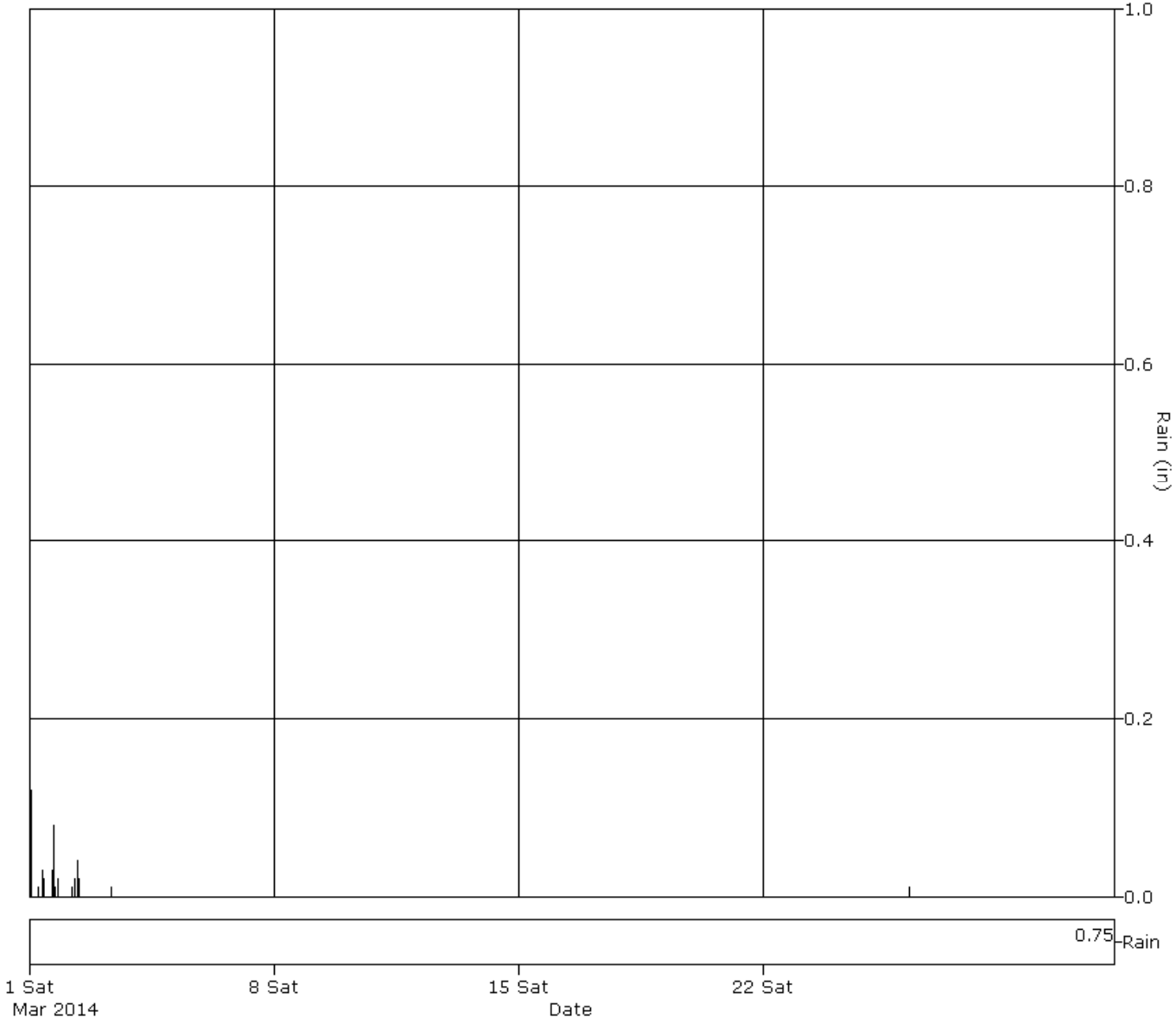


Report Period

3/1/2014
To
3/31/2014

Legend

Rain



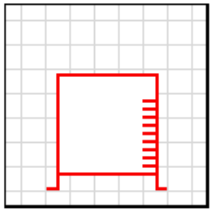
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

CARLSBAD_RG1

Rain Gauge

CARLSBAD_RG1

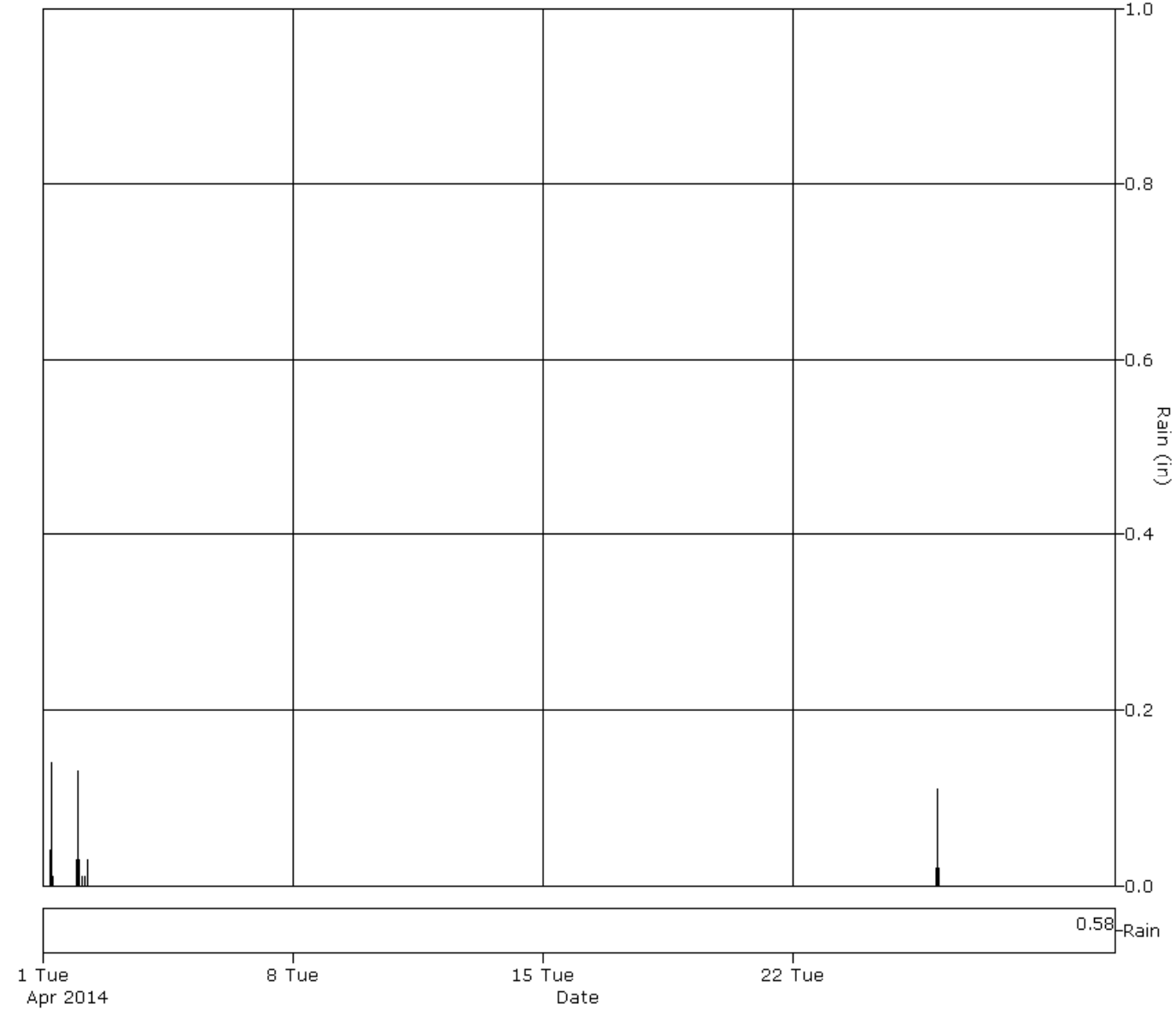


Report Period

4/1/2014
To
4/30/2014

Legend

Rain



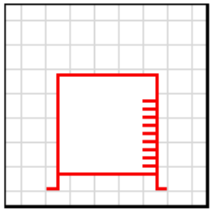
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

CARLSBAD_RG1

Rain Gauge

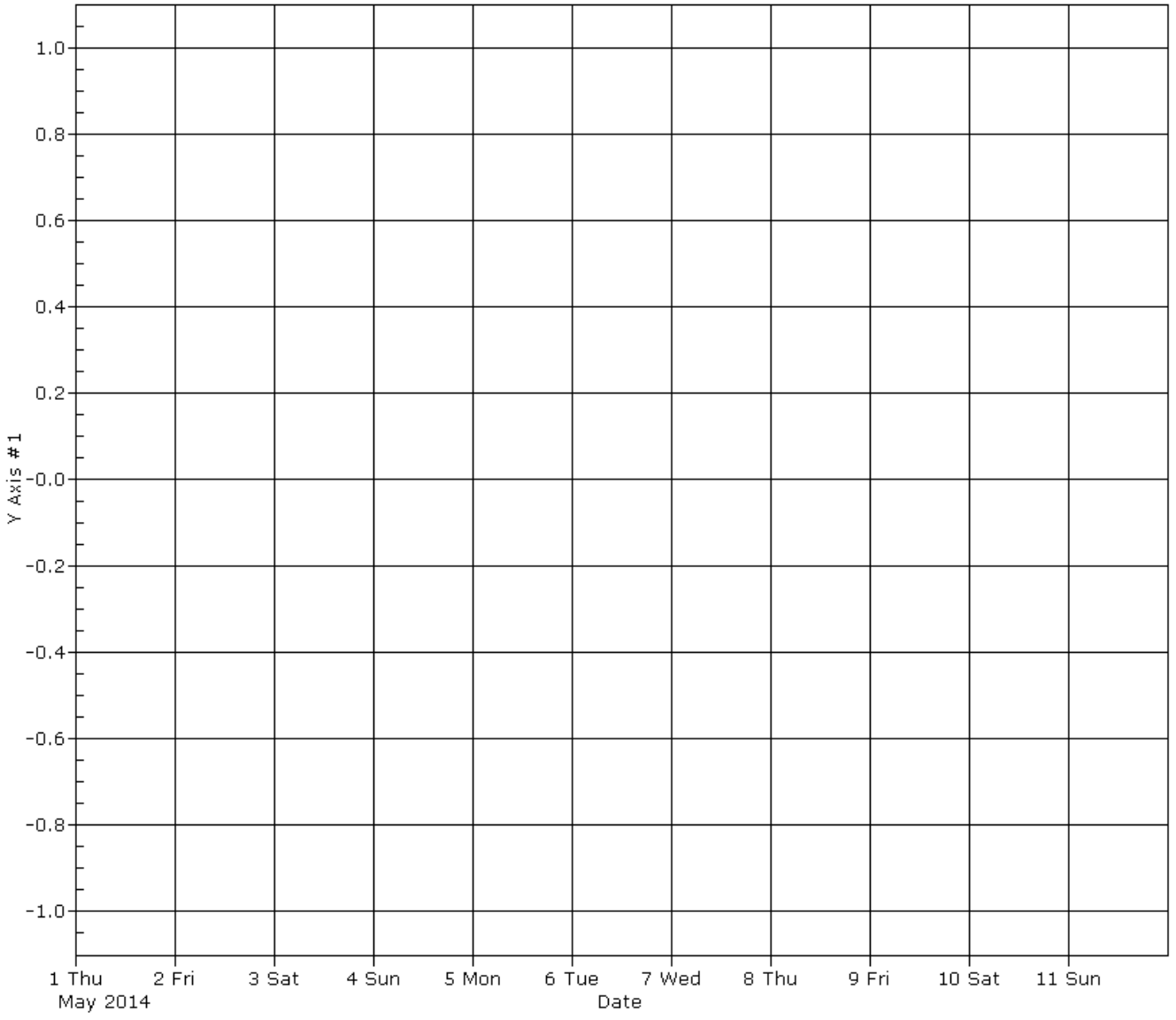
CARLSBAD_RG1



Report Period

5/1/2014
To
5/11/2014

Legend



No Data Available

Daily Tabular Report For The Period 2/22/2014 - 5/11/2014

CARLSBAD_RG1, Pipe Height:

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
2/22/2014																	
2/23/2014																	
2/24/2014																	
2/25/2014																	0.11
2/26/2014																	
2/27/2014																	0.14
2/28/2014																	1.01
3/1/2014																	0.64
3/2/2014																	0.09
3/3/2014																	0.01
3/4/2014																	
3/5/2014																	
3/6/2014																	
3/7/2014																	
3/8/2014																	
3/9/2014																	
3/10/2014																	
3/11/2014																	
3/12/2014																	
3/13/2014																	
3/14/2014																	
3/15/2014																	
3/16/2014																	
3/17/2014																	
3/18/2014																	
3/19/2014																	
3/20/2014																	
3/21/2014																	
3/22/2014																	
3/23/2014																	
3/24/2014																	
3/25/2014																	
3/26/2014																	0.01
3/27/2014																	
3/28/2014																	
3/29/2014																	
3/30/2014																	
3/31/2014																	
4/1/2014																	0.22
4/2/2014																	0.21
4/3/2014																	
4/4/2014																	
4/5/2014																	
4/6/2014																	
4/7/2014																	
4/8/2014																	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/9/2014																	
4/10/2014																	
4/11/2014																	
4/12/2014																	
4/13/2014																	
4/14/2014																	
4/15/2014																	
4/16/2014																	
4/17/2014																	
4/18/2014																	
4/19/2014																	
4/20/2014																	
4/21/2014																	
4/22/2014																	
4/23/2014																	
4/24/2014																	
4/25/2014																	
4/26/2014																	0.15
4/27/2014																	
4/28/2014																	
4/29/2014																	
4/30/2014																	
5/1/2014																	
5/2/2014																	
5/3/2014																	
5/4/2014																	
5/5/2014																	
5/6/2014																	
5/7/2014																	
5/8/2014																	
5/9/2014																	
5/10/2014																	
5/11/2014																	

Report Summary For The Period 2/22/2014 - 5/11/2014

	Rain (in)
Total	2.59
Avg	

Week 1 - Daily Flow View For The Period 2/22/2014 - 2/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																								0.02				0.02
01:00																								0.01				0.01
02:00																								0.03				0.03
03:00																								0.02				0.02
04:00																								0.04				0.15
05:00																								0.03				0.06
06:00																								0.01				0.01
07:00																								0.01				0.01
08:00																								0.01				0.02
09:00																								0.02				
10:00																0.09								0.01				0.03
11:00																0.02												0.18
12:00																												0.20
13:00																												
14:00																												
15:00																												0.15
16:00																												0.01
17:00																												0.03
18:00																												
19:00																												
20:00																												
21:00																												0.02
22:00																												0.03
23:00																								0.01				0.03

	Sat, 2/22/2014				Sun, 2/23/2014				Mon, 2/24/2014				Tue, 2/25/2014				Wed, 2/26/2014				Thu, 2/27/2014				Fri, 2/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																0.11								0.14				1.01
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				1.26
Avg				

Week 2 - Daily Flow View For The Period 3/1/2014 - 3/7/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00				0.32																								
01:00				0.12																								
02:00																												
03:00																												
04:00																												
05:00								0.01																				
06:00				0.01																								
07:00								0.02																				
08:00												0.01																
09:00				0.03				0.04																				
10:00				0.02				0.02																				
11:00																												
12:00																												
13:00																												
14:00																												
15:00																												
16:00				0.03																								
17:00				0.08																								
18:00				0.01																								
19:00																												
20:00				0.02																								
21:00																												
22:00																												
23:00																												

	Sat, 3/1/2014				Sun, 3/2/2014				Mon, 3/3/2014				Tue, 3/4/2014				Wed, 3/5/2014				Thu, 3/6/2014				Fri, 3/7/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total				0.64				0.09				0.01																
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				0.74
Avg				

Week 3 - Daily Flow View For The Period 3/8/2014 - 3/14/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
02:00																												
03:00																												
04:00																												
05:00																												
06:00																												
07:00																												
08:00																												
09:00																												
10:00																												
11:00																												
12:00																												
13:00																												
14:00																												
15:00																												
16:00																												
17:00																												
18:00																												
19:00																												
20:00																												
21:00																												
22:00																												
23:00																												

	Sat, 3/8/2014				Sun, 3/9/2014				Mon, 3/10/2014				Tue, 3/11/2014				Wed, 3/12/2014				Thu, 3/13/2014				Fri, 3/14/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				
Avg				

Week 4 - Daily Flow View For The Period 3/15/2014 - 3/21/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
02:00																												
03:00																												
04:00																												
05:00																												
06:00																												
07:00																												
08:00																												
09:00																												
10:00																												
11:00																												
12:00																												
13:00																												
14:00																												
15:00																												
16:00																												
17:00																												
18:00																												
19:00																												
20:00																												
21:00																												
22:00																												
23:00																												

	Sat, 3/15/2014				Sun, 3/16/2014				Mon, 3/17/2014				Tue, 3/18/2014				Wed, 3/19/2014				Thu, 3/20/2014				Fri, 3/21/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time Min																												
Time Max																												

	D	V	Q	Rain
Total				
Avg				

Week 5 - Daily Flow View For The Period 3/22/2014 - 3/28/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
02:00																												
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04:00																				0.01								
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	Sat, 3/22/2014				Sun, 3/23/2014				Mon, 3/24/2014				Tue, 3/25/2014				Wed, 3/26/2014				Thu, 3/27/2014				Fri, 3/28/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																				0.01								
Avg																												
Time Min																												
Time Max																												

	D	V	Q	Rain
Total				0.01
Avg				

Week 6 - Daily Flow View For The Period 3/29/2014 - 4/4/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																				0.13								
01:00																				0.03								
02:00																												
03:00																				0.01								
04:00																				0.01								
05:00																0.04												
06:00																0.14				0.03								
07:00																0.01												
08:00																												
09:00																												
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20:00																												
21:00																												
22:00																												
23:00																0.03												

	Sat, 3/29/2014				Sun, 3/30/2014				Mon, 3/31/2014				Tue, 4/1/2014				Wed, 4/2/2014				Thu, 4/3/2014				Fri, 4/4/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																0.22				0.21								
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				0.43
Avg				

Week 7 - Daily Flow View For The Period 4/5/2014 - 4/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
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18:00																												
19:00																												
20:00																												
21:00																												
22:00																												
23:00																												

	Sat, 4/5/2014				Sun, 4/6/2014				Mon, 4/7/2014				Tue, 4/8/2014				Wed, 4/9/2014				Thu, 4/10/2014				Fri, 4/11/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				
Avg				

Week 8 - Daily Flow View For The Period 4/12/2014 - 4/18/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
02:00																												
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	Sat, 4/12/2014				Sun, 4/13/2014				Mon, 4/14/2014				Tue, 4/15/2014				Wed, 4/16/2014				Thu, 4/17/2014				Fri, 4/18/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				
Avg				

Week 9 - Daily Flow View For The Period 4/19/2014 - 4/25/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
01:00																												
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	Sat, 4/19/2014				Sun, 4/20/2014				Mon, 4/21/2014				Tue, 4/22/2014				Wed, 4/23/2014				Thu, 4/24/2014				Fri, 4/25/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				
Avg				

Week 10 - Daily Flow View For The Period 4/26/2014 - 5/2/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00				0.02																								
01:00				0.11																								
02:00				0.02																								
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23:00																												

	Sat, 4/26/2014				Sun, 4/27/2014				Mon, 4/28/2014				Tue, 4/29/2014				Wed, 4/30/2014				Thu, 5/1/2014				Fri, 5/2/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total				0.15																								
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				0.15
Avg				

Week 11 - Daily Flow View For The Period 5/3/2014 - 5/9/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
00:00																												
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22:00																												
23:00																												

	Sat, 5/3/2014				Sun, 5/4/2014				Mon, 5/5/2014				Tue, 5/6/2014				Wed, 5/7/2014				Thu, 5/8/2014				Fri, 5/9/2014			
	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain	D	V	Q	Rain
Total																												
Avg																												
Time																												
Min																												
Time																												
Max																												

	D	V	Q	Rain
Total				
Avg				

Week 12 - Daily Flow View For The Period 5/10/2014 - 5/11/2014

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q Rain (in) : Rain

Time	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
00:00								
01:00								
02:00								
03:00								
04:00								
05:00								
06:00								
07:00								
08:00								
09:00								
10:00								
11:00								
12:00								
13:00								
14:00								
15:00								
16:00								
17:00								
18:00								
19:00								
20:00								
21:00								
22:00								
23:00								

	Sat, 5/10/2014				Sun, 5/11/2014			
	D	V	Q	Rain	D	V	Q	Rain
Total								
Avg								
Time Min								
Time Max								

	D	V	Q	Rain
Total				
Avg				

4. Wet Weather Analysis

This section describes an evaluation of wet weather impacts on system flows by summarizing excess flow rates and volumes from the studied sewer shed areas (basins) associated with each flow monitoring site during rain events that occurred during the study period. This section also describes an evaluation of dry weather flow data for purposes of determining base wastewater flows (to compare wet weather flows against). A map of site/basin locations is depicted on the next page.

Dry Weather Analysis

Prior to conducting a wet weather analysis, a dry weather analysis must first be performed by reviewing data obtained during dry weather conditions. For this analysis, a *dry day* is defined as any day in which there was less than 0.10 in. of rain in the previous day, less than 0.50 in. of rain in the previous three days, and less than 1.00 in. of rain in the previous five days. This process automatically eliminates the selection of most wet weather events and the periods associated with recovery from these events. Once the initial dry days are selected, they are compared to one another to make sure that the flow pattern for each day is repeatable. Any days that have an inconsistent flow pattern are removed from consideration. The resulting dry days are then averaged to establish an average diurnal flow pattern from the site. The dry weather analysis evaluates the weekday pattern separate from the weekend pattern to account for differences often observed.

Dry weather flows were evaluated for each basin during the study period. Recorded flow rates from the sanitary sewer monitoring location for each dry day are overlaid on a hydrograph, enabling a typical or average dry day flow (ADF) and minimum daily flow (MDF) to be determined for Weekdays and Weekends as depicted in Figure 4.1 for basin 18C-3.

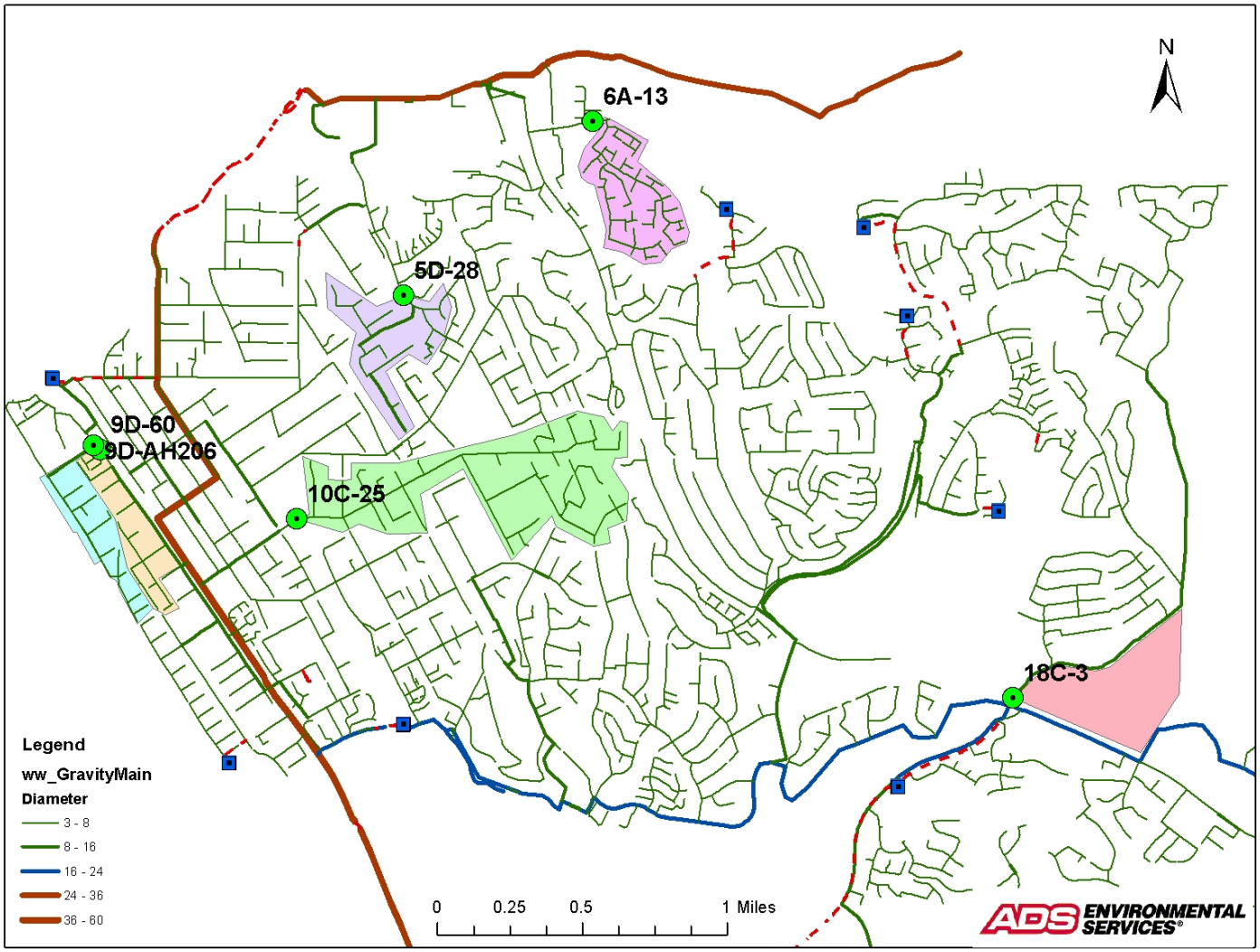

N
6A-13
5D-28
9D-60
9D-AH206
10C-25
18C-3
Legend
ww_GravityMain
Diameter
3 - 8
8 - 16
16 - 24
24 - 36
36 - 60
0
0.25
0.5
1 Miles
ADS ENVIRONMENTAL SERVICES

Figure 4.1

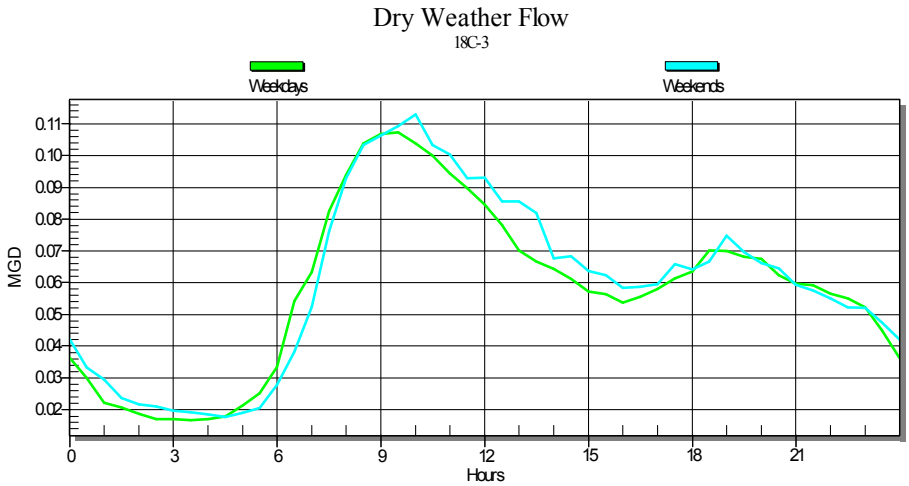


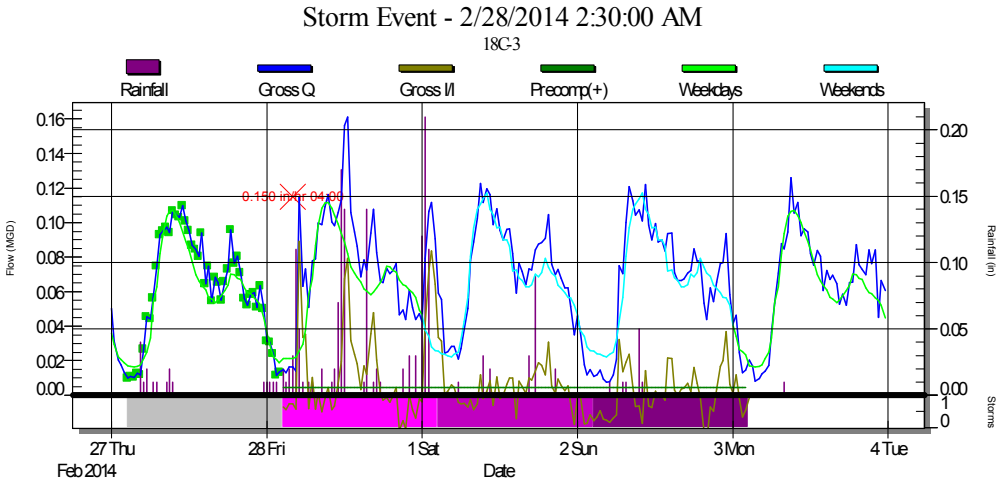
Table 4.1 summarizes the values for net (basin) ADF for weekdays and weekends.

Wet Weather Analysis

A wet weather analysis is performed by comparing specific wet weather events to average dry weather flows (ADF). Two (2) rain events were recorded and evaluated during the monitoring period. The events include 1.41 inch of rain February 28, 2014, and 0.24 inch of rain on April 1, 2014. Based on these events, an analysis was conducted to characterize the impact of wet weather on flow measured in the basins.

Recorded flow rates for a specific storm event are plotted against average dry weather conditions. The difference observed represents the rain-dependent inflow and infiltration (RDII or I/I) entering the sanitary sewer system upstream from this monitoring location and is called a storm hydrograph. Figure 4.2 depicts a storm hydrograph for site/basin 18C-3 during the largest study storm on February 28, 2014.

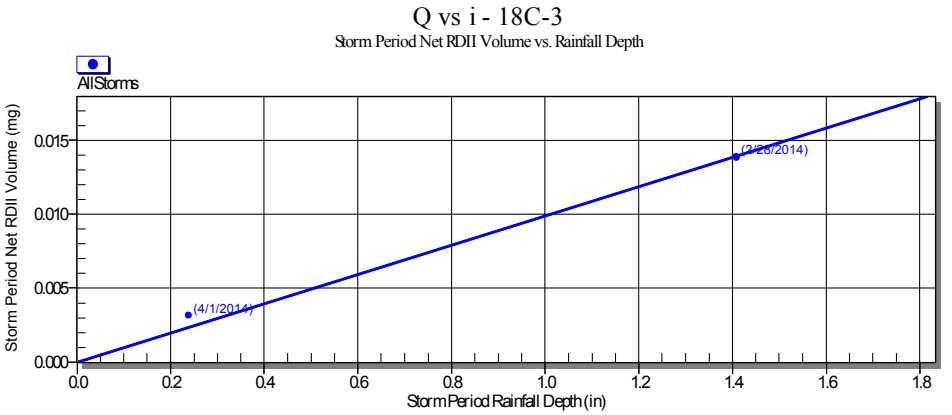
Figure 4.2

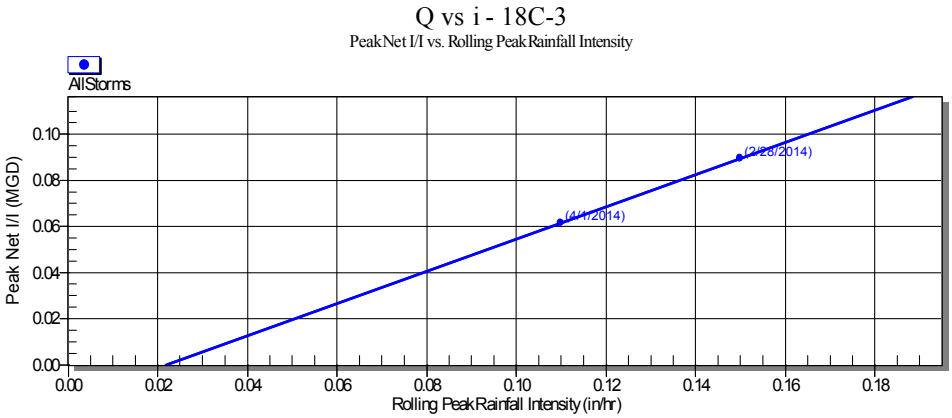


I/I calculations are made for each storm event, as shown in the colored bands above. The first period (defaulted to 24 hours) following the onset of rain is referred to as the Storm Period. The following period is referred to as Recovery 1, and the next period is referred to as Recovery 2. The storm hydrograph for this location showed an immediate excess flow response (shown as "Gross I/I" in the above hydrograph) to the most intense periods of the February 28 rainfall event, although overall volume of I/I was low.

Once the calculations were complete for each storm event, excess wet weather flow volumes and maximum peaks were plotted as a function of rainfall volume and intensity on graphs commonly referred to as Q-vs-i graphs. The rain volume vs. excess flow volume (volume-based) Q-vs-i as well as peak rain intensity vs. excess peak flow rate (rate-based) Q-vs-i graph for site/basin 18C-3 are shown in Figure 4.3.

Figure 4.3





The volume-based and rate-based Q-vs-i graphs for this basin generally show an apparent correlation between excess wastewater volume/rate and rainfall. These charts suggest about 10,000 gallons of I/I is generated per inch of rain and 0.06 mgd peak I/I is generated per 0.1 in/hr rain intensity from basin 18C-3.

To properly characterize relative I/I performance among the basins evaluated, the wet weather I/I responses must be normalized according to basin size and/or rainfall. The net I/I (normalized to show % rainfall ingress into each basin) and peak rates per inch of rainfall for each evaluated basin for the February storm are depicted in the bar charts as Figures 4.4a and 4.4b, respectively. The I/I normalized volumes are all well below 1%, which is considered low. However, looking at the responses in terms of peak I/I per inch of rain, basin 18C-3 generates short term peak of about 0.47 mgd per inch of rain. Basin 5D-28 also generates about 0.22 mgd per inch of rain and appears to be very sensitive to rain intensity. Another means of normalizing is to compare peak I/I rate to typical dry

day flow rate. This can be done by determining I/I peak factors (peak I/I rate+ADF divided by ADF), and are summarized in Figure 4.4c. An I/I peak factor of 1.0 would indicate no discernible I/I response, whereas a peak factor of 10.0 would indicate a very high peak I/I response since the basin generates an instantaneous peak flow that is 10 times higher than the average daily flow rate.

Figure 4.4a

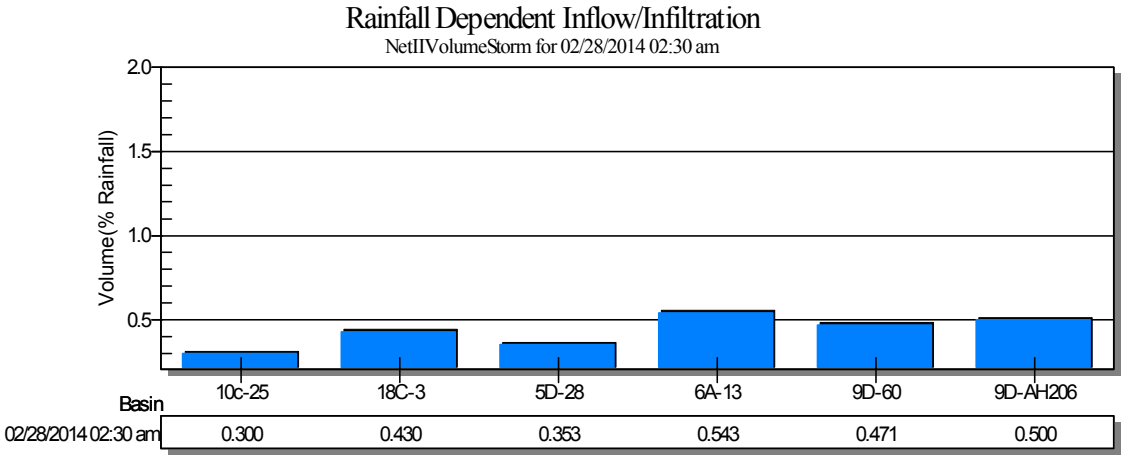


Figure 4.4b

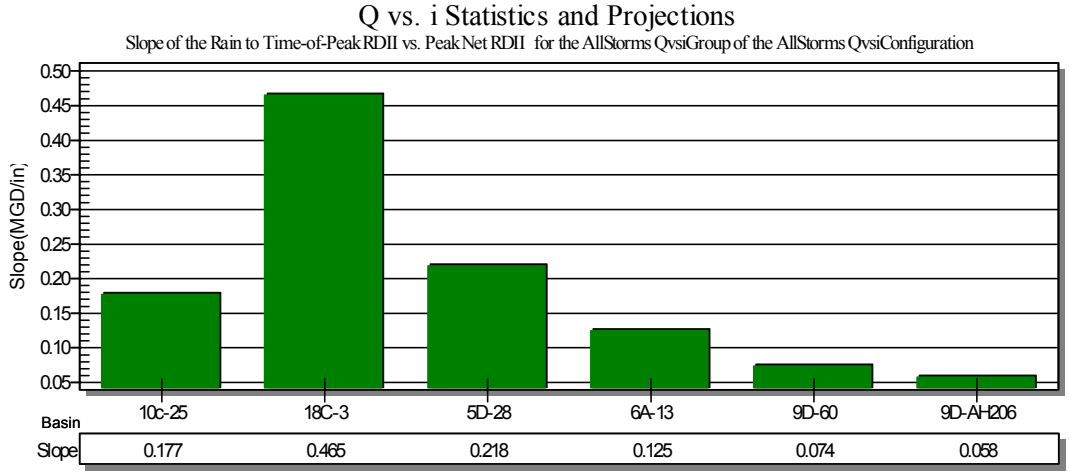
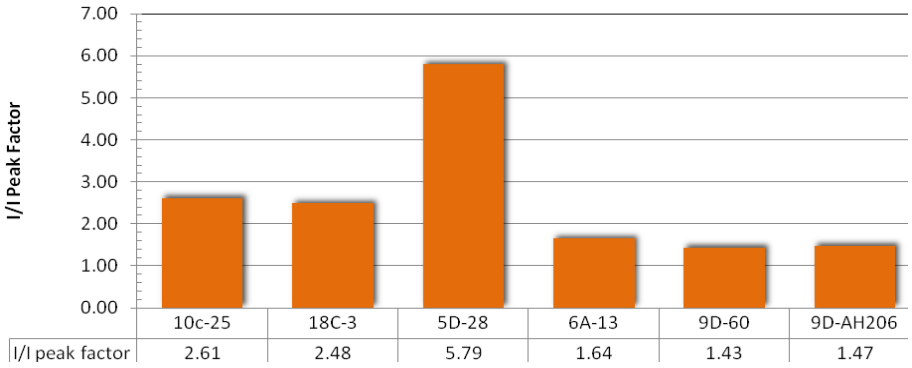


Figure 4.4c

I/I Peak Factors



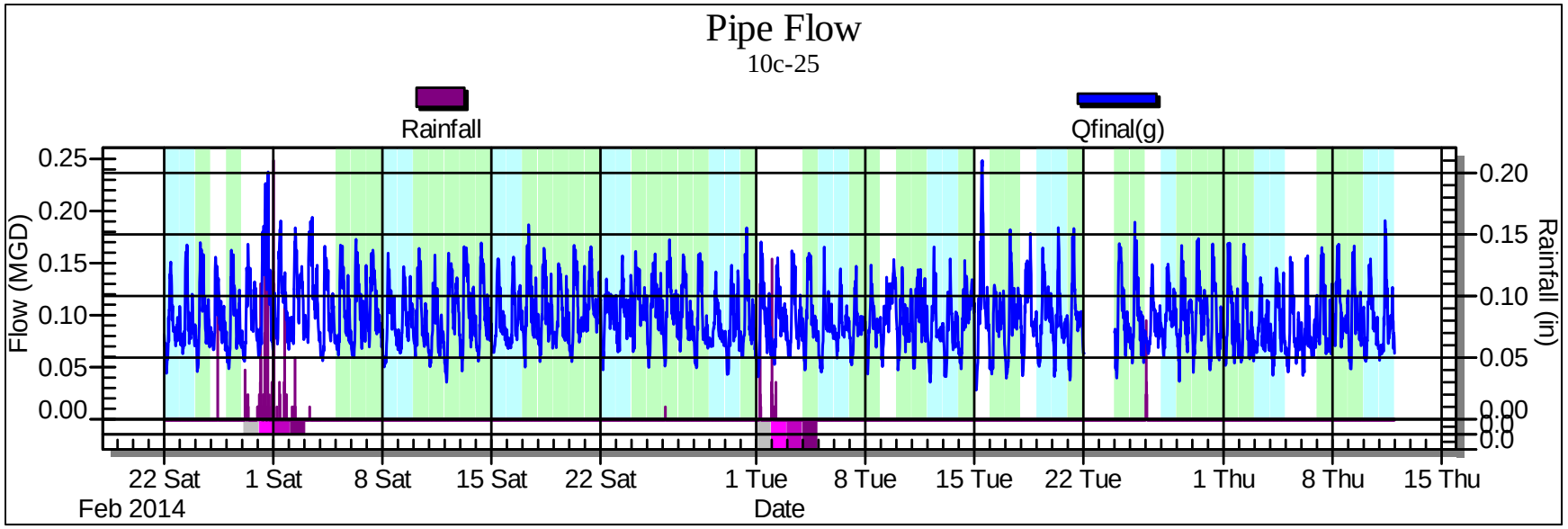
Based on the volumetric I/I performance criteria in Figure 4.4a, the basins generate relatively low overall volumes of I/I. However, looking at I/I peaks, basin 18c-3 generates the highest peak rate per inch of rainfall. Looking at peak factor (or peak I/I as a multiple of typical ADF), basin 5D-28 generated the largest relative peak I/I. The relatively low volume of I/I and high peak I/I rates in basins 18c-3 and 5D-28 are an indication of sharply defined peaks, during periods of more intense rain, that quickly recover to normal flow conditions. This type of response is typically categorized as inflow, or having direct sources of rainwater intrusion such as from flooded areas leaking into manholes or other directly connected area drainage sources.

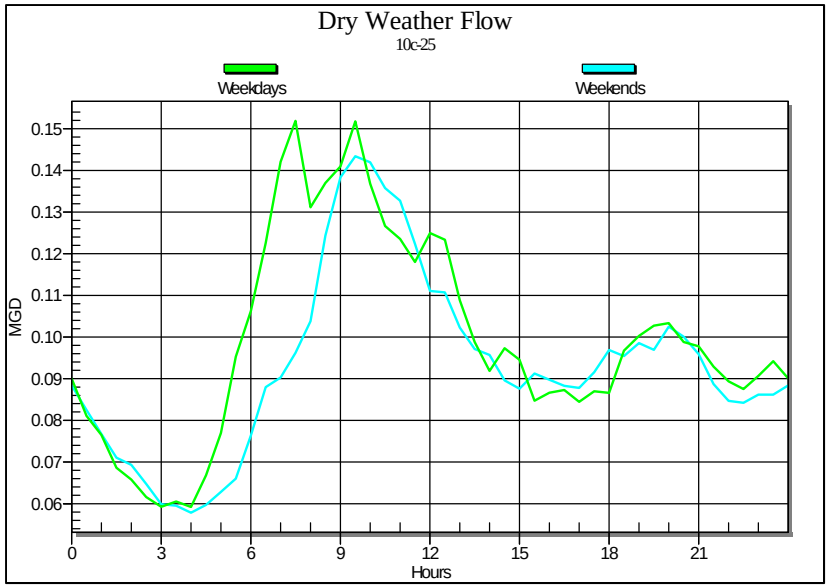
Site investigation of possible inflow sources may be warranted in basins 5D-28 and 18c-3 if peak flows during storms create capacity issues. Such investigations could include determining flooding areas that may impact sanitary manhole covers and improving storm drainage in such areas. Smoke testing could be conducted to aid in determining if there are any directly connected area drainage sources such as roof downspouts, inadvertent storm connections to the sanitary sewer, or other drains such as parking lots or open areas/ yards.

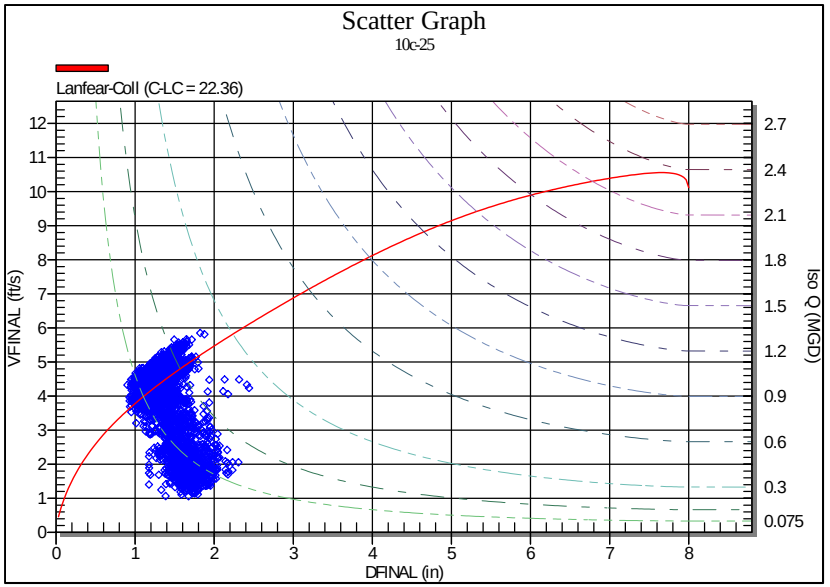
The computed values for I/I volume (% rain ingress), peak I/I (mgd per inch of rain) and I/I Peaking Factor (mgd peak as a multiple of ADF) are summarized in Table 4.1. Hydrographs of the flow monitoring period, dry day hydrographs, storm hydrographs, and volume and rate based Q vs i graphs are included in the Appendix of this report.

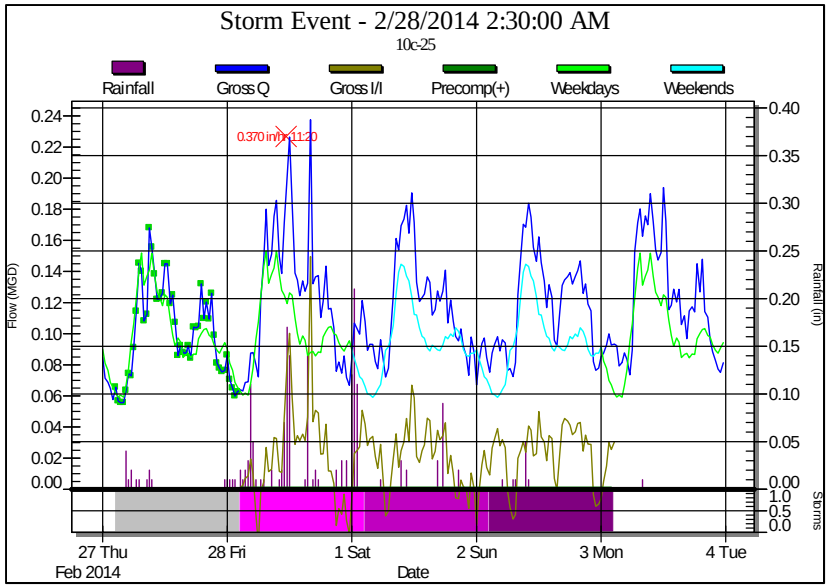
Table 4.1
Basin Wet Weather Performance Summary

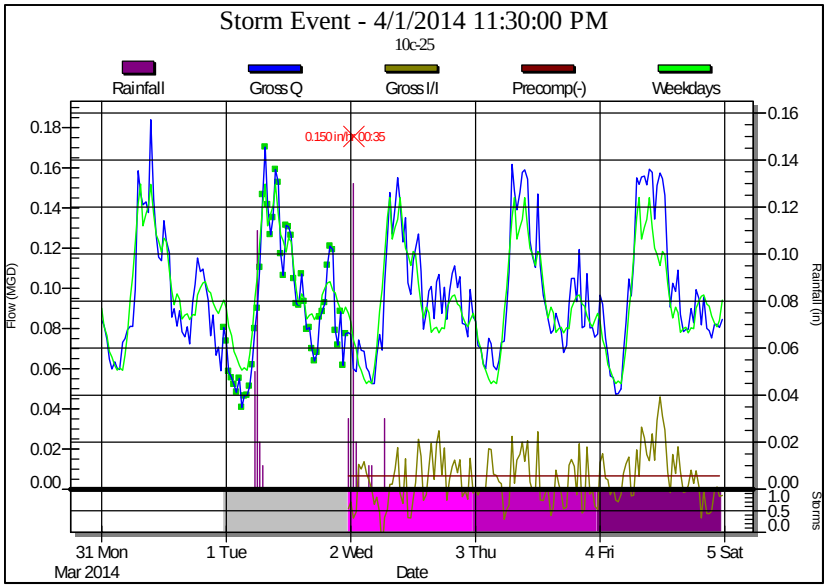
	ADF (mgd)					
Basin	weekend	weekday	I/I (% rain)	I/I peak (mgd/in)	I/I peak (mgd)	I/I peak factor
10c-25	0.093	0.099	0.3	0.18	0.15	2.61
18C-3	0.06	0.058	0.4	0.47	0.089	2.48
5D-28	0.024	0.023	0.4	0.22	0.115	5.79
6A-13	0.163	0.15	0.5	0.13	0.105	1.64
9D-60	0.127	0.119	0.5	0.07	0.055	1.43
9D-AH206	0.129	0.105	0.5	0.06	0.061	1.47

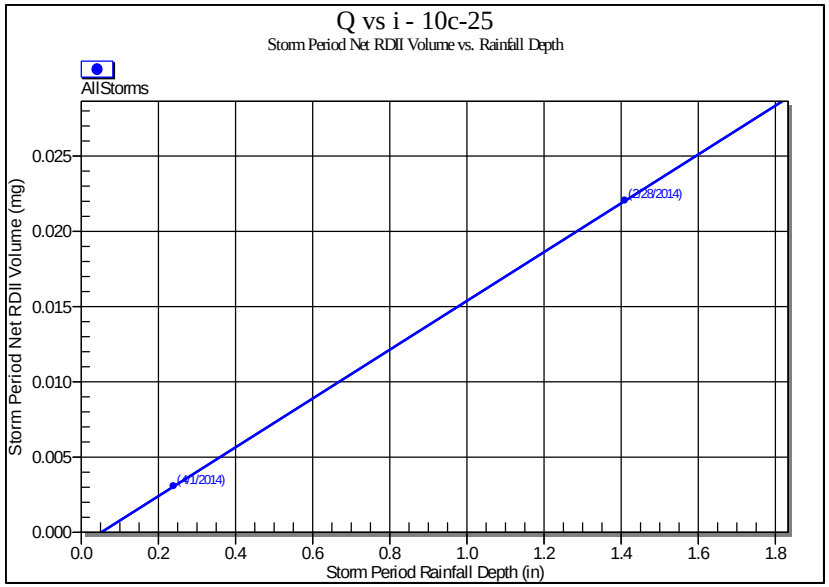

Pipe Flow
10c-25
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
0.25
0.20
0.15
0.10
0.05
0.00
22 Sat
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Feb 2014
Date

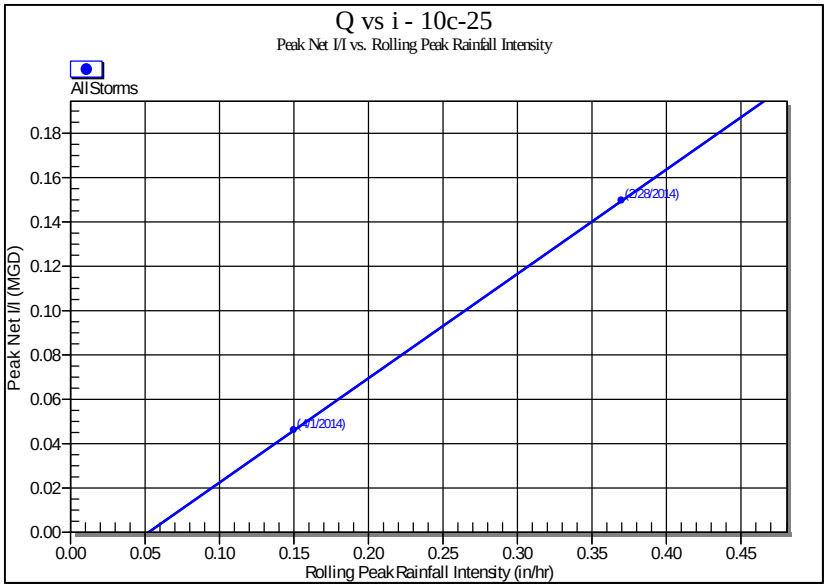

Dry Weather Flow
10c-25
Weekdays
Weekends
MGD
Hours

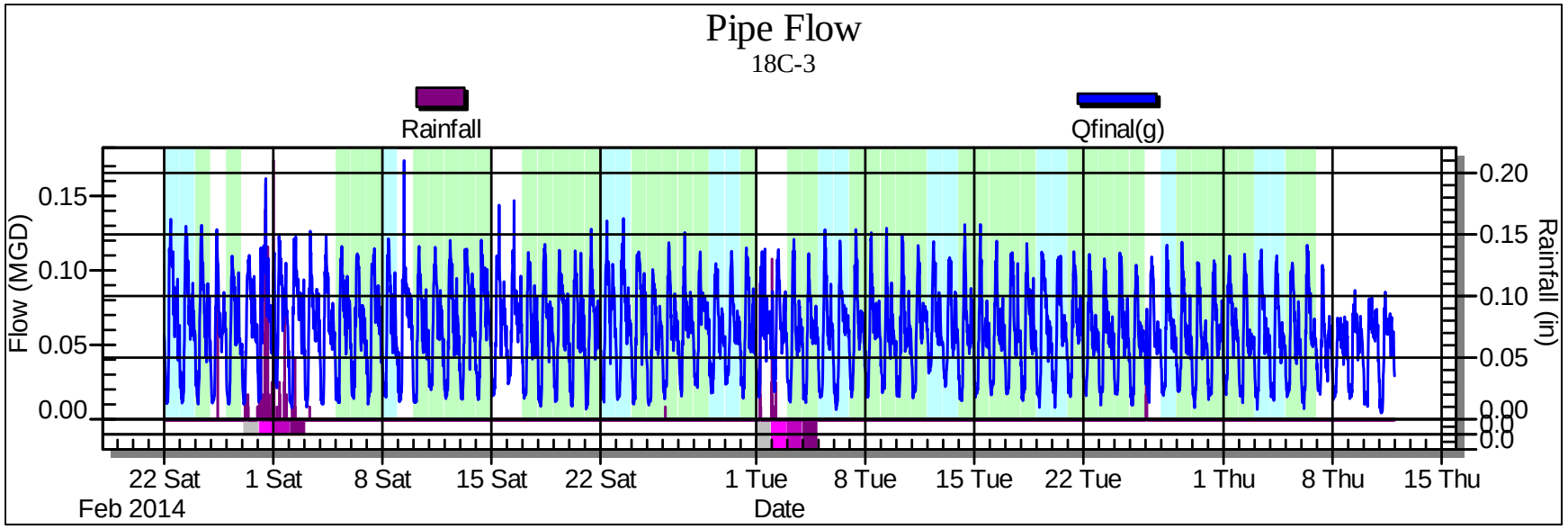

Scatter Graph
10c-25
Lanfear-Coll (C-LC = 22.36)
VFINAL (ft/s)
DFINAL (in)
Iso Q (MGD)

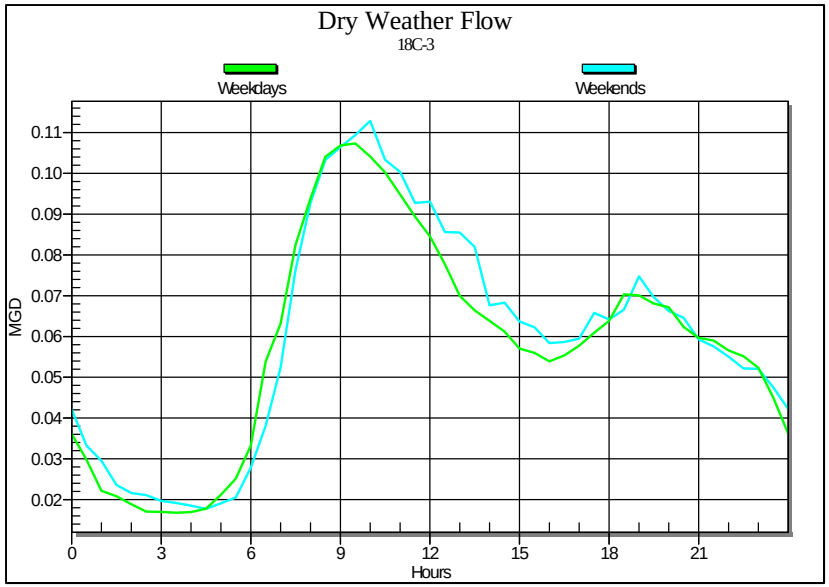

Storm Event - 2/28/2014 2:30:00 AM
10c-25
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
Weekends
0.370 in/hr
11:20
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date

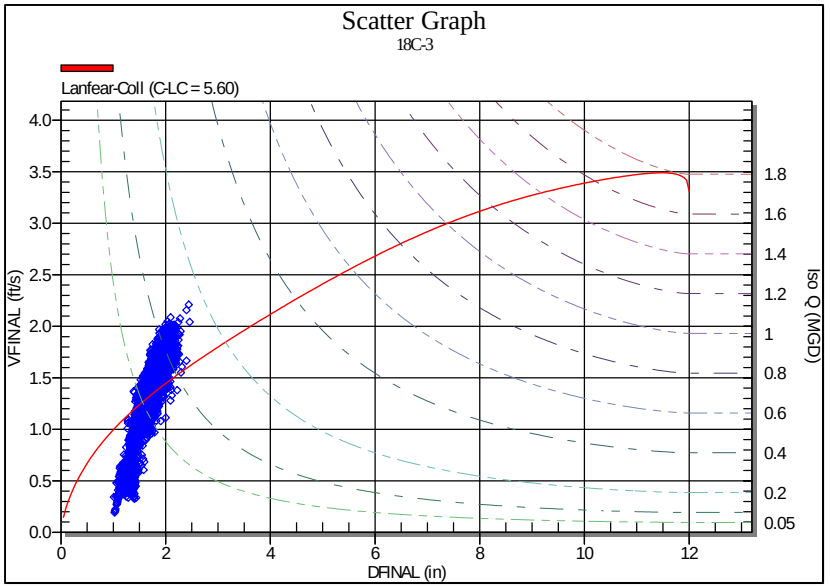

Storm Event - 4/1/2014 11:30:00 PM
10c-25
Rainfall
Gross Q
Gross I/I
Precomp(-)
Weekdays
0.150 in/hr
00:35
Flow (MGD)
Rainfall (in)
Storms
31 Mon
Mar 2014
1 Tue
2 Wed
3 Thu
4 Fri
5 Sat
Date

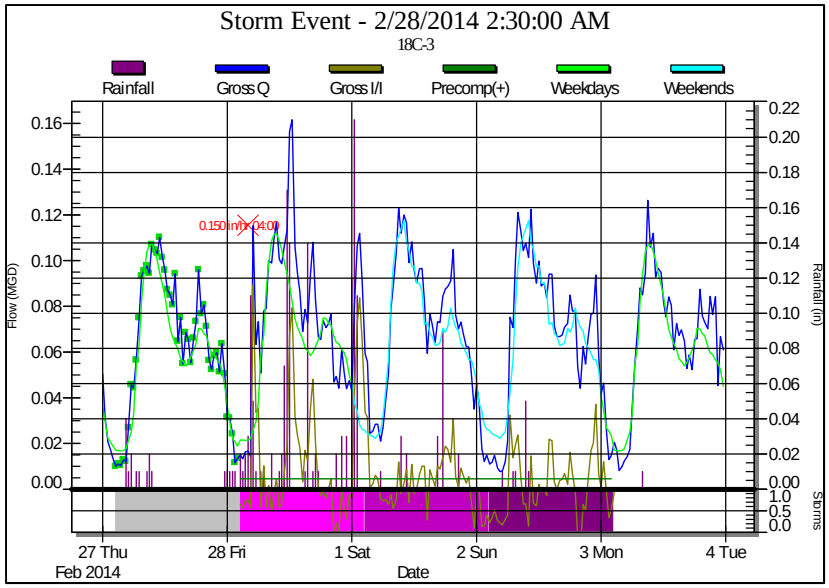

Q vs i - 10c-25
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
(3/28/2014)
(4/1/2014)
Storm Period Net RDII Volume (mg)
Storm Period Rainfall Depth (in)

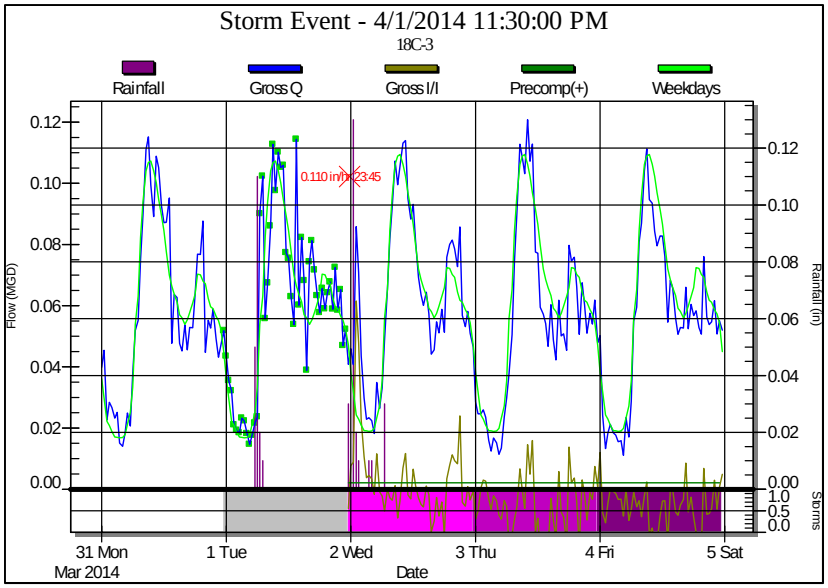

Q vs i - 10c-25
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
(3/28/2014)
(4/1/2014)
Peak Net I/I (MGD)
Rolling Peak Rainfall Intensity (in/hr)

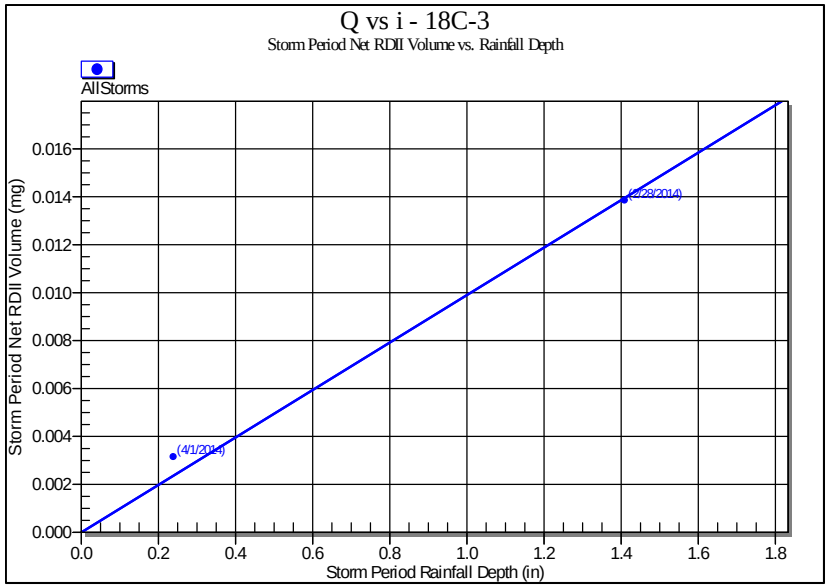

Pipe Flow
18C-3
Rainfall
Qfinal(g)
Flow (MGD)
0.15
0.10
0.05
0.00
0.20
0.15
0.10
0.05
0.00
0.0
Rainfall (in)
22 Sat
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Feb 2014
Date

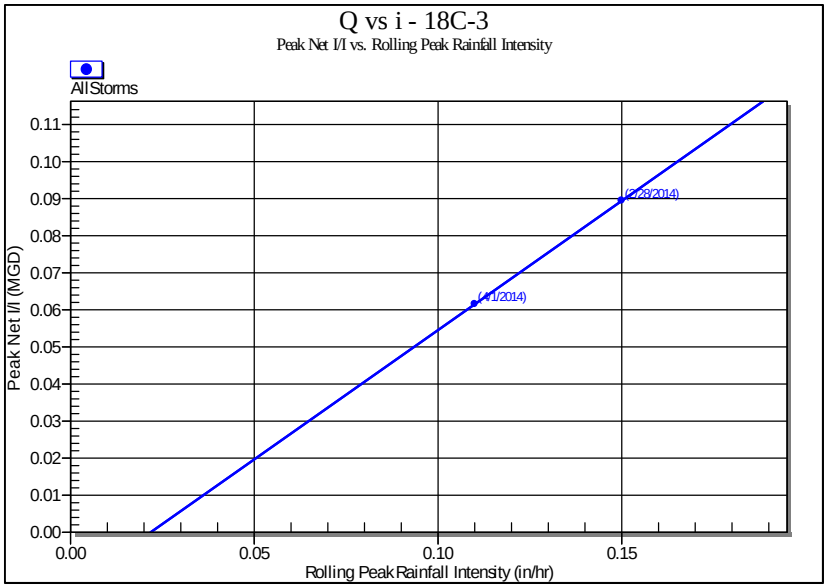

Dry Weather Flow
18C-3
Weekdays
Weekends
MGD
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0
3
6
9
12
15
18
21
Hours

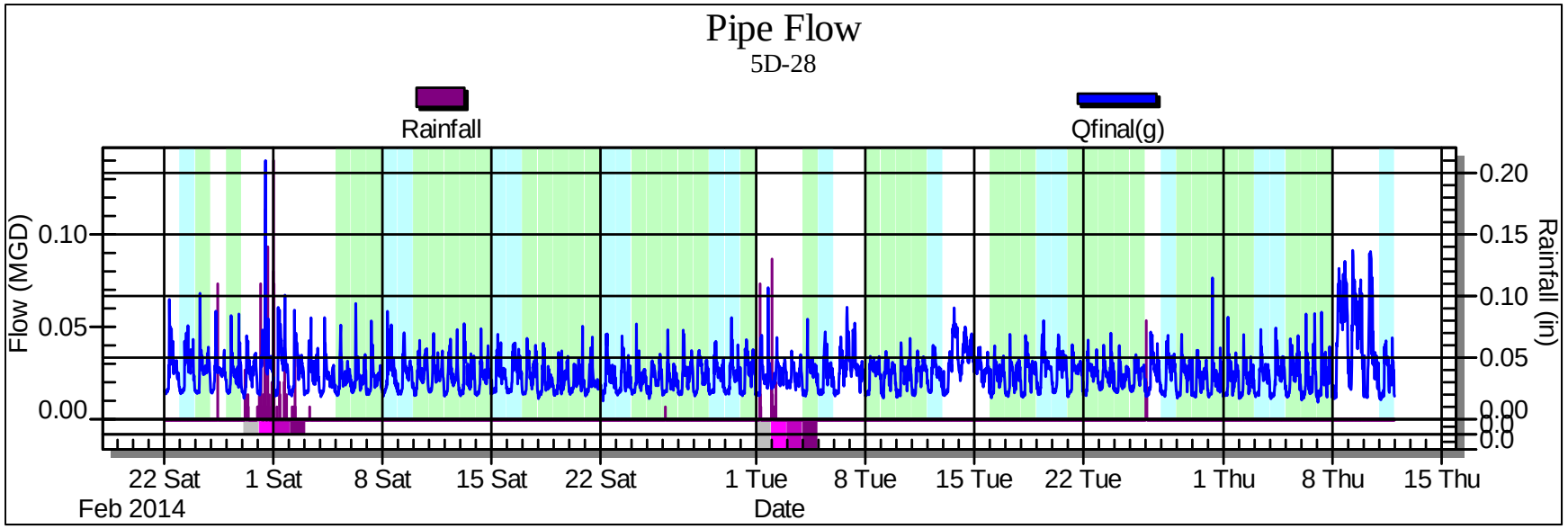

Scatter Graph
18C-3
Lanfear-Coll (C-LC = 5.60)
VFINAL (ft/s)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0.05
Iso Q (MGD)
0
2
4
6
8
10
12
DFINAL (in)

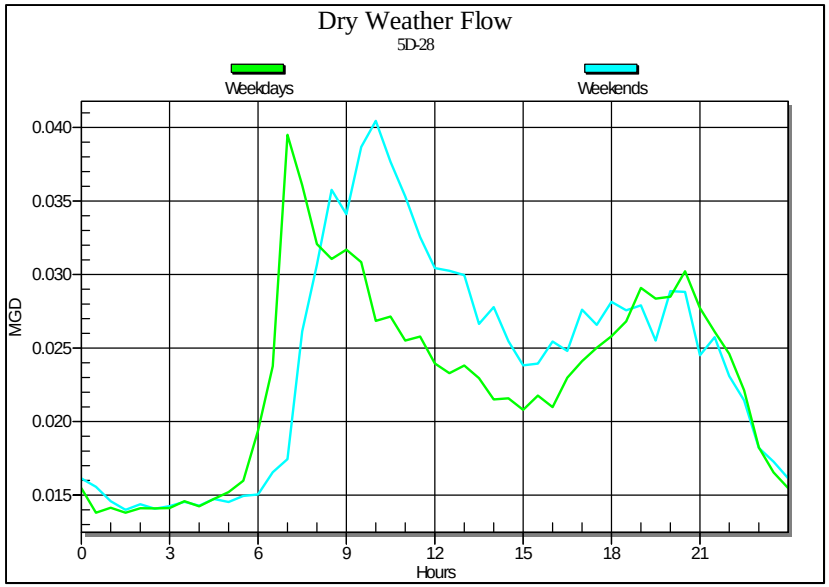

Storm Event - 2/28/2014 2:30:00 AM
18C-3
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
Weekends
0.150 in @ 04:00
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date

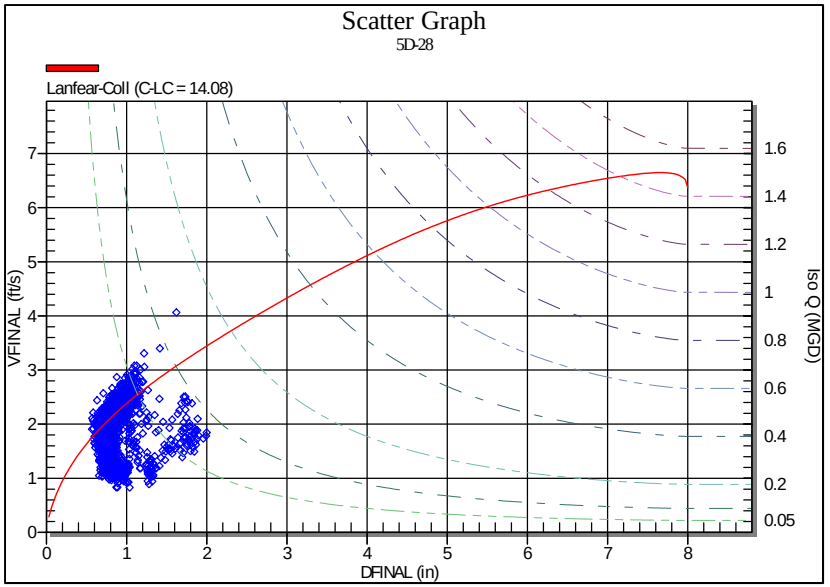

Storm Event - 4/1/2014 11:30:00 PM
18C-3
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
0.110 in @ 23:45
Flow (MGD)
Rainfall (in)
Storms
31 Mon
Mar 2014
1 Tue
2 Wed
3 Thu
4 Fri
5 Sat
Date

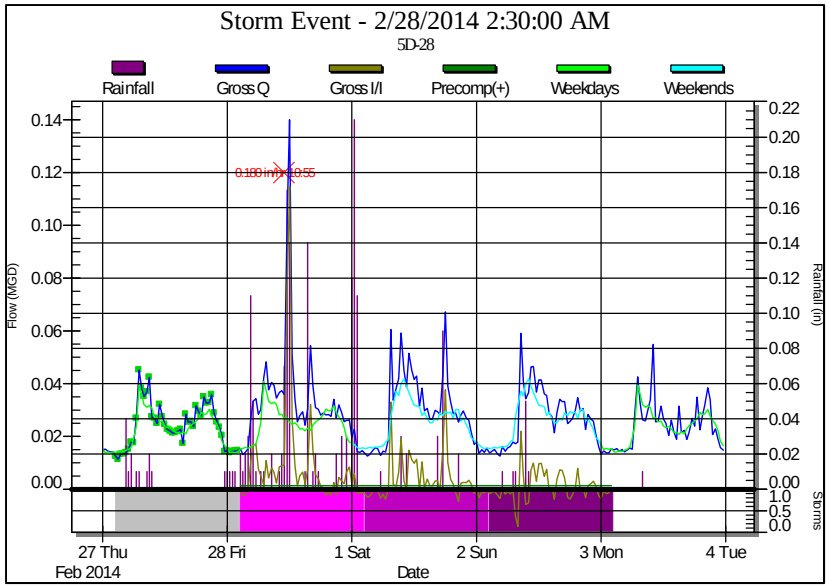

Q vs i - 18C-3
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
(4/1/2014)
(2/28/2014)
Storm Period Net RDII Volume (mg)
Storm Period Rainfall Depth (in)

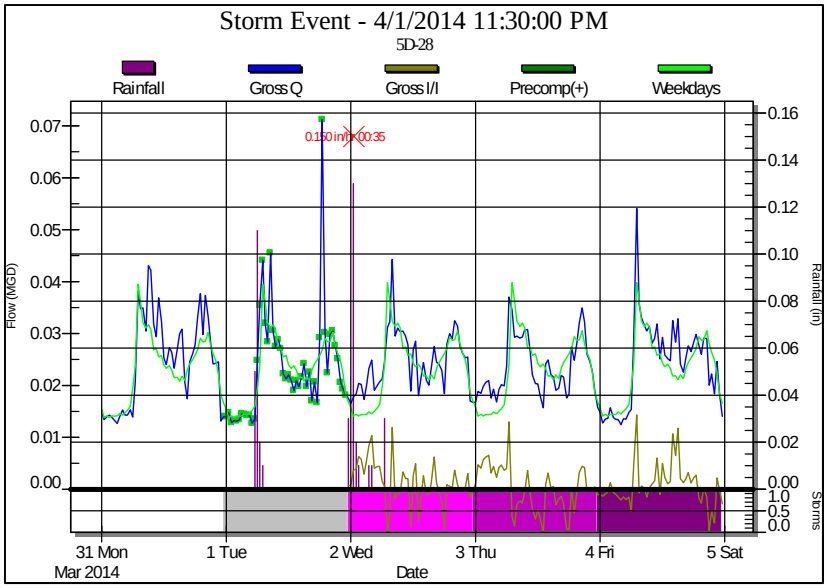

Q vs i - 18C-3
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
(4/1/2014)
(2/28/2014)
Peak Net I/I (MGD)
Rolling Peak Rainfall Intensity (in/hr)

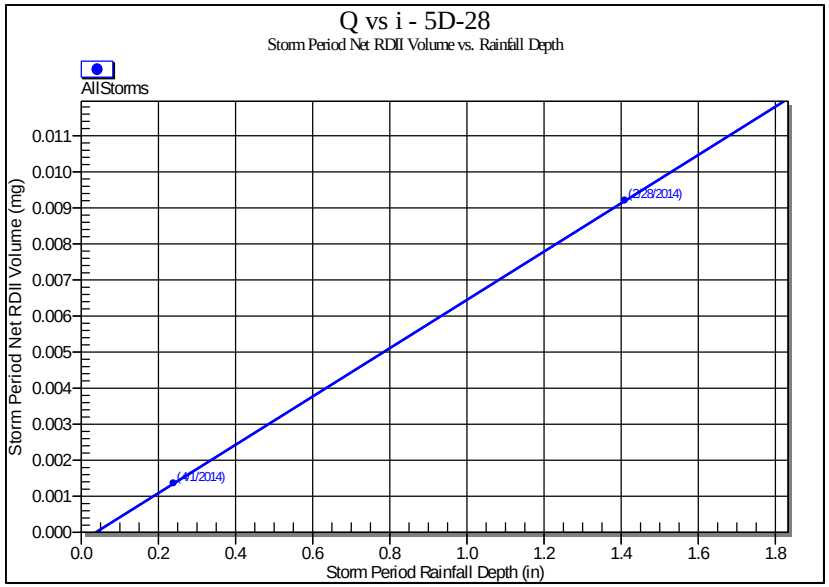

Pipe Flow
5D-28
Rainfall
Qfinal(g)
Flow (MGD)
0.10
0.05
0.00
0.20
0.15
0.10
0.05
0.00
0.0
Rainfall (in)
22 Sat
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Feb 2014
Date

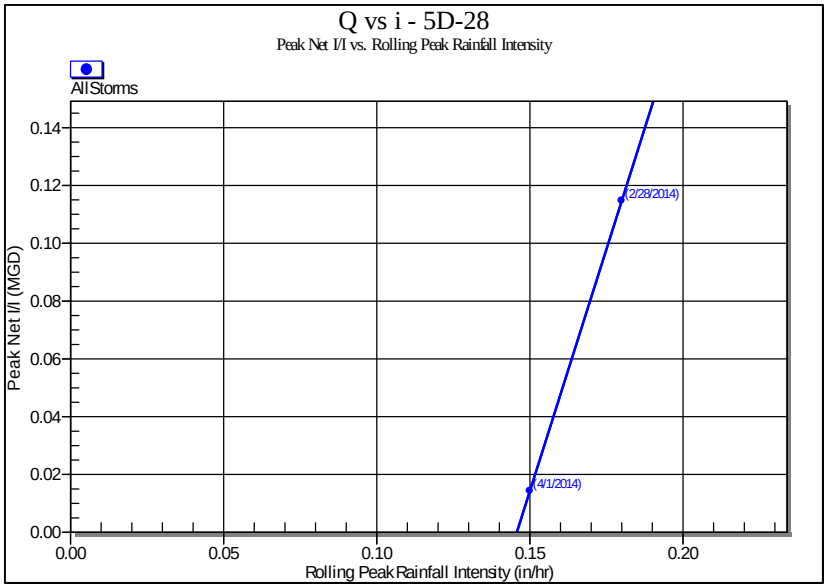

Dry Weather Flow
5D-28
Weekdays
Weekends
MGD
0.040
0.035
0.030
0.025
0.020
0.015
0
3
6
9
12
15
18
21
Hours

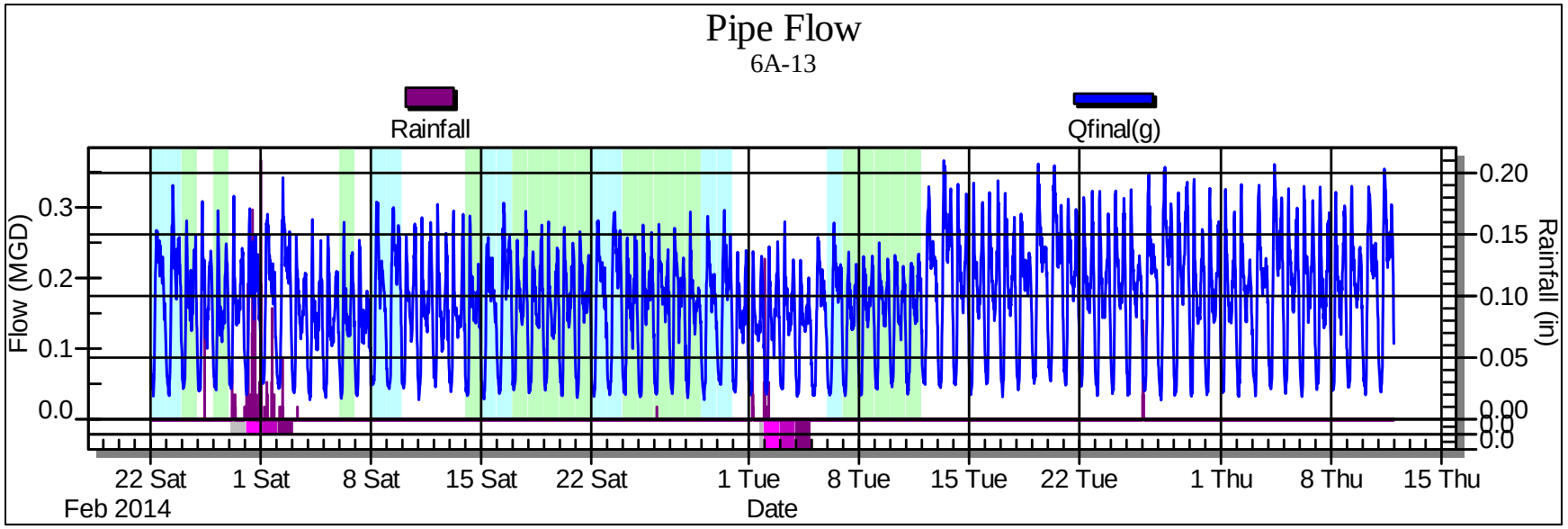

Scatter Graph
5D-28
Lanfear-Coll (C-LC = 14.08)
VFINAL (ft/s)
0
1
2
3
4
5
6
7
DFINAL (in)
0
1
2
3
4
5
6
7
8
Iso Q (MGD)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0.05

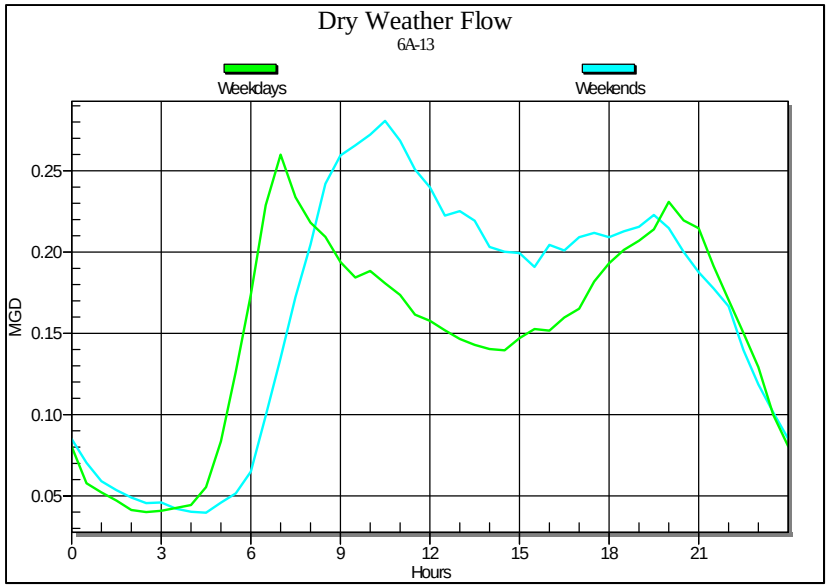

Storm Event - 2/28/2014 2:30:00 AM
5D-28
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
Weekends
0.180 in/hr
0.55
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date

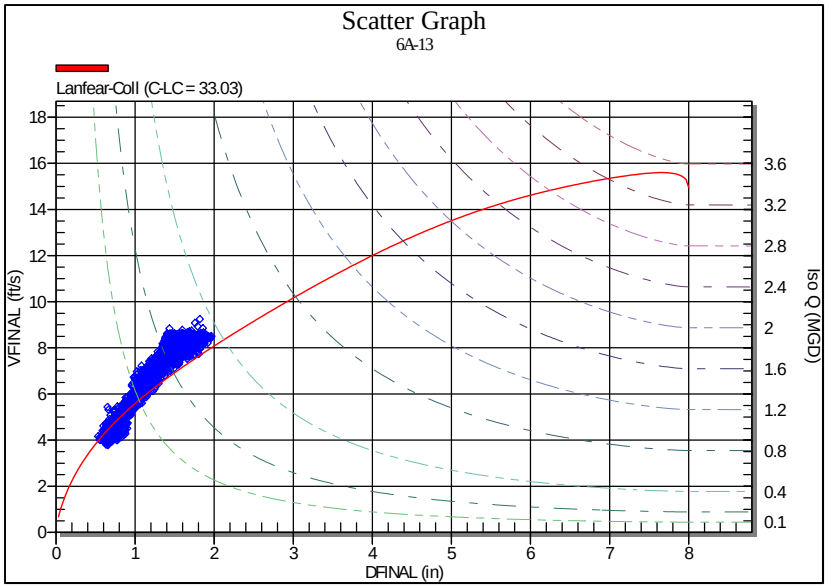

Storm Event - 4/1/2014 11:30:00 PM
5D-28
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
0.150 in/hr
0.35
Flow (MGD)
Rainfall (in)
Storms
31 Mon
Mar 2014
1 Tue
2 Wed
3 Thu
4 Fri
5 Sat
Date

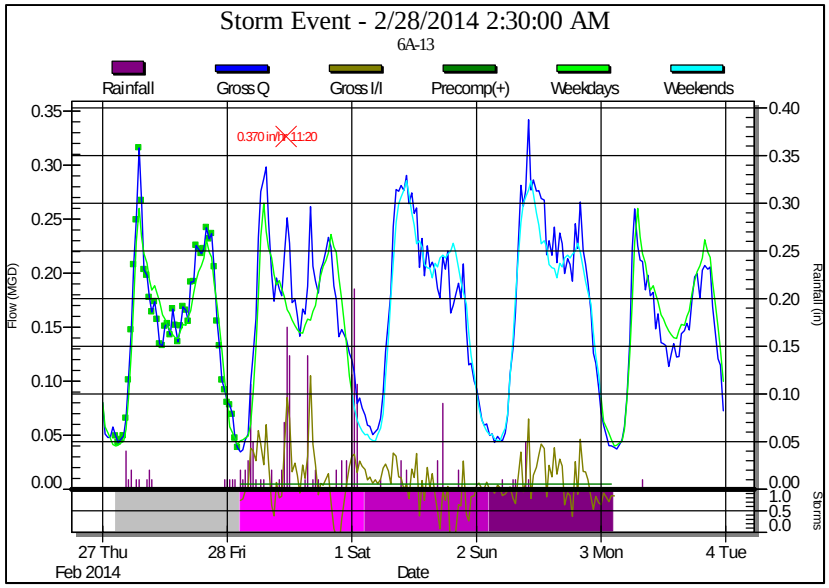

Q vs i - 5D-28
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
(2/28/2014)
(4/1/2014)
Storm Period Net RDII Volume (mg)
Storm Period Rainfall Depth (in)

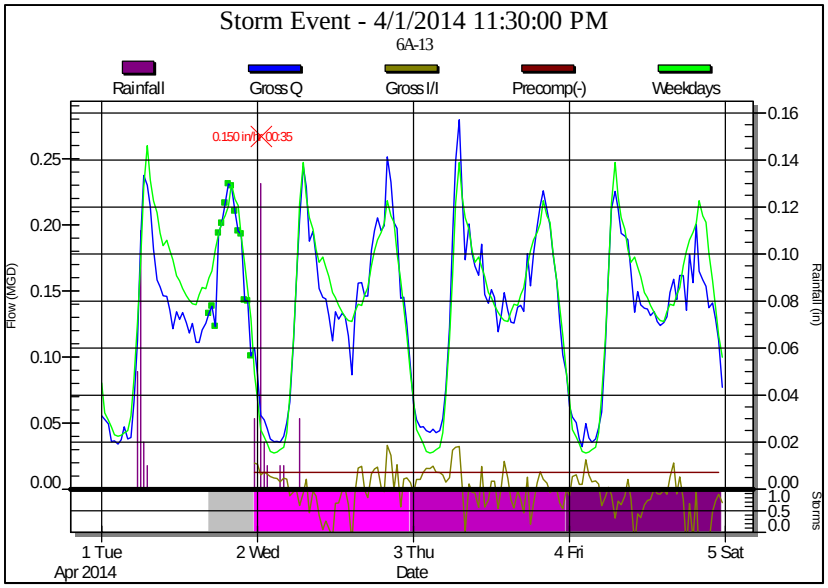

Q vs i - 5D-28
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
(2/28/2014)
(4/1/2014)
Peak Net I/I (MGD)
Rolling Peak Rainfall Intensity (in/hr)

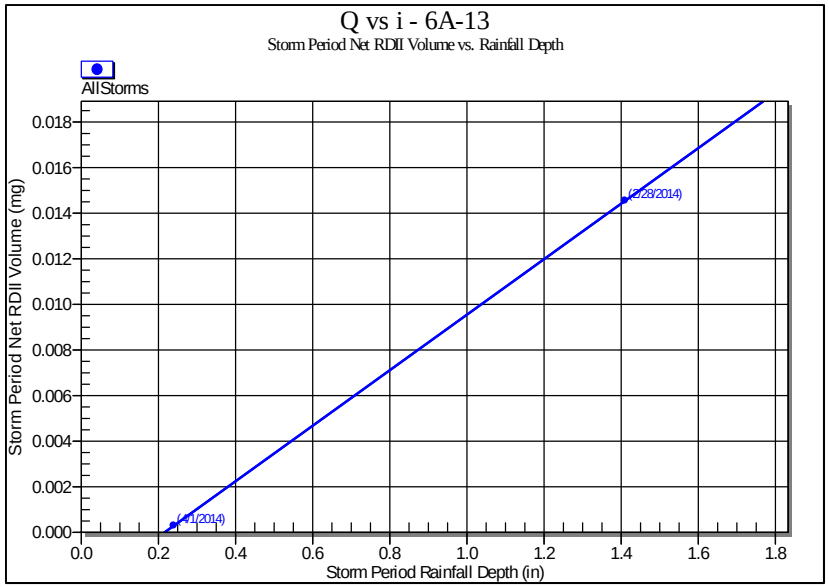

Pipe Flow
6A-13
Rainfall
Qfinal(g)
Flow (MGD)
0.3
0.2
0.1
0.0
0.20
0.15
0.10
0.05
0.00
0.0
Rainfall (in)
22 Sat
Feb 2014
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Date

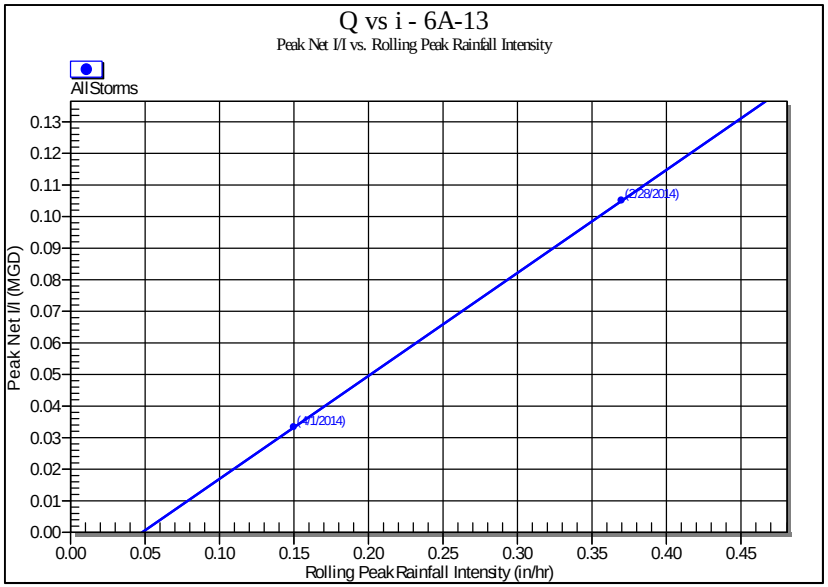

Dry Weather Flow
6A-13
Weekdays
Weekends
MGD
0.25
0.20
0.15
0.10
0.05
0
3
6
9
12
15
18
21
Hours

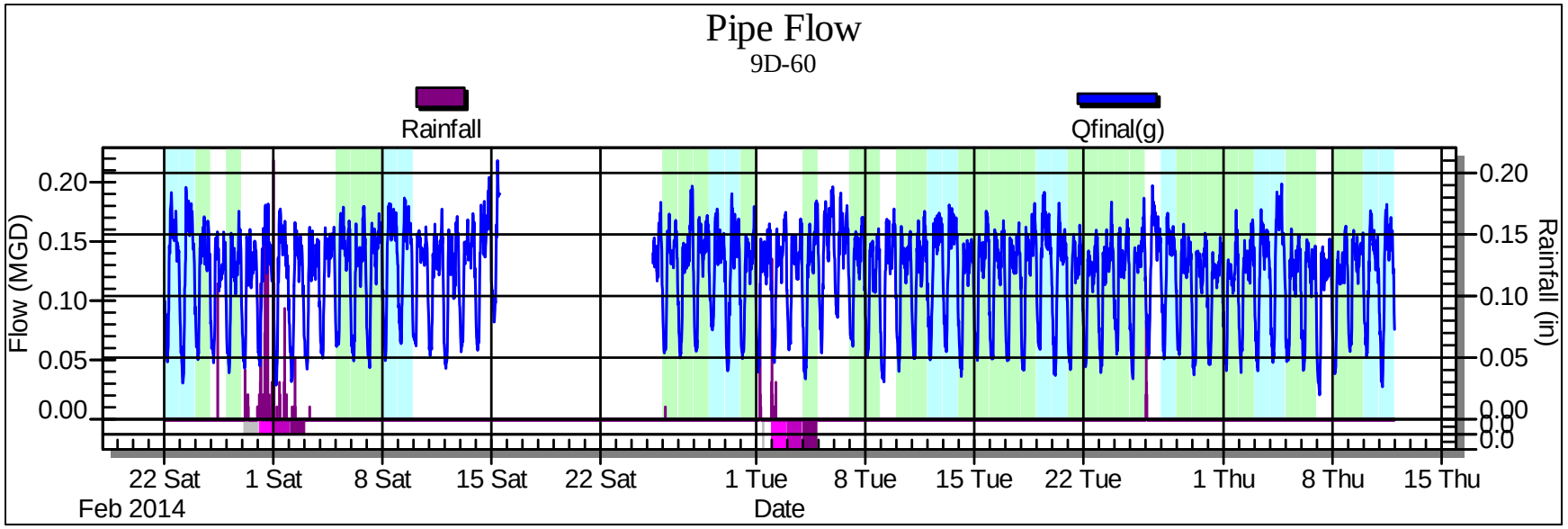

Scatter Graph
6A-13
Lanfear-Coll (C-LC = 33.03)
VFINAL (ft/s)
18
16
14
12
10
8
6
4
2
0
3.6
3.2
2.8
2.4
2
1.6
1.2
0.8
0.4
0.1
Iso Q (MGD)
0
1
2
3
4
5
6
7
8
DFINAL (in)

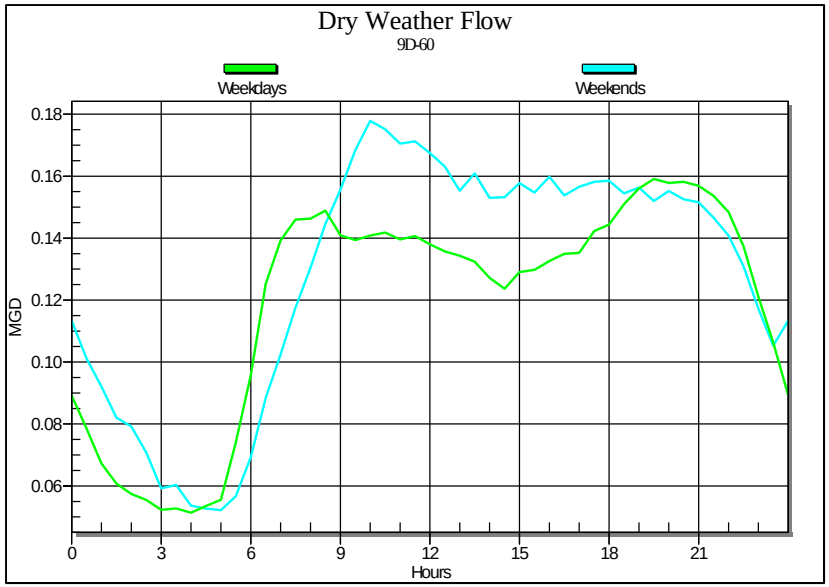

Storm Event - 2/28/2014 2:30:00 AM
6A-13
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
Weekends
0.370 in/hr 11:20
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date

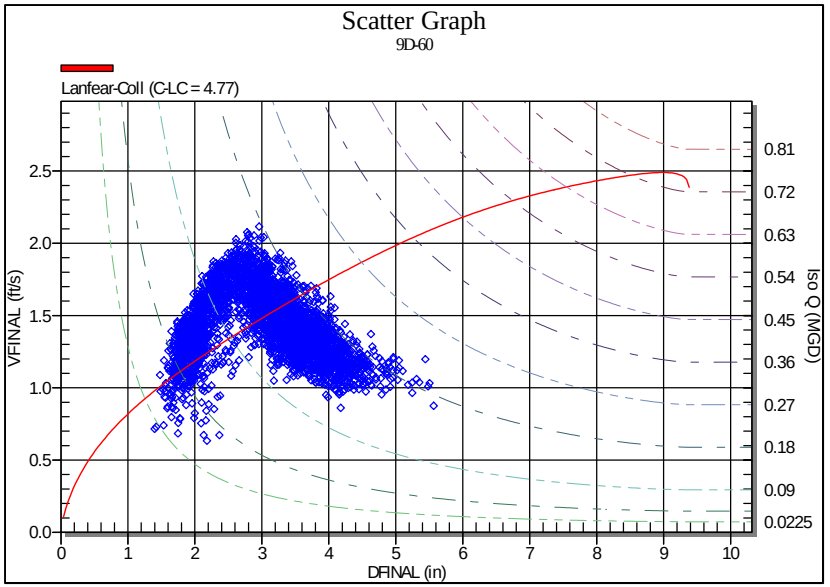

Storm Event - 4/1/2014 11:30:00 PM
6A-13
Rainfall
Gross Q
Gross I/I
Precomp(-)
Weekdays
0.150 in/hr 00:35
Flow (MGD)
Rainfall (in)
Storms
1 Tue
Apr 2014
2 Wed
3 Thu
4 Fri
5 Sat
Date

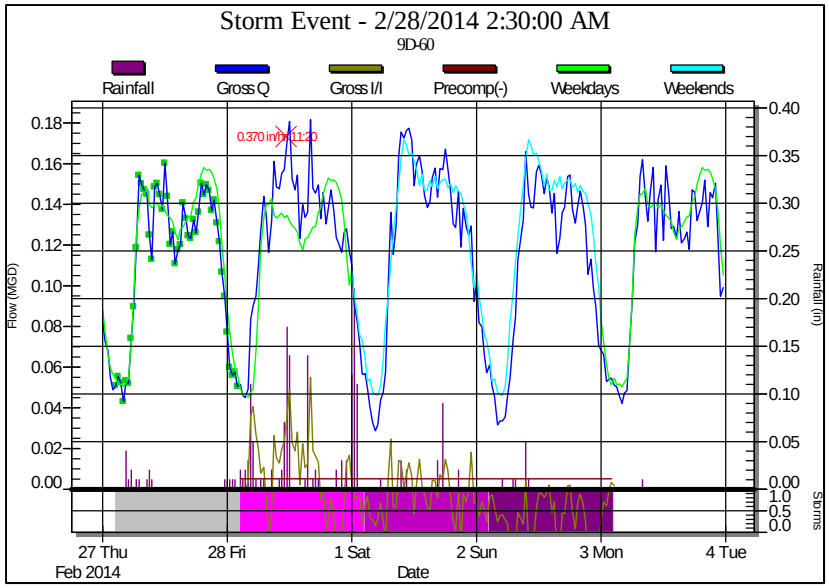

Q vs i - 6A-13
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
(2/28/2014)
(4/1/2014)
Storm Period Net RDII Volume (mg)
Storm Period Rainfall Depth (in)

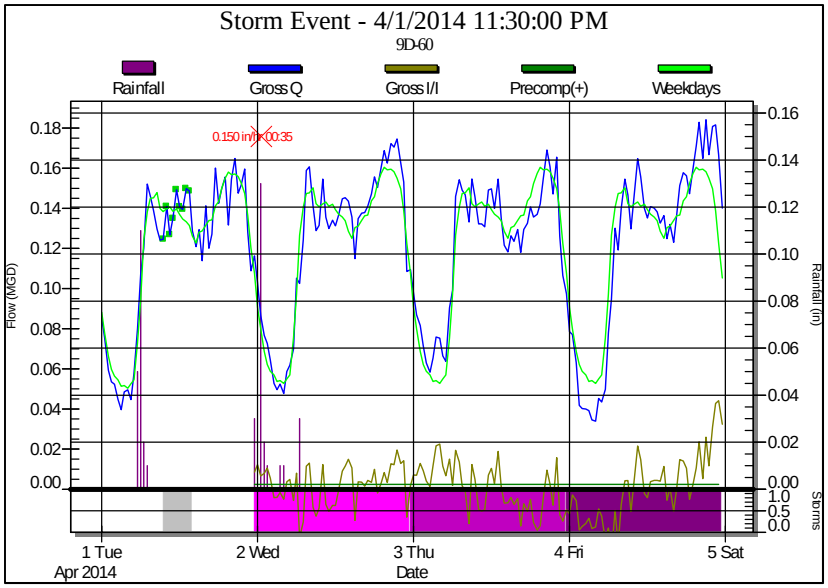

Q vs i - 6A-13
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
(2/28/2014)
(4/1/2014)
Peak Net I/I (MGD)
Rolling Peak Rainfall Intensity (in/hr)

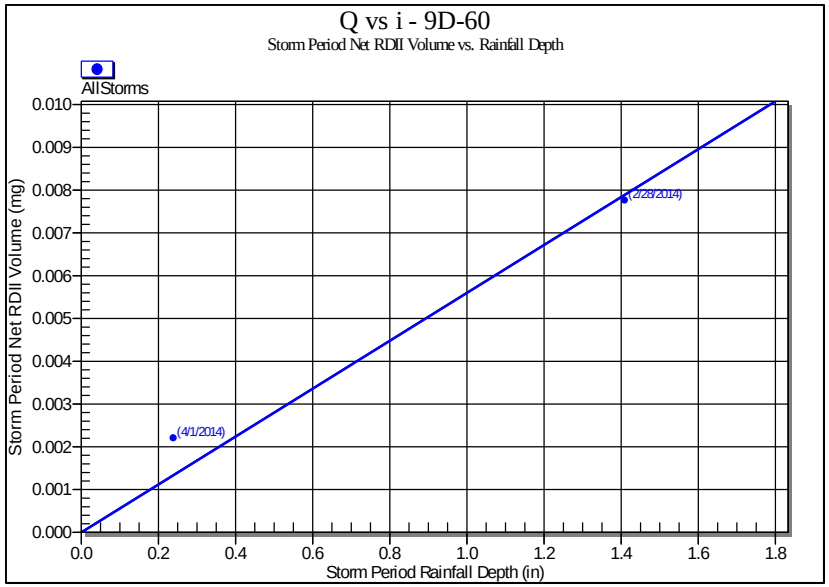

Pipe Flow
9D-60
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
0.20
0.15
0.10
0.05
0.00
22 Sat
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Feb 2014
Date

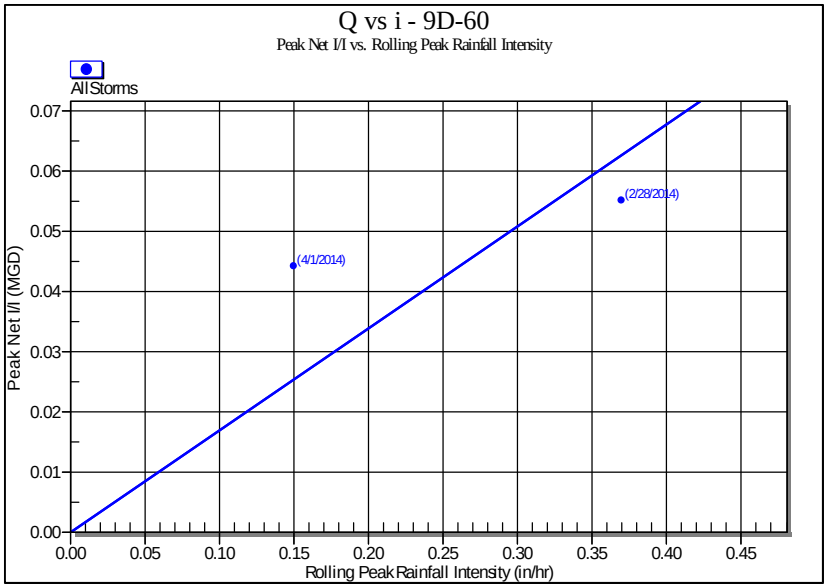

Dry Weather Flow
9D-60
Weekdays
Weekends
MGD
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0
3
6
9
12
15
18
21
Hours

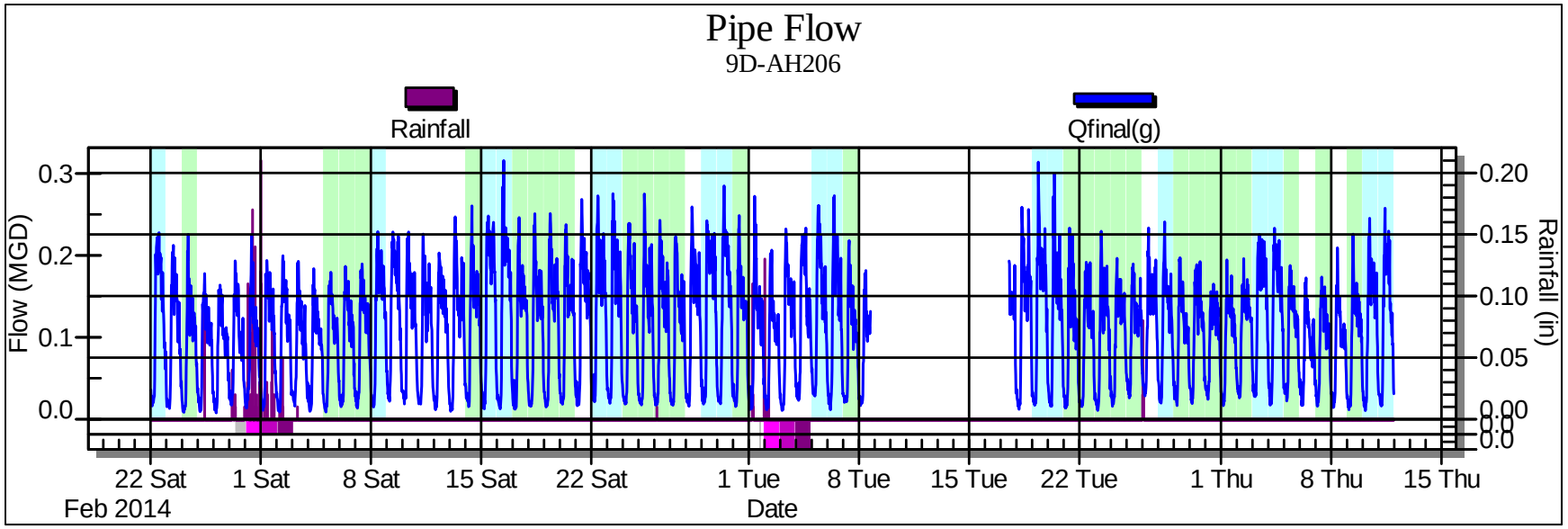

Scatter Graph
9D-60
Lanfear-Coll (C-LC = 4.77)
VFINAL (ft/s)
Iso Q (MGD)
DFINAL (in)
2.5
2.0
1.5
1.0
0.5
0.0
0.81
0.72
0.63
0.54
0.45
0.36
0.27
0.18
0.09
0.0225
0
1
2
3
4
5
6
7
8
9
10

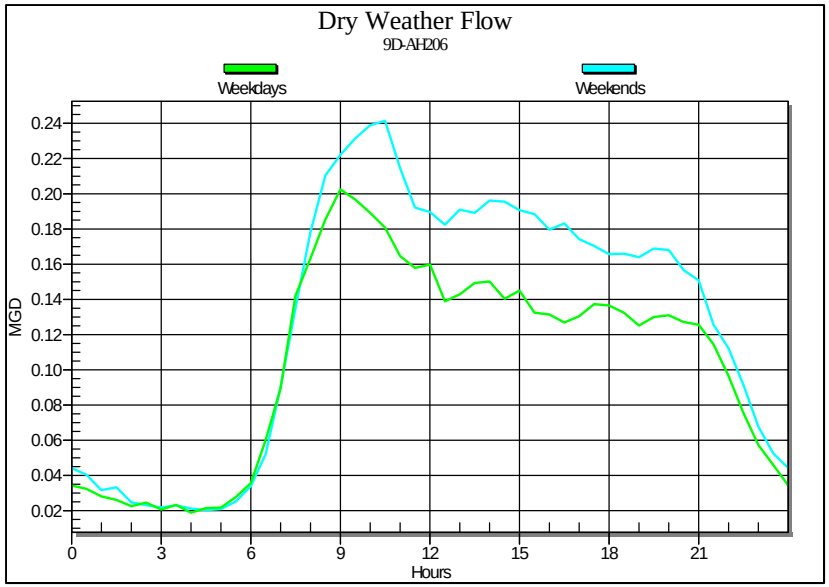

Storm Event - 2/28/2014 2:30:00 AM
9D-60
Rainfall
Gross Q
Gross I/I
Precomp(-)
Weekdays
Weekends
0.370 in/hr 11:20
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date

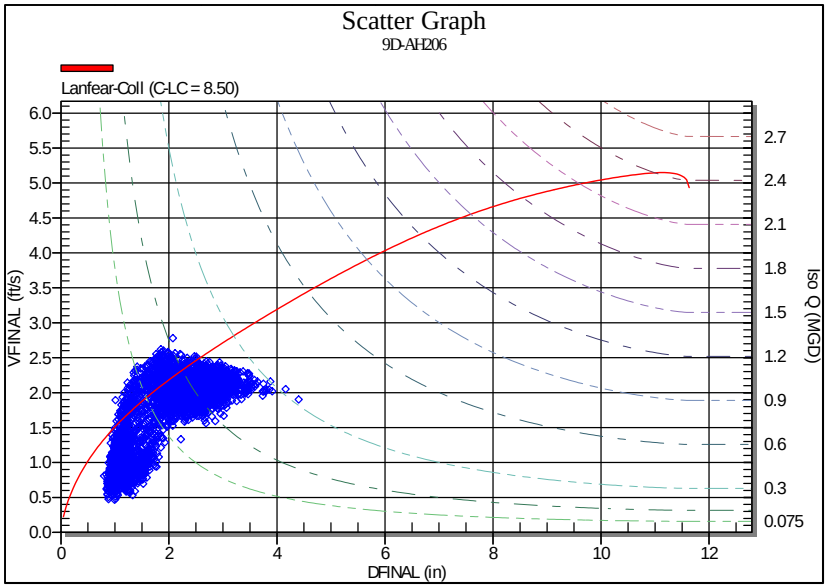

Storm Event - 4/1/2014 11:30:00 PM
9D-60
Rainfall
Gross Q
Gross I/I
Precomp(+)
Weekdays
0.150 in/hr 00:35
Flow (MGD)
Rainfall (in)
Storms
1 Tue
Apr 2014
2 Wed
3 Thu
4 Fri
5 Sat
Date

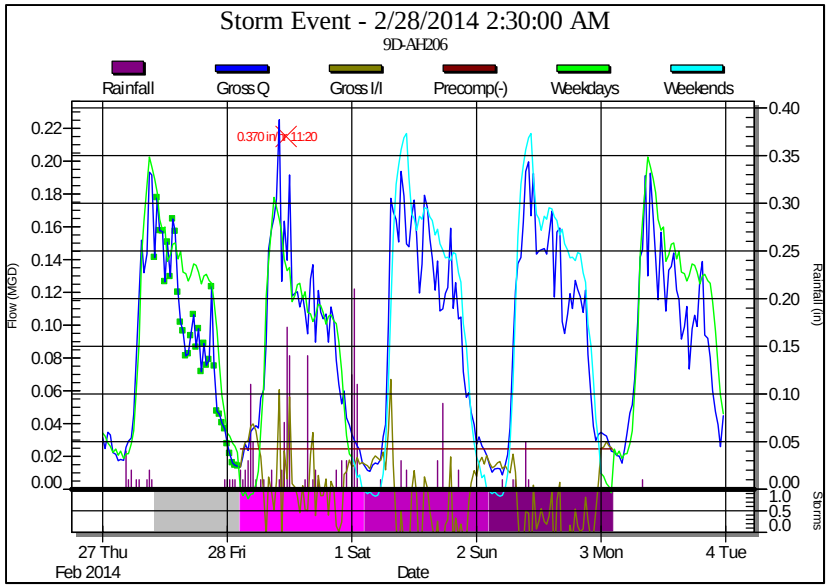

Q vs i - 9D-60
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
Storm Period Net RDII Volume (mg)
(2/28/2014)
(4/1/2014)
Storm Period Rainfall Depth (in)

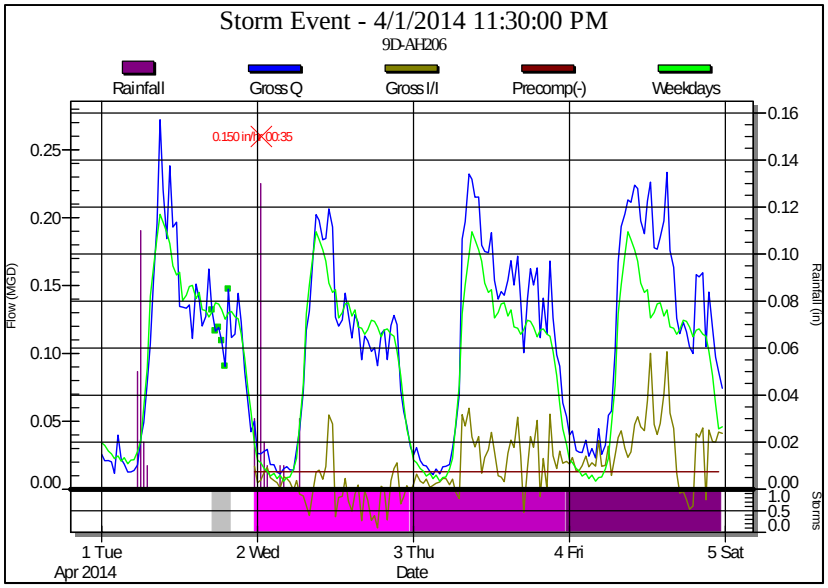

Q vs i - 9D-60
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
Peak Net I/I (MGD)
(2/28/2014)
(4/1/2014)
Rolling Peak Rainfall Intensity (in/hr)


Pipe Flow
9D-AH206
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
0.3
0.2
0.1
0.0
0.20
0.15
0.10
0.05
0.00
0.0
22 Sat
1 Sat
8 Sat
15 Sat
22 Sat
1 Tue
8 Tue
15 Tue
22 Tue
1 Thu
8 Thu
15 Thu
Feb 2014
Date


Dry Weather Flow
9D-AH206
Weekdays
Weekends
MGD
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0
3
6
9
12
15
18
21
Hours


Scatter Graph
9D-AH206
Lanfear-Coll (C-LC = 8.50)
VFINAL (ft/s)
Iso Q (MGD)
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2.7
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0.075
0
2
4
6
8
10
12
DFINAL (in)


Storm Event - 2/28/2014 2:30:00 AM
9D-AH206
Rainfall
Gross Q
Gross I/I
Precomp(-)
Weekdays
Weekends
0.370 in @ 11:20
Flow (MGD)
Rainfall (in)
Storms
27 Thu
Feb 2014
28 Fri
1 Sat
2 Sun
3 Mon
4 Tue
Date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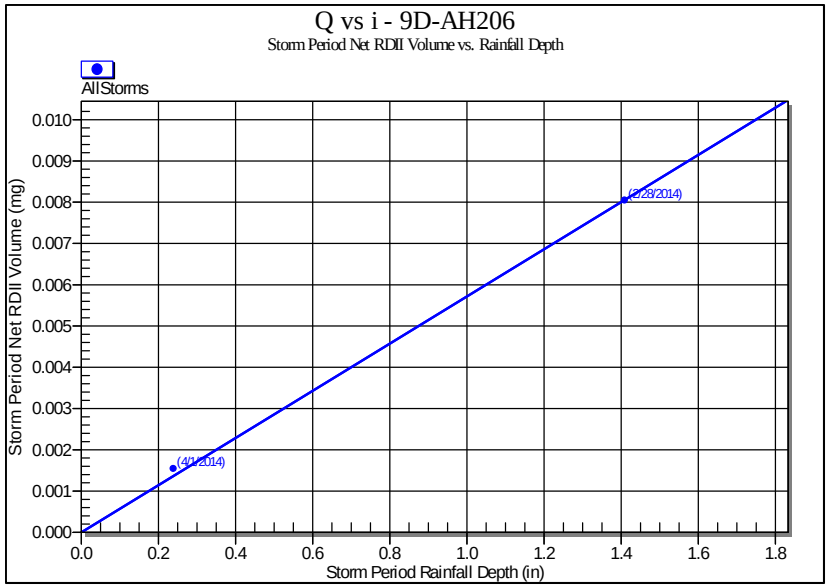
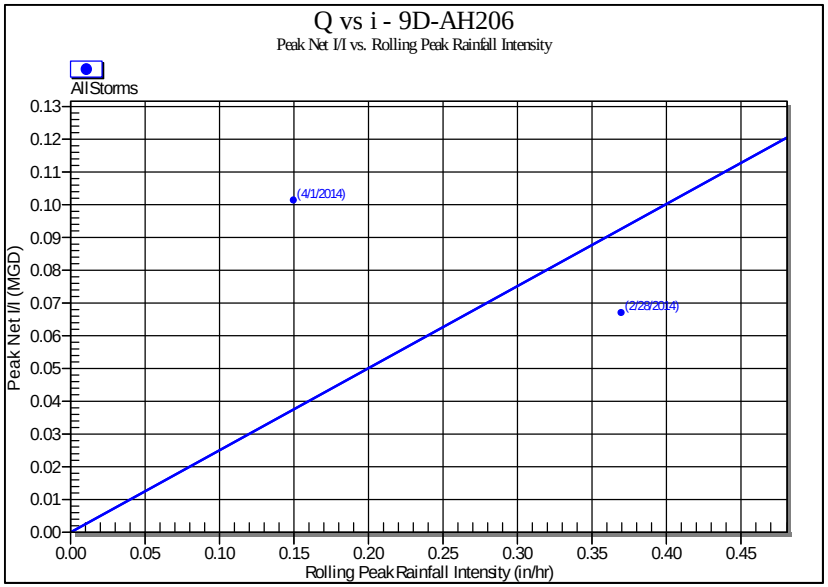
9D-AH206
Rainfall
Gross Q
Gross I/I
Precomp(-)
Weekdays
0.150 in @ 00:35
Flow (MGD)
Rainfall (in)
Storms
1 Tue
Apr 2014
2 Wed
3 Thu
4 Fri
5 Sat
Date


Q vs i - 9D-AH206
Storm Period Net RDII Volume vs. Rainfall Depth
All Storms
(2/28/2014)
(4/1/2014)
Storm Period Net RDII Volume (mg)
Storm Period Rainfall Depth (in)


Q vs i - 9D-AH206
Peak Net I/I vs. Rolling Peak Rainfall Intensity
All Storms
(4/1/2014)
(2/28/2014)
Peak Net I/I (MGD)
Rolling Peak Rainfall Intensity (in/hr)

City of Carlsbad
Sewer Flow Verification Study
January 28, 2016 – March 27, 2016

Final Report Submitted to:
City of Carlsbad
May 24, 2016

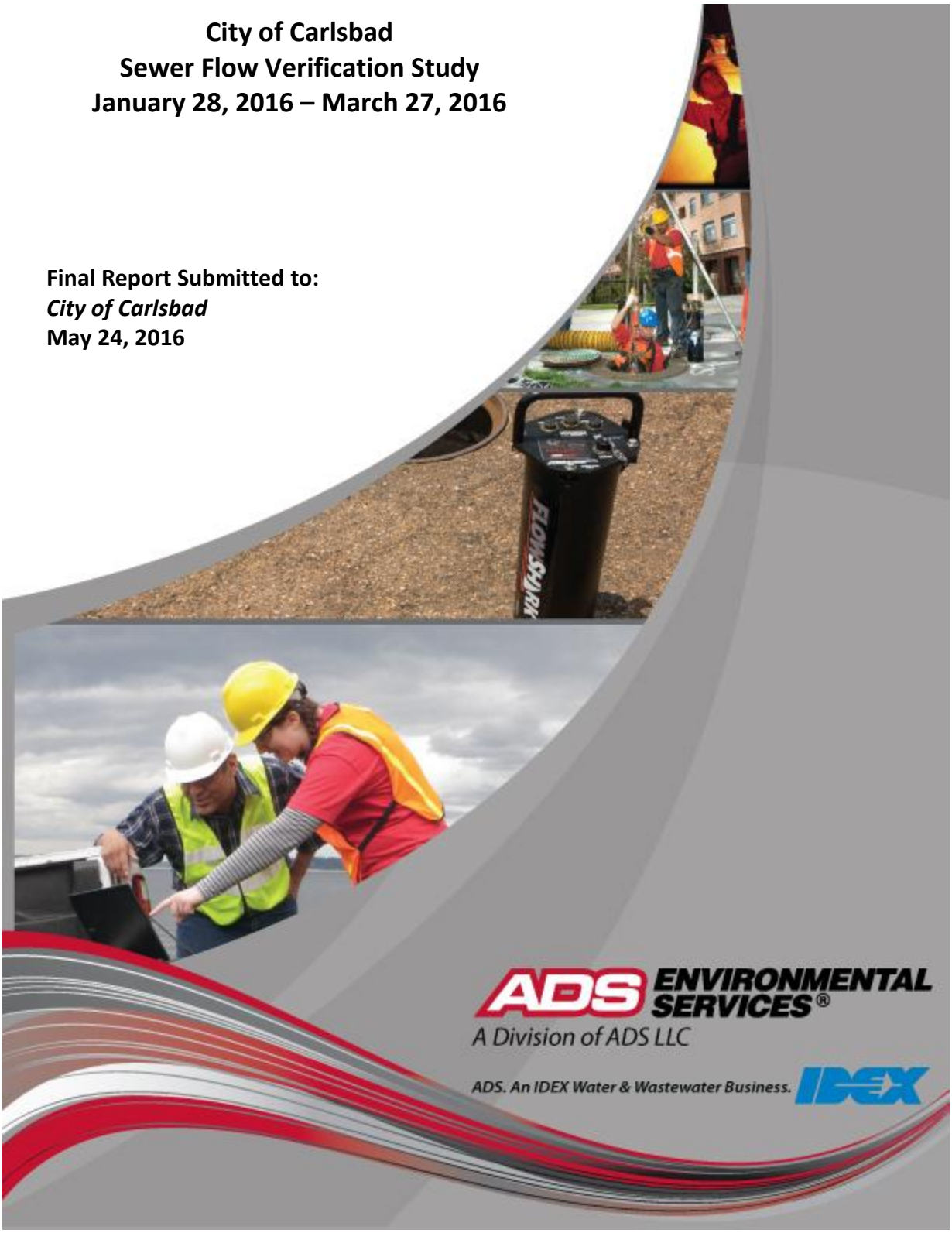


Table of Contents

City of Carlsbad Sewer Flow Verification Study

January 28, 2016 - March 27, 2016

Prepared for:

Mr. Don Wasko
City of Carlsbad
5950 El Camino Real
Carlsbad, CA 92008-8802

Prepared by:

ADS Environmental Services, Inc.
4820 Mercury Street, Suite C
San Diego, CA 92111

Letter of Transmittal

A Division of ADS LLC

4820 Mercury Street, Suite C
San Diego, CA 92111
www.adsenv.com

May 18, 2016
City of Carlsbad
5950 El Camino Real
Carlsbad, CA 92008-8802

Dear Mr. Wasko,

ADS is pleased to submit the Report - City of Carlsbad Sewer Flow Verification Study. Unfortunately, due to the minimal rainfall received and the lack of system response, a meaningful Inflow and Infiltration Analysis was not possible. Metering was performed at six (6) locations and one (1) rain gauge for the period of January 28, 2016 through March 27, 2016. The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for the flow monitoring location in 15-minute format is also provided.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, I can be reached at (858) 571-0045. You may also contact the Project Manager, Neil Volk at (858) 571-0045.

Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Sean O'Donnell
Data Analyst

Methodology

Introduction

Background

City of Carlsbad entered into agreement with ADS Environmental Services to conduct flow monitoring at (6) six locations and (1) one rain gauge location in the City of Carlsbad, CA. The study was contracted for a (60) sixty day monitoring period. Once installed the meters obtained flow data from each selected location to verify daily flow variations to aid the City of Carlsbad in sewer flow verification. The contract also included an I/I Analysis for the locations monitored. However, due insufficient rain and the lack of response by the Carlsbad System a meaningful inflow and infiltration analysis was not feasible.

Project Scope

The scope of this study involved using a temporary flow monitor to quantify wastewater flow at the designated locations. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring site for adequate hydraulic conditions.
- Flow monitor installation.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was accomplished on January 22, 2016. The monitoring period began on January 28, 2016 and was completed on March 27, 2016.

Equipment and Methodology

Flow Quantification Methods

There are two main equations used to measure open channel flow: the Continuity Equation and the Manning Equation. The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow. Most modern flow monitoring equipment, including the ADS Models, measure both depth and velocity and therefore use the Continuity Equation to calculate flow quantities.

Flow Monitoring Equipment

The monitor selected for this project was the ADS Model FlowShark-flow monitor. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS Model FlowShark-flow monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 15-minute intervals.

Three types of data acquisition sensors are available for the ADS Model FlowShark-flow monitor. The primary depth measurement device is the ADS quad-redundant ultrasonic level sensor. This sensor uses four independent ultrasonic transceivers in pairs to measure the distance from the face of the transceiver housing to the water surface (air range) with up to four transceiver pairs, of the available ones, active at one time. The elapsed time between transmitting and receiving the ultrasonic waves is used to calculate the air range between the sensor and flow surface based on the speed of sound in air. Sensors in the transceiver housing measure temperature, which is used to compensate the ultrasonic signal travel time. The speed of sound will vary with temperature. Since the ultrasonic level sensor is mounted out of the flow, it creates no disturbance to normal flow patterns and does not affect site hydraulics.

Redundant flow depth data can be provided by a pressure depth sensor, and is independent from the ultrasonic level sensor. This sensor uses a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube. Pressure depth sensors are typically used in large size channels and applications where surcharging is anticipated. Its streamlined shape minimizes flow distortion.

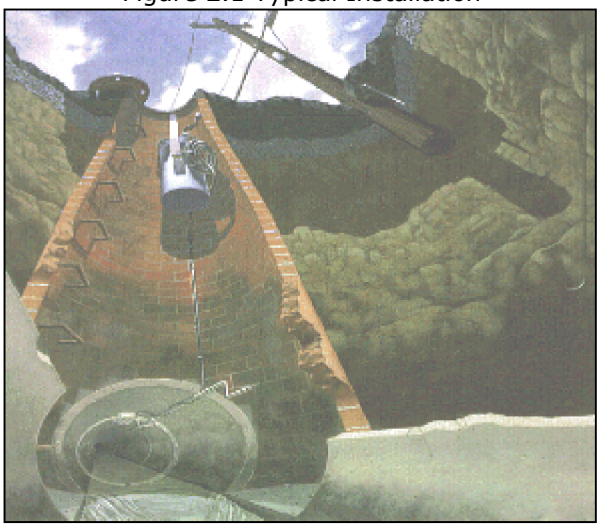
Velocity is measured using the ADS V-3 digital Doppler velocity sensor. This sensor measures velocity in the cross-sectional area of flow. An ultrasonic carrier is transmitted upstream into the flow, and is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity. Collected peak velocity information is filtered and processed using field confirmation information and proprietary software to determine the average velocity, which is used to calculate flow quantities. The sensor's small profile, measuring 1.5 inches by 1.15 inches by 0.50 inches thick, minimizes the affects on flow patterns and site hydraulics.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed. A typical flow monitor installation is shown in Figure 2.1.

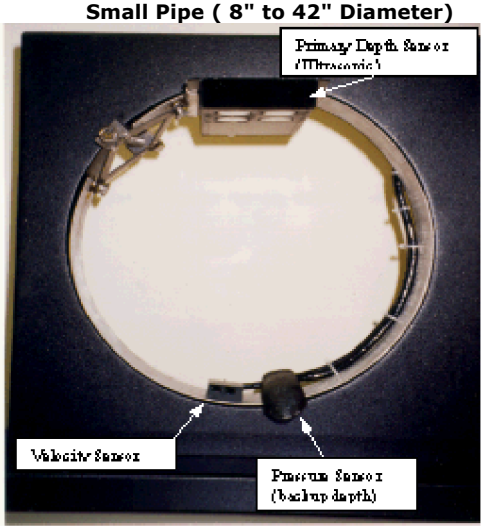
The installations depicted in Figures 2.1 are typical for circular or oval pipes up to approximately 104-inches in diameter or height. In installations into pipes 42-inches or less in diameter, depth and velocity sensors are mounted on an expandable stainless steel ring and installed one to two pipe diameters upstream of the pipe/manhole connection in the incoming sewer pipe. This reduces the affects of turbulence and backwater caused by the connection. In pipes larger than 42 inches in diameter, a special installation is made using two sections of the ring installed one to two feet upstream of the pipe/manhole connection; one bolted to the crown of the pipe for the depth sensor, and the other bolted to the bottom of the pipe (bolts are usually placed just above the water line) to hold the velocity sensor.

Figure 2.1 Typical Installation



Large Pipe (> 42" Diameter)

Small Pipe (8" to 42" Diameter)



Data Collection, Confirmation, and Quality Assurance

During the monitoring period, field crews visit each monitoring location to retrieve data, verify proper monitor operation, and document field conditions. The following quality assurance steps are taken to assure the integrity of the data collected:

- **Measure Power Supply:** The monitor is powered by a dry cell battery pack. Power levels are recorded and battery packs replaced, if necessary. A separate battery provides

back-up power to memory, which allows the primary battery to be replaced without the loss of data.

- **Perform Pipe Line Confirmations and Confirm Depth and Velocity:** Once equipment and sensor installation is accomplished, a member of the field crew descends into the manhole to perform a field measurement of flow rate, depth and velocity to confirm they are in agreement with the monitor. Since the ADS V-3 velocity sensor measures peak velocity in the wetted cross-sectional area of flow, velocity profiles are also taken to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.
- **Measure Silt Level:** During site confirmation, a member of the field crew descends into the manhole and measures and records the depth of silt at the bottom of the pipe. This data is used to compute the true area of flow.
- **Confirm Monitor Synchronization:** The field crew checks the flow monitor's clock for accuracy.
- **Upload and Review Data:** Data collected by the monitor is uploaded and reviewed for comparison with previous data. All readings are checked for consistency and screened for deviations in the flow patterns, which indicate system anomalies or equipment failure.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the air range (distance from sensor to top of flow) for each active ultrasonic depth sensor pair and (2) the peak velocity. If the monitor is equipped with a pressure sensor, then a depth reading from this sensor may also be stored. When the field personnel collects the data, the air range is converted to depth data based on the pipe height and physical offset (distance from the top of the pipe to the surface of the ultrasonic sensor). The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which ultrasonic pairs and/or depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. The data depicted on the hydrograph is based on hourly averaged data. The table

is provided in daily average format. The table shows the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the table and hydrograph.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

12C-26	
Pipe Dimensions	12.25 "
Silt Level	0.00"

Overview

Site 12C-26 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 40% full at its recorded peak of 4.84 inches and approximately 31% full during its recorded average depth of 3.79 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.79	0.52	0.073
Minimum	2.61	0.21	0.019
Maximum	6.80	0.95	0.254
Time of Minimum	2/14/2016 4:30 AM	2/25/2016 2:25 AM	2/25/2016 2:25 AM
Time of Maximum	3/16/2016 9:40 AM	3/17/2016 9:05 AM	3/17/2016 9:05 AM

Data Quality

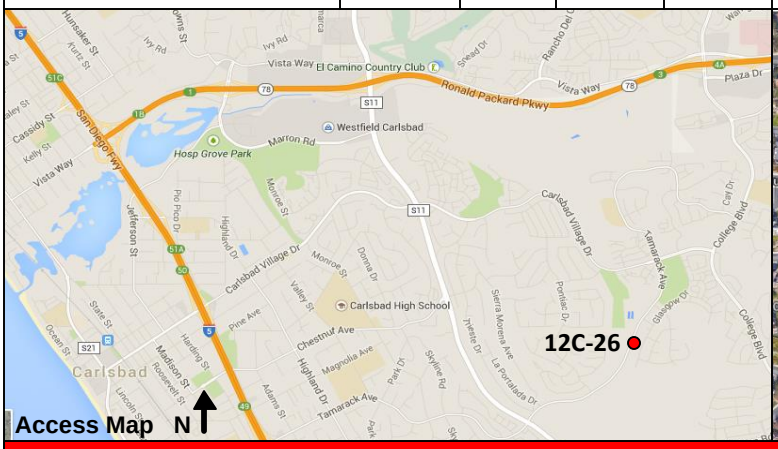
Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name:	Carlsbad_2015	**City / State:**	Carlsbad, CA	**Date Installed:** 1/21/16	**FM Initials:** JG
Site Name:	12C-26	**Monitor Series:**	5000AG	**Monitor S/N:**	16013
Address / Location:	Tamarack Ave and Kirkwall Ave			**Manhole #:**	12C-26
				Map Page #:	N/A
Access: Drive South on Tamarack 0.2 miles passed Kirkwall Ave. It'll be on the left hand side off the easement	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 12.25"
					Pipe Width: 12.00"
					IP Address: #166.219.19.138



Access Map

Site Map

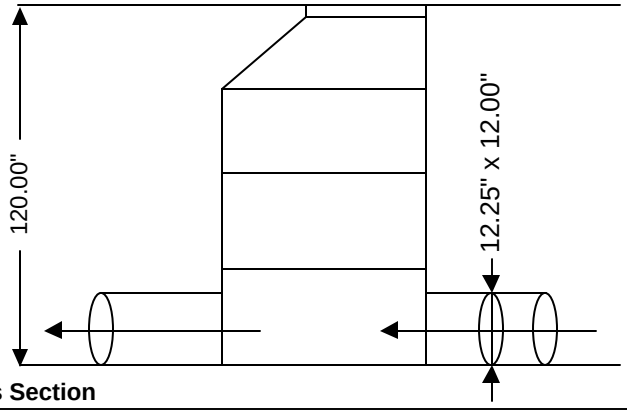
Investigation Information:

Date/Time of Investigation:	1/27/15 @ 11:30 AM			
Site Hydraulics: Low depth with low velocity				
Upstream Input: (L/S,P/S)	N/A			
Upstream Manhole:	DNI			
Downstream Manhole:	DNI			
Depth of Flow (Wet Dof):	3.75	**+/-**	0.25	
Range (Air Dof):		**+/-**		
Peak Velocity:	.70	**Fps**		
Silt:	0.00"	**Inches**		

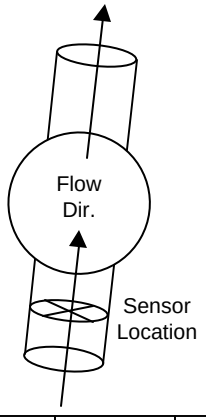
Manhole Information:

Manhole Depth:	120.00"	**Inches**			
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A	**Feet**			
Road Cut Length:	N/A	**Feet**			
Trench Length:	N/A	**Feet**			

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[x]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

12C-26

Flow Monitor

12C-26

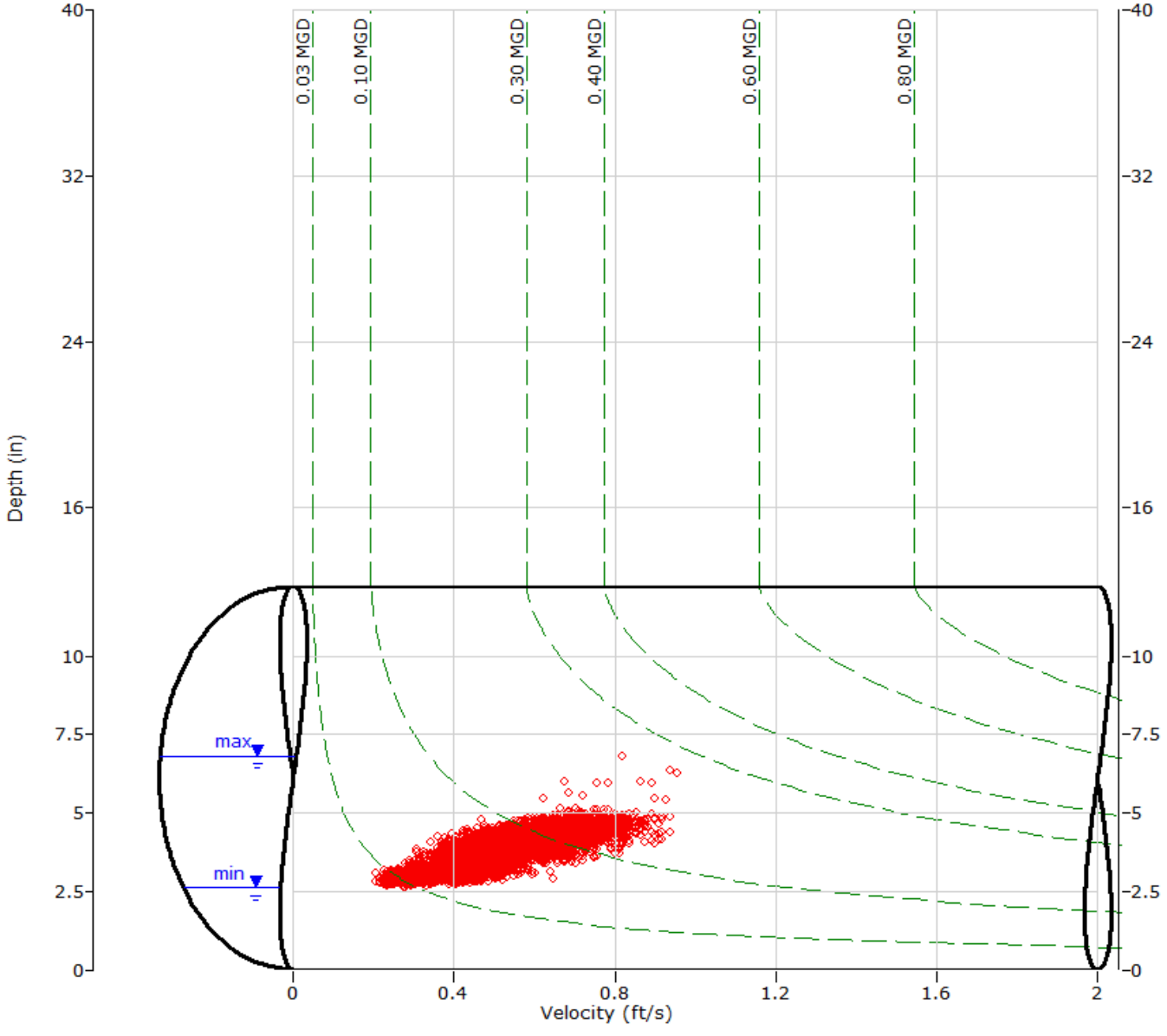
Pipe Height
12.25 in

Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



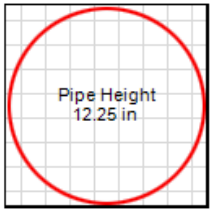
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

12C-26

Flow Monitor

12C-26

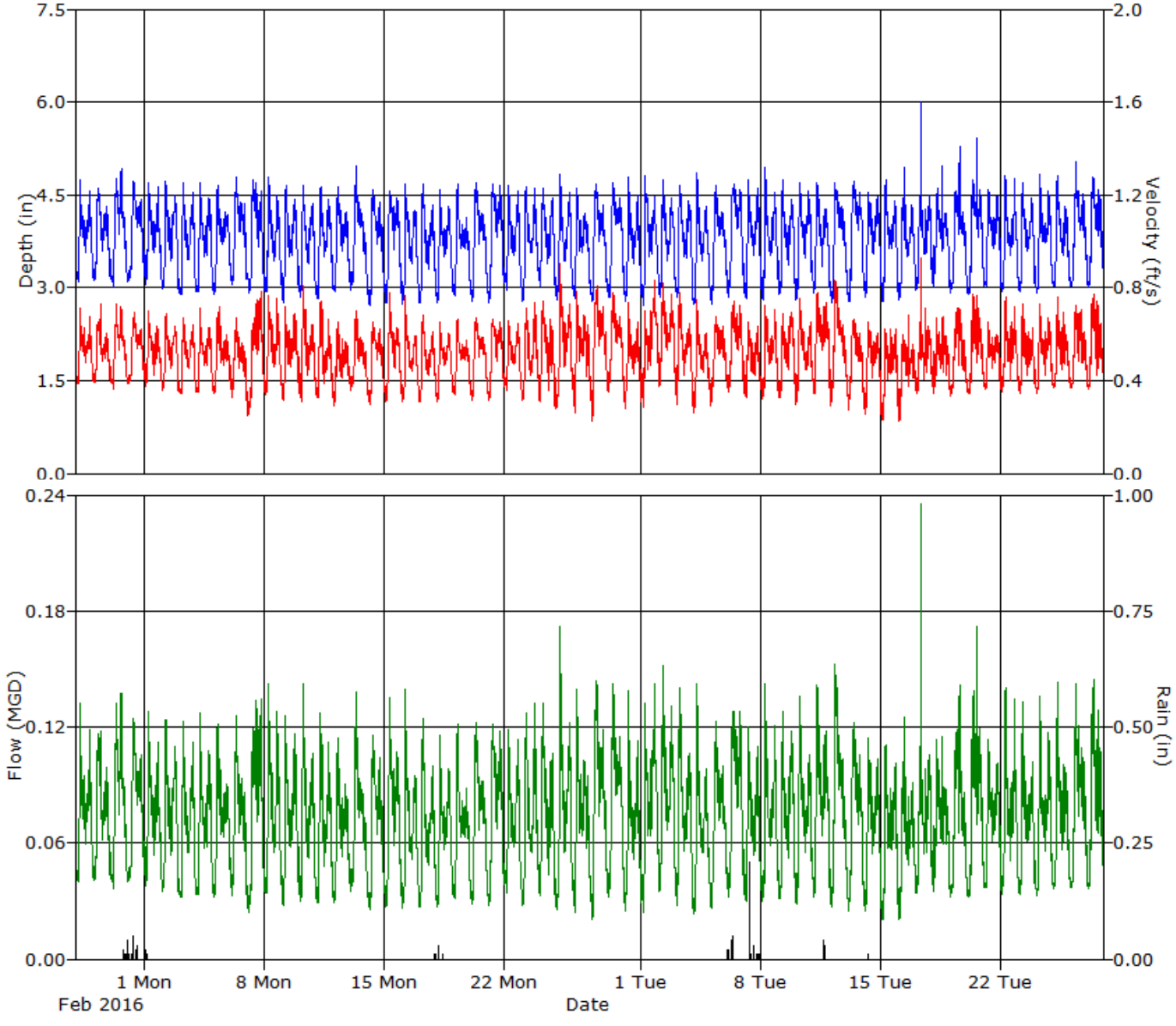


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

12C-26, Pipe Height: 12.25 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	04:15	3.05	07:10	4.91	3.85	03:35	0.37	07:30	0.84	0.53	04:15	0.038	07:30	0.149	0.076	0.076	
1/29/2016	01:10	3.10	09:20	4.81	3.85	01:10	0.39	11:35	0.84	0.52	01:10	0.040	11:35	0.149	0.075	0.075	
1/30/2016	05:15	2.98	16:00	4.99	3.93	05:15	0.36	09:05	0.82	0.54	05:15	0.035	16:25	0.151	0.080	0.080	0.06
1/31/2016	02:05	3.08	10:45	4.94	3.92	05:45	0.36	11:30	0.81	0.54	02:05	0.039	11:30	0.143	0.079	0.079	0.29
2/1/2016	02:55	2.99	20:25	4.87	3.82	02:55	0.36	07:35	0.76	0.52	02:55	0.035	07:35	0.145	0.073	0.073	0.05
2/2/2016	02:35	2.97	06:50	4.90	3.83	02:35	0.36	06:20	0.76	0.52	02:35	0.035	06:50	0.136	0.074	0.074	
2/3/2016	04:35	2.83	07:20	4.83	3.75	04:35	0.33	08:45	0.74	0.51	04:35	0.030	07:50	0.133	0.070	0.070	
2/4/2016	04:20	2.84	06:40	4.96	3.75	04:20	0.33	06:35	0.74	0.51	04:20	0.030	06:40	0.140	0.071	0.071	
2/5/2016	02:25	2.84	07:30	4.81	3.78	02:25	0.33	11:00	0.84	0.51	02:25	0.030	06:45	0.135	0.071	0.071	
2/6/2016	03:10	3.01	09:35	4.98	3.90	03:35	0.25	09:05	0.72	0.49	03:35	0.026	09:35	0.141	0.072	0.072	
2/7/2016	03:40	2.85	08:20	4.92	3.87	03:15	0.22	20:10	0.88	0.53	03:15	0.021	20:25	0.158	0.079	0.079	
2/8/2016	04:05	2.91	06:55	4.89	3.75	02:45	0.31	10:35	0.84	0.53	04:10	0.032	06:55	0.155	0.074	0.074	
2/9/2016	02:20	2.76	06:40	4.75	3.72	02:20	0.31	18:55	0.78	0.51	02:20	0.027	07:55	0.139	0.071	0.071	
2/10/2016	03:45	2.78	06:50	4.72	3.73	03:30	0.28	07:25	0.84	0.53	03:30	0.027	07:50	0.150	0.074	0.074	
2/11/2016	04:05	2.79	07:25	4.83	3.76	13:05	0.29	06:40	0.83	0.50	04:05	0.028	06:40	0.149	0.070	0.070	
2/12/2016	03:40	2.90	08:50	4.81	3.77	02:10	0.24	07:25	0.67	0.47	02:10	0.023	08:40	0.121	0.066	0.066	
2/13/2016	02:00	2.92	09:40	5.02	3.81	04:45	0.34	10:55	0.78	0.50	02:00	0.033	09:35	0.143	0.071	0.071	
2/14/2016	04:30	2.61	18:45	4.65	3.71	04:30	0.28	10:10	0.76	0.49	04:30	0.022	10:10	0.132	0.068	0.068	
2/15/2016	02:40	2.72	09:35	4.74	3.79	02:40	0.30	08:25	0.91	0.51	02:40	0.026	08:25	0.163	0.073	0.073	
2/16/2016	02:30	2.73	07:00	4.87	3.67	02:30	0.30	07:00	0.82	0.49	02:30	0.026	07:00	0.157	0.066	0.066	
2/17/2016	04:15	2.72	07:20	4.75	3.64	04:15	0.30	07:20	0.76	0.48	04:15	0.026	07:20	0.140	0.065	0.065	0.02
2/18/2016	03:05	2.73	06:55	4.68	3.68	03:05	0.30	06:50	0.72	0.49	03:05	0.026	06:50	0.127	0.067	0.067	0.09
2/19/2016	02:40	2.78	07:10	4.79	3.69	02:40	0.32	07:10	0.68	0.50	02:40	0.028	07:10	0.128	0.067	0.067	
2/20/2016	04:25	2.74	09:05	4.82	3.79	04:25	0.31	09:05	0.69	0.51	04:25	0.027	09:05	0.130	0.073	0.073	
2/21/2016	03:00	2.76	09:20	4.90	3.83	03:00	0.31	09:00	0.71	0.51	03:00	0.027	09:20	0.136	0.075	0.075	
2/22/2016	04:55	2.93	06:45	4.74	3.79	04:55	0.35	20:05	0.72	0.51	04:55	0.033	20:05	0.130	0.072	0.072	
2/23/2016	03:05	2.75	08:25	4.84	3.77	03:05	0.31	08:25	0.82	0.52	03:05	0.027	08:25	0.156	0.074	0.074	
2/24/2016	01:25	3.02	07:35	4.82	3.79	03:10	0.25	07:55	0.79	0.52	03:10	0.026	07:55	0.146	0.073	0.073	
2/25/2016	02:40	2.77	06:50	4.87	3.73	02:25	0.21	06:50	0.94	0.56	02:25	0.019	06:50	0.180	0.078	0.078	
2/26/2016	03:55	2.79	06:55	4.77	3.73	03:55	0.23	06:40	0.82	0.54	03:55	0.021	06:35	0.146	0.074	0.074	
2/27/2016	05:30	2.72	09:50	4.77	3.78	03:15	0.22	09:50	0.87	0.57	04:45	0.019	09:50	0.163	0.081	0.081	
2/28/2016	04:40	2.83	11:40	4.81	3.84	02:15	0.31	10:10	0.85	0.57	02:15	0.030	11:40	0.153	0.083	0.083	
2/29/2016	02:45	2.71	06:45	4.83	3.69	02:00	0.24	06:45	0.75	0.50	02:45	0.021	06:45	0.142	0.068	0.068	
3/1/2016	03:40	2.68	06:50	4.84	3.69	03:30	0.25	20:10	0.87	0.56	03:30	0.021	20:10	0.162	0.078	0.068	
3/2/2016	02:50	2.83	07:15	5.00	3.77	03:15	0.31	07:10	0.86	0.60	03:15	0.030	07:15	0.170	0.084	0.084	
3/3/2016	04:05	2.82	06:40	4.94	3.76	04:15	0.26	07:20	0.85	0.54	04:15	0.024	06:40	0.164	0.075	0.075	
3/4/2016	03:40	2.68	07:15	5.08	3.70	00:55	0.22	06:55	0.80	0.49	01:35	0.020	06:55	0.155	0.067	0.067	
3/5/2016	04:20	2.70	09:10	4.75	3.77	01:55	0.22	14:00	0.76	0.52	01:55	0.019	09:40	0.130	0.073	0.073	
3/6/2016	03:50	2.80	12:15	4.79	3.87	03:25	0.33	11:25	0.80	0.55	03:25	0.030	19:05	0.147	0.081	0.081	0.30
3/7/2016	03:25	2.76	07:05	4.92	3.80	04:05	0.25	18:10	0.71	0.49	04:05	0.023	07:35	0.136	0.070	0.070	0.57
3/8/2016	03:35	2.76	06:50	5.09	3.78	04:05	0.25	20:35	0.76	0.52	04:05	0.024	06:50	0.152	0.073	0.073	
3/9/2016	02:05	2.84	07:10	4.79	3.74	02:40	0.28	07:20	0.74	0.52	02:40	0.026	07:20	0.138	0.072	0.072	
3/10/2016	02:10	2.76	19:40	4.79	3.79	01:00	0.22	08:05	0.84	0.53	01:00	0.021	09:25	0.148	0.075	0.075	
3/11/2016	03:10	2.87	07:00	4.87	3.82	04:30	0.31	07:30	0.81	0.59	03:10	0.031	07:30	0.150	0.084	0.084	0.20
3/12/2016	03:50	2.74	10:00	4.94	3.83	03:20	0.24	09:55	0.92	0.57	03:50	0.022	10:00	0.174	0.083	0.083	
3/13/2016	04:10	2.75	11:45	4.91	3.85	03:15	0.23	09:45	0.71	0.50	03:55	0.022	11:45	0.131	0.073	0.073	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	02:50	2.83	06:45	4.77	3.79	02:10	0.23	19:40	0.69	0.48	01:55	0.023	06:45	0.123	0.068	0.068	0.01
3/15/2016	03:05	2.71	07:15	4.77	3.76	01:50	0.22	15:00	0.74	0.45	02:00	0.019	07:05	0.117	0.064	0.064	
3/16/2016	01:55	2.76	09:40	6.80	3.72	03:50	0.21	09:40	0.82	0.45	01:55	0.019	09:40	0.242	0.063	0.063	
3/17/2016	02:05	2.93	09:00	6.34	3.80	03:10	0.28	09:05	0.95	0.51	03:10	0.028	09:05	0.254	0.072	0.072	
3/18/2016	02:40	2.94	14:00	5.98	3.82	02:30	0.31	07:10	0.82	0.50	02:30	0.032	14:00	0.170	0.071	0.071	
3/19/2016	02:25	2.89	14:55	5.94	3.81	01:35	0.29	13:50	0.94	0.51	04:50	0.029	14:55	0.222	0.074	0.074	
3/20/2016	04:00	2.89	14:55	5.97	3.86	15:45	0.31	15:00	0.93	0.53	04:45	0.030	14:55	0.217	0.078	0.078	
3/21/2016	04:10	2.99	07:15	4.90	3.85	01:25	0.33	07:10	0.77	0.51	01:25	0.034	07:10	0.142	0.072	0.072	
3/22/2016	03:20	2.91	20:40	4.93	3.78	14:35	0.33	07:10	0.85	0.52	03:20	0.033	07:10	0.165	0.074	0.074	
3/23/2016	03:05	2.90	07:55	4.94	3.77	03:40	0.32	21:40	0.82	0.51	03:40	0.031	07:55	0.157	0.071	0.071	
3/24/2016	03:15	2.89	07:55	4.92	3.80	03:15	0.34	17:45	0.82	0.52	03:15	0.032	08:00	0.145	0.074	0.074	
3/25/2016	02:55	2.97	07:55	5.10	3.80	02:55	0.36	15:35	0.91	0.52	02:55	0.035	07:55	0.160	0.073	0.073	
3/26/2016	04:55	2.97	09:35	5.12	3.92	05:25	0.36	17:35	0.87	0.53	04:55	0.035	10:25	0.161	0.079	0.079	
3/27/2016	04:20	2.98	09:45	4.94	3.91	04:20	0.36	13:50	0.92	0.54	04:20	0.035	09:45	0.157	0.080	0.080	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			4.395	1.59
Avg	3.79	0.52	0.073	

Site Commentary

Site Information

35D-1	
Pipe Dimensions	7.88 "
Silt Level	0.00"

Overview

Site 35D-1 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 13% full at its recorded peak of 1.06 inches and approximately 8% full during its recorded average depth of 0.66 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.66	2.65	0.027
Minimum	0.27	0.85	0.003
Maximum	1.20	6.07	0.123
Time of Minimum	3/11/2016 1:50 AM	1/31/2016 4:10 AM	3/18/2016 4:40 AM
Time of Maximum	2/7/2016 10:50 AM	2/11/2016 6:45 AM	2/11/2016 6:45 AM

Data Quality

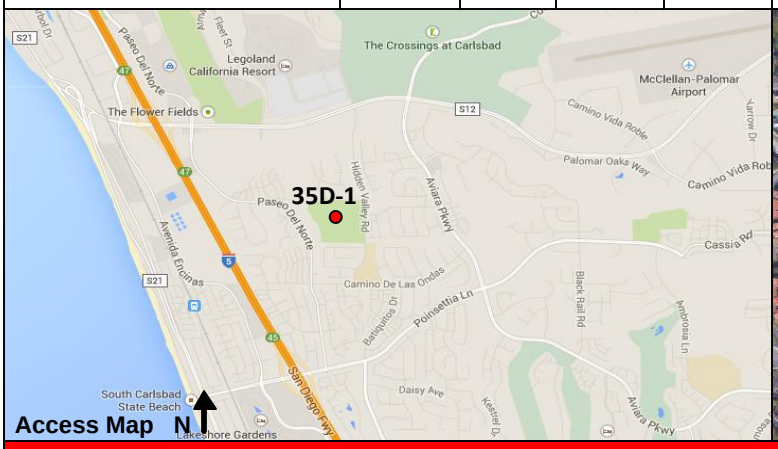
Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2015	**City / State:** Carlsbad, CA			**Date Installed:** 1/22/16	**FM Initials:** JG
Site Name: 35D-1	**Monitor Series:** 5000AG			**Monitor S/N:**	20094
Address / Location: Poinsettia Park				**Manhole #:**	35D-1
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.88"
					Pipe Width: 7.88"
					IP Address: #166.219.19.118



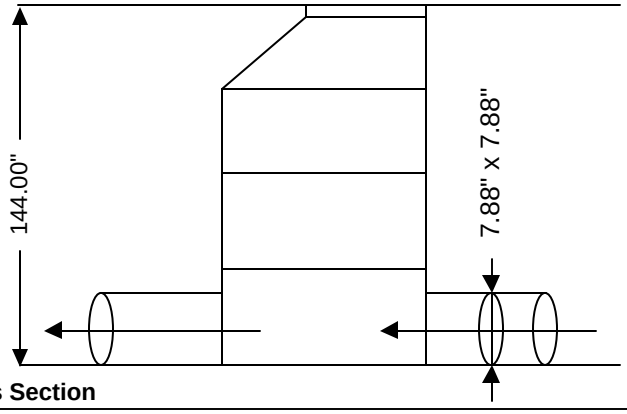
Investigation Information:

Date/Time of Investigation:	1/26/15 @ 9:00 AM
Site Hydraulics: Low depth with fast velocity	
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	0.75 +/- 0.25
Range (Air Dof):	+/-
Peak Velocity:	4.30 Fps
Silt:	0.00" Inches

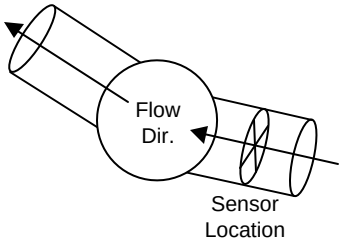
Manhole Information:

Manhole Depth:	144.00"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	PVC / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

35D-1

Flow Monitor

35D-1

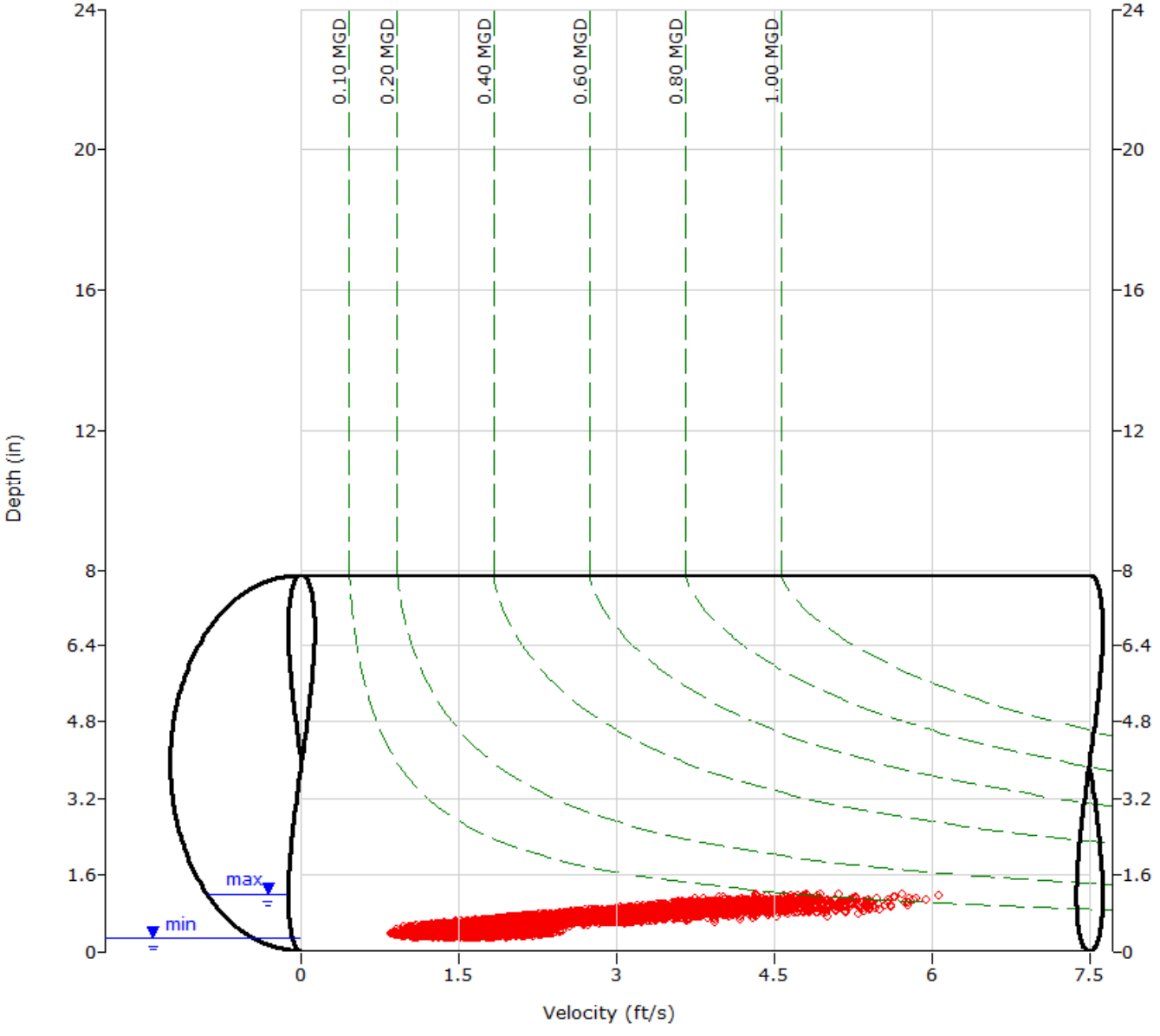
Pipe Height
7.88 in

Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



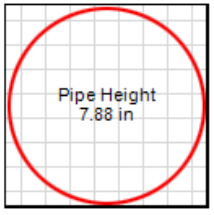
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

35D-1

Flow Monitor

35D-1

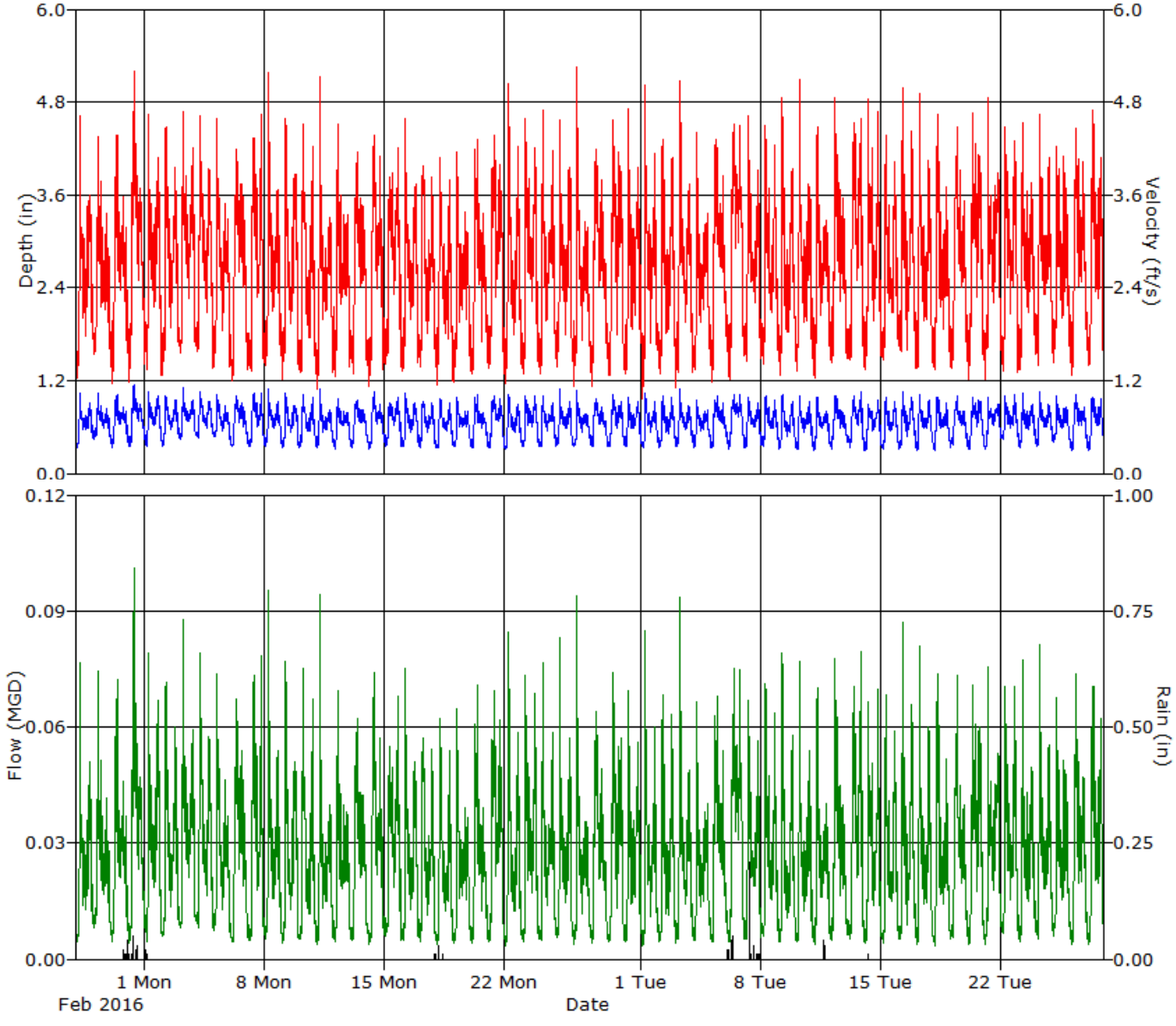


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

35D-1, Pipe Height: 7.88 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	01:20	0.29	07:00	1.16	0.64	03:00	0.90	06:30	4.90	2.52	02:00	0.003	07:00	0.096	0.024	0.024	
1/29/2016	01:40	0.41	08:05	1.06	0.67	02:30	1.31	11:30	5.04	2.55	01:40	0.006	08:05	0.088	0.025	0.025	
1/30/2016	03:15	0.32	11:50	1.07	0.68	06:20	1.03	11:55	4.83	2.64	01:55	0.004	11:50	0.081	0.027	0.027	0.06
1/31/2016	04:50	0.33	11:25	1.18	0.71	04:10	0.85	11:15	5.86	2.85	04:10	0.003	11:15	0.107	0.033	0.033	0.29
2/1/2016	03:45	0.33	07:05	1.09	0.70	03:55	1.09	06:35	5.58	2.69	03:55	0.004	06:35	0.099	0.029	0.029	0.05
2/2/2016	01:40	0.33	06:25	1.10	0.67	01:15	1.00	07:10	5.24	2.65	01:25	0.004	06:20	0.088	0.028	0.028	
2/3/2016	02:05	0.43	07:30	1.18	0.74	03:45	1.23	20:20	5.34	2.88	02:05	0.007	07:30	0.101	0.033	0.033	
2/4/2016	03:55	0.45	06:45	1.18	0.72	02:50	1.39	07:25	4.95	2.82	04:40	0.008	06:45	0.101	0.031	0.031	
2/5/2016	02:40	0.45	06:30	1.06	0.69	00:15	1.09	07:00	4.78	2.61	02:40	0.006	07:00	0.084	0.027	0.027	
2/6/2016	04:15	0.32	12:40	1.07	0.67	04:50	1.03	13:45	4.97	2.65	03:25	0.004	12:40	0.081	0.028	0.028	
2/7/2016	02:10	0.31	10:50	1.20	0.68	06:15	1.05	08:30	5.18	2.73	02:10	0.004	10:50	0.091	0.030	0.030	
2/8/2016	02:05	0.34	06:35	1.18	0.67	00:25	1.01	06:40	5.95	2.65	02:30	0.005	06:35	0.117	0.027	0.027	
2/9/2016	02:00	0.31	07:10	1.13	0.66	02:00	1.07	07:35	5.56	2.61	02:00	0.003	07:10	0.092	0.026	0.026	
2/10/2016	01:15	0.32	06:55	1.05	0.64	00:35	0.95	06:30	5.41	2.48	00:35	0.004	07:20	0.088	0.024	0.024	
2/11/2016	01:25	0.33	06:45	1.17	0.64	03:05	0.97	06:45	6.07	2.51	02:45	0.003	06:45	0.123	0.024	0.024	
2/12/2016	01:50	0.30	09:05	1.02	0.64	01:05	0.96	09:10	5.11	2.52	01:05	0.004	09:10	0.077	0.024	0.024	
2/13/2016	04:10	0.31	10:10	1.01	0.66	05:50	1.04	09:35	4.36	2.62	03:55	0.003	10:10	0.071	0.026	0.026	
2/14/2016	03:00	0.30	10:30	1.12	0.67	03:45	1.01	08:30	4.94	2.64	03:45	0.003	10:20	0.085	0.027	0.027	
2/15/2016	03:00	0.33	19:55	1.08	0.68	03:55	1.19	19:55	4.61	2.71	03:00	0.004	19:55	0.083	0.028	0.028	
2/16/2016	00:50	0.33	06:35	1.12	0.65	01:25	1.06	06:35	5.27	2.57	04:20	0.004	06:35	0.100	0.025	0.025	
2/17/2016	04:10	0.32	07:25	1.05	0.66	23:45	1.14	07:25	4.49	2.56	04:10	0.004	07:25	0.078	0.025	0.025	0.02
2/18/2016	03:20	0.29	06:45	1.03	0.64	03:10	0.94	06:45	4.41	2.49	03:10	0.003	06:45	0.074	0.024	0.024	0.09
2/19/2016	03:45	0.32	06:35	1.04	0.64	02:00	1.00	07:00	4.47	2.49	02:00	0.003	06:35	0.076	0.024	0.024	
2/20/2016	02:55	0.31	11:05	1.04	0.65	04:50	0.96	08:05	5.12	2.56	04:50	0.003	11:05	0.076	0.025	0.025	
2/21/2016	04:10	0.32	11:30	1.15	0.68	23:45	1.03	17:20	5.36	2.78	04:10	0.003	11:30	0.088	0.030	0.030	
2/22/2016	02:20	0.31	07:25	1.09	0.64	00:50	1.02	07:25	5.48	2.57	03:40	0.003	07:25	0.100	0.025	0.025	
2/23/2016	02:10	0.31	06:40	1.12	0.68	04:15	1.07	07:05	5.18	2.73	02:15	0.003	06:40	0.091	0.029	0.029	
2/24/2016	03:15	0.32	07:10	1.08	0.65	04:15	1.00	20:30	5.58	2.61	04:15	0.004	07:10	0.092	0.026	0.026	
2/25/2016	01:45	0.34	07:05	1.17	0.66	14:30	1.24	22:15	5.62	2.60	03:55	0.005	07:05	0.088	0.026	0.026	
2/26/2016	03:00	0.33	06:50	1.15	0.63	02:50	0.92	06:35	5.79	2.49	02:50	0.003	06:35	0.107	0.024	0.024	
2/27/2016	02:35	0.33	09:15	1.03	0.66	06:15	0.97	17:00	5.09	2.61	02:35	0.003	09:15	0.074	0.026	0.026	
2/28/2016	02:05	0.33	08:35	1.10	0.67	01:45	1.03	08:35	5.25	2.73	01:45	0.004	08:35	0.097	0.029	0.029	
2/29/2016	03:15	0.33	20:05	1.05	0.66	04:10	0.89	20:40	5.35	2.60	04:10	0.004	07:40	0.078	0.026	0.026	
3/1/2016	03:50	0.32	06:35	1.17	0.64	03:00	0.87	06:25	5.40	2.56	03:05	0.003	06:35	0.098	0.025	0.025	
3/2/2016	01:25	0.31	07:25	1.02	0.65	00:45	1.03	06:50	5.09	2.59	00:45	0.004	07:20	0.079	0.025	0.025	
3/3/2016	01:30	0.33	07:00	1.18	0.65	03:55	0.92	06:50	5.65	2.59	01:55	0.003	06:50	0.109	0.025	0.025	
3/4/2016	03:15	0.30	06:55	1.01	0.63	03:10	0.89	06:35	5.17	2.50	03:10	0.003	06:55	0.084	0.023	0.023	
3/5/2016	02:10	0.31	09:30	1.04	0.66	04:35	0.94	10:40	5.47	2.68	03:55	0.004	08:50	0.077	0.027	0.027	
3/6/2016	03:20	0.31	19:35	1.07	0.70	05:15	0.88	11:05	5.33	2.93	05:15	0.003	19:35	0.093	0.033	0.033	0.30
3/7/2016	03:10	0.30	06:30	1.04	0.66	04:05	1.12	08:05	5.35	2.69	04:05	0.004	07:00	0.084	0.027	0.027	0.57
3/8/2016	00:55	0.34	08:00	1.08	0.66	03:35	1.21	06:50	4.88	2.66	00:55	0.004	08:00	0.086	0.026	0.026	
3/9/2016	01:15	0.30	06:35	1.04	0.64	01:10	1.04	06:40	5.26	2.59	01:10	0.003	06:35	0.086	0.025	0.025	
3/10/2016	03:40	0.28	06:40	1.05	0.64	03:40	1.07	06:35	5.44	2.60	03:40	0.003	06:40	0.086	0.025	0.025	
3/11/2016	01:50	0.27	06:30	1.07	0.63	04:30	0.99	06:55	5.37	2.56	02:35	0.003	07:35	0.088	0.024	0.024	0.20
3/12/2016	03:20	0.31	08:30	1.03	0.66	04:05	1.22	08:15	5.31	2.74	04:05	0.004	08:15	0.084	0.028	0.028	
3/13/2016	05:45	0.31	20:50	1.11	0.67	04:20	1.20	19:50	5.42	2.84	05:15	0.004	19:50	0.094	0.030	0.030	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	01:50	0.28	22:00	1.00	0.64	03:50	1.21	20:20	5.77	2.72	04:20	0.003	20:20	0.086	0.026	0.026	0.01
3/15/2016	03:30	0.28	07:35	1.02	0.63	04:50	1.22	06:50	4.85	2.63	04:20	0.004	07:35	0.080	0.025	0.025	
3/16/2016	02:05	0.28	07:05	1.12	0.65	05:35	1.36	20:20	5.78	2.74	02:05	0.004	07:05	0.107	0.027	0.027	
3/17/2016	03:55	0.29	06:30	1.04	0.64	01:20	1.06	07:00	5.26	2.60	04:45	0.003	07:00	0.087	0.025	0.025	
3/18/2016	04:40	0.27	08:45	1.03	0.64	04:40	1.09	07:20	5.18	2.60	04:40	0.003	08:35	0.082	0.025	0.025	
3/19/2016	02:05	0.30	11:15	1.06	0.65	02:05	1.25	11:15	5.83	2.69	02:05	0.003	11:15	0.103	0.026	0.026	
3/20/2016	02:30	0.29	17:50	1.03	0.67	06:30	1.12	10:10	5.62	2.85	04:00	0.003	09:30	0.087	0.030	0.030	
3/21/2016	02:25	0.28	07:05	1.01	0.67	02:30	1.17	06:35	5.74	2.77	02:30	0.003	06:35	0.093	0.028	0.028	
3/22/2016	01:55	0.42	20:30	1.11	0.69	03:30	1.12	07:10	5.45	2.81	03:30	0.006	20:30	0.091	0.030	0.030	
3/23/2016	04:05	0.31	07:20	1.17	0.65	03:00	1.12	07:35	5.27	2.63	04:05	0.004	07:35	0.099	0.026	0.026	
3/24/2016	04:05	0.32	08:05	1.09	0.67	04:45	1.04	06:30	5.09	2.76	04:45	0.004	08:05	0.090	0.027	0.027	
3/25/2016	02:50	0.38	06:45	1.05	0.66	02:50	1.36	17:25	5.13	2.66	02:50	0.005	07:05	0.078	0.026	0.026	
3/26/2016	03:25	0.28	09:45	1.05	0.66	02:20	1.06	13:25	5.24	2.73	04:20	0.003	13:25	0.083	0.028	0.028	
3/27/2016	02:50	0.28	08:10	1.09	0.67	05:05	1.11	09:50	5.08	2.78	02:50	0.003	09:50	0.092	0.029	0.029	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			1.606	1.59
Avg	0.66	2.65	0.027	

Site Commentary

Site Information

41D-51	
Pipe Dimensions	7.75 "
Silt Level	0.00"

Overview

Site 41D-51 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 42% full at its recorded peak of 3.26 inches and approximately 26% full during its recorded average depth of 1.99 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.99	0.47	0.022
Minimum	1.10	0.17	0.004
Maximum	3.69	1.32	0.136
Time of Minimum	2/12/2016 1:30 AM	2/2/2016 5:30 AM	2/5/2016 5:30 AM
Time of Maximum	2/17/2016 2:00 PM	2/17/2016 2:00 PM	2/17/2016 2:00 PM

Data Quality

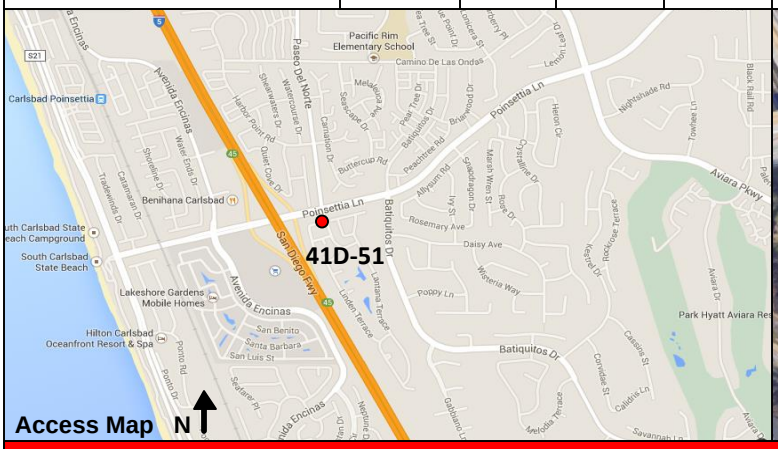
Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

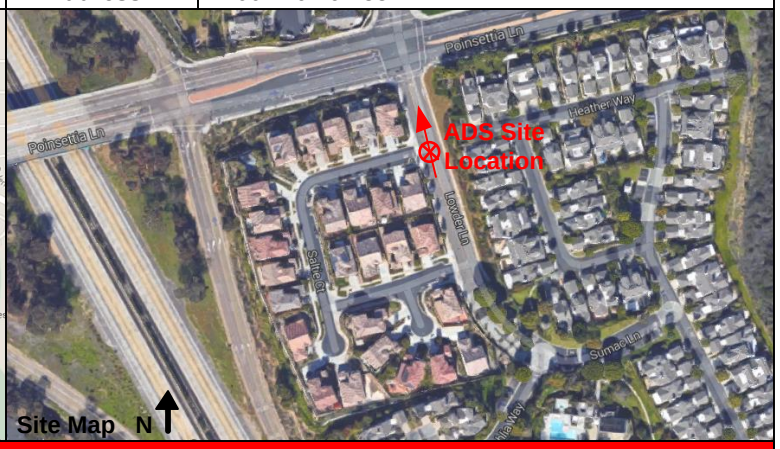
Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

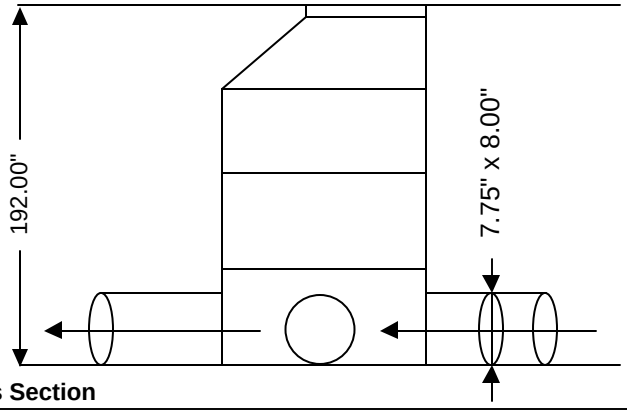
Project Name:	Carlsbad_2015	**City / State:**	Carlsbad, CA	**Date Installed:** 1/21/16	**FM Initials:** JG
Site Name:	41D-51	**Monitor Series:**	5000AG	**Monitor S/N:**	16013
Address / Location:	717 Lazarette Way			**Manhole #:**	41D-51
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.75"
					Pipe Width: 8.00"
					IP Address: #166.219.19.133



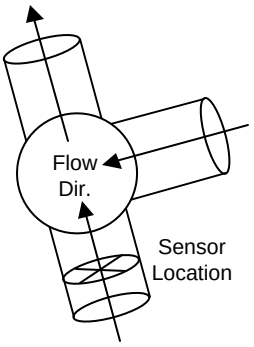


Investigation Information:		Manhole Information:	
Date/Time of Investigation:	1/26/15 @ 10:30 AM	**Manhole Depth:**	192.00" **Inches**
Site Hydraulics: Low depth with low velocity		**Manhole Material / Condition:**	Precast / Good
Upstream Input: (L/S,P/S)	N/A	**Pipe Material / Condition:**	PVC / Good
Upstream Manhole:	DNI	**Mini System Character:**	**Residential** [x] **Commercial** [ ] **Industrial** [ ] **Other** [ ]
Downstream Manhole:	DNI	**Telephone Information:**	N/A
Depth of Flow (Wet Dof):	2.25 +/- 0.25	**Access Pole #:**	N/A
Range (Air Dof):	+/-	**Distance From Manhole:**	N/A **Feet**
Peak Velocity:	0.60 **Fps**	**Road Cut Length:**	N/A **Feet**
Silt:	0.00" **Inches**	**Trench Length:**	N/A **Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[x]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

41D-51

Flow Monitor

41D-51

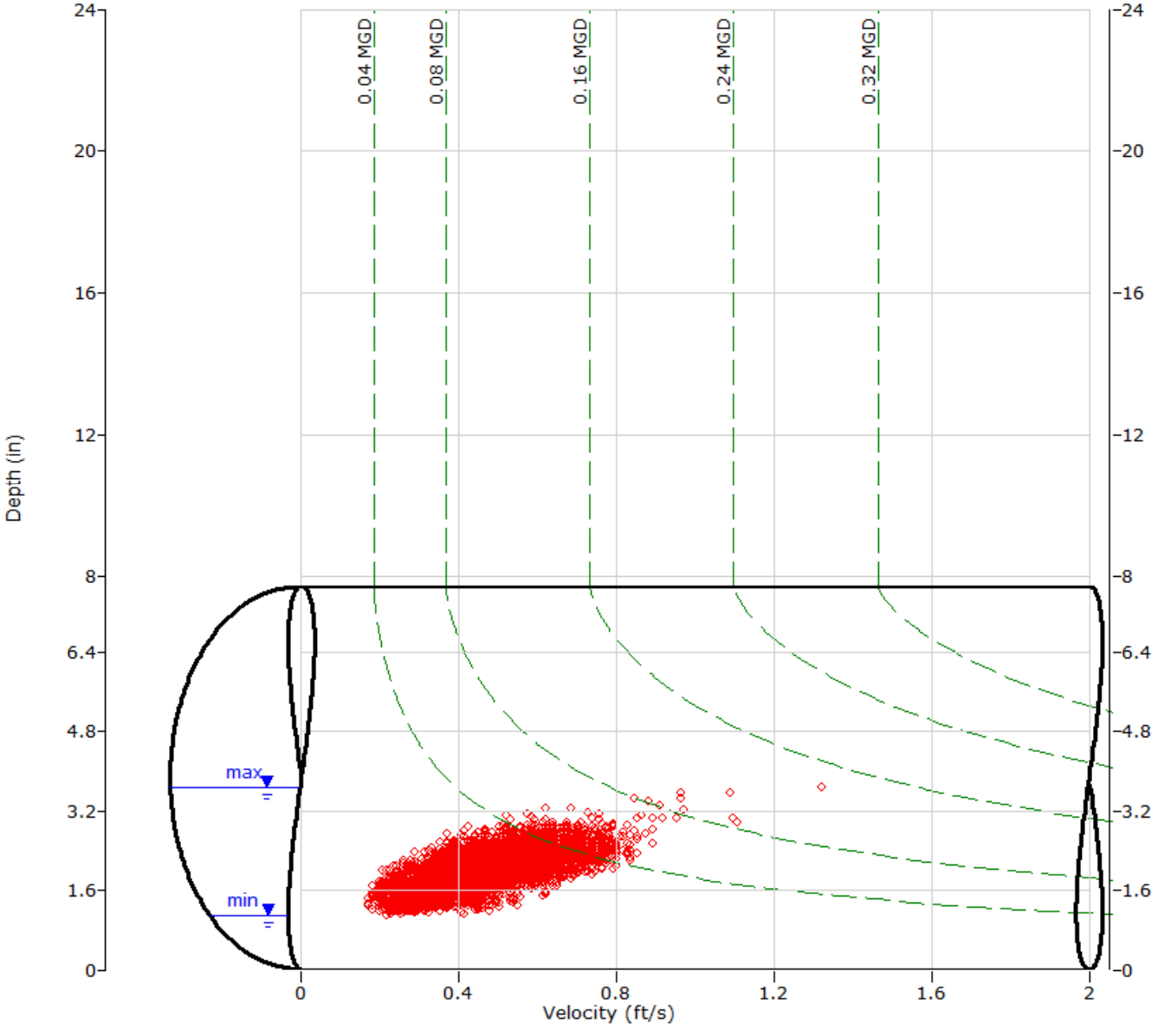
Pipe Height
7.75 in

Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



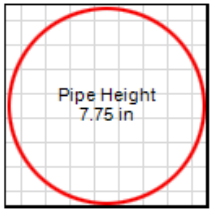
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

41D-51

Flow Monitor

41D-51

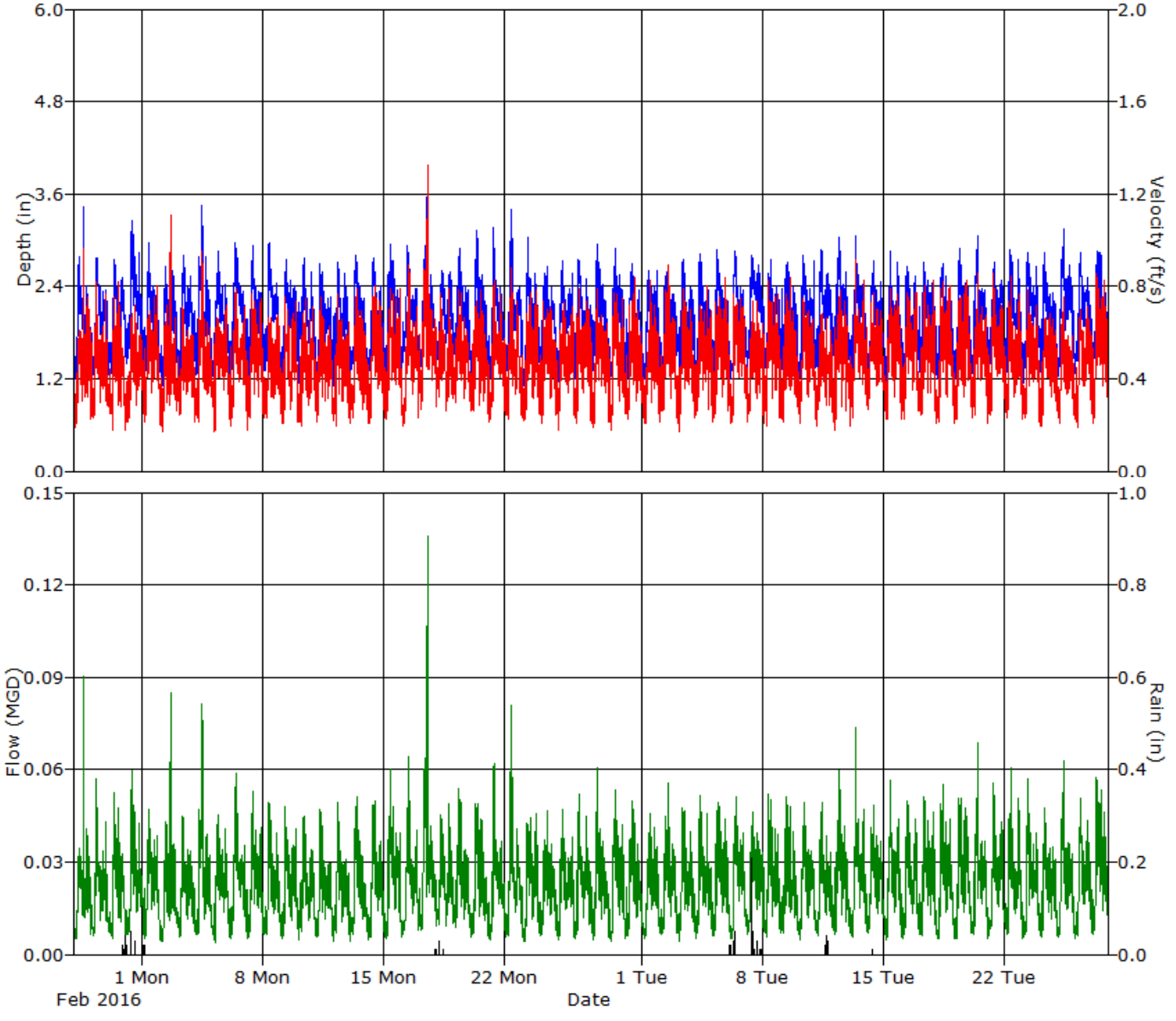


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

41D-51, Pipe Height: 7.75 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	02:30	1.20	14:00	3.44	1.90	03:45	0.19	14:00	0.96	0.44	04:15	0.005	14:00	0.090	0.020	0.020	
1/29/2016	02:15	1.23	09:45	2.77	1.93	01:00	0.22	08:15	0.82	0.46	04:30	0.006	08:15	0.057	0.021	0.021	
1/30/2016	02:00	1.26	08:30	2.75	2.01	06:45	0.18	15:15	0.82	0.44	06:45	0.005	08:30	0.053	0.021	0.021	0.06
1/31/2016	03:00	1.39	11:00	3.26	2.17	01:00	0.18	13:30	0.72	0.42	01:00	0.005	09:15	0.059	0.023	0.023	0.29
2/1/2016	03:45	1.21	09:45	2.96	1.96	03:15	0.22	21:00	0.80	0.47	03:45	0.005	09:45	0.047	0.022	0.022	0.05
2/2/2016	03:15	1.11	15:30	2.96	1.90	05:30	0.17	15:30	1.11	0.44	05:30	0.004	15:30	0.085	0.020	0.020	
2/3/2016	04:45	1.15	09:30	2.80	1.96	04:30	0.24	08:30	0.71	0.46	04:30	0.005	08:30	0.045	0.021	0.021	
2/4/2016	03:45	1.25	11:15	3.45	2.05	01:45	0.22	11:30	0.95	0.46	04:15	0.006	11:45	0.081	0.023	0.023	
2/5/2016	05:30	1.22	10:00	2.85	1.93	04:00	0.17	22:00	0.72	0.47	05:30	0.004	10:00	0.045	0.021	0.021	
2/6/2016	00:45	1.26	08:45	2.96	2.06	02:45	0.20	11:00	0.79	0.47	02:45	0.005	11:00	0.059	0.023	0.023	
2/7/2016	05:00	1.17	09:45	2.92	1.98	03:30	0.18	08:30	0.76	0.48	03:30	0.005	09:45	0.053	0.022	0.022	
2/8/2016	02:00	1.30	09:15	2.96	2.03	02:30	0.23	21:45	0.67	0.44	02:30	0.006	08:30	0.049	0.021	0.021	
2/9/2016	02:30	1.26	07:45	2.74	1.97	03:45	0.21	07:15	0.76	0.45	03:45	0.005	07:15	0.048	0.021	0.021	
2/10/2016	02:00	1.15	09:45	2.76	1.99	05:00	0.20	12:15	0.75	0.45	02:00	0.005	09:45	0.045	0.021	0.021	
2/11/2016	02:45	1.19	08:00	2.70	1.89	03:45	0.22	09:45	0.76	0.45	03:45	0.006	08:00	0.047	0.020	0.020	
2/12/2016	01:30	1.10	09:00	2.72	1.92	05:30	0.20	07:30	0.76	0.45	01:30	0.004	09:00	0.049	0.020	0.020	
2/13/2016	02:00	1.10	10:15	2.80	1.97	02:15	0.21	11:15	0.79	0.45	02:00	0.004	11:15	0.051	0.021	0.021	
2/14/2016	02:30	1.12	10:30	2.76	1.93	03:15	0.21	11:30	0.80	0.47	03:15	0.005	11:30	0.050	0.021	0.021	
2/15/2016	02:30	1.20	09:00	2.94	2.03	03:30	0.22	09:00	0.79	0.49	04:45	0.005	09:00	0.060	0.024	0.024	
2/16/2016	01:15	1.19	09:45	2.92	2.03	03:45	0.20	11:15	0.89	0.48	01:15	0.006	11:15	0.064	0.023	0.023	
2/17/2016	04:15	1.36	14:00	3.69	2.09	03:30	0.27	14:00	1.32	0.57	04:30	0.008	14:00	0.136	0.030	0.030	0.02
2/18/2016	04:00	1.45	08:45	2.61	2.02	15:45	0.26	19:45	0.79	0.48	15:45	0.009	19:45	0.049	0.022	0.022	0.09
2/19/2016	01:15	1.48	10:15	2.90	2.01	04:00	0.30	08:00	0.78	0.48	04:00	0.009	08:00	0.054	0.023	0.023	
2/20/2016	01:15	1.23	09:00	3.13	1.99	01:15	0.26	16:15	0.78	0.48	01:15	0.006	11:00	0.049	0.023	0.023	
2/21/2016	04:15	1.21	09:00	3.16	1.97	03:45	0.22	10:00	0.83	0.47	04:45	0.005	10:00	0.062	0.023	0.023	
2/22/2016	03:00	1.24	09:00	3.39	2.03	05:30	0.22	09:00	0.88	0.44	03:00	0.005	09:00	0.081	0.022	0.022	
2/23/2016	03:45	1.10	08:30	3.03	1.95	03:45	0.22	19:45	0.78	0.47	03:45	0.004	19:45	0.046	0.022	0.022	
2/24/2016	04:15	1.19	11:45	2.66	1.95	03:45	0.21	06:30	0.74	0.46	01:45	0.006	11:45	0.047	0.021	0.021	
2/25/2016	04:30	1.17	08:30	2.73	1.92	03:00	0.18	11:30	0.73	0.46	04:00	0.005	09:45	0.047	0.021	0.021	
2/26/2016	02:45	1.19	07:15	2.74	1.95	04:00	0.21	08:15	0.79	0.48	02:30	0.005	07:45	0.052	0.022	0.022	
2/27/2016	04:45	1.31	09:00	2.95	2.03	04:45	0.19	09:00	0.79	0.46	04:45	0.005	09:00	0.060	0.022	0.022	
2/28/2016	05:15	1.23	10:30	2.89	1.97	05:45	0.18	08:15	0.77	0.48	05:45	0.004	10:30	0.053	0.023	0.023	
2/29/2016	01:15	1.19	10:15	2.69	1.94	04:30	0.22	14:30	0.84	0.46	01:15	0.005	10:15	0.050	0.021	0.021	
3/1/2016	03:00	1.19	08:45	2.61	1.92	04:00	0.21	11:30	0.83	0.45	04:00	0.005	11:30	0.046	0.020	0.020	
3/2/2016	04:00	1.32	09:30	2.58	1.94	01:15	0.22	11:45	0.89	0.49	02:00	0.007	11:45	0.056	0.022	0.022	
3/3/2016	03:45	1.31	09:00	2.74	1.96	03:45	0.17	09:45	0.79	0.47	03:45	0.004	08:00	0.047	0.022	0.022	
3/4/2016	04:00	1.19	08:15	2.82	1.95	00:30	0.23	19:00	0.80	0.48	02:30	0.005	08:15	0.052	0.022	0.022	
3/5/2016	03:30	1.16	08:45	2.88	2.03	02:15	0.22	20:15	0.84	0.50	03:30	0.006	10:30	0.049	0.024	0.024	
3/6/2016	03:45	1.19	09:30	2.85	1.97	03:15	0.21	07:15	0.76	0.49	04:45	0.005	11:15	0.051	0.023	0.023	0.30
3/7/2016	02:45	1.29	07:45	2.81	2.15	03:00	0.22	11:00	0.74	0.45	02:30	0.006	11:00	0.046	0.023	0.023	0.57
3/8/2016	02:30	1.23	10:45	2.74	1.99	05:30	0.20	07:45	0.83	0.49	05:30	0.006	07:45	0.052	0.023	0.023	
3/9/2016	02:30	1.33	09:45	2.71	2.00	04:00	0.22	14:15	0.84	0.47	01:30	0.007	08:00	0.051	0.022	0.022	
3/10/2016	04:30	1.21	08:30	2.80	1.96	03:15	0.21	07:30	0.75	0.47	03:15	0.005	09:00	0.049	0.022	0.022	
3/11/2016	05:00	1.24	09:30	2.88	2.08	02:45	0.20	10:45	0.68	0.43	05:00	0.006	10:00	0.049	0.021	0.021	0.20
3/12/2016	02:15	1.50	10:15	3.03	2.13	04:30	0.18	11:00	0.78	0.47	04:30	0.006	10:15	0.060	0.024	0.024	
3/13/2016	03:45	1.19	08:45	3.06	1.99	02:00	0.20	08:45	0.92	0.50	05:30	0.005	08:45	0.074	0.024	0.024	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	03:45	1.31	10:30	2.73	1.98	03:30	0.27	09:45	0.77	0.50	03:30	0.007	10:30	0.048	0.023	0.023	0.01
3/15/2016	04:00	1.17	09:00	2.86	1.94	02:45	0.22	09:15	0.79	0.50	02:45	0.005	09:00	0.057	0.023	0.023	
3/16/2016	03:30	1.16	08:15	2.65	1.91	00:45	0.22	08:30	0.77	0.51	03:30	0.005	08:15	0.050	0.023	0.023	
3/17/2016	03:15	1.21	08:45	2.72	1.99	03:45	0.24	20:45	0.83	0.50	05:15	0.006	08:45	0.051	0.023	0.023	
3/18/2016	03:30	1.19	10:00	2.69	1.97	01:45	0.21	10:00	0.82	0.49	03:30	0.005	10:00	0.055	0.023	0.023	
3/19/2016	03:45	1.19	10:30	2.89	2.00	02:45	0.21	20:00	0.83	0.49	05:30	0.005	11:15	0.051	0.023	0.023	
3/20/2016	03:15	1.27	10:30	3.06	2.00	03:30	0.23	10:30	0.85	0.49	04:45	0.007	10:30	0.069	0.023	0.023	
3/21/2016	03:30	1.26	09:45	2.72	2.01	01:45	0.21	09:00	0.85	0.50	01:45	0.005	09:00	0.056	0.024	0.024	
3/22/2016	04:15	1.28	07:30	2.87	2.01	03:30	0.23	09:45	0.85	0.49	03:30	0.007	09:45	0.061	0.023	0.023	
3/23/2016	03:15	1.15	08:30	2.84	2.03	02:00	0.22	08:30	0.78	0.46	02:00	0.005	08:30	0.057	0.023	0.023	
3/24/2016	03:00	1.29	07:15	2.84	1.99	02:15	0.20	16:45	0.68	0.46	04:15	0.006	07:15	0.048	0.022	0.022	
3/25/2016	03:45	1.24	10:15	3.15	2.11	04:45	0.21	10:15	0.76	0.43	03:45	0.005	10:15	0.063	0.022	0.022	
3/26/2016	03:15	1.27	09:30	2.83	2.05	05:30	0.19	19:15	0.71	0.45	03:15	0.005	09:30	0.051	0.023	0.023	
3/27/2016	02:00	1.27	09:30	2.86	2.07	03:00	0.21	08:15	0.85	0.51	03:00	0.007	08:15	0.057	0.026	0.026	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			1.341	1.59
Avg	1.99	0.47	0.022	

Site Commentary

Site Information

42C-10	
Pipe Dimensions	7.88 "
Silt Level	0.00"

Overview

Site 42C-10 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line exhibits a hydraulic jump. This condition is experienced when flow transitions from super critical to sub-critical flow.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. However, it is possible that during the transition as the jump moves through the meter location, the flow rate calculation based on the measured depth and velocity can have momentary error.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 35% full at its recorded peak of 2.73 inches and approximately 19% full during its recorded average depth of 1.49 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.49	1.88	0.063
Minimum	0.33	0.39	0.003
Maximum	2.82	3.35	0.229
Time of Minimum	2/11/2016 4:15 AM	1/29/2016 11:30 PM	2/17/2016 11:45 PM
Time of Maximum	2/11/2016 9:05 AM	2/11/2016 8:45 AM	2/11/2016 9:05 AM

Data Quality

Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2015	**City / State:** Carlsbad, CA		**Date Installed:** 1/22/16	**FM Initials:** JG	
Site Name: 42C-10	**Monitor Series:** 5000AG		**Monitor S/N:**	16042	
Address / Location: 7017-7049 Batiquitos Dr			**Manhole #:**	42C-10	
			Map Page #:	N/A	
Access: Drive- 80 yards south of the Poinsettia Ln and Batiquitos Dr	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.88"
					Pipe Width: 7.88"
					IP Address: #166.219.19.144

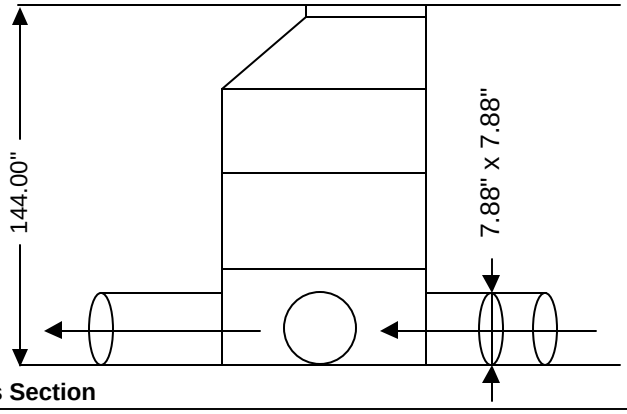
Investigation Information:

Date/Time of Investigation:	1/27/15 @ 2:00 PM		
Site Hydraulics: Low depth with slow velocity			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.63	**+/-**	0.25
Range (Air Dof):		**+/-**	
Peak Velocity:	1.96	**Fps**	
Silt:	0.00"	**Inches**	

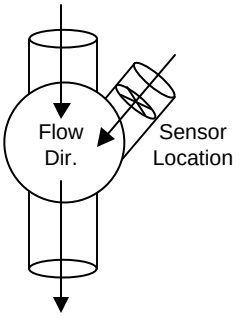
Manhole Information:

Manhole Depth:	144.00"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	PVC / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

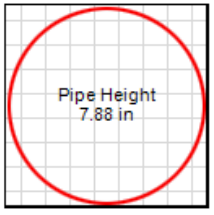
Additional Site Information / Comments:

SCATTERGRAPH REPORT

42C-10

Flow Monitor

42C-10

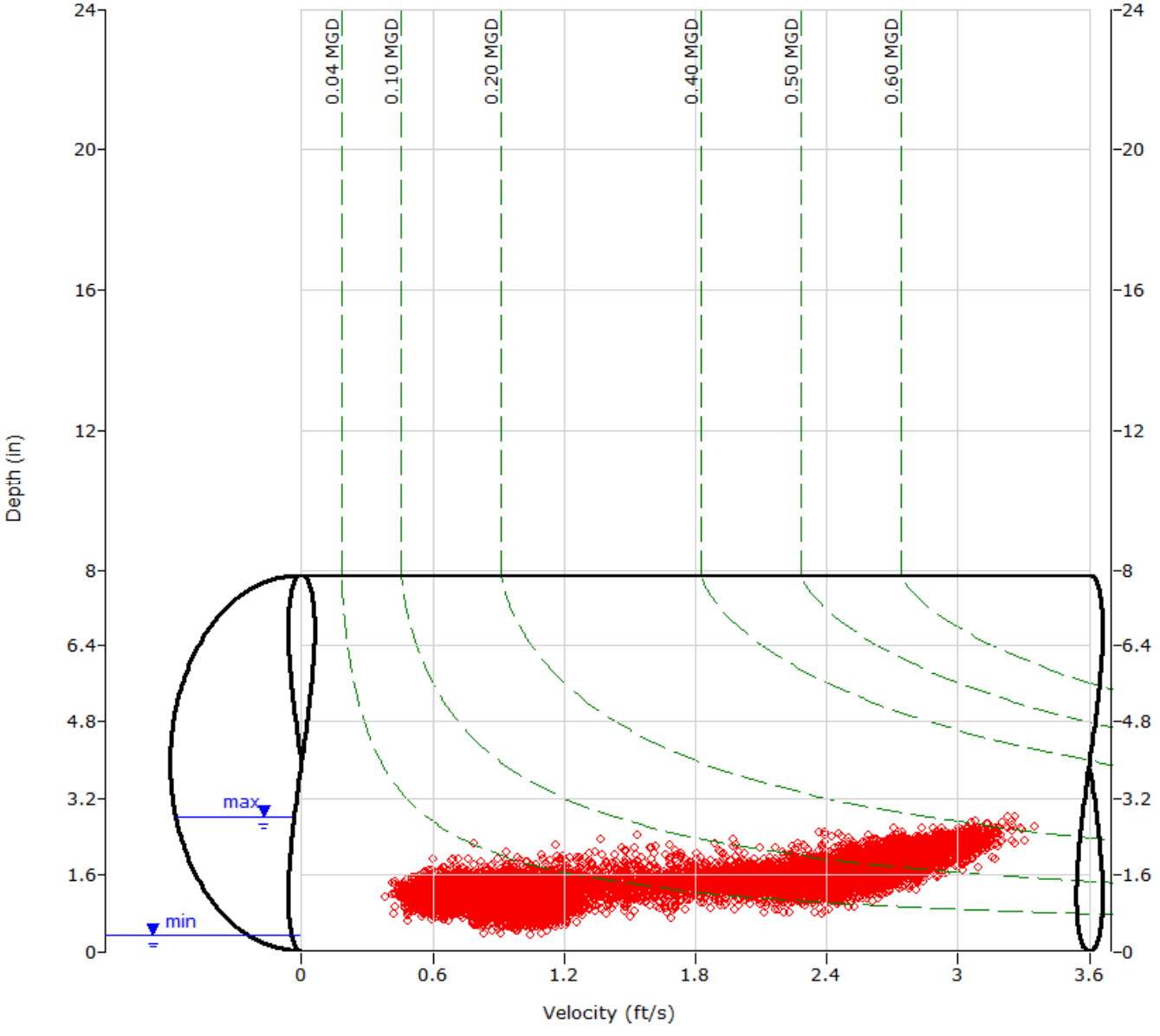


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



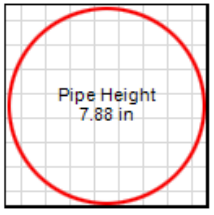
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

42C-10

Flow Monitor

42C-10

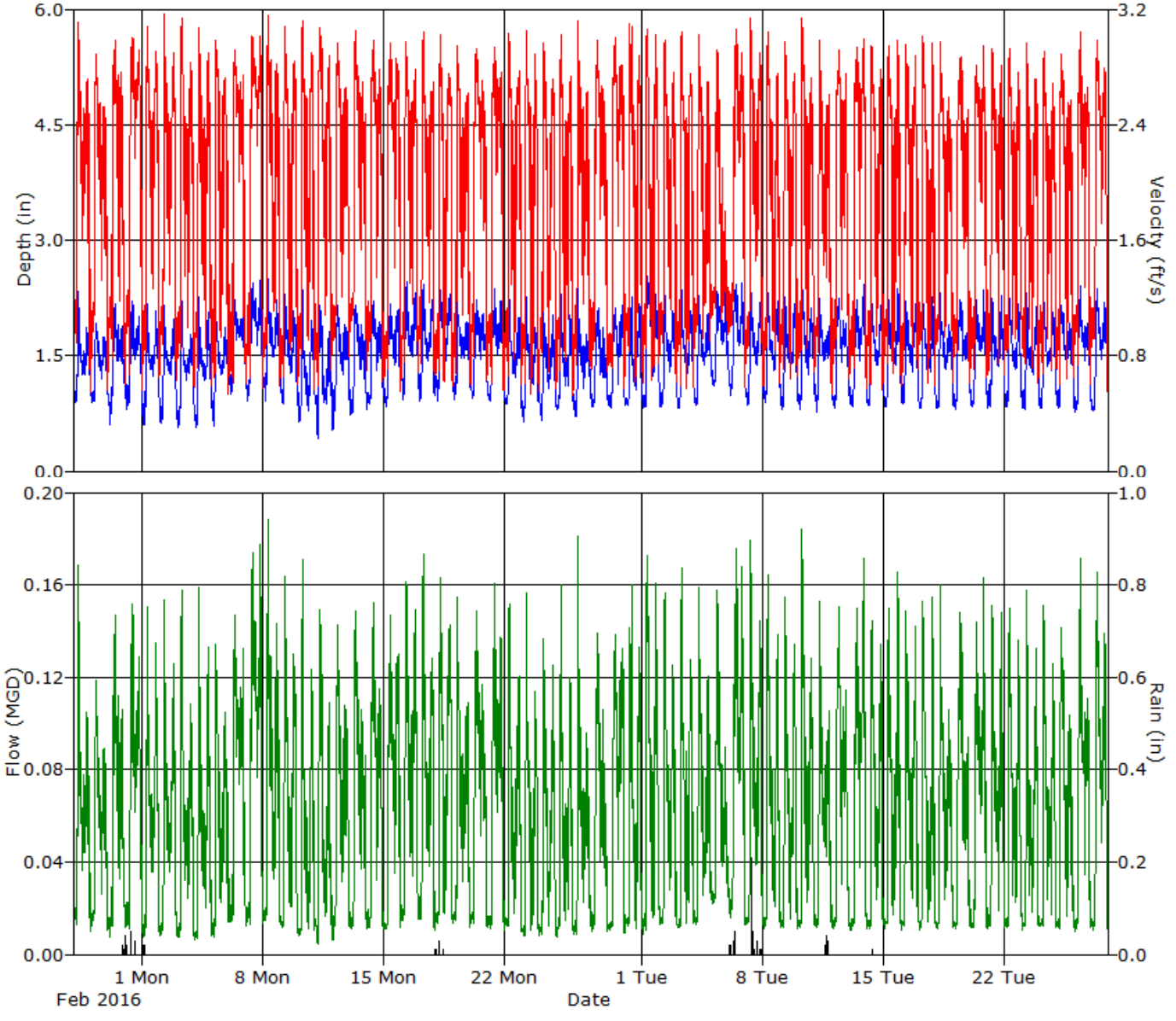


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

42C-10, Pipe Height: 7.88 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	04:10	0.71	07:00	2.57	1.39	23:35	0.50	07:00	3.29	1.98	00:00	0.008	07:00	0.204	0.058	0.058	
1/29/2016	01:30	0.77	18:35	2.11	1.40	23:30	0.39	07:30	3.07	1.87	00:00	0.007	07:30	0.129	0.055	0.055	
1/30/2016	03:10	0.56	10:25	2.33	1.43	06:25	0.53	10:25	3.11	1.92	03:05	0.006	10:25	0.168	0.060	0.060	0.06
1/31/2016	03:00	0.54	11:00	2.26	1.47	05:50	0.50	09:00	3.13	2.10	05:50	0.006	09:00	0.161	0.068	0.068	0.29
2/1/2016	04:00	0.50	06:55	2.26	1.35	23:55	0.48	07:10	3.11	2.02	00:30	0.004	06:55	0.156	0.058	0.058	0.05
2/2/2016	03:40	0.48	07:10	2.26	1.34	22:35	0.49	07:10	3.26	1.95	03:40	0.006	07:10	0.169	0.057	0.057	
2/3/2016	04:15	0.43	07:20	2.30	1.30	05:15	0.52	07:20	3.20	1.92	04:15	0.004	07:20	0.170	0.053	0.053	
2/4/2016	03:25	0.54	06:45	2.34	1.30	00:05	0.52	06:45	3.10	1.85	00:40	0.005	06:45	0.169	0.052	0.052	
2/5/2016	03:40	0.51	06:35	2.18	1.36	23:25	0.43	06:35	3.11	1.85	00:15	0.006	06:35	0.153	0.054	0.054	
2/6/2016	02:55	0.75	08:20	2.37	1.66	06:25	0.51	09:15	3.07	1.93	02:10	0.010	10:10	0.161	0.072	0.072	
2/7/2016	02:45	0.70	07:25	2.73	1.73	06:20	0.45	07:25	3.25	2.06	06:20	0.009	07:25	0.219	0.086	0.086	
2/8/2016	03:35	0.90	07:05	2.72	1.65	00:10	0.50	07:05	3.25	1.94	00:10	0.010	07:05	0.218	0.073	0.073	
2/9/2016	23:45	0.79	07:15	2.50	1.50	14:45	0.50	07:15	3.17	1.84	14:45	0.008	07:15	0.189	0.062	0.062	
2/10/2016	04:20	0.55	07:25	2.45	1.25	23:25	0.50	07:25	3.18	1.87	15:30	0.007	07:25	0.184	0.050	0.050	
2/11/2016	04:15	0.33	09:05	2.82	1.23	05:00	0.42	08:45	3.35	2.01	04:15	0.003	09:05	0.229	0.053	0.053	
2/12/2016	01:50	0.43	07:30	2.27	1.46	05:35	0.50	07:30	3.15	2.02	01:45	0.005	07:30	0.164	0.065	0.065	
2/13/2016	04:35	0.63	08:25	2.33	1.44	23:25	0.50	08:40	3.25	2.01	04:35	0.008	08:40	0.173	0.063	0.063	
2/14/2016	01:05	0.70	10:25	2.55	1.49	00:10	0.48	10:25	3.29	1.95	04:55	0.006	10:25	0.202	0.066	0.066	
2/15/2016	03:00	0.65	10:00	2.47	1.52	23:55	0.47	10:00	3.18	1.99	03:00	0.008	10:00	0.186	0.068	0.068	
2/16/2016	04:05	0.84	09:05	2.81	1.69	23:45	0.46	09:05	3.23	1.99	00:10	0.011	09:05	0.226	0.077	0.077	
2/17/2016	23:45	0.36	07:50	2.52	1.62	22:40	0.43	07:50	3.09	1.90	23:45	0.003	07:50	0.186	0.070	0.070	0.02
2/18/2016	03:20	0.83	07:00	2.50	1.65	14:15	0.47	06:35	3.15	1.80	23:30	0.012	07:00	0.185	0.070	0.070	0.09
2/19/2016	02:20	0.88	07:00	2.46	1.57	00:00	0.49	07:00	3.05	1.84	23:40	0.011	07:00	0.178	0.064	0.064	
2/20/2016	04:00	0.89	09:45	2.36	1.58	23:25	0.45	09:45	3.01	1.96	05:10	0.008	09:45	0.166	0.070	0.070	
2/21/2016	04:00	0.85	10:10	2.43	1.57	23:15	0.45	09:45	3.01	1.96	23:35	0.010	10:40	0.168	0.071	0.071	
2/22/2016	00:40	0.75	06:55	2.36	1.42	23:15	0.50	06:35	3.05	1.86	23:15	0.007	06:55	0.168	0.058	0.058	
2/23/2016	02:55	0.61	07:00	2.45	1.33	13:00	0.48	19:10	3.17	1.84	05:45	0.008	07:00	0.174	0.053	0.053	
2/24/2016	03:45	0.53	07:10	2.37	1.32	00:20	0.48	07:10	3.15	1.79	04:10	0.006	07:10	0.175	0.051	0.051	
2/25/2016	01:15	0.76	07:00	2.56	1.35	23:05	0.45	07:00	3.09	1.75	01:15	0.005	07:00	0.190	0.052	0.052	
2/26/2016	03:30	0.66	07:10	2.60	1.36	23:20	0.46	07:10	3.22	1.82	05:30	0.008	07:10	0.203	0.054	0.054	
2/27/2016	03:05	0.68	11:15	2.36	1.38	23:40	0.50	09:50	3.14	1.94	01:20	0.007	11:15	0.171	0.058	0.058	
2/28/2016	00:55	0.80	11:50	2.54	1.48	06:15	0.46	19:40	3.12	1.98	23:35	0.007	11:50	0.188	0.067	0.067	
2/29/2016	00:35	0.70	08:15	2.37	1.40	16:00	0.48	10:00	3.17	1.87	23:40	0.007	10:15	0.170	0.058	0.058	
3/1/2016	04:40	0.70	06:50	2.57	1.62	05:05	0.46	06:40	3.19	1.78	01:15	0.007	06:50	0.187	0.068	0.068	
3/2/2016	01:30	0.79	07:15	2.39	1.51	23:00	0.49	07:10	3.08	1.88	23:50	0.009	07:15	0.170	0.064	0.064	
3/3/2016	03:05	0.76	07:05	2.52	1.47	23:10	0.41	06:50	3.18	1.76	23:10	0.009	07:05	0.192	0.059	0.059	
3/4/2016	02:50	0.82	06:50	2.56	1.53	13:00	0.43	06:50	3.17	1.79	04:10	0.011	06:50	0.195	0.061	0.061	
3/5/2016	01:55	1.07	08:20	2.51	1.70	15:45	0.66	08:20	3.11	1.60	01:50	0.019	08:20	0.187	0.061	0.061	
3/6/2016	03:30	0.95	19:00	2.71	1.69	23:00	0.55	11:45	3.14	1.99	23:05	0.012	19:00	0.205	0.078	0.078	0.30
3/7/2016	03:15	0.83	07:05	2.62	1.57	05:30	0.49	07:05	3.25	1.96	00:20	0.011	07:05	0.207	0.070	0.070	0.57
3/8/2016	04:00	0.81	06:30	2.42	1.53	01:20	0.43	06:25	3.13	1.77	01:20	0.009	06:30	0.178	0.062	0.062	
3/9/2016	04:15	0.77	06:35	2.45	1.51	03:50	0.48	06:35	3.11	1.84	03:50	0.007	06:35	0.181	0.062	0.062	
3/10/2016	03:25	0.78	06:45	2.50	1.51	14:20	0.51	06:45	3.17	1.77	00:00	0.010	06:45	0.189	0.062	0.062	
3/11/2016	02:50	0.76	07:05	2.37	1.49	23:20	0.48	07:05	3.09	1.77	00:35	0.010	07:05	0.171	0.059	0.059	0.20
3/12/2016	03:25	0.79	09:35	2.42	1.53	00:10	0.50	09:35	3.10	1.84	23:30	0.009	09:35	0.177	0.064	0.064	
3/13/2016	01:40	0.81	20:25	2.69	1.54	00:35	0.54	20:25	3.20	1.97	03:00	0.010	20:25	0.211	0.071	0.071	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	02:20	0.83	07:40	2.24	1.51	22:55	0.49	07:40	3.03	1.87	05:20	0.009	07:40	0.155	0.064	0.064	0.01
3/15/2016	01:55	0.80	20:00	2.55	1.50	23:40	0.49	20:00	3.15	1.82	00:00	0.009	20:00	0.193	0.062	0.062	
3/16/2016	04:10	0.80	20:40	2.39	1.50	23:25	0.48	07:00	3.04	1.92	00:00	0.009	20:40	0.170	0.064	0.064	
3/17/2016	04:05	0.79	20:15	2.38	1.46	23:45	0.50	06:55	3.14	1.73	04:25	0.009	06:55	0.174	0.056	0.056	
3/18/2016	03:50	0.77	07:40	2.45	1.46	13:30	0.55	07:40	3.13	1.88	01:10	0.010	07:40	0.182	0.060	0.060	
3/19/2016	04:20	0.79	10:40	2.56	1.49	00:30	0.50	10:40	3.11	1.85	00:30	0.009	10:40	0.191	0.062	0.062	
3/20/2016	03:15	0.79	19:20	2.54	1.52	23:00	0.49	19:20	3.04	1.92	02:05	0.010	19:20	0.186	0.066	0.066	
3/21/2016	01:50	0.80	07:05	2.56	1.50	23:35	0.49	07:05	3.10	1.89	02:20	0.011	07:05	0.191	0.063	0.063	
3/22/2016	01:45	0.81	19:45	2.32	1.49	16:50	0.48	08:20	3.00	1.84	03:55	0.010	19:45	0.160	0.061	0.061	
3/23/2016	02:05	0.79	20:00	2.44	1.44	23:10	0.46	07:00	3.01	1.73	23:45	0.009	20:00	0.172	0.056	0.056	
3/24/2016	03:25	0.79	06:50	2.50	1.49	12:55	0.41	20:05	3.05	1.83	05:20	0.010	06:50	0.180	0.061	0.061	
3/25/2016	04:00	0.80	07:55	2.49	1.50	05:55	0.43	07:15	3.07	1.83	05:55	0.009	07:55	0.181	0.061	0.061	
3/26/2016	01:40	0.75	09:35	2.43	1.52	23:50	0.45	09:30	3.05	1.92	03:50	0.009	09:35	0.174	0.066	0.066	
3/27/2016	04:00	0.76	09:30	2.56	1.53	06:35	0.50	09:30	3.15	1.95	23:25	0.009	09:30	0.194	0.069	0.069	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			3.755	1.59
Avg	1.49	1.88	0.063	

Site Commentary

Site Information

42C-47	
Pipe Dimensions	7.75 "
Silt Level	0.00"

Overview

Site 42C-47 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 9% full at its recorded peak of .68 inches and approximately 5% full during its recorded average depth of 0.41 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.41	2.95	0.015
Minimum	0.17	0.51	0.001
Maximum	1.20	7.49	0.159
Time of Minimum	2/9/2016 3:25 AM	2/19/2016 3:10 AM	2/19/2016 3:15 AM
Time of Maximum	2/8/2016 8:25 AM	2/8/2016 8:25 AM	2/8/2016 8:25 AM

Data Quality

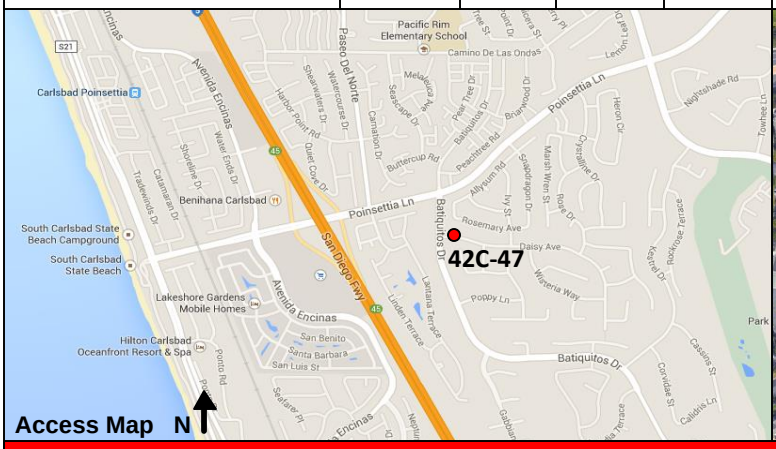
Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2015	**City / State:** Carlsbad, CA			**Date Installed:** 1/22/16	**FM Initials:** JG
Site Name: 42C-47	**Monitor Series:** 5000AG			**Monitor S/N:**	21797
Address / Location: 910 Daisy Ave.				**Manhole #:**	42C-47
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.75"
					Pipe Width: 7.88"
					IP Address: #166.219.19.130



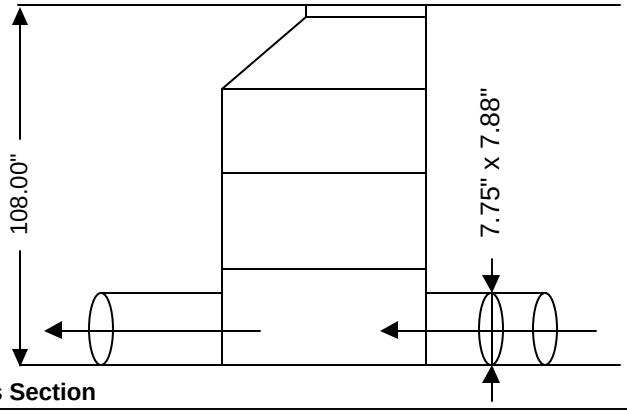
Investigation Information:

Date/Time of Investigation:	1/26/15 @ 1:00 PM
Site Hydraulics: Low depth with moderate velocity	
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	0.50 +/- 0.25
Range (Air Dof):	+/-
Peak Velocity:	3.50 Fps
Silt:	0.00" Inches

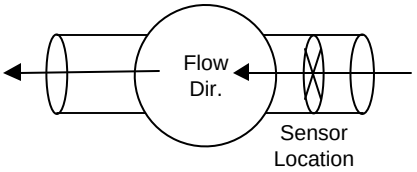
Manhole Information:

Manhole Depth:	108.00"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	PVC / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

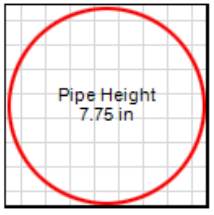
Additional Site Information / Comments:

SCATTERGRAPH REPORT

42C-47

Flow Monitor

42C-47

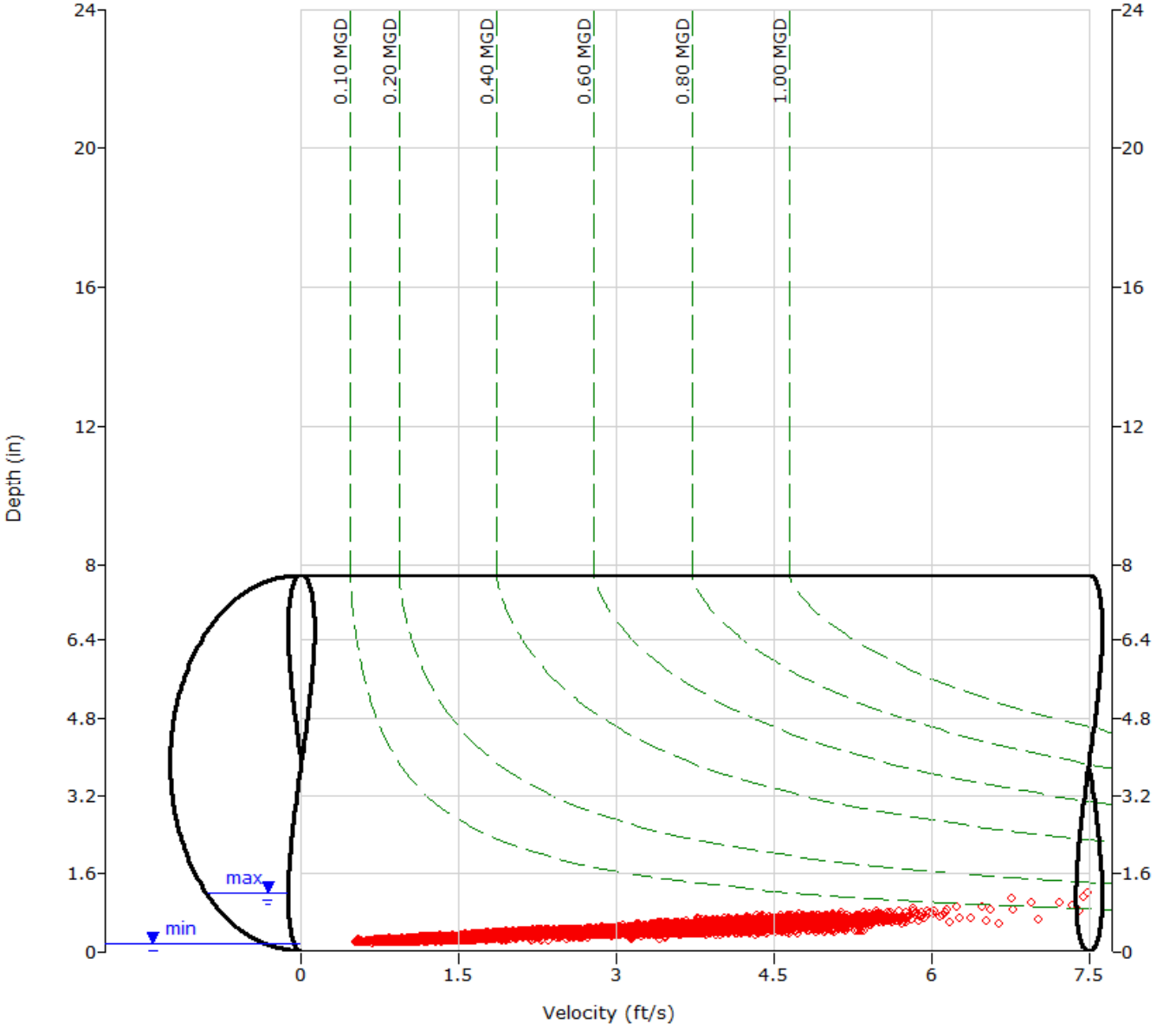


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



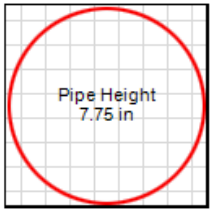
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

42C-47

Flow Monitor

42C-47

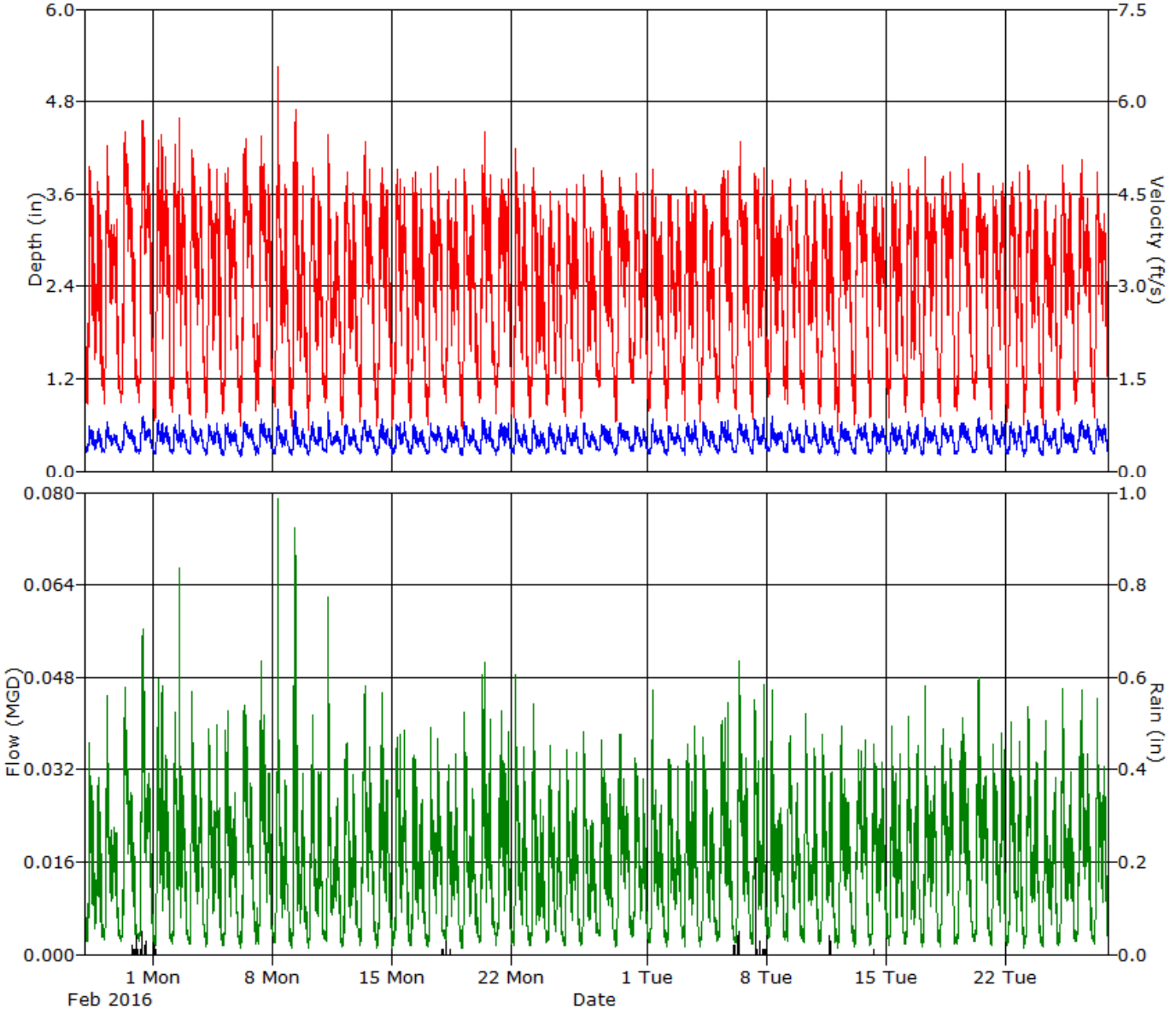


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

42C-47, Pipe Height: 7.75 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	02:35	0.22	19:35	0.68	0.39	02:25	0.97	07:25	5.64	2.98	02:35	0.002	07:25	0.051	0.014	0.014	
1/29/2016	00:30	0.22	07:55	0.72	0.39	04:05	1.04	07:55	5.78	2.95	04:05	0.002	07:55	0.058	0.014	0.014	
1/30/2016	04:20	0.21	09:35	0.73	0.42	03:15	1.02	09:45	6.08	3.21	04:20	0.002	09:45	0.061	0.018	0.018	0.06
1/31/2016	05:10	0.20	10:35	0.85	0.42	04:35	0.94	10:35	6.16	3.26	05:10	0.002	10:35	0.079	0.019	0.019	0.29
2/1/2016	03:15	0.21	13:45	0.76	0.42	04:20	0.76	13:20	7.02	3.27	04:20	0.001	13:45	0.065	0.018	0.018	0.05
2/2/2016	04:50	0.21	14:15	1.12	0.41	04:50	0.84	14:15	7.45	3.12	04:50	0.001	14:15	0.143	0.017	0.017	
2/3/2016	04:55	0.20	07:55	0.73	0.41	03:50	0.76	10:55	5.72	3.13	05:00	0.001	07:50	0.055	0.016	0.016	
2/4/2016	02:25	0.18	18:10	0.73	0.41	05:00	0.67	06:50	5.63	3.09	04:55	0.001	18:20	0.056	0.016	0.016	
2/5/2016	03:40	0.19	09:25	0.80	0.40	04:25	0.82	09:25	5.62	2.95	05:20	0.001	09:25	0.066	0.015	0.015	
2/6/2016	05:10	0.18	19:00	0.72	0.41	03:35	0.69	08:00	5.66	3.10	04:15	0.001	08:20	0.053	0.017	0.017	
2/7/2016	02:15	0.18	13:25	0.79	0.43	01:45	0.71	13:25	5.91	3.25	01:45	0.001	13:25	0.068	0.018	0.018	
2/8/2016	03:55	0.18	08:25	1.20	0.41	05:35	0.66	08:25	7.49	3.00	05:35	0.001	08:25	0.159	0.016	0.016	
2/9/2016	03:25	0.17	08:50	1.07	0.41	04:50	0.53	08:35	7.23	2.88	04:50	0.001	08:50	0.122	0.016	0.016	
2/10/2016	02:05	0.20	09:15	0.71	0.40	03:35	0.52	21:10	5.41	2.82	03:35	0.001	09:15	0.052	0.014	0.014	
2/11/2016	04:55	0.21	07:35	0.88	0.40	00:20	0.89	07:25	5.91	2.85	00:20	0.002	07:35	0.079	0.014	0.014	
2/12/2016	01:20	0.21	08:45	0.70	0.39	02:55	0.71	09:40	5.67	2.80	01:20	0.001	09:40	0.054	0.014	0.014	
2/13/2016	03:55	0.21	09:55	0.74	0.43	04:35	0.65	10:10	5.54	3.10	04:35	0.001	10:10	0.057	0.018	0.018	
2/14/2016	03:45	0.20	08:45	0.75	0.41	04:00	0.67	12:45	6.17	2.97	04:00	0.001	12:10	0.054	0.016	0.016	
2/15/2016	01:35	0.20	09:50	0.69	0.40	01:55	0.71	18:40	5.42	2.91	01:55	0.001	18:40	0.049	0.015	0.015	
2/16/2016	02:15	0.20	06:40	0.69	0.39	01:35	0.71	09:35	6.65	2.76	01:35	0.001	09:35	0.046	0.013	0.013	
2/17/2016	01:35	0.21	07:15	0.73	0.40	02:55	0.70	18:00	5.81	3.00	02:55	0.001	07:15	0.055	0.015	0.015	0.02
2/18/2016	04:05	0.19	09:30	0.70	0.40	04:45	0.97	09:30	5.37	2.88	04:05	0.002	09:30	0.052	0.014	0.014	0.09
2/19/2016	03:15	0.19	07:15	0.72	0.40	03:10	0.51	07:15	5.59	2.86	03:15	0.001	07:15	0.056	0.014	0.014	
2/20/2016	03:55	0.20	08:20	0.80	0.42	04:40	0.92	11:05	6.14	3.03	03:55	0.001	11:05	0.071	0.016	0.016	
2/21/2016	03:50	0.20	11:55	0.79	0.42	03:45	0.83	11:55	5.76	3.04	03:45	0.001	11:55	0.066	0.016	0.016	
2/22/2016	03:55	0.20	07:20	0.83	0.40	03:55	0.61	07:20	6.03	2.82	03:55	0.001	07:20	0.075	0.014	0.014	
2/23/2016	02:55	0.21	09:35	0.70	0.39	03:15	0.71	08:35	5.49	2.71	03:15	0.001	09:35	0.050	0.013	0.013	
2/24/2016	02:40	0.22	08:00	0.69	0.39	01:50	0.83	13:40	5.29	2.69	02:50	0.001	20:15	0.043	0.013	0.013	
2/25/2016	03:50	0.19	08:00	0.67	0.40	04:50	0.67	07:00	5.35	2.83	04:50	0.001	20:30	0.041	0.014	0.014	
2/26/2016	02:20	0.21	07:20	0.67	0.39	02:45	0.76	07:20	5.19	2.76	02:50	0.001	07:20	0.047	0.013	0.013	
2/27/2016	03:35	0.24	07:50	0.67	0.41	03:10	1.31	10:40	5.71	2.93	03:50	0.003	07:50	0.051	0.015	0.015	
2/28/2016	04:15	0.20	11:05	0.74	0.42	04:15	0.64	11:40	5.74	3.00	04:15	0.001	14:35	0.057	0.016	0.016	
2/29/2016	03:15	0.25	10:20	0.68	0.41	04:50	1.30	09:30	5.88	2.92	04:35	0.003	10:20	0.049	0.015	0.015	
3/1/2016	03:10	0.20	07:20	0.76	0.40	02:50	0.78	07:20	5.51	2.81	03:10	0.001	07:20	0.060	0.014	0.014	
3/2/2016	02:05	0.20	07:30	0.67	0.41	04:20	0.76	06:30	5.31	2.83	02:55	0.001	06:30	0.045	0.014	0.014	
3/3/2016	04:20	0.21	08:10	0.73	0.41	05:00	0.77	07:30	5.26	2.96	04:45	0.001	08:10	0.050	0.015	0.015	
3/4/2016	02:10	0.20	07:10	0.71	0.40	03:15	0.70	11:00	5.00	2.80	03:15	0.001	07:10	0.047	0.014	0.014	
3/5/2016	02:30	0.19	13:50	0.79	0.42	03:15	0.76	13:50	5.36	3.03	03:15	0.001	13:50	0.062	0.016	0.016	
3/6/2016	04:15	0.21	09:10	0.81	0.43	02:40	0.83	11:45	5.91	2.99	04:05	0.002	09:10	0.066	0.017	0.017	0.30
3/7/2016	03:45	0.21	07:15	0.77	0.42	04:30	0.54	06:50	5.61	2.95	04:30	0.001	07:15	0.061	0.016	0.016	0.57
3/8/2016	05:05	0.22	07:25	0.73	0.41	03:20	1.10	08:45	5.21	2.92	05:05	0.002	07:20	0.047	0.015	0.015	
3/9/2016	05:10	0.22	07:05	0.68	0.41	05:10	0.85	08:35	5.50	2.91	05:10	0.001	08:35	0.050	0.015	0.015	
3/10/2016	01:05	0.23	19:35	0.77	0.40	04:45	0.72	06:25	5.26	2.83	04:45	0.002	19:35	0.053	0.014	0.014	
3/11/2016	04:15	0.20	19:55	0.73	0.40	02:50	0.67	07:15	5.30	2.85	03:00	0.001	19:55	0.048	0.014	0.014	0.20
3/12/2016	03:25	0.20	09:20	0.70	0.41	03:30	0.56	09:10	5.65	2.95	03:30	0.001	09:30	0.052	0.015	0.015	
3/13/2016	02:15	0.20	12:45	0.69	0.42	04:00	0.66	12:45	5.70	3.02	04:00	0.001	12:45	0.054	0.016	0.016	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	00:40	0.22	07:10	0.68	0.42	01:20	0.70	06:15	5.57	3.03	01:20	0.001	06:45	0.046	0.016	0.016	0.01
3/15/2016	04:35	0.20	08:30	0.75	0.41	04:45	0.70	10:25	5.32	2.95	04:45	0.001	08:30	0.055	0.015	0.015	
3/16/2016	03:15	0.19	07:40	0.72	0.41	04:30	0.79	21:30	5.33	2.88	04:10	0.001	07:40	0.052	0.015	0.015	
3/17/2016	03:10	0.20	07:10	0.83	0.41	03:15	0.76	07:10	5.69	3.00	03:15	0.001	07:10	0.070	0.016	0.016	
3/18/2016	00:55	0.20	08:10	0.70	0.42	04:35	0.86	07:25	5.27	3.10	04:35	0.001	08:10	0.048	0.017	0.017	
3/19/2016	03:15	0.19	12:15	0.75	0.42	03:25	0.79	12:15	5.80	3.04	03:25	0.001	12:15	0.062	0.017	0.017	
3/20/2016	04:55	0.22	09:00	0.91	0.44	04:55	0.91	09:00	6.24	3.06	04:55	0.002	09:00	0.088	0.018	0.018	
3/21/2016	04:35	0.20	22:00	0.70	0.41	04:35	0.71	18:45	5.09	2.96	04:35	0.001	21:45	0.048	0.015	0.015	
3/22/2016	02:10	0.20	08:40	0.76	0.40	03:15	0.67	08:40	5.50	2.86	03:20	0.001	08:40	0.060	0.015	0.015	
3/23/2016	04:20	0.18	21:15	0.72	0.41	02:40	0.55	21:15	5.37	2.95	02:40	0.001	21:15	0.054	0.015	0.015	
3/24/2016	01:35	0.20	08:50	0.72	0.40	04:45	0.69	08:50	5.23	2.76	04:45	0.001	08:50	0.053	0.014	0.014	
3/25/2016	01:15	0.21	08:25	0.75	0.41	03:25	0.78	11:50	5.10	3.03	03:25	0.001	08:25	0.052	0.016	0.016	
3/26/2016	01:35	0.21	12:05	0.85	0.44	04:45	0.86	12:05	6.15	3.02	04:45	0.001	12:05	0.079	0.017	0.017	
3/27/2016	03:10	0.20	08:55	0.70	0.43	04:45	0.68	08:55	5.09	2.91	04:45	0.001	08:55	0.049	0.016	0.016	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			0.926	1.59
Avg	0.41	2.95	0.015	

Site Commentary

Site Information

6B-4	
Pipe Dimensions	7.88 "
Silt Level	0.00"

Overview

Site 6B-4 functioned under normal conditions during the period Thursday, January 28, 2016 to Sunday, March 27, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 28, 2016 to Sunday, March 27, 2016 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. In regards to depth, this site flows at 33% full at its recorded peak of 2.63 inches and approximately 23% full during its recorded average depth of 1.85 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.85	0.83	0.035
Minimum	1.06	0.17	0.004
Maximum	2.81	1.70	0.106
Time of Minimum	3/17/2016 2:30 AM	3/27/2016 4:30 AM	3/27/2016 4:30 AM
Time of Maximum	3/12/2016 10:00 AM	3/24/2016 8:15 PM	3/12/2016 10:00 AM

Data Quality

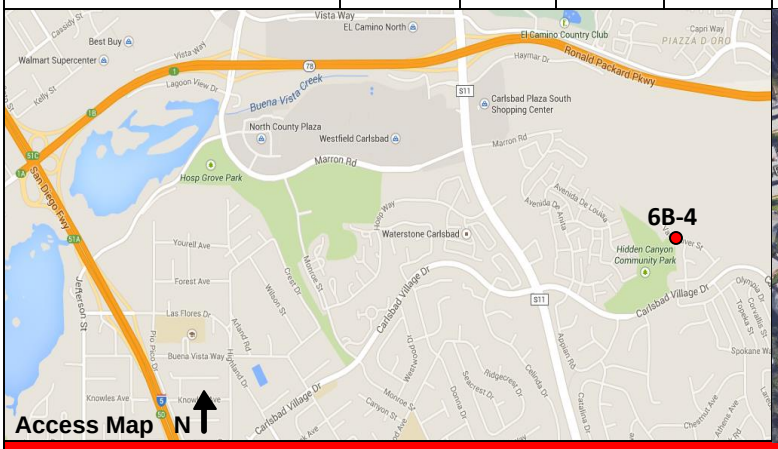
Data uptime observed during the Thursday, January 28, 2016 to the Sunday, March 27, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

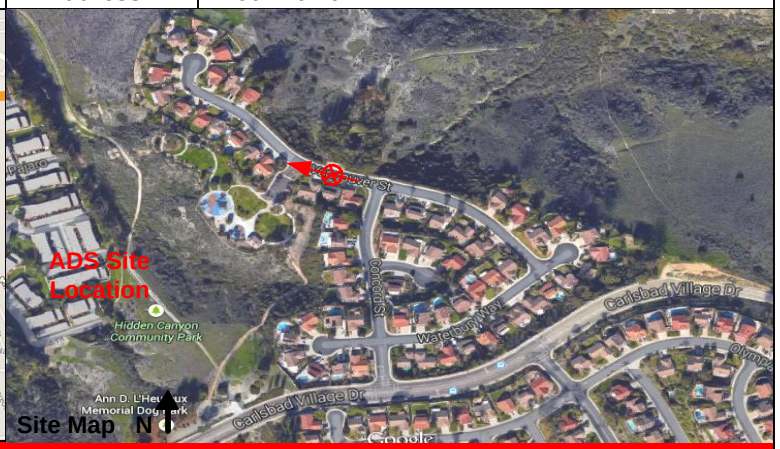
Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2015	**City / State:** Carlsbad, CA			**Date Installed:** 1/22/16	**FM Initials:** JG
Site Name: 6B-4	**Monitor Series:** 5000AG			**Monitor S/N:**	20025
Address / Location: 2693 Vancouver St.				**Manhole #:**	6B-4
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.88"
					Pipe Width: 7.88"
					IP Address: #166.219.19.114





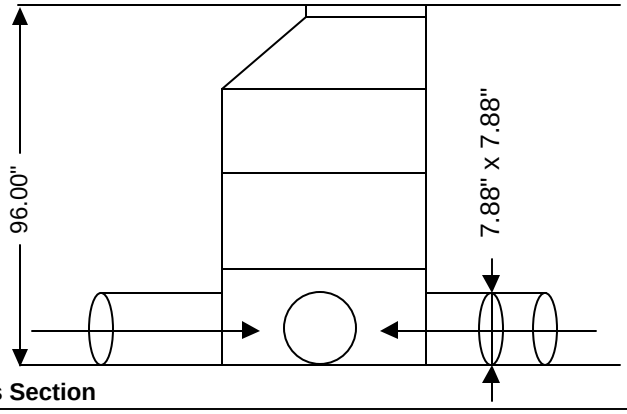
Investigation Information:

Date/Time of Investigation:	1/27/15 @ 9:00 AM
Site Hydraulics: Low depth with slow velocity	
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	1.88 **+/-** 0.25
Range (Air Dof):	**+/-**
Peak Velocity:	1.25 **Fps**
Silt:	0.00" **Inches**

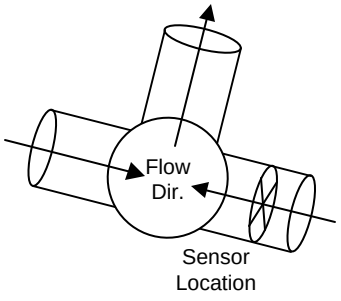
Manhole Information:

Manhole Depth:	96.00"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	PVC / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: 103 Ultra and 103 Velocity		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

6B-4

Flow Monitor

6B-4

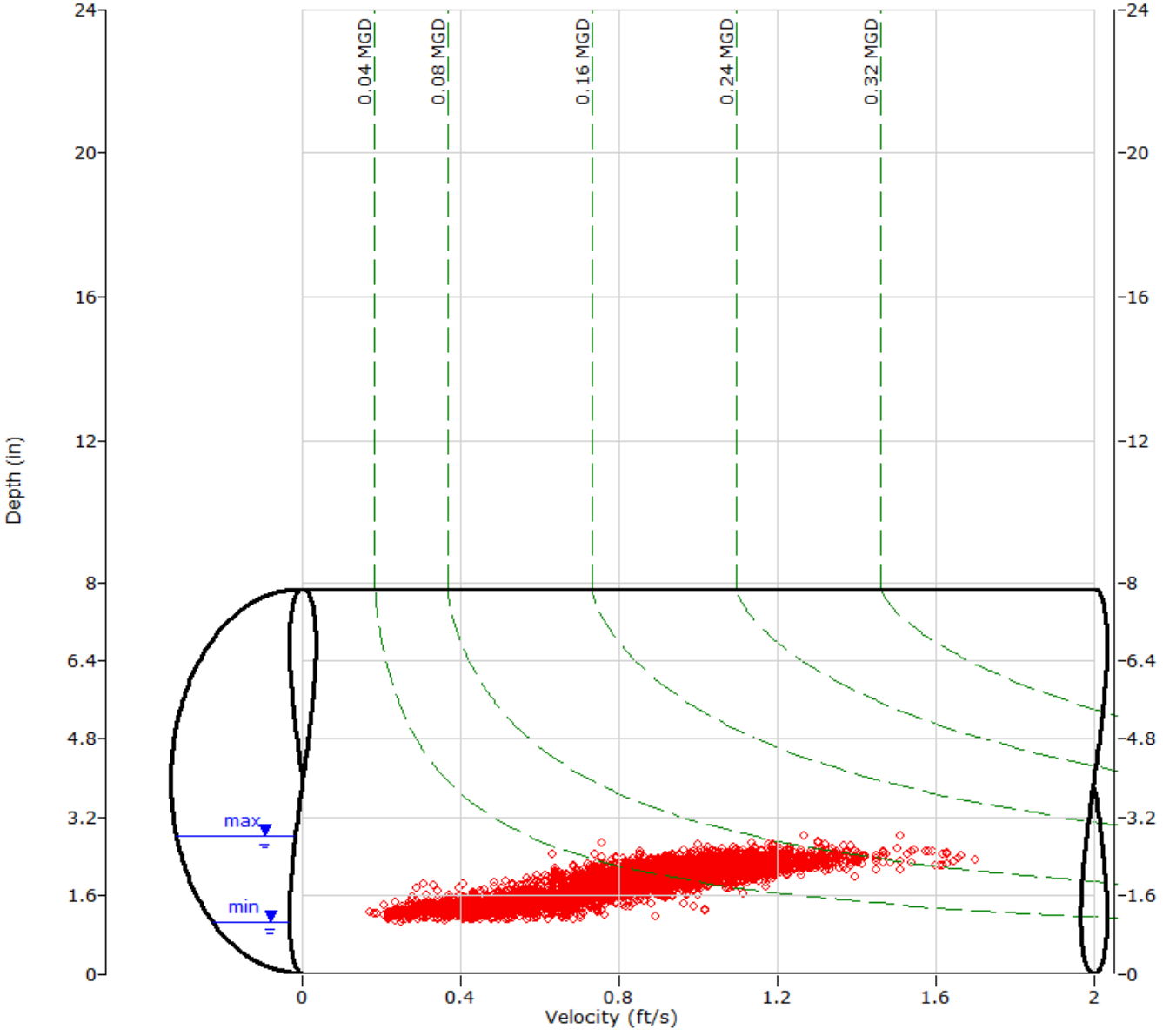
Pipe Height
7.88 in

Report Period

1/28/2016
To
3/27/2016

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



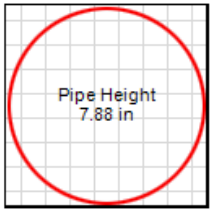
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

6B-4

Flow Monitor

6B-4

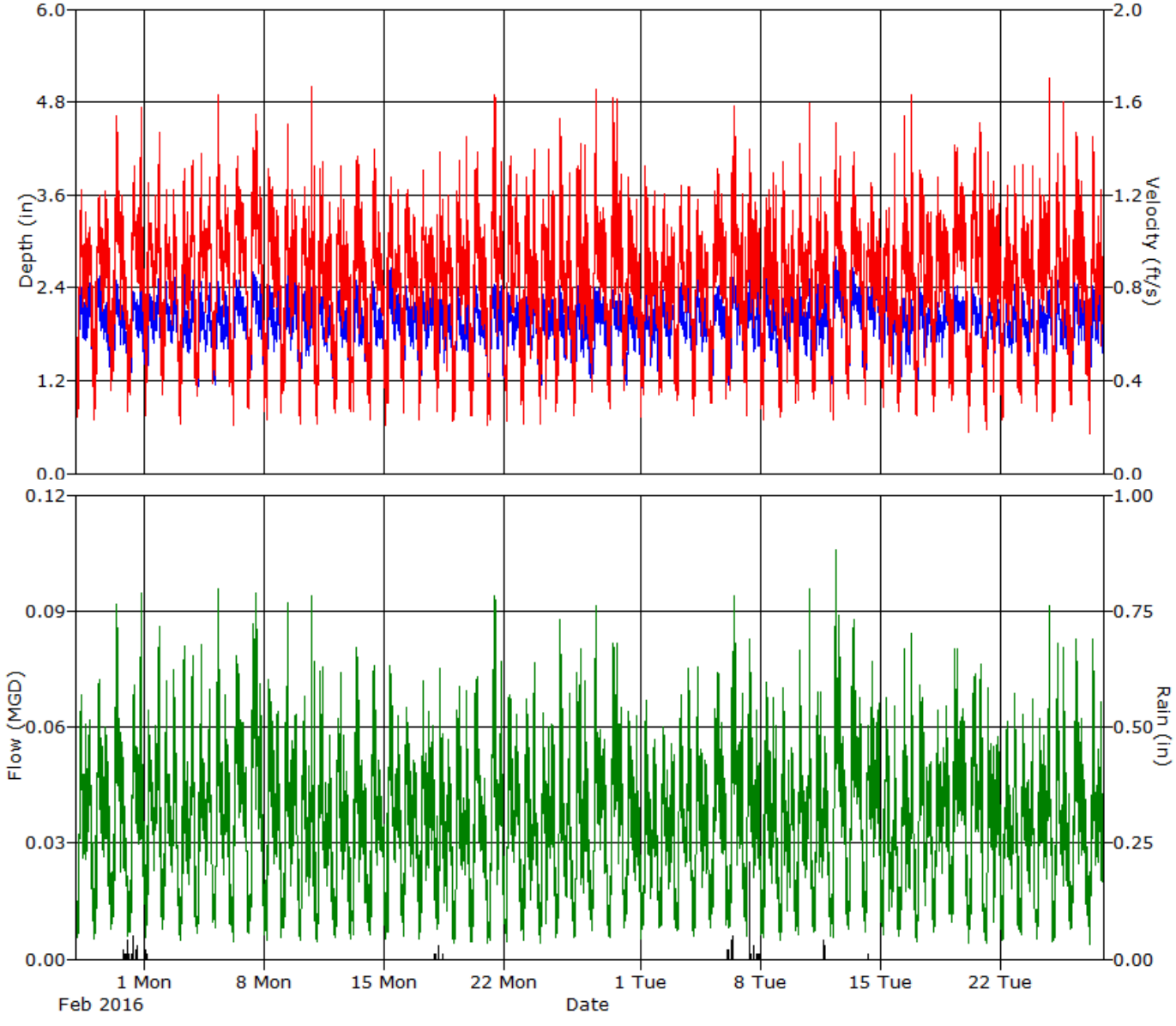


Report Period

1/28/2016
To
3/27/2016

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

6B-4, Pipe Height: 7.88 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016	02:00	1.24	07:45	2.46	1.89	03:30	0.24	08:15	1.22	0.79	03:30	0.005	08:15	0.068	0.034	0.034	
1/29/2016	03:15	1.24	09:45	2.55	1.89	03:15	0.23	18:45	1.22	0.81	03:15	0.005	09:45	0.072	0.035	0.035	
1/30/2016	02:00	1.22	10:30	2.50	1.85	02:00	0.36	10:30	1.54	0.86	02:00	0.008	10:30	0.092	0.036	0.036	0.06
1/31/2016	03:30	1.10	20:00	2.51	1.85	00:45	0.27	20:00	1.57	0.86	00:45	0.006	20:00	0.095	0.037	0.037	0.29
2/1/2016	03:15	1.22	19:45	2.52	1.88	03:00	0.25	21:30	1.47	0.86	03:00	0.006	21:30	0.086	0.037	0.037	0.05
2/2/2016	02:15	1.23	18:15	2.54	1.90	02:00	0.34	08:15	1.22	0.80	02:00	0.008	18:15	0.075	0.035	0.035	
2/3/2016	04:45	1.16	08:30	2.56	1.83	03:30	0.22	20:15	1.35	0.84	03:30	0.005	08:30	0.081	0.035	0.035	
2/4/2016	04:00	1.12	08:30	2.48	1.81	03:15	0.33	08:30	1.38	0.87	03:15	0.007	08:30	0.081	0.036	0.036	
2/5/2016	04:45	1.14	08:30	2.47	1.82	00:30	0.39	08:30	1.63	0.90	04:45	0.008	08:30	0.096	0.037	0.037	
2/6/2016	04:30	1.19	09:15	2.50	1.91	05:00	0.21	12:15	1.37	0.88	05:00	0.004	09:15	0.078	0.039	0.039	
2/7/2016	03:15	1.26	09:30	2.61	1.92	02:45	0.28	12:15	1.55	0.90	03:45	0.007	12:15	0.094	0.041	0.041	
2/8/2016	04:30	1.16	19:00	2.47	1.86	04:30	0.23	06:45	1.31	0.84	04:30	0.005	06:45	0.072	0.036	0.036	
2/9/2016	04:45	1.21	09:15	2.55	1.87	01:00	0.26	09:15	1.50	0.82	01:00	0.006	09:15	0.092	0.035	0.035	
2/10/2016	03:00	1.23	22:30	2.45	1.80	02:45	0.22	19:30	1.66	0.82	02:45	0.005	19:30	0.094	0.034	0.034	
2/11/2016	02:30	1.17	06:15	2.54	1.79	02:30	0.22	10:00	1.34	0.78	02:30	0.004	10:00	0.076	0.032	0.032	
2/12/2016	02:15	1.22	11:30	2.39	1.81	04:00	0.26	11:30	1.32	0.79	04:00	0.006	11:30	0.074	0.032	0.032	
2/13/2016	02:15	1.15	09:30	2.50	1.82	02:15	0.27	10:45	1.37	0.83	02:15	0.005	09:30	0.081	0.034	0.034	
2/14/2016	02:30	1.34	08:00	2.51	1.87	04:45	0.23	10:45	1.39	0.81	04:45	0.006	10:15	0.076	0.034	0.034	
2/15/2016	05:00	1.26	10:30	2.66	1.94	02:00	0.21	10:45	1.28	0.82	02:00	0.005	09:15	0.076	0.037	0.037	
2/16/2016	03:30	1.29	08:30	2.43	1.85	03:30	0.26	10:30	1.22	0.82	03:30	0.006	08:00	0.065	0.034	0.034	
2/17/2016	01:45	1.27	15:45	2.58	1.91	01:45	0.23	08:00	1.31	0.82	01:45	0.005	08:00	0.072	0.035	0.035	0.02
2/18/2016	04:45	1.23	10:45	2.35	1.82	03:15	0.27	07:00	1.39	0.82	03:15	0.008	07:00	0.075	0.033	0.033	0.09
2/19/2016	03:15	1.08	08:15	2.39	1.78	01:00	0.22	20:15	1.45	0.80	03:15	0.004	09:45	0.070	0.032	0.032	
2/20/2016	02:30	1.10	09:30	2.42	1.79	02:30	0.25	11:45	1.39	0.79	02:30	0.005	11:45	0.073	0.032	0.032	
2/21/2016	05:00	1.12	11:45	2.44	1.85	02:15	0.21	11:45	1.63	0.85	02:15	0.004	11:45	0.094	0.037	0.037	
2/22/2016	02:45	1.09	06:30	2.34	1.81	04:30	0.22	10:45	1.37	0.84	04:30	0.004	07:45	0.068	0.035	0.035	
2/23/2016	02:30	1.16	19:30	2.38	1.79	03:45	0.22	19:15	1.39	0.81	03:45	0.005	19:15	0.076	0.032	0.032	
2/24/2016	02:30	1.11	07:15	2.32	1.78	03:45	0.22	15:45	1.39	0.81	03:45	0.004	07:15	0.063	0.032	0.032	
2/25/2016	01:45	1.10	07:15	2.43	1.76	00:30	0.27	07:15	1.53	0.77	01:30	0.006	07:15	0.088	0.030	0.030	
2/26/2016	04:30	1.13	08:15	2.42	1.81	03:15	0.25	11:30	1.42	0.83	03:15	0.006	11:30	0.080	0.034	0.034	
2/27/2016	03:45	1.19	07:30	2.40	1.88	04:30	0.35	10:15	1.66	0.89	04:30	0.007	10:15	0.091	0.038	0.038	
2/28/2016	03:15	1.13	09:15	2.37	1.83	04:30	0.28	10:00	1.62	0.88	04:30	0.006	14:30	0.082	0.037	0.037	
2/29/2016	04:30	1.15	18:15	2.36	1.81	00:45	0.36	07:30	1.28	0.80	00:45	0.008	07:30	0.064	0.032	0.032	
3/1/2016	02:45	1.11	08:30	2.33	1.78	00:30	0.24	06:00	1.32	0.78	00:30	0.005	08:30	0.067	0.031	0.031	
3/2/2016	04:30	1.16	07:00	2.37	1.80	01:30	0.34	08:45	1.21	0.79	02:15	0.008	07:00	0.060	0.031	0.031	
3/3/2016	04:45	1.23	19:15	2.54	1.88	02:15	0.31	08:45	1.24	0.82	02:15	0.007	19:15	0.075	0.035	0.035	
3/4/2016	04:00	1.23	08:15	2.63	1.89	03:30	0.25	08:15	1.18	0.77	03:30	0.006	08:15	0.075	0.033	0.033	
3/5/2016	05:15	1.27	13:00	2.43	1.93	01:30	0.31	11:15	1.31	0.85	01:30	0.008	11:15	0.074	0.037	0.037	
3/6/2016	03:30	1.14	09:15	2.53	1.93	00:00	0.32	11:30	1.58	0.85	03:30	0.008	11:30	0.094	0.039	0.039	0.30
3/7/2016	02:45	1.24	08:15	2.49	1.89	04:45	0.25	08:15	1.39	0.83	04:45	0.006	08:15	0.083	0.036	0.036	0.57
3/8/2016	02:00	1.24	07:45	2.52	1.85	04:30	0.23	18:30	1.30	0.82	04:30	0.006	07:45	0.072	0.034	0.034	
3/9/2016	02:00	1.10	19:45	2.42	1.77	04:00	0.24	07:30	1.34	0.79	04:00	0.005	07:30	0.070	0.031	0.031	
3/10/2016	03:15	1.17	21:00	2.51	1.79	01:00	0.31	21:00	1.59	0.84	04:30	0.006	21:00	0.096	0.034	0.034	
3/11/2016	05:00	1.12	08:45	2.45	1.84	02:15	0.32	11:30	1.28	0.82	02:15	0.007	11:30	0.069	0.034	0.034	0.20
3/12/2016	04:15	1.17	10:00	2.81	2.04	05:30	0.23	10:00	1.51	0.85	05:30	0.005	10:00	0.106	0.042	0.042	
3/13/2016	01:30	1.28	09:15	2.65	2.02	02:30	0.32	11:45	1.39	0.85	02:30	0.008	11:45	0.088	0.041	0.041	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016	03:30	1.14	20:00	2.64	2.00	02:30	0.30	10:30	1.25	0.83	02:30	0.007	12:15	0.077	0.038	0.038	0.01
3/15/2016	03:45	1.12	09:00	2.53	1.80	04:15	0.29	19:30	1.38	0.76	04:15	0.006	09:00	0.068	0.030	0.030	
3/16/2016	02:45	1.10	07:30	2.27	1.75	01:45	0.27	18:45	1.63	0.81	01:45	0.006	18:45	0.084	0.031	0.031	
3/17/2016	02:30	1.06	07:45	2.38	1.81	02:30	0.25	07:15	1.31	0.83	02:30	0.004	07:15	0.071	0.034	0.034	
3/18/2016	04:45	1.37	20:15	2.56	1.91	02:30	0.27	07:30	1.28	0.83	02:30	0.007	20:15	0.065	0.036	0.036	
3/19/2016	04:00	1.45	11:15	2.42	1.93	04:30	0.31	08:15	1.41	0.90	04:15	0.009	08:15	0.080	0.039	0.039	
3/20/2016	04:15	1.24	10:00	2.40	1.85	04:15	0.18	19:15	1.51	0.85	04:15	0.004	20:15	0.076	0.036	0.036	
3/21/2016	04:45	1.10	19:15	2.28	1.78	04:30	0.19	07:30	1.39	0.77	04:45	0.004	07:30	0.070	0.031	0.031	
3/22/2016	02:30	1.10	19:45	2.44	1.79	02:15	0.23	20:15	1.32	0.80	02:30	0.005	20:30	0.069	0.032	0.032	
3/23/2016	04:00	1.13	08:15	2.33	1.77	04:45	0.31	06:45	1.33	0.81	04:45	0.006	20:30	0.067	0.032	0.032	
3/24/2016	03:30	1.13	20:00	2.37	1.83	02:30	0.27	20:15	1.70	0.84	02:30	0.005	20:15	0.092	0.035	0.035	
3/25/2016	02:15	1.12	08:30	2.49	1.79	01:30	0.22	17:15	1.60	0.77	01:30	0.005	08:30	0.082	0.031	0.031	
3/26/2016	02:15	1.40	08:15	2.46	1.91	02:15	0.30	09:45	1.47	0.86	02:15	0.008	09:45	0.083	0.037	0.037	
3/27/2016	06:15	1.24	10:00	2.42	1.88	04:30	0.17	10:00	1.45	0.80	04:30	0.004	10:00	0.083	0.034	0.034	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.084	1.59
Avg	1.85	0.83	0.035	

Site Commentary

Overview

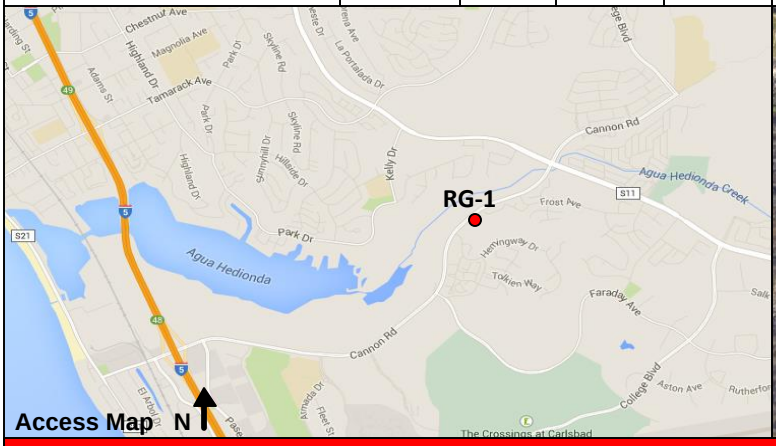
RG1	
Total Rainfall	1.59 "

A review of the hydrograph indicates that RG1 functioned under normal conditions during the period Thursday, January 28, 2016 through Sunday, March 27, 2016 .

ADS Site Report

Quality Form

Project Name:	Carlsbad_2015	**City / State:**	Carlsbad, CA	**Date Installed:**	1/22/16	**FM Initials:**	JG
Site Name:	RG1	**Monitor Series:**	3600	**Monitor S/N:**	2723		
Address / Location:	P/S on Cannon Rd. E. of Hemming			**Manhole #:**	N/A		
				Map Page #:	N/A		
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:**	N/A	
					Pipe Width:	N/A	
					IP Address:	N/A	



Access Map

Site Map

Investigation Information:

Date/Time of Investigation:	1/28/15 @ 11:30 AM		
Site Hydraulics: N/A			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	N/A	**+/-**	N/A
Range (Air Dof):		**+/-**	
Peak Velocity:	N/A	**Fps**	
Silt:	N/A	**Inches**	

Manhole Information:

Manhole Depth:	N/A				**Inches**
Manhole Material / Condition:	N/A				
Pipe Material / Condition:	N/A				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:

Cross Section

Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: 3600 meter and tipping bucket		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

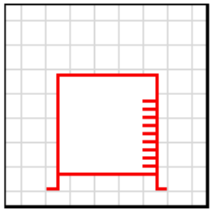
Additional Site Information / Comments:

HYDROGRAPH REPORT

RG1

Rain Gauge

RG1

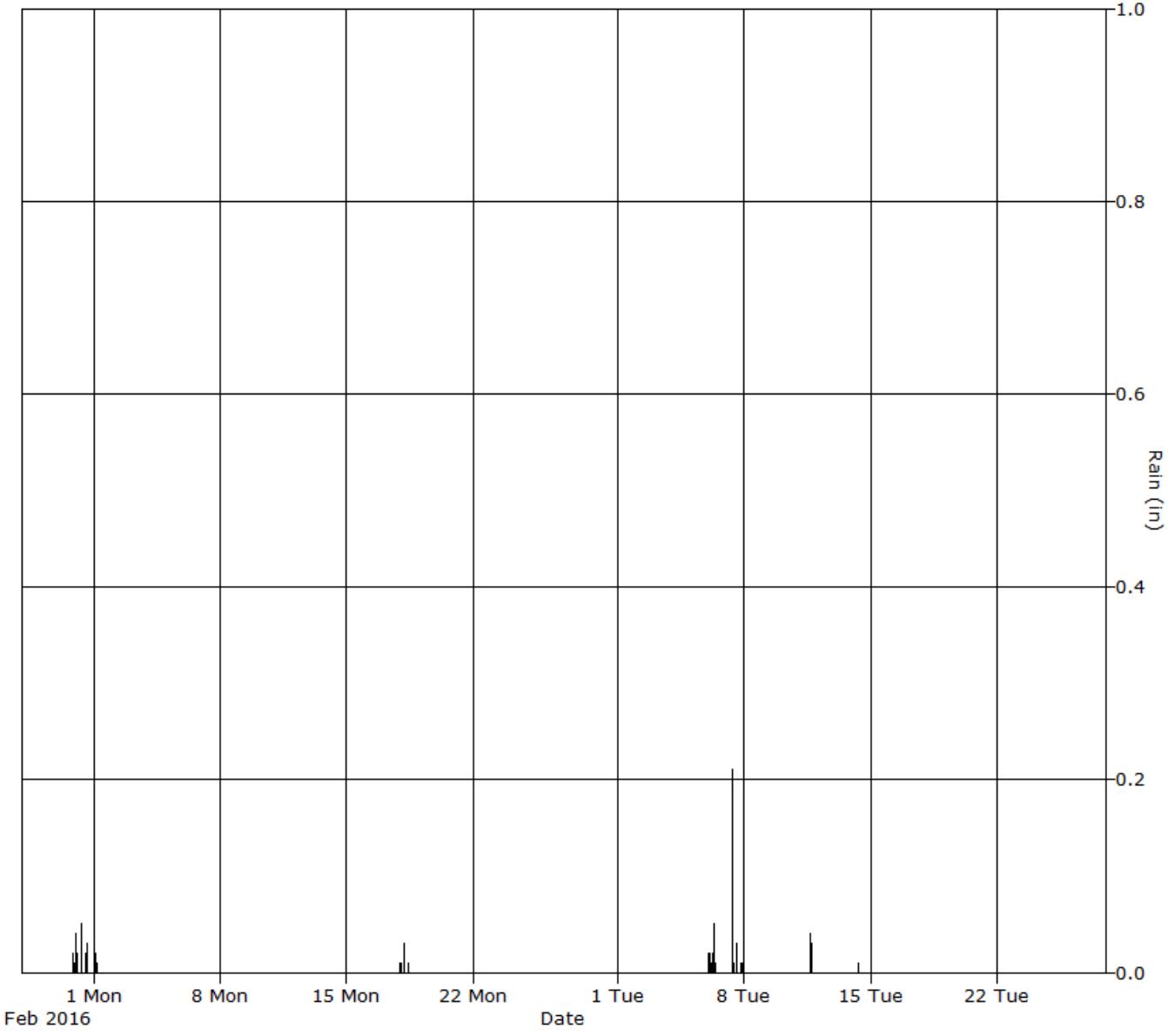


Report Period

1/28/2016
To
3/27/2016

Legend

Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 1/28/2016 - 3/27/2016

RG1, Pipe Height:

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
1/28/2016																	
1/29/2016																	
1/30/2016																	0.06
1/31/2016																	0.29
2/1/2016																	0.05
2/2/2016																	
2/3/2016																	
2/4/2016																	
2/5/2016																	
2/6/2016																	
2/7/2016																	
2/8/2016																	
2/9/2016																	
2/10/2016																	
2/11/2016																	
2/12/2016																	
2/13/2016																	
2/14/2016																	
2/15/2016																	
2/16/2016																	
2/17/2016																	0.02
2/18/2016																	0.09
2/19/2016																	
2/20/2016																	
2/21/2016																	
2/22/2016																	
2/23/2016																	
2/24/2016																	
2/25/2016																	
2/26/2016																	
2/27/2016																	
2/28/2016																	
2/29/2016																	
3/1/2016																	
3/2/2016																	
3/3/2016																	
3/4/2016																	
3/5/2016																	
3/6/2016																	0.30
3/7/2016																	0.57
3/8/2016																	
3/9/2016																	
3/10/2016																	
3/11/2016																	0.20
3/12/2016																	
3/13/2016																	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
3/14/2016																	0.01
3/15/2016																	
3/16/2016																	
3/17/2016																	
3/18/2016																	
3/19/2016																	
3/20/2016																	
3/21/2016																	
3/22/2016																	
3/23/2016																	
3/24/2016																	
3/25/2016																	
3/26/2016																	
3/27/2016																	

Report Summary For The Period 1/28/2016 - 3/27/2016

	Rain (in)
Total	1.59
Avg	

City of Carlsbad
Sewer Flow Verification Study

January 25, 2018 – March 26, 2018

Final Report Submitted to:
City of Carlsbad
April 25, 2018

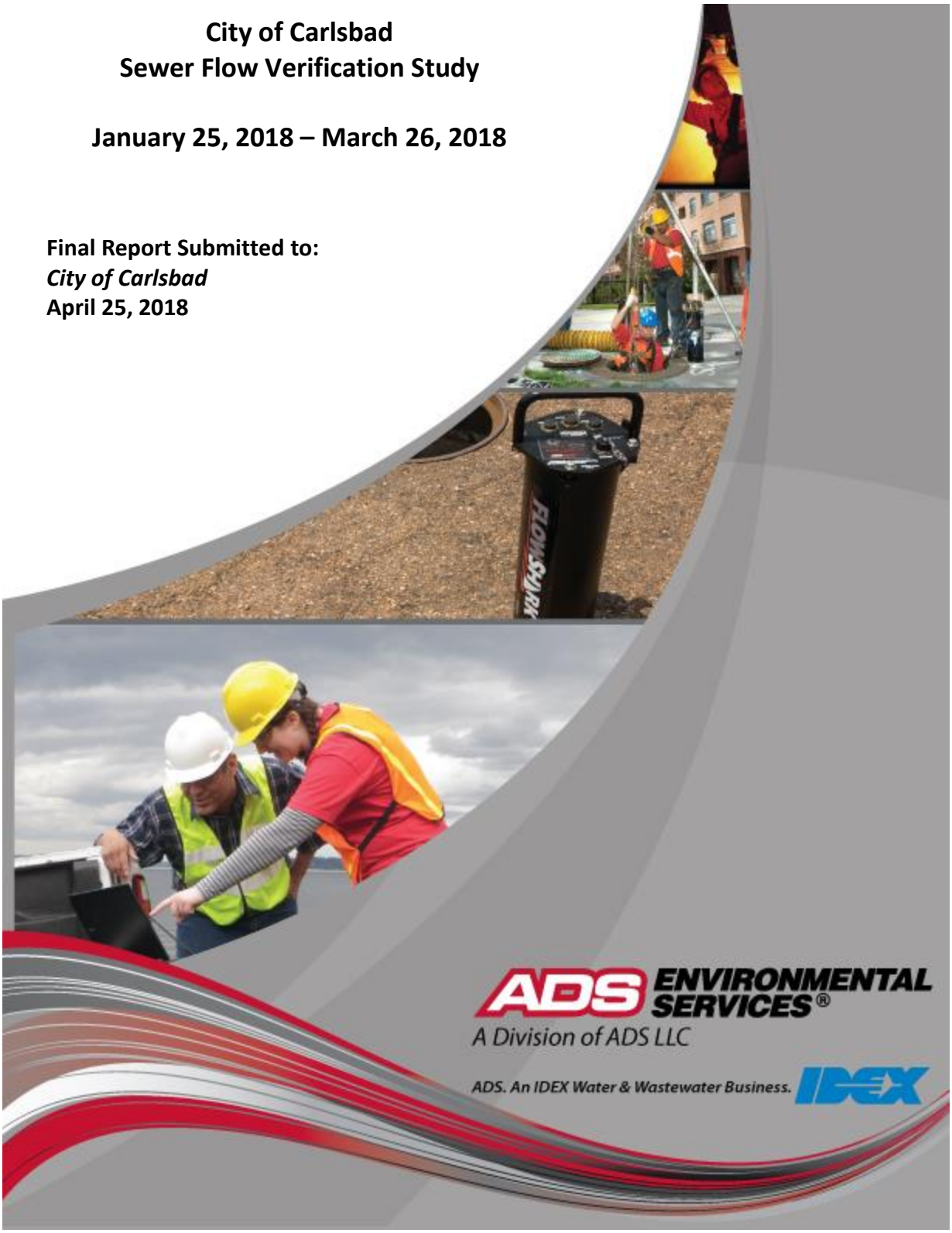


Table of Contents

City of Carlsbad
Sewer Flow Verification Study

January 25, 2018 - March 26, 2018

Prepared for:

Mr. Don Wasko
City of Carlsbad
5950 El Camino Real
Carlsbad, CA 92008-8802

Prepared by:

ADS Environmental Services, Inc.
4820 Mercury Street, Suite C
San Diego, CA 92111

Letter of Transmittal

ADS LLC

April 25, 2017

Mr. Don Wasko
City of Carlsbad
5950 El Camino Blvd
Carlsbad, CA 92008

SUBJECT: City of Carlsbad Sewer Flow Verification Study

Dear Mr. Wasko,

ADS is pleased to submit the Final Report for the City of Carlsbad Sewer Flow Verification Study. The metering was contracted for sixty (60) days at six (6) locations and one (1) rain gauge. The study period is January 25, 2018 - March 26, 2018. The report contains hourly averaged depth, velocity, and quantity hydrographs along with daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for each monitoring location in 15-minute format is also provided.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, you may contact the Project Manager, Neil Volk at (858) 571-0045 ext 227.

Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Mackenzie Michaud
Data Analyst

Scope and Methodology

Introduction

City of Carlsbad entered into an agreement with ADS Environmental Services to conduct flow monitoring at (6) six metering locations and (1) one rain gauge in the Carlsbad, CA Sanitary Sewer Collection System. The objective of this study was to measure depth, velocity, and quantify flows, along with a possible Inflow and Infiltration Analysis. The system response to rainfall was insufficient for wet weather analysis. The study was contracted for a 60-day period.

Project Scope

The scope of this study involved using flow monitors to quantify wastewater flows at the designated locations for the 60-day time period. Specifically, the study included the following key components.

- Investigate each proposed flow-monitoring site for adequate hydraulic conditions.
- Flow monitor installation.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was accomplished on January 24, 2018. The monitoring period began on January 25, 2018 and was completed on March 26, 2018.

Flow Monitoring Equipment

The ***ADS FlowShark Triton*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS FlowShark Triton monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The FS Triton monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The FS Triton monitor can support two (2) sets of sensors. The sensor option used for this project was:

The Peak Combo Sensor. The sensor is installed at the bottom of the pipe and includes three types of data acquisition technologies.

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

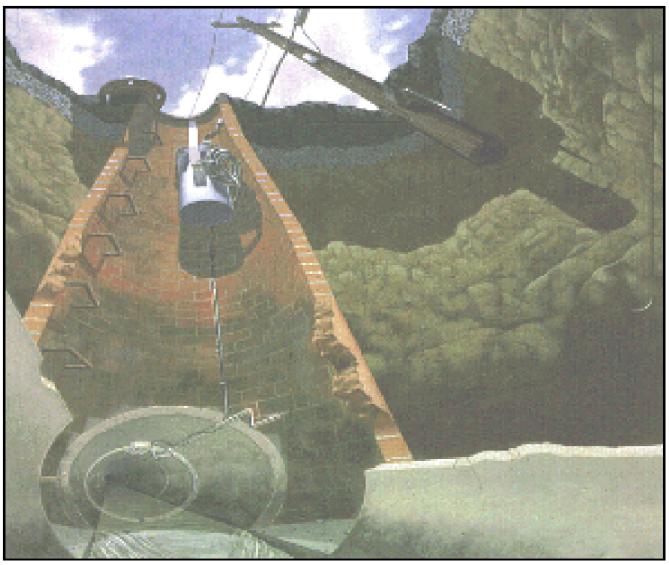
The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity*****,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 56 inches in diameter, the sensors were mounted on expandable stainless steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.



Data Collection, Confirmation, and Quality Assurance

Data collects were done on a regular basis via ADS Field Representatives. During the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare them meter readings to

confirm that they agreed. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects

which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 2") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Hydrographs are based on hourly averaging. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

17B-5	
Pipe Dimensions	7.88 "
Silt Level	0.00"

Overview

Site 17B-5 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 29% full at its recorded peak of 2.29 inches and approximately 16% full during its recorded average depth of 1.28 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.28	1.92	0.050
Minimum	0.69	0.65	0.008
Maximum	2.29	4.69	0.248
Time of Minimum	2/12/2018 2:35 AM	3/11/2018 2:20 AM	2/27/2018 3:05 AM
Time of Maximum	1/28/2018 10:35 AM	1/28/2018 10:35 AM	1/28/2018 10:35 AM

Data Quality

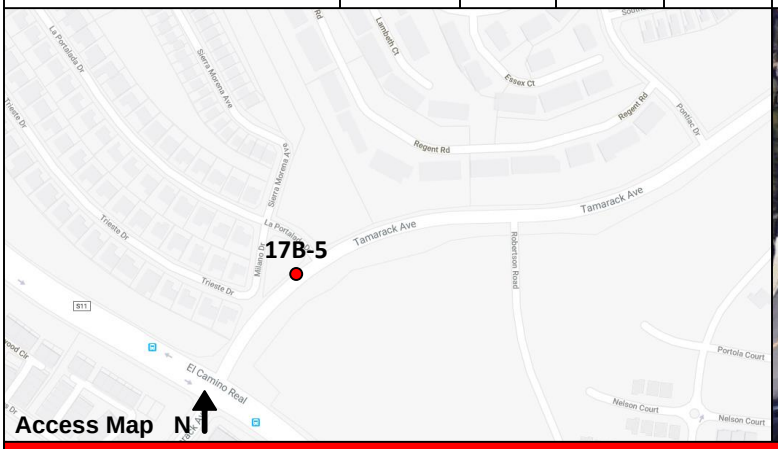
Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA			**Date Installed:** 01/23/18	**FM Initials:** JG
Site Name: 17B-5	**Monitor Series:** FS			**Monitor S/N:**	21464
Address / Location: 2184–2198 Tamarack Ave				**Manhole #:**	17B-5
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 7.88"
					Pipe Width: 7.88"
					IP Address: N/A



Access Map N

Site Map N

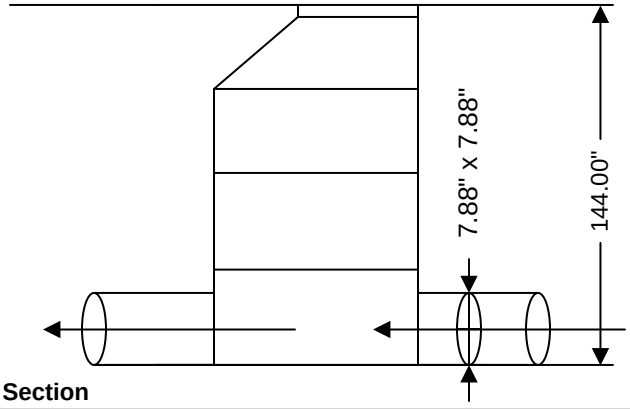
Investigation Information:

Date/Time of Investigation:	01/23/18 @ 1300		
Site Hydraulics: Smooth flow straight into manhole			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.38	**+/-**	0.25
Range (Air Dof):		**+/-**	
Peak Velocity:	2.5	**Fps**	
Silt:	0.00	**Inches**	

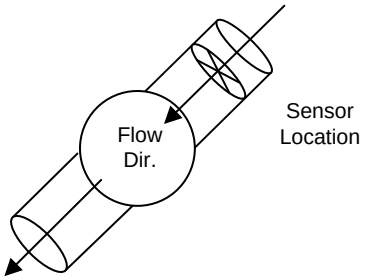
Manhole Information:

Manhole Depth:	144"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

17B-5

Flow Monitor

17B-5

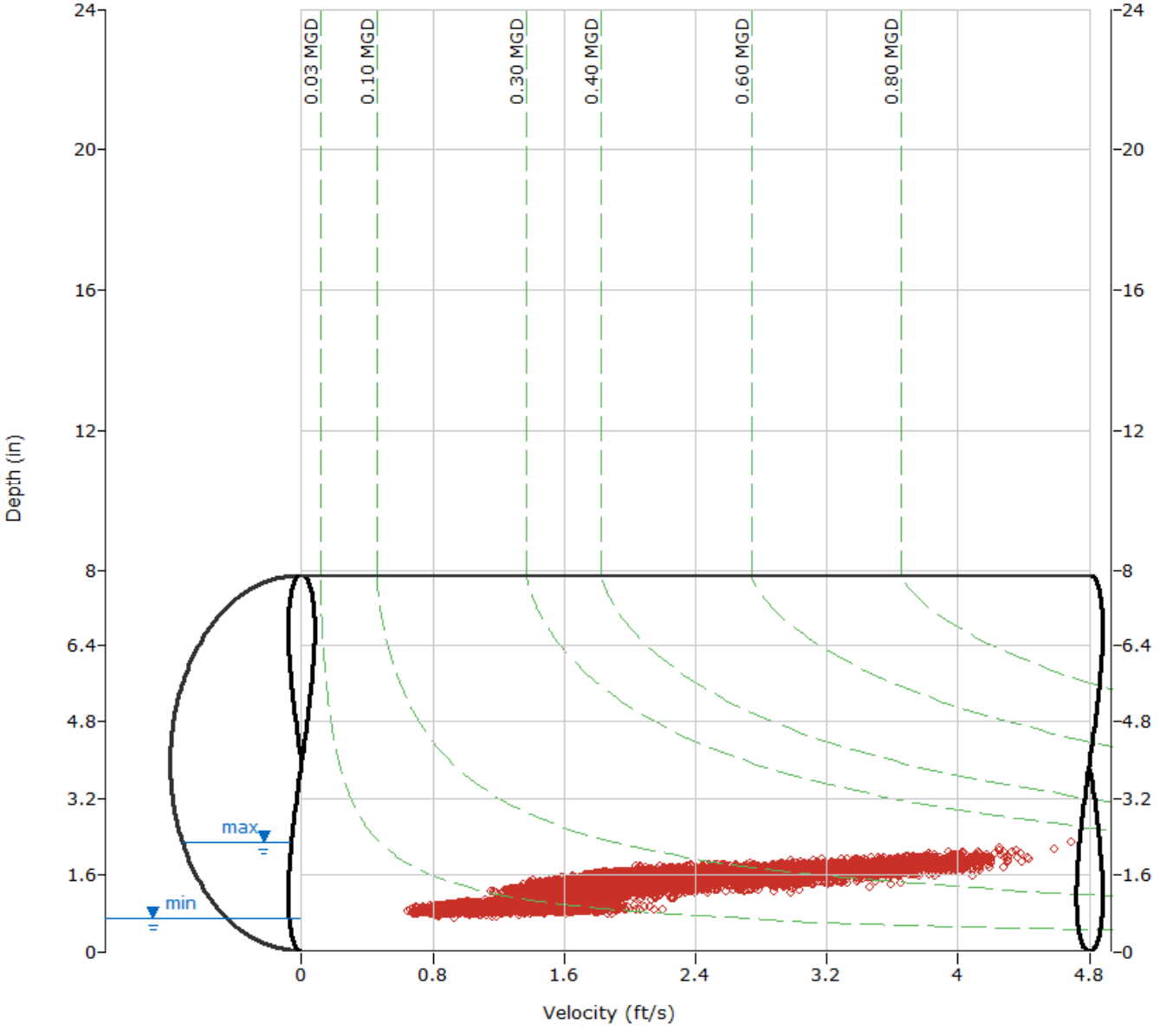
Pipe Height
7.88 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



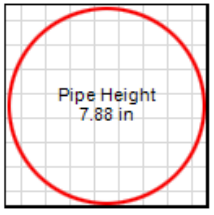
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

17B-5

Flow Monitor

17B-5

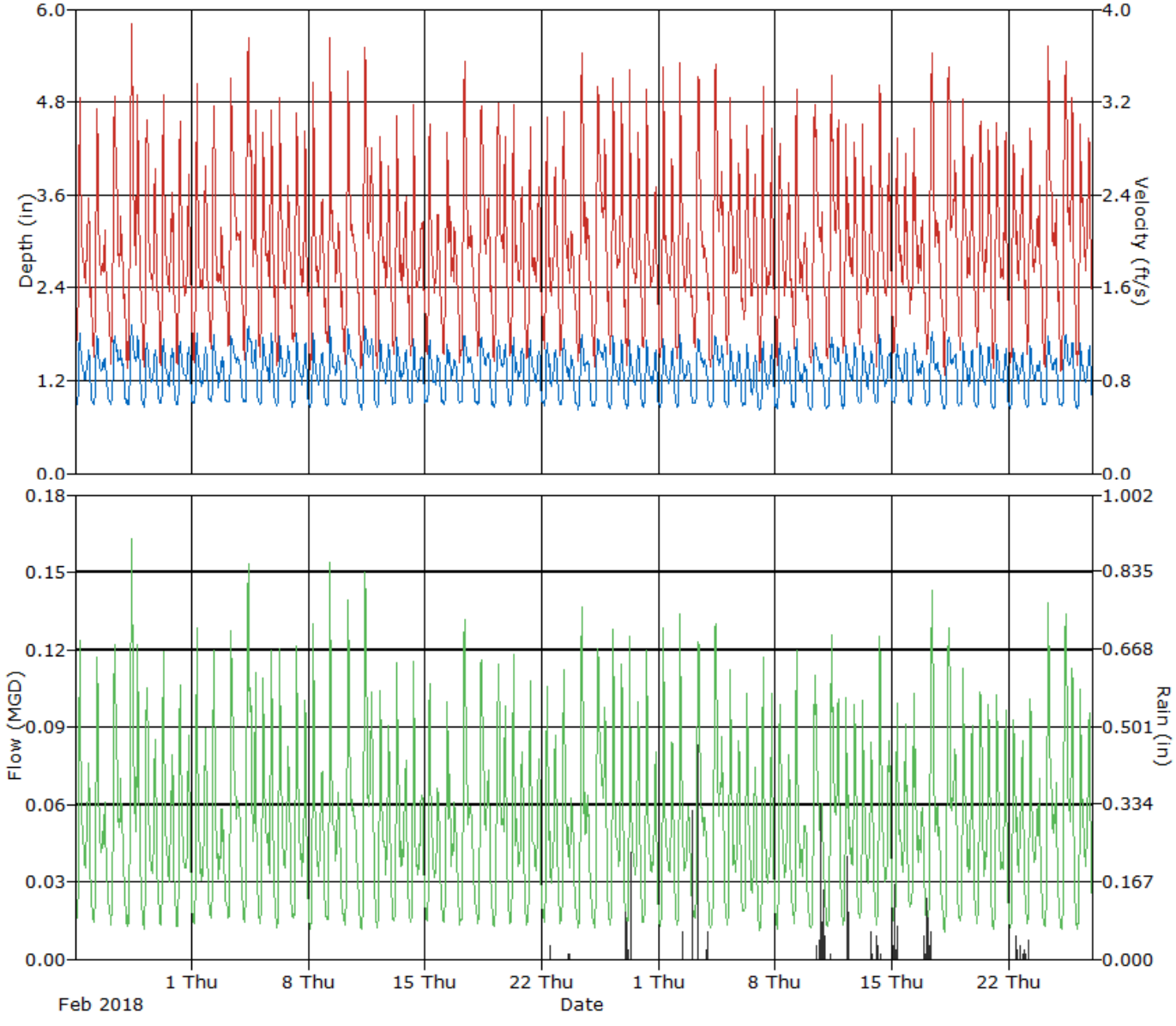


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

17B-5, Pipe Height: 7.88 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Total	Total
01/25/2018	03:00	0.85 07:20	1.99	1.29	01:35	0.78 07:00	4.14	1.85	01:35	0.010 07:00	0.170	0.048	0.048	
01/26/2018	04:15	0.78 08:45	1.98	1.30	04:15	0.70 09:00	4.05	1.79	04:15	0.008 09:00	0.163	0.046	0.046	
01/27/2018	04:45	0.85 11:00	2.08	1.34	04:50	0.81 09:35	4.18	1.92	04:50	0.011 11:00	0.182	0.053	0.053	
01/28/2018	05:00	0.75 10:35	2.29	1.37	04:50	0.74 10:35	4.69	2.07	05:00	0.009 10:35	0.248	0.061	0.061	
01/29/2018	03:10	0.81 19:15	1.83	1.28	04:00	0.69 09:45	4.18	1.88	04:05	0.009 06:30	0.158	0.048	0.048	
01/30/2018	03:00	0.84 07:05	1.93	1.28	03:15	0.75 06:40	4.02	1.83	03:15	0.010 07:05	0.166	0.047	0.047	
01/31/2018	01:25	0.79 07:10	1.94	1.29	03:30	0.76 07:15	3.91	1.81	02:00	0.010 07:15	0.159	0.046	0.046	
02/01/2018	02:20	0.85 07:00	2.03	1.28	02:10	0.76 07:00	4.38	1.84	02:10	0.010 07:00	0.196	0.047	0.047	
02/02/2018	03:55	0.87 07:15	1.98	1.28	04:00	0.84 07:15	4.15	1.81	04:00	0.012 07:15	0.179	0.046	0.046	
02/03/2018	05:25	0.88 08:45	1.96	1.34	05:25	0.74 08:45	4.05	2.02	05:25	0.010 08:45	0.172	0.055	0.055	
02/04/2018	00:55	0.86 10:20	2.09	1.37	04:00	0.84 09:35	4.33	2.15	04:00	0.011 09:35	0.200	0.064	0.064	
02/05/2018	01:45	0.83 07:00	1.97	1.32	01:45	0.80 07:10	4.18	1.93	01:45	0.010 07:10	0.179	0.052	0.052	
02/06/2018	03:00	0.80 06:50	1.93	1.30	03:15	0.78 06:35	4.12	1.87	03:15	0.009 06:50	0.163	0.049	0.049	
02/07/2018	00:45	0.77 07:05	2.05	1.29	03:20	0.84 07:05	4.23	1.94	03:20	0.011 07:05	0.191	0.051	0.051	
02/08/2018	02:00	0.77 07:10	1.97	1.27	03:25	0.75 07:10	4.11	1.84	03:25	0.009 07:10	0.176	0.047	0.047	
02/09/2018	02:55	0.79 07:10	2.15	1.30	01:55	0.88 07:10	4.25	1.90	04:25	0.012 07:10	0.206	0.050	0.050	
02/10/2018	02:35	0.76 09:40	2.03	1.31	01:25	0.72 09:15	4.12	1.91	01:25	0.009 09:50	0.178	0.051	0.051	
02/11/2018	04:35	0.73 09:05	2.06	1.37	03:55	0.69 09:40	4.16	2.07	03:55	0.008 09:05	0.184	0.062	0.062	
02/12/2018	02:35	0.69 19:35	1.91	1.30	02:45	0.73 06:40	3.63	1.84	02:35	0.009 19:35	0.149	0.048	0.048	
02/13/2018	04:20	0.80 07:00	1.97	1.29	03:05	0.79 07:05	4.03	1.83	03:10	0.010 07:05	0.170	0.047	0.047	
02/14/2018	03:50	0.82 06:50	1.95	1.27	04:00	0.75 06:40	3.91	1.79	04:00	0.010 06:50	0.162	0.045	0.045	
02/15/2018	04:15	0.84 06:35	1.96	1.25	03:55	0.85 06:35	4.43	1.79	03:55	0.012 06:35	0.188	0.044	0.044	
02/16/2018	03:15	0.82 09:10	1.80	1.27	03:55	0.74 07:45	4.28	1.82	03:55	0.009 07:45	0.155	0.045	0.045	
02/17/2018	02:20	0.80 09:25	1.98	1.31	02:20	0.75 08:55	4.10	1.94	02:20	0.009 08:55	0.175	0.053	0.053	
02/18/2018	04:50	0.83 08:50	1.97	1.32	05:55	0.88 10:50	4.09	2.00	04:50	0.011 08:50	0.173	0.054	0.054	
02/19/2018	04:00	0.80 09:05	1.94	1.31	02:50	0.67 09:45	4.10	1.99	02:05	0.009 09:05	0.167	0.054	0.054	
02/20/2018	02:10	0.79 07:35	2.01	1.29	03:10	0.77 07:35	4.18	1.84	03:10	0.010 07:35	0.184	0.048	0.048	
02/21/2018	04:00	0.77 07:15	1.92	1.27	04:15	0.76 07:00	4.18	1.82	04:00	0.010 07:00	0.171	0.045	0.045	
02/22/2018	02:05	0.81 06:45	1.84	1.27	03:55	0.85 07:10	3.96	1.86	03:55	0.010 07:10	0.147	0.047	0.047	0.03
02/23/2018	03:45	0.80 07:05	1.97	1.27	02:55	0.71 07:05	4.29	1.84	02:55	0.010 07:05	0.184	0.046	0.046	0.02
02/24/2018	04:15	0.75 09:25	1.94	1.28	03:10	0.70 09:30	4.06	2.00	04:15	0.009 10:45	0.164	0.053	0.053	
02/25/2018	03:15	0.77 08:55	1.99	1.34	04:30	0.76 13:40	4.03	2.09	04:30	0.009 08:55	0.165	0.059	0.059	
02/26/2018	01:20	0.80 07:05	2.00	1.27	02:40	0.76 20:10	4.13	2.00	02:40	0.009 07:10	0.175	0.052	0.052	
02/27/2018	03:05	0.77 07:05	1.95	1.25	03:15	0.67 07:05	4.36	1.88	03:05	0.008 07:05	0.184	0.047	0.047	0.55
02/28/2018	02:30	0.81 07:00	1.92	1.24	03:00	0.86 07:05	4.14	1.85	02:30	0.011 07:05	0.170	0.045	0.045	
03/01/2018	03:05	0.75 07:20	1.96	1.26	03:30	0.71 07:00	4.10	1.88	03:30	0.010 07:00	0.169	0.047	0.047	
03/02/2018	02:10	0.79 07:10	1.96	1.26	02:30	0.79 07:00	4.20	1.83	02:30	0.010 07:00	0.176	0.046	0.046	0.06
03/03/2018	06:00	0.81 08:35	1.93	1.30	03:30	0.82 08:35	4.20	1.97	04:35	0.012 08:35	0.175	0.052	0.052	1.04
03/04/2018	02:10	0.80 09:50	1.93	1.32	01:50	0.68 10:55	4.09	2.07	01:50	0.009 10:55	0.169	0.057	0.057	
03/05/2018	02:40	0.80 07:00	1.93	1.25	02:15	0.89 20:20	4.12	1.94	02:15	0.011 07:00	0.169	0.048	0.048	
03/06/2018	23:30	0.79 07:20	1.93	1.20	03:45	1.05 06:40	4.18	1.90	02:55	0.014 06:40	0.170	0.044	0.044	
03/07/2018	01:25	0.78 19:20	1.94	1.22	03:40	0.73 07:25	3.82	1.81	03:40	0.009 19:20	0.152	0.044	0.044	
03/08/2018	04:00	0.76 07:05	1.88	1.26	01:15	0.76 07:05	3.88	1.86	03:30	0.010 07:05	0.155	0.046	0.046	
03/09/2018	02:35	0.73 07:35	1.90	1.22	04:45	0.86 06:50	4.02	1.84	04:45	0.011 06:40	0.155	0.043	0.043	
03/10/2018	03:45	0.78 09:55	1.89	1.26	05:35	0.73 10:25	3.95	1.94	05:35	0.009 10:20	0.155	0.050	0.050	0.91
03/11/2018	01:25	0.78 09:45	1.99	1.30	02:20	0.65 10:45	4.04	2.07	02:20	0.008 09:45	0.175	0.056	0.056	0.01

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	02:35	0.80	18:40	1.94	1.27	02:15	0.80	06:15	3.69	1.91	01:10	0.010	18:40	0.154	0.048	0.048	0.32
03/13/2018	02:35	0.82	18:45	1.90	1.27	04:20	0.75	18:45	3.92	1.81	04:20	0.011	18:45	0.160	0.045	0.045	0.07
03/14/2018	01:40	0.84	06:05	1.89	1.30	02:45	0.75	19:55	3.93	1.94	02:00	0.010	06:05	0.156	0.051	0.051	0.11
03/15/2018	02:55	0.84	19:35	1.95	1.28	04:05	0.84	07:35	3.96	1.84	02:45	0.012	19:35	0.160	0.046	0.046	0.46
03/16/2018	03:15	0.84	07:30	1.81	1.29	02:00	1.04	07:55	3.97	1.92	02:00	0.014	07:55	0.149	0.047	0.047	0.05
03/17/2018	03:20	0.80	10:00	2.11	1.29	04:30	0.83	10:00	4.36	2.05	03:15	0.011	10:00	0.205	0.055	0.055	0.35
03/18/2018	03:45	0.79	11:20	1.91	1.30	04:55	0.65	10:35	4.30	2.09	04:50	0.008	10:35	0.170	0.057	0.057	
03/19/2018	01:45	0.73	07:45	1.92	1.25	04:00	0.76	07:00	4.13	1.95	04:00	0.011	07:45	0.168	0.048	0.048	
03/20/2018	03:20	0.74	20:30	1.89	1.27	02:15	0.74	19:20	4.19	1.99	03:05	0.010	20:30	0.159	0.050	0.050	
03/21/2018	04:05	0.76	20:20	1.95	1.24	02:20	0.69	20:20	4.08	1.91	02:20	0.009	20:20	0.172	0.047	0.047	
03/22/2018	03:00	0.78	20:15	1.96	1.25	03:20	0.76	20:15	4.18	1.92	03:00	0.009	20:15	0.178	0.047	0.047	0.16
03/23/2018	04:20	0.81	08:45	1.93	1.24	04:20	0.80	08:50	3.99	1.89	04:20	0.010	08:45	0.155	0.045	0.045	0.06
03/24/2018	04:40	0.83	09:40	2.03	1.29	04:30	0.69	09:45	4.14	2.01	04:30	0.009	09:40	0.184	0.053	0.053	
03/25/2018	05:05	0.81	09:25	2.07	1.33	04:40	0.68	20:10	4.44	2.14	04:40	0.009	09:25	0.196	0.061	0.061	
03/26/2018	00:35	0.79	20:00	1.90	1.25	03:50	0.75	20:00	4.00	1.97	03:50	0.009	20:00	0.162	0.048	0.048	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			3.037	4.20
Avg	1.28	1.92	0.050	

Site Commentary

Site Information

21D-5	
Pipe Dimensions	10.38 "
Silt Level	0.00"

Overview

Site 21D-5 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 46% full at its recorded peak of 4.82 inches and approximately 27% full during its recorded average depth of 2.76 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.76	1.47	0.127
Minimum	1.66	0.45	0.020
Maximum	4.82	2.82	0.486
Time of Minimum	2/12/2018 4:40 AM	3/1/2018 6:00 AM	3/9/2018 5:30 AM
Time of Maximum	3/17/2018 4:35 AM	3/17/2018 4:35 AM	3/17/2018 4:35 AM

Data Quality

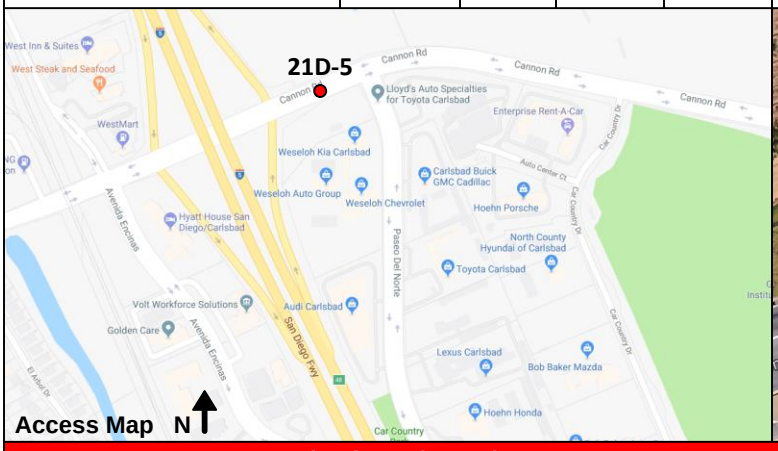
Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA			**Date Installed:** 01/23/18	**FM Initials:** JG
Site Name: 21D-5	**Monitor Series:** FS		**Monitor S/N:**	21506	
Address / Location: 5331 Paseo Del Norte			**Manhole #:**	21D-5	
			Map Page #:	N/A	
Access: Drive	**Type of System:**	Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	10.38"	
			Pipe Width:	10.38"	
			IP Address:	N/A	



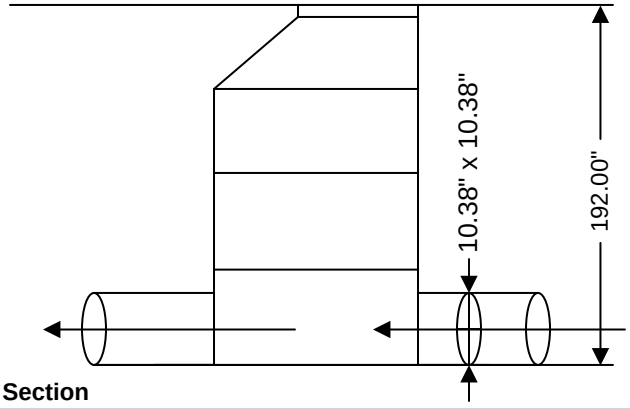
Investigation Information:

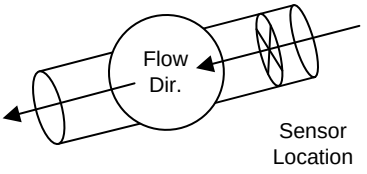
Date/Time of Investigation:	01/23/18 @ 1500		
Site Hydraulics: Fairly smooth flow through manhole			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	3.5	**+/-**	0.25
Range (Air Dof):		**+/-**	
Peak Velocity:	2.0	**Fps**	
Silt:	0.00	**Inches**	

Manhole Information:

Manhole Depth:	192"	**Inches**			
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [ ]	**Commercial** [x]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A	**Feet**			
Road Cut Length:	N/A	**Feet**			
Trench Length:	N/A	**Feet**			

Other Information:





Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

21D-5

Flow Monitor

21D-5

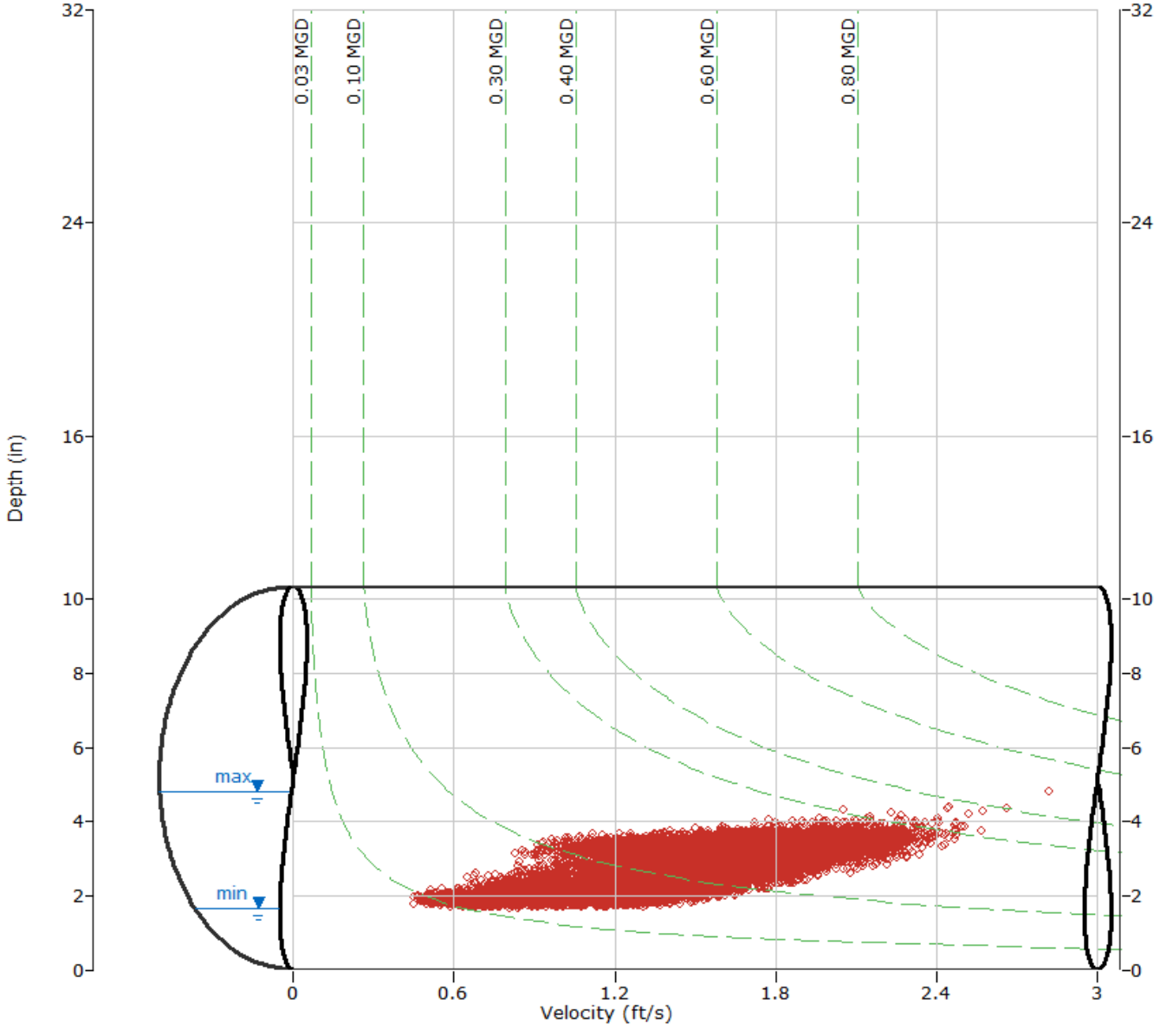
Pipe Height
10.38 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



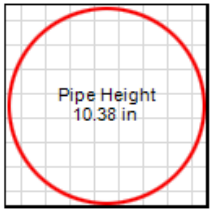
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

21D-5

Flow Monitor

21D-5

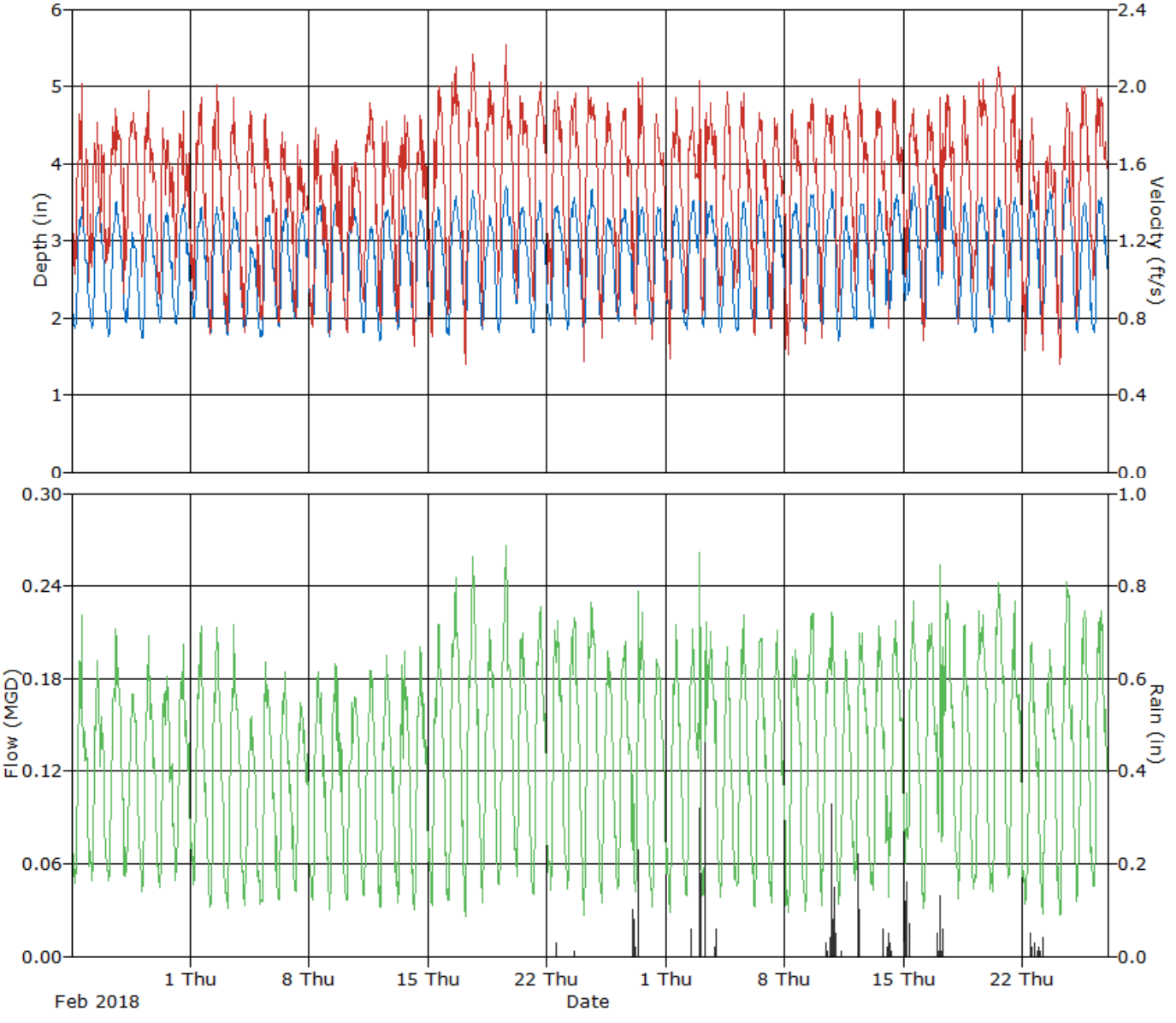


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

21D-5, Pipe Height: 10.38 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/25/2018	06:05	1.84	14:40	3.74	2.67	06:35	0.52	14:10	2.36	1.47	06:35	0.026	14:10	0.275	0.119	0.119	
01/26/2018	05:10	1.80	15:05	3.57	2.71	06:00	0.52	13:55	2.21	1.44	06:00	0.024	13:55	0.243	0.118	0.118	
01/27/2018	06:25	1.68	14:05	3.85	2.72	06:30	0.55	14:10	2.47	1.54	06:30	0.023	14:05	0.298	0.129	0.129	
01/28/2018	07:20	1.87	13:45	3.41	2.51	06:00	0.53	15:05	2.13	1.54	06:00	0.026	15:05	0.209	0.113	0.113	
01/29/2018	05:15	1.70	14:35	3.53	2.60	04:40	0.87	13:25	2.43	1.52	04:40	0.036	13:25	0.261	0.119	0.119	
01/30/2018	05:30	1.89	14:05	3.56	2.68	01:50	0.57	09:35	2.24	1.43	06:05	0.028	09:35	0.240	0.117	0.117	
01/31/2018	06:30	1.83	15:40	3.68	2.75	04:15	0.76	14:10	2.24	1.51	04:15	0.037	14:10	0.259	0.126	0.126	
02/01/2018	05:05	1.92	16:10	3.62	2.74	04:25	0.63	12:10	2.35	1.45	05:20	0.033	15:45	0.251	0.123	0.123	
02/02/2018	04:50	1.79	13:30	3.69	2.69	05:40	0.64	11:20	2.42	1.42	05:40	0.029	12:55	0.268	0.121	0.121	
02/03/2018	06:15	1.72	13:00	3.67	2.67	03:25	0.64	13:40	2.23	1.38	04:55	0.027	13:10	0.258	0.116	0.116	
02/04/2018	06:35	1.81	13:45	3.21	2.39	04:15	0.64	14:20	2.22	1.35	04:20	0.029	12:20	0.196	0.094	0.094	
02/05/2018	03:55	1.70	13:35	3.52	2.59	06:35	0.60	13:15	2.23	1.36	06:35	0.025	12:10	0.225	0.109	0.109	
02/06/2018	05:00	1.84	14:55	3.71	2.66	03:30	0.66	15:00	2.14	1.36	04:30	0.031	15:00	0.247	0.111	0.111	
02/07/2018	06:35	1.92	14:15	3.64	2.74	05:10	0.63	16:20	2.34	1.33	05:10	0.032	13:40	0.245	0.111	0.111	
02/08/2018	05:00	1.86	14:15	3.86	2.83	05:20	0.65	16:10	2.31	1.31	05:05	0.031	16:10	0.264	0.116	0.116	
02/09/2018	05:05	1.72	12:55	3.86	2.77	04:55	0.63	13:00	2.45	1.35	04:55	0.027	13:00	0.282	0.116	0.116	
02/10/2018	05:50	1.84	15:45	3.58	2.79	06:05	0.63	17:50	2.30	1.27	06:05	0.029	17:20	0.244	0.111	0.111	
02/11/2018	05:20	1.75	17:10	3.47	2.55	05:20	0.62	13:30	2.29	1.47	05:20	0.026	14:40	0.236	0.113	0.113	
02/12/2018	04:40	1.66	15:35	3.60	2.67	05:40	0.59	16:20	2.47	1.40	05:40	0.024	16:20	0.278	0.116	0.116	
02/13/2018	05:25	1.81	13:50	3.61	2.70	02:45	0.66	16:10	2.36	1.42	05:40	0.030	13:50	0.270	0.118	0.118	
02/14/2018	04:35	1.84	15:55	3.70	2.74	04:15	0.61	13:30	2.44	1.40	05:25	0.028	13:30	0.294	0.121	0.121	
02/15/2018	05:00	1.86	14:55	3.56	2.75	04:45	0.64	14:55	2.32	1.50	04:45	0.030	14:55	0.267	0.130	0.130	
02/16/2018	05:00	1.74	15:10	3.88	2.80	02:45	0.52	15:10	2.49	1.58	02:45	0.023	15:10	0.323	0.143	0.143	
02/17/2018	05:10	1.84	14:05	3.86	2.85	05:55	0.47	15:15	2.47	1.57	05:55	0.022	15:10	0.306	0.145	0.145	
02/18/2018	04:20	1.82	15:55	3.48	2.69	04:50	0.57	17:05	2.22	1.58	04:50	0.026	14:55	0.240	0.130	0.130	
02/19/2018	04:15	1.78	09:10	3.84	2.88	04:40	0.56	14:55	2.43	1.63	04:40	0.026	15:05	0.294	0.152	0.152	
02/20/2018	05:20	2.16	13:45	3.75	2.83	05:30	0.62	13:45	2.21	1.56	05:30	0.036	13:45	0.274	0.137	0.137	
02/21/2018	05:35	1.76	13:35	3.96	2.74	05:10	0.63	13:35	2.31	1.59	05:10	0.028	13:35	0.308	0.138	0.138	
02/22/2018	04:55	1.83	12:20	3.69	2.80	02:25	0.51	13:30	2.33	1.56	05:20	0.023	13:30	0.271	0.137	0.137	0.03
02/23/2018	05:45	1.82	15:30	3.75	2.83	05:45	0.80	13:00	2.30	1.56	05:45	0.036	14:00	0.272	0.140	0.140	0.02
02/24/2018	05:20	1.84	15:10	4.00	2.88	04:10	0.50	15:10	2.32	1.54	04:10	0.023	15:10	0.313	0.143	0.143	
02/25/2018	04:50	1.94	18:50	3.56	2.70	05:25	0.50	18:55	2.24	1.45	05:25	0.026	18:55	0.256	0.121	0.121	
02/26/2018	05:30	1.88	14:40	3.85	2.74	03:15	0.58	10:50	2.15	1.48	03:35	0.031	14:45	0.246	0.126	0.126	
02/27/2018	05:30	1.89	08:55	4.40	2.84	04:50	0.58	08:40	2.66	1.46	05:10	0.030	08:40	0.402	0.132	0.132	0.55
02/28/2018	05:05	1.82	15:45	3.66	2.71	05:45	0.51	10:55	2.20	1.43	05:45	0.023	15:45	0.256	0.122	0.122	
03/01/2018	05:25	1.87	15:20	3.66	2.75	06:00	0.45	15:20	2.28	1.41	06:25	0.022	15:20	0.273	0.122	0.122	
03/02/2018	05:15	1.79	16:20	3.72	2.78	04:35	0.51	14:15	2.38	1.45	05:40	0.029	14:15	0.280	0.127	0.127	0.06
03/03/2018	05:55	1.85	09:10	4.14	2.95	04:55	0.58	00:20	2.47	1.53	04:55	0.029	00:20	0.331	0.147	0.147	1.04
03/04/2018	04:55	1.78	13:20	3.46	2.58	05:15	0.70	13:25	2.20	1.44	05:45	0.031	14:55	0.234	0.113	0.113	
03/05/2018	06:25	1.78	14:15	3.82	2.68	01:55	0.62	10:05	2.20	1.48	01:55	0.030	14:15	0.277	0.124	0.124	
03/06/2018	06:05	1.81	14:55	3.89	2.75	05:05	0.50	12:30	2.21	1.44	05:05	0.023	12:30	0.269	0.125	0.125	
03/07/2018	04:20	1.84	13:20	3.81	2.76	05:50	0.51	10:45	2.25	1.42	05:50	0.023	13:45	0.259	0.124	0.124	
03/08/2018	05:05	1.84	16:10	3.70	2.79	05:35	0.50	13:55	2.14	1.43	05:35	0.023	17:15	0.252	0.127	0.127	
03/09/2018	06:00	1.76	13:35	3.81	2.81	05:30	0.45	14:00	2.19	1.45	05:30	0.020	15:55	0.270	0.132	0.132	
03/10/2018	04:40	1.85	22:00	3.98	2.83	04:35	0.53	22:00	2.36	1.53	04:35	0.025	22:00	0.316	0.138	0.138	0.91
03/11/2018	04:10	1.69	19:15	3.47	2.55	04:20	0.68	14:50	2.19	1.48	04:20	0.028	14:50	0.241	0.115	0.115	0.01

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	03:00	1.93	15:20	3.78	2.81	03:20	0.75	13:20	2.22	1.53	03:15	0.039	13:20	0.270	0.134	0.134	0.32
03/13/2018	01:10	1.79	14:50	3.73	2.75	02:10	0.54	15:20	2.29	1.49	02:10	0.025	15:20	0.272	0.129	0.129	0.07
03/14/2018	03:10	1.94	14:50	3.92	2.93	03:15	0.55	13:10	2.39	1.55	03:15	0.028	13:20	0.296	0.142	0.142	0.11
03/15/2018	01:45	2.14	13:45	4.14	2.97	03:35	0.56	13:50	2.47	1.53	03:35	0.033	13:50	0.321	0.143	0.143	0.46
03/16/2018	03:25	1.82	15:05	4.01	2.88	04:25	0.49	15:05	2.26	1.43	04:25	0.022	15:05	0.306	0.135	0.135	0.05
03/17/2018	07:20	2.19	04:35	4.82	3.14	03:00	0.71	04:35	2.82	1.59	03:00	0.044	04:35	0.486	0.161	0.161	0.35
03/18/2018	05:55	1.88	14:55	3.60	2.70	04:40	0.57	13:10	2.25	1.46	04:40	0.028	13:10	0.248	0.122	0.122	
03/19/2018	04:50	1.76	17:40	3.77	2.79	02:55	0.72	11:10	2.23	1.59	02:15	0.038	16:50	0.275	0.142	0.142	
03/20/2018	05:35	1.79	13:55	3.84	2.82	02:20	0.56	14:50	2.29	1.63	02:20	0.028	13:55	0.289	0.149	0.149	
03/21/2018	05:10	1.90	13:55	3.82	2.84	23:55	0.84	13:00	2.25	1.54	04:20	0.046	13:55	0.276	0.137	0.137	
03/22/2018	06:10	1.79	11:10	3.90	2.78	04:15	0.50	11:10	2.03	1.32	05:35	0.026	11:10	0.265	0.117	0.117	0.16
03/23/2018	04:45	1.73	14:40	3.77	2.86	04:15	0.50	10:40	2.00	1.35	04:15	0.022	10:40	0.235	0.123	0.123	0.06
03/24/2018	06:25	1.77	15:25	4.10	2.91	05:00	0.47	16:45	2.20	1.34	06:20	0.022	16:45	0.291	0.131	0.131	
03/25/2018	06:00	1.78	14:55	3.88	2.70	05:45	0.58	14:55	2.50	1.55	05:45	0.026	14:55	0.324	0.131	0.131	
03/26/2018	06:05	1.74	14:10	3.91	2.80	06:20	0.80	11:40	2.56	1.58	06:20	0.036	11:40	0.316	0.140	0.140	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			7.762	4.20
Avg	2.76	1.47	0.127	

Site Commentary

Site Information

22D-2	
Pipe Dimensions	11.63 "
Silt Level	0.00"

Overview

Site 22D-2 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 47% full at its recorded peak of 5.42 inches and approximately 23% full during its recorded average depth of 2.68 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.68	0.51	0.046
Minimum	1.26	0.18	0.007
Maximum	5.42	2.01	0.282
Time of Minimum	1/28/2018 5:40 AM	2/24/2018 4:20 AM	2/5/2018 3:40 AM
Time of Maximum	3/19/2018 12:30 PM	1/25/2018 10:00 AM	1/26/2018 10:15 AM

Data Quality

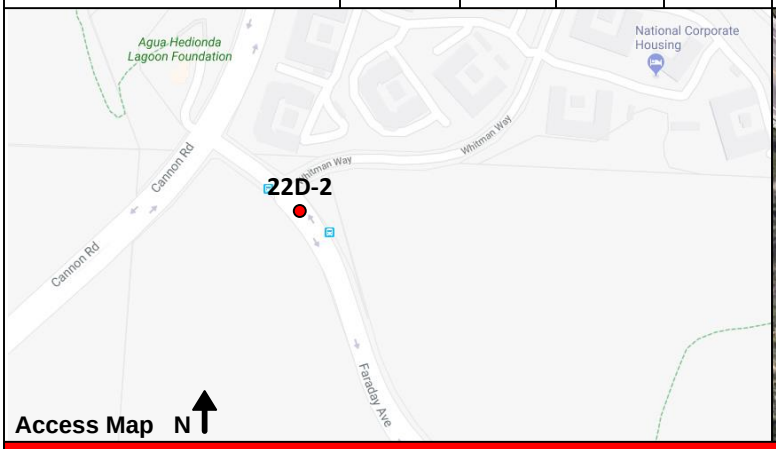
Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	99
Velocity (ft/s)	99
Quantity (MGD)	99

ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA	**Date Installed:** 01/24/18	**FM Initials:** JG
Site Name: 22D-2	**Monitor Series:** FS	**Monitor S/N:**	26118
Address / Location: Faraday Ave & Whitman Way		**Manhole #:**	22D-2
		Map Page #:	N/A
Access: Drive	**Type of System:** Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	11.63"
		Pipe Width:	11.63"
		IP Address:	N/A



Access Map N

Site Map N

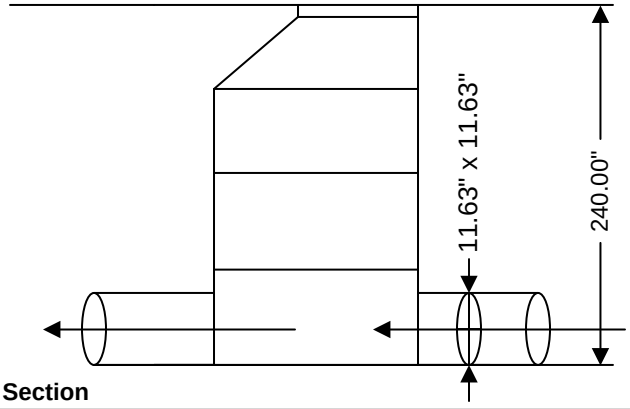
Investigation Information:

Date/Time of Investigation:	01/24/18 @ 0800
Site Hydraulics: Smooth flow into manhole	
Upstream Input: (L/S,P/S)	N/A
Upstream Manhole:	DNI
Downstream Manhole:	DNI
Depth of Flow (Wet Dof):	2.88 +/- 0.25
Range (Air Dof):	+/-
Peak Velocity:	2.40 Fps
Silt:	0.00 Inches

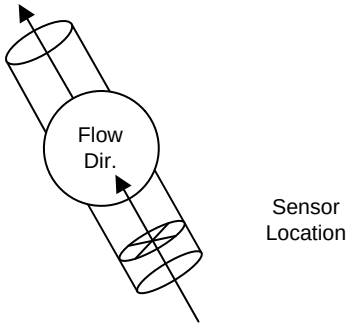
Manhole Information:

Manhole Depth:	240"				**Inches**
Manhole Material / Condition:	Precast/Lined Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [x]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

22D-2

Flow Monitor

22D-2

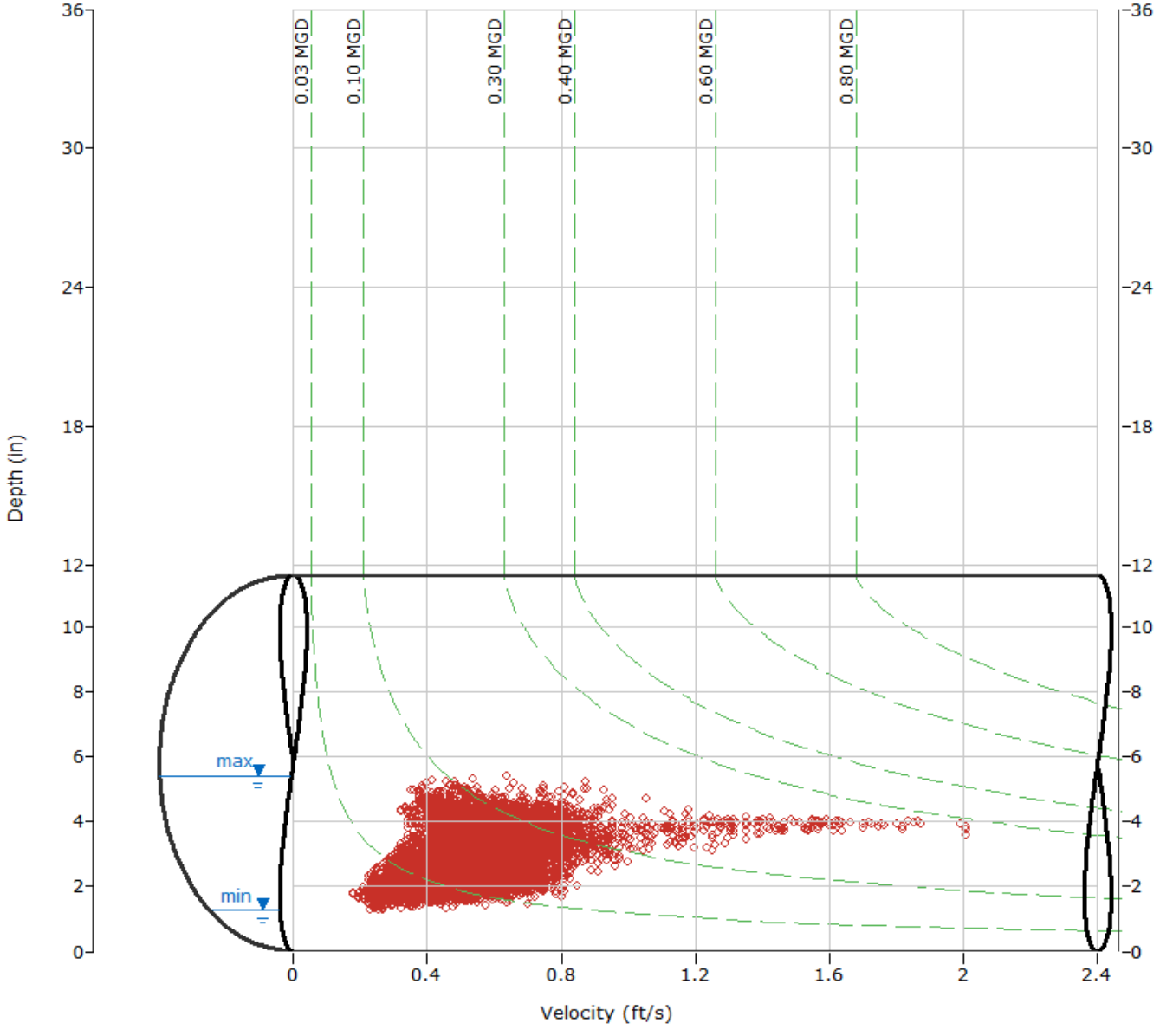
Pipe Height
11.63 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



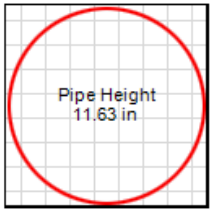
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

22D-2

Flow Monitor

22D-2

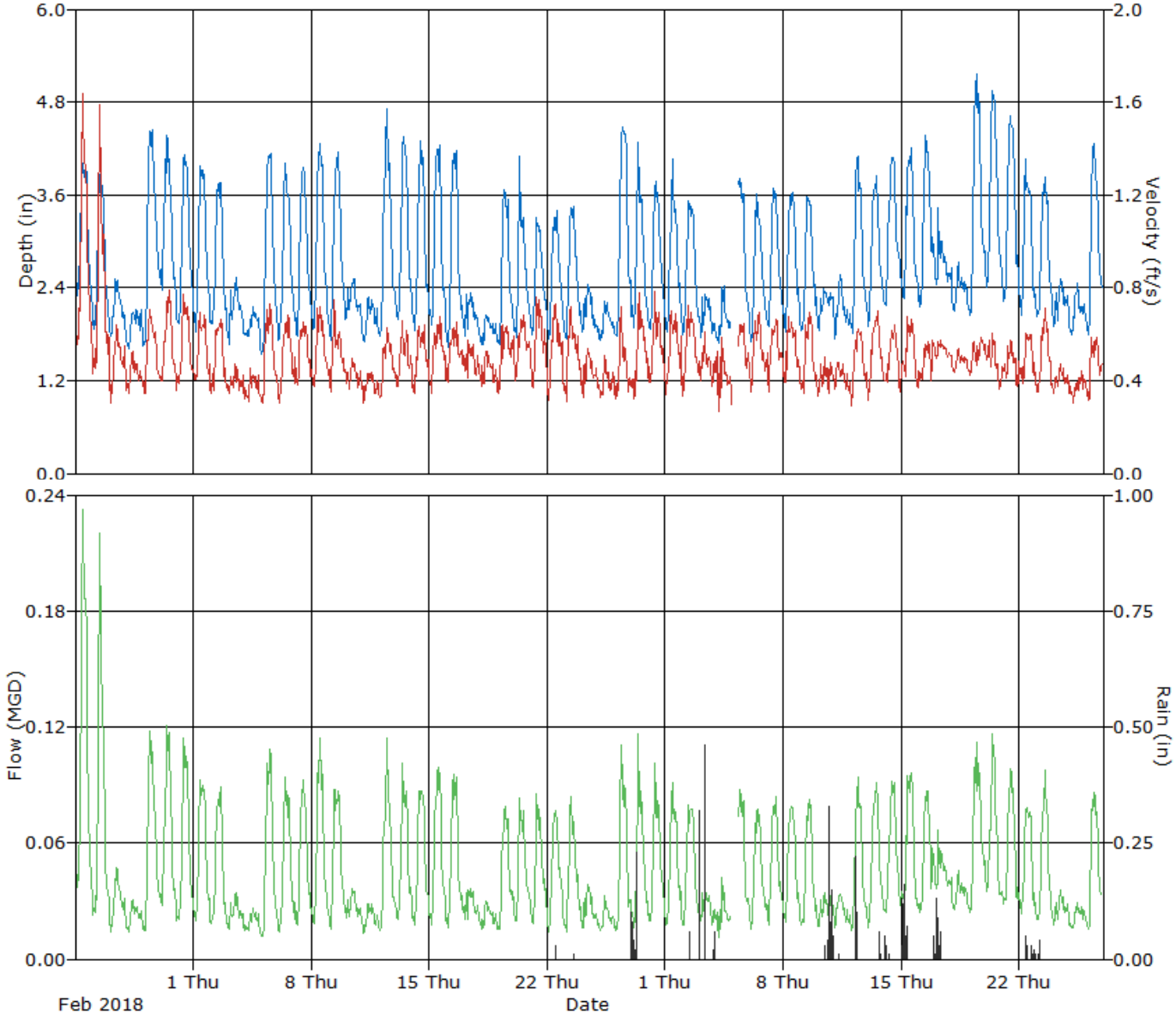


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

22D-2, Pipe Height: 11.63 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/25/2018	23:40	1.95	14:55	4.18	3.10	03:45	0.48	10:00	2.01	0.94	23:40	0.027	12:20	0.277	0.107	0.107	
01/26/2018	01:40	1.61	10:10	4.07	2.79	04:35	0.28	10:20	2.01	0.79	01:35	0.013	10:15	0.282	0.081	0.081	
01/27/2018	03:00	1.55	10:05	2.84	2.13	02:25	0.23	15:30	0.78	0.49	03:00	0.010	12:00	0.061	0.030	0.030	
01/28/2018	05:40	1.26	12:20	2.52	1.92	05:25	0.22	08:10	0.69	0.43	05:40	0.007	09:50	0.046	0.023	0.023	
01/29/2018	01:05	1.43	14:00	4.70	3.16	04:00	0.21	09:35	1.01	0.53	04:00	0.009	10:50	0.162	0.062	0.062	
01/30/2018	04:40	2.10	11:40	4.57	3.23	03:50	0.33	14:15	1.11	0.56	04:20	0.021	14:15	0.178	0.065	0.065	
01/31/2018	01:40	1.66	11:55	4.36	2.99	02:00	0.28	10:45	1.04	0.56	02:00	0.012	10:45	0.157	0.059	0.059	
02/01/2018	03:35	1.57	10:00	4.35	2.93	02:35	0.25	09:45	0.95	0.54	04:40	0.011	09:45	0.139	0.055	0.055	
02/02/2018	01:50	1.68	15:55	4.25	2.78	04:50	0.23	08:35	0.87	0.50	04:50	0.010	15:55	0.122	0.048	0.048	
02/03/2018	03:25	1.37	13:50	2.83	2.12	03:10	0.22	06:20	0.65	0.40	03:25	0.008	12:20	0.042	0.024	0.024	
02/04/2018	07:25	1.41	11:55	2.39	1.92	08:45	0.21	09:40	0.67	0.38	04:05	0.008	14:15	0.036	0.020	0.020	
02/05/2018	03:40	1.28	12:50	4.41	2.84	01:05	0.22	10:05	0.84	0.52	03:40	0.007	14:45	0.131	0.054	0.054	
02/06/2018	03:05	1.56	11:30	4.27	2.81	03:50	0.23	08:40	0.93	0.51	03:05	0.011	10:15	0.129	0.050	0.050	
02/07/2018	05:10	1.36	11:20	4.26	2.84	05:10	0.25	10:10	0.88	0.52	05:10	0.008	10:10	0.116	0.051	0.051	
02/08/2018	03:40	1.61	14:40	4.53	2.97	02:50	0.26	09:55	0.98	0.54	03:40	0.012	12:45	0.155	0.057	0.057	
02/09/2018	04:00	1.61	14:25	4.43	2.93	04:40	0.26	08:25	1.05	0.52	04:40	0.011	15:10	0.122	0.053	0.053	
02/10/2018	03:55	1.66	13:00	2.74	2.24	06:50	0.29	10:00	0.69	0.43	03:40	0.014	10:00	0.053	0.028	0.028	
02/11/2018	05:10	1.40	10:50	2.55	2.01	04:05	0.25	14:40	0.67	0.38	04:50	0.010	14:40	0.044	0.021	0.021	
02/12/2018	01:40	1.32	11:35	5.02	3.02	01:40	0.24	12:10	1.05	0.48	01:40	0.007	12:10	0.191	0.052	0.052	
02/13/2018	03:50	1.73	12:00	4.53	3.03	03:45	0.25	10:30	0.85	0.50	04:25	0.014	10:30	0.131	0.053	0.053	
02/14/2018	04:15	1.64	12:25	4.45	2.96	00:40	0.23	09:50	0.94	0.51	02:45	0.011	15:40	0.127	0.053	0.053	
02/15/2018	04:35	1.71	15:25	4.50	2.99	04:55	0.28	16:55	0.83	0.53	04:55	0.013	12:20	0.127	0.055	0.055	
02/16/2018	05:00	1.45	14:40	4.57	2.86	04:45	0.26	12:10	0.91	0.53	04:45	0.011	12:10	0.139	0.052	0.052	
02/17/2018	04:30	1.58	05:35	2.86	2.07	04:50	0.28	05:45	0.78	0.49	04:50	0.012	05:45	0.056	0.028	0.028	
02/18/2018	01:00	1.39	22:45	2.25	1.86	06:45	0.22	22:35	0.69	0.44	06:45	0.008	09:55	0.041	0.022	0.022	
02/19/2018	03:50	1.37	11:15	4.03	2.61	00:40	0.26	13:35	0.90	0.52	04:00	0.010	12:35	0.107	0.045	0.045	
02/20/2018	04:20	1.54	09:40	4.70	2.63	03:05	0.29	10:30	1.19	0.56	04:20	0.014	09:40	0.172	0.048	0.048	
02/21/2018	03:40	1.64	09:55	3.78	2.53	04:05	0.27	13:45	1.25	0.57	03:40	0.012	13:45	0.128	0.046	0.046	
02/22/2018	03:15	1.56	14:40	3.66	2.58	02:45	0.23	13:30	0.98	0.54	03:15	0.010	13:30	0.112	0.046	0.046	0.03
02/23/2018	04:15	1.49	10:25	3.60	2.60	04:05	0.22	10:25	0.99	0.53	04:05	0.009	10:25	0.124	0.045	0.045	0.02
02/24/2018	17:50	1.59	12:10	2.63	2.08	04:20	0.18	05:10	0.81	0.44	04:20	0.008	10:45	0.058	0.026	0.026	
02/25/2018	04:35	1.52	14:35	2.59	1.96	05:35	0.18	10:15	0.74	0.40	05:35	0.008	10:15	0.049	0.021	0.021	
02/26/2018	00:50	1.56	11:25	4.76	3.15	04:25	0.20	09:20	1.17	0.46	04:25	0.009	09:20	0.182	0.053	0.053	
02/27/2018	04:55	1.77	11:05	4.60	2.81	04:40	0.21	10:15	1.18	0.53	04:40	0.010	10:25	0.191	0.051	0.051	0.55
02/28/2018	03:55	1.71	09:55	4.16	2.76	04:20	0.22	10:35	0.98	0.55	04:20	0.011	10:35	0.141	0.051	0.051	
03/01/2018	05:05	1.67	11:35	4.21	2.74	01:35	0.23	16:35	0.91	0.55	02:35	0.012	11:40	0.125	0.050	0.050	
03/02/2018	02:40	1.68	15:15	4.03	2.66	02:15	0.24	09:15	0.97	0.54	02:15	0.011	15:15	0.116	0.048	0.048	0.06
03/03/2018	03:45	1.51	09:40	2.64	2.04	19:40	0.27	08:25	0.80	0.47	03:45	0.012	09:55	0.051	0.027	0.027	1.04
03/04/2018	07:40	1.46	10:15	2.76	1.98	04:00	0.20	06:55	0.85	0.42	07:40	0.008	09:20	0.061	0.024	0.022	
03/05/2018	22:30	1.88	10:05	4.30	3.05	23:35	0.38	11:50	0.87	0.57	22:10	0.023	11:50	0.125	0.059	0.035	
03/06/2018	04:45	1.47	13:20	3.97	2.63	05:00	0.24	14:10	0.91	0.53	05:00	0.009	13:20	0.116	0.046	0.046	
03/07/2018	04:20	1.69	14:00	3.92	2.75	04:40	0.23	16:10	0.85	0.54	03:25	0.012	14:00	0.112	0.049	0.049	
03/08/2018	03:55	1.60	15:25	3.86	2.73	06:35	0.28	08:25	0.85	0.53	04:55	0.013	15:25	0.098	0.048	0.048	
03/09/2018	02:25	1.62	11:50	3.80	2.68	06:25	0.21	12:10	0.90	0.51	06:25	0.011	12:10	0.117	0.046	0.046	
03/10/2018	03:00	1.62	05:50	2.67	2.19	01:20	0.25	10:30	0.67	0.41	04:50	0.012	10:30	0.049	0.026	0.026	0.91
03/11/2018	02:50	1.59	09:40	2.83	2.13	02:05	0.23	05:15	0.78	0.42	02:05	0.010	05:45	0.055	0.025	0.025	0.01

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	01:10	1.50	09:00	4.65	2.88	01:35	0.25	11:35	0.82	0.49	03:15	0.011	11:35	0.138	0.049	0.049	0.32
03/13/2018	02:40	1.75	14:20	4.26	2.89	02:20	0.24	13:10	0.88	0.53	02:10	0.012	14:00	0.119	0.052	0.052	0.07
03/14/2018	02:55	1.99	15:10	4.46	3.15	23:45	0.28	15:45	0.94	0.49	04:15	0.019	14:55	0.136	0.054	0.054	0.11
03/15/2018	03:25	1.98	14:55	4.35	3.15	05:55	0.23	11:25	1.12	0.53	05:55	0.016	11:25	0.176	0.059	0.059	0.46
03/16/2018	01:25	1.87	11:35	4.61	3.19	03:15	0.24	14:40	0.86	0.48	03:15	0.016	14:40	0.137	0.054	0.054	0.05
03/17/2018	22:35	2.11	05:20	4.10	2.72	05:15	0.38	09:35	0.61	0.53	22:35	0.026	05:25	0.082	0.045	0.045	0.35
03/18/2018	03:40	1.77	00:20	3.05	2.39	06:30	0.24	00:20	0.57	0.48	06:30	0.014	00:20	0.057	0.034	0.034	
03/19/2018	03:25	1.76	12:30	5.42	3.54	06:25	0.29	12:05	0.87	0.51	03:25	0.017	12:05	0.181	0.065	0.065	
03/20/2018	04:05	2.15	10:45	5.11	3.57	23:35	0.25	12:00	0.93	0.49	23:35	0.020	12:00	0.181	0.063	0.063	
03/21/2018	02:25	1.96	11:45	4.78	3.38	05:50	0.25	10:10	0.76	0.47	05:20	0.018	10:10	0.130	0.057	0.057	
03/22/2018	03:15	1.90	09:50	4.32	2.98	01:30	0.22	11:15	0.80	0.50	03:55	0.012	12:30	0.110	0.051	0.051	0.16
03/23/2018	01:25	1.72	14:00	4.11	2.86	03:40	0.25	14:10	0.85	0.51	01:25	0.014	13:55	0.123	0.050	0.050	0.06
03/24/2018	03:00	1.73	11:35	2.67	2.22	23:25	0.23	11:25	0.65	0.41	01:25	0.012	11:35	0.046	0.026	0.026	
03/25/2018	01:40	1.57	12:35	2.65	2.10	06:25	0.22	01:10	0.62	0.38	02:50	0.010	10:10	0.042	0.022	0.022	
03/26/2018	02:10	1.54	11:45	4.58	3.00	00:55	0.24	08:10	0.90	0.47	02:10	0.010	08:10	0.119	0.050	0.050	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.788	4.20
Avg	2.68	0.51	0.046	

Site Commentary

Site Information

31A-12	
Pipe Dimensions	15.25 "
Silt Level	0.00"

Overview

Site 31A-12 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 16% full at its recorded peak of 2.43 inches and approximately 10% full during its recorded average depth of 1.49 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.49	0.87	0.041
Minimum	0.76	0.22	0.006
Maximum	2.44	3.06	0.226
Time of Minimum	1/27/2018 11:25 PM	2/17/2018 1:25 AM	2/17/2018 11:15 PM
Time of Maximum	1/29/2018 6:20 AM	2/27/2018 8:45 AM	1/29/2018 11:20 AM

Data Quality

Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

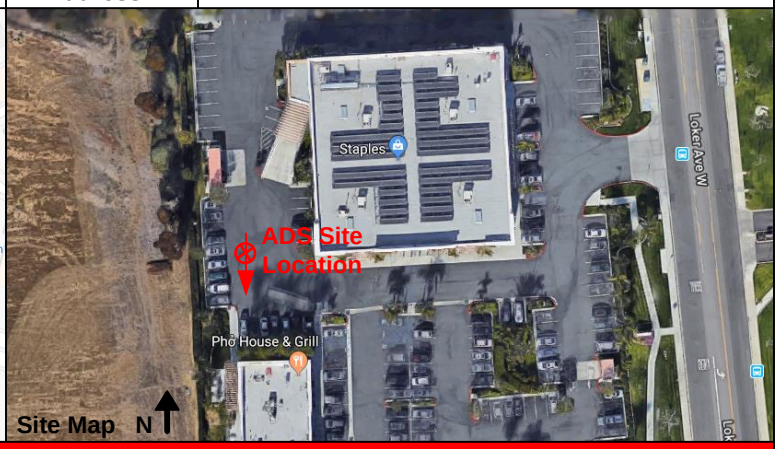
Percent Uptime	
Depth (in)	99
Velocity (ft/s)	99
Quantity (MGD)	99

ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA			**Date Installed:** 01/24/18	**FM Initials:** JG
Site Name: 31A-12	**Monitor Series:** FS			**Monitor S/N:**	21703
Address / Location: 2712 Loker Ave W				**Manhole #:**	31A-12
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** 15.25"
					Pipe Width: 15.00"
					IP Address: N/A

Access Map N



Site Map N

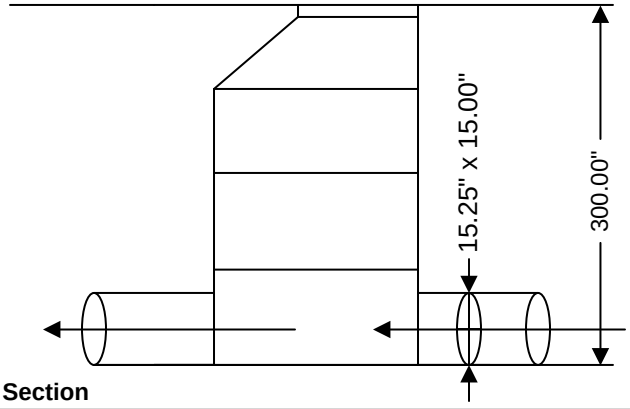
Investigation Information:

Date/Time of Investigation:	01/24/18 @ 0930		
Site Hydraulics: Smooth flow into manhole			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.50	**+/-**	0.25
Range (Air Dof):		**+/-**	
Peak Velocity:	1.24	**Fps**	
Silt:	0.00	**Inches**	

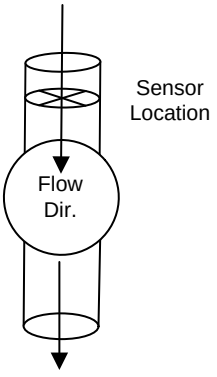
Manhole Information:

Manhole Depth:	300"				**Inches**
Manhole Material / Condition:	Precast/Lined Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	**Residential** [ ]	**Commercial** [x]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard installation	**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)	**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge **Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1	**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

31A-12

Flow Monitor

31A-12

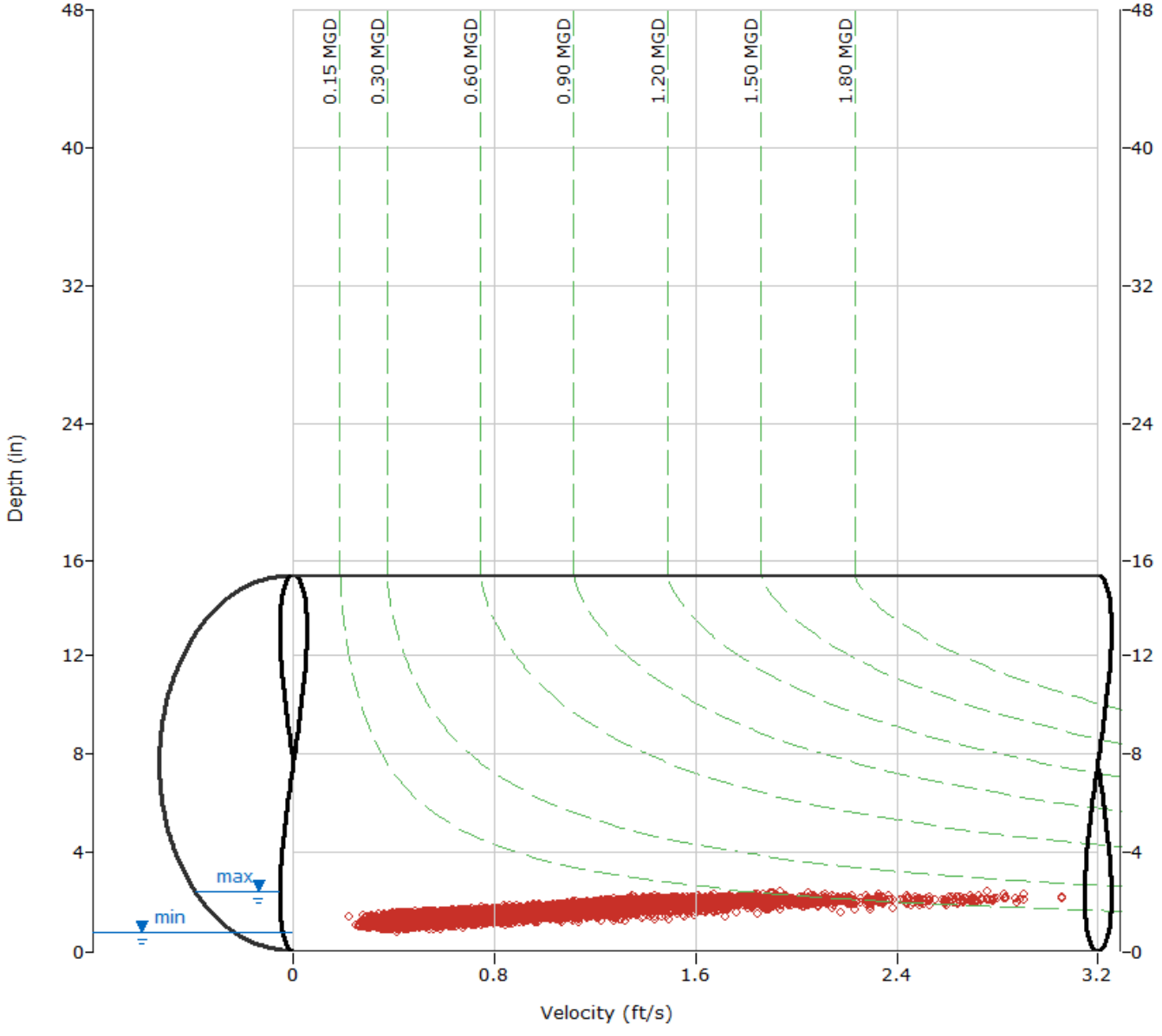
Pipe Height
15.25 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



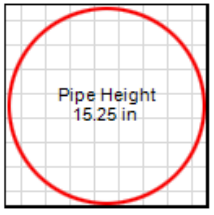
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

31A-12

Flow Monitor

31A-12

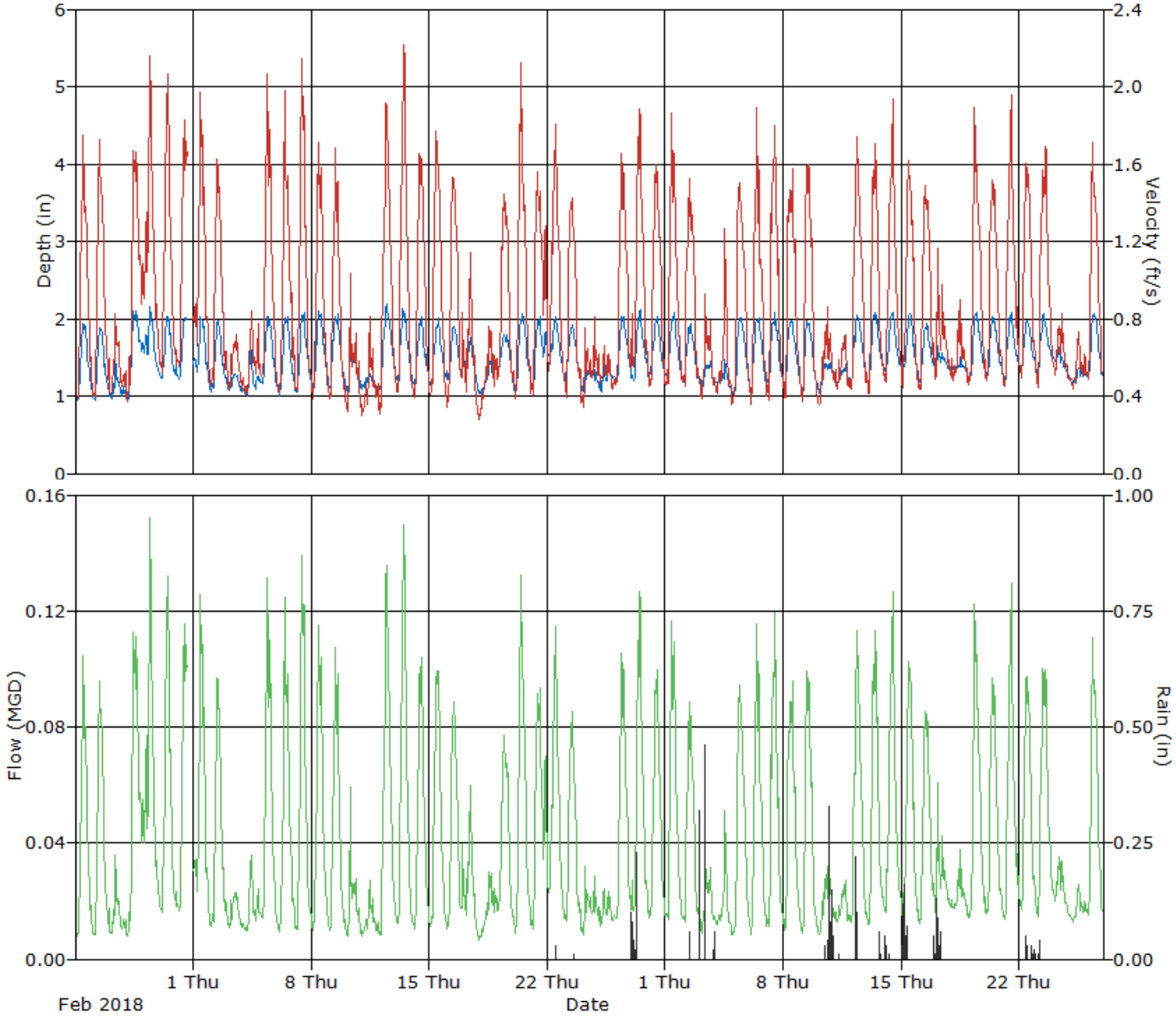


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

31A-12, Pipe Height: 15.25 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Total	Total
01/25/2018	03:00	0.86 14:20	2.05	1.42	03:25	0.34 11:20	2.23	0.93	03:00	0.006 11:00	0.135	0.042	0.042	
01/26/2018	01:10	0.89 11:20	1.97	1.39	02:10	0.35 09:50	2.29	0.93	04:20	0.007 09:50	0.134	0.041	0.041	
01/27/2018	23:25	0.76 10:10	2.00	1.11	05:20	0.33 10:15	1.23	0.55	23:25	0.006 10:10	0.075	0.015	0.015	
01/28/2018	04:40	0.88 10:10	2.37	1.58	03:25	0.31 10:10	1.90	1.01	03:25	0.006 10:10	0.152	0.054	0.054	
01/29/2018	19:50	1.25 06:20	2.44	1.69	00:00	0.46 11:20	2.91	1.21	00:00	0.016 11:20	0.226	0.064	0.064	
01/30/2018	04:35	1.16 11:40	2.14	1.56	04:05	0.46 13:20	2.72	1.09	04:25	0.013 12:35	0.174	0.054	0.054	
01/31/2018	04:05	1.17 13:10	2.20	1.60	01:25	0.46 13:25	2.74	1.11	01:25	0.013 13:25	0.186	0.057	0.036	
02/01/2018	22:55	1.09 11:15	2.10	1.57	23:05	0.40 10:25	2.91	1.09	23:05	0.010 10:25	0.189	0.053	0.053	
02/02/2018	01:40	0.95 09:55	2.09	1.47	03:00	0.34 10:00	2.23	0.93	02:20	0.008 10:00	0.145	0.043	0.043	
02/03/2018	10:05	0.91 06:45	1.74	1.17	02:30	0.37 06:45	1.24	0.56	10:05	0.008 06:45	0.063	0.016	0.016	
02/04/2018	05:10	0.92 09:40	1.91	1.20	03:55	0.36 21:40	1.49	0.57	06:45	0.008 12:15	0.073	0.018	0.018	
02/05/2018	23:50	1.04 11:15	2.17	1.55	23:50	0.40 10:25	2.41	1.05	23:50	0.009 10:00	0.159	0.052	0.052	
02/06/2018	04:15	0.93 14:05	2.14	1.51	04:45	0.35 11:20	2.51	0.98	04:45	0.008 11:20	0.158	0.048	0.048	
02/07/2018	06:10	0.94 10:50	2.20	1.52	23:00	0.37 12:50	2.79	1.03	02:25	0.009 12:50	0.188	0.052	0.052	
02/08/2018	01:35	1.02 11:15	2.26	1.60	04:40	0.28 09:50	2.80	0.93	03:05	0.008 09:50	0.195	0.049	0.049	
02/09/2018	02:55	1.03 14:00	2.20	1.57	03:05	0.31 11:25	2.59	0.87	03:05	0.007 11:30	0.169	0.044	0.044	
02/10/2018	04:40	1.01 08:55	2.31	1.29	04:50	0.28 08:55	1.87	0.52	04:30	0.007 08:55	0.144	0.019	0.019	
02/11/2018	05:25	1.02 16:35	1.61	1.18	02:20	0.27 12:35	1.39	0.46	05:25	0.007 16:35	0.054	0.013	0.013	
02/12/2018	03:45	1.01 11:30	2.26	1.63	01:20	0.28 11:40	2.73	1.01	01:20	0.007 11:40	0.198	0.055	0.055	
02/13/2018	04:50	1.06 09:50	2.30	1.62	01:40	0.38 13:35	2.87	1.08	05:05	0.011 12:30	0.199	0.058	0.058	
02/14/2018	04:10	1.00 14:10	2.12	1.53	04:20	0.29 13:50	2.59	0.96	04:20	0.007 13:50	0.161	0.046	0.046	
02/15/2018	02:30	1.12 14:50	2.14	1.54	01:55	0.35 09:05	2.29	0.98	02:30	0.010 14:20	0.142	0.048	0.048	
02/16/2018	03:15	1.14 12:00	2.04	1.53	02:20	0.30 12:00	2.03	0.89	03:15	0.008 12:00	0.131	0.042	0.042	
02/17/2018	22:40	1.03 14:25	2.05	1.44	01:25	0.22 14:25	1.63	0.61	23:15	0.006 14:25	0.106	0.026	0.026	
02/18/2018	02:00	0.97 13:25	1.71	1.25	02:50	0.25 21:55	1.12	0.52	00:10	0.006 21:55	0.048	0.017	0.017	
02/19/2018	23:55	1.10 15:00	1.98	1.54	23:15	0.39 13:10	1.88	0.91	23:15	0.011 13:10	0.096	0.042	0.042	
02/20/2018	02:05	0.97 10:40	2.13	1.57	02:20	0.31 10:40	2.83	1.04	02:10	0.007 10:40	0.193	0.053	0.053	
02/21/2018	05:05	0.92 14:35	2.17	1.60	01:45	0.37 12:00	2.05	1.03	05:05	0.008 14:45	0.134	0.052	0.052	
02/22/2018	23:55	1.25 12:50	2.19	1.67	04:10	0.36 13:15	2.44	1.04	04:10	0.014 12:20	0.166	0.053	0.053	0.03
02/23/2018	01:45	1.14 12:40	2.15	1.55	05:25	0.33 12:50	1.90	0.88	04:15	0.011 12:50	0.124	0.042	0.042	0.02
02/24/2018	01:45	0.97 07:20	1.72	1.26	04:25	0.29 07:20	1.23	0.54	04:25	0.007 07:20	0.062	0.017	0.017	
02/25/2018	06:25	0.98 09:30	1.67	1.25	05:00	0.38 18:00	1.11	0.53	01:50	0.010 09:30	0.052	0.017	0.017	
02/26/2018	00:55	1.14 11:20	2.18	1.61	04:50	0.38 11:05	2.02	0.98	04:50	0.011 11:00	0.131	0.050	0.050	
02/27/2018	00:30	1.05 12:40	2.39	1.61	05:50	0.40 08:45	3.06	1.06	03:55	0.011 12:40	0.223	0.055	0.055	0.55
02/28/2018	00:25	1.19 13:50	2.17	1.60	05:30	0.36 13:50	2.03	0.98	04:10	0.012 13:50	0.143	0.049	0.049	
03/01/2018	04:55	1.12 09:10	2.22	1.61	03:20	0.35 09:05	3.06	0.99	05:05	0.011 09:05	0.216	0.051	0.051	
03/02/2018	05:15	1.11 13:15	2.01	1.51	05:35	0.39 11:50	2.00	0.90	04:35	0.011 11:50	0.124	0.042	0.042	0.06
03/03/2018	04:20	0.97 09:00	1.80	1.26	04:50	0.32 09:05	1.65	0.57	04:50	0.007 09:05	0.076	0.019	0.019	1.04
03/04/2018	23:35	0.96 14:10	1.70	1.21	23:20	0.30 13:25	1.94	0.59	23:20	0.006 13:25	0.094	0.018	0.018	
03/05/2018	01:20	0.96 11:25	2.14	1.55	01:35	0.30 10:35	1.90	0.94	01:35	0.006 10:35	0.126	0.047	0.047	
03/06/2018	03:35	0.98 10:10	2.16	1.57	03:20	0.31 13:55	2.74	0.96	03:30	0.007 13:55	0.177	0.049	0.049	
03/07/2018	05:25	1.07 13:50	2.31	1.57	04:05	0.35 13:25	2.43	0.97	04:40	0.009 13:25	0.161	0.049	0.049	
03/08/2018	03:10	0.97 12:20	2.14	1.55	03:05	0.34 14:55	1.94	0.93	03:45	0.008 08:35	0.126	0.046	0.046	
03/09/2018	03:40	0.97 09:00	2.28	1.51	03:15	0.33 12:55	2.71	0.92	03:40	0.007 12:45	0.197	0.045	0.045	
03/10/2018	03:30	0.99 18:30	1.50	1.28	02:15	0.31 15:05	1.56	0.55	03:30	0.007 15:05	0.056	0.019	0.019	0.91
03/11/2018	05:25	1.12 15:05	1.49	1.26	04:35	0.37 15:35	1.03	0.55	04:35	0.010 15:35	0.042	0.017	0.017	0.01

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	01:05	1.12	10:05	2.17	1.63	03:05	0.39	10:20	2.76	1.01	01:05	0.011	10:20	0.186	0.053	0.053	0.32
03/13/2018	02:30	1.12	10:45	2.27	1.63	04:30	0.33	12:30	2.83	0.96	02:30	0.010	12:30	0.197	0.051	0.051	0.07
03/14/2018	03:05	1.26	13:35	2.26	1.66	02:10	0.41	12:50	2.61	1.02	03:15	0.014	11:20	0.177	0.054	0.054	0.11
03/15/2018	02:30	1.15	11:15	2.16	1.63	02:50	0.38	10:05	2.46	0.97	02:50	0.011	10:05	0.136	0.050	0.050	0.46
03/16/2018	02:20	1.14	13:25	2.03	1.56	02:45	0.35	10:55	1.84	0.93	01:55	0.010	10:55	0.111	0.045	0.045	0.05
03/17/2018	03:00	1.20	04:25	2.34	1.43	02:55	0.40	04:30	2.66	0.68	03:25	0.012	04:30	0.163	0.027	0.027	0.35
03/18/2018	23:30	1.23	13:00	1.77	1.37	03:05	0.41	09:45	1.17	0.60	23:10	0.014	13:00	0.060	0.022	0.022	
03/19/2018	02:35	1.18	09:45	2.25	1.64	01:35	0.40	09:35	2.72	1.03	02:20	0.012	09:45	0.181	0.054	0.054	
03/20/2018	04:05	1.16	13:15	2.25	1.62	05:15	0.43	13:15	2.07	0.97	04:05	0.013	13:15	0.153	0.049	0.049	
03/21/2018	01:50	1.16	13:20	2.17	1.62	05:20	0.40	12:35	2.63	1.04	03:55	0.012	13:20	0.183	0.053	0.053	
03/22/2018	04:15	1.29	14:20	2.13	1.64	03:25	0.43	14:25	2.65	1.00	03:25	0.015	14:25	0.164	0.051	0.051	0.16
03/23/2018	02:25	1.22	11:15	2.14	1.67	01:20	0.40	16:35	2.38	1.04	03:20	0.012	14:15	0.144	0.054	0.054	0.06
03/24/2018	23:20	1.21	10:25	1.86	1.45	20:05	0.43	13:15	0.98	0.62	21:20	0.014	10:25	0.047	0.024	0.024	
03/25/2018	10:35	1.12	15:25	1.47	1.26	04:45	0.38	14:30	1.34	0.54	05:45	0.011	14:30	0.053	0.017	0.017	
03/26/2018	23:00	1.14	09:25	2.25	1.63	02:55	0.40	09:25	2.22	0.99	02:55	0.013	09:25	0.165	0.051	0.051	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.491	4.20
Avg	1.49	0.87	0.041	

Site Commentary

Site Information

48D-16	
Pipe Dimensions	11.63 "
Silt Level	0.00"

Overview

Site 48D-16 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 14% full at its recorded peak of 1.64 inches and approximately 9% full during its recorded average depth of 1.09 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.09	4.26	0.107
Minimum	0.56	1.44	0.014
Maximum	1.64	7.53	0.313
Time of Minimum	3/25/2018 3:55 AM	3/1/2018 2:35 AM	3/26/2018 2:20 AM
Time of Maximum	1/27/2018 10:05 AM	3/11/2018 10:10 AM	3/11/2018 10:10 AM

Data Quality

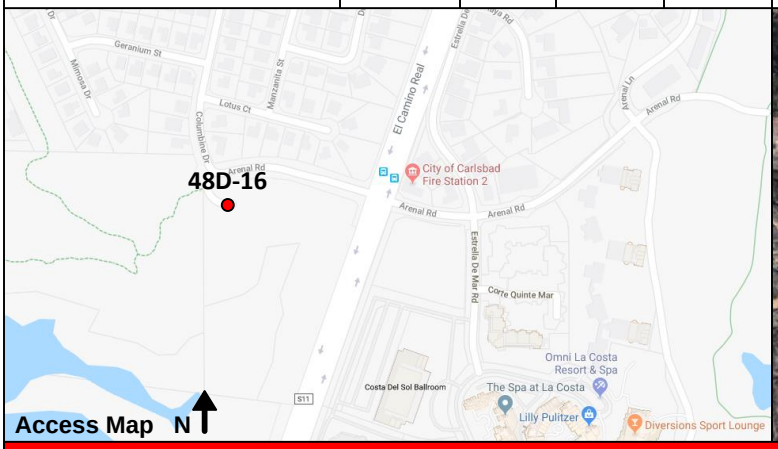
Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA		**Date Installed:** 01/23/18	**FM Initials:** JG
Site Name: 48D-16	**Monitor Series:** FS		**Monitor S/N:**	21488
Address / Location: 1811-1875 Arenal Rd			**Manhole #:**	48D-16
			Map Page #:	N/A
Access: Drive	**Type of System:**	Sanitary [x] Storm [ ] Combined [ ]	**Pipe Height:**	11.63"
			Pipe Width:	11.88"
			IP Address:	N/A



Access Map N

Site Map N

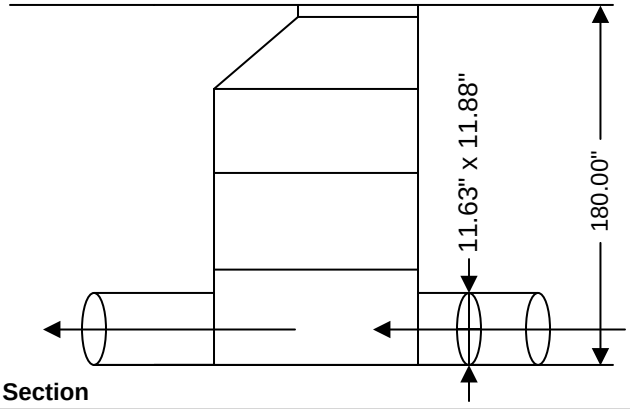
Investigation Information:

Date/Time of Investigation:	01/23/18 @ 0730				
Site Hydraulics: Fast flow around 80 degree bend					
Upstream Input: (L/S,P/S)	N/A				
Upstream Manhole:	DNI				
Downstream Manhole:	DNI				
Depth of Flow (Wet Dof):	1.25	**+/-**	0.25		
Range (Air Dof):		**+/-**			
Peak Velocity:	8.7	**Fps**			
Silt:	0.00	**Inches**			

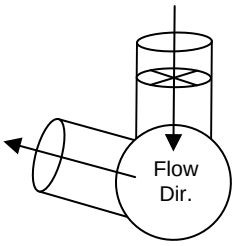
Manhole Information:

Manhole Depth:	180"	**Inches**			
Manhole Material / Condition:	Lined / Good				
Pipe Material / Condition:	PVC / Good				
Mini System Character:	Residential [x]	Commercial [ ]	Industrial [ ]	Other [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A	**Feet**			
Road Cut Length:	N/A	**Feet**			
Trench Length:	N/A	**Feet**			

Other Information:



Cross Section



Sensor Location

Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

48D-16

Flow Monitor

48D-16

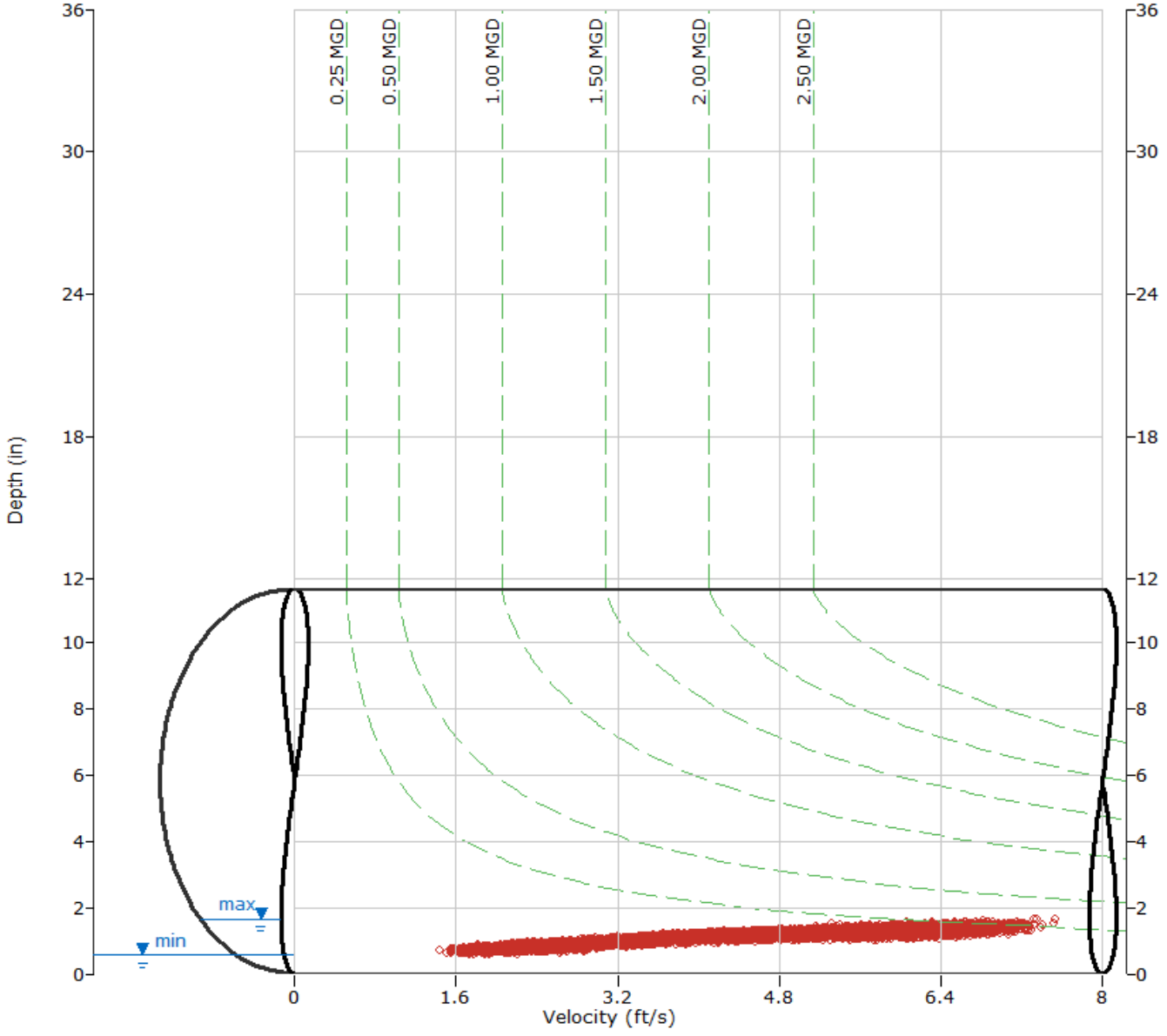
Pipe Height
11.63 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



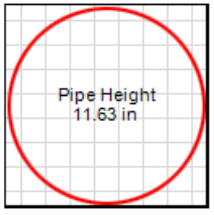
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

48D-16

Flow Monitor

48D-16

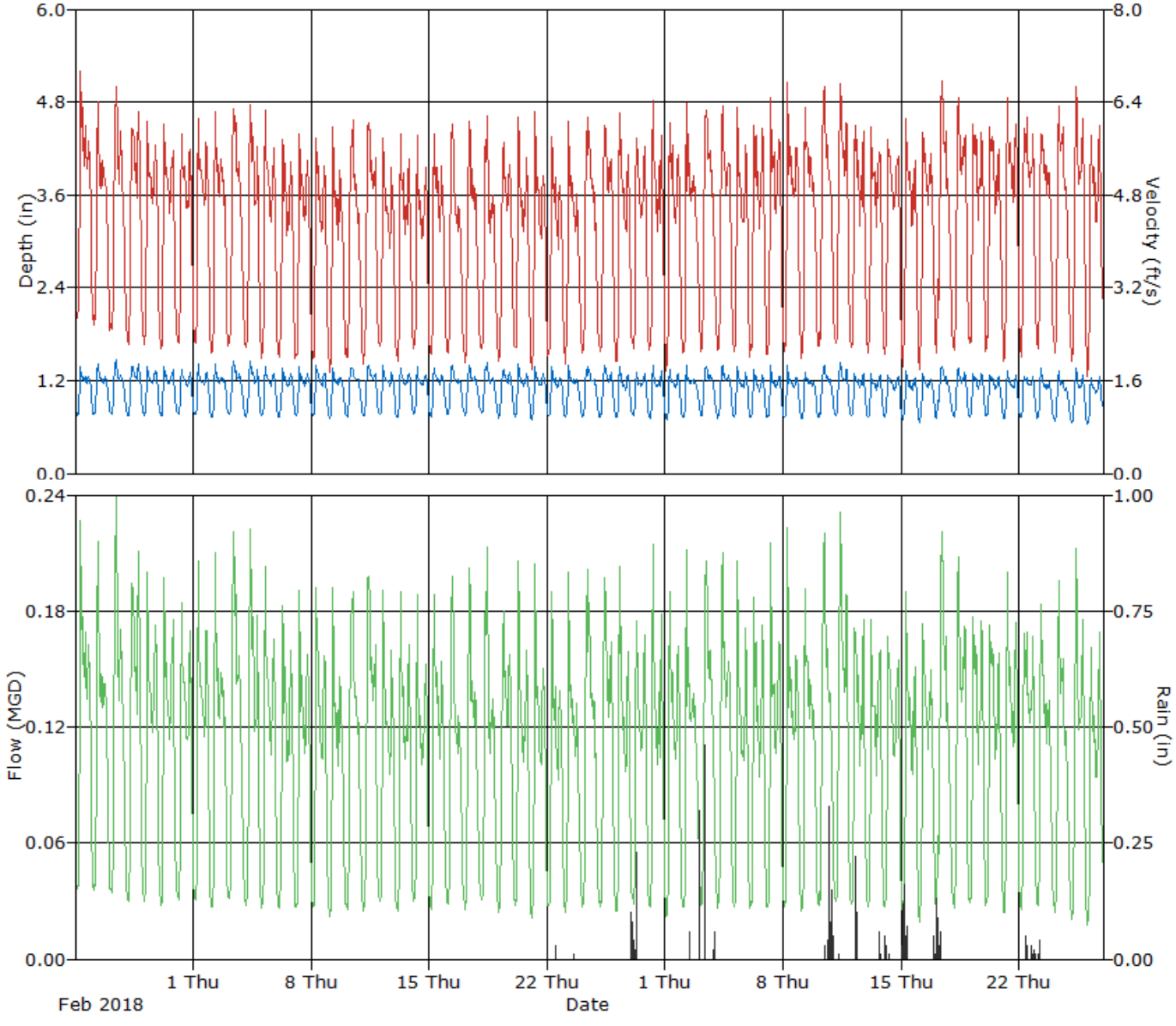


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

48D-16, Pipe Height: 11.63 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Total	Total
01/25/2018	03:20	0.67 07:50	1.52	1.11	04:55	2.29 07:50	7.52	4.86	03:20	0.028 07:50	0.282	0.124	0.124	
01/26/2018	04:00	0.68 08:20	1.51	1.11	03:50	1.96 08:10	7.22	4.44	04:00	0.023 08:20	0.266	0.114	0.114	
01/27/2018	03:30	0.70 10:05	1.64	1.12	01:30	2.17 10:05	7.33	4.51	04:50	0.027 10:05	0.307	0.120	0.120	
01/28/2018	03:30	0.68 18:25	1.64	1.13	05:05	1.84 18:25	7.35	4.44	03:50	0.024 18:25	0.308	0.120	0.120	
01/29/2018	01:25	0.68 07:25	1.47	1.12	03:40	2.04 18:20	6.85	4.37	03:40	0.025 07:25	0.241	0.113	0.113	
01/30/2018	04:05	0.66 07:35	1.52	1.11	03:25	1.90 18:35	6.69	4.32	04:05	0.022 07:35	0.248	0.112	0.112	
01/31/2018	02:05	0.73 07:40	1.44	1.10	03:10	1.94 18:25	6.99	4.30	03:10	0.027 07:40	0.222	0.108	0.108	
02/01/2018	04:00	0.69 07:30	1.49	1.10	02:05	1.95 19:00	6.96	4.35	04:00	0.025 19:00	0.246	0.112	0.112	
02/02/2018	02:45	0.66 07:30	1.49	1.10	03:40	1.69 08:00	7.18	4.33	03:40	0.019 07:30	0.247	0.111	0.111	
02/03/2018	04:50	0.70 09:55	1.57	1.12	03:50	1.92 10:25	7.18	4.36	04:50	0.024 09:55	0.261	0.116	0.116	
02/04/2018	04:40	0.64 09:45	1.56	1.10	04:15	1.89 10:30	6.91	4.25	03:40	0.022 09:45	0.267	0.112	0.112	
02/05/2018	01:30	0.68 07:55	1.46	1.10	02:30	1.73 07:30	6.97	4.25	01:30	0.021 07:35	0.235	0.109	0.109	
02/06/2018	02:15	0.65 08:05	1.44	1.09	02:25	1.67 08:40	7.03	4.07	02:25	0.018 08:40	0.229	0.103	0.103	
02/07/2018	04:05	0.69 07:25	1.48	1.10	04:05	1.66 08:05	6.87	4.12	04:05	0.019 07:25	0.232	0.105	0.105	
02/08/2018	04:05	0.66 18:30	1.50	1.11	04:00	1.68 10:20	7.18	4.04	04:05	0.019 10:20	0.249	0.105	0.105	
02/09/2018	04:05	0.61 07:00	1.45	1.09	03:00	1.56 07:00	6.88	3.95	04:05	0.017 07:00	0.241	0.099	0.099	
02/10/2018	04:25	0.66 12:10	1.51	1.10	02:00	1.63 12:15	6.87	4.05	02:05	0.021 12:10	0.245	0.106	0.106	
02/11/2018	04:05	0.67 11:25	1.52	1.11	02:10	1.63 11:25	7.08	4.17	02:10	0.020 11:25	0.266	0.111	0.111	
02/12/2018	03:55	0.68 07:40	1.49	1.10	02:15	2.03 06:50	6.39	3.95	03:00	0.025 07:35	0.217	0.100	0.100	
02/13/2018	01:55	0.65 07:30	1.53	1.09	04:05	1.62 07:35	6.83	4.02	04:05	0.019 07:30	0.250	0.102	0.102	
02/14/2018	03:35	0.70 07:35	1.49	1.10	02:20	1.99 20:35	6.64	3.98	02:10	0.025 07:10	0.228	0.100	0.100	
02/15/2018	03:50	0.67 06:50	1.44	1.10	04:15	1.77 06:50	6.80	4.06	03:35	0.022 06:50	0.236	0.104	0.104	
02/16/2018	03:55	0.71 09:50	1.50	1.11	01:30	1.86 09:50	7.03	4.06	03:55	0.025 09:50	0.259	0.105	0.105	
02/17/2018	04:40	0.65 10:30	1.49	1.10	04:15	1.75 11:20	7.05	3.96	04:40	0.019 10:55	0.243	0.102	0.102	
02/18/2018	03:15	0.73 10:35	1.57	1.10	01:50	1.94 08:20	6.90	3.94	01:50	0.026 10:20	0.255	0.102	0.102	
02/19/2018	03:10	0.67 10:20	1.47	1.10	03:30	1.75 09:45	6.85	4.06	03:10	0.020 10:55	0.227	0.104	0.104	
02/20/2018	02:25	0.67 07:55	1.47	1.10	02:25	1.75 07:00	6.75	4.09	02:25	0.020 07:00	0.232	0.104	0.104	
02/21/2018	02:35	0.61 07:40	1.53	1.09	02:55	1.60 08:00	7.10	4.02	02:35	0.017 07:40	0.264	0.102	0.102	
02/22/2018	03:20	0.65 07:20	1.45	1.09	04:05	1.61 06:50	6.92	4.02	04:05	0.018 07:20	0.229	0.100	0.100	0.03
02/23/2018	02:20	0.65 07:40	1.55	1.08	02:20	1.66 07:45	6.67	3.96	02:20	0.018 07:40	0.256	0.098	0.098	0.02
02/24/2018	04:35	0.65 08:30	1.46	1.09	02:50	1.74 11:50	7.03	4.16	03:00	0.021 10:20	0.245	0.106	0.106	
02/25/2018	04:40	0.67 09:50	1.47	1.09	05:00	1.66 13:20	6.82	4.24	04:40	0.019 19:15	0.239	0.109	0.109	
02/26/2018	02:15	0.67 07:20	1.51	1.07	03:15	1.56 07:35	7.41	4.16	03:15	0.018 07:20	0.261	0.103	0.103	
02/27/2018	00:10	0.69 07:25	1.46	1.08	04:20	1.97 07:25	7.23	4.21	03:25	0.025 07:25	0.256	0.104	0.104	0.55
02/28/2018	02:55	0.65 07:30	1.51	1.07	02:55	1.77 07:30	7.20	4.24	02:55	0.019 07:30	0.267	0.105	0.105	
03/01/2018	04:00	0.63 06:55	1.50	1.07	02:35	1.44 06:50	7.11	4.21	02:35	0.018 06:55	0.249	0.105	0.105	
03/02/2018	03:00	0.66 07:30	1.48	1.07	04:40	1.80 09:35	6.95	4.18	04:40	0.022 07:30	0.248	0.103	0.103	0.06
03/03/2018	04:25	0.66 09:55	1.47	1.11	04:30	1.74 10:40	7.19	4.38	04:25	0.019 10:40	0.249	0.114	0.114	1.04
03/04/2018	03:40	0.67 10:15	1.54	1.10	03:40	1.81 08:05	6.81	4.32	03:40	0.020 10:15	0.258	0.112	0.112	
03/05/2018	03:10	0.67 07:45	1.53	1.08	03:10	1.74 08:20	7.03	4.21	03:10	0.020 07:45	0.250	0.105	0.105	
03/06/2018	03:10	0.64 19:40	1.48	1.06	04:10	1.73 06:45	6.92	4.35	03:10	0.020 19:40	0.238	0.106	0.106	
03/07/2018	04:40	0.65 06:55	1.51	1.07	01:25	1.67 06:55	7.06	4.39	03:30	0.021 06:55	0.262	0.108	0.108	
03/08/2018	02:45	0.66 07:15	1.49	1.07	03:30	1.79 08:00	7.20	4.45	03:30	0.021 06:50	0.258	0.109	0.109	
03/09/2018	02:25	0.65 07:10	1.46	1.06	02:30	1.66 07:10	7.08	4.41	02:25	0.018 07:10	0.250	0.107	0.107	
03/10/2018	04:25	0.62 11:10	1.51	1.09	04:45	1.80 13:25	7.40	4.50	04:45	0.019 11:10	0.267	0.115	0.115	0.91
03/11/2018	03:00	0.69 10:10	1.63	1.10	03:05	1.89 10:10	7.53	4.49	03:05	0.025 10:10	0.313	0.118	0.118	0.01

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	03:35	0.67	19:10	1.47	1.07	02:50	1.89	19:30	7.06	4.35	03:35	0.022	19:10	0.245	0.107	0.107	0.32
03/13/2018	02:15	0.68	19:50	1.44	1.06	01:45	1.77	06:25	6.97	4.28	01:45	0.021	19:50	0.217	0.103	0.103	0.07
03/14/2018	01:45	0.68	06:45	1.42	1.07	02:20	1.79	06:50	7.30	4.38	02:00	0.022	06:50	0.218	0.106	0.106	0.11
03/15/2018	03:10	0.61	07:35	1.42	1.05	02:45	1.55	07:55	6.98	4.18	02:45	0.017	07:40	0.230	0.100	0.100	0.46
03/16/2018	02:40	0.60	07:35	1.47	1.05	02:45	1.64	16:55	7.05	4.27	02:45	0.016	07:30	0.224	0.102	0.102	0.05
03/17/2018	02:30	0.67	08:55	1.51	1.09	02:40	1.79	11:15	7.32	4.51	02:40	0.021	11:15	0.259	0.115	0.115	0.35
03/18/2018	02:50	0.67	10:30	1.46	1.08	03:00	1.87	09:35	7.01	4.44	03:00	0.021	09:35	0.245	0.112	0.112	
03/19/2018	03:00	0.64	20:00	1.44	1.08	04:10	1.92	07:20	6.86	4.50	02:30	0.021	20:00	0.236	0.111	0.111	
03/20/2018	03:00	0.66	07:45	1.40	1.07	01:50	1.92	07:55	6.97	4.45	03:00	0.024	19:25	0.221	0.109	0.109	
03/21/2018	03:30	0.63	07:25	1.45	1.06	03:25	1.75	07:40	6.97	4.55	03:30	0.019	07:25	0.240	0.111	0.111	
03/22/2018	03:15	0.64	19:20	1.39	1.06	03:20	1.66	11:40	7.14	4.51	03:20	0.018	14:35	0.218	0.109	0.109	0.16
03/23/2018	02:25	0.65	08:10	1.58	1.05	03:45	1.95	10:55	7.27	4.41	02:25	0.023	08:10	0.271	0.105	0.105	0.06
03/24/2018	04:55	0.61	09:35	1.44	1.02	04:30	1.82	09:10	7.10	4.36	05:05	0.020	09:10	0.229	0.100	0.100	
03/25/2018	03:55	0.56	10:10	1.49	1.02	04:55	1.57	10:10	7.25	4.38	04:00	0.018	10:10	0.264	0.103	0.103	
03/26/2018	01:50	0.58	07:00	1.38	1.00	02:20	1.51	20:05	7.15	4.21	02:20	0.014	19:50	0.223	0.095	0.095	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			6.539	4.20
Avg	1.09	4.26	0.107	

Site Commentary

Site Information

5B-24	
Pipe Dimensions	10.38 "
Silt Level	0.00"

Overview

Site 5B-24 functioned under normal conditions during the period Thursday, January 25, 2018 to Monday, March 26, 2018 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flow in this line remained free-flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Thursday, January 25, 2018 to Monday, March 26, 2018 , along with observed minimum and maximum data, are provided in the following table. The minimum and maximum rates recorded in the table are based on 5-minute data intervals. As a result, the values may differ from those contained in the excel file which are 15-minute averaged data. In regards to depth, this site flows at 17% full at its recorded peak of 1.79 inches and approximately 11% full during its recorded average depth of 1.09 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.09	2.15	0.049
Minimum	0.45	0.83	0.006
Maximum	1.79	3.49	0.140
Time of Minimum	3/25/2018 4:30 AM	2/11/2018 5:20 AM	2/25/2018 5:10 AM
Time of Maximum	2/25/2018 10:15 AM	3/22/2018 7:45 AM	3/22/2018 7:45 AM

Data Quality

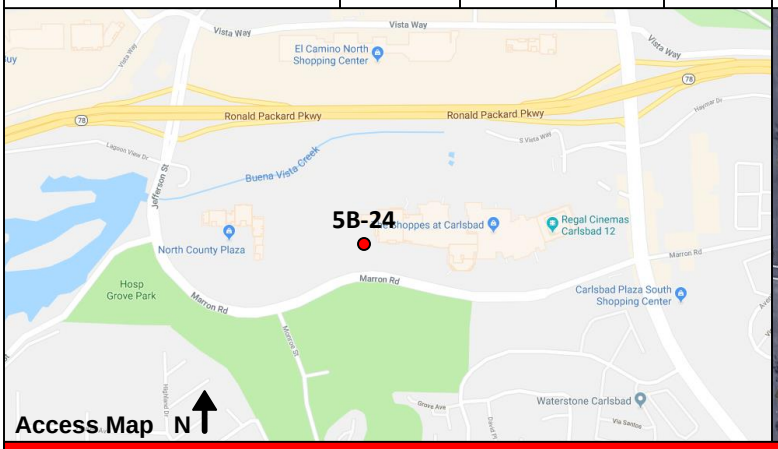
Data uptime observed during the Thursday, January 25, 2018 to the Monday, March 26, 2018 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

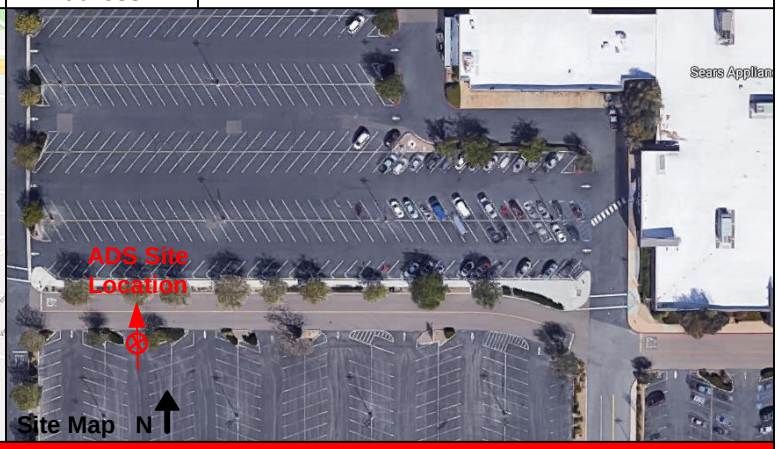
ADS Site Report

Quality Form

Project Name: Carlsbad_2018	**City / State:** Carlsbad, CA		**Date Installed:** 01/23/18	**FM Initials:** JG	
Site Name: 5B-24	**Monitor Series:** FS		**Monitor S/N:**	20856	
Address / Location: 2525 El Camino Road			**Manhole #:**	5B-24	
			Map Page #:	N/A	
Access: Drive	**Type of System:**	Sanitary [x] / Storm [ ] / Combined [ ]	**Pipe Height:**	10.38"	
			Pipe Width:	10.38"	
			IP Address:	N/A	



Access Map N



Site Map N

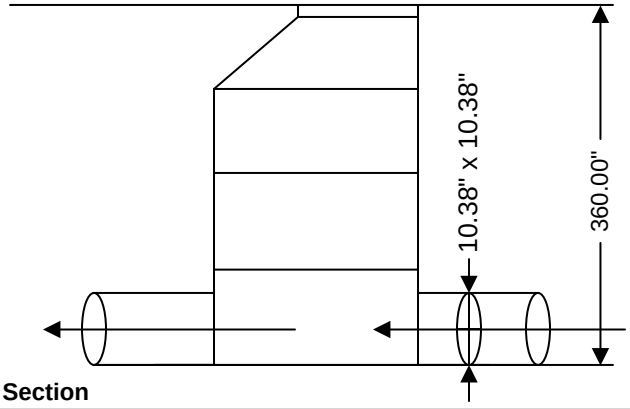
Investigation Information:

Date/Time of Investigation:	01/23/18 @1100		
Site Hydraulics: Smooth flow straight into manhole			
Upstream Input: (L/S,P/S)	N/A		
Upstream Manhole:	DNI		
Downstream Manhole:	DNI		
Depth of Flow (Wet Dof):	1.25	+/- 0.25	
Range (Air Dof):		+/-	
Peak Velocity:	2.7	Fps	
Silt:	0.00	Inches	

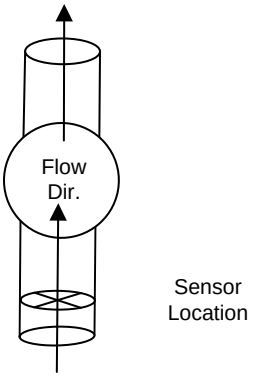
Manhole Information:

Manhole Depth:	360"				**Inches**
Manhole Material / Condition:	Precast / Good				
Pipe Material / Condition:	VCP / Good				
Mini System Character:	Residential [ ]	Commercial [x]	Industrial [ ]	Other [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:



Cross Section



Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[x]	[ ]		
Sensors/ Devices: CS4 (Ultrasonic Depth/ Velocity/ Pressure)		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height: No Evidence of Surcharge	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone: 1		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

SCATTERGRAPH REPORT

5B-24

Flow Monitor

5B-24

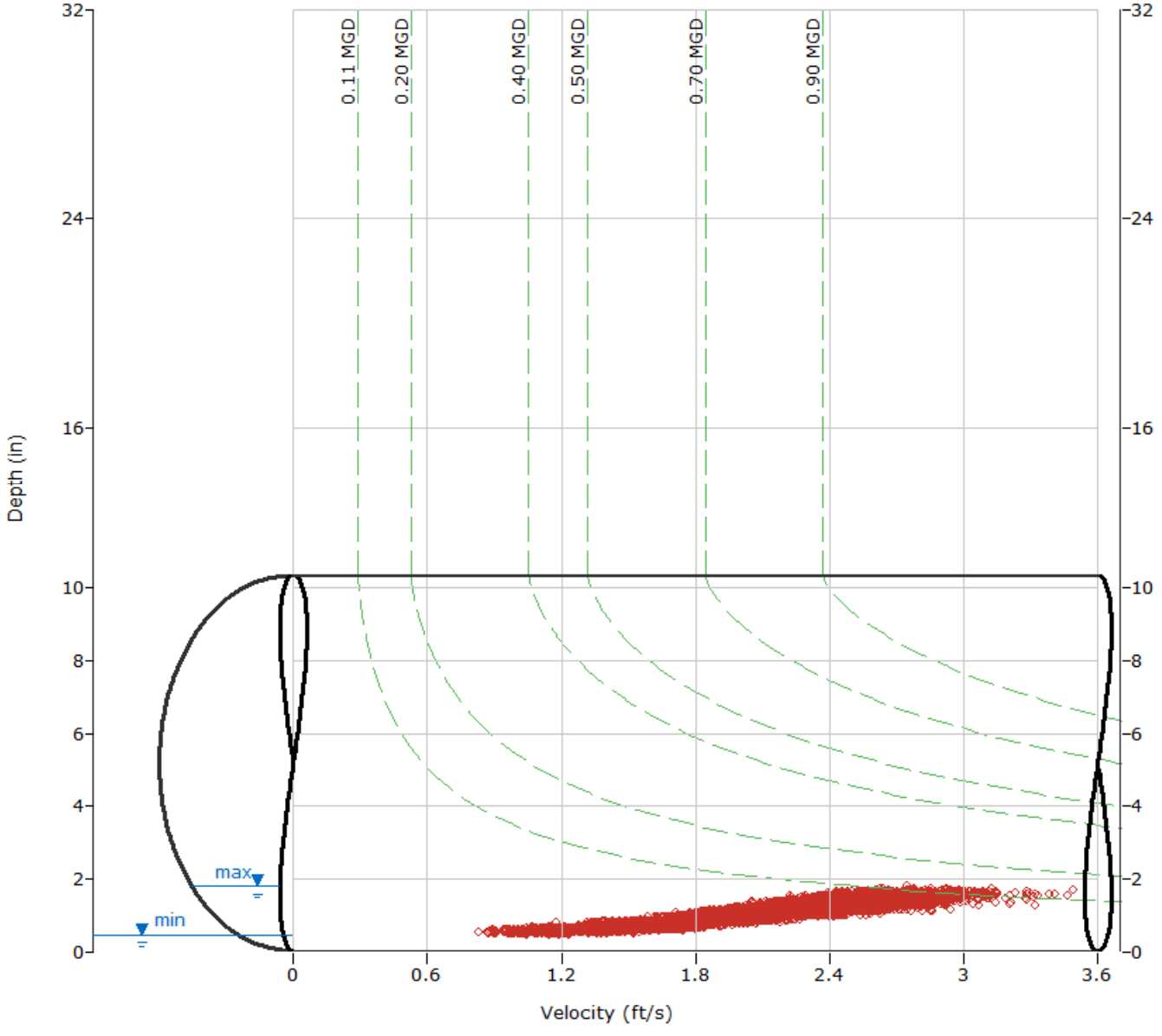
Pipe Height
10.38 in

Report Period

1/25/2018
To
3/26/2018

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth



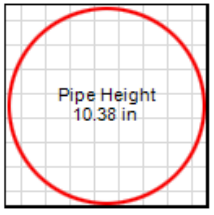
ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

5B-24

Flow Monitor

5B-24

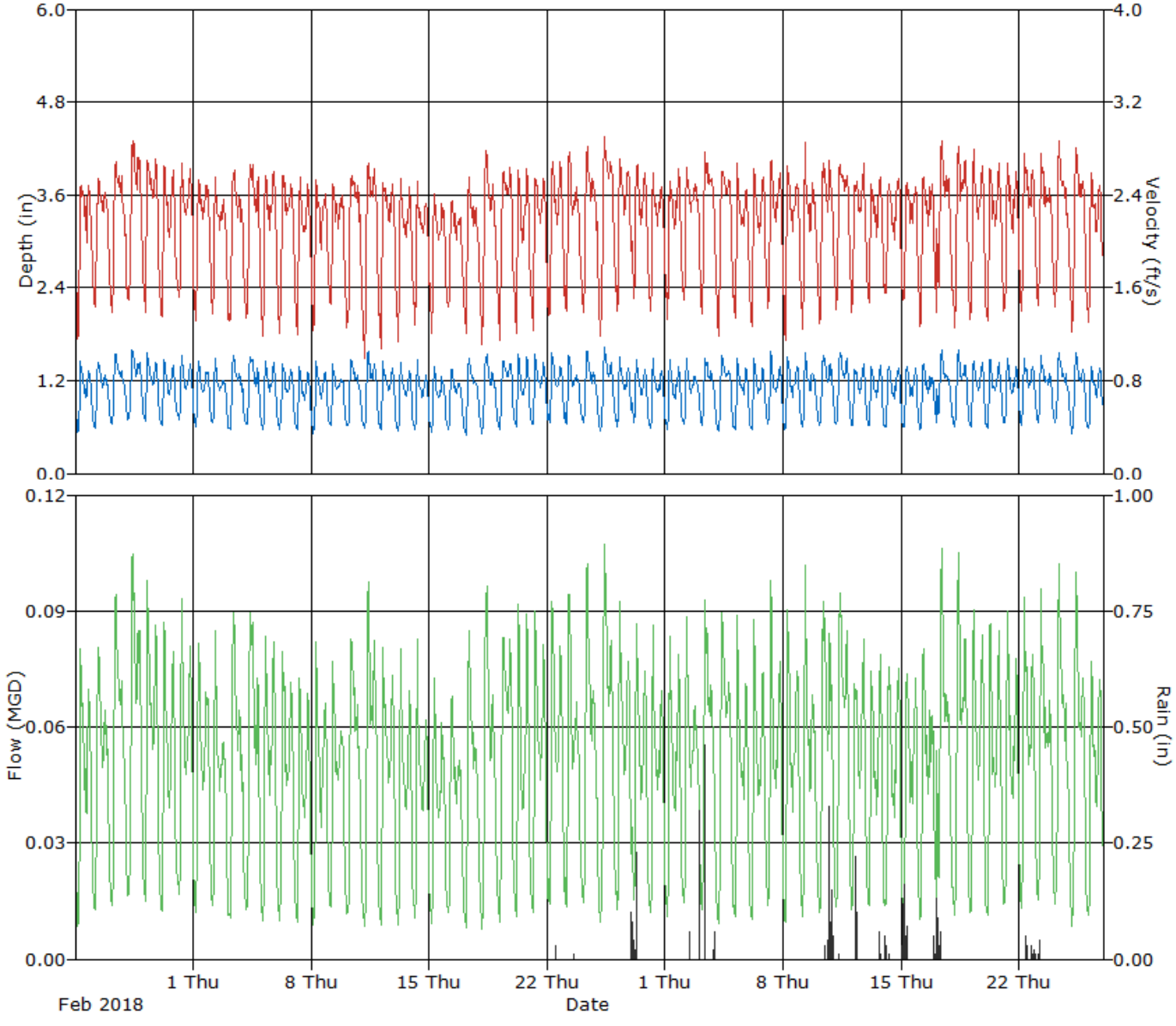


Report Period

1/25/2018
To
3/26/2018

Legend

- Depth
- Velocity
- Quantity
- Rain



Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

5B-24, Pipe Height: 10.38 in, Silt: 0.00 in

Daily Tabular Report

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Time	Min Time	Max	Avg	Total	Total
01/25/2018	04:05	0.47 07:50	1.54	1.04	04:00	0.90 15:50	2.92	2.08	04:00	0.006 07:10	0.088	0.045	0.045	
01/26/2018	04:45	0.52 09:05	1.54	1.08	04:45	1.17 09:25	2.95	2.15	04:45	0.008 09:25	0.093	0.049	0.049	
01/27/2018	04:40	0.61 09:50	1.66	1.14	05:10	1.16 18:40	2.86	2.18	05:10	0.011 09:10	0.105	0.054	0.054	
01/28/2018	03:55	0.66 09:15	1.71	1.19	02:30	1.18 10:20	3.13	2.30	03:55	0.014 09:15	0.128	0.061	0.061	
01/29/2018	04:15	0.62 07:15	1.70	1.16	04:15	1.18 07:30	3.06	2.26	04:15	0.011 07:40	0.116	0.056	0.056	
01/30/2018	04:35	0.57 07:20	1.60	1.09	04:35	1.04 08:15	2.93	2.13	04:35	0.009 08:15	0.104	0.049	0.049	
01/31/2018	04:10	0.65 07:20	1.64	1.13	03:30	1.28 07:15	2.98	2.20	03:30	0.013 07:15	0.112	0.052	0.052	
02/01/2018	04:50	0.52 07:40	1.65	1.09	04:50	0.94 17:50	2.99	2.14	04:50	0.007 07:45	0.105	0.049	0.049	
02/02/2018	04:35	0.61 07:20	1.56	1.06	02:35	1.26 07:00	2.82	2.08	02:35	0.012 07:45	0.092	0.045	0.045	
02/03/2018	02:40	0.50 08:55	1.66	1.08	03:00	1.00 07:45	3.14	2.09	03:15	0.007 09:20	0.113	0.049	0.049	
02/04/2018	04:10	0.61 09:35	1.63	1.11	03:40	1.20 21:35	3.21	2.14	04:45	0.012 10:20	0.113	0.052	0.052	
02/05/2018	04:40	0.49 19:40	1.56	1.07	04:35	0.90 09:55	2.90	2.12	04:35	0.006 19:40	0.102	0.048	0.048	
02/06/2018	02:45	0.52 19:50	1.48	1.05	02:40	0.99 07:45	2.92	2.13	02:40	0.007 07:45	0.094	0.047	0.047	
02/07/2018	04:15	0.52 07:45	1.48	1.01	04:35	0.98 09:25	2.73	2.05	04:35	0.007 07:45	0.083	0.043	0.043	
02/08/2018	03:30	0.49 07:10	1.58	1.03	04:00	0.99 12:50	2.82	2.06	04:00	0.007 07:10	0.103	0.044	0.044	
02/09/2018	04:40	0.59 07:10	1.53	1.04	04:05	1.31 07:10	2.75	2.10	04:40	0.011 07:10	0.095	0.045	0.045	
02/10/2018	05:25	0.56 11:10	1.60	1.07	03:55	0.97 16:05	3.07	2.11	03:55	0.008 11:05	0.101	0.048	0.048	
02/11/2018	05:15	0.51 09:15	1.71	1.11	05:20	0.83 18:15	2.92	2.10	05:15	0.006 10:00	0.108	0.052	0.052	
02/12/2018	04:10	0.50 07:10	1.53	1.06	04:05	0.87 07:15	2.78	2.08	04:05	0.006 07:15	0.095	0.046	0.046	
02/13/2018	04:25	0.51 19:30	1.57	1.03	03:35	1.00 19:35	2.87	2.03	04:20	0.007 19:30	0.097	0.043	0.043	
02/14/2018	04:30	0.54 07:10	1.57	1.02	04:45	1.12 07:10	2.88	2.04	04:30	0.009 07:10	0.104	0.042	0.042	
02/15/2018	04:30	0.51 08:05	1.62	0.99	04:45	0.97 09:40	2.74	1.99	04:10	0.007 08:05	0.101	0.040	0.040	
02/16/2018	04:20	0.50 07:15	1.50	1.01	04:20	1.19 08:10	2.63	1.99	04:20	0.008 08:10	0.087	0.041	0.041	
02/17/2018	05:35	0.47 09:05	1.64	1.04	05:30	1.03 09:10	3.01	2.02	05:30	0.007 10:10	0.108	0.044	0.044	
02/18/2018	03:50	0.48 10:10	1.64	1.06	04:30	0.99 09:20	3.46	2.09	04:30	0.006 10:15	0.123	0.048	0.048	
02/19/2018	04:35	0.54 10:20	1.63	1.13	04:35	0.97 11:45	2.80	2.16	04:35	0.007 09:10	0.101	0.053	0.053	
02/20/2018	04:10	0.55 19:55	1.67	1.09	04:10	0.94 19:15	2.91	2.09	04:10	0.007 07:10	0.110	0.048	0.048	
02/21/2018	04:05	0.59 07:20	1.65	1.12	04:05	1.06 19:45	2.85	2.13	04:05	0.009 19:45	0.108	0.051	0.051	
02/22/2018	04:40	0.62 07:35	1.72	1.13	02:25	1.14 09:35	3.14	2.18	04:40	0.012 07:35	0.109	0.053	0.053	0.03
02/23/2018	04:25	0.61 07:55	1.65	1.11	01:40	1.22 07:15	3.01	2.18	01:40	0.012 07:50	0.111	0.051	0.051	0.02
02/24/2018	05:15	0.62 10:45	1.69	1.12	04:45	1.22 08:20	3.03	2.20	05:15	0.012 10:45	0.118	0.053	0.053	
02/25/2018	05:05	0.48 10:15	1.79	1.12	05:10	0.87 09:20	3.20	2.24	05:10	0.006 09:40	0.121	0.057	0.057	
02/26/2018	04:15	0.51 07:25	1.60	1.09	04:20	1.07 17:45	2.96	2.23	04:20	0.008 07:25	0.110	0.051	0.051	
02/27/2018	04:35	0.61 07:40	1.61	1.09	04:35	1.29 08:10	2.91	2.24	04:35	0.012 07:45	0.104	0.051	0.051	0.55
02/28/2018	03:15	0.53 07:20	1.59	1.05	04:20	1.10 07:20	2.96	2.13	04:20	0.009 07:20	0.109	0.046	0.046	
03/01/2018	04:25	0.52 07:35	1.62	1.05	04:30	1.07 07:50	2.80	2.15	04:30	0.008 07:40	0.093	0.046	0.046	
03/02/2018	03:30	0.60 06:50	1.62	1.07	03:30	1.39 06:55	3.05	2.22	03:30	0.012 06:55	0.112	0.049	0.049	0.06
03/03/2018	04:30	0.57 12:05	1.65	1.11	04:40	1.25 08:55	3.10	2.25	04:30	0.011 08:55	0.114	0.053	0.053	1.04
03/04/2018	04:30	0.47 08:40	1.68	1.10	04:30	0.91 11:10	3.00	2.17	04:30	0.006 08:40	0.110	0.052	0.052	
03/05/2018	03:00	0.52 07:30	1.62	1.05	04:35	1.12 07:10	2.84	2.09	04:30	0.008 07:10	0.100	0.046	0.046	
03/06/2018	04:25	0.49 07:10	1.62	1.06	04:30	1.00 08:00	3.11	2.11	04:30	0.007 07:10	0.110	0.047	0.047	
03/07/2018	03:30	0.62 07:25	1.65	1.10	02:35	1.07 07:05	2.94	2.20	02:35	0.011 07:45	0.106	0.051	0.051	
03/08/2018	03:45	0.49 07:10	1.62	1.09	04:15	1.03 06:55	3.29	2.15	03:45	0.007 06:55	0.120	0.050	0.050	
03/09/2018	04:05	0.52 07:25	1.64	1.10	04:10	0.95 07:40	3.33	2.13	04:10	0.007 07:40	0.117	0.050	0.050	
03/10/2018	05:15	0.55 09:25	1.65	1.14	05:20	1.08 18:45	3.31	2.20	05:15	0.009 09:25	0.120	0.055	0.055	0.91
03/11/2018	04:40	0.59 09:15	1.64	1.15	04:40	1.22 09:10	2.96	2.23	04:40	0.010 19:20	0.107	0.056	0.056	0.01

Date	Depth (in)				Velocity (ft/s)				Quantity (MGD - Total MG)					Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018	03:05	0.52	19:15	1.52	1.08	03:00	1.12	19:05	3.01	2.20	03:00	0.009	19:15	0.093	0.049	0.049	0.32
03/13/2018	02:10	0.58	19:35	1.50	1.06	02:55	1.23	06:50	3.28	2.16	01:20	0.011	06:50	0.107	0.047	0.047	0.07
03/14/2018	01:50	0.57	08:55	1.55	1.07	01:50	1.31	21:05	2.84	2.16	01:50	0.011	21:05	0.098	0.048	0.048	0.11
03/15/2018	04:15	0.52	08:55	1.51	1.05	04:15	1.13	07:40	2.79	2.15	04:15	0.008	07:40	0.091	0.046	0.046	0.46
03/16/2018	03:40	0.54	07:45	1.55	1.06	03:40	1.03	07:30	2.94	2.13	03:40	0.008	07:30	0.104	0.047	0.047	0.05
03/17/2018	02:55	0.57	10:40	1.67	1.15	02:45	1.10	10:45	3.15	2.26	03:10	0.010	10:45	0.119	0.056	0.056	0.35
03/18/2018	05:30	0.55	10:00	1.73	1.13	05:40	1.12	10:55	3.09	2.21	05:30	0.009	10:00	0.121	0.055	0.055	
03/19/2018	04:50	0.58	08:05	1.63	1.10	03:05	1.15	08:10	3.29	2.19	03:05	0.010	08:05	0.126	0.052	0.052	
03/20/2018	04:15	0.53	08:05	1.63	1.08	04:35	1.02	08:05	3.05	2.14	04:35	0.008	08:05	0.116	0.049	0.049	
03/21/2018	02:10	0.60	07:00	1.62	1.09	02:50	1.20	07:00	3.23	2.16	02:10	0.011	07:00	0.122	0.050	0.050	
03/22/2018	04:05	0.60	07:45	1.69	1.12	04:35	1.26	07:45	3.49	2.24	04:05	0.011	07:45	0.140	0.054	0.054	0.16
03/23/2018	04:00	0.60	07:25	1.63	1.13	03:15	1.26	07:30	3.41	2.21	03:15	0.012	07:30	0.125	0.053	0.053	0.06
03/24/2018	03:45	0.61	09:00	1.68	1.12	03:50	1.24	10:50	3.32	2.21	03:50	0.012	10:50	0.118	0.053	0.053	
03/25/2018	04:30	0.45	11:15	1.64	1.10	05:00	1.04	10:40	3.11	2.18	05:00	0.006	10:40	0.111	0.052	0.052	
03/26/2018	04:15	0.56	08:00	1.52	1.04	04:15	1.11	07:00	3.29	2.08	04:15	0.009	07:00	0.104	0.046	0.046	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			3.019	4.20
Avg	1.09	2.15	0.049	

Site Commentary

Overview

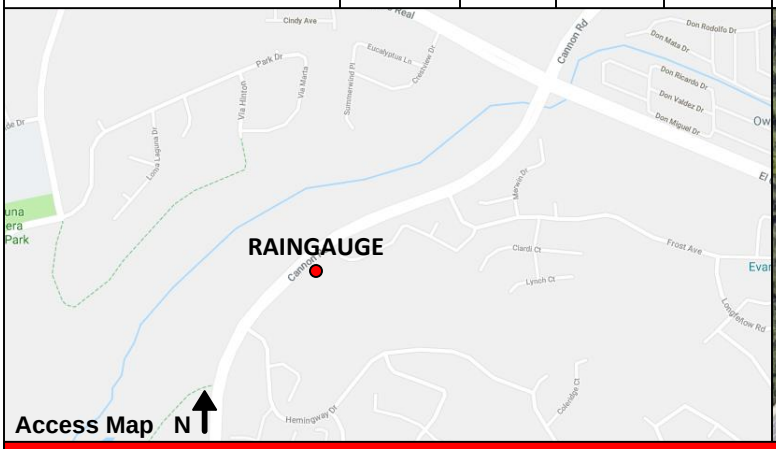
RAINGAUGE	
Total Rainfall	4.20 "

Location RAINGAUGE monitored rainfall during the period Thursday, January 25, 2018 through Monday, March 26, 2018.

ADS Site Report

Quality Form

Project Name: Crestline Temp 2018	**City / State:** Crestline, CA			**Date Installed:** 01/24/2018	**FM Initials:** JG
Site Name: RAINGAUGE	**Monitor Series:** FS			**Monitor S/N:**	N/A
Address / Location: 2229 Cannon Road				**Manhole #:**	N/A
				Map Page #:	N/A
Access: Drive	**Type of System:**	**Sanitary** [x]	**Storm** [ ]	**Combined** [ ]	**Pipe Height:** N/A
					Pipe Width: N/A
					IP Address: N/A



Access Map N

Site Map N

Investigation Information:

Date/Time of Investigation:	01/24/18 @ 1030			
Site Hydraulics: Rain Gauge				
Upstream Input: (L/S,P/S)	N/A			
Upstream Manhole:	DNI			
Downstream Manhole:	DNI			
Depth of Flow (Wet Dof):	N/A	**+/-**	0.25	
Range (Air Dof):		**+/-**		
Peak Velocity:	N/A	**Fps**		
Silt:	0.00	**Inches**		

Manhole Information:

Manhole Depth:	N/A				**Inches**
Manhole Material / Condition:	N/A / N/A				
Pipe Material / Condition:	N/A				
Mini System Character:	**Residential** [ ]	**Commercial** [ ]	**Industrial** [ ]	**Other** [ ]	
Telephone Information:	N/A				
Access Pole #:	N/A				
Distance From Manhole:	N/A				**Feet**
Road Cut Length:	N/A				**Feet**
Trench Length:	N/A				**Feet**

Other Information:

Cross Section

Planar N

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard installation		**Trunk**	[ ]	[ ]		
Sensors/ Devices: Rain Gauge		**Lift/ Pump Station**	[ ]	[ ]		
Surcharge Height:	**Feet**	**WWTP**	[ ]	[ ]		
Rain Gauge Zone:		**Other**	[ ]	[ ]		

Additional Site Information / Comments:

Daily Tabular Report For The Period 01/25/2018 00:00 - 03/26/2018 23:59

RAINGAUGE , Silt: --

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/25/2018																	
01/26/2018																	
01/27/2018																	
01/28/2018																	
01/29/2018																	
01/30/2018																	
01/31/2018																	
02/01/2018																	
02/02/2018																	
02/03/2018																	
02/04/2018																	
02/05/2018																	
02/06/2018																	
02/07/2018																	
02/08/2018																	
02/09/2018																	
02/10/2018																	
02/11/2018																	
02/12/2018																	
02/13/2018																	
02/14/2018																	
02/15/2018																	
02/16/2018																	
02/17/2018																	
02/18/2018																	
02/19/2018																	
02/20/2018																	
02/21/2018																	
02/22/2018																	0.03
02/23/2018																	0.02
02/24/2018																	
02/25/2018																	
02/26/2018																	
02/27/2018																	0.55
02/28/2018																	
03/01/2018																	
03/02/2018																	0.06
03/03/2018																	1.04
03/04/2018																	
03/05/2018																	
03/06/2018																	
03/07/2018																	
03/08/2018																	
03/09/2018																	
03/10/2018																	0.91
03/11/2018																	0.01

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/12/2018																	0.32
03/13/2018																	0.07
03/14/2018																	0.11
03/15/2018																	0.46
03/16/2018																	0.05
03/17/2018																	0.35
03/18/2018																	
03/19/2018																	
03/20/2018																	
03/21/2018																	
03/22/2018																	0.16
03/23/2018																	0.06
03/24/2018																	
03/25/2018																	
03/26/2018																	

Report Summary For The Period 01/25/2018 00:00 - 03/26/2018 23:59

	Rain (in)
Total	4.20
Avg	

Appendix C. Hydraulic Model Data

Appendix C-1. Encina Wastewater Authority Flow Meter Data Reports

ENCINA WATER POLLUTION CONTROL FACILITIES CAPACITY MANAGEMENT REPORT

December 2017

Agenda Item No. 8

Ref: Admin. 17-12869

TREATMENT PLANT - LIQUID

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista *	6.23	0.032	10.67	4.41	58%	59%
Carlsbad	5.81	1.192	10.26	3.25	57%	68%
Buena*	1.77	0.015	3.00	1.22	59%	59%
Vallecitos*	3.48	-0.034	7.67	4.23	45%	45%
Leucadia	3.71	0.036	7.11	3.36	52%	53%
Encinitas	0.97	0.140	1.80	0.69	54%	62%
Total	21.97	1.38	40.51	17.16	54%	58%

TREATMENT PLANT - SOLIDS

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	6.23	0.032	10.67	4.41	58%	59%
Carlsbad	5.81	1.192	10.26	3.25	57%	68%
Buena (d)*	1.77	0.015	3.00	1.22	59%	59%
Vallecitos (d)*	6.18	-0.034	10.47	4.32	59%	59%
Leucadia (d)	3.71	0.036	7.11	3.36	52%	53%
Encinitas	0.97	0.140	1.80	0.69	54%	62%
Total	24.67	1.38	43.31	17.26	57%	60%

OUTFALL - FLOW

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	6.23	0.032	10.67	4.41	58%	59%
Carlsbad (f)	4.18	1.192	10.26	4.89	41%	52%
Buena (e) *	1.77	0.015	3.00	1.22	59%	59%
Vallecitos (e) *	3.48	-0.034	10.47	7.03	33%	33%
Leucadia (f)	3.60	0.036	7.11	3.47	51%	51%
Encinitas	0.97	0.140	1.80	0.69	54%	62%
Total	20.23	1.38	43.31	21.70	47%	50%

All units are in Million Gallons Per Day (MGD) unless specified otherwise.

(a) Available capacity = (Member Agency Phase V Projected Capacity) - (Current + Committed Flows)
(b) % Capacity Used = Current Flow / Member Agency Phase V Projected Capacity
(c) % Capacity Used and Committed = (Current Flow + Committed) / Member Agency Phase V Projected Capacity
(d) To determine the total solids flow, the plant influent from the reclamation facilities is added to the raw wastewater flow.
(e) To determine the total outfall flow, the reclamation failsafe line flow is added to the raw wastewater flow.
(f) To determine LWD and CARLSBAD Outfall Flow, the corresponding recycled flow is subtracted from influent flows.
* Arbor Ranch Flows and Rancho Santalina Flows are subtracted from Vista and Buena and are added to Vallecitos

ENCINA WATER POLLUTION CONTROL FACILITIES CAPACITY MANAGEMENT REPORT

November 2017

Agenda Item No. 8

Ref: Admin. 17-12869

TREATMENT PLANT - LIQUID

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista *	6.27	0.023	10.67	4.38	59%	59%
Carlsbad	5.85	1.145	10.26	3.26	57%	68%
Buena*	1.78	0.015	3.00	1.20	59%	60%
Vallecitos*	3.53	-0.029	7.67	4.17	46%	46%
Leucadia	3.81	0.028	7.11	3.27	54%	54%
Encinitas	0.97	0.139	1.80	0.69	54%	62%
Total	22.21	1.32	40.51	16.98	55%	58%

TREATMENT PLANT - SOLIDS

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	6.27	0.023	10.67	4.38	59%	59%
Carlsbad	5.85	1.145	10.26	3.26	57%	68%
Buena (d)*	1.78	0.015	3.00	1.20	59%	60%
Vallecitos (d)*	6.25	-0.029	10.47	4.25	60%	59%
Leucadia (d)	3.81	0.028	7.11	3.27	54%	54%
Encinitas	0.97	0.139	1.80	0.69	54%	62%
Total	24.94	1.32	43.31	17.05	58%	61%

OUTFALL - FLOW

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	6.27	0.023	10.67	4.38	59%	59%
Carlsbad (f)	4.01	1.145	10.26	5.11	39%	50%
Buena (e) *	1.78	0.015	3.00	1.20	59%	60%
Vallecitos (e) *	3.53	-0.029	10.47	6.97	34%	33%
Leucadia (f)	3.59	0.028	7.11	3.49	50%	51%
Encinitas	0.97	0.139	1.80	0.69	54%	62%
Total	20.14	1.32	43.31	21.85	47%	50%

All units are in Million Gallons Per Day (MGD) unless specified otherwise.

(a) Available capacity = (Member Agency Phase V Projected Capacity) - (Current + Committed Flows)

(b) % Capacity Used = Current Flow / Member Agency Phase V Projected Capacity

(c) % Capacity Used and Committed = (Current Flow + Committed) / Member Agency Phase V Projected Capacity

(d) To determine the total solids flow, the plant influent from the reclamation facilities is added to the raw wastewater flow.

(e) To determine the total outfall flow, the reclamation failsafe line flow is added to the raw wastewater flow.

(f) To determine LWD and CARLSBAD Outfall Flow, the corresponding recycled flow is subtracted from influent flows.

* Arbor Ranch Flows and Rancho Santalina Flows are subtracted from Vista and Buena and are added to Vallecitos

ENCINA WATER POLLUTION CONTROL FACILITIES CAPACITY MANAGEMENT REPORT

October 2017

Agenda Item No. 8

Ref: Admin. 17-12869

TREATMENT PLANT - LIQUID

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista *	5.94	0.014	10.67	4.72	56%	56%
Carlsbad	6.23	1.121	10.26	2.91	61%	72%
Buena*	1.79	0.015	3.00	1.19	60%	60%
Vallecitos*	2.99	-0.036	7.67	4.71	39%	39%
Leucadia	3.67	0.028	7.11	3.41	52%	52%
Encinitas	0.95	0.139	1.80	0.71	53%	60%
Total	21.57	1.28	40.51	17.66	53%	56%

TREATMENT PLANT - SOLIDS

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	5.94	0.014	10.67	4.72	56%	56%
Carlsbad	6.23	1.121	10.26	2.91	61%	72%
Buena (d)*	1.79	0.015	3.00	1.19	60%	60%
Vallecitos (d)*	6.13	-0.036	10.47	4.38	59%	58%
Leucadia (d)	3.67	0.028	7.11	3.41	52%	52%
Encinitas	0.95	0.139	1.80	0.71	53%	60%
Total	24.71	1.28	43.31	17.32	57%	60%

OUTFALL - FLOW

Member Agency	Current Flow	Committed	Phase V Projected Capacity	Available Capacity (a)	% of Capacity Used (b)	% of Capacity Used and Committed (c)
Vista*	5.94	0.014	10.67	4.72	56%	56%
Carlsbad (f)	3.91	1.121	10.26	5.23	38%	49%
Buena (e) *	1.79	0.015	3.00	1.19	60%	60%
Vallecitos (e) *	2.99	-0.036	10.47	7.51	29%	28%
Leucadia (f)	3.28	0.028	7.11	3.81	46%	46%
Encinitas	0.95	0.139	1.80	0.71	53%	60%
Total	18.85	1.28	43.31	23.18	44%	46%

All units are in Million Gallons Per Day (MGD) unless specified otherwise.

(a) Available capacity = (Member Agency Phase V Projected Capacity) - (Current + Committed Flows)
(b) % Capacity Used = Current Flow / Member Agency Phase V Projected Capacity
(c) % Capacity Used and Committed = (Current Flow + Committed) / Member Agency Phase V Projected Capacity
(d) To determine the total solids flow, the plant influent from the reclamation facilities is added to the raw wastewater flow.
(e) To determine the total outfall flow, the reclamation failsafe line flow is added to the raw wastewater flow.
(f) To determine LWD and CARLSBAD Outfall Flow, the corresponding recycled flow is subtracted from influent flows.
* Arbor Ranch Flows and Rancho Santalina Flows are subtracted from Vista and Buena and are added to Vallecitos

Appendix C-2. Model Validation Results

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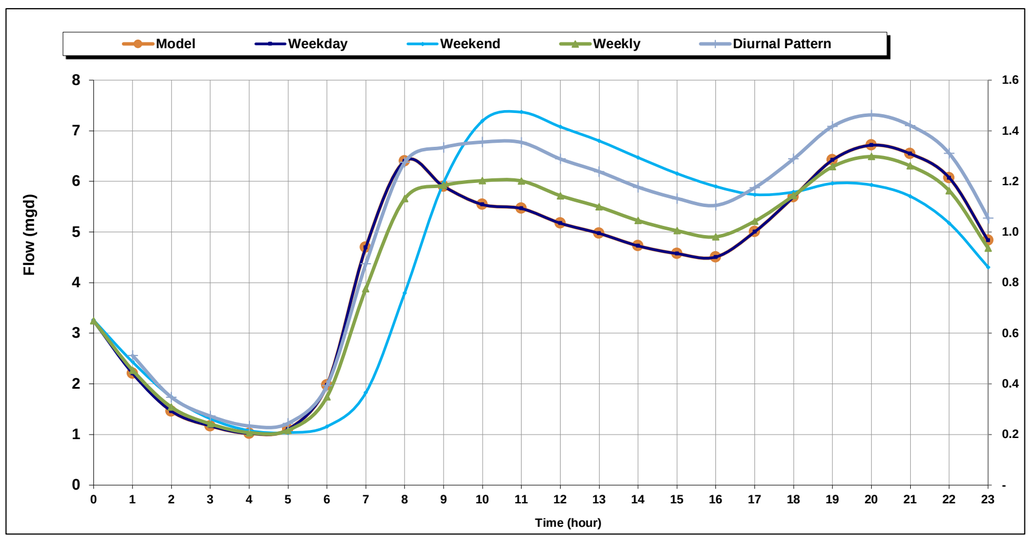
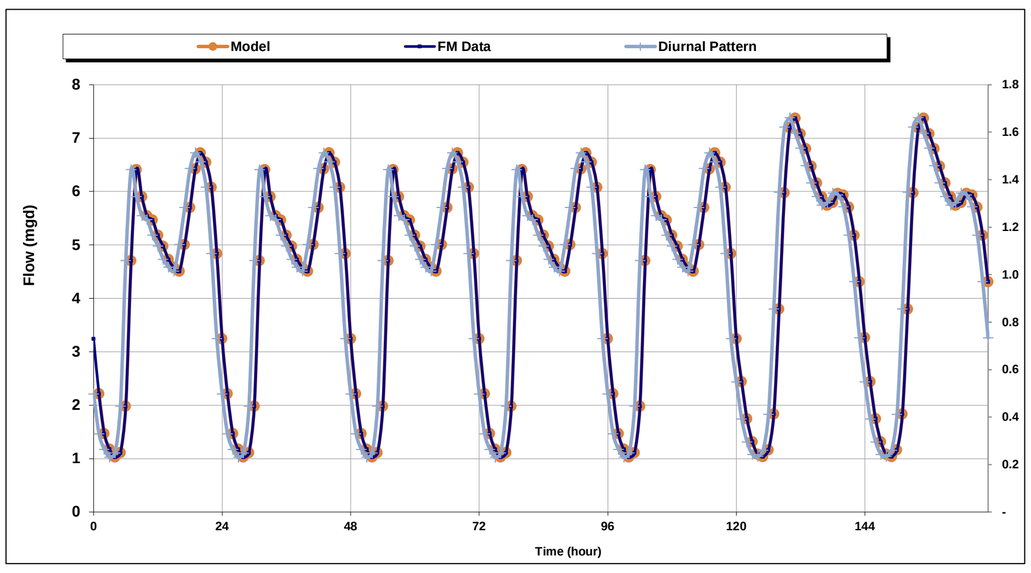
Dry Weather Flow Model Validation

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	6.71	1.02	4.39	7.37	1.04	4.55
Model	6.71	1.02	4.39	7.37	1.04	4.55
Diff	(0.00)	(0.00)	(0.00)	0.00	(0.00)	(0.00)
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	3.24	3.26	3.25
1	2.21	2.43	2.27
2	1.46	1.74	1.54
3	1.17	1.31	1.21
4	1.02	1.08	1.04
5	1.10	1.04	1.08
6	1.98	1.16	1.74
7	4.70	1.83	3.88
8	6.40	3.80	5.66
9	5.90	5.97	5.92
10	5.54	7.20	6.01
11	5.46	7.37	6.01
12	5.17	7.08	5.72
13	4.97	6.80	5.50
14	4.73	6.47	5.22
15	4.57	6.16	5.03
16	4.51	5.90	4.90
17	5.00	5.74	5.21
18	5.69	5.79	5.72
19	6.42	5.96	6.29
20	6.71	5.93	6.49
21	6.55	5.70	6.31
22	6.07	5.17	5.82
23	4.83	4.31	4.68
Average	4.39	4.55	4.44

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
1	0.50	0.55	0.51
2	0.33	0.39	0.35
3	0.26	0.30	0.27
4	0.23	0.24	0.23
5	0.25	0.23	0.24
6	0.45	0.26	0.39
7	1.06	0.41	0.87
8	1.44	0.86	1.27
9	1.33	1.35	1.33
10	1.25	1.62	1.36
11	1.23	1.66	1.35
12	1.17	1.60	1.29
13	1.12	1.53	1.24
14	1.07	1.46	1.18
15	1.03	1.39	1.13
16	1.02	1.33	1.11
17	1.13	1.29	1.17
18	1.28	1.30	1.29
19	1.45	1.34	1.42
20	1.51	1.34	1.46
21	1.48	1.29	1.42
22	1.37	1.17	1.31
23	1.09	0.97	1.06
24	0.73	0.73	0.73
Total	23.76	24.61	24.00
Average	0.99	1.03	1.00

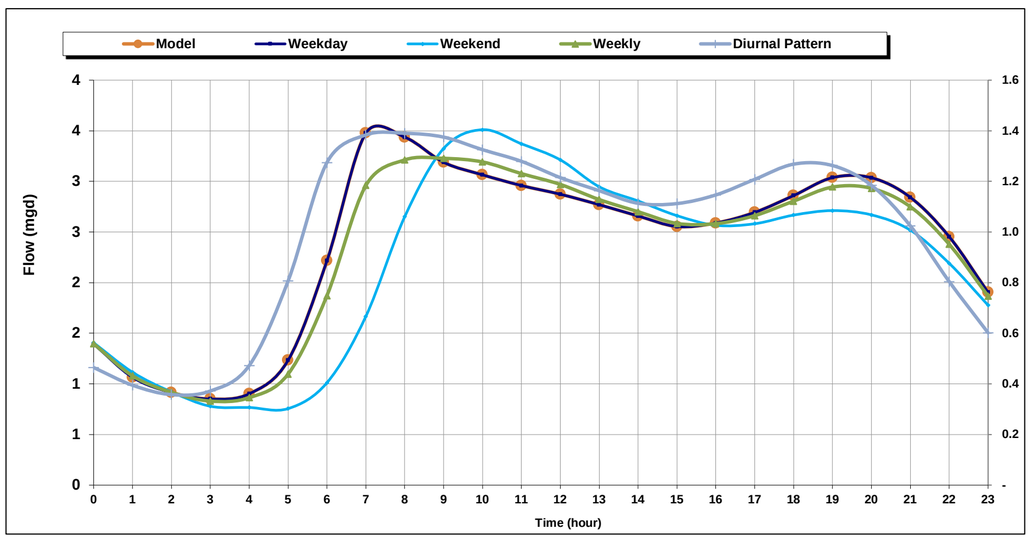
Diurnal Patterns Normalized

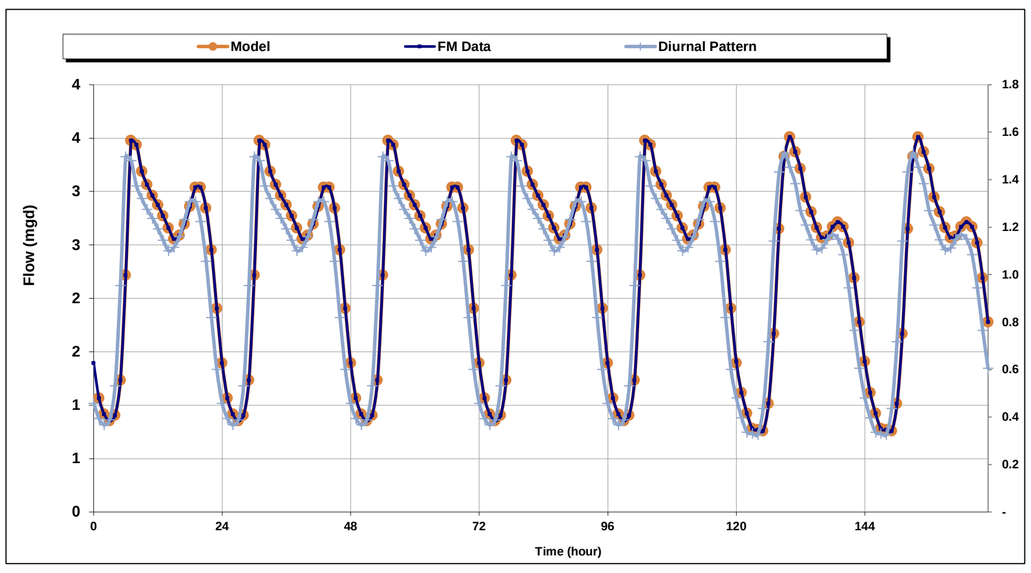
Date/Time	Weekday	Weekend	Weekly
0	0.50	0.53	0.51
1	0.33	0.38	0.35
2	0.27	0.29	0.27
3	0.23	0.24	0.23
4	0.25	0.23	0.24
5	0.45	0.25	0.39
6	1.07	0.40	0.87
7	1.46	0.83	1.27
8	1.34	1.31	1.33
9	1.26	1.58	1.36
10	1.24	1.62	1.35
11	1.18	1.56	1.29
12	1.13	1.49	1.24
13	1.08	1.42	1.18
14	1.04	1.35	1.13
15	1.03	1.30	1.11
16	1.14	1.26	1.17
17	1.30	1.27	1.29
18	1.46	1.31	1.42
19	1.53	1.30	1.46
20	1.49	1.25	1.42
21	1.38	1.14	1.31
22	1.10	0.95	1.06
23	0.74	0.72	0.73
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	3.24	0.50	
Monday	1	2.21	0.33	2.21
Monday	2	1.46	0.26	1.46
Monday	3	1.17	0.23	1.17
Monday	4	1.02	0.25	1.02
Monday	5	1.10	0.45	1.10
Monday	6	1.98	1.06	1.98
Monday	7	4.70	1.44	4.70
Monday	8	6.40	1.33	6.40
Monday	9	5.90	1.25	5.90
Monday	10	5.54	1.23	5.54
Monday	11	5.46	1.17	5.46
Monday	12	5.17	1.12	5.17
Monday	13	4.97	1.07	4.97
Monday	14	4.73	1.03	4.73
Monday	15	4.57	1.02	4.57
Monday	16	4.51	1.13	4.51
Monday	17	5.00	1.28	5.00
Monday	18	5.69	1.45	5.69
Monday	19	6.42	1.51	6.42
Monday	20	6.71	1.48	6.71
Monday	21	6.55	1.37	6.55
Monday	22	6.07	1.09	6.07
Monday	23	4.83	0.73	4.83
Tuesday	24	3.24	0.50	3.24
Tuesday	25	2.21	0.33	2.21
Tuesday	26	1.46	0.26	1.46
Tuesday	27	1.17	0.23	1.17
Tuesday	28	1.02	0.25	1.02
Tuesday	29	1.10	0.45	1.10
Tuesday	30	1.98	1.06	1.98
Tuesday	31	4.70	1.44	4.70
Tuesday	32	6.40	1.33	6.40
Tuesday	33	5.90	1.25	5.90
Tuesday	34	5.54	1.23	5.54
Tuesday	35	5.46	1.17	5.46
Tuesday	36	5.17	1.12	5.17
Tuesday	37	4.97	1.07	4.97
Tuesday	38	4.73	1.03	4.73
Tuesday	39	4.57	1.02	4.57
Tuesday	40	4.51	1.13	4.51
Tuesday	41	5.00	1.28	5.00
Tuesday	42	5.69	1.45	5.69
Tuesday	43	6.42	1.51	6.42
Tuesday	44	6.71	1.48	6.71
Tuesday	45	6.55	1.37	6.55
Tuesday	46	6.07	1.09	6.07
Tuesday	47	4.83	0.73	4.83
Wednesday	48	3.24	0.50	3.24
Wednesday	49	2.21	0.33	2.21
Wednesday	50	1.46	0.26	1.46
Wednesday	51	1.17	0.23	1.17
Wednesday	52	1.02	0.25	1.02
Wednesday	53	1.10	0.45	1.10
Wednesday	54	1.98	1.06	1.98
Wednesday	55	4.70	1.44	4.70
Wednesday	56	6.40	1.33	6.40
Wednesday	57	5.90	1.25	5.90
Wednesday	58	5.54	1.23	5.54
Wednesday	59	5.46	1.17	5.46
Wednesday	60	5.17	1.12	5.17
Wednesday	61	4.97	1.07	4.97
Wednesday	62	4.73	1.03	4.73
Wednesday	63	4.57	1.02	4.57
Wednesday	64	4.51	1.13	4.51
Wednesday	65	5.00	1.28	5.00
Wednesday	66	5.69	1.45	5.69
Wednesday	67	6.42	1.51	6.42
Wednesday	68	6.71	1.48	6.71
Wednesday	69	6.55	1.37	6.55
Wednesday	70	6.07	1.09	6.07
Wednesday	71	4.83	0.73	4.83
Thursday	72	3.24	0.50	3.24
Thursday	73	2.21	0.33	2.21
Thursday	74	1.46	0.26	1.46
Thursday	75	1.17	0.23	1.17
Thursday	76	1.02	0.25	1.02
Thursday	77	1.10	0.45	1.10
Thursday	78	1.98	1.06	1.98
Thursday	79	4.70	1.44	4.70
Thursday	80	6.40	1.33	6.40
Thursday	81	5.90	1.25	5.90
Thursday	82	5.54	1.23	5.54
Thursday	83	5.46	1.17	5.46
Thursday	84	5.17	1.12	5.17
Thursday	85	4.97	1.07	4.97
Thursday	86	4.73	1.03	4.73
Thursday	87	4.57	1.02	4.57
Thursday	88	4.51	1.13	4.51
Thursday	89	5.00	1.28	5.00
Thursday	90	5.69	1.45	5.69
Thursday	91	6.42	1.51	6.42
Thursday	92	6.71	1.48	6.71
Thursday	93	6.55	1.37	6.55
Thursday	94	6.07	1.09	6.07
Thursday	95	4.83	0.73	4.83
Friday	96	3.24	0.50	3.24
Friday	97	2.21	0.33	2.21
Friday	98	1.46	0.26	1.46
Friday	99	1.17	0.23	1.17
Friday	100	1.02	0.25	1.02
Friday	101	1.10	0.45	1.10
Friday	102	1.98	1.06	1.98
Friday	103	4.70	1.44	4.70
Friday	104	6.40	1.33	6.40
Friday	105	5.90	1.25	5.90
Friday	106	5.54	1.23	5.54
Friday	107	5.46	1.17	5.46
Friday	108	5.17	1.12	5.17
Friday	109	4.97	1.07	4.97
Friday	110	4.73	1.03	4.73
Friday	111	4.57	1.02	4.57
Friday	112	4.51	1.13	4.51
Friday	113	5.00	1.28	5.00
Friday	114	5.69	1.45	5.69
Friday	115	6.42	1.51	6.42
Friday	116	6.71	1.48	6.71
Friday	117	6.55	1.37	6.55
Friday	118	6.07	1.09	6.07
Friday	119	4.83	0.73	4.83
Saturday	120	3.26	0.55	3.24
Saturday	121	2.43	0.39	2.43
Saturday	122	1.74	0.30	1.74
Saturday	123	1.31	0.24	1.31
Saturday	124	1.08	0.23	1.08
Saturday	125	1.04	0.26	1.04
Saturday	126	1.16	0.41	1.16
Saturday	127	1.83	0.86	1.83
Saturday	128	3.80	1.35	3.80
Saturday	129	5.97	1.62	5.97
Saturday	130	7.20	1.66	7.20
Saturday	131	7.37	1.60	7.37
Saturday	132	7.08	1.53	7.08
Saturday	133	6.80	1.46	6.80
Saturday	134	6.47	1.39	6.47
Saturday	135	6.16	1.33	6.16
Saturday	136	5.90	1.29	5.90
Saturday	137	5.74	1.30	5.74
Saturday	138	5.79	1.34	5.79
Saturday	139	5.96	1.34	5.96
Saturday	140	5.93	1.29	5.93
Saturday	141	5.70	1.17	5.70
Saturday	142	5.17	0.97	5.17
Saturday	143	4.31	0.73	4.31
Sunday	144	3.26	0.55	3.26
Sunday	145	2.43	0.39	2.43
Sunday	146	1.74	0.30	1.74
Sunday	147	1.31	0.24	1.31
Sunday	148	1.08	0.23	1.08
Sunday	149	1.04	0.26	1.04
Sunday	150	1.16	0.41	1.16
Sunday	151	1.83	0.86	1.83
Sunday	152	3.80	1.35	3.80
Sunday	153	5.97	1.62	5.97
Sunday	154	7.20	1.66	7.20
Sunday	155	7.37	1.60	7.37
Sunday	156	7.08	1.53	7.08
Sunday	157	6.80	1.46	6.80
Sunday	158	6.47	1.39	6.47
Sunday	159	6.16	1.33	6.16
Sunday	160	5.90	1.29	5.90
Sunday	161	5.74	1.30	5.74
Sunday	162	5.79	1.34	5.79
Sunday	163	5.96	1.34	5.96
Sunday	164	5.93	1.29	5.93
Sunday	165	5.70	1.17	5.70
Sunday	166	5.17	0.97	5.17
Sunday	167	4.31	0.73	4.31

Flow	Daily	Hourly	Wkend
4.44	1.03	0.50	0.53
	0.99	0.33	0.38
	0.99	0.27	0.29
	0.99	0.23	0.24
	0.99	0.25	0.23
	0.99	0.45	0.25
	1.03	1.07	0.40
		1.46	0.83
		1.34	1.31
		1.26	1.58
		1.24	1.62
		1.18	1.56
		1.13	1.49
		1.08	1.42
		1.04	1.35
		1.03	1.30
		1.14	1.26
		1.30	1.27
		1.46	1.31
		1.53	1.30
		1.49	1.25
		1.38	1.14
		1.10	0.95
		0.74	0.72

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	3.48	0.85	2.37	3.51	0.76	2.19
Model	3.48	0.85	2.37	3.51	0.76	2.19
Diff	(0.00)	(0.00)	(0.00)	-	0.00	(0.00)
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	1.39	1.41	1.40
1	1.06	1.11	1.08
2	0.91	0.92	0.92
3	0.85	0.78	0.83
4	0.90	0.77	0.86
5	1.23	0.76	1.10
6	2.22	1.01	1.87
7	3.48	1.67	2.96
8	3.44	2.65	3.21
9	3.19	3.33	3.23
10	3.06	3.51	3.19
11	2.96	3.37	3.08
12	2.87	3.21	2.97
13	2.77	2.95	2.82
14	2.66	2.81	2.70
15	2.55	2.66	2.58
16	2.59	2.57	2.58
17	2.69	2.58	2.66
18	2.86	2.67	2.80
19	3.04	2.71	2.94
20	3.04	2.67	2.93
21	2.84	2.52	2.75
22	2.45	2.19	2.38
23	1.90	1.78	1.87
Average	2.37	2.19	2.32

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.46	0.48	0.46
1	0.39	0.40	0.39
2	0.37	0.34	0.36
3	0.39	0.33	0.37
4	0.53	0.33	0.47
5	0.95	0.44	0.81
6	1.50	0.72	1.27
7	1.48	1.14	1.38
8	1.37	1.43	1.39
9	1.32	1.51	1.37
10	1.27	1.45	1.33
11	1.24	1.38	1.28
12	1.19	1.27	1.21
13	1.14	1.21	1.16
14	1.10	1.15	1.11
15	1.12	1.11	1.11
16	1.16	1.11	1.15
17	1.23	1.15	1.21
18	1.31	1.17	1.27
19	1.31	1.15	1.26
20	1.22	1.08	1.18
21	1.06	0.94	1.02
22	0.82	0.77	0.80
23	0.60	0.61	0.60
Total	24.54	22.65	24.00
Average	1.02	0.94	1.00

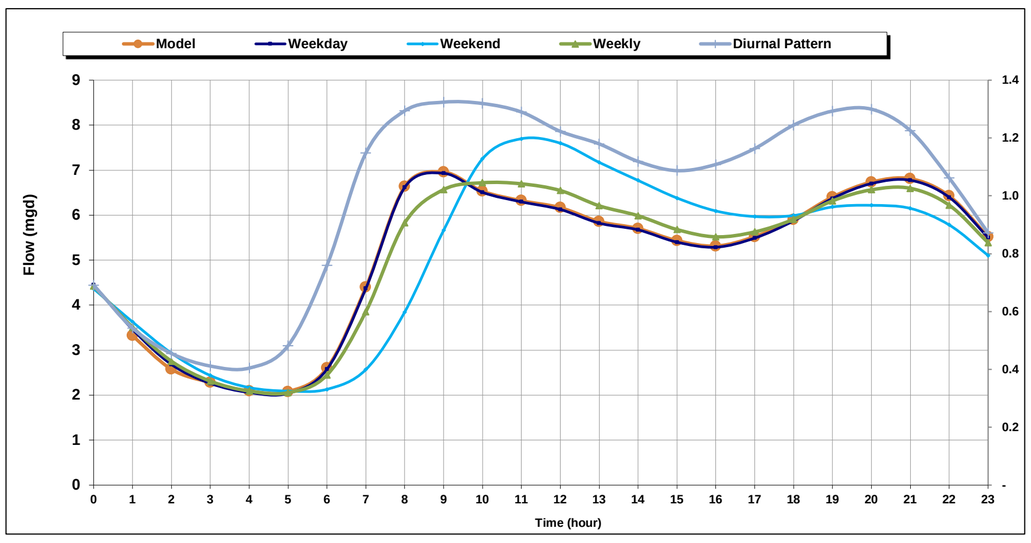
Diurnal Patterns Normalized

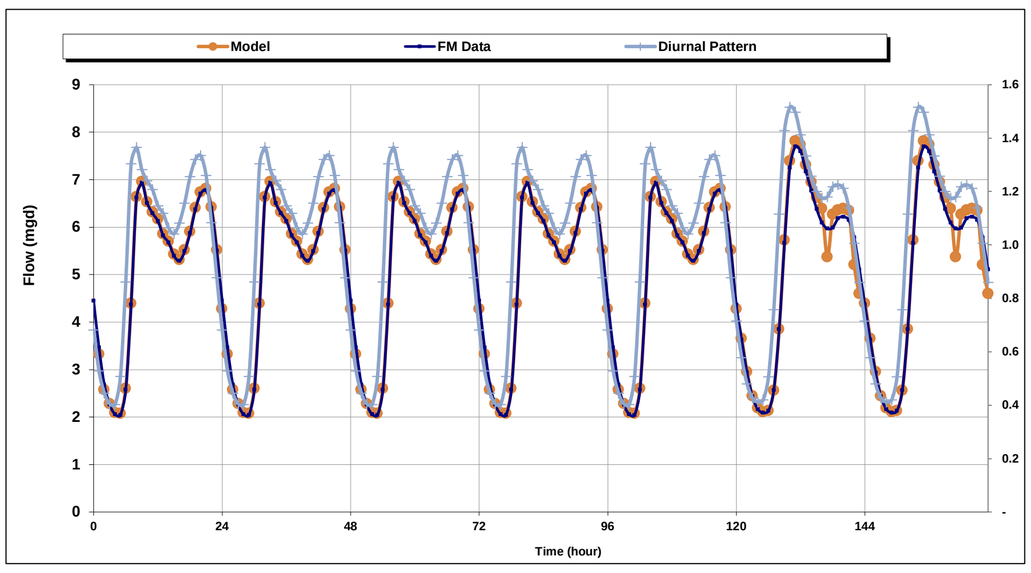
Date/Time	Weekday	Weekend	Weekly
0	0.45	0.51	0.46
1	0.39	0.42	0.39
2	0.36	0.36	0.36
3	0.38	0.35	0.37
4	0.52	0.34	0.47
5	0.93	0.46	0.81
6	1.46	0.76	1.27
7	1.45	1.21	1.38
8	1.34	1.52	1.39
9	1.29	1.60	1.37
10	1.25	1.54	1.33
11	1.21	1.47	1.28
12	1.17	1.34	1.21
13	1.12	1.28	1.16
14	1.08	1.21	1.11
15	1.09	1.17	1.11
16	1.13	1.18	1.15
17	1.20	1.22	1.21
18	1.28	1.24	1.27
19	1.28	1.22	1.26
20	1.20	1.15	1.18
21	1.03	1.00	1.02
22	0.80	0.81	0.80
23	0.59	0.64	0.60
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	1.39	0.46	
Monday	1	1.06	0.39	1.06
Monday	2	0.91	0.37	0.91
Monday	3	0.85	0.39	0.85
Monday	4	0.90	0.53	0.90
Monday	5	1.23	0.95	1.23
Monday	6	2.22	1.50	2.22
Monday	7	3.48	1.48	3.48
Monday	8	3.44	1.37	3.44
Monday	9	3.19	1.32	3.19
Monday	10	3.06	1.27	3.06
Monday	11	2.96	1.24	2.96
Monday	12	2.87	1.19	2.87
Monday	13	2.77	1.14	2.77
Monday	14	2.66	1.10	2.66
Monday	15	2.55	1.12	2.55
Monday	16	2.59	1.16	2.59
Monday	17	2.69	1.23	2.69
Monday	18	2.86	1.31	2.86
Monday	19	3.04	1.31	3.04
Monday	20	3.04	1.22	3.04
Monday	21	2.84	1.06	2.84
Monday	22	2.45	0.82	2.45
Monday	23	1.90	0.60	1.90
Tuesday	24	1.39	0.46	1.39
Tuesday	25	1.06	0.39	1.06
Tuesday	26	0.91	0.37	0.91
Tuesday	27	0.85	0.39	0.85
Tuesday	28	0.90	0.53	0.90
Tuesday	29	1.23	0.95	1.23
Tuesday	30	2.22	1.50	2.22
Tuesday	31	3.48	1.48	3.48
Tuesday	32	3.44	1.37	3.44
Tuesday	33	3.19	1.32	3.19
Tuesday	34	3.06	1.27	3.06
Tuesday	35	2.96	1.24	2.96
Tuesday	36	2.87	1.19	2.87
Tuesday	37	2.77	1.14	2.77
Tuesday	38	2.66	1.10	2.66
Tuesday	39	2.55	1.12	2.55
Tuesday	40	2.59	1.16	2.59
Tuesday	41	2.69	1.23	2.69
Tuesday	42	2.86	1.31	2.86
Tuesday	43	3.04	1.31	3.04
Tuesday	44	3.04	1.22	3.04
Tuesday	45	2.84	1.06	2.84
Tuesday	46	2.45	0.82	2.45
Tuesday	47	1.90	0.60	1.90
Wednesday	48	1.39	0.46	1.39
Wednesday	49	1.06	0.39	1.06
Wednesday	50	0.91	0.37	0.91
Wednesday	51	0.85	0.39	0.85
Wednesday	52	0.90	0.53	0.90
Wednesday	53	1.23	0.95	1.23
Wednesday	54	2.22	1.50	2.22
Wednesday	55	3.48	1.48	3.48
Wednesday	56	3.44	1.37	3.44
Wednesday	57	3.19	1.32	3.19
Wednesday	58	3.06	1.27	3.06
Wednesday	59	2.96	1.24	2.96
Wednesday	60	2.87	1.19	2.87
Wednesday	61	2.77	1.14	2.77
Wednesday	62	2.66	1.10	2.66
Wednesday	63	2.55	1.12	2.55
Wednesday	64	2.59	1.16	2.59
Wednesday	65	2.69	1.23	2.69
Wednesday	66	2.86	1.31	2.86
Wednesday	67	3.04	1.31	3.04
Wednesday	68	3.04	1.22	3.04
Wednesday	69	2.84	1.06	2.84
Wednesday	70	2.45	0.82	2.45
Wednesday	71	1.90	0.60	1.90
Thursday	72	1.39	0.46	1.39
Thursday	73	1.06	0.39	1.06
Thursday	74	0.91	0.37	0.91
Thursday	75	0.85	0.39	0.85
Thursday	76	0.90	0.53	0.90
Thursday	77	1.23	0.95	1.23
Thursday	78	2.22	1.50	2.22
Thursday	79	3.48	1.48	3.48
Thursday	80	3.44	1.37	3.44
Thursday	81	3.19	1.32	3.19
Thursday	82	3.06	1.27	3.06
Thursday	83	2.96	1.24	2.96
Thursday	84	2.87	1.19	2.87
Thursday	85	2.77	1.14	2.77
Thursday	86	2.66	1.10	2.66
Thursday	87	2.55	1.12	2.55
Thursday	88	2.59	1.16	2.59
Thursday	89	2.69	1.23	2.69
Thursday	90	2.86	1.31	2.86
Thursday	91	3.04	1.31	3.04
Thursday	92	3.04	1.22	3.04
Thursday	93	2.84	1.06	2.84
Thursday	94	2.45	0.82	2.45
Thursday	95	1.90	0.60	1.90
Friday	96	1.39	0.46	1.39
Friday	97	1.06	0.39	1.06
Friday	98	0.91	0.37	0.91
Friday	99	0.85	0.39	0.85
Friday	100	0.90	0.53	0.90
Friday	101	1.23	0.95	1.23
Friday	102	2.22	1.50	2.22
Friday	103	3.48	1.48	3.48
Friday	104	3.44	1.37	3.44
Friday	105	3.19	1.32	3.19
Friday	106	3.06	1.27	3.06
Friday	107	2.96	1.24	2.96
Friday	108	2.87	1.19	2.87
Friday	109	2.77	1.14	2.77
Friday	110	2.66	1.10	2.66
Friday	111	2.55	1.12	2.55
Friday	112	2.59	1.16	2.59
Friday	113	2.69	1.23	2.69
Friday	114	2.86	1.31	2.86
Friday	115	3.04	1.31	3.04
Friday	116	3.04	1.22	3.04
Friday	117	2.84	1.06	2.84
Friday	118	2.45	0.82	2.45
Friday	119	1.90	0.60	1.90
Saturday	120	1.41	0.48	1.39
Saturday	121	1.11	0.40	1.11
Saturday	122	0.92	0.34	0.92
Saturday	123	0.78	0.33	0.78
Saturday	124	0.77	0.33	0.77
Saturday	125	0.76	0.44	0.76
Saturday	126	1.01	0.72	1.01
Saturday	127	1.67	1.14	1.67
Saturday	128	2.65	1.43	2.65
Saturday	129	3.33	1.51	3.33
Saturday	130	3.51	1.45	3.51
Saturday	131	3.37	1.38	3.37
Saturday	132	3.21	1.27	3.21
Saturday	133	2.95	1.21	2.95
Saturday	134	2.81	1.15	2.81
Saturday	135	2.66	1.11	2.66
Saturday	136	2.57	1.11	2.57
Saturday	137	2.58	1.15	2.58
Saturday	138	2.67	1.17	2.67
Saturday	139	2.71	1.15	2.71
Saturday	140	2.67	1.08	2.67
Saturday	141	2.52	0.94	2.52
Saturday	142	2.19	0.77	2.19
Saturday	143	1.78	0.61	1.78
Sunday	144	1.41	0.48	1.41
Sunday	145	1.11	0.40	1.11
Sunday	146	0.92	0.34	0.92
Sunday	147	0.78	0.33	0.78
Sunday	148	0.77	0.33	0.77
Sunday	149	0.76	0.44	0.76
Sunday	150	1.01	0.72	1.01
Sunday	151	1.67	1.14	1.67
Sunday	152	2.65	1.43	2.65
Sunday	153	3.33	1.51	3.33
Sunday	154	3.51	1.45	3.51
Sunday	155	3.37	1.38	3.37
Sunday	156	3.21	1.27	3.21
Sunday	157	2.95	1.21	2.95
Sunday	158	2.81	1.15	2.81
Sunday	159	2.66	1.11	2.66
Sunday	160	2.57	1.11	2.57
Sunday	161	2.58	1.15	2.58
Sunday	162	2.67	1.17	2.67
Sunday	163	2.71	1.15	2.71
Sunday	164	2.67	1.08	2.67
Sunday	165	2.52	0.94	2.52
Sunday	166	2.19	0.77	2.19
Sunday	167	1.78	0.61	1.78

Flow	Daily	Hourly	Wkend
2.32	0.94	0.45	0.51
	1.02	0.39	0.42
	1.02	0.36	0.36
	1.02	0.38	0.35
	1.02	0.52	0.34
	1.02	0.93	0.46
	0.94	1.46	0.76
		1.45	1.21
		1.34	1.52
		1.29	1.60
		1.25	1.54
		1.21	1.47
		1.17	1.34
		1.12	1.28
		1.08	1.21
		1.09	1.17
		1.13	1.18
		1.20	1.22
		1.28	1.24
		1.28	1.22
		1.20	1.15
		1.03	1.00
		0.80	0.81
		0.59	0.64

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	6.93	2.04	5.07	7.70	2.09	5.09
Model	6.96	2.08	5.08	7.81	2.11	5.11
Diff	0.02	0.04	0.01	0.11	0.02	0.02
% Diff	0%	2%	0%	1%	1%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	4.45	4.36	4.43
1	3.46	3.63	3.51
2	2.68	2.93	2.75
3	2.26	2.44	2.31
4	2.06	2.17	2.09
5	2.04	2.09	2.05
6	2.57	2.13	2.45
7	4.37	2.57	3.85
8	6.62	3.85	5.83
9	6.93	5.66	6.57
10	6.51	7.25	6.72
11	6.30	7.70	6.70
12	6.13	7.60	6.55
13	5.82	7.17	6.21
14	5.67	6.77	5.99
15	5.40	6.38	5.68
16	5.29	6.09	5.52
17	5.49	5.97	5.63
18	5.87	5.99	5.91
19	6.37	6.18	6.32
20	6.70	6.22	6.56
21	6.78	6.15	6.60
22	6.40	5.78	6.22
23	5.50	5.11	5.39
Average	5.07	5.09	5.08

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.68	0.71	0.69
1	0.53	0.58	0.54
2	0.45	0.48	0.46
3	0.41	0.43	0.41
4	0.40	0.41	0.40
5	0.51	0.42	0.48
6	0.86	0.51	0.76
7	1.30	0.76	1.15
8	1.37	1.12	1.29
9	1.28	1.43	1.32
10	1.24	1.52	1.32
11	1.21	1.50	1.29
12	1.15	1.41	1.22
13	1.12	1.33	1.18
14	1.06	1.26	1.12
15	1.04	1.20	1.09
16	1.08	1.18	1.11
17	1.16	1.18	1.16
18	1.26	1.22	1.24
19	1.32	1.23	1.29
20	1.33	1.21	1.30
21	1.26	1.14	1.23
22	1.08	1.01	1.06
23	0.88	0.86	0.87
Total	23.97	24.07	24.00
Average	1.00	1.00	1.00

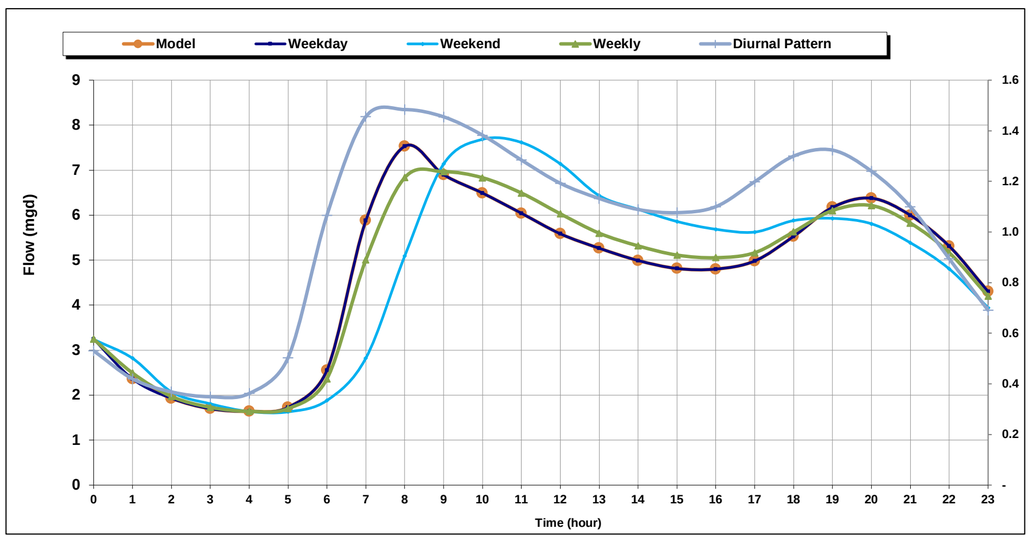
Diurnal Patterns Normalized

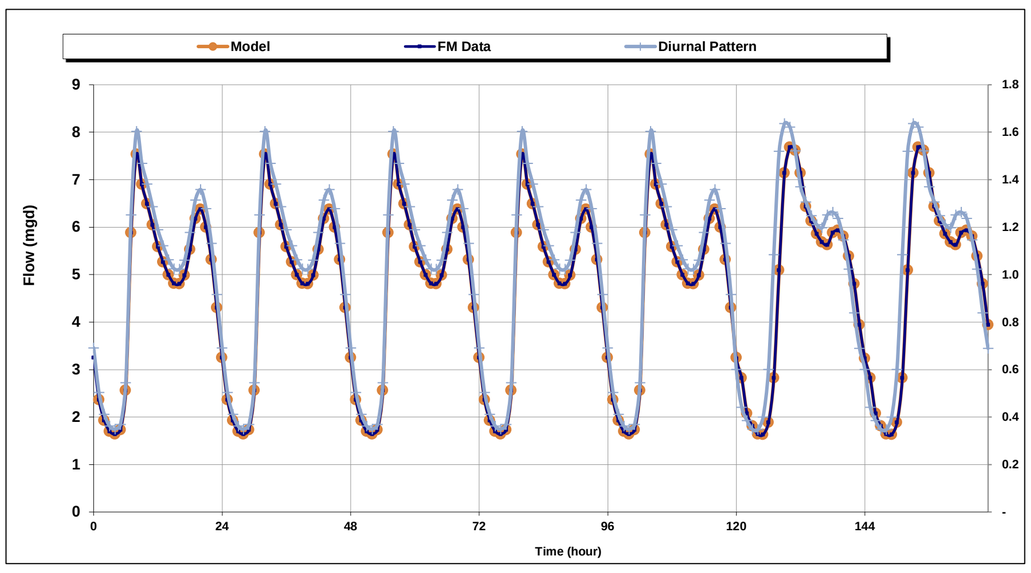
Date/Time	Weekday	Weekend	Weekly
0	0.68	0.71	0.69
1	0.53	0.58	0.54
2	0.45	0.48	0.46
3	0.41	0.43	0.41
4	0.40	0.41	0.40
5	0.51	0.42	0.48
6	0.86	0.50	0.76
7	1.31	0.76	1.15
8	1.37	1.11	1.29
9	1.28	1.42	1.32
10	1.24	1.51	1.32
11	1.21	1.49	1.29
12	1.15	1.41	1.22
13	1.12	1.33	1.18
14	1.07	1.25	1.12
15	1.04	1.20	1.09
16	1.08	1.17	1.11
17	1.16	1.18	1.16
18	1.26	1.21	1.24
19	1.32	1.22	1.29
20	1.34	1.21	1.30
21	1.26	1.14	1.23
22	1.09	1.00	1.06
23	0.88	0.86	0.87
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	4.45	0.68	
Monday	1	3.46	0.53	3.32
Monday	2	2.68	0.45	2.57
Monday	3	2.26	0.41	2.28
Monday	4	2.06	0.40	2.09
Monday	5	2.04	0.51	2.08
Monday	6	2.57	0.86	2.60
Monday	7	4.37	1.30	4.40
Monday	8	6.62	1.37	6.63
Monday	9	6.93	1.28	6.96
Monday	10	6.51	1.24	6.53
Monday	11	6.30	1.21	6.32
Monday	12	6.13	1.15	6.17
Monday	13	5.82	1.12	5.86
Monday	14	5.67	1.06	5.70
Monday	15	5.40	1.04	5.43
Monday	16	5.29	1.08	5.31
Monday	17	5.49	1.16	5.52
Monday	18	5.87	1.26	5.90
Monday	19	6.37	1.32	6.40
Monday	20	6.70	1.33	6.73
Monday	21	6.78	1.26	6.81
Monday	22	6.40	1.08	6.43
Monday	23	5.50	0.88	5.52
Tuesday	24	4.45	0.68	4.27
Tuesday	25	3.46	0.53	3.32
Tuesday	26	2.68	0.45	2.57
Tuesday	27	2.26	0.41	2.28
Tuesday	28	2.06	0.40	2.09
Tuesday	29	2.04	0.51	2.08
Tuesday	30	2.57	0.86	2.60
Tuesday	31	4.37	1.30	4.40
Tuesday	32	6.62	1.37	6.63
Tuesday	33	6.93	1.28	6.96
Tuesday	34	6.51	1.24	6.53
Tuesday	35	6.30	1.21	6.32
Tuesday	36	6.13	1.15	6.17
Tuesday	37	5.82	1.12	5.86
Tuesday	38	5.67	1.06	5.70
Tuesday	39	5.40	1.04	5.43
Tuesday	40	5.29	1.08	5.31
Tuesday	41	5.49	1.16	5.52
Tuesday	42	5.87	1.26	5.90
Tuesday	43	6.37	1.32	6.40
Tuesday	44	6.70	1.33	6.73
Tuesday	45	6.78	1.26	6.81
Tuesday	46	6.40	1.08	6.43
Tuesday	47	5.50	0.88	5.52
Wednesday	48	4.45	0.68	4.27
Wednesday	49	3.46	0.53	3.32
Wednesday	50	2.68	0.45	2.57
Wednesday	51	2.26	0.41	2.28
Wednesday	52	2.06	0.40	2.09
Wednesday	53	2.04	0.51	2.08
Wednesday	54	2.57	0.86	2.60
Wednesday	55	4.37	1.30	4.40
Wednesday	56	6.62	1.37	6.63
Wednesday	57	6.93	1.28	6.96
Wednesday	58	6.51	1.24	6.53
Wednesday	59	6.30	1.21	6.32
Wednesday	60	6.13	1.15	6.17
Wednesday	61	5.82	1.12	5.86
Wednesday	62	5.67	1.06	5.70
Wednesday	63	5.40	1.04	5.43
Wednesday	64	5.29	1.08	5.31
Wednesday	65	5.49	1.16	5.52
Wednesday	66	5.87	1.26	5.90
Wednesday	67	6.37	1.32	6.40
Wednesday	68	6.70	1.33	6.73
Wednesday	69	6.78	1.26	6.81
Wednesday	70	6.40	1.08	6.43
Wednesday	71	5.50	0.88	5.52
Thursday	72	4.45	0.68	4.27
Thursday	73	3.46	0.53	3.32
Thursday	74	2.68	0.45	2.57
Thursday	75	2.26	0.41	2.28
Thursday	76	2.06	0.40	2.09
Thursday	77	2.04	0.51	2.08
Thursday	78	2.57	0.86	2.60
Thursday	79	4.37	1.30	4.40
Thursday	80	6.62	1.37	6.63
Thursday	81	6.93	1.28	6.96
Thursday	82	6.51	1.24	6.53
Thursday	83	6.30	1.21	6.32
Thursday	84	6.13	1.15	6.17
Thursday	85	5.82	1.12	5.86
Thursday	86	5.67	1.06	5.70
Thursday	87	5.40	1.04	5.43
Thursday	88	5.29	1.08	5.31
Thursday	89	5.49	1.16	5.52
Thursday	90	5.87	1.26	5.90
Thursday	91	6.37	1.32	6.40
Thursday	92	6.70	1.33	6.73
Thursday	93	6.78	1.26	6.81
Thursday	94	6.40	1.08	6.43
Thursday	95	5.50	0.88	5.52
Friday	96	4.45	0.68	4.27
Friday	97	3.46	0.53	3.32
Friday	98	2.68	0.45	2.57
Friday	99	2.26	0.41	2.28
Friday	100	2.06	0.40	2.09
Friday	101	2.04	0.51	2.08
Friday	102	2.57	0.86	2.60
Friday	103	4.37	1.30	4.40
Friday	104	6.62	1.37	6.63
Friday	105	6.93	1.28	6.96
Friday	106	6.51	1.24	6.53
Friday	107	6.30	1.21	6.32
Friday	108	6.13	1.15	6.17
Friday	109	5.82	1.12	5.86
Friday	110	5.67	1.06	5.70
Friday	111	5.40	1.04	5.43
Friday	112	5.29	1.08	5.31
Friday	113	5.49	1.16	5.52
Friday	114	5.87	1.26	5.90
Friday	115	6.37	1.32	6.40
Friday	116	6.70	1.33	6.73
Friday	117	6.78	1.26	6.81
Friday	118	6.40	1.08	6.43
Friday	119	5.50	0.88	5.52
Saturday	120	4.36	0.71	4.27
Saturday	121	3.63	0.58	3.65
Saturday	122	2.93	0.48	2.95
Saturday	123	2.44	0.43	2.44
Saturday	124	2.17	0.41	2.19
Saturday	125	2.09	0.42	2.11
Saturday	126	2.13	0.51	2.14
Saturday	127	2.57	0.76	2.56
Saturday	128	3.85	1.12	3.85
Saturday	129	5.66	1.43	5.72
Saturday	130	7.25	1.52	7.39
Saturday	131	7.70	1.50	7.81
Saturday	132	7.60	1.41	7.74
Saturday	133	7.17	1.33	7.31
Saturday	134	6.77	1.26	6.95
Saturday	135	6.38	1.20	6.62
Saturday	136	6.09	1.18	6.39
Saturday	137	5.97	1.18	5.37
Saturday	138	5.99	1.22	6.27
Saturday	139	6.18	1.23	6.36
Saturday	140	6.22	1.21	6.39
Saturday	141	6.15	1.14	6.35
Saturday	142	5.78	1.01	5.20
Saturday	143	5.11	0.86	4.59
Sunday	144	4.36	0.71	4.39
Sunday	145	3.63	0.58	3.65
Sunday	146	2.93	0.48	2.95
Sunday	147	2.44	0.43	2.44
Sunday	148	2.17	0.41	2.19
Sunday	149	2.09	0.42	2.11
Sunday	150	2.13	0.51	2.14
Sunday	151	2.57	0.76	2.56
Sunday	152	3.85	1.12	3.85
Sunday	153	5.66	1.43	5.72
Sunday	154	7.25	1.52	7.39
Sunday	155	7.70	1.50	7.81
Sunday	156	7.60	1.41	7.74
Sunday	157	7.17	1.33	7.31
Sunday	158	6.77	1.26	6.95
Sunday	159	6.38	1.20	6.62
Sunday	160	6.09	1.18	6.39
Sunday	161	5.97	1.18	5.37
Sunday	162	5.99	1.22	6.27
Sunday	163	6.18	1.23	6.36
Sunday	164	6.22	1.21	6.39
Sunday	165	6.15	1.14	6.35
Sunday	166	5.78	1.01	5.20
Sunday	167	5.11	0.86	4.59

Flow	Daily	Hourly	Wkend
5.08	1.00	0.68	0.71
	1.00	0.53	0.58
	1.00	0.45	0.48
	1.00	0.41	0.43
	1.00	0.40	0.41
	1.00	0.51	0.42
	1.00	0.86	0.50
		1.31	0.76
		1.37	1.11
		1.28	1.42
		1.24	1.51
		1.21	1.49
		1.15	1.41
		1.12	1.33
		1.07	1.25
		1.04	1.20
		1.08	1.17
		1.16	1.18
		1.26	1.21
		1.32	1.22
		1.34	1.21
		1.26	1.14
		1.09	1.00
		0.88	0.86

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	7.53	1.64	4.67	7.69	1.63	4.75
Model	7.53	1.64	4.67	7.68	1.63	4.75
Diff	0.00	0.00	0.00	(0.00)	(0.00)	0.00
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	3.25	3.24	3.24
1	2.36	2.82	2.49
2	1.93	2.07	1.97
3	1.70	1.81	1.73
4	1.64	1.64	1.64
5	1.73	1.63	1.70
6	2.56	1.88	2.36
7	5.88	2.82	5.01
8	7.53	5.09	6.83
9	6.90	7.14	6.97
10	6.49	7.69	6.83
11	6.04	7.62	6.49
12	5.59	7.14	6.03
13	5.26	6.43	5.60
14	4.99	6.13	5.32
15	4.81	5.86	5.11
16	4.80	5.69	5.05
17	4.98	5.62	5.17
18	5.53	5.88	5.63
19	6.17	5.93	6.10
20	6.38	5.81	6.21
21	6.00	5.39	5.82
22	5.31	4.81	5.17
23	4.30	3.94	4.20
Average	4.67	4.75	4.69

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.50	0.60	0.53
1	0.41	0.44	0.42
2	0.36	0.38	0.37
3	0.35	0.35	0.35
4	0.37	0.35	0.36
5	0.54	0.40	0.50
6	1.25	0.60	1.07
7	1.60	1.08	1.46
8	1.47	1.52	1.48
9	1.38	1.64	1.46
10	1.29	1.62	1.38
11	1.19	1.52	1.28
12	1.12	1.37	1.19
13	1.06	1.31	1.13
14	1.03	1.25	1.09
15	1.02	1.21	1.08
16	1.06	1.20	1.10
17	1.18	1.25	1.20
18	1.31	1.26	1.30
19	1.36	1.24	1.32
20	1.28	1.15	1.24
21	1.13	1.02	1.10
22	0.92	0.84	0.89
23	0.69	0.69	0.69
Total	23.88	24.29	24.00
Average	1.00	1.01	1.00

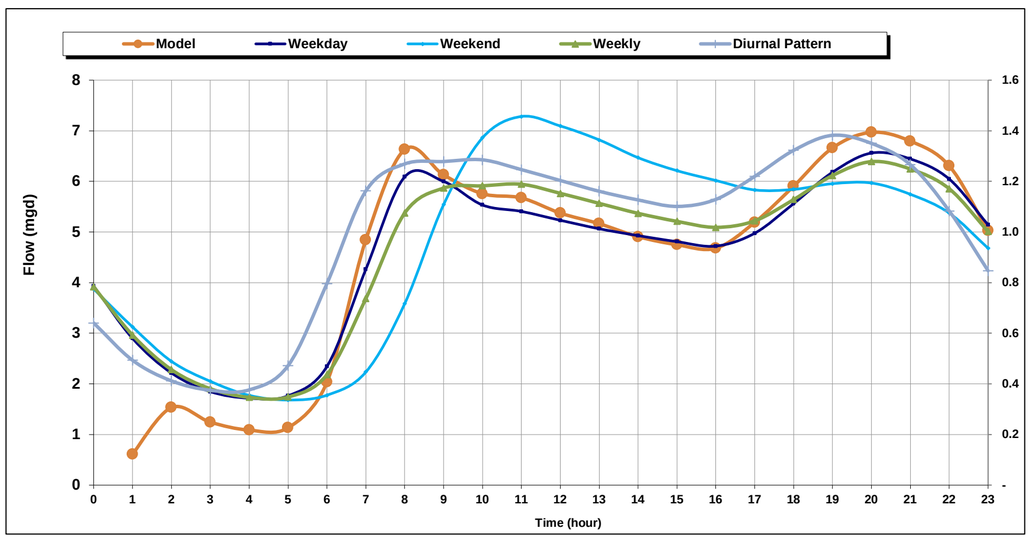
Diurnal Patterns Normalized

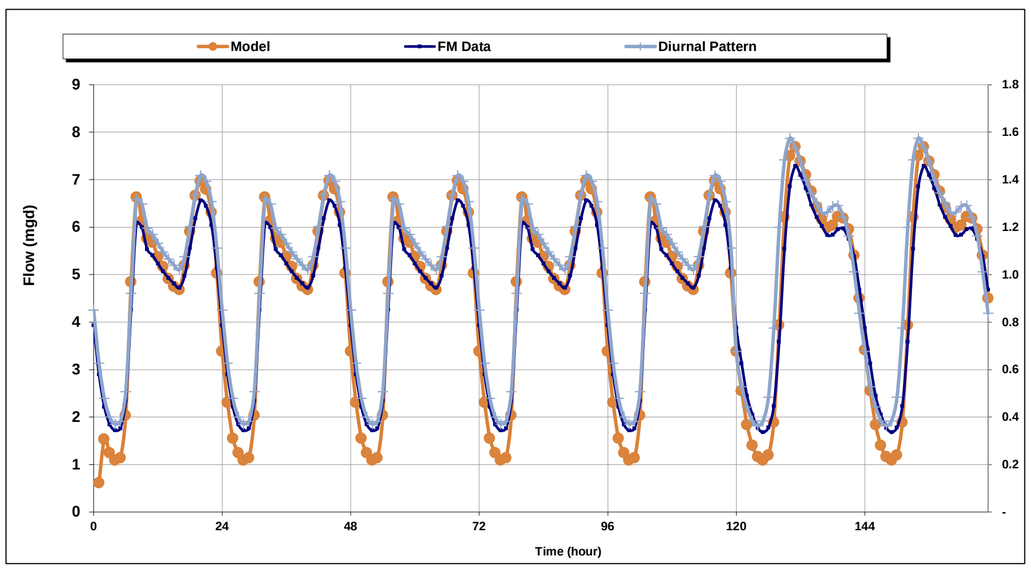
Date/Time	Weekday	Weekend	Weekly
0	0.51	0.59	0.53
1	0.41	0.44	0.42
2	0.36	0.38	0.37
3	0.35	0.34	0.35
4	0.37	0.34	0.36
5	0.55	0.40	0.50
6	1.26	0.59	1.07
7	1.61	1.07	1.46
8	1.48	1.50	1.48
9	1.39	1.62	1.46
10	1.29	1.60	1.38
11	1.20	1.50	1.28
12	1.13	1.35	1.19
13	1.07	1.29	1.13
14	1.03	1.23	1.09
15	1.03	1.20	1.08
16	1.07	1.18	1.10
17	1.18	1.24	1.20
18	1.32	1.25	1.30
19	1.36	1.22	1.32
20	1.28	1.13	1.24
21	1.14	1.01	1.10
22	0.92	0.83	0.89
23	0.70	0.68	0.69
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	3.25	0.69	
Monday	1	2.36	0.50	2.36
Monday	2	1.93	0.41	1.93
Monday	3	1.70	0.36	1.70
Monday	4	1.64	0.35	1.64
Monday	5	1.73	0.37	1.73
Monday	6	2.56	0.54	2.56
Monday	7	5.88	1.25	5.88
Monday	8	7.53	1.60	7.53
Monday	9	6.90	1.47	6.90
Monday	10	6.49	1.38	6.49
Monday	11	6.04	1.29	6.04
Monday	12	5.59	1.19	5.59
Monday	13	5.26	1.12	5.26
Monday	14	4.99	1.06	4.99
Monday	15	4.81	1.03	4.81
Monday	16	4.80	1.02	4.80
Monday	17	4.98	1.06	4.98
Monday	18	5.53	1.18	5.53
Monday	19	6.17	1.31	6.17
Monday	20	6.38	1.36	6.38
Monday	21	6.00	1.28	6.00
Monday	22	5.31	1.13	5.31
Monday	23	4.30	0.92	4.30
Tuesday	24	3.25	0.69	3.25
Tuesday	25	2.36	0.50	2.36
Tuesday	26	1.93	0.41	1.93
Tuesday	27	1.70	0.36	1.70
Tuesday	28	1.64	0.35	1.64
Tuesday	29	1.73	0.37	1.73
Tuesday	30	2.56	0.54	2.56
Tuesday	31	5.88	1.25	5.88
Tuesday	32	7.53	1.60	7.53
Tuesday	33	6.90	1.47	6.90
Tuesday	34	6.49	1.38	6.49
Tuesday	35	6.04	1.29	6.04
Tuesday	36	5.59	1.19	5.59
Tuesday	37	5.26	1.12	5.26
Tuesday	38	4.99	1.06	4.99
Tuesday	39	4.81	1.03	4.81
Tuesday	40	4.80	1.02	4.80
Tuesday	41	4.98	1.06	4.98
Tuesday	42	5.53	1.18	5.53
Tuesday	43	6.17	1.31	6.17
Tuesday	44	6.38	1.36	6.38
Tuesday	45	6.00	1.28	6.00
Tuesday	46	5.31	1.13	5.31
Tuesday	47	4.30	0.92	4.30
Wednesday	48	3.25	0.69	3.25
Wednesday	49	2.36	0.50	2.36
Wednesday	50	1.93	0.41	1.93
Wednesday	51	1.70	0.36	1.70
Wednesday	52	1.64	0.35	1.64
Wednesday	53	1.73	0.37	1.73
Wednesday	54	2.56	0.54	2.56
Wednesday	55	5.88	1.25	5.88
Wednesday	56	7.53	1.60	7.53
Wednesday	57	6.90	1.47	6.90
Wednesday	58	6.49	1.38	6.49
Wednesday	59	6.04	1.29	6.04
Wednesday	60	5.59	1.19	5.59
Wednesday	61	5.26	1.12	5.26
Wednesday	62	4.99	1.06	4.99
Wednesday	63	4.81	1.03	4.81
Wednesday	64	4.80	1.02	4.80
Wednesday	65	4.98	1.06	4.98
Wednesday	66	5.53	1.18	5.53
Wednesday	67	6.17	1.31	6.17
Wednesday	68	6.38	1.36	6.38
Wednesday	69	6.00	1.28	6.00
Wednesday	70	5.31	1.13	5.31
Wednesday	71	4.30	0.92	4.30
Thursday	72	3.25	0.69	3.25
Thursday	73	2.36	0.50	2.36
Thursday	74	1.93	0.41	1.93
Thursday	75	1.70	0.36	1.70
Thursday	76	1.64	0.35	1.64
Thursday	77	1.73	0.37	1.73
Thursday	78	2.56	0.54	2.56
Thursday	79	5.88	1.25	5.88
Thursday	80	7.53	1.60	7.53
Thursday	81	6.90	1.47	6.90
Thursday	82	6.49	1.38	6.49
Thursday	83	6.04	1.29	6.04
Thursday	84	5.59	1.19	5.59
Thursday	85	5.26	1.12	5.26
Thursday	86	4.99	1.06	4.99
Thursday	87	4.81	1.03	4.81
Thursday	88	4.80	1.02	4.80
Thursday	89	4.98	1.06	4.98
Thursday	90	5.53	1.18	5.53
Thursday	91	6.17	1.31	6.17
Thursday	92	6.38	1.36	6.38
Thursday	93	6.00	1.28	6.00
Thursday	94	5.31	1.13	5.31
Thursday	95	4.30	0.92	4.30
Friday	96	3.25	0.69	3.25
Friday	97	2.36	0.50	2.36
Friday	98	1.93	0.41	1.93
Friday	99	1.70	0.36	1.70
Friday	100	1.64	0.35	1.64
Friday	101	1.73	0.37	1.73
Friday	102	2.56	0.54	2.56
Friday	103	5.88	1.25	5.88
Friday	104	7.53	1.60	7.53
Friday	105	6.90	1.47	6.90
Friday	106	6.49	1.38	6.49
Friday	107	6.04	1.29	6.04
Friday	108	5.59	1.19	5.59
Friday	109	5.26	1.12	5.26
Friday	110	4.99	1.06	4.99
Friday	111	4.81	1.03	4.81
Friday	112	4.80	1.02	4.80
Friday	113	4.98	1.06	4.98
Friday	114	5.53	1.18	5.53
Friday	115	6.17	1.31	6.17
Friday	116	6.38	1.36	6.38
Friday	117	6.00	1.28	6.00
Friday	118	5.31	1.13	5.31
Friday	119	4.30	0.92	4.30
Saturday	120	3.24	0.60	3.25
Saturday	121	2.82	0.44	2.82
Saturday	122	2.07	0.38	2.07
Saturday	123	1.81	0.35	1.81
Saturday	124	1.64	0.35	1.64
Saturday	125	1.63	0.40	1.63
Saturday	126	1.88	0.60	1.88
Saturday	127	2.82	1.08	2.82
Saturday	128	5.09	1.52	5.09
Saturday	129	7.14	1.64	7.14
Saturday	130	7.69	1.62	7.68
Saturday	131	7.62	1.52	7.62
Saturday	132	7.14	1.37	7.14
Saturday	133	6.43	1.31	6.43
Saturday	134	6.13	1.25	6.13
Saturday	135	5.86	1.21	5.86
Saturday	136	5.69	1.20	5.69
Saturday	137	5.62	1.25	5.62
Saturday	138	5.88	1.26	5.88
Saturday	139	5.93	1.24	5.93
Saturday	140	5.81	1.15	5.81
Saturday	141	5.39	1.02	5.39
Saturday	142	4.81	0.84	4.81
Saturday	143	3.94	0.69	3.94
Sunday	144	3.24	0.60	3.24
Sunday	145	2.82	0.44	2.82
Sunday	146	2.07	0.38	2.07
Sunday	147	1.81	0.35	1.81
Sunday	148	1.64	0.35	1.64
Sunday	149	1.63	0.40	1.63
Sunday	150	1.88	0.60	1.88
Sunday	151	2.82	1.08	2.82
Sunday	152	5.09	1.52	5.09
Sunday	153	7.14	1.64	7.14
Sunday	154	7.69	1.62	7.68
Sunday	155	7.62	1.52	7.62
Sunday	156	7.14	1.37	7.14
Sunday	157	6.43	1.31	6.43
Sunday	158	6.13	1.25	6.13
Sunday	159	5.86	1.21	5.86
Sunday	160	5.69	1.20	5.69
Sunday	161	5.62	1.25	5.62
Sunday	162	5.88	1.26	5.88
Sunday	163	5.93	1.24	5.93
Sunday	164	5.81	1.15	5.81
Sunday	165	5.39	1.02	5.39
Sunday	166	4.81	0.84	4.81
Sunday	167	3.94	0.69	3.94

Flow	Daily	Hourly	Wkend
4.69	1.01	0.51	0.59
	1.00	0.41	0.44
	1.00	0.36	0.38
	1.00	0.35	0.34
	1.00	0.37	0.34
	1.00	0.55	0.40
	1.01	1.26	0.59
		1.61	1.07
		1.48	1.50
		1.39	1.62
		1.29	1.60
		1.20	1.50
		1.13	1.35
		1.07	1.29
		1.03	1.23
		1.03	1.20
		1.07	1.18
		1.18	1.24
		1.32	1.25
		1.36	1.22
		1.28	1.13
		1.14	1.01
		0.92	0.83
		0.70	0.68

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	6.56	1.72	4.57	7.28	1.68	4.76
Model	6.97	1.09	4.56	7.69	1.09	4.75
Diff	0.41	(0.63)	(0.01)	0.40	(0.59)	(0.01)
% Diff	6%	-37%	0%	6%	-35%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	3.93	3.87	3.92
1	2.90	3.12	2.96
2	2.22	2.45	2.28
3	1.85	2.05	1.90
4	1.72	1.77	1.73
5	1.76	1.68	1.74
6	2.35	1.78	2.18
7	4.26	2.23	3.68
8	6.09	3.59	5.37
9	6.00	5.54	5.87
10	5.53	6.86	5.91
11	5.41	7.28	5.94
12	5.23	7.09	5.76
13	5.06	6.82	5.57
14	4.93	6.47	5.37
15	4.81	6.21	5.21
16	4.72	6.02	5.09
17	4.98	5.83	5.22
18	5.56	5.84	5.64
19	6.18	5.96	6.12
20	6.56	5.97	6.39
21	6.44	5.75	6.24
22	6.05	5.38	5.86
23	5.14	4.68	5.01
Average	4.57	4.76	4.62

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.63	0.68	0.64
1	0.48	0.53	0.49
2	0.40	0.44	0.41
3	0.37	0.38	0.37
4	0.38	0.36	0.38
5	0.51	0.38	0.47
6	0.92	0.48	0.80
7	1.32	0.78	1.16
8	1.30	1.20	1.27
9	1.20	1.48	1.28
10	1.17	1.57	1.29
11	1.13	1.53	1.25
12	1.10	1.47	1.20
13	1.07	1.40	1.16
14	1.04	1.34	1.13
15	1.02	1.30	1.10
16	1.08	1.26	1.13
17	1.20	1.26	1.22
18	1.34	1.29	1.32
19	1.42	1.29	1.38
20	1.39	1.24	1.35
21	1.31	1.16	1.27
22	1.11	1.01	1.08
23	0.85	0.84	0.85
Total	23.72	24.70	24.00
Average	0.99	1.03	1.00

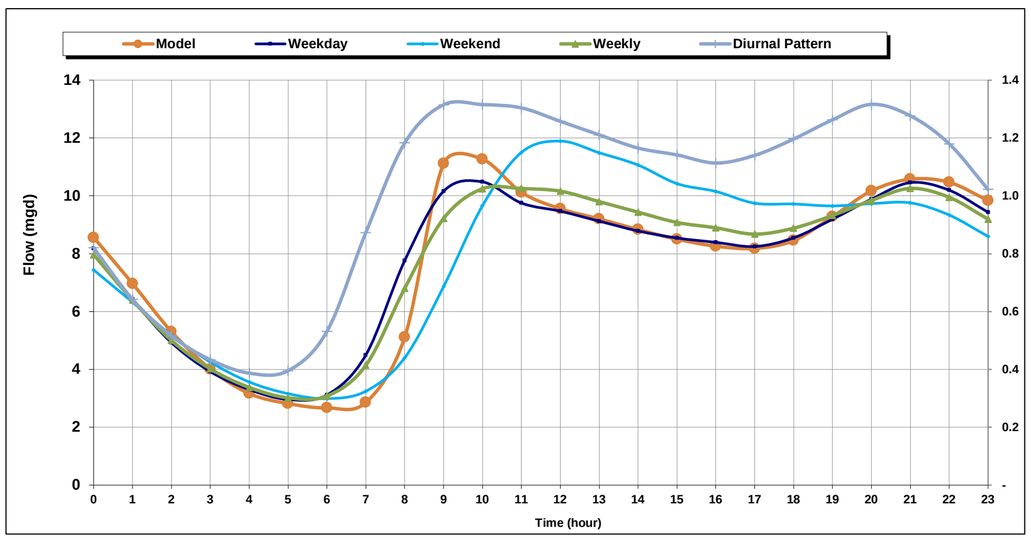
Diurnal Patterns Normalized

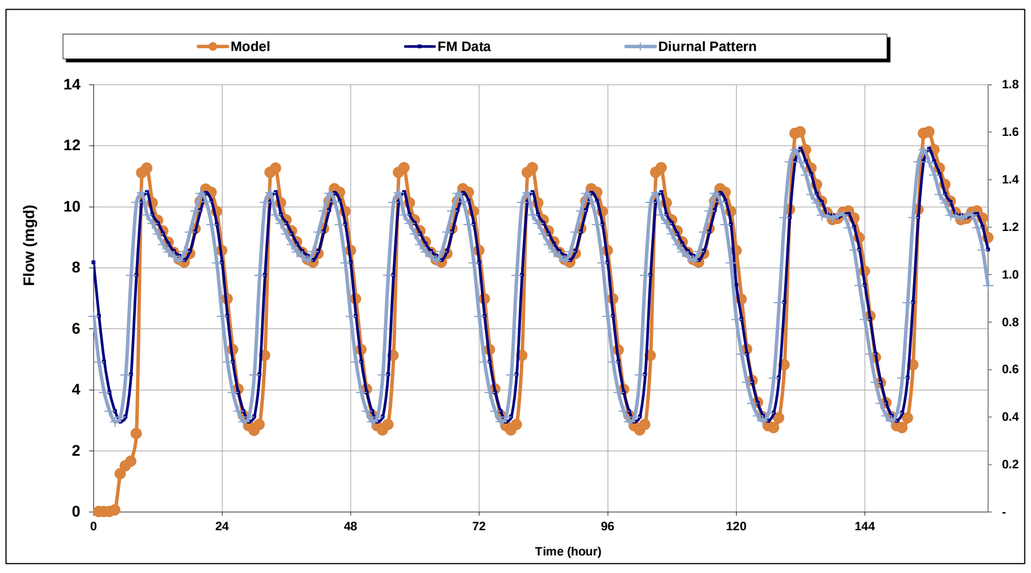
Date/Time	Weekday	Weekend	Weekly
0	0.63	0.66	0.64
1	0.48	0.51	0.49
2	0.40	0.43	0.41
3	0.38	0.37	0.37
4	0.39	0.35	0.38
5	0.51	0.37	0.47
6	0.93	0.47	0.80
7	1.33	0.75	1.16
8	1.31	1.16	1.27
9	1.21	1.44	1.28
10	1.18	1.53	1.29
11	1.14	1.49	1.25
12	1.11	1.43	1.20
13	1.08	1.36	1.16
14	1.05	1.30	1.13
15	1.03	1.26	1.10
16	1.09	1.22	1.13
17	1.22	1.23	1.22
18	1.35	1.25	1.32
19	1.44	1.25	1.38
20	1.41	1.21	1.35
21	1.32	1.13	1.27
22	1.13	0.98	1.08
23	0.86	0.81	0.85
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	3.93	0.85	
Monday	1	2.90	0.63	0.61
Monday	2	2.22	0.48	1.53
Monday	3	1.85	0.40	1.24
Monday	4	1.72	0.37	1.09
Monday	5	1.76	0.38	1.13
Monday	6	2.35	0.51	2.03
Monday	7	4.26	0.92	4.85
Monday	8	6.09	1.32	6.63
Monday	9	6.00	1.30	6.13
Monday	10	5.53	1.20	5.76
Monday	11	5.41	1.17	5.67
Monday	12	5.23	1.13	5.37
Monday	13	5.06	1.10	5.16
Monday	14	4.93	1.07	4.91
Monday	15	4.81	1.04	4.75
Monday	16	4.72	1.02	4.68
Monday	17	4.98	1.08	5.19
Monday	18	5.56	1.20	5.90
Monday	19	6.18	1.34	6.66
Monday	20	6.56	1.42	6.97
Monday	21	6.44	1.39	6.80
Monday	22	6.05	1.31	6.31
Monday	23	5.14	1.11	5.03
Tuesday	24	3.93	0.85	3.38
Tuesday	25	2.90	0.63	2.31
Tuesday	26	2.22	0.48	1.55
Tuesday	27	1.85	0.40	1.25
Tuesday	28	1.72	0.37	1.09
Tuesday	29	1.76	0.38	1.13
Tuesday	30	2.35	0.51	2.03
Tuesday	31	4.26	0.92	4.85
Tuesday	32	6.09	1.32	6.63
Tuesday	33	6.00	1.30	6.13
Tuesday	34	5.53	1.20	5.76
Tuesday	35	5.41	1.17	5.68
Tuesday	36	5.23	1.13	5.38
Tuesday	37	5.06	1.10	5.17
Tuesday	38	4.93	1.07	4.91
Tuesday	39	4.81	1.04	4.75
Tuesday	40	4.72	1.02	4.68
Tuesday	41	4.98	1.08	5.19
Tuesday	42	5.56	1.20	5.91
Tuesday	43	6.18	1.34	6.66
Tuesday	44	6.56	1.42	6.97
Tuesday	45	6.44	1.39	6.80
Tuesday	46	6.05	1.31	6.31
Tuesday	47	5.14	1.11	5.03
Wednesday	48	3.93	0.85	3.38
Wednesday	49	2.90	0.63	2.31
Wednesday	50	2.22	0.48	1.55
Wednesday	51	1.85	0.40	1.25
Wednesday	52	1.72	0.37	1.09
Wednesday	53	1.76	0.38	1.13
Wednesday	54	2.35	0.51	2.03
Wednesday	55	4.26	0.92	4.85
Wednesday	56	6.09	1.32	6.63
Wednesday	57	6.00	1.30	6.13
Wednesday	58	5.53	1.20	5.76
Wednesday	59	5.41	1.17	5.68
Wednesday	60	5.23	1.13	5.38
Wednesday	61	5.06	1.10	5.17
Wednesday	62	4.93	1.07	4.91
Wednesday	63	4.81	1.04	4.75
Wednesday	64	4.72	1.02	4.68
Wednesday	65	4.98	1.08	5.19
Wednesday	66	5.56	1.20	5.91
Wednesday	67	6.18	1.34	6.66
Wednesday	68	6.56	1.42	6.97
Wednesday	69	6.44	1.39	6.80
Wednesday	70	6.05	1.31	6.31
Wednesday	71	5.14	1.11	5.03
Thursday	72	3.93	0.85	3.38
Thursday	73	2.90	0.63	2.31
Thursday	74	2.22	0.48	1.55
Thursday	75	1.85	0.40	1.25
Thursday	76	1.72	0.37	1.09
Thursday	77	1.76	0.38	1.13
Thursday	78	2.35	0.51	2.03
Thursday	79	4.26	0.92	4.85
Thursday	80	6.09	1.32	6.63
Thursday	81	6.00	1.30	6.13
Thursday	82	5.53	1.20	5.76
Thursday	83	5.41	1.17	5.68
Thursday	84	5.23	1.13	5.38
Thursday	85	5.06	1.10	5.17
Thursday	86	4.93	1.07	4.91
Thursday	87	4.81	1.04	4.75
Thursday	88	4.72	1.02	4.68
Thursday	89	4.98	1.08	5.19
Thursday	90	5.56	1.20	5.91
Thursday	91	6.18	1.34	6.66
Thursday	92	6.56	1.42	6.97
Thursday	93	6.44	1.39	6.80
Thursday	94	6.05	1.31	6.31
Thursday	95	5.14	1.11	5.03
Friday	96	3.93	0.85	3.38
Friday	97	2.90	0.63	2.31
Friday	98	2.22	0.48	1.55
Friday	99	1.85	0.40	1.25
Friday	100	1.72	0.37	1.09
Friday	101	1.76	0.38	1.13
Friday	102	2.35	0.51	2.03
Friday	103	4.26	0.92	4.85
Friday	104	6.09	1.32	6.63
Friday	105	6.00	1.30	6.13
Friday	106	5.53	1.20	5.76
Friday	107	5.41	1.17	5.68
Friday	108	5.23	1.13	5.38
Friday	109	5.06	1.10	5.17
Friday	110	4.93	1.07	4.91
Friday	111	4.81	1.04	4.75
Friday	112	4.72	1.02	4.68
Friday	113	4.98	1.08	5.19
Friday	114	5.56	1.20	5.91
Friday	115	6.18	1.34	6.66
Friday	116	6.56	1.42	6.97
Friday	117	6.44	1.39	6.80
Friday	118	6.05	1.31	6.31
Friday	119	5.14	1.11	5.03
Saturday	120	3.87	0.68	3.38
Saturday	121	3.12	0.53	2.55
Saturday	122	2.45	0.44	1.83
Saturday	123	2.05	0.38	1.40
Saturday	124	1.77	0.36	1.16
Saturday	125	1.68	0.38	1.09
Saturday	126	1.78	0.48	1.19
Saturday	127	2.23	0.78	1.89
Saturday	128	3.59	1.20	3.94
Saturday	129	5.54	1.48	6.21
Saturday	130	6.86	1.57	7.50
Saturday	131	7.28	1.53	7.69
Saturday	132	7.09	1.47	7.39
Saturday	133	6.82	1.40	7.10
Saturday	134	6.47	1.34	6.75
Saturday	135	6.21	1.30	6.43
Saturday	136	6.02	1.26	6.16
Saturday	137	5.83	1.26	5.99
Saturday	138	5.84	1.29	6.04
Saturday	139	5.96	1.29	6.22
Saturday	140	5.97	1.24	6.19
Saturday	141	5.75	1.16	5.95
Saturday	142	5.38	1.01	5.40
Saturday	143	4.68	0.84	4.50
Sunday	144	3.87	0.68	3.41
Sunday	145	3.12	0.53	2.55
Sunday	146	2.45	0.44	1.83
Sunday	147	2.05	0.38	1.40
Sunday	148	1.77	0.36	1.16
Sunday	149	1.68	0.38	1.09
Sunday	150	1.78	0.48	1.19
Sunday	151	2.23	0.78	1.89
Sunday	152	3.59	1.20	3.94
Sunday	153	5.54	1.48	6.21
Sunday	154	6.86	1.57	7.50
Sunday	155	7.28	1.53	7.69
Sunday	156	7.09	1.47	7.39
Sunday	157	6.82	1.40	7.10
Sunday	158	6.47	1.34	6.75
Sunday	159	6.21	1.30	6.43
Sunday	160	6.02	1.26	6.16
Sunday	161	5.83	1.26	5.99
Sunday	162	5.84	1.29	6.04
Sunday	163	5.96	1.29	6.22
Sunday	164	5.97	1.24	6.19
Sunday	165	5.75	1.16	5.95
Sunday	166	5.38	1.01	5.40
Sunday	167	4.68	0.84	4.50

Flow	Daily	Hourly	Wkend
4.62	1.03	0.63	0.66
	0.99	0.48	0.51
	0.99	0.40	0.43
	0.99	0.38	0.37
	0.99	0.39	0.35
	0.99	0.51	0.37
	1.03	0.93	0.47
		1.33	0.75
		1.31	1.16
		1.21	1.44
		1.18	1.53
		1.14	1.49
		1.11	1.43
		1.08	1.36
		1.05	1.30
		1.03	1.26
		1.09	1.22
		1.22	1.23
		1.35	1.25
		1.44	1.25
		1.41	1.21
		1.32	1.13
		1.13	0.98
		0.86	0.81

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	10.48	2.96	7.74	11.89	2.99	7.92
Model	11.27	2.67	7.72	12.45	2.76	7.97
Diff	0.78	(0.29)	(0.02)	0.55	(0.23)	0.05
% Diff	7%	-10%	0%	5%	-8%	1%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	8.18	7.44	7.97
1	6.42	6.32	6.39
2	4.93	5.18	5.00
3	3.92	4.26	4.02
4	3.30	3.57	3.38
5	2.96	3.16	3.02
6	3.12	2.99	3.08
7	4.50	3.25	4.14
8	7.76	4.40	6.80
9	10.16	6.87	9.22
10	10.48	9.66	10.25
11	9.75	11.50	10.25
12	9.47	11.89	10.16
13	9.12	11.49	9.80
14	8.79	11.07	9.44
15	8.54	10.42	9.08
16	8.39	10.15	8.90
17	8.25	9.75	8.68
18	8.55	9.72	8.88
19	9.19	9.65	9.32
20	9.89	9.73	9.84
21	10.46	9.76	10.26
22	10.20	9.34	9.95
23	9.43	8.60	9.19
Average	7.74	7.92	7.79

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.82	0.81	0.82
1	0.63	0.67	0.64
2	0.50	0.55	0.52
3	0.42	0.46	0.43
4	0.38	0.41	0.39
5	0.40	0.38	0.40
6	0.58	0.42	0.53
7	1.00	0.57	0.87
8	1.30	0.88	1.18
9	1.35	1.24	1.32
10	1.25	1.48	1.32
11	1.22	1.53	1.30
12	1.17	1.47	1.26
13	1.13	1.42	1.21
14	1.10	1.34	1.17
15	1.08	1.30	1.14
16	1.06	1.25	1.11
17	1.10	1.25	1.14
18	1.18	1.24	1.20
19	1.27	1.25	1.26
20	1.34	1.25	1.32
21	1.31	1.20	1.28
22	1.21	1.10	1.18
23	1.05	0.95	1.02
Total	23.84	24.40	24.00
Average	0.99	1.02	1.00

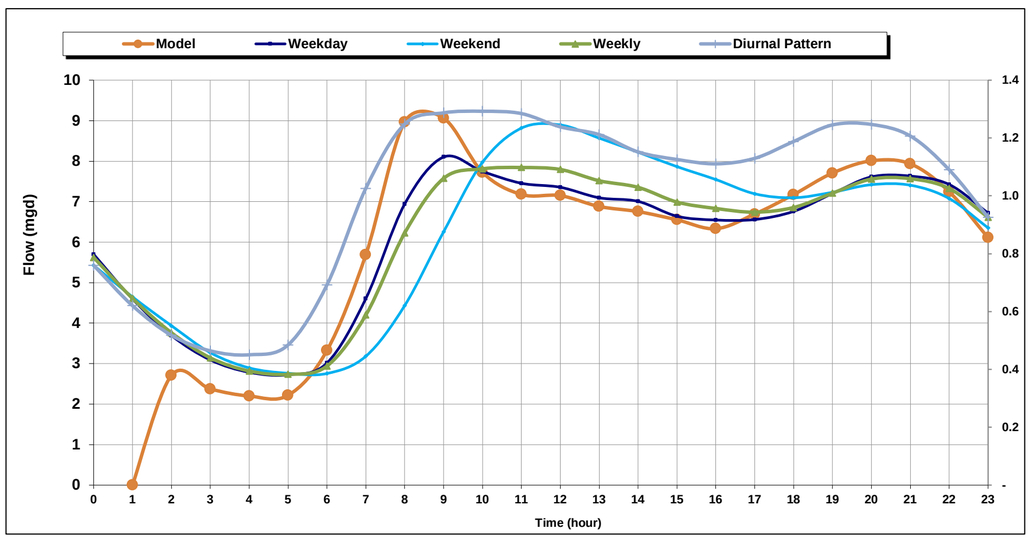
Diurnal Patterns Normalized

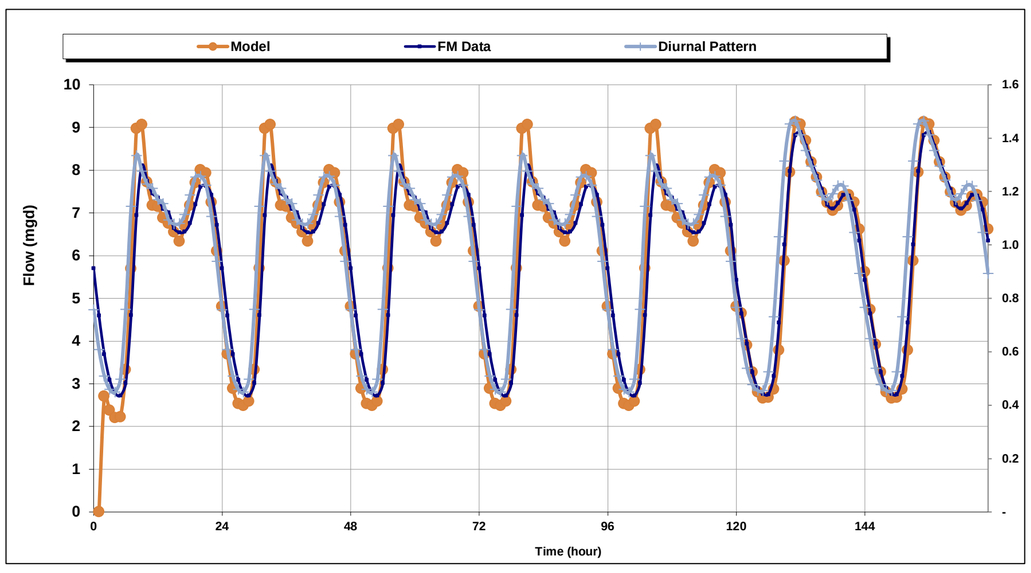
Date/Time	Weekday	Weekend	Weekly
0	0.83	0.80	0.82
1	0.64	0.65	0.64
2	0.51	0.54	0.52
3	0.43	0.45	0.43
4	0.38	0.40	0.39
5	0.40	0.38	0.40
6	0.58	0.41	0.53
7	1.00	0.56	0.87
8	1.31	0.87	1.18
9	1.35	1.22	1.32
10	1.26	1.45	1.32
11	1.22	1.50	1.30
12	1.18	1.45	1.26
13	1.14	1.40	1.21
14	1.10	1.32	1.17
15	1.08	1.28	1.14
16	1.07	1.23	1.11
17	1.10	1.23	1.14
18	1.19	1.22	1.20
19	1.28	1.23	1.26
20	1.35	1.23	1.32
21	1.32	1.18	1.28
22	1.22	1.08	1.18
23	1.06	0.94	1.02
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	8.18	0.82	
Monday	1	6.42	0.63	0.01
Monday	2	4.93	0.50	0.01
Monday	3	3.92	0.42	0.01
Monday	4	3.30	0.38	0.06
Monday	5	2.96	0.40	1.24
Monday	6	3.12	0.58	1.50
Monday	7	4.50	1.00	1.66
Monday	8	7.76	1.30	2.57
Monday	9	10.16	1.35	11.10
Monday	10	10.48	1.25	11.26
Monday	11	9.75	1.22	10.12
Monday	12	9.47	1.17	9.55
Monday	13	9.12	1.13	9.20
Monday	14	8.79	1.10	8.83
Monday	15	8.54	1.08	8.50
Monday	16	8.39	1.06	8.26
Monday	17	8.25	1.10	8.18
Monday	18	8.55	1.18	8.46
Monday	19	9.19	1.27	9.28
Monday	20	9.89	1.34	10.17
Monday	21	10.46	1.31	10.57
Monday	22	10.20	1.21	10.46
Monday	23	9.43	1.05	9.84
Tuesday	24	8.18	0.82	8.56
Tuesday	25	6.42	0.63	6.97
Tuesday	26	4.93	0.50	5.31
Tuesday	27	3.92	0.42	4.01
Tuesday	28	3.30	0.38	3.17
Tuesday	29	2.96	0.40	2.82
Tuesday	30	3.12	0.58	2.67
Tuesday	31	4.50	1.00	2.86
Tuesday	32	7.76	1.30	5.12
Tuesday	33	10.16	1.35	11.12
Tuesday	34	10.48	1.25	11.26
Tuesday	35	9.75	1.22	10.12
Tuesday	36	9.47	1.17	9.55
Tuesday	37	9.12	1.13	9.20
Tuesday	38	8.79	1.10	8.84
Tuesday	39	8.54	1.08	8.50
Tuesday	40	8.39	1.06	8.26
Tuesday	41	8.25	1.10	8.18
Tuesday	42	8.55	1.18	8.46
Tuesday	43	9.19	1.27	9.28
Tuesday	44	9.89	1.34	10.17
Tuesday	45	10.46	1.31	10.58
Tuesday	46	10.20	1.21	10.47
Tuesday	47	9.43	1.05	9.84
Wednesday	48	8.18	0.82	8.56
Wednesday	49	6.42	0.63	6.97
Wednesday	50	4.93	0.50	5.31
Wednesday	51	3.92	0.42	4.01
Wednesday	52	3.30	0.38	3.17
Wednesday	53	2.96	0.40	2.82
Wednesday	54	3.12	0.58	2.67
Wednesday	55	4.50	1.00	2.86
Wednesday	56	7.76	1.30	5.12
Wednesday	57	10.16	1.35	11.12
Wednesday	58	10.48	1.25	11.27
Wednesday	59	9.75	1.22	10.12
Wednesday	60	9.47	1.17	9.55
Wednesday	61	9.12	1.13	9.20
Wednesday	62	8.79	1.10	8.84
Wednesday	63	8.54	1.08	8.50
Wednesday	64	8.39	1.06	8.26
Wednesday	65	8.25	1.10	8.18
Wednesday	66	8.55	1.18	8.45
Wednesday	67	9.19	1.27	9.28
Wednesday	68	9.89	1.34	10.17
Wednesday	69	10.46	1.31	10.58
Wednesday	70	10.20	1.21	10.47
Wednesday	71	9.43	1.05	9.84
Thursday	72	8.18	0.82	8.56
Thursday	73	6.42	0.63	6.97
Thursday	74	4.93	0.50	5.31
Thursday	75	3.92	0.42	4.01
Thursday	76	3.30	0.38	3.17
Thursday	77	2.96	0.40	2.82
Thursday	78	3.12	0.58	2.67
Thursday	79	4.50	1.00	2.86
Thursday	80	7.76	1.30	5.12
Thursday	81	10.16	1.35	11.12
Thursday	82	10.48	1.25	11.27
Thursday	83	9.75	1.22	10.12
Thursday	84	9.47	1.17	9.55
Thursday	85	9.12	1.13	9.20
Thursday	86	8.79	1.10	8.84
Thursday	87	8.54	1.08	8.50
Thursday	88	8.39	1.06	8.26
Thursday	89	8.25	1.10	8.18
Thursday	90	8.55	1.18	8.45
Thursday	91	9.19	1.27	9.28
Thursday	92	9.89	1.34	10.17
Thursday	93	10.46	1.31	10.58
Thursday	94	10.20	1.21	10.47
Thursday	95	9.43	1.05	9.84
Friday	96	8.18	0.82	8.56
Friday	97	6.42	0.63	6.97
Friday	98	4.93	0.50	5.30
Friday	99	3.92	0.42	4.01
Friday	100	3.30	0.38	3.16
Friday	101	2.96	0.40	2.82
Friday	102	3.12	0.58	2.67
Friday	103	4.50	1.00	2.86
Friday	104	7.76	1.30	5.12
Friday	105	10.16	1.35	11.12
Friday	106	10.48	1.25	11.27
Friday	107	9.75	1.22	10.12
Friday	108	9.47	1.17	9.55
Friday	109	9.12	1.13	9.20
Friday	110	8.79	1.10	8.84
Friday	111	8.54	1.08	8.50
Friday	112	8.39	1.06	8.26
Friday	113	8.25	1.10	8.18
Friday	114	8.55	1.18	8.45
Friday	115	9.19	1.27	9.28
Friday	116	9.89	1.34	10.17
Friday	117	10.46	1.31	10.58
Friday	118	10.20	1.21	10.47
Friday	119	9.43	1.05	9.84
Saturday	120	7.44	0.81	8.56
Saturday	121	6.32	0.67	6.96
Saturday	122	5.18	0.55	5.32
Saturday	123	4.26	0.46	4.30
Saturday	124	3.57	0.41	3.58
Saturday	125	3.16	0.38	3.11
Saturday	126	2.99	0.42	2.82
Saturday	127	3.25	0.57	2.76
Saturday	128	4.40	0.88	3.08
Saturday	129	6.87	1.24	4.81
Saturday	130	9.66	1.48	9.91
Saturday	131	11.50	1.53	12.39
Saturday	132	11.89	1.47	12.45
Saturday	133	11.49	1.42	11.86
Saturday	134	11.07	1.34	11.26
Saturday	135	10.42	1.30	10.72
Saturday	136	10.15	1.25	10.17
Saturday	137	9.75	1.25	9.79
Saturday	138	9.72	1.24	9.57
Saturday	139	9.65	1.25	9.61
Saturday	140	9.73	1.25	9.81
Saturday	141	9.76	1.20	9.86
Saturday	142	9.34	1.10	9.63
Saturday	143	8.60	0.95	8.98
Sunday	144	7.44	0.81	7.89
Sunday	145	6.32	0.67	6.41
Sunday	146	5.18	0.55	5.06
Sunday	147	4.26	0.46	4.22
Sunday	148	3.57	0.41	3.58
Sunday	149	3.16	0.38	3.11
Sunday	150	2.99	0.42	2.82
Sunday	151	3.25	0.57	2.76
Sunday	152	4.40	0.88	3.08
Sunday	153	6.87	1.24	4.81
Sunday	154	9.66	1.48	9.91
Sunday	155	11.50	1.53	12.39
Sunday	156	11.89	1.47	12.45
Sunday	157	11.49	1.42	11.86
Sunday	158	11.07	1.34	11.26
Sunday	159	10.42	1.30	10.72
Sunday	160	10.15	1.25	10.17
Sunday	161	9.75	1.25	9.80
Sunday	162	9.72	1.24	9.57
Sunday	163	9.65	1.25	9.61
Sunday	164	9.73	1.25	9.81
Sunday	165	9.76	1.20	9.86
Sunday	166	9.34	1.10	9.63
Sunday	167	8.60	0.95	8.98

Flow	Daily	Hourly	Wkend
7.79	1.02	0.83	0.80
	0.99	0.64	0.65
	0.99	0.51	0.54
	0.99	0.43	0.45
	0.99	0.38	0.40
	0.99	0.40	0.38
	1.02	0.58	0.41
		1.00	0.56
		1.31	0.87
		1.35	1.22
		1.26	1.45
		1.22	1.50
		1.18	1.45
		1.14	1.40
		1.10	1.32
		1.08	1.28
		1.07	1.23
		1.10	1.23
		1.19	1.22
		1.28	1.23
		1.35	1.23
		1.32	1.18
		1.22	1.08
		1.06	0.94

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	8.10	2.72	6.04	8.89	2.76	6.13
Model	9.06	2.49	6.06	9.13	2.66	6.07
Diff	0.96	(0.23)	0.02	0.24	(0.10)	(0.06)
% Diff	12%	-9%	0%	3%	-4%	-1%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	5.70	5.43	5.62
1	4.60	4.65	4.61
2	3.69	3.94	3.76
3	3.09	3.27	3.14
4	2.79	2.89	2.82
5	2.72	2.76	2.73
6	3.02	2.76	2.94
7	4.61	3.18	4.20
8	6.94	4.44	6.23
9	8.10	6.26	7.57
10	7.74	7.97	7.81
11	7.45	8.82	7.84
12	7.35	8.89	7.79
13	7.10	8.57	7.52
14	7.01	8.22	7.35
15	6.64	7.86	6.99
16	6.55	7.55	6.83
17	6.56	7.19	6.74
18	6.76	7.10	6.86
19	7.20	7.23	7.21
20	7.61	7.42	7.56
21	7.63	7.41	7.57
22	7.42	7.08	7.32
23	6.72	6.35	6.61
Average	6.04	6.13	6.07

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.76	0.77	0.76
1	0.61	0.65	0.62
2	0.51	0.54	0.52
3	0.46	0.48	0.46
4	0.45	0.46	0.45
5	0.50	0.45	0.48
6	0.76	0.52	0.69
7	1.14	0.73	1.03
8	1.34	1.03	1.25
9	1.28	1.31	1.29
10	1.23	1.45	1.29
11	1.21	1.47	1.28
12	1.17	1.41	1.24
13	1.15	1.35	1.21
14	1.09	1.30	1.15
15	1.08	1.24	1.13
16	1.08	1.19	1.11
17	1.11	1.17	1.13
18	1.19	1.19	1.19
19	1.25	1.22	1.25
20	1.26	1.22	1.25
21	1.22	1.17	1.21
22	1.11	1.05	1.09
23	0.94	0.89	0.93
Total	23.90	24.26	24.00
Average	1.00	1.01	1.00

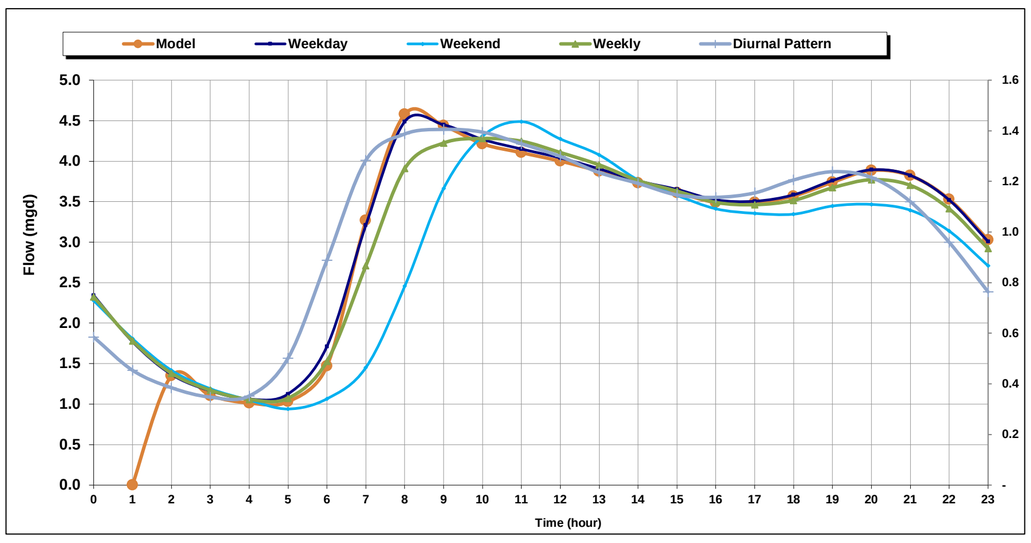
Diurnal Patterns Normalized

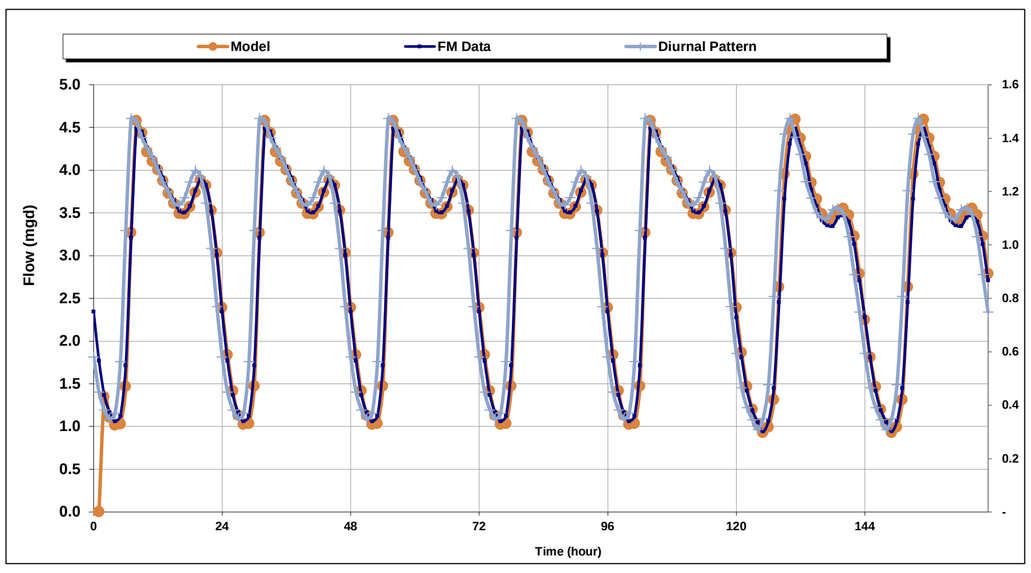
Date/Time	Weekday	Weekend	Weekly
0	0.76	0.76	0.76
1	0.61	0.64	0.62
2	0.51	0.53	0.52
3	0.46	0.47	0.46
4	0.45	0.45	0.45
5	0.50	0.45	0.48
6	0.76	0.52	0.69
7	1.15	0.72	1.03
8	1.34	1.02	1.25
9	1.28	1.30	1.29
10	1.23	1.44	1.29
11	1.22	1.45	1.28
12	1.17	1.40	1.24
13	1.16	1.34	1.21
14	1.10	1.28	1.15
15	1.08	1.23	1.13
16	1.09	1.17	1.11
17	1.12	1.16	1.13
18	1.19	1.18	1.19
19	1.26	1.21	1.25
20	1.26	1.21	1.25
21	1.23	1.15	1.21
22	1.11	1.04	1.09
23	0.94	0.88	0.93
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	5.70	0.76	
Monday	1	4.60	0.61	-
Monday	2	3.69	0.51	2.71
Monday	3	3.09	0.46	2.38
Monday	4	2.79	0.45	2.20
Monday	5	2.72	0.50	2.22
Monday	6	3.02	0.76	3.32
Monday	7	4.61	1.14	5.69
Monday	8	6.94	1.34	8.97
Monday	9	8.10	1.28	9.06
Monday	10	7.74	1.23	7.72
Monday	11	7.45	1.21	7.18
Monday	12	7.35	1.17	7.15
Monday	13	7.10	1.15	6.88
Monday	14	7.01	1.09	6.75
Monday	15	6.64	1.08	6.55
Monday	16	6.55	1.08	6.33
Monday	17	6.56	1.11	6.69
Monday	18	6.76	1.19	7.17
Monday	19	7.20	1.25	7.71
Monday	20	7.61	1.26	8.01
Monday	21	7.63	1.22	7.93
Monday	22	7.42	1.11	7.24
Monday	23	6.72	0.94	6.11
Tuesday	24	5.70	0.76	4.81
Tuesday	25	4.60	0.61	3.69
Tuesday	26	3.69	0.51	2.88
Tuesday	27	3.09	0.46	2.53
Tuesday	28	2.79	0.45	2.49
Tuesday	29	2.72	0.50	2.58
Tuesday	30	3.02	0.76	3.33
Tuesday	31	4.61	1.14	5.70
Tuesday	32	6.94	1.34	8.97
Tuesday	33	8.10	1.28	9.06
Tuesday	34	7.74	1.23	7.72
Tuesday	35	7.45	1.21	7.18
Tuesday	36	7.35	1.17	7.15
Tuesday	37	7.10	1.15	6.88
Tuesday	38	7.01	1.09	6.76
Tuesday	39	6.64	1.08	6.55
Tuesday	40	6.55	1.08	6.33
Tuesday	41	6.56	1.11	6.69
Tuesday	42	6.76	1.19	7.17
Tuesday	43	7.20	1.25	7.71
Tuesday	44	7.61	1.26	8.01
Tuesday	45	7.63	1.22	7.93
Tuesday	46	7.42	1.11	7.24
Tuesday	47	6.72	0.94	6.11
Wednesday	48	5.70	0.76	4.81
Wednesday	49	4.60	0.61	3.69
Wednesday	50	3.69	0.51	2.88
Wednesday	51	3.09	0.46	2.53
Wednesday	52	2.79	0.45	2.49
Wednesday	53	2.72	0.50	2.58
Wednesday	54	3.02	0.76	3.33
Wednesday	55	4.61	1.14	5.70
Wednesday	56	6.94	1.34	8.97
Wednesday	57	8.10	1.28	9.06
Wednesday	58	7.74	1.23	7.72
Wednesday	59	7.45	1.21	7.18
Wednesday	60	7.35	1.17	7.15
Wednesday	61	7.10	1.15	6.88
Wednesday	62	7.01	1.09	6.76
Wednesday	63	6.64	1.08	6.55
Wednesday	64	6.55	1.08	6.33
Wednesday	65	6.56	1.11	6.69
Wednesday	66	6.76	1.19	7.17
Wednesday	67	7.20	1.25	7.71
Wednesday	68	7.61	1.26	8.01
Wednesday	69	7.63	1.22	7.93
Wednesday	70	7.42	1.11	7.24
Wednesday	71	6.72	0.94	6.11
Thursday	72	5.70	0.76	4.81
Thursday	73	4.60	0.61	3.69
Thursday	74	3.69	0.51	2.88
Thursday	75	3.09	0.46	2.53
Thursday	76	2.79	0.45	2.49
Thursday	77	2.72	0.50	2.58
Thursday	78	3.02	0.76	3.33
Thursday	79	4.61	1.14	5.70
Thursday	80	6.94	1.34	8.97
Thursday	81	8.10	1.28	9.06
Thursday	82	7.74	1.23	7.72
Thursday	83	7.45	1.21	7.18
Thursday	84	7.35	1.17	7.15
Thursday	85	7.10	1.15	6.88
Thursday	86	7.01	1.09	6.76
Thursday	87	6.64	1.08	6.55
Thursday	88	6.55	1.08	6.33
Thursday	89	6.56	1.11	6.69
Thursday	90	6.76	1.19	7.17
Thursday	91	7.20	1.25	7.71
Thursday	92	7.61	1.26	8.01
Thursday	93	7.63	1.22	7.93
Thursday	94	7.42	1.11	7.24
Thursday	95	6.72	0.94	6.11
Friday	96	5.70	0.76	4.81
Friday	97	4.60	0.61	3.69
Friday	98	3.69	0.51	2.88
Friday	99	3.09	0.46	2.53
Friday	100	2.79	0.45	2.49
Friday	101	2.72	0.50	2.58
Friday	102	3.02	0.76	3.33
Friday	103	4.61	1.14	5.70
Friday	104	6.94	1.34	8.97
Friday	105	8.10	1.28	9.06
Friday	106	7.74	1.23	7.72
Friday	107	7.45	1.21	7.18
Friday	108	7.35	1.17	7.15
Friday	109	7.10	1.15	6.88
Friday	110	7.01	1.09	6.76
Friday	111	6.64	1.08	6.55
Friday	112	6.55	1.08	6.33
Friday	113	6.56	1.11	6.69
Friday	114	6.76	1.19	7.17
Friday	115	7.20	1.25	7.71
Friday	116	7.61	1.26	8.01
Friday	117	7.63	1.22	7.93
Friday	118	7.42	1.11	7.24
Friday	119	6.72	0.94	6.11
Saturday	120	5.43	0.77	4.81
Saturday	121	4.65	0.65	4.66
Saturday	122	3.94	0.54	3.90
Saturday	123	3.27	0.48	3.27
Saturday	124	2.89	0.46	2.81
Saturday	125	2.76	0.45	2.66
Saturday	126	2.76	0.52	2.68
Saturday	127	3.18	0.73	2.87
Saturday	128	4.44	1.03	3.78
Saturday	129	6.26	1.31	5.88
Saturday	130	7.97	1.45	7.95
Saturday	131	8.82	1.47	9.13
Saturday	132	8.89	1.41	9.08
Saturday	133	8.57	1.35	8.69
Saturday	134	8.22	1.30	8.18
Saturday	135	7.86	1.24	7.83
Saturday	136	7.55	1.19	7.48
Saturday	137	7.19	1.17	7.24
Saturday	138	7.10	1.19	7.06
Saturday	139	7.23	1.22	7.16
Saturday	140	7.42	1.22	7.38
Saturday	141	7.41	1.17	7.42
Saturday	142	7.08	1.05	7.24
Saturday	143	6.35	0.89	6.62
Sunday	144	5.43	0.77	5.62
Sunday	145	4.65	0.65	4.73
Sunday	146	3.94	0.54	3.93
Sunday	147	3.27	0.48	3.27
Sunday	148	2.89	0.46	2.81
Sunday	149	2.76	0.45	2.66
Sunday	150	2.76	0.52	2.68
Sunday	151	3.18	0.73	2.87
Sunday	152	4.44	1.03	3.78
Sunday	153	6.26	1.31	5.88
Sunday	154	7.97	1.45	7.95
Sunday	155	8.82	1.47	9.13
Sunday	156	8.89	1.41	9.08
Sunday	157	8.57	1.35	8.69
Sunday	158	8.22	1.30	8.18
Sunday	159	7.86	1.24	7.83
Sunday	160	7.55	1.19	7.48
Sunday	161	7.19	1.17	7.24
Sunday	162	7.10	1.19	7.06
Sunday	163	7.23	1.22	7.17
Sunday	164	7.42	1.22	7.38
Sunday	165	7.41	1.17	7.42
Sunday	166	7.08	1.05	7.24
Sunday	167	6.35	0.89	6.62

Flow	Daily	Hourly	Wkend
6.07	1.01	0.76	0.76
	1.00	0.61	0.64
	1.00	0.51	0.53
	1.00	0.46	0.47
	1.00	0.45	0.45
	1.00	0.50	0.45
	1.01	0.76	0.52
		1.15	0.72
		1.34	1.02
		1.28	1.30
		1.23	1.44
		1.22	1.45
		1.17	1.40
		1.16	1.34
		1.10	1.28
		1.08	1.23
		1.09	1.17
		1.12	1.16
		1.19	1.18
		1.26	1.21
		1.26	1.21
		1.23	1.15
		1.11	1.04
		0.94	0.88

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	4.49	1.06	3.13	4.49	0.94	2.84
Model	4.58	1.02	3.11	4.59	0.93	2.91
Diff	0.09	(0.04)	(0.02)	0.10	(0.01)	0.07
% Diff	2%	-4%	-1%	2%	-1%	2%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	2.34	2.28	2.33
1	1.77	1.81	1.78
2	1.37	1.42	1.38
3	1.16	1.19	1.17
4	1.06	1.05	1.06
5	1.13	0.94	1.07
6	1.71	1.07	1.53
7	3.21	1.45	2.71
8	4.49	2.46	3.91
9	4.45	3.66	4.22
10	4.27	4.31	4.28
11	4.15	4.49	4.25
12	4.04	4.27	4.11
13	3.91	4.08	3.95
14	3.76	3.77	3.76
15	3.65	3.58	3.63
16	3.52	3.41	3.49
17	3.51	3.36	3.46
18	3.58	3.35	3.52
19	3.76	3.45	3.67
20	3.89	3.47	3.77
21	3.82	3.39	3.70
22	3.52	3.14	3.41
23	3.01	2.71	2.92
Average	3.13	2.84	3.05

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.58	0.59	0.58
1	0.45	0.47	0.45
2	0.38	0.39	0.38
3	0.35	0.34	0.35
4	0.37	0.31	0.35
5	0.56	0.35	0.50
6	1.05	0.48	0.89
7	1.47	0.81	1.28
8	1.46	1.20	1.39
9	1.40	1.41	1.41
10	1.36	1.47	1.39
11	1.33	1.40	1.35
12	1.28	1.34	1.30
13	1.23	1.24	1.23
14	1.20	1.17	1.19
15	1.16	1.12	1.15
16	1.15	1.10	1.14
17	1.18	1.10	1.15
18	1.24	1.13	1.21
19	1.28	1.14	1.24
20	1.26	1.11	1.22
21	1.16	1.03	1.12
22	0.99	0.89	0.96
23	0.77	0.75	0.76
Total	24.66	22.36	24.00
Average	1.03	0.93	1.00

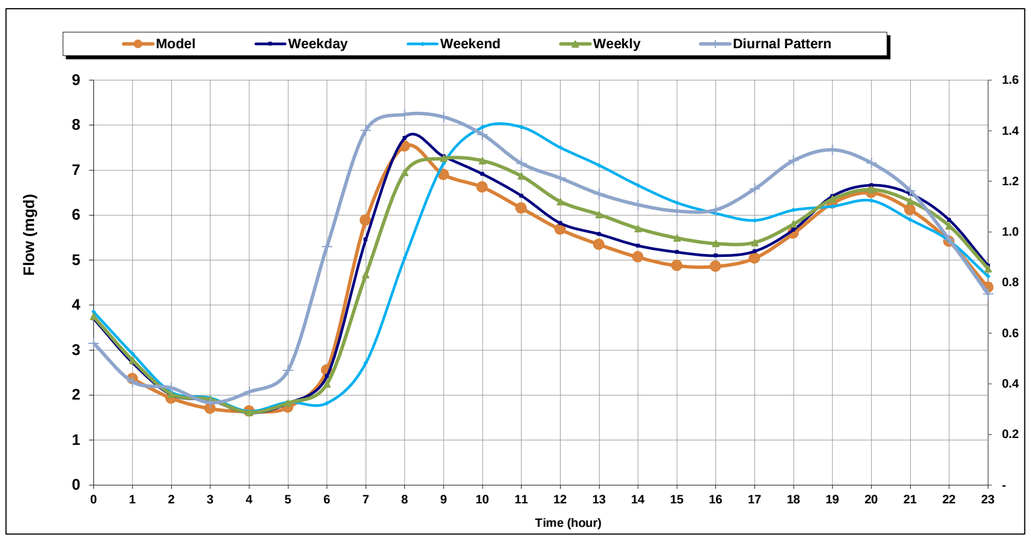
Diurnal Patterns Normalized

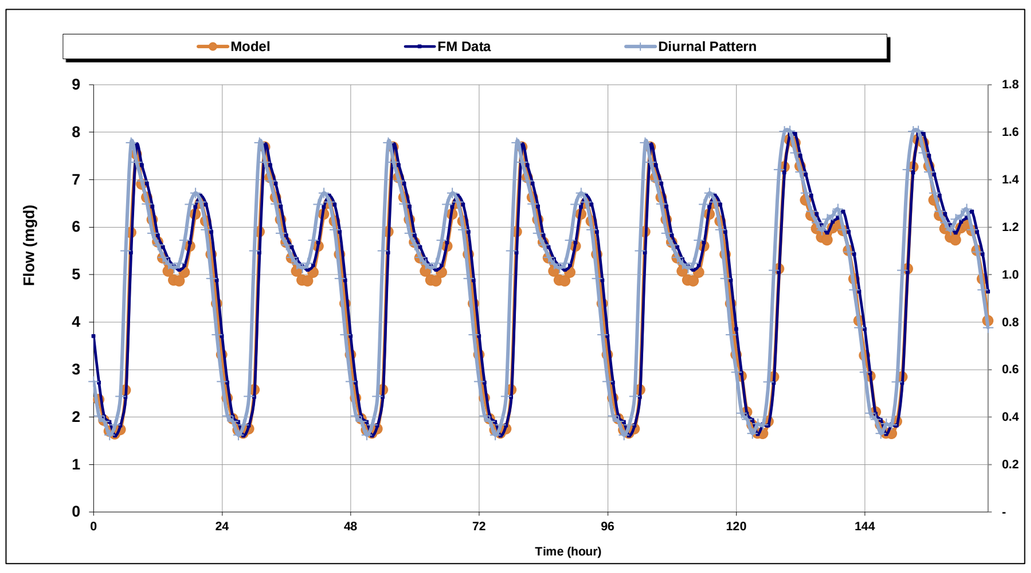
Date/Time	Weekday	Weekend	Weekly
0	0.57	0.64	0.58
1	0.44	0.50	0.45
2	0.37	0.42	0.38
3	0.34	0.37	0.35
4	0.36	0.33	0.35
5	0.55	0.38	0.50
6	1.03	0.51	0.89
7	1.43	0.87	1.28
8	1.42	1.29	1.39
9	1.36	1.52	1.41
10	1.33	1.58	1.39
11	1.29	1.51	1.35
12	1.25	1.44	1.30
13	1.20	1.33	1.23
14	1.17	1.26	1.19
15	1.13	1.20	1.15
16	1.12	1.18	1.14
17	1.15	1.18	1.15
18	1.20	1.21	1.21
19	1.24	1.22	1.24
20	1.22	1.20	1.22
21	1.13	1.11	1.12
22	0.96	0.95	0.96
23	0.75	0.80	0.76
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	2.34	0.58	
Monday	1	1.77	0.45	0.00
Monday	2	1.37	0.38	1.35
Monday	3	1.16	0.35	1.11
Monday	4	1.06	0.37	1.01
Monday	5	1.13	0.56	1.03
Monday	6	1.71	1.05	1.47
Monday	7	3.21	1.47	3.27
Monday	8	4.49	1.46	4.58
Monday	9	4.45	1.40	4.44
Monday	10	4.27	1.36	4.21
Monday	11	4.15	1.33	4.10
Monday	12	4.04	1.28	4.00
Monday	13	3.91	1.23	3.88
Monday	14	3.76	1.20	3.73
Monday	15	3.65	1.16	3.61
Monday	16	3.52	1.15	3.49
Monday	17	3.51	1.18	3.49
Monday	18	3.58	1.24	3.57
Monday	19	3.76	1.28	3.74
Monday	20	3.89	1.26	3.89
Monday	21	3.82	1.16	3.82
Monday	22	3.52	0.99	3.53
Monday	23	3.01	0.77	3.03
Tuesday	24	2.34	0.58	2.39
Tuesday	25	1.77	0.45	1.84
Tuesday	26	1.37	0.38	1.42
Tuesday	27	1.16	0.35	1.13
Tuesday	28	1.06	0.37	1.02
Tuesday	29	1.13	0.56	1.03
Tuesday	30	1.71	1.05	1.47
Tuesday	31	3.21	1.47	3.27
Tuesday	32	4.49	1.46	4.58
Tuesday	33	4.45	1.40	4.44
Tuesday	34	4.27	1.36	4.21
Tuesday	35	4.15	1.33	4.10
Tuesday	36	4.04	1.28	4.00
Tuesday	37	3.91	1.23	3.88
Tuesday	38	3.76	1.20	3.73
Tuesday	39	3.65	1.16	3.61
Tuesday	40	3.52	1.15	3.49
Tuesday	41	3.51	1.18	3.49
Tuesday	42	3.58	1.24	3.57
Tuesday	43	3.76	1.28	3.74
Tuesday	44	3.89	1.26	3.89
Tuesday	45	3.82	1.16	3.82
Tuesday	46	3.52	0.99	3.53
Tuesday	47	3.01	0.77	3.03
Wednesday	48	2.34	0.58	2.39
Wednesday	49	1.77	0.45	1.84
Wednesday	50	1.37	0.38	1.42
Wednesday	51	1.16	0.35	1.13
Wednesday	52	1.06	0.37	1.02
Wednesday	53	1.13	0.56	1.03
Wednesday	54	1.71	1.05	1.47
Wednesday	55	3.21	1.47	3.27
Wednesday	56	4.49	1.46	4.58
Wednesday	57	4.45	1.40	4.44
Wednesday	58	4.27	1.36	4.21
Wednesday	59	4.15	1.33	4.10
Wednesday	60	4.04	1.28	4.00
Wednesday	61	3.91	1.23	3.88
Wednesday	62	3.76	1.20	3.73
Wednesday	63	3.65	1.16	3.61
Wednesday	64	3.52	1.15	3.49
Wednesday	65	3.51	1.18	3.49
Wednesday	66	3.58	1.24	3.57
Wednesday	67	3.76	1.28	3.74
Wednesday	68	3.89	1.26	3.89
Wednesday	69	3.82	1.16	3.82
Wednesday	70	3.52	0.99	3.53
Wednesday	71	3.01	0.77	3.03
Thursday	72	2.34	0.58	2.39
Thursday	73	1.77	0.45	1.84
Thursday	74	1.37	0.38	1.42
Thursday	75	1.16	0.35	1.13
Thursday	76	1.06	0.37	1.02
Thursday	77	1.13	0.56	1.03
Thursday	78	1.71	1.05	1.47
Thursday	79	3.21	1.47	3.27
Thursday	80	4.49	1.46	4.58
Thursday	81	4.45	1.40	4.44
Thursday	82	4.27	1.36	4.21
Thursday	83	4.15	1.33	4.10
Thursday	84	4.04	1.28	4.00
Thursday	85	3.91	1.23	3.88
Thursday	86	3.76	1.20	3.73
Thursday	87	3.65	1.16	3.61
Thursday	88	3.52	1.15	3.49
Thursday	89	3.51	1.18	3.49
Thursday	90	3.58	1.24	3.57
Thursday	91	3.76	1.28	3.74
Thursday	92	3.89	1.26	3.89
Thursday	93	3.82	1.16	3.82
Thursday	94	3.52	0.99	3.53
Thursday	95	3.01	0.77	3.03
Friday	96	2.34	0.58	2.39
Friday	97	1.77	0.45	1.84
Friday	98	1.37	0.38	1.42
Friday	99	1.16	0.35	1.13
Friday	100	1.06	0.37	1.02
Friday	101	1.13	0.56	1.03
Friday	102	1.71	1.05	1.47
Friday	103	3.21	1.47	3.27
Friday	104	4.49	1.46	4.58
Friday	105	4.45	1.40	4.44
Friday	106	4.27	1.36	4.21
Friday	107	4.15	1.33	4.10
Friday	108	4.04	1.28	4.00
Friday	109	3.91	1.23	3.88
Friday	110	3.76	1.20	3.73
Friday	111	3.65	1.16	3.61
Friday	112	3.52	1.15	3.49
Friday	113	3.51	1.18	3.49
Friday	114	3.58	1.24	3.57
Friday	115	3.76	1.28	3.74
Friday	116	3.89	1.26	3.89
Friday	117	3.82	1.16	3.82
Friday	118	3.52	0.99	3.53
Friday	119	3.01	0.77	3.03
Saturday	120	2.28	0.59	2.39
Saturday	121	1.81	0.47	1.86
Saturday	122	1.42	0.39	1.47
Saturday	123	1.19	0.34	1.20
Saturday	124	1.05	0.31	1.03
Saturday	125	0.94	0.35	0.93
Saturday	126	1.07	0.48	0.99
Saturday	127	1.45	0.81	1.31
Saturday	128	2.46	1.20	2.63
Saturday	129	3.66	1.41	3.95
Saturday	130	4.31	1.47	4.47
Saturday	131	4.49	1.40	4.59
Saturday	132	4.27	1.34	4.37
Saturday	133	4.08	1.24	4.16
Saturday	134	3.77	1.17	3.85
Saturday	135	3.58	1.12	3.66
Saturday	136	3.41	1.10	3.48
Saturday	137	3.36	1.10	3.41
Saturday	138	3.35	1.13	3.42
Saturday	139	3.45	1.14	3.52
Saturday	140	3.47	1.11	3.55
Saturday	141	3.39	1.03	3.47
Saturday	142	3.14	0.89	3.23
Saturday	143	2.71	0.75	2.79
Sunday	144	2.28	0.59	2.25
Sunday	145	1.81	0.47	1.81
Sunday	146	1.42	0.39	1.46
Sunday	147	1.19	0.34	1.20
Sunday	148	1.05	0.31	1.03
Sunday	149	0.94	0.35	0.93
Sunday	150	1.07	0.48	0.99
Sunday	151	1.45	0.81	1.31
Sunday	152	2.46	1.20	2.63
Sunday	153	3.66	1.41	3.95
Sunday	154	4.31	1.47	4.47
Sunday	155	4.49	1.40	4.59
Sunday	156	4.27	1.34	4.37
Sunday	157	4.08	1.24	4.16
Sunday	158	3.77	1.17	3.85
Sunday	159	3.58	1.12	3.66
Sunday	160	3.41	1.10	3.48
Sunday	161	3.36	1.10	3.41
Sunday	162	3.35	1.13	3.42
Sunday	163	3.45	1.14	3.52
Sunday	164	3.47	1.11	3.55
Sunday	165	3.39	1.03	3.47
Sunday	166	3.14	0.89	3.23
Sunday	167	2.71	0.75	2.79

Flow	Daily	Hourly	Wkend
3.05	0.93	0.57	0.64
	1.03	0.44	0.50
	1.03	0.37	0.42
	1.03	0.34	0.37
	1.03	0.36	0.33
	1.03	0.55	0.38
0.93	1.03	0.51	
	1.43	0.87	
	1.42	1.29	
	1.36	1.52	
	1.33	1.58	
	1.29	1.51	
	1.25	1.44	
	1.20	1.33	
	1.17	1.26	
	1.13	1.20	
	1.12	1.18	
	1.15	1.18	
	1.20	1.21	
	1.24	1.22	
	1.22	1.20	
	1.13	1.11	
	0.96	0.95	
	0.75	0.80	

EWA Meter V1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	7.71	1.61	4.92	7.96	1.64	5.04
Model	7.68	1.66	4.75	7.84	1.65	4.83
Diff	(0.03)	0.05	(0.18)	(0.12)	0.01	(0.21)
% Diff	0%	3%	-4%	-2%	0%	-4%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	3.70	3.85	3.74
1	2.72	2.92	2.78
2	2.01	2.07	2.02
3	1.89	1.94	1.90
4	1.61	1.64	1.62
5	1.82	1.84	1.83
6	2.42	1.82	2.25
7	5.46	2.71	4.67
8	7.71	5.05	6.95
9	7.30	7.15	7.26
10	6.91	7.95	7.21
11	6.43	7.96	6.87
12	5.82	7.50	6.30
13	5.58	7.11	6.01
14	5.32	6.66	5.70
15	5.18	6.28	5.49
16	5.10	6.04	5.37
17	5.20	5.88	5.39
18	5.68	6.11	5.80
19	6.42	6.19	6.36
20	6.66	6.32	6.57
21	6.48	5.90	6.31
22	5.89	5.43	5.76
23	4.88	4.64	4.81
Average	4.92	5.04	4.96

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.55	0.59	0.56
1	0.40	0.42	0.41
2	0.38	0.39	0.38
3	0.32	0.33	0.33
4	0.37	0.37	0.37
5	0.49	0.37	0.45
6	1.10	0.55	0.94
7	1.56	1.02	1.40
8	1.47	1.44	1.46
9	1.39	1.60	1.45
10	1.30	1.61	1.39
11	1.17	1.51	1.27
12	1.12	1.43	1.21
13	1.07	1.34	1.15
14	1.04	1.27	1.11
15	1.03	1.22	1.08
16	1.05	1.19	1.09
17	1.14	1.23	1.17
18	1.30	1.25	1.28
19	1.34	1.28	1.32
20	1.31	1.19	1.27
21	1.19	1.10	1.16
22	0.98	0.94	0.97
23	0.75	0.78	0.76
Total	23.84	24.40	24.00
Average	0.99	1.02	1.00

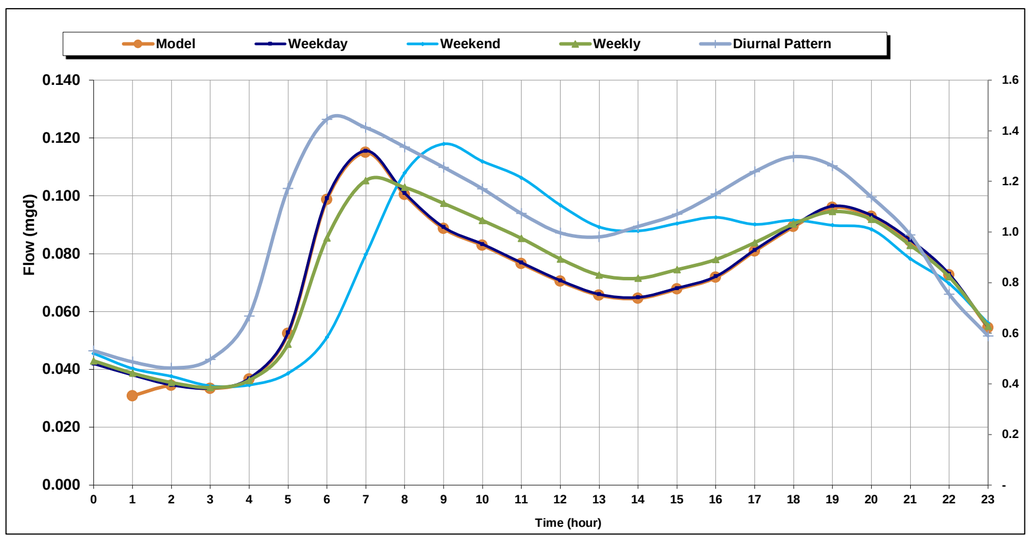
Diurnal Patterns Normalized

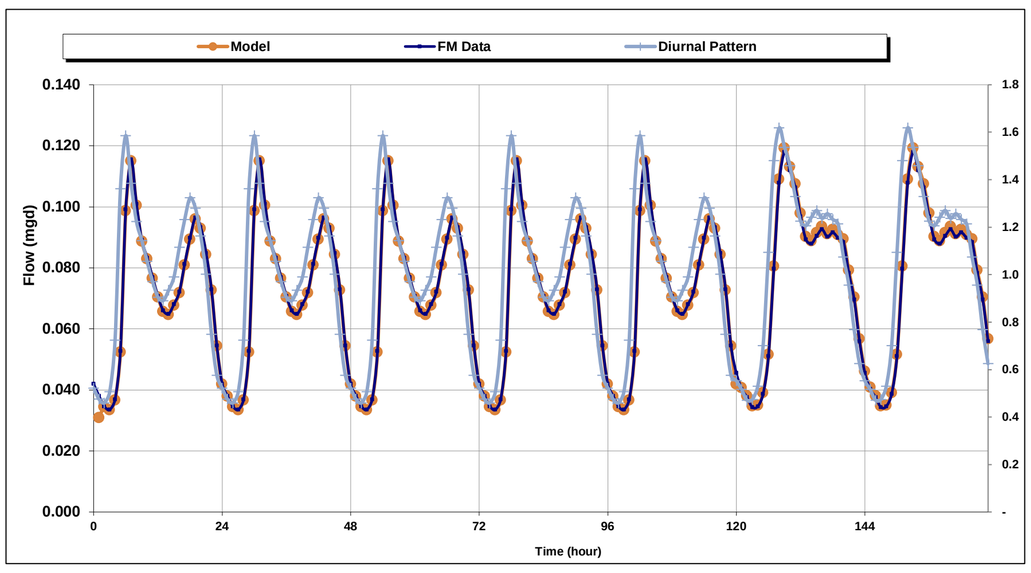
Date/Time	Weekday	Weekend	Weekly
0	0.55	0.58	0.56
1	0.41	0.41	0.41
2	0.38	0.38	0.38
3	0.33	0.33	0.33
4	0.37	0.37	0.37
5	0.49	0.36	0.45
6	1.11	0.54	0.94
7	1.57	1.00	1.40
8	1.48	1.42	1.46
9	1.40	1.58	1.45
10	1.31	1.58	1.39
11	1.18	1.49	1.27
12	1.13	1.41	1.21
13	1.08	1.32	1.15
14	1.05	1.25	1.11
15	1.04	1.20	1.08
16	1.06	1.17	1.09
17	1.15	1.21	1.17
18	1.30	1.23	1.28
19	1.35	1.25	1.32
20	1.32	1.17	1.27
21	1.20	1.08	1.16
22	0.99	0.92	0.97
23	0.75	0.76	0.76
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	3.70	0.55	
Monday	1	2.72	0.40	2.36
Monday	2	2.01	0.38	1.93
Monday	3	1.89	0.32	1.70
Monday	4	1.61	0.37	1.64
Monday	5	1.82	0.49	1.73
Monday	6	2.42	1.10	2.56
Monday	7	5.46	1.56	5.88
Monday	8	7.71	1.47	7.53
Monday	9	7.30	1.39	6.90
Monday	10	6.91	1.30	6.62
Monday	11	6.43	1.17	6.15
Monday	12	5.82	1.12	5.68
Monday	13	5.58	1.07	5.35
Monday	14	5.32	1.04	5.06
Monday	15	5.18	1.03	4.88
Monday	16	5.10	1.05	4.86
Monday	17	5.20	1.14	5.04
Monday	18	5.68	1.30	5.59
Monday	19	6.42	1.34	6.27
Monday	20	6.66	1.31	6.50
Monday	21	6.48	1.19	6.12
Monday	22	5.89	0.98	5.42
Monday	23	4.88	0.75	4.39
Tuesday	24	3.70	0.55	3.31
Tuesday	25	2.72	0.40	2.40
Tuesday	26	2.01	0.38	1.96
Tuesday	27	1.89	0.32	1.72
Tuesday	28	1.61	0.37	1.66
Tuesday	29	1.82	0.49	1.74
Tuesday	30	2.42	1.10	2.57
Tuesday	31	5.46	1.56	5.90
Tuesday	32	7.71	1.47	7.68
Tuesday	33	7.30	1.39	7.04
Tuesday	34	6.91	1.30	6.62
Tuesday	35	6.43	1.17	6.15
Tuesday	36	5.82	1.12	5.68
Tuesday	37	5.58	1.07	5.35
Tuesday	38	5.32	1.04	5.06
Tuesday	39	5.18	1.03	4.88
Tuesday	40	5.10	1.05	4.86
Tuesday	41	5.20	1.14	5.04
Tuesday	42	5.68	1.30	5.59
Tuesday	43	6.42	1.34	6.27
Tuesday	44	6.66	1.31	6.50
Tuesday	45	6.48	1.19	6.12
Tuesday	46	5.89	0.98	5.42
Tuesday	47	4.88	0.75	4.39
Wednesday	48	3.70	0.55	3.31
Wednesday	49	2.72	0.40	2.40
Wednesday	50	2.01	0.38	1.96
Wednesday	51	1.89	0.32	1.72
Wednesday	52	1.61	0.37	1.66
Wednesday	53	1.82	0.49	1.74
Wednesday	54	2.42	1.10	2.57
Wednesday	55	5.46	1.56	5.90
Wednesday	56	7.71	1.47	7.68
Wednesday	57	7.30	1.39	7.04
Wednesday	58	6.91	1.30	6.62
Wednesday	59	6.43	1.17	6.15
Wednesday	60	5.82	1.12	5.68
Wednesday	61	5.58	1.07	5.35
Wednesday	62	5.32	1.04	5.06
Wednesday	63	5.18	1.03	4.88
Wednesday	64	5.10	1.05	4.86
Wednesday	65	5.20	1.14	5.04
Wednesday	66	5.68	1.30	5.59
Wednesday	67	6.42	1.34	6.27
Wednesday	68	6.66	1.31	6.50
Wednesday	69	6.48	1.19	6.12
Wednesday	70	5.89	0.98	5.42
Wednesday	71	4.88	0.75	4.39
Thursday	72	3.70	0.55	3.31
Thursday	73	2.72	0.40	2.40
Thursday	74	2.01	0.38	1.96
Thursday	75	1.89	0.32	1.72
Thursday	76	1.61	0.37	1.66
Thursday	77	1.82	0.49	1.74
Thursday	78	2.42	1.10	2.57
Thursday	79	5.46	1.56	5.90
Thursday	80	7.71	1.47	7.68
Thursday	81	7.30	1.39	7.04
Thursday	82	6.91	1.30	6.62
Thursday	83	6.43	1.17	6.15
Thursday	84	5.82	1.12	5.68
Thursday	85	5.58	1.07	5.35
Thursday	86	5.32	1.04	5.06
Thursday	87	5.18	1.03	4.88
Thursday	88	5.10	1.05	4.86
Thursday	89	5.20	1.14	5.04
Thursday	90	5.68	1.30	5.59
Thursday	91	6.42	1.34	6.27
Thursday	92	6.66	1.31	6.50
Thursday	93	6.48	1.19	6.12
Thursday	94	5.89	0.98	5.42
Thursday	95	4.88	0.75	4.39
Friday	96	3.70	0.55	3.31
Friday	97	2.72	0.40	2.40
Friday	98	2.01	0.38	1.96
Friday	99	1.89	0.32	1.72
Friday	100	1.61	0.37	1.66
Friday	101	1.82	0.49	1.74
Friday	102	2.42	1.10	2.57
Friday	103	5.46	1.56	5.90
Friday	104	7.71	1.47	7.68
Friday	105	7.30	1.39	7.04
Friday	106	6.91	1.30	6.62
Friday	107	6.43	1.17	6.15
Friday	108	5.82	1.12	5.68
Friday	109	5.58	1.07	5.35
Friday	110	5.32	1.04	5.06
Friday	111	5.18	1.03	4.88
Friday	112	5.10	1.05	4.86
Friday	113	5.20	1.14	5.04
Friday	114	5.68	1.30	5.59
Friday	115	6.42	1.34	6.27
Friday	116	6.66	1.31	6.50
Friday	117	6.48	1.19	6.12
Friday	118	5.89	0.98	5.42
Friday	119	4.88	0.75	4.39
Saturday	120	3.85	0.59	3.31
Saturday	121	2.92	0.42	2.86
Saturday	122	2.07	0.39	2.10
Saturday	123	1.94	0.33	1.83
Saturday	124	1.64	0.37	1.65
Saturday	125	1.84	0.37	1.65
Saturday	126	1.82	0.55	1.90
Saturday	127	2.71	1.02	2.84
Saturday	128	5.05	1.44	5.12
Saturday	129	7.15	1.60	7.26
Saturday	130	7.95	1.61	7.84
Saturday	131	7.96	1.51	7.77
Saturday	132	7.50	1.43	7.28
Saturday	133	7.11	1.34	6.56
Saturday	134	6.66	1.27	6.25
Saturday	135	6.28	1.22	5.96
Saturday	136	6.04	1.19	5.78
Saturday	137	5.88	1.23	5.72
Saturday	138	6.11	1.25	5.98
Saturday	139	6.19	1.28	6.04
Saturday	140	6.32	1.19	5.92
Saturday	141	5.90	1.10	5.50
Saturday	142	5.43	0.94	4.91
Saturday	143	4.64	0.78	4.02
Sunday	144	3.85	0.59	3.29
Sunday	145	2.92	0.42	2.86
Sunday	146	2.07	0.39	2.10
Sunday	147	1.94	0.33	1.83
Sunday	148	1.64	0.37	1.65
Sunday	149	1.84	0.37	1.65
Sunday	150	1.82	0.55	1.90
Sunday	151	2.71	1.02	2.84
Sunday	152	5.05	1.44	5.12
Sunday	153	7.15	1.60	7.26
Sunday	154	7.95	1.61	7.84
Sunday	155	7.96	1.51	7.77
Sunday	156	7.50	1.43	7.28
Sunday	157	7.11	1.34	6.56
Sunday	158	6.66	1.27	6.25
Sunday	159	6.28	1.22	5.96
Sunday	160	6.04	1.19	5.78
Sunday	161	5.88	1.23	5.72
Sunday	162	6.11	1.25	5.98
Sunday	163	6.19	1.28	6.04
Sunday	164	6.32	1.19	5.92
Sunday	165	5.90	1.10	5.50
Sunday	166	5.43	0.94	4.91
Sunday	167	4.64	0.78	4.02

Flow	Daily	Hourly	Wkend
4.96	1.02	0.55	0.58
	0.99	0.41	0.41
	0.99	0.38	0.38
	0.99	0.33	0.33
	0.99	0.37	0.37
	0.99	0.49	0.36
	1.02	1.11	0.54
		1.57	1.00
		1.48	1.42
		1.40	1.58
		1.31	1.58
		1.18	1.49
		1.13	1.41
		1.08	1.32
		1.05	1.25
		1.04	1.20
		1.06	1.17
		1.15	1.21
		1.30	1.23
		1.35	1.25
		1.32	1.17
		1.20	1.08
		0.99	0.92
		0.75	0.76

2016 ADS Meter 12C-26 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.12	0.03	0.07	0.12	0.03	0.08
Model	0.11	0.03	0.07	0.12	0.03	0.08
Diff	(0.00)	(0.00)	(0.00)	0.00	0.00	0.00
% Diff	-1%	0%	-1%	1%	1%	1%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.04	0.05	0.04
1	0.04	0.04	0.04
2	0.03	0.04	0.04
3	0.03	0.03	0.03
4	0.04	0.03	0.04
5	0.05	0.04	0.05
6	0.10	0.05	0.09
7	0.12	0.08	0.11
8	0.10	0.11	0.10
9	0.09	0.12	0.10
10	0.08	0.11	0.09
11	0.08	0.11	0.09
12	0.07	0.10	0.08
13	0.07	0.09	0.07
14	0.06	0.09	0.07
15	0.07	0.09	0.07
16	0.07	0.09	0.08
17	0.08	0.09	0.08
18	0.09	0.09	0.09
19	0.10	0.09	0.09
20	0.09	0.09	0.09
21	0.08	0.08	0.08
22	0.07	0.07	0.07
23	0.05	0.06	0.05
Average	0.07	0.08	0.07

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.52	0.55	0.53
1	0.48	0.52	0.49
2	0.46	0.47	0.46
3	0.51	0.47	0.50
4	0.72	0.53	0.67
5	1.36	0.70	1.17
6	1.59	1.09	1.45
7	1.38	1.48	1.41
8	1.22	1.62	1.34
9	1.14	1.54	1.26
10	1.06	1.46	1.17
11	0.97	1.33	1.07
12	0.91	1.22	1.00
13	0.89	1.21	0.98
14	0.93	1.24	1.02
15	0.99	1.27	1.07
16	1.12	1.24	1.15
17	1.23	1.26	1.24
18	1.32	1.23	1.30
19	1.28	1.21	1.26
20	1.16	1.07	1.14
21	1.00	0.96	0.99
22	0.75	0.77	0.75
23	0.58	0.62	0.59
Total	23.57	25.07	24.00
Average	0.98	1.04	1.00

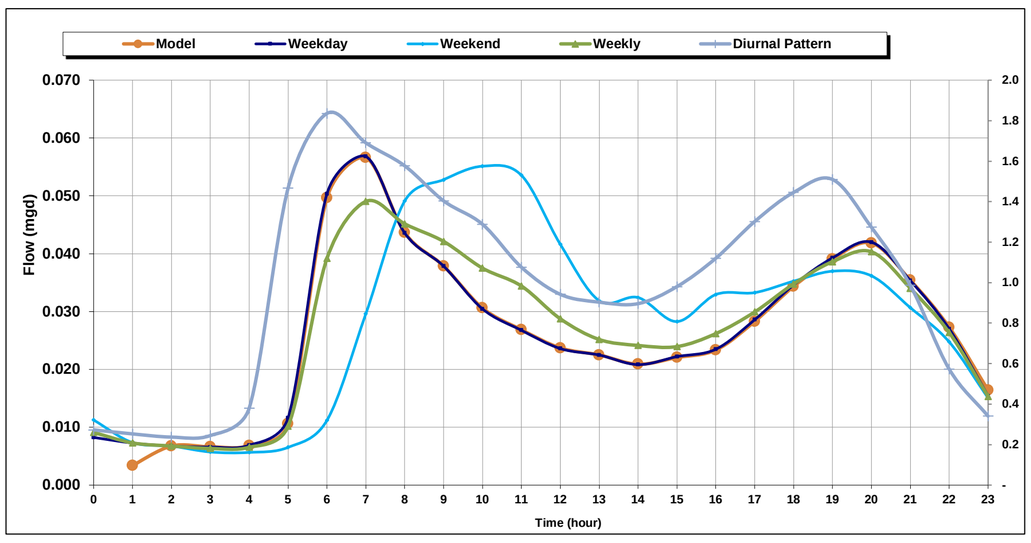
Diurnal Patterns Normalized

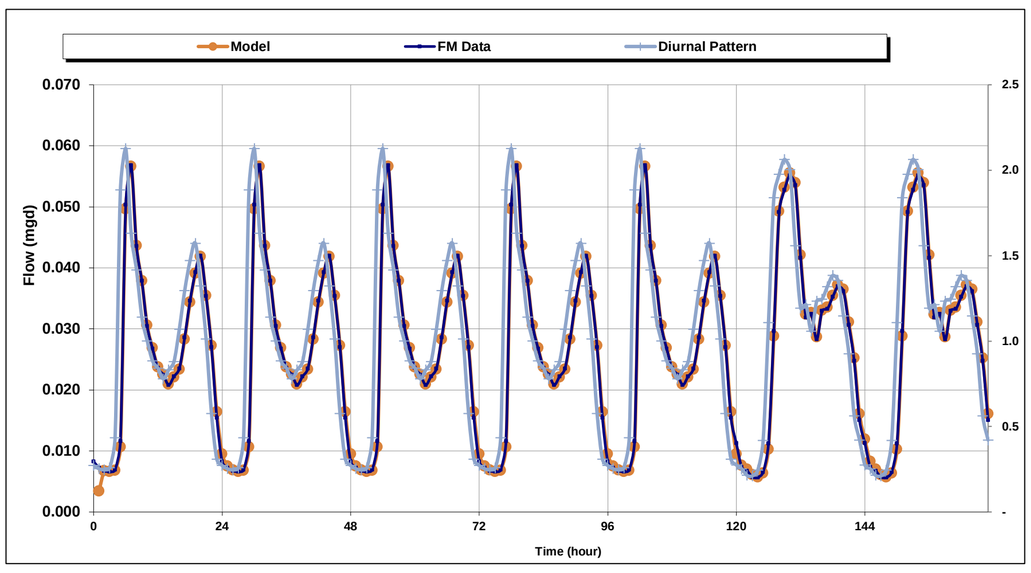
Date/Time	Weekday	Weekend	Weekly
0	0.53	0.53	0.53
1	0.48	0.49	0.49
2	0.47	0.45	0.46
3	0.52	0.45	0.50
4	0.74	0.51	0.67
5	1.39	0.67	1.17
6	1.61	1.05	1.45
7	1.41	1.42	1.41
8	1.25	1.55	1.34
9	1.16	1.47	1.26
10	1.07	1.40	1.17
11	0.99	1.27	1.07
12	0.92	1.17	1.00
13	0.91	1.15	0.98
14	0.95	1.19	1.02
15	1.01	1.22	1.07
16	1.14	1.18	1.15
17	1.25	1.20	1.24
18	1.35	1.18	1.30
19	1.30	1.16	1.26
20	1.18	1.03	1.14
21	1.02	0.92	0.99
22	0.76	0.74	0.75
23	0.59	0.60	0.59
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.04	0.52	
Monday	1	0.04	0.48	0.03
Monday	2	0.03	0.46	0.03
Monday	3	0.03	0.51	0.03
Monday	4	0.04	0.72	0.04
Monday	5	0.05	1.36	0.05
Monday	6	0.10	1.59	0.10
Monday	7	0.12	1.38	0.11
Monday	8	0.10	1.22	0.10
Monday	9	0.09	1.14	0.09
Monday	10	0.08	1.06	0.08
Monday	11	0.08	0.97	0.08
Monday	12	0.07	0.91	0.07
Monday	13	0.07	0.89	0.07
Monday	14	0.06	0.93	0.06
Monday	15	0.07	0.99	0.07
Monday	16	0.07	1.12	0.07
Monday	17	0.08	1.23	0.08
Monday	18	0.09	1.32	0.09
Monday	19	0.10	1.28	0.10
Monday	20	0.09	1.16	0.09
Monday	21	0.08	1.00	0.08
Monday	22	0.07	0.75	0.07
Monday	23	0.05	0.58	0.05
Tuesday	24	0.04	0.52	0.04
Tuesday	25	0.04	0.48	0.04
Tuesday	26	0.03	0.46	0.03
Tuesday	27	0.03	0.51	0.03
Tuesday	28	0.04	0.72	0.04
Tuesday	29	0.05	1.36	0.05
Tuesday	30	0.10	1.59	0.10
Tuesday	31	0.12	1.38	0.11
Tuesday	32	0.10	1.22	0.10
Tuesday	33	0.09	1.14	0.09
Tuesday	34	0.08	1.06	0.08
Tuesday	35	0.08	0.97	0.08
Tuesday	36	0.07	0.91	0.07
Tuesday	37	0.07	0.89	0.07
Tuesday	38	0.06	0.93	0.06
Tuesday	39	0.07	0.99	0.07
Tuesday	40	0.07	1.12	0.07
Tuesday	41	0.08	1.23	0.08
Tuesday	42	0.09	1.32	0.09
Tuesday	43	0.10	1.28	0.10
Tuesday	44	0.09	1.16	0.09
Tuesday	45	0.08	1.00	0.08
Tuesday	46	0.07	0.75	0.07
Tuesday	47	0.05	0.58	0.05
Wednesday	48	0.04	0.52	0.04
Wednesday	49	0.04	0.48	0.04
Wednesday	50	0.03	0.46	0.03
Wednesday	51	0.03	0.51	0.03
Wednesday	52	0.04	0.72	0.04
Wednesday	53	0.05	1.36	0.05
Wednesday	54	0.10	1.59	0.10
Wednesday	55	0.12	1.38	0.11
Wednesday	56	0.10	1.22	0.10
Wednesday	57	0.09	1.14	0.09
Wednesday	58	0.08	1.06	0.08
Wednesday	59	0.08	0.97	0.08
Wednesday	60	0.07	0.91	0.07
Wednesday	61	0.07	0.89	0.07
Wednesday	62	0.06	0.93	0.06
Wednesday	63	0.07	0.99	0.07
Wednesday	64	0.07	1.12	0.07
Wednesday	65	0.08	1.23	0.08
Wednesday	66	0.09	1.32	0.09
Wednesday	67	0.10	1.28	0.10
Wednesday	68	0.09	1.16	0.09
Wednesday	69	0.08	1.00	0.08
Wednesday	70	0.07	0.75	0.07
Wednesday	71	0.05	0.58	0.05
Thursday	72	0.04	0.52	0.04
Thursday	73	0.04	0.48	0.04
Thursday	74	0.03	0.46	0.03
Thursday	75	0.03	0.51	0.03
Thursday	76	0.04	0.72	0.04
Thursday	77	0.05	1.36	0.05
Thursday	78	0.10	1.59	0.10
Thursday	79	0.12	1.38	0.11
Thursday	80	0.10	1.22	0.10
Thursday	81	0.09	1.14	0.09
Thursday	82	0.08	1.06	0.08
Thursday	83	0.08	0.97	0.08
Thursday	84	0.07	0.91	0.07
Thursday	85	0.07	0.89	0.07
Thursday	86	0.06	0.93	0.06
Thursday	87	0.07	0.99	0.07
Thursday	88	0.07	1.12	0.07
Thursday	89	0.08	1.23	0.08
Thursday	90	0.09	1.32	0.09
Thursday	91	0.10	1.28	0.10
Thursday	92	0.09	1.16	0.09
Thursday	93	0.08	1.00	0.08
Thursday	94	0.07	0.75	0.07
Thursday	95	0.05	0.58	0.05
Friday	96	0.04	0.52	0.04
Friday	97	0.04	0.48	0.04
Friday	98	0.03	0.46	0.03
Friday	99	0.03	0.51	0.03
Friday	100	0.04	0.72	0.04
Friday	101	0.05	1.36	0.05
Friday	102	0.10	1.59	0.10
Friday	103	0.12	1.38	0.11
Friday	104	0.10	1.22	0.10
Friday	105	0.09	1.14	0.09
Friday	106	0.08	1.06	0.08
Friday	107	0.08	0.97	0.08
Friday	108	0.07	0.91	0.07
Friday	109	0.07	0.89	0.07
Friday	110	0.06	0.93	0.06
Friday	111	0.07	0.99	0.07
Friday	112	0.07	1.12	0.07
Friday	113	0.08	1.23	0.08
Friday	114	0.09	1.32	0.09
Friday	115	0.10	1.28	0.10
Friday	116	0.09	1.16	0.09
Friday	117	0.08	1.00	0.08
Friday	118	0.07	0.75	0.07
Friday	119	0.05	0.58	0.05
Saturday	120	0.05	0.55	0.04
Saturday	121	0.04	0.52	0.04
Saturday	122	0.04	0.47	0.04
Saturday	123	0.03	0.47	0.03
Saturday	124	0.03	0.53	0.03
Saturday	125	0.04	0.70	0.04
Saturday	126	0.05	1.09	0.05
Saturday	127	0.08	1.48	0.08
Saturday	128	0.11	1.62	0.11
Saturday	129	0.12	1.54	0.12
Saturday	130	0.11	1.46	0.11
Saturday	131	0.11	1.33	0.11
Saturday	132	0.10	1.22	0.10
Saturday	133	0.09	1.21	0.09
Saturday	134	0.09	1.24	0.09
Saturday	135	0.09	1.27	0.09
Saturday	136	0.09	1.24	0.09
Saturday	137	0.09	1.26	0.09
Saturday	138	0.09	1.23	0.09
Saturday	139	0.09	1.21	0.09
Saturday	140	0.09	1.07	0.09
Saturday	141	0.08	0.96	0.08
Saturday	142	0.07	0.77	0.07
Saturday	143	0.06	0.62	0.06
Sunday	144	0.05	0.55	0.05
Sunday	145	0.04	0.52	0.04
Sunday	146	0.04	0.47	0.04
Sunday	147	0.03	0.47	0.03
Sunday	148	0.03	0.53	0.03
Sunday	149	0.04	0.70	0.04
Sunday	150	0.05	1.09	0.05
Sunday	151	0.08	1.48	0.08
Sunday	152	0.11	1.62	0.11
Sunday	153	0.12	1.54	0.12
Sunday	154	0.11	1.46	0.11
Sunday	155	0.11	1.33	0.11
Sunday	156	0.10	1.22	0.10
Sunday	157	0.09	1.21	0.09
Sunday	158	0.09	1.24	0.09
Sunday	159	0.09	1.27	0.09
Sunday	160	0.09	1.24	0.09
Sunday	161	0.09	1.26	0.09
Sunday	162	0.09	1.23	0.09
Sunday	163	0.09	1.21	0.09
Sunday	164	0.09	1.07	0.09
Sunday	165	0.08	0.96	0.08
Sunday	166	0.07	0.77	0.07
Sunday	167	0.06	0.62	0.06

Flow	Daily	Hourly	Wkend
0.07	1.04	0.53	0.53
	0.98	0.48	0.49
	0.98	0.47	0.45
	0.98	0.52	0.45
	0.98	0.74	0.51
	0.98	1.39	0.67
	1.04	1.61	1.05
		1.41	1.42
		1.25	1.55
		1.16	1.47
		1.07	1.40
		0.99	1.27
		0.92	1.17
		0.91	1.15
		0.95	1.19
		1.01	1.22
		1.14	1.18
		1.25	1.20
		1.35	1.18
		1.30	1.16
		1.18	1.03
		1.02	0.92
		0.76	0.74
		0.59	0.60

2016 ADS Meter 35D-1 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.06	0.01	0.03	0.06	0.01	0.03
Model	0.06	0.01	0.03	0.06	0.01	0.03
Diff	(0.00)	0.00	0.00	0.00	0.00	0.00
% Diff	0%	1%	0%	1%	1%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.01	0.01	0.01
1	0.01	0.01	0.01
2	0.01	0.01	0.01
3	0.01	0.01	0.01
4	0.01	0.01	0.01
5	0.01	0.01	0.01
6	0.05	0.01	0.04
7	0.06	0.03	0.05
8	0.04	0.05	0.05
9	0.04	0.05	0.04
10	0.03	0.06	0.04
11	0.03	0.05	0.03
12	0.02	0.04	0.03
13	0.02	0.03	0.03
14	0.02	0.03	0.02
15	0.02	0.03	0.02
16	0.02	0.03	0.03
17	0.03	0.03	0.03
18	0.03	0.04	0.03
19	0.04	0.04	0.04
20	0.04	0.04	0.04
21	0.04	0.03	0.03
22	0.03	0.02	0.03
23	0.02	0.02	0.02
Average	0.03	0.03	0.03

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.27	0.28	0.27
1	0.25	0.25	0.25
2	0.25	0.21	0.24
3	0.26	0.21	0.24
4	0.43	0.24	0.38
5	1.89	0.42	1.47
6	2.13	1.11	1.84
7	1.63	1.84	1.69
8	1.42	1.98	1.58
9	1.14	2.06	1.40
10	1.00	2.00	1.29
11	0.88	1.56	1.08
12	0.84	1.19	0.94
13	0.78	1.21	0.90
14	0.83	1.06	0.90
15	0.88	1.23	0.98
16	1.07	1.25	1.12
17	1.30	1.32	1.30
18	1.47	1.38	1.45
19	1.57	1.35	1.51
20	1.32	1.15	1.27
21	1.01	0.93	0.99
22	0.58	0.56	0.57
23	0.31	0.42	0.34
Total	23.51	25.23	24.00
Average	0.98	1.05	1.00

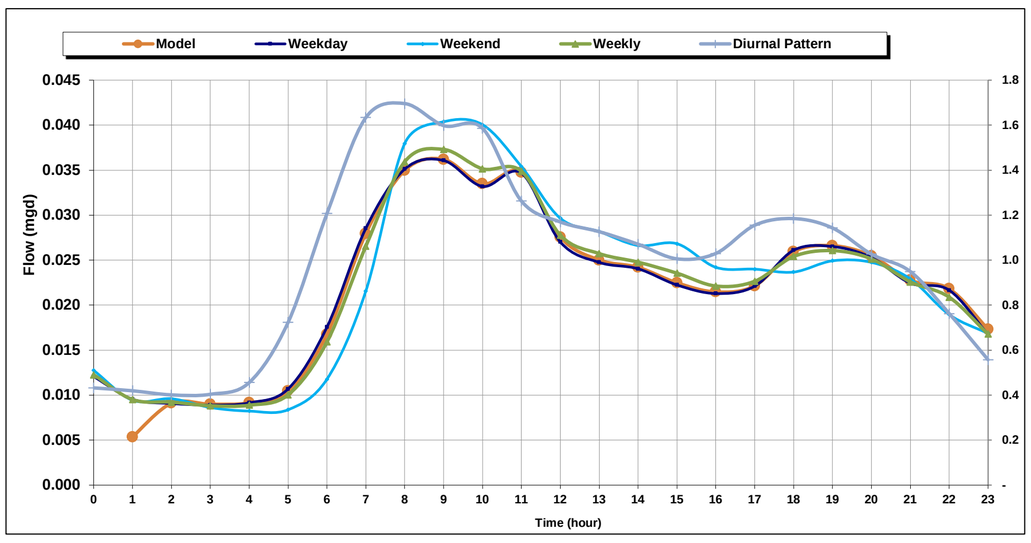
Diurnal Patterns Normalized

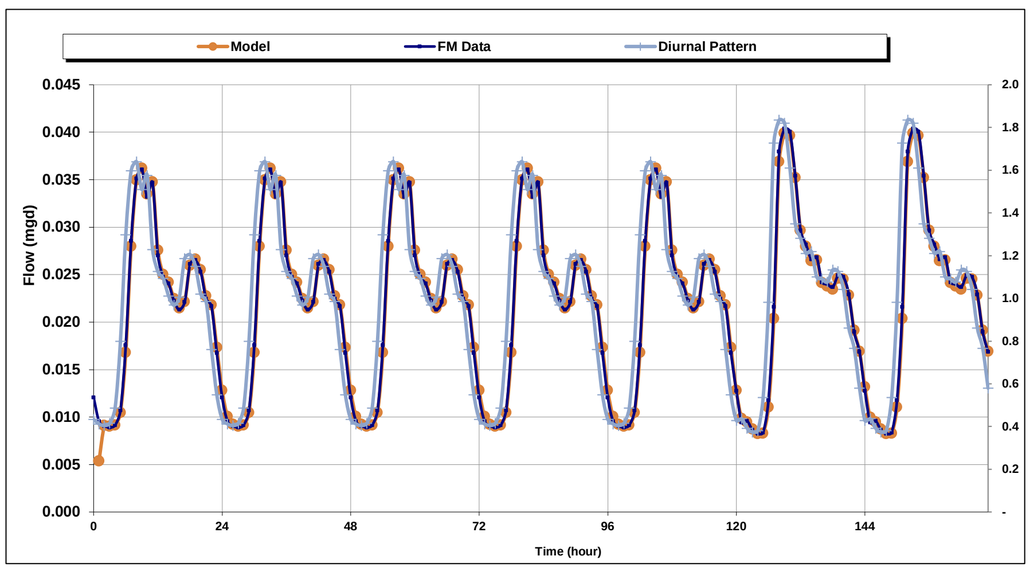
Date/Time	Weekday	Weekend	Weekly
0	0.28	0.26	0.27
1	0.26	0.24	0.25
2	0.25	0.20	0.24
3	0.26	0.20	0.24
4	0.44	0.23	0.38
5	1.92	0.40	1.47
6	2.17	1.05	1.84
7	1.66	1.75	1.69
8	1.45	1.88	1.58
9	1.16	1.96	1.40
10	1.02	1.91	1.29
11	0.90	1.48	1.08
12	0.86	1.14	0.94
13	0.80	1.15	0.90
14	0.85	1.01	0.90
15	0.90	1.17	0.98
16	1.09	1.18	1.12
17	1.32	1.26	1.30
18	1.50	1.32	1.45
19	1.60	1.29	1.51
20	1.35	1.09	1.27
21	1.03	0.88	0.99
22	0.59	0.54	0.57
23	0.31	0.40	0.34
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.01	0.27	
Monday	1	0.01	0.25	0.00
Monday	2	0.01	0.25	0.01
Monday	3	0.01	0.26	0.01
Monday	4	0.01	0.43	0.01
Monday	5	0.01	1.89	0.01
Monday	6	0.05	2.13	0.05
Monday	7	0.06	1.63	0.06
Monday	8	0.04	1.42	0.04
Monday	9	0.04	1.14	0.04
Monday	10	0.03	1.00	0.03
Monday	11	0.03	0.88	0.03
Monday	12	0.02	0.84	0.02
Monday	13	0.02	0.78	0.02
Monday	14	0.02	0.83	0.02
Monday	15	0.02	0.88	0.02
Monday	16	0.02	1.07	0.02
Monday	17	0.03	1.30	0.03
Monday	18	0.03	1.47	0.03
Monday	19	0.04	1.57	0.04
Monday	20	0.04	1.32	0.04
Monday	21	0.04	1.01	0.04
Monday	22	0.03	0.58	0.03
Monday	23	0.02	0.31	0.02
Tuesday	24	0.01	0.27	0.01
Tuesday	25	0.01	0.25	0.01
Tuesday	26	0.01	0.25	0.01
Tuesday	27	0.01	0.26	0.01
Tuesday	28	0.01	0.43	0.01
Tuesday	29	0.01	1.89	0.01
Tuesday	30	0.05	2.13	0.05
Tuesday	31	0.06	1.63	0.06
Tuesday	32	0.04	1.42	0.04
Tuesday	33	0.04	1.14	0.04
Tuesday	34	0.03	1.00	0.03
Tuesday	35	0.03	0.88	0.03
Tuesday	36	0.02	0.84	0.02
Tuesday	37	0.02	0.78	0.02
Tuesday	38	0.02	0.83	0.02
Tuesday	39	0.02	0.88	0.02
Tuesday	40	0.02	1.07	0.02
Tuesday	41	0.03	1.30	0.03
Tuesday	42	0.03	1.47	0.03
Tuesday	43	0.04	1.57	0.04
Tuesday	44	0.04	1.32	0.04
Tuesday	45	0.04	1.01	0.04
Tuesday	46	0.03	0.58	0.03
Tuesday	47	0.02	0.31	0.02
Wednesday	48	0.01	0.27	0.01
Wednesday	49	0.01	0.25	0.01
Wednesday	50	0.01	0.25	0.01
Wednesday	51	0.01	0.26	0.01
Wednesday	52	0.01	0.43	0.01
Wednesday	53	0.01	1.89	0.01
Wednesday	54	0.05	2.13	0.05
Wednesday	55	0.06	1.63	0.06
Wednesday	56	0.04	1.42	0.04
Wednesday	57	0.04	1.14	0.04
Wednesday	58	0.03	1.00	0.03
Wednesday	59	0.03	0.88	0.03
Wednesday	60	0.02	0.84	0.02
Wednesday	61	0.02	0.78	0.02
Wednesday	62	0.02	0.83	0.02
Wednesday	63	0.02	0.88	0.02
Wednesday	64	0.02	1.07	0.02
Wednesday	65	0.03	1.30	0.03
Wednesday	66	0.03	1.47	0.03
Wednesday	67	0.04	1.57	0.04
Wednesday	68	0.04	1.32	0.04
Wednesday	69	0.04	1.01	0.04
Wednesday	70	0.03	0.58	0.03
Wednesday	71	0.02	0.31	0.02
Thursday	72	0.01	0.27	0.01
Thursday	73	0.01	0.25	0.01
Thursday	74	0.01	0.25	0.01
Thursday	75	0.01	0.26	0.01
Thursday	76	0.01	0.43	0.01
Thursday	77	0.01	1.89	0.01
Thursday	78	0.05	2.13	0.05
Thursday	79	0.06	1.63	0.06
Thursday	80	0.04	1.42	0.04
Thursday	81	0.04	1.14	0.04
Thursday	82	0.03	1.00	0.03
Thursday	83	0.03	0.88	0.03
Thursday	84	0.02	0.84	0.02
Thursday	85	0.02	0.78	0.02
Thursday	86	0.02	0.83	0.02
Thursday	87	0.02	0.88	0.02
Thursday	88	0.02	1.07	0.02
Thursday	89	0.03	1.30	0.03
Thursday	90	0.03	1.47	0.03
Thursday	91	0.04	1.57	0.04
Thursday	92	0.04	1.32	0.04
Thursday	93	0.04	1.01	0.04
Thursday	94	0.03	0.58	0.03
Thursday	95	0.02	0.31	0.02
Friday	96	0.01	0.27	0.01
Friday	97	0.01	0.25	0.01
Friday	98	0.01	0.25	0.01
Friday	99	0.01	0.26	0.01
Friday	100	0.01	0.43	0.01
Friday	101	0.01	1.89	0.01
Friday	102	0.05	2.13	0.05
Friday	103	0.06	1.63	0.06
Friday	104	0.04	1.42	0.04
Friday	105	0.04	1.14	0.04
Friday	106	0.03	1.00	0.03
Friday	107	0.03	0.88	0.03
Friday	108	0.02	0.84	0.02
Friday	109	0.02	0.78	0.02
Friday	110	0.02	0.83	0.02
Friday	111	0.02	0.88	0.02
Friday	112	0.02	1.07	0.02
Friday	113	0.03	1.30	0.03
Friday	114	0.03	1.47	0.03
Friday	115	0.04	1.57	0.04
Friday	116	0.04	1.32	0.04
Friday	117	0.04	1.01	0.04
Friday	118	0.03	0.58	0.03
Friday	119	0.02	0.31	0.02
Saturday	120	0.01	0.28	0.01
Saturday	121	0.01	0.25	0.01
Saturday	122	0.01	0.21	0.01
Saturday	123	0.01	0.21	0.01
Saturday	124	0.01	0.24	0.01
Saturday	125	0.01	0.42	0.01
Saturday	126	0.01	1.11	0.01
Saturday	127	0.03	1.84	0.03
Saturday	128	0.05	1.98	0.05
Saturday	129	0.05	2.06	0.05
Saturday	130	0.06	2.00	0.06
Saturday	131	0.05	1.56	0.05
Saturday	132	0.04	1.19	0.04
Saturday	133	0.03	1.21	0.03
Saturday	134	0.03	1.06	0.03
Saturday	135	0.03	1.23	0.03
Saturday	136	0.03	1.25	0.03
Saturday	137	0.03	1.32	0.03
Saturday	138	0.04	1.38	0.04
Saturday	139	0.04	1.35	0.04
Saturday	140	0.04	1.15	0.04
Saturday	141	0.03	0.93	0.03
Saturday	142	0.02	0.56	0.03
Saturday	143	0.02	0.42	0.02
Sunday	144	0.01	0.28	0.01
Sunday	145	0.01	0.25	0.01
Sunday	146	0.01	0.21	0.01
Sunday	147	0.01	0.21	0.01
Sunday	148	0.01	0.24	0.01
Sunday	149	0.01	0.42	0.01
Sunday	150	0.01	1.11	0.01
Sunday	151	0.03	1.84	0.03
Sunday	152	0.05	1.98	0.05
Sunday	153	0.05	2.06	0.05
Sunday	154	0.06	2.00	0.06
Sunday	155	0.05	1.56	0.05
Sunday	156	0.04	1.19	0.04
Sunday	157	0.03	1.21	0.03
Sunday	158	0.03	1.06	0.03
Sunday	159	0.03	1.23	0.03
Sunday	160	0.03	1.25	0.03
Sunday	161	0.03	1.32	0.03
Sunday	162	0.04	1.38	0.04
Sunday	163	0.04	1.35	0.04
Sunday	164	0.04	1.15	0.04
Sunday	165	0.03	0.93	0.03
Sunday	166	0.02	0.56	0.03
Sunday	167	0.02	0.42	0.02

Flow	Daily	Hourly	Wkend
0.03	1.05	0.28	0.26
	0.98	0.26	0.24
	0.98	0.25	0.20
	0.98	0.26	0.20
	0.98	0.44	0.23
	0.98	1.92	0.40
	1.05	2.17	1.05
		1.66	1.75
		1.45	1.88
		1.16	1.96
		1.02	1.91
		0.90	1.48
		0.86	1.14
		0.80	1.15
		0.85	1.01
		0.90	1.17
		1.09	1.18
		1.32	1.26
		1.50	1.32
		1.60	1.29
		1.35	1.09
		1.03	0.88
		0.59	0.54
		0.31	0.40

2016 ADS Meter 41D-51 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.04	0.01	0.02	0.04	0.01	0.02
Model	0.04	0.01	0.02	0.04	0.01	0.02
Diff	0.00	0.00	0.00	(0.00)	0.00	(0.00)
% Diff	0%	1%	1%	-1%	0%	-1%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.01	0.01	0.01
1	0.01	0.01	0.01
2	0.01	0.01	0.01
3	0.01	0.01	0.01
4	0.01	0.01	0.01
5	0.01	0.01	0.01
6	0.02	0.01	0.02
7	0.03	0.02	0.03
8	0.04	0.04	0.04
9	0.04	0.04	0.04
10	0.03	0.04	0.04
11	0.03	0.04	0.03
12	0.03	0.03	0.03
13	0.02	0.03	0.03
14	0.02	0.03	0.02
15	0.02	0.03	0.02
16	0.02	0.02	0.02
17	0.02	0.02	0.02
18	0.03	0.02	0.03
19	0.03	0.02	0.03
20	0.03	0.02	0.03
21	0.02	0.02	0.02
22	0.02	0.02	0.02
23	0.02	0.02	0.02
Average	0.02	0.02	0.02

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.43	0.43	0.43
1	0.41	0.44	0.42
2	0.40	0.39	0.40
3	0.42	0.37	0.40
4	0.49	0.38	0.46
5	0.80	0.54	0.72
6	1.30	0.98	1.21
7	1.60	1.73	1.63
8	1.64	1.84	1.70
9	1.51	1.82	1.60
10	1.58	1.61	1.59
11	1.23	1.35	1.26
12	1.13	1.28	1.17
13	1.09	1.21	1.13
14	1.01	1.22	1.07
15	0.97	1.10	1.01
16	1.01	1.09	1.03
17	1.19	1.08	1.16
18	1.21	1.13	1.18
19	1.15	1.13	1.14
20	1.02	1.04	1.03
21	0.98	0.86	0.95
22	0.76	0.77	0.76
23	0.55	0.58	0.56
Total	23.86	24.36	24.00
Average	0.99	1.01	1.00

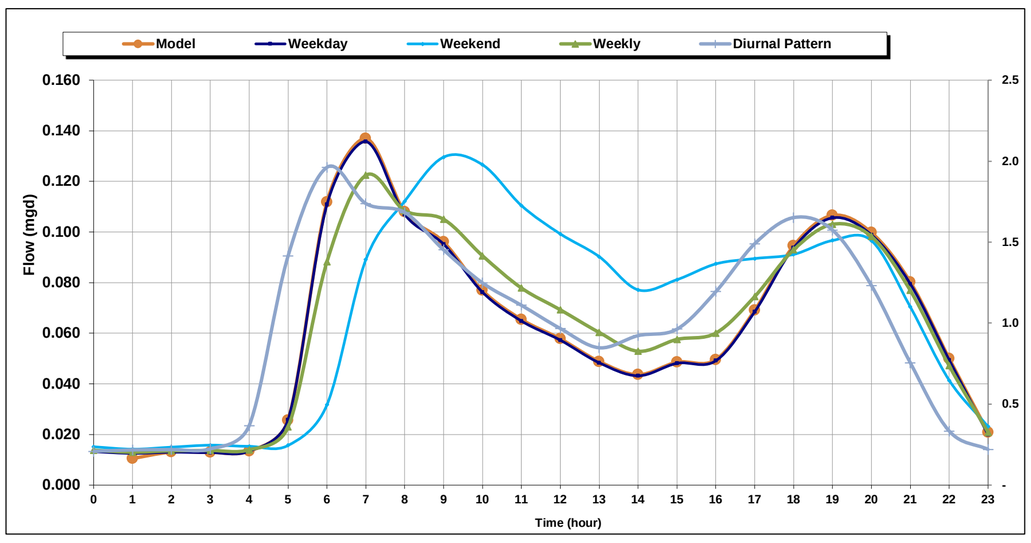
Diurnal Patterns Normalized

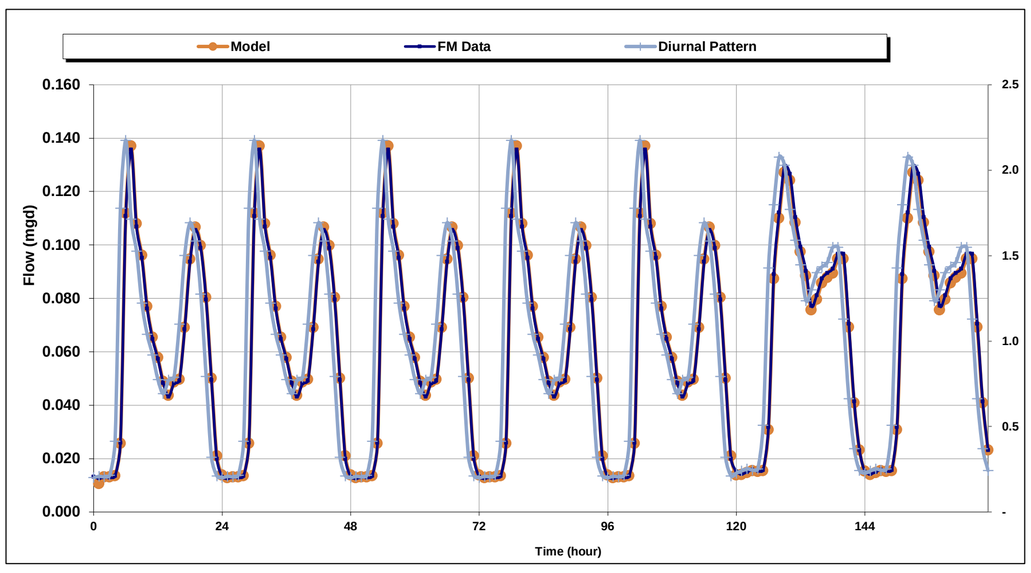
Date/Time	Weekday	Weekend	Weekly
0	0.44	0.42	0.43
1	0.41	0.43	0.42
2	0.41	0.39	0.40
3	0.42	0.37	0.40
4	0.49	0.38	0.46
5	0.80	0.53	0.72
6	1.31	0.97	1.21
7	1.61	1.70	1.63
8	1.65	1.81	1.70
9	1.52	1.79	1.60
10	1.59	1.59	1.59
11	1.24	1.33	1.26
12	1.13	1.26	1.17
13	1.10	1.19	1.13
14	1.02	1.20	1.07
15	0.97	1.08	1.01
16	1.01	1.08	1.03
17	1.19	1.06	1.16
18	1.21	1.12	1.18
19	1.16	1.11	1.14
20	1.03	1.03	1.03
21	0.99	0.85	0.95
22	0.77	0.75	0.76
23	0.55	0.57	0.56
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.01	0.43	
Monday	1	0.01	0.41	0.01
Monday	2	0.01	0.40	0.01
Monday	3	0.01	0.42	0.01
Monday	4	0.01	0.49	0.01
Monday	5	0.01	0.80	0.01
Monday	6	0.02	1.30	0.02
Monday	7	0.03	1.60	0.03
Monday	8	0.04	1.64	0.03
Monday	9	0.04	1.51	0.04
Monday	10	0.03	1.58	0.03
Monday	11	0.03	1.23	0.03
Monday	12	0.03	1.13	0.03
Monday	13	0.02	1.09	0.03
Monday	14	0.02	1.01	0.02
Monday	15	0.02	0.97	0.02
Monday	16	0.02	1.01	0.02
Monday	17	0.02	1.19	0.02
Monday	18	0.03	1.21	0.03
Monday	19	0.03	1.15	0.03
Monday	20	0.03	1.02	0.03
Monday	21	0.02	0.98	0.02
Monday	22	0.02	0.76	0.02
Monday	23	0.02	0.55	0.02
Tuesday	24	0.01	0.43	0.01
Tuesday	25	0.01	0.41	0.01
Tuesday	26	0.01	0.40	0.01
Tuesday	27	0.01	0.42	0.01
Tuesday	28	0.01	0.49	0.01
Tuesday	29	0.01	0.80	0.01
Tuesday	30	0.02	1.30	0.02
Tuesday	31	0.03	1.60	0.03
Tuesday	32	0.04	1.64	0.03
Tuesday	33	0.04	1.51	0.04
Tuesday	34	0.03	1.58	0.03
Tuesday	35	0.03	1.23	0.03
Tuesday	36	0.03	1.13	0.03
Tuesday	37	0.02	1.09	0.03
Tuesday	38	0.02	1.01	0.02
Tuesday	39	0.02	0.97	0.02
Tuesday	40	0.02	1.01	0.02
Tuesday	41	0.02	1.19	0.02
Tuesday	42	0.03	1.21	0.03
Tuesday	43	0.03	1.15	0.03
Tuesday	44	0.03	1.02	0.03
Tuesday	45	0.02	0.98	0.02
Tuesday	46	0.02	0.76	0.02
Tuesday	47	0.02	0.55	0.02
Wednesday	48	0.01	0.43	0.01
Wednesday	49	0.01	0.41	0.01
Wednesday	50	0.01	0.40	0.01
Wednesday	51	0.01	0.42	0.01
Wednesday	52	0.01	0.49	0.01
Wednesday	53	0.01	0.80	0.01
Wednesday	54	0.02	1.30	0.02
Wednesday	55	0.03	1.60	0.03
Wednesday	56	0.04	1.64	0.03
Wednesday	57	0.04	1.51	0.04
Wednesday	58	0.03	1.58	0.03
Wednesday	59	0.03	1.23	0.03
Wednesday	60	0.03	1.13	0.03
Wednesday	61	0.02	1.09	0.03
Wednesday	62	0.02	1.01	0.02
Wednesday	63	0.02	0.97	0.02
Wednesday	64	0.02	1.01	0.02
Wednesday	65	0.02	1.19	0.02
Wednesday	66	0.03	1.21	0.03
Wednesday	67	0.03	1.15	0.03
Wednesday	68	0.03	1.02	0.03
Wednesday	69	0.02	0.98	0.02
Wednesday	70	0.02	0.76	0.02
Wednesday	71	0.02	0.55	0.02
Thursday	72	0.01	0.43	0.01
Thursday	73	0.01	0.41	0.01
Thursday	74	0.01	0.40	0.01
Thursday	75	0.01	0.42	0.01
Thursday	76	0.01	0.49	0.01
Thursday	77	0.01	0.80	0.01
Thursday	78	0.02	1.30	0.02
Thursday	79	0.03	1.60	0.03
Thursday	80	0.04	1.64	0.03
Thursday	81	0.04	1.51	0.04
Thursday	82	0.03	1.58	0.03
Thursday	83	0.03	1.23	0.03
Thursday	84	0.03	1.13	0.03
Thursday	85	0.02	1.09	0.03
Thursday	86	0.02	1.01	0.02
Thursday	87	0.02	0.97	0.02
Thursday	88	0.02	1.01	0.02
Thursday	89	0.02	1.19	0.02
Thursday	90	0.03	1.21	0.03
Thursday	91	0.03	1.15	0.03
Thursday	92	0.03	1.02	0.03
Thursday	93	0.02	0.98	0.02
Thursday	94	0.02	0.76	0.02
Thursday	95	0.02	0.55	0.02
Friday	96	0.01	0.43	0.01
Friday	97	0.01	0.41	0.01
Friday	98	0.01	0.40	0.01
Friday	99	0.01	0.42	0.01
Friday	100	0.01	0.49	0.01
Friday	101	0.01	0.80	0.01
Friday	102	0.02	1.30	0.02
Friday	103	0.03	1.60	0.03
Friday	104	0.04	1.64	0.03
Friday	105	0.04	1.51	0.04
Friday	106	0.03	1.58	0.03
Friday	107	0.03	1.23	0.03
Friday	108	0.03	1.13	0.03
Friday	109	0.02	1.09	0.03
Friday	110	0.02	1.01	0.02
Friday	111	0.02	0.97	0.02
Friday	112	0.02	1.01	0.02
Friday	113	0.02	1.19	0.02
Friday	114	0.03	1.21	0.03
Friday	115	0.03	1.15	0.03
Friday	116	0.03	1.02	0.03
Friday	117	0.02	0.98	0.02
Friday	118	0.02	0.76	0.02
Friday	119	0.02	0.55	0.02
Saturday	120	0.01	0.43	0.01
Saturday	121	0.01	0.44	0.01
Saturday	122	0.01	0.39	0.01
Saturday	123	0.01	0.37	0.01
Saturday	124	0.01	0.38	0.01
Saturday	125	0.01	0.54	0.01
Saturday	126	0.01	0.98	0.01
Saturday	127	0.02	1.73	0.02
Saturday	128	0.04	1.84	0.04
Saturday	129	0.04	1.82	0.04
Saturday	130	0.04	1.61	0.04
Saturday	131	0.04	1.35	0.04
Saturday	132	0.03	1.28	0.03
Saturday	133	0.03	1.21	0.03
Saturday	134	0.03	1.22	0.03
Saturday	135	0.03	1.10	0.03
Saturday	136	0.02	1.09	0.02
Saturday	137	0.02	1.08	0.02
Saturday	138	0.02	1.13	0.02
Saturday	139	0.02	1.13	0.02
Saturday	140	0.02	1.04	0.02
Saturday	141	0.02	0.86	0.02
Saturday	142	0.02	0.77	0.02
Saturday	143	0.02	0.58	0.02
Sunday	144	0.01	0.43	0.01
Sunday	145	0.01	0.44	0.01
Sunday	146	0.01	0.39	0.01
Sunday	147	0.01	0.37	0.01
Sunday	148	0.01	0.38	0.01
Sunday	149	0.01	0.54	0.01
Sunday	150	0.01	0.98	0.01
Sunday	151	0.02	1.73	0.02
Sunday	152	0.04	1.84	0.04
Sunday	153	0.04	1.82	0.04
Sunday	154	0.04	1.61	0.04
Sunday	155	0.04	1.35	0.04
Sunday	156	0.03	1.28	0.03
Sunday	157	0.03	1.21	0.03
Sunday	158	0.03	1.22	0.03
Sunday	159	0.03	1.10	0.03
Sunday	160	0.02	1.09	0.02
Sunday	161	0.02	1.08	0.02
Sunday	162	0.02	1.13	0.02
Sunday	163	0.02	1.13	0.02
Sunday	164	0.02	1.04	0.02
Sunday	165	0.02	0.86	0.02
Sunday	166	0.02	0.77	0.02
Sunday	167	0.02	0.58	0.02

Flow	Daily	Hourly	Wkend
0.02	1.01	0.44	0.42
	0.99	0.41	0.43
	0.99	0.41	0.39
	0.99	0.42	0.37
	0.99	0.49	0.38
	0.99	0.80	0.53
	1.01	1.31	0.97
		1.61	1.70
		1.65	1.81
		1.52	1.79
		1.59	1.59
		1.24	1.33
		1.13	1.26
		1.10	1.19
		1.02	1.20
		0.97	1.08
		1.01	1.08
		1.19	1.06
		1.21	1.12
		1.16	1.11
		1.03	1.03
		0.99	0.85
		0.77	0.75
		0.55	0.57

2016 ADS Meter 42C-10 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.14	0.01	0.06	0.13	0.01	0.07
Model	0.14	0.01	0.06	0.13	0.01	0.07
Diff	0.00	0.00	0.00	(0.00)	(0.00)	(0.00)
% Diff	1%	1%	1%	-2%	-3%	-2%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.01	0.02	0.01
1	0.01	0.01	0.01
2	0.01	0.02	0.01
3	0.01	0.02	0.01
4	0.01	0.02	0.01
5	0.03	0.02	0.02
6	0.11	0.03	0.09
7	0.14	0.09	0.12
8	0.11	0.11	0.11
9	0.10	0.13	0.11
10	0.08	0.13	0.09
11	0.06	0.11	0.08
12	0.06	0.10	0.07
13	0.05	0.09	0.06
14	0.04	0.08	0.05
15	0.05	0.08	0.06
16	0.05	0.09	0.06
17	0.07	0.09	0.07
18	0.09	0.09	0.09
19	0.11	0.10	0.10
20	0.10	0.10	0.10
21	0.08	0.07	0.08
22	0.05	0.04	0.05
23	0.02	0.02	0.02
Average	0.06	0.07	0.06

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.20	0.23	0.21
1	0.21	0.24	0.22
2	0.21	0.25	0.22
3	0.22	0.25	0.22
4	0.41	0.25	0.37
5	1.78	0.51	1.41
6	2.18	1.43	1.96
7	1.71	1.80	1.74
8	1.53	2.08	1.68
9	1.22	2.03	1.45
10	1.04	1.77	1.25
11	0.92	1.59	1.11
12	0.77	1.45	0.97
13	0.69	1.24	0.85
14	0.77	1.30	0.92
15	0.79	1.40	0.96
16	1.10	1.43	1.19
17	1.50	1.46	1.49
18	1.69	1.55	1.65
19	1.58	1.55	1.57
20	1.27	1.13	1.23
21	0.79	0.66	0.76
22	0.32	0.37	0.33
23	0.21	0.24	0.22
Total	23.12	26.20	24.00
Average	0.96	1.09	1.00

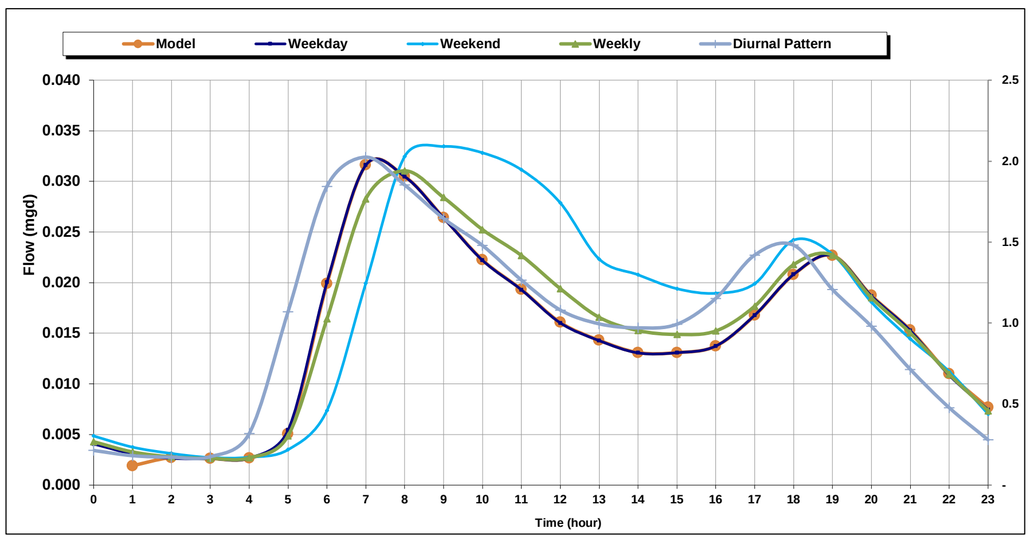
Diurnal Patterns Normalized

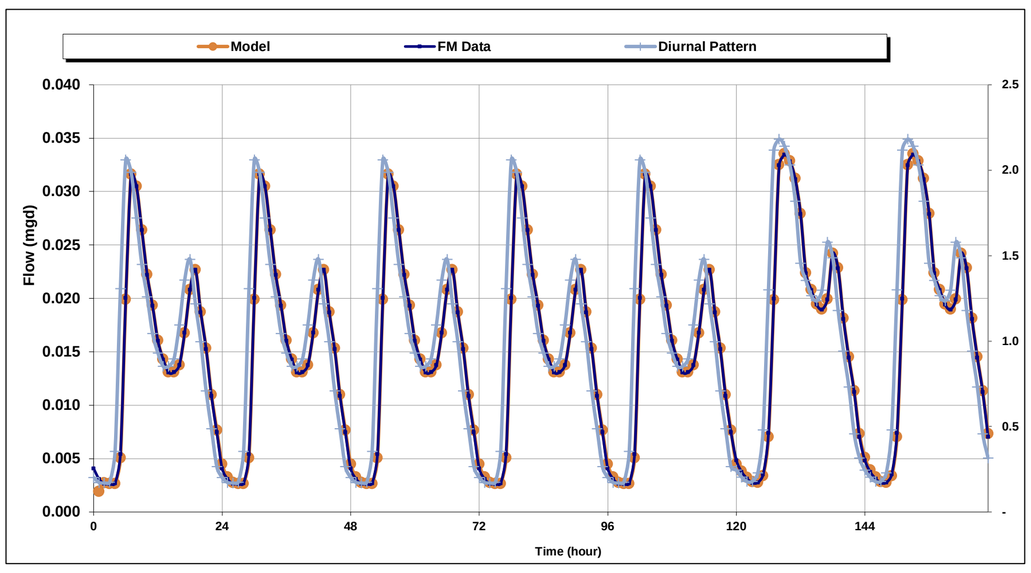
Date/Time	Weekday	Weekend	Weekly
0	0.21	0.21	0.21
1	0.22	0.22	0.22
2	0.21	0.23	0.22
3	0.22	0.22	0.22
4	0.43	0.23	0.37
5	1.85	0.47	1.41
6	2.26	1.31	1.96
7	1.78	1.65	1.74
8	1.58	1.90	1.68
9	1.27	1.86	1.45
10	1.08	1.62	1.25
11	0.95	1.46	1.11
12	0.80	1.33	0.97
13	0.72	1.13	0.85
14	0.80	1.19	0.92
15	0.82	1.28	0.96
16	1.14	1.31	1.19
17	1.56	1.34	1.49
18	1.76	1.42	1.65
19	1.65	1.42	1.57
20	1.32	1.03	1.23
21	0.82	0.61	0.76
22	0.33	0.34	0.33
23	0.22	0.22	0.22
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.01	0.20	
Monday	1	0.01	0.21	0.01
Monday	2	0.01	0.21	0.01
Monday	3	0.01	0.22	0.01
Monday	4	0.01	0.41	0.01
Monday	5	0.03	1.78	0.03
Monday	6	0.11	2.18	0.11
Monday	7	0.14	1.71	0.14
Monday	8	0.11	1.53	0.11
Monday	9	0.10	1.22	0.10
Monday	10	0.08	1.04	0.08
Monday	11	0.06	0.92	0.07
Monday	12	0.06	0.77	0.06
Monday	13	0.05	0.69	0.05
Monday	14	0.04	0.77	0.04
Monday	15	0.05	0.79	0.05
Monday	16	0.05	1.10	0.05
Monday	17	0.07	1.50	0.07
Monday	18	0.09	1.69	0.09
Monday	19	0.11	1.58	0.11
Monday	20	0.10	1.27	0.10
Monday	21	0.08	0.79	0.08
Monday	22	0.05	0.32	0.05
Monday	23	0.02	0.21	0.02
Tuesday	24	0.01	0.20	0.01
Tuesday	25	0.01	0.21	0.01
Tuesday	26	0.01	0.21	0.01
Tuesday	27	0.01	0.22	0.01
Tuesday	28	0.01	0.41	0.01
Tuesday	29	0.03	1.78	0.03
Tuesday	30	0.11	2.18	0.11
Tuesday	31	0.14	1.71	0.14
Tuesday	32	0.11	1.53	0.11
Tuesday	33	0.10	1.22	0.10
Tuesday	34	0.08	1.04	0.08
Tuesday	35	0.06	0.92	0.07
Tuesday	36	0.06	0.77	0.06
Tuesday	37	0.05	0.69	0.05
Tuesday	38	0.04	0.77	0.04
Tuesday	39	0.05	0.79	0.05
Tuesday	40	0.05	1.10	0.05
Tuesday	41	0.07	1.50	0.07
Tuesday	42	0.09	1.69	0.09
Tuesday	43	0.11	1.58	0.11
Tuesday	44	0.10	1.27	0.10
Tuesday	45	0.08	0.79	0.08
Tuesday	46	0.05	0.32	0.05
Tuesday	47	0.02	0.21	0.02
Wednesday	48	0.01	0.20	0.01
Wednesday	49	0.01	0.21	0.01
Wednesday	50	0.01	0.21	0.01
Wednesday	51	0.01	0.22	0.01
Wednesday	52	0.01	0.41	0.01
Wednesday	53	0.03	1.78	0.03
Wednesday	54	0.11	2.18	0.11
Wednesday	55	0.14	1.71	0.14
Wednesday	56	0.11	1.53	0.11
Wednesday	57	0.10	1.22	0.10
Wednesday	58	0.08	1.04	0.08
Wednesday	59	0.06	0.92	0.07
Wednesday	60	0.06	0.77	0.06
Wednesday	61	0.05	0.69	0.05
Wednesday	62	0.04	0.77	0.04
Wednesday	63	0.05	0.79	0.05
Wednesday	64	0.05	1.10	0.05
Wednesday	65	0.07	1.50	0.07
Wednesday	66	0.09	1.69	0.09
Wednesday	67	0.11	1.58	0.11
Wednesday	68	0.10	1.27	0.10
Wednesday	69	0.08	0.79	0.08
Wednesday	70	0.05	0.32	0.05
Wednesday	71	0.02	0.21	0.02
Thursday	72	0.01	0.20	0.01
Thursday	73	0.01	0.21	0.01
Thursday	74	0.01	0.21	0.01
Thursday	75	0.01	0.22	0.01
Thursday	76	0.01	0.41	0.01
Thursday	77	0.03	1.78	0.03
Thursday	78	0.11	2.18	0.11
Thursday	79	0.14	1.71	0.14
Thursday	80	0.11	1.53	0.11
Thursday	81	0.10	1.22	0.10
Thursday	82	0.08	1.04	0.08
Thursday	83	0.06	0.92	0.07
Thursday	84	0.06	0.77	0.06
Thursday	85	0.05	0.69	0.05
Thursday	86	0.04	0.77	0.04
Thursday	87	0.05	0.79	0.05
Thursday	88	0.05	1.10	0.05
Thursday	89	0.07	1.50	0.07
Thursday	90	0.09	1.69	0.09
Thursday	91	0.11	1.58	0.11
Thursday	92	0.10	1.27	0.10
Thursday	93	0.08	0.79	0.08
Thursday	94	0.05	0.32	0.05
Thursday	95	0.02	0.21	0.02
Friday	96	0.01	0.20	0.01
Friday	97	0.01	0.21	0.01
Friday	98	0.01	0.21	0.01
Friday	99	0.01	0.22	0.01
Friday	100	0.01	0.41	0.01
Friday	101	0.03	1.78	0.03
Friday	102	0.11	2.18	0.11
Friday	103	0.14	1.71	0.14
Friday	104	0.11	1.53	0.11
Friday	105	0.10	1.22	0.10
Friday	106	0.08	1.04	0.08
Friday	107	0.06	0.92	0.07
Friday	108	0.06	0.77	0.06
Friday	109	0.05	0.69	0.05
Friday	110	0.04	0.77	0.04
Friday	111	0.05	0.79	0.05
Friday	112	0.05	1.10	0.05
Friday	113	0.07	1.50	0.07
Friday	114	0.09	1.69	0.09
Friday	115	0.11	1.58	0.11
Friday	116	0.10	1.27	0.10
Friday	117	0.08	0.79	0.08
Friday	118	0.05	0.32	0.05
Friday	119	0.02	0.21	0.02
Saturday	120	0.02	0.23	0.01
Saturday	121	0.01	0.24	0.01
Saturday	122	0.02	0.25	0.01
Saturday	123	0.02	0.25	0.02
Saturday	124	0.02	0.25	0.02
Saturday	125	0.02	0.51	0.02
Saturday	126	0.03	1.43	0.03
Saturday	127	0.09	1.80	0.09
Saturday	128	0.11	2.08	0.11
Saturday	129	0.13	2.03	0.13
Saturday	130	0.13	1.77	0.12
Saturday	131	0.11	1.59	0.11
Saturday	132	0.10	1.45	0.10
Saturday	133	0.09	1.24	0.09
Saturday	134	0.08	1.30	0.08
Saturday	135	0.08	1.40	0.08
Saturday	136	0.09	1.43	0.09
Saturday	137	0.09	1.46	0.09
Saturday	138	0.09	1.55	0.09
Saturday	139	0.10	1.55	0.09
Saturday	140	0.10	1.13	0.09
Saturday	141	0.07	0.66	0.07
Saturday	142	0.04	0.37	0.04
Saturday	143	0.02	0.24	0.02
Sunday	144	0.02	0.23	0.02
Sunday	145	0.01	0.24	0.01
Sunday	146	0.02	0.25	0.01
Sunday	147	0.02	0.25	0.02
Sunday	148	0.02	0.25	0.02
Sunday	149	0.02	0.51	0.02
Sunday	150	0.03	1.43	0.03
Sunday	151	0.09	1.80	0.09
Sunday	152	0.11	2.08	0.11
Sunday	153	0.13	2.03	0.13
Sunday	154	0.13	1.77	0.12
Sunday	155	0.11	1.59	0.11
Sunday	156	0.10	1.45	0.10
Sunday	157	0.09	1.24	0.09
Sunday	158	0.08	1.30	0.08
Sunday	159	0.08	1.40	0.08
Sunday	160	0.09	1.43	0.09
Sunday	161	0.09	1.46	0.09
Sunday	162	0.09	1.55	0.09
Sunday	163	0.10	1.55	0.09
Sunday	164	0.10	1.13	0.09
Sunday	165	0.07	0.66	0.07
Sunday	166	0.04	0.37	0.04
Sunday	167	0.02	0.24	0.02

Flow	Daily	Hourly	Wkend
0.06	1.09	0.21	0.21
	0.96	0.22	0.22
	0.96	0.21	0.23
	0.96	0.22	0.22
	0.96	0.43	0.23
	0.96	1.85	0.47
	1.09	2.26	1.31
		1.78	1.65
		1.58	1.90
		1.27	1.86
		1.08	1.62
		0.95	1.46
		0.80	1.33
		0.72	1.13
		0.80	1.19
		0.82	1.28
		1.14	1.31
		1.56	1.34
		1.76	1.42
		1.65	1.42
		1.32	1.03
		0.82	0.61
		0.33	0.34
		0.22	0.22

2016 ADS Meter 42C-47 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.03	0.00	0.01	0.03	0.00	0.02
Model	0.03	0.00	0.01	0.03	0.00	0.02
Diff	(0.00)	0.00	0.00	0.00	0.00	0.00
% Diff	0%	0%	0%	0%	1%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.00	0.00	0.00
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	0.00	0.00	0.00
5	0.01	0.00	0.00
6	0.02	0.01	0.02
7	0.03	0.02	0.03
8	0.03	0.03	0.03
9	0.03	0.03	0.03
10	0.02	0.03	0.03
11	0.02	0.03	0.02
12	0.02	0.03	0.02
13	0.01	0.02	0.02
14	0.01	0.02	0.02
15	0.01	0.02	0.01
16	0.01	0.02	0.02
17	0.02	0.02	0.02
18	0.02	0.02	0.02
19	0.02	0.02	0.02
20	0.02	0.02	0.02
21	0.02	0.01	0.02
22	0.01	0.01	0.01
23	0.01	0.01	0.01
Average	0.01	0.02	0.02

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.20	0.24	0.21
1	0.17	0.20	0.18
2	0.17	0.18	0.17
3	0.17	0.18	0.18
4	0.35	0.23	0.32
5	1.31	0.48	1.07
6	2.06	1.30	1.84
7	1.99	2.12	2.02
8	1.72	2.18	1.85
9	1.45	2.14	1.65
10	1.26	2.03	1.48
11	1.04	1.82	1.27
12	0.93	1.46	1.08
13	0.85	1.36	1.00
14	0.85	1.27	0.97
15	0.90	1.24	0.99
16	1.10	1.30	1.15
17	1.36	1.58	1.42
18	1.48	1.49	1.48
19	1.22	1.18	1.21
20	1.00	0.94	0.98
21	0.71	0.73	0.71
22	0.49	0.46	0.48
23	0.26	0.32	0.28
Total	23.04	26.41	24.00
Average	0.96	1.10	1.00

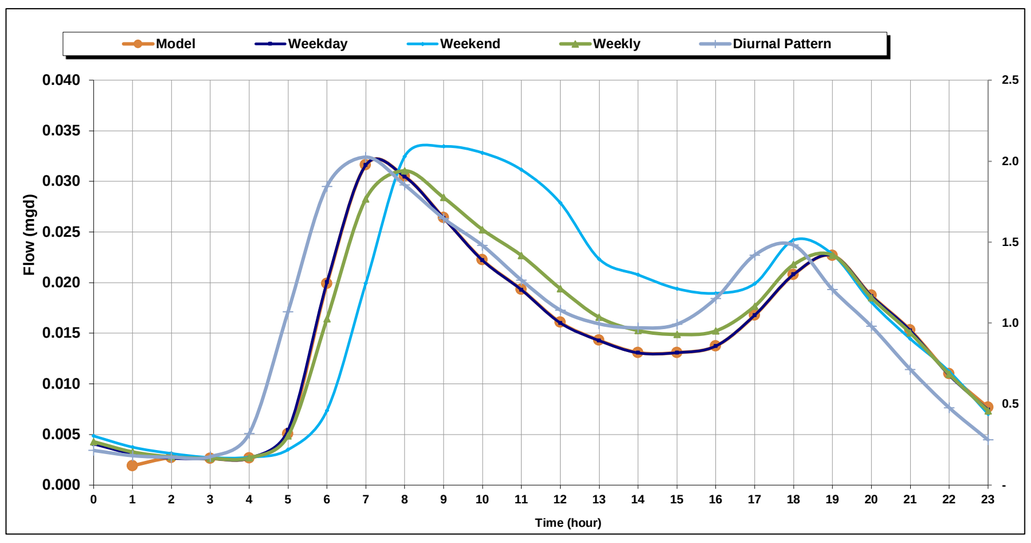
Diurnal Patterns Normalized

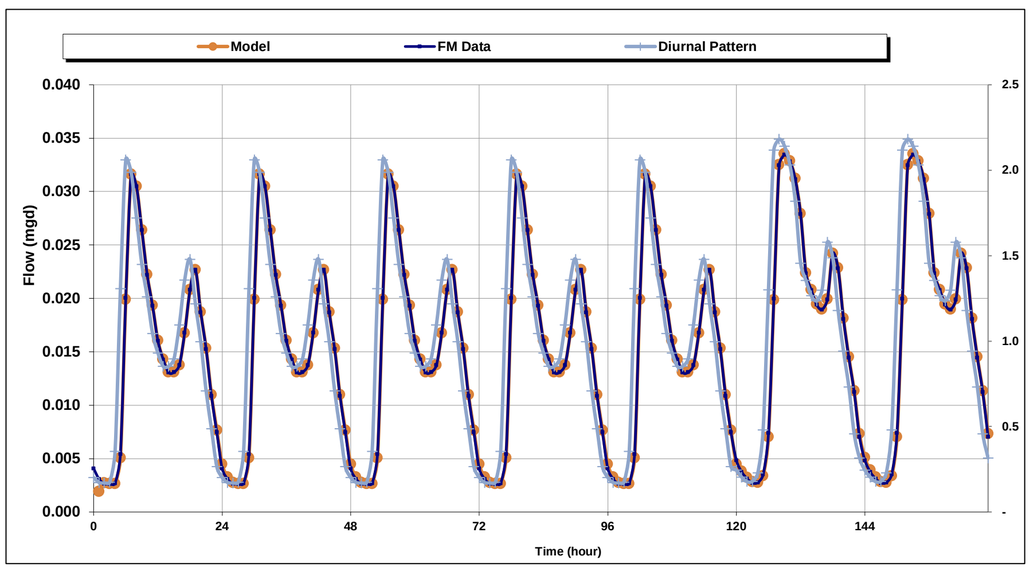
Date/Time	Weekday	Weekend	Weekly
0	0.21	0.22	0.21
1	0.18	0.19	0.18
2	0.18	0.16	0.17
3	0.18	0.16	0.18
4	0.37	0.21	0.32
5	1.36	0.44	1.07
6	2.15	1.18	1.84
7	2.07	1.92	2.02
8	1.79	1.98	1.85
9	1.51	1.95	1.65
10	1.31	1.85	1.48
11	1.09	1.65	1.27
12	0.97	1.32	1.08
13	0.89	1.23	1.00
14	0.89	1.15	0.97
15	0.93	1.12	0.99
16	1.14	1.18	1.15
17	1.41	1.43	1.42
18	1.54	1.35	1.48
19	1.27	1.07	1.21
20	1.04	0.86	0.98
21	0.74	0.67	0.71
22	0.51	0.42	0.48
23	0.28	0.29	0.28
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.00	0.20	
Monday	1	0.00	0.17	0.00
Monday	2	0.00	0.17	0.00
Monday	3	0.00	0.17	0.00
Monday	4	0.00	0.35	0.00
Monday	5	0.01	1.31	0.01
Monday	6	0.02	2.06	0.02
Monday	7	0.03	1.99	0.03
Monday	8	0.03	1.72	0.03
Monday	9	0.03	1.45	0.03
Monday	10	0.02	1.26	0.02
Monday	11	0.02	1.04	0.02
Monday	12	0.02	0.93	0.02
Monday	13	0.01	0.85	0.01
Monday	14	0.01	0.85	0.01
Monday	15	0.01	0.90	0.01
Monday	16	0.01	1.10	0.01
Monday	17	0.02	1.36	0.02
Monday	18	0.02	1.48	0.02
Monday	19	0.02	1.22	0.02
Monday	20	0.02	1.00	0.02
Monday	21	0.02	0.71	0.02
Monday	22	0.01	0.49	0.01
Monday	23	0.01	0.26	0.01
Tuesday	24	0.00	0.20	0.00
Tuesday	25	0.00	0.17	0.00
Tuesday	26	0.00	0.17	0.00
Tuesday	27	0.00	0.17	0.00
Tuesday	28	0.00	0.35	0.00
Tuesday	29	0.01	1.31	0.01
Tuesday	30	0.02	2.06	0.02
Tuesday	31	0.03	1.99	0.03
Tuesday	32	0.03	1.72	0.03
Tuesday	33	0.03	1.45	0.03
Tuesday	34	0.02	1.26	0.02
Tuesday	35	0.02	1.04	0.02
Tuesday	36	0.02	0.93	0.02
Tuesday	37	0.01	0.85	0.01
Tuesday	38	0.01	0.85	0.01
Tuesday	39	0.01	0.90	0.01
Tuesday	40	0.01	1.10	0.01
Tuesday	41	0.02	1.36	0.02
Tuesday	42	0.02	1.48	0.02
Tuesday	43	0.02	1.22	0.02
Tuesday	44	0.02	1.00	0.02
Tuesday	45	0.02	0.71	0.02
Tuesday	46	0.01	0.49	0.01
Tuesday	47	0.01	0.26	0.01
Wednesday	48	0.00	0.20	0.00
Wednesday	49	0.00	0.17	0.00
Wednesday	50	0.00	0.17	0.00
Wednesday	51	0.00	0.17	0.00
Wednesday	52	0.00	0.35	0.00
Wednesday	53	0.01	1.31	0.01
Wednesday	54	0.02	2.06	0.02
Wednesday	55	0.03	1.99	0.03
Wednesday	56	0.03	1.72	0.03
Wednesday	57	0.03	1.45	0.03
Wednesday	58	0.02	1.26	0.02
Wednesday	59	0.02	1.04	0.02
Wednesday	60	0.02	0.93	0.02
Wednesday	61	0.01	0.85	0.01
Wednesday	62	0.01	0.85	0.01
Wednesday	63	0.01	0.90	0.01
Wednesday	64	0.01	1.10	0.01
Wednesday	65	0.02	1.36	0.02
Wednesday	66	0.02	1.48	0.02
Wednesday	67	0.02	1.22	0.02
Wednesday	68	0.02	1.00	0.02
Wednesday	69	0.02	0.71	0.02
Wednesday	70	0.01	0.49	0.01
Wednesday	71	0.01	0.26	0.01
Thursday	72	0.00	0.20	0.00
Thursday	73	0.00	0.17	0.00
Thursday	74	0.00	0.17	0.00
Thursday	75	0.00	0.17	0.00
Thursday	76	0.00	0.35	0.00
Thursday	77	0.01	1.31	0.01
Thursday	78	0.02	2.06	0.02
Thursday	79	0.03	1.99	0.03
Thursday	80	0.03	1.72	0.03
Thursday	81	0.03	1.45	0.03
Thursday	82	0.02	1.26	0.02
Thursday	83	0.02	1.04	0.02
Thursday	84	0.02	0.93	0.02
Thursday	85	0.01	0.85	0.01
Thursday	86	0.01	0.85	0.01
Thursday	87	0.01	0.90	0.01
Thursday	88	0.01	1.10	0.01
Thursday	89	0.02	1.36	0.02
Thursday	90	0.02	1.48	0.02
Thursday	91	0.02	1.22	0.02
Thursday	92	0.02	1.00	0.02
Thursday	93	0.02	0.71	0.02
Thursday	94	0.01	0.49	0.01
Thursday	95	0.01	0.26	0.01
Friday	96	0.00	0.20	0.00
Friday	97	0.00	0.17	0.00
Friday	98	0.00	0.17	0.00
Friday	99	0.00	0.17	0.00
Friday	100	0.00	0.35	0.00
Friday	101	0.01	1.31	0.01
Friday	102	0.02	2.06	0.02
Friday	103	0.03	1.99	0.03
Friday	104	0.03	1.72	0.03
Friday	105	0.03	1.45	0.03
Friday	106	0.02	1.26	0.02
Friday	107	0.02	1.04	0.02
Friday	108	0.02	0.93	0.02
Friday	109	0.01	0.85	0.01
Friday	110	0.01	0.85	0.01
Friday	111	0.01	0.90	0.01
Friday	112	0.01	1.10	0.01
Friday	113	0.02	1.36	0.02
Friday	114	0.02	1.48	0.02
Friday	115	0.02	1.22	0.02
Friday	116	0.02	1.00	0.02
Friday	117	0.02	0.71	0.02
Friday	118	0.01	0.49	0.01
Friday	119	0.01	0.26	0.01
Saturday	120	0.00	0.24	0.00
Saturday	121	0.00	0.20	0.00
Saturday	122	0.00	0.18	0.00
Saturday	123	0.00	0.18	0.00
Saturday	124	0.00	0.23	0.00
Saturday	125	0.00	0.48	0.00
Saturday	126	0.01	1.30	0.01
Saturday	127	0.02	2.12	0.02
Saturday	128	0.03	2.18	0.03
Saturday	129	0.03	2.14	0.03
Saturday	130	0.03	2.03	0.03
Saturday	131	0.03	1.82	0.03
Saturday	132	0.03	1.46	0.03
Saturday	133	0.02	1.36	0.02
Saturday	134	0.02	1.27	0.02
Saturday	135	0.02	1.24	0.02
Saturday	136	0.02	1.30	0.02
Saturday	137	0.02	1.58	0.02
Saturday	138	0.02	1.49	0.02
Saturday	139	0.02	1.18	0.02
Saturday	140	0.02	0.94	0.02
Saturday	141	0.01	0.73	0.01
Saturday	142	0.01	0.46	0.01
Saturday	143	0.01	0.32	0.01
Sunday	144	0.00	0.24	0.01
Sunday	145	0.00	0.20	0.00
Sunday	146	0.00	0.18	0.00
Sunday	147	0.00	0.18	0.00
Sunday	148	0.00	0.23	0.00
Sunday	149	0.00	0.48	0.00
Sunday	150	0.01	1.30	0.01
Sunday	151	0.02	2.12	0.02
Sunday	152	0.03	2.18	0.03
Sunday	153	0.03	2.14	0.03
Sunday	154	0.03	2.03	0.03
Sunday	155	0.03	1.82	0.03
Sunday	156	0.03	1.46	0.03
Sunday	157	0.02	1.36	0.02
Sunday	158	0.02	1.27	0.02
Sunday	159	0.02	1.24	0.02
Sunday	160	0.02	1.30	0.02
Sunday	161	0.02	1.58	0.02
Sunday	162	0.02	1.49	0.02
Sunday	163	0.02	1.18	0.02
Sunday	164	0.02	0.94	0.02
Sunday	165	0.01	0.73	0.01
Sunday	166	0.01	0.46	0.01
Sunday	167	0.01	0.32	0.01

Flow	Daily	Hourly	Wkend
0.02	1.10	0.21	0.22
	0.96	0.18	0.19
	0.96	0.18	0.16
	0.96	0.18	0.16
	0.96	0.37	0.21
	0.96	1.36	0.44
1.10		2.15	1.18
		2.07	1.92
		1.79	1.98
		1.51	1.95
		1.31	1.85
		1.09	1.65
		0.97	1.32
		0.89	1.23
		0.89	1.15
		0.93	1.12
		1.14	1.18
		1.41	1.43
		1.54	1.35
		1.27	1.07
		1.04	0.86
		0.74	0.67
		0.51	0.42
		0.28	0.29

2016 ADS Meter 42C-47 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.03	0.00	0.01	0.03	0.00	0.02
Model	0.03	0.00	0.01	0.03	0.00	0.02
Diff	(0.00)	0.00	0.00	0.00	0.00	0.00
% Diff	0%	0%	0%	0%	1%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.00	0.00	0.00
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	0.00	0.00	0.00
5	0.01	0.00	0.00
6	0.02	0.01	0.02
7	0.03	0.02	0.03
8	0.03	0.03	0.03
9	0.03	0.03	0.03
10	0.02	0.03	0.03
11	0.02	0.03	0.02
12	0.02	0.03	0.02
13	0.01	0.02	0.02
14	0.01	0.02	0.02
15	0.01	0.02	0.01
16	0.01	0.02	0.02
17	0.02	0.02	0.02
18	0.02	0.02	0.02
19	0.02	0.02	0.02
20	0.02	0.02	0.02
21	0.02	0.01	0.02
22	0.01	0.01	0.01
23	0.01	0.01	0.01
Average	0.01	0.02	0.02

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.20	0.24	0.21
1	0.17	0.20	0.18
2	0.17	0.18	0.17
3	0.17	0.18	0.18
4	0.35	0.23	0.32
5	1.31	0.48	1.07
6	2.06	1.30	1.84
7	1.99	2.12	2.02
8	1.72	2.18	1.85
9	1.45	2.14	1.65
10	1.26	2.03	1.48
11	1.04	1.82	1.27
12	0.93	1.46	1.08
13	0.85	1.36	1.00
14	0.85	1.27	0.97
15	0.90	1.24	0.99
16	1.10	1.30	1.15
17	1.36	1.58	1.42
18	1.48	1.49	1.48
19	1.22	1.18	1.21
20	1.00	0.94	0.98
21	0.71	0.73	0.71
22	0.49	0.46	0.48
23	0.26	0.32	0.28
Total	23.04	26.41	24.00
Average	0.96	1.10	1.00

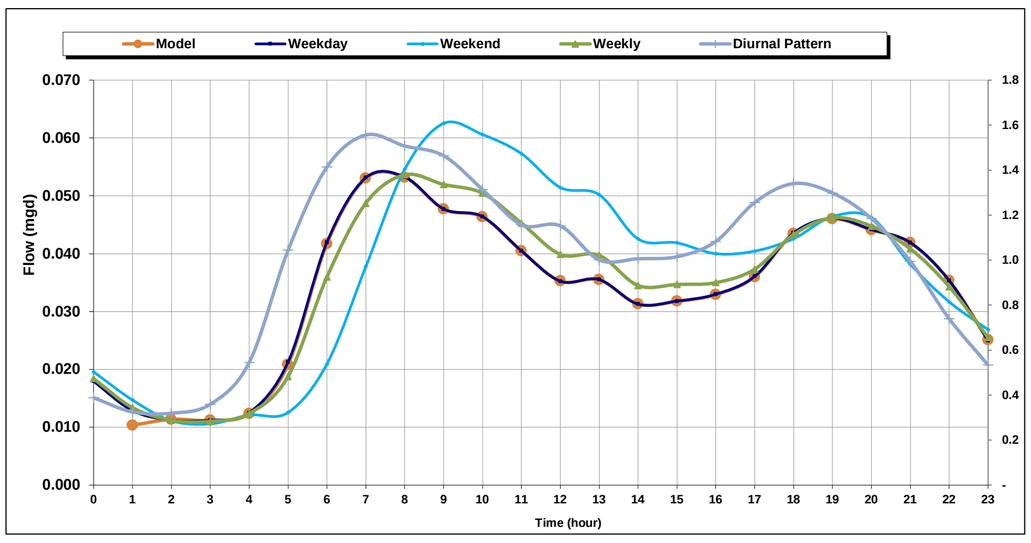
Diurnal Patterns Normalized

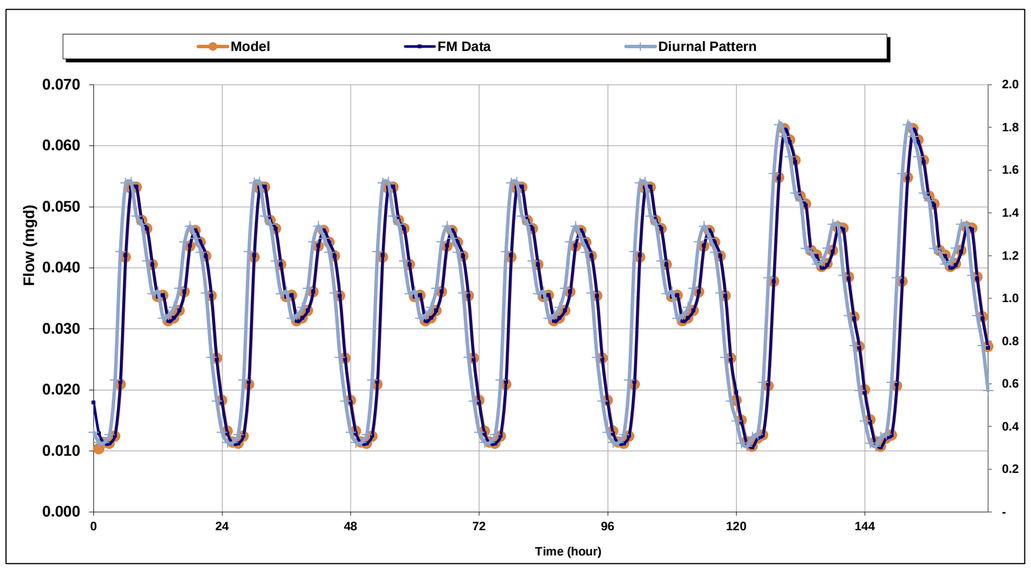
Date/Time	Weekday	Weekend	Weekly
0	0.21	0.22	0.21
1	0.18	0.19	0.18
2	0.18	0.16	0.17
3	0.18	0.16	0.18
4	0.37	0.21	0.32
5	1.36	0.44	1.07
6	2.15	1.18	1.84
7	2.07	1.92	2.02
8	1.79	1.98	1.85
9	1.51	1.95	1.65
10	1.31	1.85	1.48
11	1.09	1.65	1.27
12	0.97	1.32	1.08
13	0.89	1.23	1.00
14	0.89	1.15	0.97
15	0.93	1.12	0.99
16	1.14	1.18	1.15
17	1.41	1.43	1.42
18	1.54	1.35	1.48
19	1.27	1.07	1.21
20	1.04	0.86	0.98
21	0.74	0.67	0.71
22	0.51	0.42	0.48
23	0.28	0.29	0.28
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.00	0.20	
Monday	1	0.00	0.17	0.00
Monday	2	0.00	0.17	0.00
Monday	3	0.00	0.17	0.00
Monday	4	0.00	0.35	0.00
Monday	5	0.01	1.31	0.01
Monday	6	0.02	2.06	0.02
Monday	7	0.03	1.99	0.03
Monday	8	0.03	1.72	0.03
Monday	9	0.03	1.45	0.03
Monday	10	0.02	1.26	0.02
Monday	11	0.02	1.04	0.02
Monday	12	0.02	0.93	0.02
Monday	13	0.01	0.85	0.01
Monday	14	0.01	0.85	0.01
Monday	15	0.01	0.90	0.01
Monday	16	0.01	1.10	0.01
Monday	17	0.02	1.36	0.02
Monday	18	0.02	1.48	0.02
Monday	19	0.02	1.22	0.02
Monday	20	0.02	1.00	0.02
Monday	21	0.02	0.71	0.02
Monday	22	0.01	0.49	0.01
Monday	23	0.01	0.26	0.01
Tuesday	24	0.00	0.20	0.00
Tuesday	25	0.00	0.17	0.00
Tuesday	26	0.00	0.17	0.00
Tuesday	27	0.00	0.17	0.00
Tuesday	28	0.00	0.35	0.00
Tuesday	29	0.01	1.31	0.01
Tuesday	30	0.02	2.06	0.02
Tuesday	31	0.03	1.99	0.03
Tuesday	32	0.03	1.72	0.03
Tuesday	33	0.03	1.45	0.03
Tuesday	34	0.02	1.26	0.02
Tuesday	35	0.02	1.04	0.02
Tuesday	36	0.02	0.93	0.02
Tuesday	37	0.01	0.85	0.01
Tuesday	38	0.01	0.85	0.01
Tuesday	39	0.01	0.90	0.01
Tuesday	40	0.01	1.10	0.01
Tuesday	41	0.02	1.36	0.02
Tuesday	42	0.02	1.48	0.02
Tuesday	43	0.02	1.22	0.02
Tuesday	44	0.02	1.00	0.02
Tuesday	45	0.02	0.71	0.02
Tuesday	46	0.01	0.49	0.01
Tuesday	47	0.01	0.26	0.01
Wednesday	48	0.00	0.20	0.00
Wednesday	49	0.00	0.17	0.00
Wednesday	50	0.00	0.17	0.00
Wednesday	51	0.00	0.17	0.00
Wednesday	52	0.00	0.35	0.00
Wednesday	53	0.01	1.31	0.01
Wednesday	54	0.02	2.06	0.02
Wednesday	55	0.03	1.99	0.03
Wednesday	56	0.03	1.72	0.03
Wednesday	57	0.03	1.45	0.03
Wednesday	58	0.02	1.26	0.02
Wednesday	59	0.02	1.04	0.02
Wednesday	60	0.02	0.93	0.02
Wednesday	61	0.01	0.85	0.01
Wednesday	62	0.01	0.85	0.01
Wednesday	63	0.01	0.90	0.01
Wednesday	64	0.01	1.10	0.01
Wednesday	65	0.02	1.36	0.02
Wednesday	66	0.02	1.48	0.02
Wednesday	67	0.02	1.22	0.02
Wednesday	68	0.02	1.00	0.02
Wednesday	69	0.02	0.71	0.02
Wednesday	70	0.01	0.49	0.01
Wednesday	71	0.01	0.26	0.01
Thursday	72	0.00	0.20	0.00
Thursday	73	0.00	0.17	0.00
Thursday	74	0.00	0.17	0.00
Thursday	75	0.00	0.17	0.00
Thursday	76	0.00	0.35	0.00
Thursday	77	0.01	1.31	0.01
Thursday	78	0.02	2.06	0.02
Thursday	79	0.03	1.99	0.03
Thursday	80	0.03	1.72	0.03
Thursday	81	0.03	1.45	0.03
Thursday	82	0.02	1.26	0.02
Thursday	83	0.02	1.04	0.02
Thursday	84	0.02	0.93	0.02
Thursday	85	0.01	0.85	0.01
Thursday	86	0.01	0.85	0.01
Thursday	87	0.01	0.90	0.01
Thursday	88	0.01	1.10	0.01
Thursday	89	0.02	1.36	0.02
Thursday	90	0.02	1.48	0.02
Thursday	91	0.02	1.22	0.02
Thursday	92	0.02	1.00	0.02
Thursday	93	0.02	0.71	0.02
Thursday	94	0.01	0.49	0.01
Thursday	95	0.01	0.26	0.01
Friday	96	0.00	0.20	0.00
Friday	97	0.00	0.17	0.00
Friday	98	0.00	0.17	0.00
Friday	99	0.00	0.17	0.00
Friday	100	0.00	0.35	0.00
Friday	101	0.01	1.31	0.01
Friday	102	0.02	2.06	0.02
Friday	103	0.03	1.99	0.03
Friday	104	0.03	1.72	0.03
Friday	105	0.03	1.45	0.03
Friday	106	0.02	1.26	0.02
Friday	107	0.02	1.04	0.02
Friday	108	0.02	0.93	0.02
Friday	109	0.01	0.85	0.01
Friday	110	0.01	0.85	0.01
Friday	111	0.01	0.90	0.01
Friday	112	0.01	1.10	0.01
Friday	113	0.02	1.36	0.02
Friday	114	0.02	1.48	0.02
Friday	115	0.02	1.22	0.02
Friday	116	0.02	1.00	0.02
Friday	117	0.02	0.71	0.02
Friday	118	0.01	0.49	0.01
Friday	119	0.01	0.26	0.01
Saturday	120	0.00	0.24	0.00
Saturday	121	0.00	0.20	0.00
Saturday	122	0.00	0.18	0.00
Saturday	123	0.00	0.18	0.00
Saturday	124	0.00	0.23	0.00
Saturday	125	0.00	0.48	0.00
Saturday	126	0.01	1.30	0.01
Saturday	127	0.02	2.12	0.02
Saturday	128	0.03	2.18	0.03
Saturday	129	0.03	2.14	0.03
Saturday	130	0.03	2.03	0.03
Saturday	131	0.03	1.82	0.03
Saturday	132	0.03	1.46	0.03
Saturday	133	0.02	1.36	0.02
Saturday	134	0.02	1.27	0.02
Saturday	135	0.02	1.24	0.02
Saturday	136	0.02	1.30	0.02
Saturday	137	0.02	1.58	0.02
Saturday	138	0.02	1.49	0.02
Saturday	139	0.02	1.18	0.02
Saturday	140	0.02	0.94	0.02
Saturday	141	0.01	0.73	0.01
Saturday	142	0.01	0.46	0.01
Saturday	143	0.01	0.32	0.01
Sunday	144	0.00	0.24	0.01
Sunday	145	0.00	0.20	0.00
Sunday	146	0.00	0.18	0.00
Sunday	147	0.00	0.18	0.00
Sunday	148	0.00	0.23	0.00
Sunday	149	0.00	0.48	0.00
Sunday	150	0.01	1.30	0.01
Sunday	151	0.02	2.12	0.02
Sunday	152	0.03	2.18	0.03
Sunday	153	0.03	2.14	0.03
Sunday	154	0.03	2.03	0.03
Sunday	155	0.03	1.82	0.03
Sunday	156	0.03	1.46	0.03
Sunday	157	0.02	1.36	0.02
Sunday	158	0.02	1.27	0.02
Sunday	159	0.02	1.24	0.02
Sunday	160	0.02	1.30	0.02
Sunday	161	0.02	1.58	0.02
Sunday	162	0.02	1.49	0.02
Sunday	163	0.02	1.18	0.02
Sunday	164	0.02	0.94	0.02
Sunday	165	0.01	0.73	0.01
Sunday	166	0.01	0.46	0.01
Sunday	167	0.01	0.32	0.01

Flow	Daily	Hourly	Wkend
0.02	1.10	0.21	0.22
	0.96	0.18	0.19
	0.96	0.18	0.16
	0.96	0.18	0.16
	0.96	0.37	0.21
	0.96	1.36	0.44
1.10		2.15	1.18
		2.07	1.92
		1.79	1.98
		1.51	1.95
		1.31	1.85
		1.09	1.65
		0.97	1.32
		0.89	1.23
		0.89	1.15
		0.93	1.12
		1.14	1.18
		1.41	1.43
		1.54	1.35
		1.27	1.07
		1.04	0.86
		0.74	0.67
		0.51	0.42
		0.28	0.29

2016 ADS Meter 6B-4 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.05	0.01	0.03	0.06	0.01	0.04
Model	0.05	0.01	0.03	0.06	0.01	0.04
Diff	(0.00)	(0.00)	(0.00)	0.00	0.00	0.00
% Diff	0%	0%	0%	0%	1%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.02	0.02	0.02
1	0.01	0.01	0.01
2	0.01	0.01	0.01
3	0.01	0.01	0.01
4	0.01	0.01	0.01
5	0.02	0.01	0.02
6	0.04	0.02	0.04
7	0.05	0.04	0.05
8	0.05	0.05	0.05
9	0.05	0.06	0.05
10	0.05	0.06	0.05
11	0.04	0.06	0.05
12	0.04	0.05	0.04
13	0.04	0.05	0.04
14	0.03	0.04	0.03
15	0.03	0.04	0.03
16	0.03	0.04	0.03
17	0.04	0.04	0.04
18	0.04	0.04	0.04
19	0.05	0.05	0.05
20	0.04	0.05	0.04
21	0.04	0.04	0.04
22	0.04	0.03	0.03
23	0.02	0.03	0.03
Average	0.03	0.04	0.03

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.37	0.43	0.39
1	0.33	0.32	0.33
2	0.32	0.31	0.32
3	0.36	0.35	0.36
4	0.62	0.36	0.54
5	1.22	0.61	1.04
6	1.54	1.10	1.41
7	1.55	1.58	1.56
8	1.38	1.81	1.51
9	1.35	1.76	1.46
10	1.17	1.66	1.31
11	1.02	1.49	1.16
12	1.03	1.46	1.15
13	0.91	1.23	1.00
14	0.92	1.21	1.01
15	0.96	1.16	1.02
16	1.05	1.17	1.08
17	1.26	1.24	1.26
18	1.34	1.35	1.34
19	1.28	1.34	1.30
20	1.22	1.11	1.19
21	1.03	0.92	1.00
22	0.72	0.78	0.74
23	0.52	0.57	0.53
Total	23.47	25.32	24.00
Average	0.98	1.06	1.00

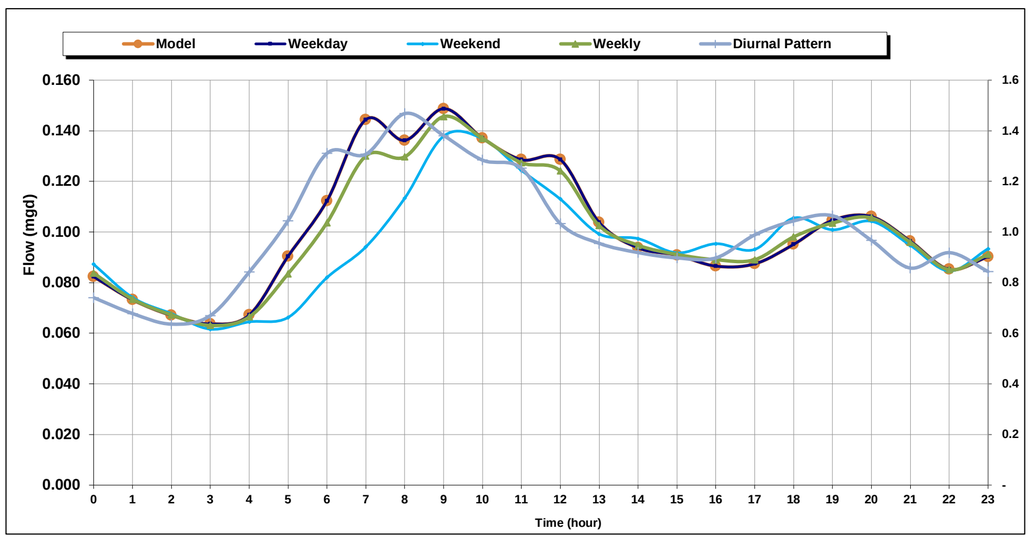
Diurnal Patterns Normalized

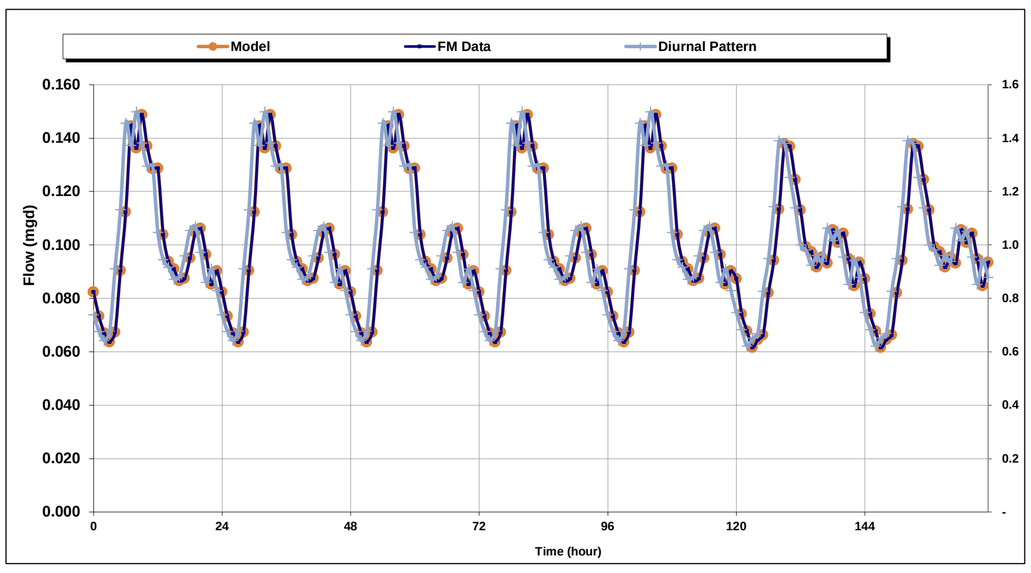
Date/Time	Weekday	Weekend	Weekly
0	0.38	0.40	0.39
1	0.33	0.31	0.33
2	0.33	0.29	0.32
3	0.37	0.33	0.36
4	0.63	0.35	0.54
5	1.25	0.58	1.04
6	1.58	1.04	1.41
7	1.58	1.50	1.56
8	1.42	1.72	1.51
9	1.38	1.67	1.46
10	1.20	1.58	1.31
11	1.05	1.41	1.16
12	1.05	1.38	1.15
13	0.93	1.17	1.00
14	0.94	1.15	1.01
15	0.98	1.10	1.02
16	1.07	1.11	1.08
17	1.29	1.17	1.26
18	1.37	1.28	1.34
19	1.31	1.27	1.30
20	1.24	1.05	1.19
21	1.05	0.87	1.00
22	0.74	0.74	0.74
23	0.53	0.54	0.53
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.02	0.37	
Monday	1	0.01	0.33	0.01
Monday	2	0.01	0.32	0.01
Monday	3	0.01	0.36	0.01
Monday	4	0.01	0.62	0.01
Monday	5	0.02	1.22	0.02
Monday	6	0.04	1.54	0.04
Monday	7	0.05	1.55	0.05
Monday	8	0.05	1.38	0.05
Monday	9	0.05	1.35	0.05
Monday	10	0.05	1.17	0.05
Monday	11	0.04	1.02	0.04
Monday	12	0.04	1.03	0.04
Monday	13	0.04	0.91	0.04
Monday	14	0.03	0.92	0.03
Monday	15	0.03	0.96	0.03
Monday	16	0.03	1.05	0.03
Monday	17	0.04	1.26	0.04
Monday	18	0.04	1.34	0.04
Monday	19	0.05	1.28	0.05
Monday	20	0.04	1.22	0.04
Monday	21	0.04	1.03	0.04
Monday	22	0.04	0.72	0.04
Monday	23	0.02	0.52	0.03
Tuesday	24	0.02	0.37	0.02
Tuesday	25	0.01	0.33	0.01
Tuesday	26	0.01	0.32	0.01
Tuesday	27	0.01	0.36	0.01
Tuesday	28	0.01	0.62	0.01
Tuesday	29	0.02	1.22	0.02
Tuesday	30	0.04	1.54	0.04
Tuesday	31	0.05	1.55	0.05
Tuesday	32	0.05	1.38	0.05
Tuesday	33	0.05	1.35	0.05
Tuesday	34	0.05	1.17	0.05
Tuesday	35	0.04	1.02	0.04
Tuesday	36	0.04	1.03	0.04
Tuesday	37	0.04	0.91	0.04
Tuesday	38	0.03	0.92	0.03
Tuesday	39	0.03	0.96	0.03
Tuesday	40	0.03	1.05	0.03
Tuesday	41	0.04	1.26	0.04
Tuesday	42	0.04	1.34	0.04
Tuesday	43	0.05	1.28	0.05
Tuesday	44	0.04	1.22	0.04
Tuesday	45	0.04	1.03	0.04
Tuesday	46	0.04	0.72	0.04
Tuesday	47	0.02	0.52	0.03
Wednesday	48	0.02	0.37	0.02
Wednesday	49	0.01	0.33	0.01
Wednesday	50	0.01	0.32	0.01
Wednesday	51	0.01	0.36	0.01
Wednesday	52	0.01	0.62	0.01
Wednesday	53	0.02	1.22	0.02
Wednesday	54	0.04	1.54	0.04
Wednesday	55	0.05	1.55	0.05
Wednesday	56	0.05	1.38	0.05
Wednesday	57	0.05	1.35	0.05
Wednesday	58	0.05	1.17	0.05
Wednesday	59	0.04	1.02	0.04
Wednesday	60	0.04	1.03	0.04
Wednesday	61	0.04	0.91	0.04
Wednesday	62	0.03	0.92	0.03
Wednesday	63	0.03	0.96	0.03
Wednesday	64	0.03	1.05	0.03
Wednesday	65	0.04	1.26	0.04
Wednesday	66	0.04	1.34	0.04
Wednesday	67	0.05	1.28	0.05
Wednesday	68	0.04	1.22	0.04
Wednesday	69	0.04	1.03	0.04
Wednesday	70	0.04	0.72	0.04
Wednesday	71	0.02	0.52	0.03
Thursday	72	0.02	0.37	0.02
Thursday	73	0.01	0.33	0.01
Thursday	74	0.01	0.32	0.01
Thursday	75	0.01	0.36	0.01
Thursday	76	0.01	0.62	0.01
Thursday	77	0.02	1.22	0.02
Thursday	78	0.04	1.54	0.04
Thursday	79	0.05	1.55	0.05
Thursday	80	0.05	1.38	0.05
Thursday	81	0.05	1.35	0.05
Thursday	82	0.05	1.17	0.05
Thursday	83	0.04	1.02	0.04
Thursday	84	0.04	1.03	0.04
Thursday	85	0.04	0.91	0.04
Thursday	86	0.03	0.92	0.03
Thursday	87	0.03	0.96	0.03
Thursday	88	0.03	1.05	0.03
Thursday	89	0.04	1.26	0.04
Thursday	90	0.04	1.34	0.04
Thursday	91	0.05	1.28	0.05
Thursday	92	0.04	1.22	0.04
Thursday	93	0.04	1.03	0.04
Thursday	94	0.04	0.72	0.04
Thursday	95	0.02	0.52	0.03
Friday	96	0.02	0.37	0.02
Friday	97	0.01	0.33	0.01
Friday	98	0.01	0.32	0.01
Friday	99	0.01	0.36	0.01
Friday	100	0.01	0.62	0.01
Friday	101	0.02	1.22	0.02
Friday	102	0.04	1.54	0.04
Friday	103	0.05	1.55	0.05
Friday	104	0.05	1.38	0.05
Friday	105	0.05	1.35	0.05
Friday	106	0.05	1.17	0.05
Friday	107	0.04	1.02	0.04
Friday	108	0.04	1.03	0.04
Friday	109	0.04	0.91	0.04
Friday	110	0.03	0.92	0.03
Friday	111	0.03	0.96	0.03
Friday	112	0.03	1.05	0.03
Friday	113	0.04	1.26	0.04
Friday	114	0.04	1.34	0.04
Friday	115	0.05	1.28	0.05
Friday	116	0.04	1.22	0.04
Friday	117	0.04	1.03	0.04
Friday	118	0.04	0.72	0.04
Friday	119	0.02	0.52	0.03
Saturday	120	0.02	0.43	0.02
Saturday	121	0.01	0.32	0.01
Saturday	122	0.01	0.31	0.01
Saturday	123	0.01	0.35	0.01
Saturday	124	0.01	0.36	0.01
Saturday	125	0.01	0.61	0.01
Saturday	126	0.02	1.10	0.02
Saturday	127	0.04	1.58	0.04
Saturday	128	0.05	1.81	0.05
Saturday	129	0.06	1.76	0.06
Saturday	130	0.06	1.66	0.06
Saturday	131	0.06	1.49	0.06
Saturday	132	0.05	1.46	0.05
Saturday	133	0.05	1.23	0.05
Saturday	134	0.04	1.21	0.04
Saturday	135	0.04	1.16	0.04
Saturday	136	0.04	1.17	0.04
Saturday	137	0.04	1.24	0.04
Saturday	138	0.04	1.35	0.04
Saturday	139	0.05	1.34	0.05
Saturday	140	0.05	1.11	0.05
Saturday	141	0.04	0.92	0.04
Saturday	142	0.03	0.78	0.03
Saturday	143	0.03	0.57	0.03
Sunday	144	0.02	0.43	0.02
Sunday	145	0.01	0.32	0.02
Sunday	146	0.01	0.31	0.01
Sunday	147	0.01	0.35	0.01
Sunday	148	0.01	0.36	0.01
Sunday	149	0.01	0.61	0.01
Sunday	150	0.02	1.10	0.02
Sunday	151	0.04	1.58	0.04
Sunday	152	0.05	1.81	0.05
Sunday	153	0.06	1.76	0.06
Sunday	154	0.06	1.66	0.06
Sunday	155	0.06	1.49	0.06
Sunday	156	0.05	1.46	0.05
Sunday	157	0.05	1.23	0.05
Sunday	158	0.04	1.21	0.04
Sunday	159	0.04	1.16	0.04
Sunday	160	0.04	1.17	0.04
Sunday	161	0.04	1.24	0.04
Sunday	162	0.04	1.35	0.04
Sunday	163	0.05	1.34	0.05
Sunday	164	0.05	1.11	0.05
Sunday	165	0.04	0.92	0.04
Sunday	166	0.03	0.78	0.03
Sunday	167	0.03	0.57	0.03

Flow	Daily	Hourly	Wkend
0.03	1.06	0.38	0.40
	0.98	0.33	0.31
	0.98	0.33	0.29
	0.98	0.37	0.33
	0.98	0.63	0.35
	0.98	1.25	0.58
1.06		1.58	1.04
		1.58	1.50
		1.42	1.72
		1.38	1.67
		1.20	1.58
		1.05	1.41
		1.05	1.38
		0.93	1.17
		0.94	1.15
		0.98	1.10
		1.07	1.11
		1.29	1.17
		1.37	1.28
		1.31	1.27
		1.24	1.05
		1.05	0.87
		0.74	0.74
		0.53	0.54

2014 ADS Meter 10c-25 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.15	0.06	0.10	0.14	0.06	0.10
Model	0.15	0.06	0.10	0.14	0.06	0.10
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.08	0.09	0.08
1	0.07	0.07	0.07
2	0.07	0.07	0.07
3	0.06	0.06	0.06
4	0.07	0.06	0.07
5	0.09	0.07	0.08
6	0.11	0.08	0.10
7	0.14	0.09	0.13
8	0.14	0.11	0.13
9	0.15	0.14	0.15
10	0.14	0.14	0.14
11	0.13	0.12	0.13
12	0.13	0.11	0.12
13	0.10	0.10	0.10
14	0.09	0.10	0.09
15	0.09	0.09	0.09
16	0.09	0.10	0.09
17	0.09	0.09	0.09
18	0.10	0.11	0.10
19	0.10	0.10	0.10
20	0.11	0.10	0.11
21	0.10	0.09	0.10
22	0.09	0.08	0.09
23	0.09	0.09	0.09
Average	0.10	0.10	0.10

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.74	0.75	0.74
1	0.68	0.68	0.68
2	0.64	0.62	0.64
3	0.68	0.65	0.67
4	0.91	0.67	0.84
5	1.13	0.83	1.04
6	1.46	0.95	1.31
7	1.37	1.14	1.31
8	1.50	1.39	1.47
9	1.38	1.38	1.38
10	1.30	1.25	1.28
11	1.30	1.14	1.25
12	1.05	1.00	1.03
13	0.94	0.98	0.96
14	0.92	0.92	0.92
15	0.87	0.96	0.90
16	0.88	0.94	0.90
17	0.96	1.06	0.99
18	1.05	1.02	1.04
19	1.07	1.05	1.06
20	0.97	0.96	0.97
21	0.86	0.85	0.86
22	0.91	0.94	0.92
23	0.83	0.88	0.84
Total	24.39	23.02	24.00
Average	1.02	0.96	1.00

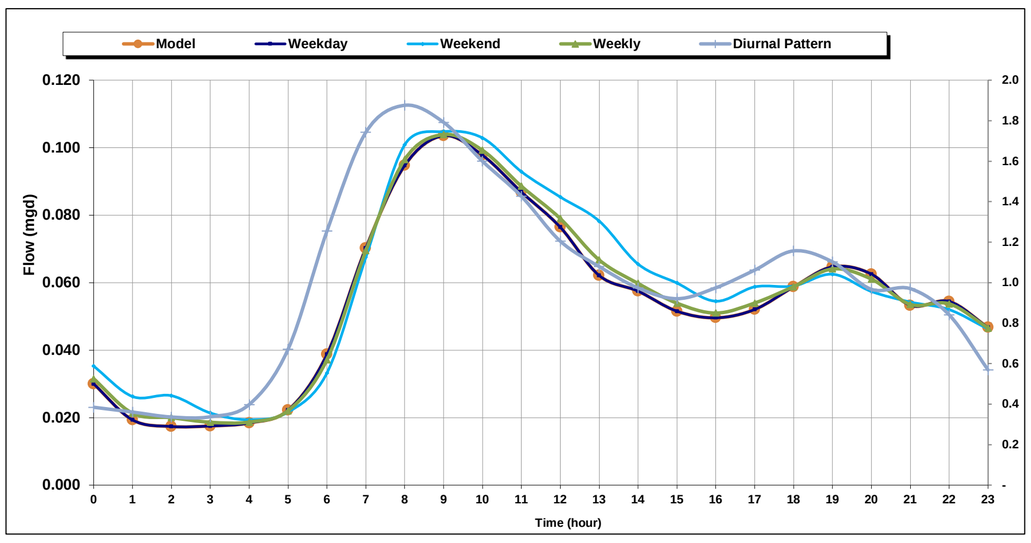
Diurnal Patterns Normalized

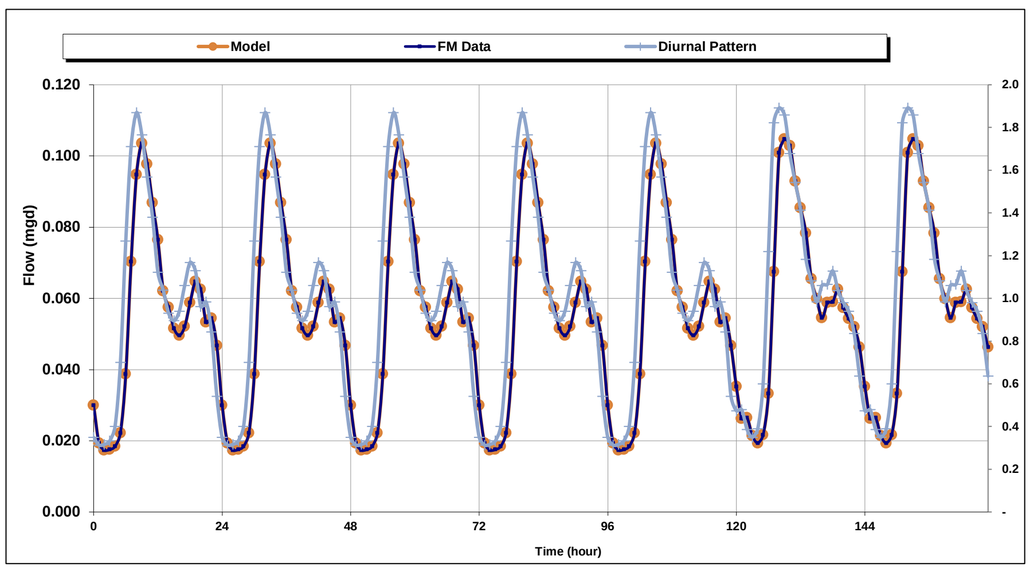
Date/Time	Weekday	Weekend	Weekly
0	0.73	0.78	0.74
1	0.66	0.71	0.68
2	0.63	0.65	0.64
3	0.67	0.68	0.67
4	0.90	0.70	0.84
5	1.11	0.86	1.04
6	1.43	0.99	1.31
7	1.35	1.19	1.31
8	1.48	1.45	1.47
9	1.36	1.44	1.38
10	1.28	1.31	1.28
11	1.28	1.19	1.25
12	1.03	1.04	1.03
13	0.93	1.02	0.96
14	0.90	0.96	0.92
15	0.86	1.00	0.90
16	0.87	0.98	0.90
17	0.94	1.11	0.99
18	1.04	1.06	1.04
19	1.05	1.10	1.06
20	0.96	1.00	0.97
21	0.85	0.89	0.86
22	0.89	0.98	0.92
23	0.82	0.92	0.84
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.08	0.74	0.08
Monday	1	0.07	0.68	0.07
Monday	2	0.07	0.64	0.07
Monday	3	0.06	0.68	0.06
Monday	4	0.07	0.91	0.07
Monday	5	0.09	1.13	0.09
Monday	6	0.11	1.46	0.11
Monday	7	0.14	1.37	0.14
Monday	8	0.14	1.50	0.14
Monday	9	0.15	1.38	0.15
Monday	10	0.14	1.30	0.14
Monday	11	0.13	1.30	0.13
Monday	12	0.13	1.05	0.13
Monday	13	0.10	0.94	0.10
Monday	14	0.09	0.92	0.09
Monday	15	0.09	0.87	0.09
Monday	16	0.09	0.88	0.09
Monday	17	0.09	0.96	0.09
Monday	18	0.10	1.05	0.10
Monday	19	0.10	1.07	0.10
Monday	20	0.11	0.97	0.11
Monday	21	0.10	0.86	0.10
Monday	22	0.09	0.91	0.09
Monday	23	0.09	0.83	0.09
Tuesday	24	0.08	0.74	0.08
Tuesday	25	0.07	0.68	0.07
Tuesday	26	0.07	0.64	0.07
Tuesday	27	0.06	0.68	0.06
Tuesday	28	0.07	0.91	0.07
Tuesday	29	0.09	1.13	0.09
Tuesday	30	0.11	1.46	0.11
Tuesday	31	0.14	1.37	0.14
Tuesday	32	0.14	1.50	0.14
Tuesday	33	0.15	1.38	0.15
Tuesday	34	0.14	1.30	0.14
Tuesday	35	0.13	1.30	0.13
Tuesday	36	0.13	1.05	0.13
Tuesday	37	0.10	0.94	0.10
Tuesday	38	0.09	0.92	0.09
Tuesday	39	0.09	0.87	0.09
Tuesday	40	0.09	0.88	0.09
Tuesday	41	0.09	0.96	0.09
Tuesday	42	0.10	1.05	0.10
Tuesday	43	0.10	1.07	0.10
Tuesday	44	0.11	0.97	0.11
Tuesday	45	0.10	0.86	0.10
Tuesday	46	0.09	0.91	0.09
Tuesday	47	0.09	0.83	0.09
Wednesday	48	0.08	0.74	0.08
Wednesday	49	0.07	0.68	0.07
Wednesday	50	0.07	0.64	0.07
Wednesday	51	0.06	0.68	0.06
Wednesday	52	0.07	0.91	0.07
Wednesday	53	0.09	1.13	0.09
Wednesday	54	0.11	1.46	0.11
Wednesday	55	0.14	1.37	0.14
Wednesday	56	0.14	1.50	0.14
Wednesday	57	0.15	1.38	0.15
Wednesday	58	0.14	1.30	0.14
Wednesday	59	0.13	1.30	0.13
Wednesday	60	0.13	1.05	0.13
Wednesday	61	0.10	0.94	0.10
Wednesday	62	0.09	0.92	0.09
Wednesday	63	0.09	0.87	0.09
Wednesday	64	0.09	0.88	0.09
Wednesday	65	0.09	0.96	0.09
Wednesday	66	0.10	1.05	0.10
Wednesday	67	0.10	1.07	0.10
Wednesday	68	0.11	0.97	0.11
Wednesday	69	0.10	0.86	0.10
Wednesday	70	0.09	0.91	0.09
Wednesday	71	0.09	0.83	0.09
Thursday	72	0.08	0.74	0.08
Thursday	73	0.07	0.68	0.07
Thursday	74	0.07	0.64	0.07
Thursday	75	0.06	0.68	0.06
Thursday	76	0.07	0.91	0.07
Thursday	77	0.09	1.13	0.09
Thursday	78	0.11	1.46	0.11
Thursday	79	0.14	1.37	0.14
Thursday	80	0.14	1.50	0.14
Thursday	81	0.15	1.38	0.15
Thursday	82	0.14	1.30	0.14
Thursday	83	0.13	1.30	0.13
Thursday	84	0.13	1.05	0.13
Thursday	85	0.10	0.94	0.10
Thursday	86	0.09	0.92	0.09
Thursday	87	0.09	0.87	0.09
Thursday	88	0.09	0.88	0.09
Thursday	89	0.09	0.96	0.09
Thursday	90	0.10	1.05	0.10
Thursday	91	0.10	1.07	0.10
Thursday	92	0.11	0.97	0.11
Thursday	93	0.10	0.86	0.10
Thursday	94	0.09	0.91	0.09
Thursday	95	0.09	0.83	0.09
Friday	96	0.08	0.74	0.08
Friday	97	0.07	0.68	0.07
Friday	98	0.07	0.64	0.07
Friday	99	0.06	0.68	0.06
Friday	100	0.07	0.91	0.07
Friday	101	0.09	1.13	0.09
Friday	102	0.11	1.46	0.11
Friday	103	0.14	1.37	0.14
Friday	104	0.14	1.50	0.14
Friday	105	0.15	1.38	0.15
Friday	106	0.14	1.30	0.14
Friday	107	0.13	1.30	0.13
Friday	108	0.13	1.05	0.13
Friday	109	0.10	0.94	0.10
Friday	110	0.09	0.92	0.09
Friday	111	0.09	0.87	0.09
Friday	112	0.09	0.88	0.09
Friday	113	0.09	0.96	0.09
Friday	114	0.10	1.05	0.10
Friday	115	0.10	1.07	0.10
Friday	116	0.11	0.97	0.11
Friday	117	0.10	0.86	0.10
Friday	118	0.09	0.91	0.09
Friday	119	0.09	0.83	0.09
Saturday	120	0.09	0.75	0.09
Saturday	121	0.07	0.68	0.07
Saturday	122	0.07	0.62	0.07
Saturday	123	0.06	0.65	0.06
Saturday	124	0.06	0.67	0.06
Saturday	125	0.07	0.83	0.07
Saturday	126	0.08	0.95	0.08
Saturday	127	0.09	1.14	0.09
Saturday	128	0.11	1.39	0.11
Saturday	129	0.14	1.38	0.14
Saturday	130	0.14	1.25	0.14
Saturday	131	0.12	1.14	0.12
Saturday	132	0.11	1.00	0.11
Saturday	133	0.10	0.98	0.10
Saturday	134	0.10	0.92	0.10
Saturday	135	0.09	0.96	0.09
Saturday	136	0.10	0.94	0.10
Saturday	137	0.09	1.06	0.09
Saturday	138	0.11	1.02	0.11
Saturday	139	0.10	1.05	0.10
Saturday	140	0.10	0.96	0.10
Saturday	141	0.09	0.85	0.09
Saturday	142	0.08	0.94	0.08
Saturday	143	0.09	0.88	0.09
Sunday	144	0.09	0.75	0.09
Sunday	145	0.07	0.68	0.07
Sunday	146	0.07	0.62	0.07
Sunday	147	0.06	0.65	0.06
Sunday	148	0.06	0.67	0.06
Sunday	149	0.07	0.83	0.07
Sunday	150	0.08	0.95	0.08
Sunday	151	0.09	1.14	0.09
Sunday	152	0.11	1.39	0.11
Sunday	153	0.14	1.38	0.14
Sunday	154	0.14	1.25	0.14
Sunday	155	0.12	1.14	0.12
Sunday	156	0.11	1.00	0.11
Sunday	157	0.10	0.98	0.10
Sunday	158	0.10	0.92	0.10
Sunday	159	0.09	0.96	0.09
Sunday	160	0.10	0.94	0.10
Sunday	161	0.09	1.06	0.09
Sunday	162	0.11	1.02	0.11
Sunday	163	0.10	1.05	0.10
Sunday	164	0.10	0.96	0.10
Sunday	165	0.09	0.85	0.09
Sunday	166	0.08	0.94	0.08
Sunday	167	0.09	0.88	0.09

Flow	Daily	Hourly	Wkend
0.10	0.96	0.73	0.78
	1.02	0.66	0.71
	1.02	0.63	0.65
	1.02	0.67	0.68
	1.02	0.90	0.70
	1.02	1.11	0.86
	0.96	1.43	0.99
		1.35	1.19
		1.48	1.45
		1.36	1.44
		1.28	1.31
		1.28	1.19
		1.03	1.04
		0.93	1.02
		0.90	0.96
		0.86	1.00
		0.87	0.98
		0.94	1.11
		1.04	1.06
		1.05	1.10
		0.96	1.00
		0.85	0.89
		0.89	0.98
		0.82	0.92

2014 ADS Meter 18C-3 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.10	0.02	0.05	0.10	0.02	0.06
Model	0.10	0.02	0.05	0.10	0.02	0.06
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.03	0.04	0.03
1	0.02	0.03	0.02
2	0.02	0.03	0.02
3	0.02	0.02	0.02
4	0.02	0.02	0.02
5	0.02	0.02	0.02
6	0.04	0.03	0.04
7	0.07	0.07	0.07
8	0.09	0.10	0.10
9	0.10	0.10	0.10
10	0.10	0.10	0.10
11	0.09	0.09	0.09
12	0.08	0.09	0.08
13	0.06	0.08	0.07
14	0.06	0.07	0.06
15	0.05	0.06	0.05
16	0.05	0.05	0.05
17	0.05	0.06	0.05
18	0.06	0.06	0.06
19	0.06	0.06	0.06
20	0.06	0.06	0.06
21	0.05	0.05	0.05
22	0.05	0.05	0.05
23	0.05	0.05	0.05
Average	0.05	0.06	0.06

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.35	0.47	0.38
1	0.31	0.48	0.36
2	0.32	0.39	0.34
3	0.33	0.35	0.34
4	0.40	0.39	0.40
5	0.70	0.60	0.67
6	1.27	1.22	1.25
7	1.71	1.82	1.74
8	1.87	1.89	1.88
9	1.76	1.86	1.79
10	1.57	1.68	1.60
11	1.38	1.54	1.43
12	1.12	1.41	1.20
13	1.04	1.18	1.08
14	0.93	1.08	0.97
15	0.90	0.98	0.92
16	0.94	1.06	0.97
17	1.06	1.07	1.06
18	1.17	1.13	1.16
19	1.13	1.04	1.10
20	0.96	0.98	0.97
21	0.98	0.94	0.97
22	0.84	0.84	0.84
23	0.54	0.64	0.57
Total	23.59	25.03	24.00
Average	0.98	1.04	1.00

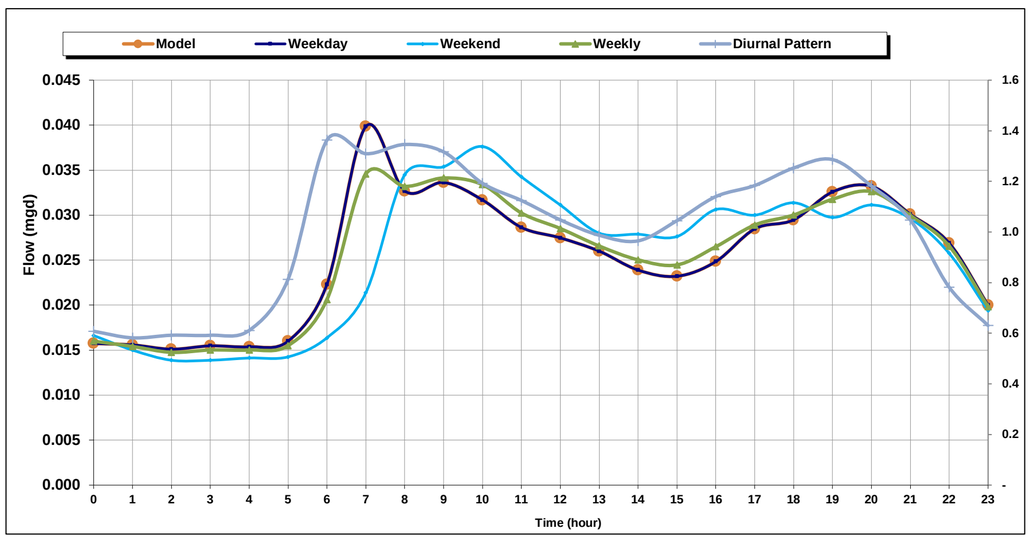
Diurnal Patterns Normalized

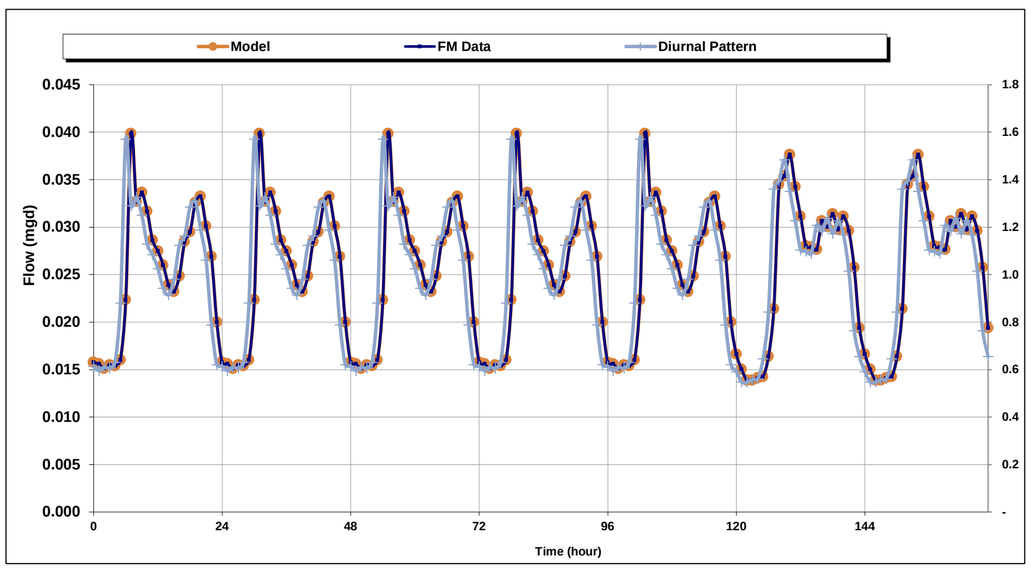
Date/Time	Weekday	Weekend	Weekly
0	0.35	0.45	0.38
1	0.32	0.46	0.36
2	0.32	0.37	0.34
3	0.34	0.34	0.34
4	0.41	0.37	0.40
5	0.71	0.58	0.67
6	1.29	1.17	1.25
7	1.74	1.75	1.74
8	1.90	1.81	1.88
9	1.80	1.78	1.79
10	1.60	1.61	1.60
11	1.40	1.48	1.43
12	1.14	1.35	1.20
13	1.06	1.13	1.08
14	0.95	1.04	0.97
15	0.91	0.94	0.92
16	0.96	1.02	0.97
17	1.08	1.02	1.06
18	1.19	1.08	1.16
19	1.15	0.99	1.10
20	0.98	0.94	0.97
21	1.00	0.90	0.97
22	0.86	0.80	0.84
23	0.55	0.61	0.57
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.03	0.35	0.03
Monday	1	0.02	0.31	0.02
Monday	2	0.02	0.32	0.02
Monday	3	0.02	0.33	0.02
Monday	4	0.02	0.40	0.02
Monday	5	0.02	0.70	0.02
Monday	6	0.04	1.27	0.04
Monday	7	0.07	1.71	0.07
Monday	8	0.09	1.87	0.09
Monday	9	0.10	1.76	0.10
Monday	10	0.10	1.57	0.10
Monday	11	0.09	1.38	0.09
Monday	12	0.08	1.12	0.08
Monday	13	0.06	1.04	0.06
Monday	14	0.06	0.93	0.06
Monday	15	0.05	0.90	0.05
Monday	16	0.05	0.94	0.05
Monday	17	0.05	1.06	0.05
Monday	18	0.06	1.17	0.06
Monday	19	0.06	1.13	0.06
Monday	20	0.06	0.96	0.06
Monday	21	0.05	0.98	0.05
Monday	22	0.05	0.84	0.05
Monday	23	0.05	0.54	0.05
Tuesday	24	0.03	0.35	0.03
Tuesday	25	0.02	0.31	0.02
Tuesday	26	0.02	0.32	0.02
Tuesday	27	0.02	0.33	0.02
Tuesday	28	0.02	0.40	0.02
Tuesday	29	0.02	0.70	0.02
Tuesday	30	0.04	1.27	0.04
Tuesday	31	0.07	1.71	0.07
Tuesday	32	0.09	1.87	0.09
Tuesday	33	0.10	1.76	0.10
Tuesday	34	0.10	1.57	0.10
Tuesday	35	0.09	1.38	0.09
Tuesday	36	0.08	1.12	0.08
Tuesday	37	0.06	1.04	0.06
Tuesday	38	0.06	0.93	0.06
Tuesday	39	0.05	0.90	0.05
Tuesday	40	0.05	0.94	0.05
Tuesday	41	0.05	1.06	0.05
Tuesday	42	0.06	1.17	0.06
Tuesday	43	0.06	1.13	0.06
Tuesday	44	0.06	0.96	0.06
Tuesday	45	0.05	0.98	0.05
Tuesday	46	0.05	0.84	0.05
Tuesday	47	0.05	0.54	0.05
Wednesday	48	0.03	0.35	0.03
Wednesday	49	0.02	0.31	0.02
Wednesday	50	0.02	0.32	0.02
Wednesday	51	0.02	0.33	0.02
Wednesday	52	0.02	0.40	0.02
Wednesday	53	0.02	0.70	0.02
Wednesday	54	0.04	1.27	0.04
Wednesday	55	0.07	1.71	0.07
Wednesday	56	0.09	1.87	0.09
Wednesday	57	0.10	1.76	0.10
Wednesday	58	0.10	1.57	0.10
Wednesday	59	0.09	1.38	0.09
Wednesday	60	0.08	1.12	0.08
Wednesday	61	0.06	1.04	0.06
Wednesday	62	0.06	0.93	0.06
Wednesday	63	0.05	0.90	0.05
Wednesday	64	0.05	0.94	0.05
Wednesday	65	0.05	1.06	0.05
Wednesday	66	0.06	1.17	0.06
Wednesday	67	0.06	1.13	0.06
Wednesday	68	0.06	0.96	0.06
Wednesday	69	0.05	0.98	0.05
Wednesday	70	0.05	0.84	0.05
Wednesday	71	0.05	0.54	0.05
Thursday	72	0.03	0.35	0.03
Thursday	73	0.02	0.31	0.02
Thursday	74	0.02	0.32	0.02
Thursday	75	0.02	0.33	0.02
Thursday	76	0.02	0.40	0.02
Thursday	77	0.02	0.70	0.02
Thursday	78	0.04	1.27	0.04
Thursday	79	0.07	1.71	0.07
Thursday	80	0.09	1.87	0.09
Thursday	81	0.10	1.76	0.10
Thursday	82	0.10	1.57	0.10
Thursday	83	0.09	1.38	0.09
Thursday	84	0.08	1.12	0.08
Thursday	85	0.06	1.04	0.06
Thursday	86	0.06	0.93	0.06
Thursday	87	0.05	0.90	0.05
Thursday	88	0.05	0.94	0.05
Thursday	89	0.05	1.06	0.05
Thursday	90	0.06	1.17	0.06
Thursday	91	0.06	1.13	0.06
Thursday	92	0.06	0.96	0.06
Thursday	93	0.05	0.98	0.05
Thursday	94	0.05	0.84	0.05
Thursday	95	0.05	0.54	0.05
Friday	96	0.03	0.35	0.03
Friday	97	0.02	0.31	0.02
Friday	98	0.02	0.32	0.02
Friday	99	0.02	0.33	0.02
Friday	100	0.02	0.40	0.02
Friday	101	0.02	0.70	0.02
Friday	102	0.04	1.27	0.04
Friday	103	0.07	1.71	0.07
Friday	104	0.09	1.87	0.09
Friday	105	0.10	1.76	0.10
Friday	106	0.10	1.57	0.10
Friday	107	0.09	1.38	0.09
Friday	108	0.08	1.12	0.08
Friday	109	0.06	1.04	0.06
Friday	110	0.06	0.93	0.06
Friday	111	0.05	0.90	0.05
Friday	112	0.05	0.94	0.05
Friday	113	0.05	1.06	0.05
Friday	114	0.06	1.17	0.06
Friday	115	0.06	1.13	0.06
Friday	116	0.06	0.96	0.06
Friday	117	0.05	0.98	0.05
Friday	118	0.05	0.84	0.05
Friday	119	0.05	0.54	0.05
Saturday	120	0.04	0.47	0.04
Saturday	121	0.03	0.48	0.03
Saturday	122	0.03	0.39	0.03
Saturday	123	0.02	0.35	0.02
Saturday	124	0.02	0.39	0.02
Saturday	125	0.02	0.60	0.02
Saturday	126	0.03	1.22	0.03
Saturday	127	0.07	1.82	0.07
Saturday	128	0.10	1.89	0.10
Saturday	129	0.10	1.86	0.10
Saturday	130	0.10	1.68	0.10
Saturday	131	0.09	1.54	0.09
Saturday	132	0.09	1.41	0.09
Saturday	133	0.08	1.18	0.08
Saturday	134	0.07	1.08	0.07
Saturday	135	0.06	0.98	0.06
Saturday	136	0.05	1.06	0.05
Saturday	137	0.06	1.07	0.06
Saturday	138	0.06	1.13	0.06
Saturday	139	0.06	1.04	0.06
Saturday	140	0.06	0.98	0.06
Saturday	141	0.05	0.94	0.05
Saturday	142	0.05	0.84	0.05
Saturday	143	0.05	0.64	0.05
Sunday	144	0.04	0.47	0.04
Sunday	145	0.03	0.48	0.03
Sunday	146	0.03	0.39	0.03
Sunday	147	0.02	0.35	0.02
Sunday	148	0.02	0.39	0.02
Sunday	149	0.02	0.60	0.02
Sunday	150	0.03	1.22	0.03
Sunday	151	0.07	1.82	0.07
Sunday	152	0.10	1.89	0.10
Sunday	153	0.10	1.86	0.10
Sunday	154	0.10	1.68	0.10
Sunday	155	0.09	1.54	0.09
Sunday	156	0.09	1.41	0.09
Sunday	157	0.08	1.18	0.08
Sunday	158	0.07	1.08	0.07
Sunday	159	0.06	0.98	0.06
Sunday	160	0.05	1.06	0.05
Sunday	161	0.06	1.07	0.06
Sunday	162	0.06	1.13	0.06
Sunday	163	0.06	1.04	0.06
Sunday	164	0.06	0.98	0.06
Sunday	165	0.05	0.94	0.05
Sunday	166	0.05	0.84	0.05
Sunday	167	0.05	0.64	0.05

Flow	Daily	Hourly	Wkend
0.06	1.04	0.35	0.45
	0.98	0.32	0.46
	0.98	0.32	0.37
	0.98	0.34	0.34
	0.98	0.41	0.37
	0.98	0.71	0.58
	1.04	1.29	1.17
		1.74	1.75
		1.90	1.81
		1.80	1.78
		1.60	1.61
		1.40	1.48
		1.14	1.35
		1.06	1.13
		0.95	1.04
		0.91	0.94
		0.96	1.02
		1.08	1.02
		1.19	1.08
		1.15	0.99
		0.98	0.94
		1.00	0.90
		0.86	0.80
		0.55	0.61

2014 ADS Meter 5D-28 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.04	0.02	0.03	0.04	0.01	0.03
Model	0.04	0.02	0.03	0.04	0.01	0.03
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.02	0.02	0.02
1	0.02	0.02	0.02
2	0.02	0.01	0.01
3	0.02	0.01	0.02
4	0.02	0.01	0.02
5	0.02	0.01	0.02
6	0.02	0.02	0.02
7	0.04	0.02	0.03
8	0.03	0.03	0.03
9	0.03	0.04	0.03
10	0.03	0.04	0.03
11	0.03	0.03	0.03
12	0.03	0.03	0.03
13	0.03	0.03	0.03
14	0.02	0.03	0.03
15	0.02	0.03	0.02
16	0.02	0.03	0.03
17	0.03	0.03	0.03
18	0.03	0.03	0.03
19	0.03	0.03	0.03
20	0.03	0.03	0.03
21	0.03	0.03	0.03
22	0.03	0.03	0.03
23	0.02	0.02	0.02
Average	0.03	0.03	0.03

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.61	0.59	0.61
1	0.60	0.55	0.58
2	0.61	0.55	0.59
3	0.61	0.56	0.59
4	0.63	0.56	0.61
5	0.88	0.65	0.81
6	1.57	0.84	1.36
7	1.29	1.36	1.31
8	1.33	1.40	1.35
9	1.25	1.48	1.32
10	1.13	1.35	1.19
11	1.08	1.23	1.12
12	1.03	1.10	1.05
13	0.94	1.10	0.99
14	0.92	1.09	0.97
15	0.98	1.21	1.04
16	1.12	1.18	1.14
17	1.16	1.24	1.18
18	1.28	1.17	1.25
19	1.31	1.23	1.29
20	1.19	1.17	1.18
21	1.06	1.02	1.05
22	0.79	0.76	0.78
23	0.62	0.66	0.63
Total	23.99	24.04	24.00
Average	1.00	1.00	1.00

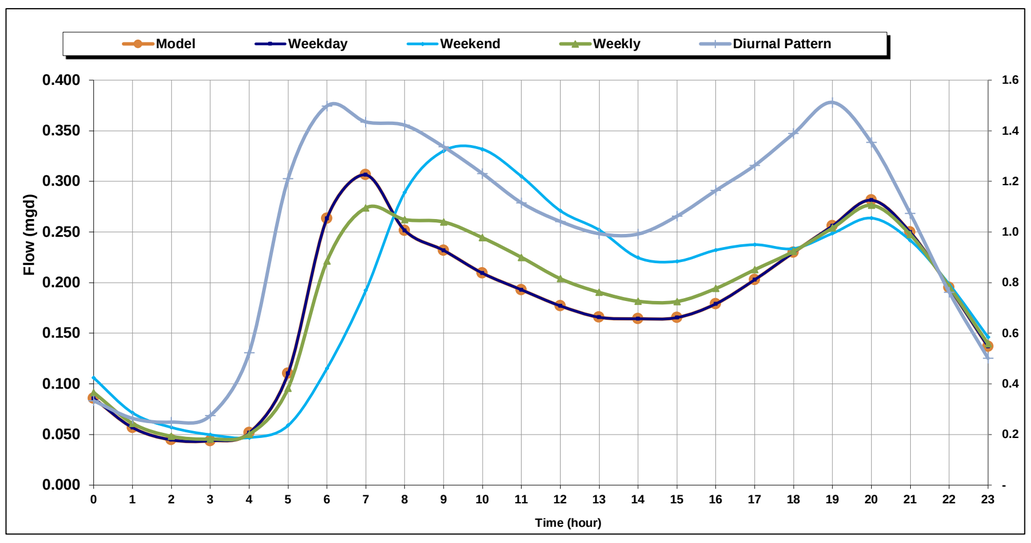
Diurnal Patterns Normalized

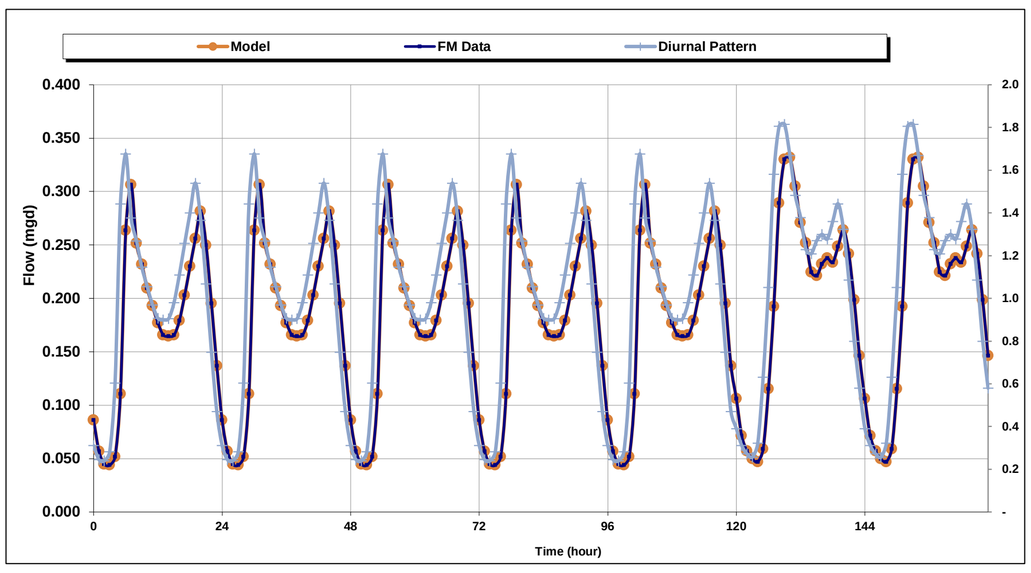
Date/Time	Weekday	Weekend	Weekly
0	0.61	0.59	0.61
1	0.60	0.55	0.58
2	0.61	0.55	0.59
3	0.61	0.56	0.59
4	0.63	0.56	0.61
5	0.88	0.64	0.81
6	1.57	0.84	1.36
7	1.29	1.36	1.31
8	1.33	1.39	1.35
9	1.25	1.48	1.32
10	1.13	1.35	1.19
11	1.08	1.23	1.12
12	1.03	1.10	1.05
13	0.94	1.10	0.99
14	0.92	1.09	0.97
15	0.98	1.21	1.04
16	1.12	1.18	1.14
17	1.16	1.24	1.18
18	1.29	1.17	1.25
19	1.31	1.23	1.29
20	1.19	1.17	1.18
21	1.06	1.01	1.05
22	0.79	0.76	0.78
23	0.62	0.65	0.63
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.02	0.61	0.02
Monday	1	0.02	0.60	0.02
Monday	2	0.02	0.61	0.02
Monday	3	0.02	0.61	0.02
Monday	4	0.02	0.63	0.02
Monday	5	0.02	0.88	0.02
Monday	6	0.02	1.57	0.02
Monday	7	0.04	1.29	0.04
Monday	8	0.03	1.33	0.03
Monday	9	0.03	1.25	0.03
Monday	10	0.03	1.13	0.03
Monday	11	0.03	1.08	0.03
Monday	12	0.03	1.03	0.03
Monday	13	0.03	0.94	0.03
Monday	14	0.02	0.92	0.02
Monday	15	0.02	0.98	0.02
Monday	16	0.02	1.12	0.02
Monday	17	0.03	1.16	0.03
Monday	18	0.03	1.28	0.03
Monday	19	0.03	1.31	0.03
Monday	20	0.03	1.19	0.03
Monday	21	0.03	1.06	0.03
Monday	22	0.03	0.79	0.03
Monday	23	0.02	0.62	0.02
Tuesday	24	0.02	0.61	0.02
Tuesday	25	0.02	0.60	0.02
Tuesday	26	0.02	0.61	0.02
Tuesday	27	0.02	0.61	0.02
Tuesday	28	0.02	0.63	0.02
Tuesday	29	0.02	0.88	0.02
Tuesday	30	0.02	1.57	0.02
Tuesday	31	0.04	1.29	0.04
Tuesday	32	0.03	1.33	0.03
Tuesday	33	0.03	1.25	0.03
Tuesday	34	0.03	1.13	0.03
Tuesday	35	0.03	1.08	0.03
Tuesday	36	0.03	1.03	0.03
Tuesday	37	0.03	0.94	0.03
Tuesday	38	0.02	0.92	0.02
Tuesday	39	0.02	0.98	0.02
Tuesday	40	0.02	1.12	0.02
Tuesday	41	0.03	1.16	0.03
Tuesday	42	0.03	1.28	0.03
Tuesday	43	0.03	1.31	0.03
Tuesday	44	0.03	1.19	0.03
Tuesday	45	0.03	1.06	0.03
Tuesday	46	0.03	0.79	0.03
Tuesday	47	0.02	0.62	0.02
Wednesday	48	0.02	0.61	0.02
Wednesday	49	0.02	0.60	0.02
Wednesday	50	0.02	0.61	0.02
Wednesday	51	0.02	0.61	0.02
Wednesday	52	0.02	0.63	0.02
Wednesday	53	0.02	0.88	0.02
Wednesday	54	0.02	1.57	0.02
Wednesday	55	0.04	1.29	0.04
Wednesday	56	0.03	1.33	0.03
Wednesday	57	0.03	1.25	0.03
Wednesday	58	0.03	1.13	0.03
Wednesday	59	0.03	1.08	0.03
Wednesday	60	0.03	1.03	0.03
Wednesday	61	0.03	0.94	0.03
Wednesday	62	0.02	0.92	0.02
Wednesday	63	0.02	0.98	0.02
Wednesday	64	0.02	1.12	0.02
Wednesday	65	0.03	1.16	0.03
Wednesday	66	0.03	1.28	0.03
Wednesday	67	0.03	1.31	0.03
Wednesday	68	0.03	1.19	0.03
Wednesday	69	0.03	1.06	0.03
Wednesday	70	0.03	0.79	0.03
Wednesday	71	0.02	0.62	0.02
Thursday	72	0.02	0.61	0.02
Thursday	73	0.02	0.60	0.02
Thursday	74	0.02	0.61	0.02
Thursday	75	0.02	0.61	0.02
Thursday	76	0.02	0.63	0.02
Thursday	77	0.02	0.88	0.02
Thursday	78	0.02	1.57	0.02
Thursday	79	0.04	1.29	0.04
Thursday	80	0.03	1.33	0.03
Thursday	81	0.03	1.25	0.03
Thursday	82	0.03	1.13	0.03
Thursday	83	0.03	1.08	0.03
Thursday	84	0.03	1.03	0.03
Thursday	85	0.03	0.94	0.03
Thursday	86	0.02	0.92	0.02
Thursday	87	0.02	0.98	0.02
Thursday	88	0.02	1.12	0.02
Thursday	89	0.03	1.16	0.03
Thursday	90	0.03	1.28	0.03
Thursday	91	0.03	1.31	0.03
Thursday	92	0.03	1.19	0.03
Thursday	93	0.03	1.06	0.03
Thursday	94	0.03	0.79	0.03
Thursday	95	0.02	0.62	0.02
Friday	96	0.02	0.61	0.02
Friday	97	0.02	0.60	0.02
Friday	98	0.02	0.61	0.02
Friday	99	0.02	0.61	0.02
Friday	100	0.02	0.63	0.02
Friday	101	0.02	0.88	0.02
Friday	102	0.02	1.57	0.02
Friday	103	0.04	1.29	0.04
Friday	104	0.03	1.33	0.03
Friday	105	0.03	1.25	0.03
Friday	106	0.03	1.13	0.03
Friday	107	0.03	1.08	0.03
Friday	108	0.03	1.03	0.03
Friday	109	0.03	0.94	0.03
Friday	110	0.02	0.92	0.02
Friday	111	0.02	0.98	0.02
Friday	112	0.02	1.12	0.02
Friday	113	0.03	1.16	0.03
Friday	114	0.03	1.28	0.03
Friday	115	0.03	1.31	0.03
Friday	116	0.03	1.19	0.03
Friday	117	0.03	1.06	0.03
Friday	118	0.03	0.79	0.03
Friday	119	0.02	0.62	0.02
Saturday	120	0.02	0.59	0.02
Saturday	121	0.02	0.55	0.02
Saturday	122	0.01	0.55	0.01
Saturday	123	0.01	0.56	0.01
Saturday	124	0.01	0.56	0.01
Saturday	125	0.01	0.65	0.01
Saturday	126	0.02	0.84	0.02
Saturday	127	0.02	1.36	0.02
Saturday	128	0.03	1.40	0.03
Saturday	129	0.04	1.48	0.04
Saturday	130	0.04	1.35	0.04
Saturday	131	0.03	1.23	0.03
Saturday	132	0.03	1.10	0.03
Saturday	133	0.03	1.10	0.03
Saturday	134	0.03	1.09	0.03
Saturday	135	0.03	1.21	0.03
Saturday	136	0.03	1.18	0.03
Saturday	137	0.03	1.24	0.03
Saturday	138	0.03	1.17	0.03
Saturday	139	0.03	1.23	0.03
Saturday	140	0.03	1.17	0.03
Saturday	141	0.03	1.02	0.03
Saturday	142	0.03	0.76	0.03
Saturday	143	0.02	0.66	0.02
Sunday	144	0.02	0.59	0.02
Sunday	145	0.02	0.55	0.02
Sunday	146	0.01	0.55	0.01
Sunday	147	0.01	0.56	0.01
Sunday	148	0.01	0.56	0.01
Sunday	149	0.01	0.65	0.01
Sunday	150	0.02	0.84	0.02
Sunday	151	0.02	1.36	0.02
Sunday	152	0.03	1.40	0.03
Sunday	153	0.04	1.48	0.04
Sunday	154	0.04	1.35	0.04
Sunday	155	0.03	1.23	0.03
Sunday	156	0.03	1.10	0.03
Sunday	157	0.03	1.10	0.03
Sunday	158	0.03	1.09	0.03
Sunday	159	0.03	1.21	0.03
Sunday	160	0.03	1.18	0.03
Sunday	161	0.03	1.24	0.03
Sunday	162	0.03	1.17	0.03
Sunday	163	0.03	1.23	0.03
Sunday	164	0.03	1.17	0.03
Sunday	165	0.03	1.02	0.03
Sunday	166	0.03	0.76	0.03
Sunday	167	0.02	0.66	0.02

Flow	Daily	Hourly	Wkend
0.03	1.00	0.61	0.59
	1.00	0.60	0.55
	1.00	0.61	0.55
	1.00	0.61	0.56
	1.00	0.63	0.56
	1.00	0.88	0.64
	1.00	1.57	0.84
		1.29	1.36
		1.33	1.39
		1.25	1.48
		1.13	1.35
		1.08	1.23
		1.03	1.10
		0.94	1.10
		0.92	1.09
		0.98	1.21
		1.12	1.18
		1.16	1.24
		1.29	1.17
		1.31	1.23
		1.19	1.17
		1.06	1.01
		0.79	0.76
		0.62	0.65

2014 ADS Meter 6A-13 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.31	0.04	0.18	0.33	0.05	0.20
Model	0.31	0.04	0.18	0.33	0.05	0.20
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.09	0.11	0.09
1	0.06	0.07	0.06
2	0.04	0.06	0.05
3	0.04	0.05	0.05
4	0.05	0.05	0.05
5	0.11	0.06	0.10
6	0.26	0.12	0.22
7	0.31	0.19	0.27
8	0.25	0.29	0.26
9	0.23	0.33	0.26
10	0.21	0.33	0.24
11	0.19	0.31	0.22
12	0.18	0.27	0.20
13	0.17	0.25	0.19
14	0.16	0.22	0.18
15	0.17	0.22	0.18
16	0.18	0.23	0.19
17	0.20	0.24	0.21
18	0.23	0.23	0.23
19	0.26	0.25	0.25
20	0.28	0.26	0.28
21	0.25	0.24	0.25
22	0.20	0.20	0.20
23	0.14	0.15	0.14
Average	0.18	0.20	0.18

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.31	0.39	0.33
1	0.24	0.31	0.26
2	0.24	0.27	0.25
3	0.28	0.26	0.27
4	0.60	0.32	0.52
5	1.44	0.63	1.21
6	1.68	1.05	1.50
7	1.38	1.58	1.44
8	1.27	1.81	1.42
9	1.15	1.81	1.34
10	1.06	1.67	1.23
11	0.97	1.48	1.12
12	0.91	1.38	1.04
13	0.90	1.23	0.99
14	0.91	1.21	0.99
15	0.98	1.27	1.06
16	1.11	1.30	1.16
17	1.26	1.28	1.26
18	1.40	1.36	1.39
19	1.54	1.44	1.51
20	1.37	1.32	1.35
21	1.07	1.09	1.07
22	0.75	0.80	0.76
23	0.47	0.58	0.50
Total	23.26	25.84	24.00
Average	0.97	1.08	1.00

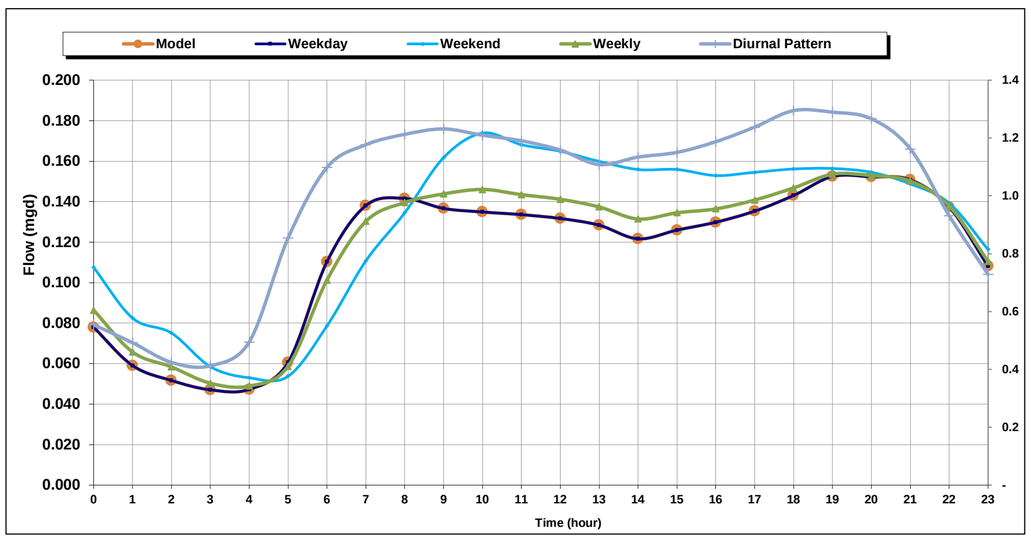
Diurnal Patterns Normalized

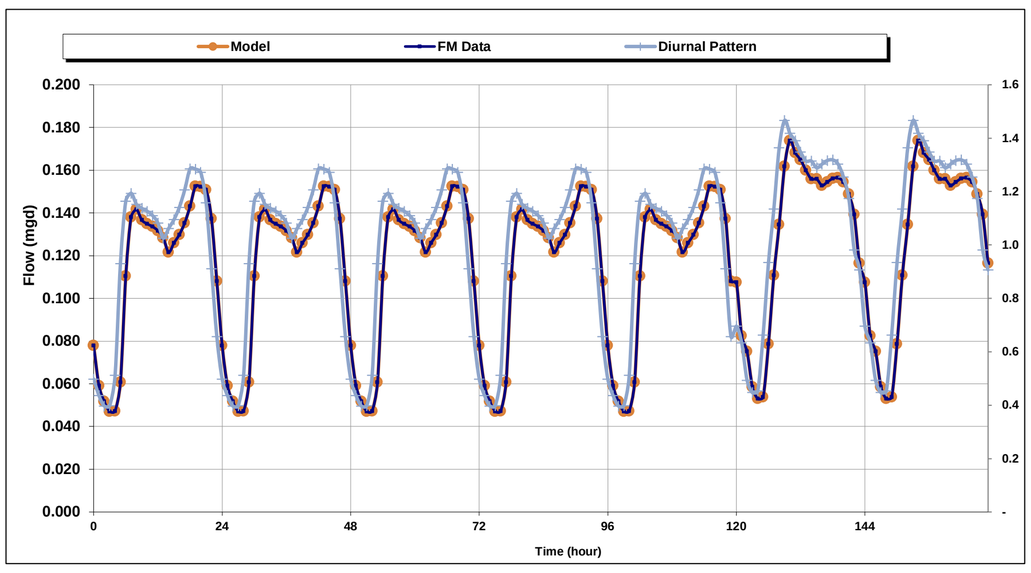
Date/Time	Weekday	Weekend	Weekly
0	0.32	0.36	0.33
1	0.25	0.29	0.26
2	0.25	0.25	0.25
3	0.29	0.24	0.27
4	0.62	0.30	0.52
5	1.49	0.59	1.21
6	1.73	0.98	1.50
7	1.42	1.47	1.44
8	1.31	1.68	1.42
9	1.18	1.69	1.34
10	1.09	1.55	1.23
11	1.00	1.38	1.12
12	0.94	1.28	1.04
13	0.93	1.14	0.99
14	0.93	1.12	0.99
15	1.01	1.18	1.06
16	1.15	1.21	1.16
17	1.30	1.19	1.26
18	1.45	1.26	1.39
19	1.59	1.34	1.51
20	1.41	1.23	1.35
21	1.10	1.01	1.07
22	0.77	0.74	0.76
23	0.48	0.54	0.50
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.09	0.31	0.09
Monday	1	0.06	0.24	0.06
Monday	2	0.04	0.24	0.04
Monday	3	0.04	0.28	0.04
Monday	4	0.05	0.60	0.05
Monday	5	0.11	1.44	0.11
Monday	6	0.26	1.68	0.26
Monday	7	0.31	1.38	0.31
Monday	8	0.25	1.27	0.25
Monday	9	0.23	1.15	0.23
Monday	10	0.21	1.06	0.21
Monday	11	0.19	0.97	0.19
Monday	12	0.18	0.91	0.18
Monday	13	0.17	0.90	0.17
Monday	14	0.16	0.91	0.16
Monday	15	0.17	0.98	0.17
Monday	16	0.18	1.11	0.18
Monday	17	0.20	1.26	0.20
Monday	18	0.23	1.40	0.23
Monday	19	0.26	1.54	0.26
Monday	20	0.28	1.37	0.28
Monday	21	0.25	1.07	0.25
Monday	22	0.20	0.75	0.20
Monday	23	0.14	0.47	0.14
Tuesday	24	0.09	0.31	0.09
Tuesday	25	0.06	0.24	0.06
Tuesday	26	0.04	0.24	0.04
Tuesday	27	0.04	0.28	0.04
Tuesday	28	0.05	0.60	0.05
Tuesday	29	0.11	1.44	0.11
Tuesday	30	0.26	1.68	0.26
Tuesday	31	0.31	1.38	0.31
Tuesday	32	0.25	1.27	0.25
Tuesday	33	0.23	1.15	0.23
Tuesday	34	0.21	1.06	0.21
Tuesday	35	0.19	0.97	0.19
Tuesday	36	0.18	0.91	0.18
Tuesday	37	0.17	0.90	0.17
Tuesday	38	0.16	0.91	0.16
Tuesday	39	0.17	0.98	0.17
Tuesday	40	0.18	1.11	0.18
Tuesday	41	0.20	1.26	0.20
Tuesday	42	0.23	1.40	0.23
Tuesday	43	0.26	1.54	0.26
Tuesday	44	0.28	1.37	0.28
Tuesday	45	0.25	1.07	0.25
Tuesday	46	0.20	0.75	0.20
Tuesday	47	0.14	0.47	0.14
Wednesday	48	0.09	0.31	0.09
Wednesday	49	0.06	0.24	0.06
Wednesday	50	0.04	0.24	0.04
Wednesday	51	0.04	0.28	0.04
Wednesday	52	0.05	0.60	0.05
Wednesday	53	0.11	1.44	0.11
Wednesday	54	0.26	1.68	0.26
Wednesday	55	0.31	1.38	0.31
Wednesday	56	0.25	1.27	0.25
Wednesday	57	0.23	1.15	0.23
Wednesday	58	0.21	1.06	0.21
Wednesday	59	0.19	0.97	0.19
Wednesday	60	0.18	0.91	0.18
Wednesday	61	0.17	0.90	0.17
Wednesday	62	0.16	0.91	0.16
Wednesday	63	0.17	0.98	0.17
Wednesday	64	0.18	1.11	0.18
Wednesday	65	0.20	1.26	0.20
Wednesday	66	0.23	1.40	0.23
Wednesday	67	0.26	1.54	0.26
Wednesday	68	0.28	1.37	0.28
Wednesday	69	0.25	1.07	0.25
Wednesday	70	0.20	0.75	0.20
Wednesday	71	0.14	0.47	0.14
Thursday	72	0.09	0.31	0.09
Thursday	73	0.06	0.24	0.06
Thursday	74	0.04	0.24	0.04
Thursday	75	0.04	0.28	0.04
Thursday	76	0.05	0.60	0.05
Thursday	77	0.11	1.44	0.11
Thursday	78	0.26	1.68	0.26
Thursday	79	0.31	1.38	0.31
Thursday	80	0.25	1.27	0.25
Thursday	81	0.23	1.15	0.23
Thursday	82	0.21	1.06	0.21
Thursday	83	0.19	0.97	0.19
Thursday	84	0.18	0.91	0.18
Thursday	85	0.17	0.90	0.17
Thursday	86	0.16	0.91	0.16
Thursday	87	0.17	0.98	0.17
Thursday	88	0.18	1.11	0.18
Thursday	89	0.20	1.26	0.20
Thursday	90	0.23	1.40	0.23
Thursday	91	0.26	1.54	0.26
Thursday	92	0.28	1.37	0.28
Thursday	93	0.25	1.07	0.25
Thursday	94	0.20	0.75	0.20
Thursday	95	0.14	0.47	0.14
Friday	96	0.09	0.31	0.09
Friday	97	0.06	0.24	0.06
Friday	98	0.04	0.24	0.04
Friday	99	0.04	0.28	0.04
Friday	100	0.05	0.60	0.05
Friday	101	0.11	1.44	0.11
Friday	102	0.26	1.68	0.26
Friday	103	0.31	1.38	0.31
Friday	104	0.25	1.27	0.25
Friday	105	0.23	1.15	0.23
Friday	106	0.21	1.06	0.21
Friday	107	0.19	0.97	0.19
Friday	108	0.18	0.91	0.18
Friday	109	0.17	0.90	0.17
Friday	110	0.16	0.91	0.16
Friday	111	0.17	0.98	0.17
Friday	112	0.18	1.11	0.18
Friday	113	0.20	1.26	0.20
Friday	114	0.23	1.40	0.23
Friday	115	0.26	1.54	0.26
Friday	116	0.28	1.37	0.28
Friday	117	0.25	1.07	0.25
Friday	118	0.20	0.75	0.20
Friday	119	0.14	0.47	0.14
Saturday	120	0.11	0.39	0.11
Saturday	121	0.07	0.31	0.07
Saturday	122	0.06	0.27	0.06
Saturday	123	0.05	0.26	0.05
Saturday	124	0.05	0.32	0.05
Saturday	125	0.06	0.63	0.06
Saturday	126	0.12	1.05	0.12
Saturday	127	0.19	1.58	0.19
Saturday	128	0.29	1.81	0.29
Saturday	129	0.33	1.81	0.33
Saturday	130	0.33	1.67	0.33
Saturday	131	0.31	1.48	0.31
Saturday	132	0.27	1.38	0.27
Saturday	133	0.25	1.23	0.25
Saturday	134	0.22	1.21	0.22
Saturday	135	0.22	1.27	0.22
Saturday	136	0.23	1.30	0.23
Saturday	137	0.24	1.28	0.24
Saturday	138	0.23	1.36	0.23
Saturday	139	0.25	1.44	0.25
Saturday	140	0.26	1.32	0.26
Saturday	141	0.24	1.09	0.24
Saturday	142	0.20	0.80	0.20
Saturday	143	0.15	0.58	0.15
Sunday	144	0.11	0.39	0.11
Sunday	145	0.07	0.31	0.07
Sunday	146	0.06	0.27	0.06
Sunday	147	0.05	0.26	0.05
Sunday	148	0.05	0.32	0.05
Sunday	149	0.06	0.63	0.06
Sunday	150	0.12	1.05	0.12
Sunday	151	0.19	1.58	0.19
Sunday	152	0.29	1.81	0.29
Sunday	153	0.33	1.81	0.33
Sunday	154	0.33	1.67	0.33
Sunday	155	0.31	1.48	0.31
Sunday	156	0.27	1.38	0.27
Sunday	157	0.25	1.23	0.25
Sunday	158	0.22	1.21	0.22
Sunday	159	0.22	1.27	0.22
Sunday	160	0.23	1.30	0.23
Sunday	161	0.24	1.28	0.24
Sunday	162	0.23	1.36	0.23
Sunday	163	0.25	1.44	0.25
Sunday	164	0.26	1.32	0.26
Sunday	165	0.24	1.09	0.24
Sunday	166	0.20	0.80	0.20
Sunday	167	0.15	0.58	0.15

Flow	Daily	Hourly	Wkend
0.18	1.08	0.32	0.36
	0.97	0.25	0.29
	0.97	0.25	0.25
	0.97	0.29	0.24
	0.97	0.62	0.30
	0.97	1.49	0.59
	1.08	1.73	0.98
		1.42	1.47
		1.31	1.68
		1.18	1.69
		1.09	1.55
		1.00	1.38
		0.94	1.28
		0.93	1.14
		0.93	1.12
		1.01	1.18
		1.15	1.21
		1.30	1.19
		1.45	1.26
		1.59	1.34
		1.41	1.23
		1.10	1.01
		0.77	0.74
		0.48	0.54

2014 ADS Meter 9D-60 Dry Weather Flow Model Validation Results





	Weekday			Weekend		
Data Set	Max	Min	Ave	Max	Min	Ave
FM Data	0.15	0.05	0.11	0.17	0.05	0.13
Model	0.15	0.05	0.11	0.17	0.05	0.13
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.08	0.11	0.09
1	0.06	0.08	0.07
2	0.05	0.08	0.06
3	0.05	0.06	0.05
4	0.05	0.05	0.05
5	0.06	0.05	0.06
6	0.11	0.08	0.10
7	0.14	0.11	0.13
8	0.14	0.13	0.14
9	0.14	0.16	0.14
10	0.13	0.17	0.15
11	0.13	0.17	0.14
12	0.13	0.16	0.14
13	0.13	0.16	0.14
14	0.12	0.16	0.13
15	0.13	0.16	0.13
16	0.13	0.15	0.14
17	0.14	0.15	0.14
18	0.14	0.16	0.15
19	0.15	0.16	0.15
20	0.15	0.15	0.15
21	0.15	0.15	0.15
22	0.14	0.14	0.14
23	0.11	0.12	0.11
Average	0.11	0.13	0.12

Diurnal Patterns

Date/Time	Weekday	Weekend	Weekly
0	0.50	0.70	0.55
1	0.44	0.63	0.49
2	0.40	0.49	0.42
3	0.40	0.45	0.41
4	0.51	0.45	0.49
5	0.93	0.66	0.85
6	1.16	0.93	1.10
7	1.19	1.13	1.18
8	1.15	1.36	1.21
9	1.14	1.47	1.23
10	1.13	1.42	1.21
11	1.11	1.39	1.19
12	1.08	1.35	1.16
13	1.03	1.31	1.11
14	1.06	1.31	1.13
15	1.09	1.29	1.15
16	1.14	1.30	1.19
17	1.21	1.32	1.24
18	1.29	1.32	1.29
19	1.28	1.30	1.29
20	1.27	1.25	1.27
21	1.16	1.17	1.16
22	0.91	0.98	0.93
23	0.66	0.91	0.73
Total	23.23	25.91	24.00
Average	0.97	1.08	1.00

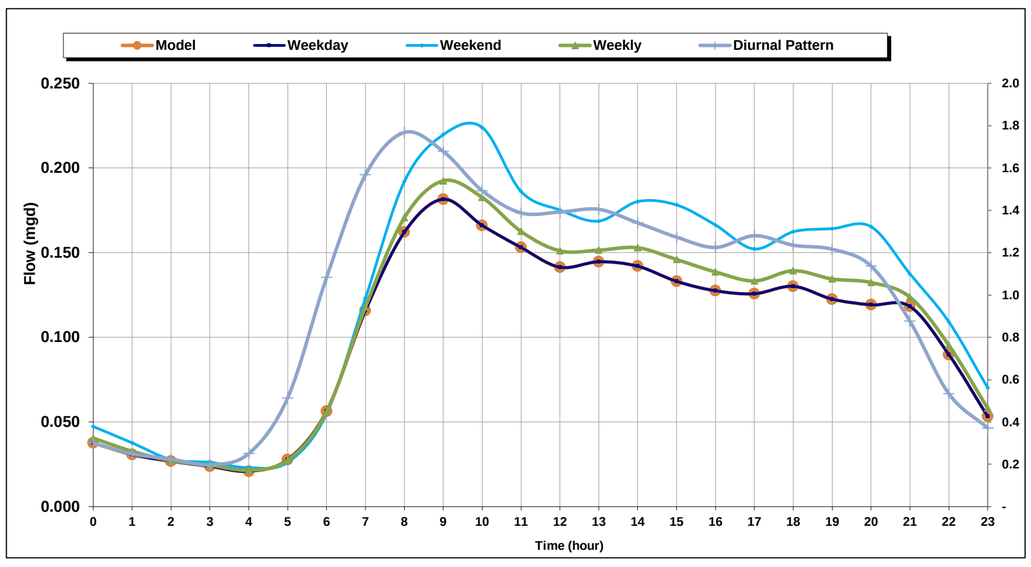
Diurnal Patterns Normalized

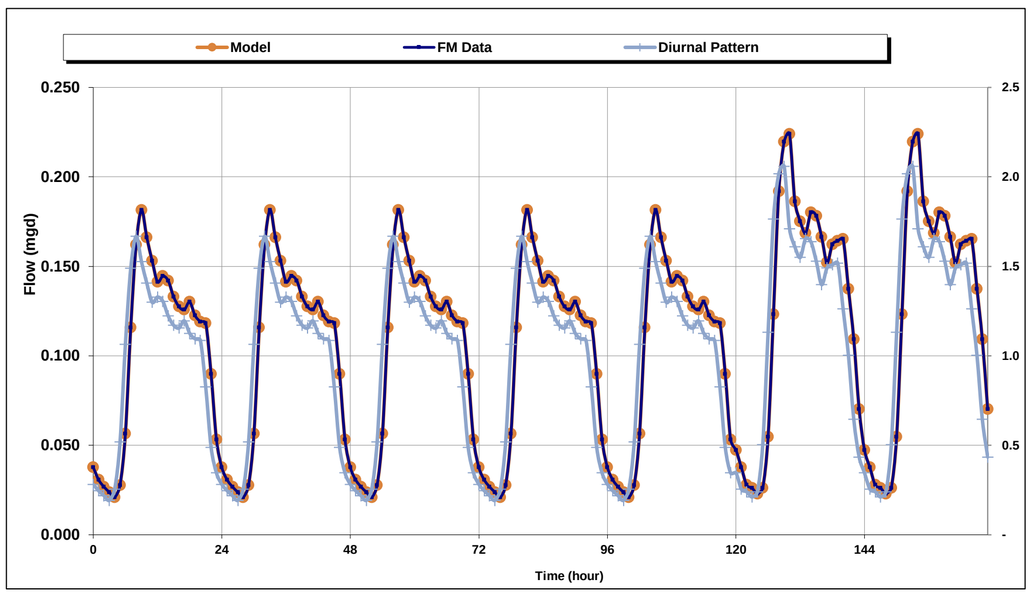
Date/Time	Weekday	Weekend	Weekly
0	0.51	0.64	0.55
1	0.45	0.59	0.49
2	0.41	0.46	0.42
3	0.41	0.41	0.41
4	0.53	0.42	0.49
5	0.96	0.61	0.85
6	1.20	0.86	1.10
7	1.23	1.05	1.18
8	1.19	1.26	1.21
9	1.17	1.36	1.23
10	1.16	1.31	1.21
11	1.15	1.29	1.19
12	1.12	1.25	1.16
13	1.06	1.22	1.11
14	1.10	1.22	1.13
15	1.13	1.19	1.15
16	1.18	1.21	1.19
17	1.25	1.22	1.24
18	1.33	1.22	1.29
19	1.33	1.21	1.29
20	1.31	1.16	1.27
21	1.20	1.09	1.16
22	0.94	0.91	0.93
23	0.68	0.84	0.73
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.08	0.50	0.08
Monday	1	0.06	0.44	0.06
Monday	2	0.05	0.40	0.05
Monday	3	0.05	0.40	0.05
Monday	4	0.05	0.51	0.05
Monday	5	0.06	0.93	0.06
Monday	6	0.11	1.16	0.11
Monday	7	0.14	1.19	0.14
Monday	8	0.14	1.15	0.14
Monday	9	0.14	1.14	0.14
Monday	10	0.13	1.13	0.13
Monday	11	0.13	1.11	0.13
Monday	12	0.13	1.08	0.13
Monday	13	0.13	1.03	0.13
Monday	14	0.12	1.06	0.12
Monday	15	0.13	1.09	0.13
Monday	16	0.13	1.14	0.13
Monday	17	0.14	1.21	0.14
Monday	18	0.14	1.29	0.14
Monday	19	0.15	1.28	0.15
Monday	20	0.15	1.27	0.15
Monday	21	0.15	1.16	0.15
Monday	22	0.14	0.91	0.14
Monday	23	0.11	0.66	0.11
Tuesday	24	0.08	0.50	0.08
Tuesday	25	0.06	0.44	0.06
Tuesday	26	0.05	0.40	0.05
Tuesday	27	0.05	0.40	0.05
Tuesday	28	0.05	0.51	0.05
Tuesday	29	0.06	0.93	0.06
Tuesday	30	0.11	1.16	0.11
Tuesday	31	0.14	1.19	0.14
Tuesday	32	0.14	1.15	0.14
Tuesday	33	0.14	1.14	0.14
Tuesday	34	0.13	1.13	0.13
Tuesday	35	0.13	1.11	0.13
Tuesday	36	0.13	1.08	0.13
Tuesday	37	0.13	1.03	0.13
Tuesday	38	0.12	1.06	0.12
Tuesday	39	0.13	1.09	0.13
Tuesday	40	0.13	1.14	0.13
Tuesday	41	0.14	1.21	0.14
Tuesday	42	0.14	1.29	0.14
Tuesday	43	0.15	1.28	0.15
Tuesday	44	0.15	1.27	0.15
Tuesday	45	0.15	1.16	0.15
Tuesday	46	0.14	0.91	0.14
Tuesday	47	0.11	0.66	0.11
Wednesday	48	0.08	0.50	0.08
Wednesday	49	0.06	0.44	0.06
Wednesday	50	0.05	0.40	0.05
Wednesday	51	0.05	0.40	0.05
Wednesday	52	0.05	0.51	0.05
Wednesday	53	0.06	0.93	0.06
Wednesday	54	0.11	1.16	0.11
Wednesday	55	0.14	1.19	0.14
Wednesday	56	0.14	1.15	0.14
Wednesday	57	0.14	1.14	0.14
Wednesday	58	0.13	1.13	0.13
Wednesday	59	0.13	1.11	0.13
Wednesday	60	0.13	1.08	0.13
Wednesday	61	0.13	1.03	0.13
Wednesday	62	0.12	1.06	0.12
Wednesday	63	0.13	1.09	0.13
Wednesday	64	0.13	1.14	0.13
Wednesday	65	0.14	1.21	0.14
Wednesday	66	0.14	1.29	0.14
Wednesday	67	0.15	1.28	0.15
Wednesday	68	0.15	1.27	0.15
Wednesday	69	0.15	1.16	0.15
Wednesday	70	0.14	0.91	0.14
Wednesday	71	0.11	0.66	0.11
Thursday	72	0.08	0.50	0.08
Thursday	73	0.06	0.44	0.06
Thursday	74	0.05	0.40	0.05
Thursday	75	0.05	0.40	0.05
Thursday	76	0.05	0.51	0.05
Thursday	77	0.06	0.93	0.06
Thursday	78	0.11	1.16	0.11
Thursday	79	0.14	1.19	0.14
Thursday	80	0.14	1.15	0.14
Thursday	81	0.14	1.14	0.14
Thursday	82	0.13	1.13	0.13
Thursday	83	0.13	1.11	0.13
Thursday	84	0.13	1.08	0.13
Thursday	85	0.13	1.03	0.13
Thursday	86	0.12	1.06	0.12
Thursday	87	0.13	1.09	0.13
Thursday	88	0.13	1.14	0.13
Thursday	89	0.14	1.21	0.14
Thursday	90	0.14	1.29	0.14
Thursday	91	0.15	1.28	0.15
Thursday	92	0.15	1.27	0.15
Thursday	93	0.15	1.16	0.15
Thursday	94	0.14	0.91	0.14
Thursday	95	0.11	0.66	0.11
Friday	96	0.08	0.50	0.08
Friday	97	0.06	0.44	0.06
Friday	98	0.05	0.40	0.05
Friday	99	0.05	0.40	0.05
Friday	100	0.05	0.51	0.05
Friday	101	0.06	0.93	0.06
Friday	102	0.11	1.16	0.11
Friday	103	0.14	1.19	0.14
Friday	104	0.14	1.15	0.14
Friday	105	0.14	1.14	0.14
Friday	106	0.13	1.13	0.13
Friday	107	0.13	1.11	0.13
Friday	108	0.13	1.08	0.13
Friday	109	0.13	1.03	0.13
Friday	110	0.12	1.06	0.12
Friday	111	0.13	1.09	0.13
Friday	112	0.13	1.14	0.13
Friday	113	0.14	1.21	0.14
Friday	114	0.14	1.29	0.14
Friday	115	0.15	1.28	0.15
Friday	116	0.15	1.27	0.15
Friday	117	0.15	1.16	0.15
Friday	118	0.14	0.91	0.14
Friday	119	0.11	0.66	0.11
Saturday	120	0.11	0.70	0.11
Saturday	121	0.08	0.63	0.08
Saturday	122	0.08	0.49	0.08
Saturday	123	0.06	0.45	0.06
Saturday	124	0.05	0.45	0.05
Saturday	125	0.05	0.66	0.05
Saturday	126	0.08	0.93	0.08
Saturday	127	0.11	1.13	0.11
Saturday	128	0.13	1.36	0.13
Saturday	129	0.16	1.47	0.16
Saturday	130	0.17	1.42	0.17
Saturday	131	0.17	1.39	0.17
Saturday	132	0.16	1.35	0.16
Saturday	133	0.16	1.31	0.16
Saturday	134	0.16	1.31	0.16
Saturday	135	0.16	1.29	0.16
Saturday	136	0.15	1.30	0.15
Saturday	137	0.15	1.32	0.15
Saturday	138	0.16	1.32	0.16
Saturday	139	0.16	1.30	0.16
Saturday	140	0.15	1.25	0.15
Saturday	141	0.15	1.17	0.15
Saturday	142	0.14	0.98	0.14
Saturday	143	0.12	0.91	0.12
Sunday	144	0.11	0.70	0.11
Sunday	145	0.08	0.63	0.08
Sunday	146	0.08	0.49	0.08
Sunday	147	0.06	0.45	0.06
Sunday	148	0.05	0.45	0.05
Sunday	149	0.05	0.66	0.05
Sunday	150	0.08	0.93	0.08
Sunday	151	0.11	1.13	0.11
Sunday	152	0.13	1.36	0.13
Sunday	153	0.16	1.47	0.16
Sunday	154	0.17	1.42	0.17
Sunday	155	0.17	1.39	0.17
Sunday	156	0.16	1.35	0.16
Sunday	157	0.16	1.31	0.16
Sunday	158	0.16	1.31	0.16
Sunday	159	0.16	1.29	0.16
Sunday	160	0.15	1.30	0.15
Sunday	161	0.15	1.32	0.15
Sunday	162	0.16	1.32	0.16
Sunday	163	0.16	1.30	0.16
Sunday	164	0.15	1.25	0.15
Sunday	165	0.15	1.17	0.15
Sunday	166	0.14	0.98	0.14
Sunday	167	0.12	0.91	0.12

Flow	Daily	Hourly	Wkend
0.12	1.08	0.51	0.64
	0.97	0.45	0.59
	0.97	0.41	0.46
	0.97	0.41	0.41
	0.97	0.53	0.42
	0.97	0.96	0.61
	1.08	1.20	0.86
		1.23	1.05
		1.19	1.26
		1.17	1.36
		1.16	1.31
		1.15	1.29
		1.12	1.25
		1.06	1.22
		1.10	1.22
		1.13	1.19
		1.18	1.21
		1.25	1.22
		1.33	1.22
		1.33	1.21
		1.31	1.16
		1.20	1.09
		0.94	0.91
		0.68	0.84

2014 ADS Meter 9D-AH206 Dry Weather Flow Model Validation Results





Data Set	Weekday			Weekend		
	Max	Min	Ave	Max	Min	Ave
FM Data	0.18	0.02	0.10	0.22	0.02	0.13
Model	0.18	0.02	0.10	0.22	0.02	0.13
Diff	-	-	-	-	-	-
% Diff	0%	0%	0%	0%	0%	0%

FM Averages

Date/Time	Weekday	Weekend	Weekly
0	0.04	0.05	0.04
1	0.03	0.04	0.03
2	0.03	0.03	0.03
3	0.02	0.03	0.02
4	0.02	0.02	0.02
5	0.03	0.03	0.03
6	0.06	0.05	0.06
7	0.12	0.12	0.12
8	0.16	0.19	0.17
9	0.18	0.22	0.19
10	0.17	0.22	0.18
11	0.15	0.19	0.16
12	0.14	0.18	0.15
13	0.14	0.17	0.15
14	0.14	0.18	0.15
15	0.13	0.18	0.15
16	0.13	0.17	0.14
17	0.13	0.15	0.13
18	0.13	0.16	0.14
19	0.12	0.16	0.13
20	0.12	0.17	0.13
21	0.12	0.14	0.12
22	0.09	0.11	0.10
23	0.05	0.07	0.06
Average	0.10	0.13	0.11

Diurnal Patterns

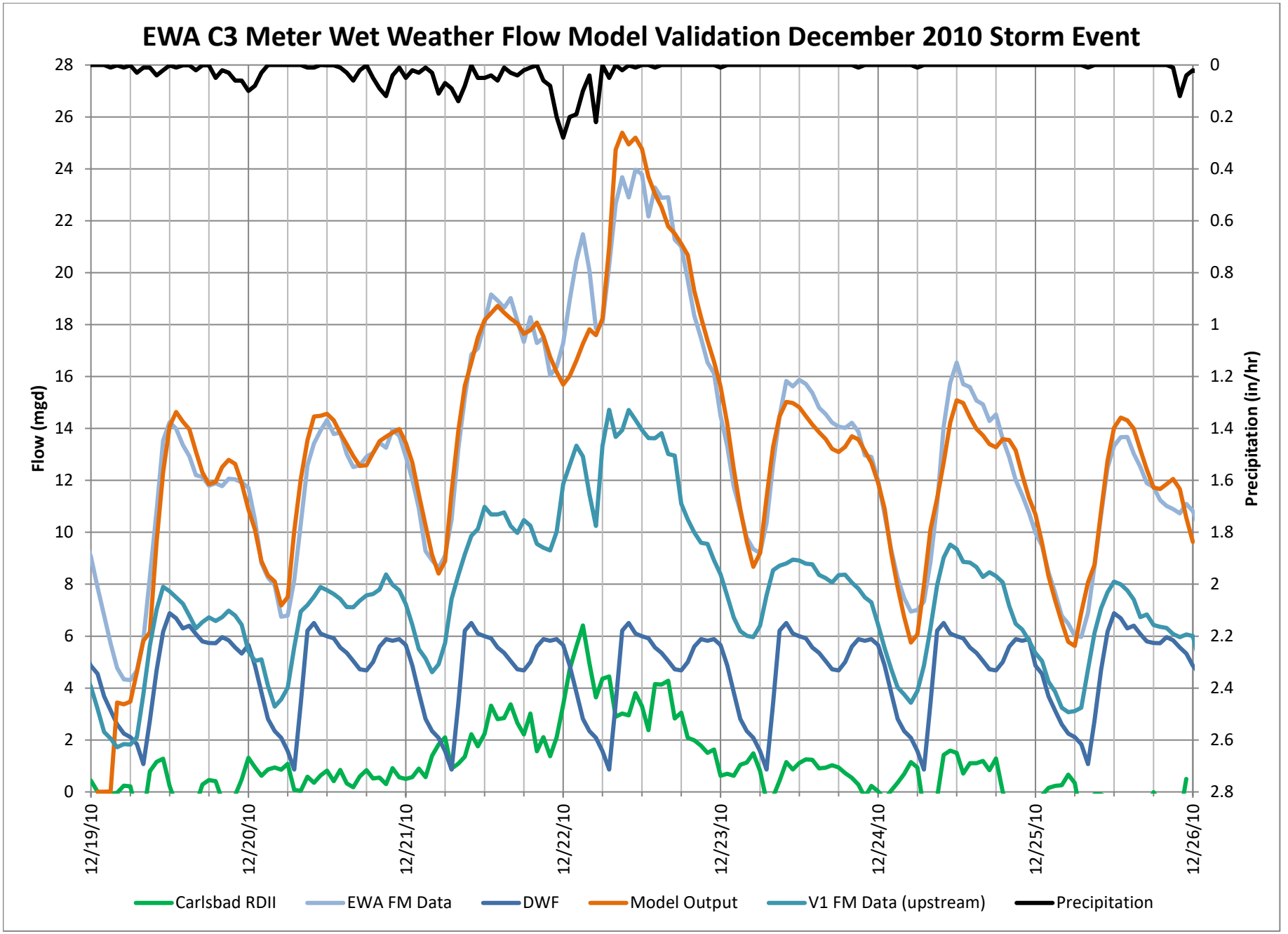
Date/Time	Weekday	Weekend	Weekly
0	0.28	0.35	0.30
1	0.25	0.26	0.25
2	0.22	0.24	0.22
3	0.19	0.21	0.20
4	0.26	0.24	0.25
5	0.52	0.50	0.51
6	1.06	1.13	1.08
7	1.49	1.76	1.57
8	1.67	2.02	1.77
9	1.53	2.06	1.68
10	1.41	1.71	1.49
11	1.30	1.61	1.39
12	1.33	1.55	1.39
13	1.30	1.66	1.40
14	1.22	1.64	1.34
15	1.17	1.53	1.27
16	1.16	1.40	1.22
17	1.20	1.49	1.28
18	1.13	1.51	1.24
19	1.10	1.52	1.22
20	1.09	1.26	1.14
21	0.83	1.00	0.88
22	0.49	0.64	0.53
23	0.35	0.43	0.37
Total	22.51	27.72	24.00
Average	0.94	1.16	1.00

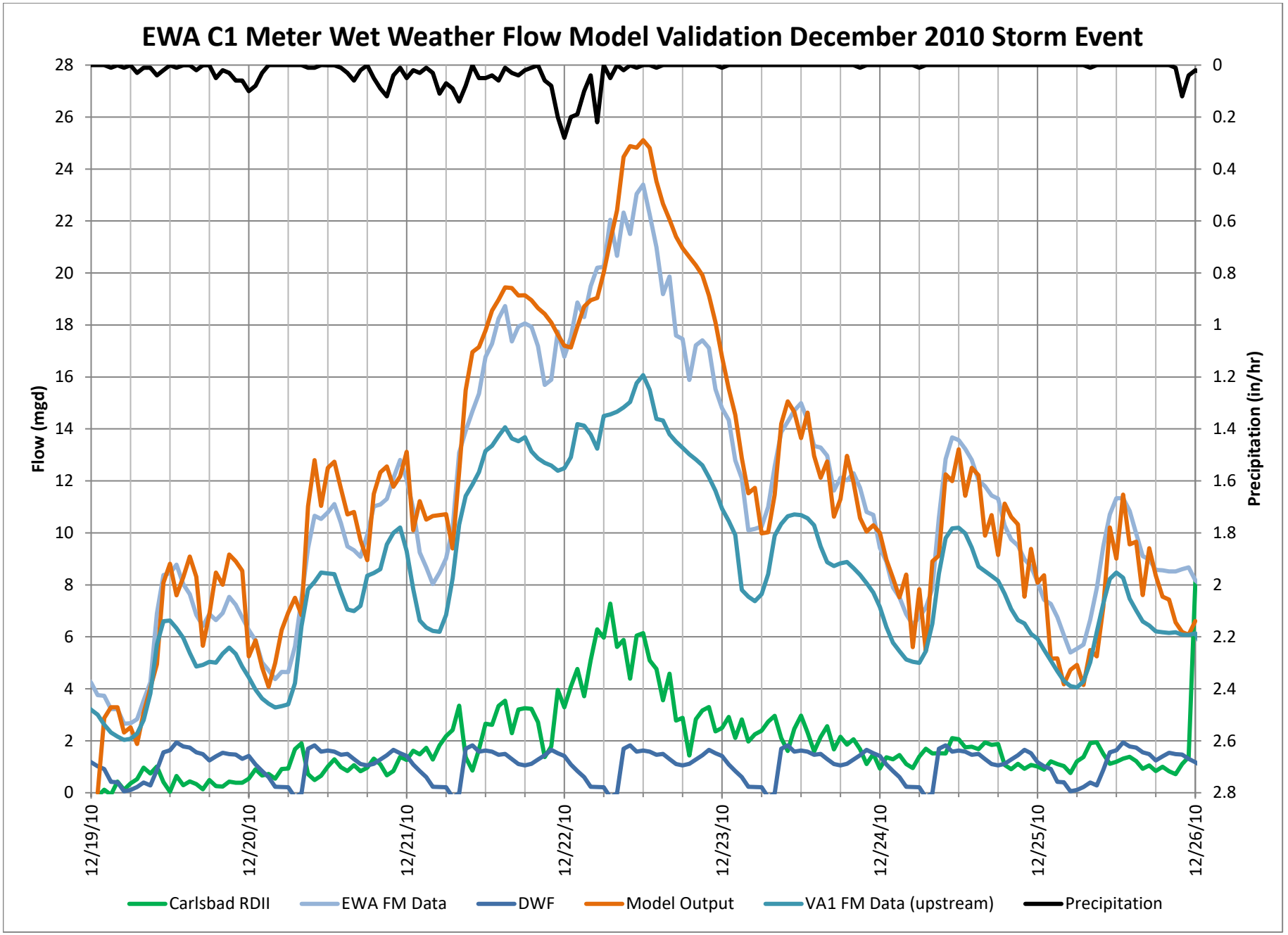
Diurnal Patterns Normalized

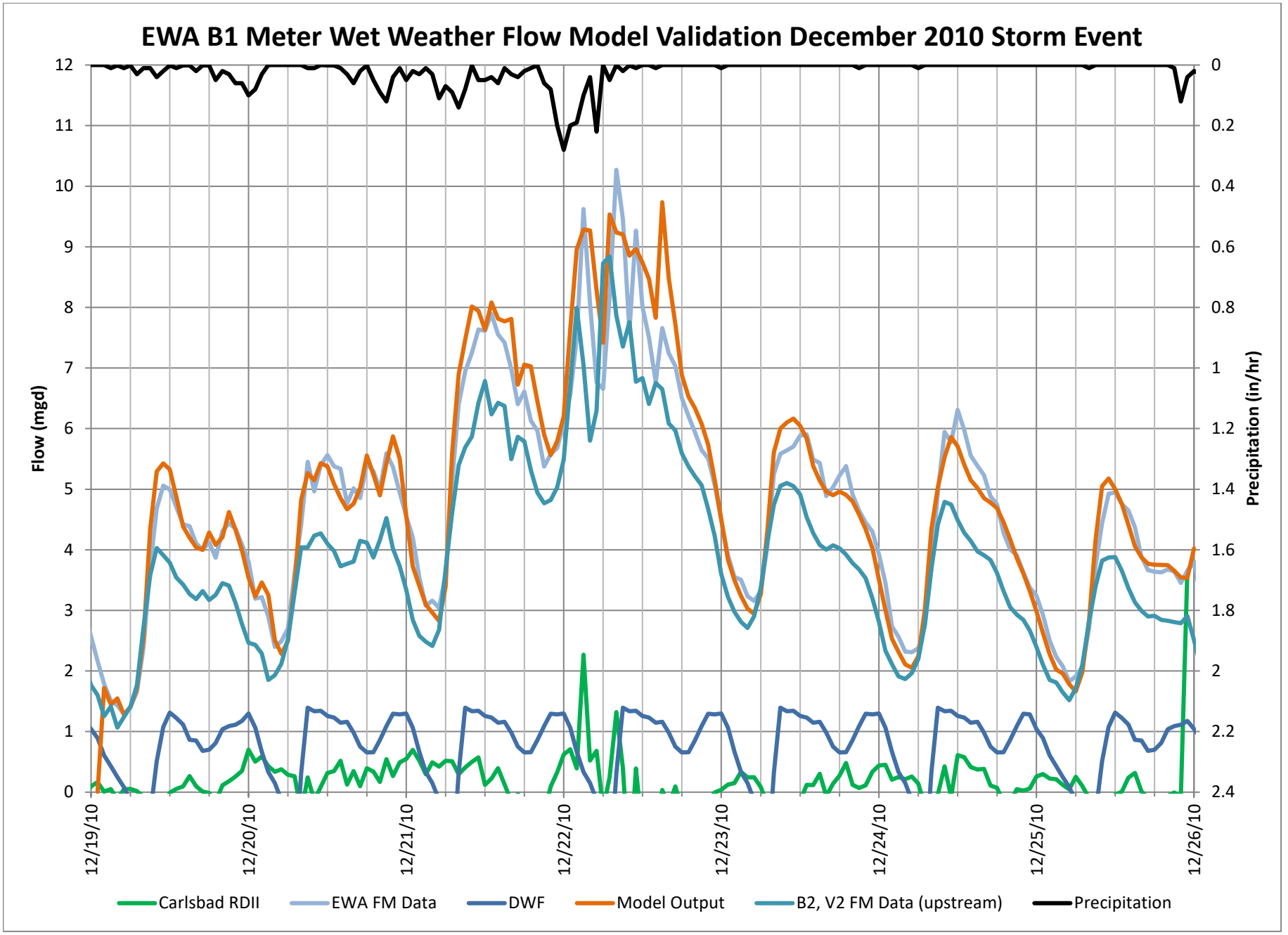
Date/Time	Weekday	Weekend	Weekly
0	0.30	0.30	0.30
1	0.26	0.22	0.25
2	0.23	0.21	0.22
3	0.21	0.18	0.20
4	0.27	0.21	0.25
5	0.55	0.44	0.51
6	1.13	0.98	1.08
7	1.59	1.53	1.57
8	1.78	1.75	1.77
9	1.63	1.78	1.68
10	1.50	1.48	1.49
11	1.38	1.39	1.39
12	1.42	1.34	1.39
13	1.39	1.43	1.40
14	1.30	1.42	1.34
15	1.25	1.32	1.27
16	1.23	1.21	1.22
17	1.27	1.29	1.28
18	1.20	1.31	1.24
19	1.17	1.32	1.22
20	1.16	1.09	1.14
21	0.88	0.87	0.88
22	0.52	0.56	0.53
23	0.37	0.38	0.37
Total	24.00	24.00	24.00
Average	1.00	1.00	1.00

Day	Time	FM Data	Diurnal Pattern	Model
Monday	0	0.04	0.28	0.04
Monday	1	0.03	0.25	0.03
Monday	2	0.03	0.22	0.03
Monday	3	0.02	0.19	0.02
Monday	4	0.02	0.26	0.02
Monday	5	0.03	0.52	0.03
Monday	6	0.06	1.06	0.06
Monday	7	0.12	1.49	0.12
Monday	8	0.16	1.67	0.16
Monday	9	0.18	1.53	0.18
Monday	10	0.17	1.41	0.17
Monday	11	0.15	1.30	0.15
Monday	12	0.14	1.33	0.14
Monday	13	0.14	1.30	0.14
Monday	14	0.14	1.22	0.14
Monday	15	0.13	1.17	0.13
Monday	16	0.13	1.16	0.13
Monday	17	0.13	1.20	0.13
Monday	18	0.13	1.13	0.13
Monday	19	0.12	1.10	0.12
Monday	20	0.12	1.09	0.12
Monday	21	0.12	0.83	0.12
Monday	22	0.09	0.49	0.09
Monday	23	0.05	0.35	0.05
Tuesday	24	0.04	0.28	0.04
Tuesday	25	0.03	0.25	0.03
Tuesday	26	0.03	0.22	0.03
Tuesday	27	0.02	0.19	0.02
Tuesday	28	0.02	0.26	0.02
Tuesday	29	0.03	0.52	0.03
Tuesday	30	0.06	1.06	0.06
Tuesday	31	0.12	1.49	0.12
Tuesday	32	0.16	1.67	0.16
Tuesday	33	0.18	1.53	0.18
Tuesday	34	0.17	1.41	0.17
Tuesday	35	0.15	1.30	0.15
Tuesday	36	0.14	1.33	0.14
Tuesday	37	0.14	1.30	0.14
Tuesday	38	0.14	1.22	0.14
Tuesday	39	0.13	1.17	0.13
Tuesday	40	0.13	1.16	0.13
Tuesday	41	0.13	1.20	0.13
Tuesday	42	0.13	1.13	0.13
Tuesday	43	0.12	1.10	0.12
Tuesday	44	0.12	1.09	0.12
Tuesday	45	0.12	0.83	0.12
Tuesday	46	0.09	0.49	0.09
Tuesday	47	0.05	0.35	0.05
Wednesday	48	0.04	0.28	0.04
Wednesday	49	0.03	0.25	0.03
Wednesday	50	0.03	0.22	0.03
Wednesday	51	0.02	0.19	0.02
Wednesday	52	0.02	0.26	0.02
Wednesday	53	0.03	0.52	0.03
Wednesday	54	0.06	1.06	0.06
Wednesday	55	0.12	1.49	0.12
Wednesday	56	0.16	1.67	0.16
Wednesday	57	0.18	1.53	0.18
Wednesday	58	0.17	1.41	0.17
Wednesday	59	0.15	1.30	0.15
Wednesday	60	0.14	1.33	0.14
Wednesday	61	0.14	1.30	0.14
Wednesday	62	0.14	1.22	0.14
Wednesday	63	0.13	1.17	0.13
Wednesday	64	0.13	1.16	0.13
Wednesday	65	0.13	1.20	0.13
Wednesday	66	0.13	1.13	0.13
Wednesday	67	0.12	1.10	0.12
Wednesday	68	0.12	1.09	0.12
Wednesday	69	0.12	0.83	0.12
Wednesday	70	0.09	0.49	0.09
Wednesday	71	0.05	0.35	0.05
Thursday	72	0.04	0.28	0.04
Thursday	73	0.03	0.25	0.03
Thursday	74	0.03	0.22	0.03
Thursday	75	0.02	0.19	0.02
Thursday	76	0.02	0.26	0.02
Thursday	77	0.03	0.52	0.03
Thursday	78	0.06	1.06	0.06
Thursday	79	0.12	1.49	0.12
Thursday	80	0.16	1.67	0.16
Thursday	81	0.18	1.53	0.18
Thursday	82	0.17	1.41	0.17
Thursday	83	0.15	1.30	0.15
Thursday	84	0.14	1.33	0.14
Thursday	85	0.14	1.30	0.14
Thursday	86	0.14	1.22	0.14
Thursday	87	0.13	1.17	0.13
Thursday	88	0.13	1.16	0.13
Thursday	89	0.13	1.20	0.13
Thursday	90	0.13	1.13	0.13
Thursday	91	0.12	1.10	0.12
Thursday	92	0.12	1.09	0.12
Thursday	93	0.12	0.83	0.12
Thursday	94	0.09	0.49	0.09
Thursday	95	0.05	0.35	0.05
Friday	96	0.04	0.28	0.04
Friday	97	0.03	0.25	0.03
Friday	98	0.03	0.22	0.03
Friday	99	0.02	0.19	0.02
Friday	100	0.02	0.26	0.02
Friday	101	0.03	0.52	0.03
Friday	102	0.06	1.06	0.06
Friday	103	0.12	1.49	0.12
Friday	104	0.16	1.67	0.16
Friday	105	0.18	1.53	0.18
Friday	106	0.17	1.41	0.17
Friday	107	0.15	1.30	0.15
Friday	108	0.14	1.33	0.14
Friday	109	0.14	1.30	0.14
Friday	110	0.14	1.22	0.14
Friday	111	0.13	1.17	0.13
Friday	112	0.13	1.16	0.13
Friday	113	0.13	1.20	0.13
Friday	114	0.13	1.13	0.13
Friday	115	0.12	1.10	0.12
Friday	116	0.12	1.09	0.12
Friday	117	0.12	0.83	0.12
Friday	118	0.09	0.49	0.09
Friday	119	0.05	0.35	0.05
Saturday	120	0.05	0.35	0.05
Saturday	121	0.04	0.26	0.04
Saturday	122	0.03	0.24	0.03
Saturday	123	0.03	0.21	0.03
Saturday	124	0.02	0.24	0.02
Saturday	125	0.03	0.50	0.03
Saturday	126	0.05	1.13	0.05
Saturday	127	0.12	1.76	0.12
Saturday	128	0.19	2.02	0.19
Saturday	129	0.22	2.06	0.22
Saturday	130	0.22	1.71	0.22
Saturday	131	0.19	1.61	0.19
Saturday	132	0.18	1.55	0.18
Saturday	133	0.17	1.66	0.17
Saturday	134	0.18	1.64	0.18
Saturday	135	0.18	1.53	0.18
Saturday	136	0.17	1.40	0.17
Saturday	137	0.15	1.49	0.15
Saturday	138	0.16	1.51	0.16
Saturday	139	0.16	1.52	0.16
Saturday	140	0.17	1.26	0.17
Saturday	141	0.14	1.00	0.14
Saturday	142	0.11	0.64	0.11
Saturday	143	0.07	0.43	0.07
Sunday	144	0.05	0.35	0.05
Sunday	145	0.04	0.26	0.04
Sunday	146	0.03	0.24	0.03
Sunday	147	0.03	0.21	0.03
Sunday	148	0.02	0.24	0.02
Sunday	149	0.03	0.50	0.03
Sunday	150	0.05	1.13	0.05
Sunday	151	0.12	1.76	0.12
Sunday	152	0.19	2.02	0.19
Sunday	153	0.22	2.06	0.22
Sunday	154	0.22	1.71	0.22
Sunday	155	0.19	1.61	0.19
Sunday	156	0.18	1.55	0.18
Sunday	157	0.17	1.66	0.17
Sunday	158	0.18	1.64	0.18
Sunday	159	0.18	1.53	0.18
Sunday	160	0.17	1.40	0.17
Sunday	161	0.15	1.49	0.15
Sunday	162	0.16	1.51	0.16
Sunday	163	0.16	1.52	0.16
Sunday	164	0.17	1.26	0.17
Sunday	165	0.14	1.00	0.14
Sunday	166	0.11	0.64	0.11
Sunday	167	0.07	0.43	0.07

Flow	Daily	Hourly	Wkend
0.11	1.16	0.30	0.30
	0.94	0.26	0.22
	0.94	0.23	0.21
	0.94	0.21	0.18
	0.94	0.27	0.21
	0.94	0.55	0.44
	1.16	1.13	0.98
		1.59	1.53
		1.78	1.75
		1.63	1.78
		1.50	1.48
		1.38	1.39
		1.42	1.34
		1.39	1.43
		1.30	1.42
		1.25	1.32
		1.23	1.21
		1.27	1.29
		1.20	1.31
		1.17	1.32
		1.16	1.09
		0.88	0.87
		0.52	0.56
		0.37	0.38


EWA C3 Meter Wet Weather Flow Model Validation December 2010 Storm Event
Flow (mgd)
Precipitation (in/hr)
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
12/19/10
12/20/10
12/21/10
12/22/10
12/23/10
12/24/10
12/25/10
12/26/10
Carlsbad RDII
EWA FM Data
DWF
Model Output
V1 FM Data (upstream)
Precipitation


EWA C1 Meter Wet Weather Flow Model Validation December 2010 Storm Event
Flow (mgd)
Precipitation (in/hr)
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
12/19/10
12/20/10
12/21/10
12/22/10
12/23/10
12/24/10
12/25/10
12/26/10
Carlsbad RDII
EWA FM Data
DWF
Model Output
VA1 FM Data (upstream)
Precipitation


EWA B1 Meter Wet Weather Flow Model Validation December 2010 Storm Event
Flow (mgd)
Precipitation (in/hr)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
12/19/10
12/20/10
12/21/10
12/22/10
12/23/10
12/24/10
12/25/10
12/26/10
Carlsbad RDII
EWA FM Data
DWF
Model Output
B2, V2 FM Data (upstream)
Precipitation

Appendix C-3. Existing System Capacity Analysis Results

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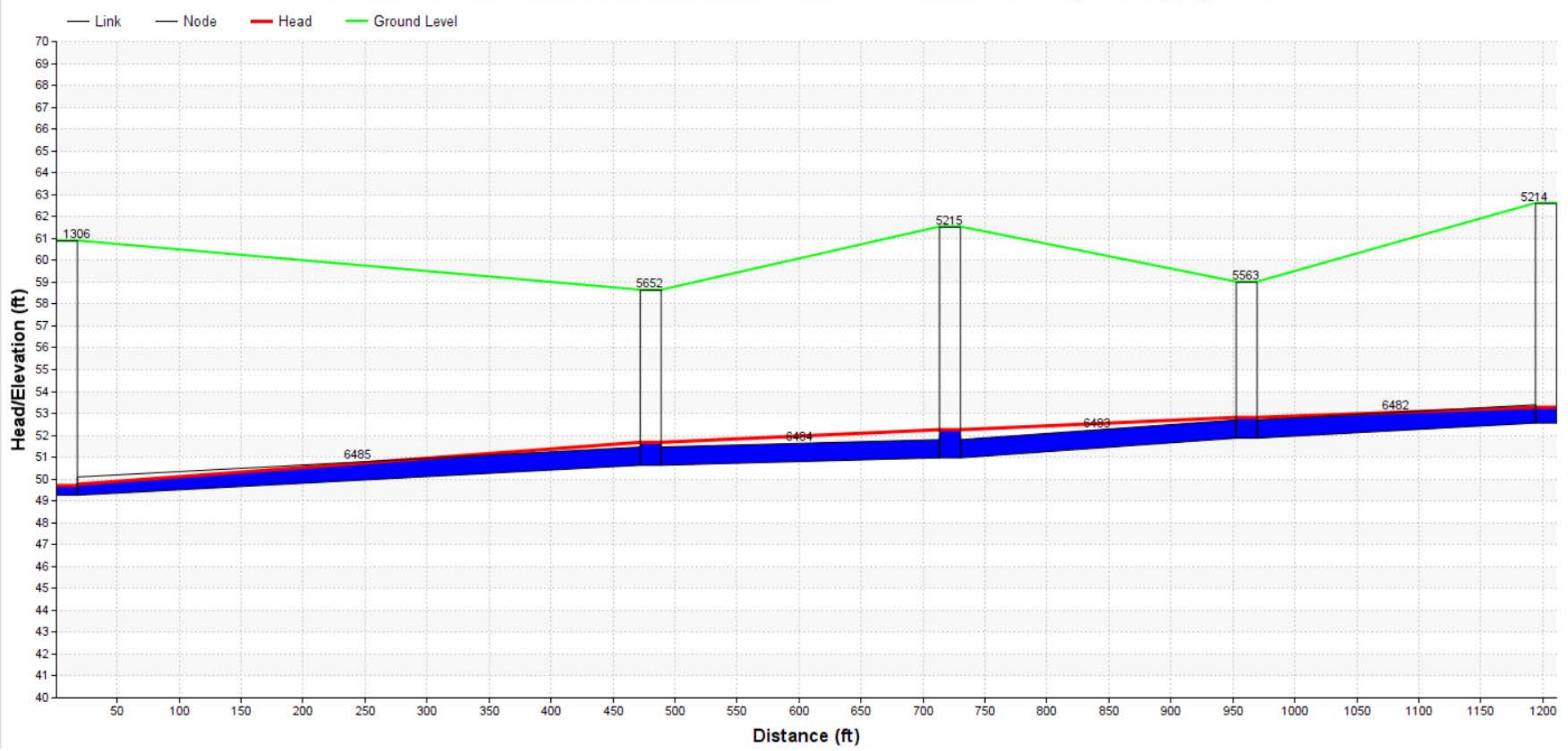
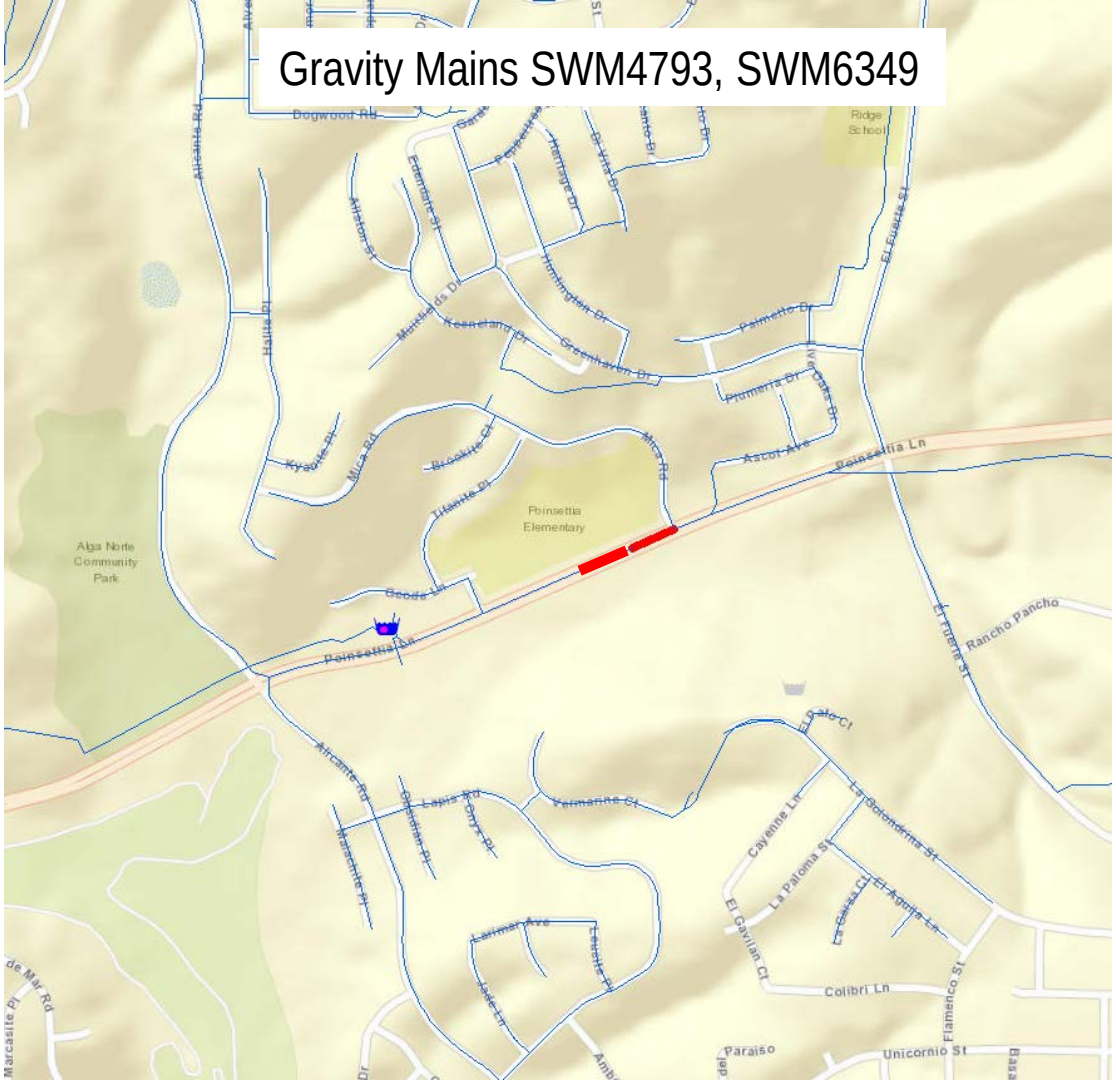
Existing System Capacity Analysis Results

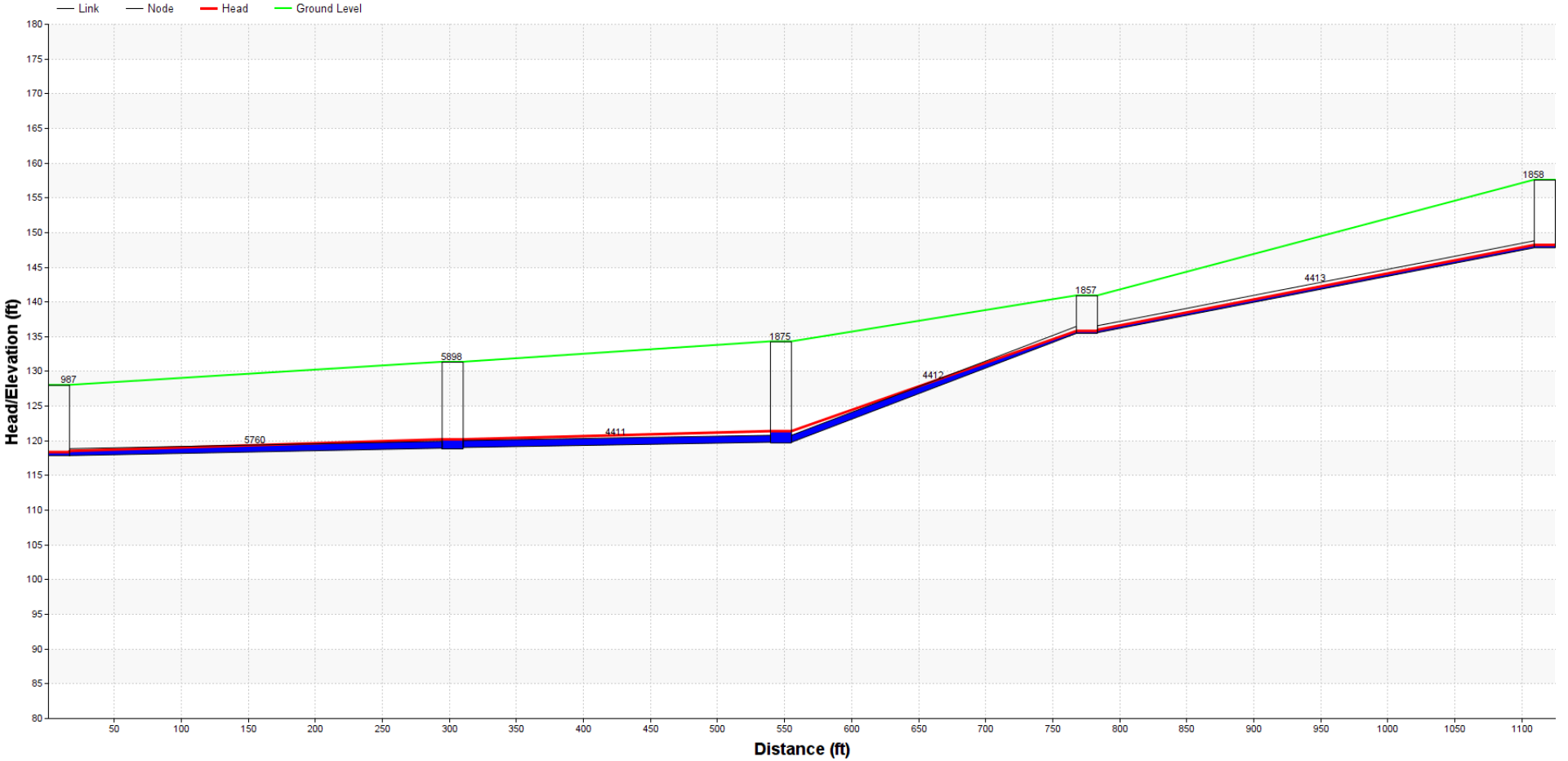

Gravity Main SWM4273
Carlsbad
Laguna Dr
Carlsbad Village Dr
Oak Ave
Pine Ave
Cypress Ave
Grand Ave
Walnut Ave
Chestnut Ave
Magnolia Ave
Palm Ave
Brassweed Ave
State St
Roosevelt St
Madison St
Harding St
Jefferson St
Tyler St
Lincoln St
Adams St
Eureka Pl
Highland Dr
McKinley St
Woodland Pkwy
Avocado Ln
Camellia Pl
Rio Rico Dr
Maxton Brown Rd
Brava Vista Cir
Kemmeyer Dr
Arbuckle Pl
Elmwood St
Newland Ct
James Dr
Valley
Home Ave
Pine Ave
Army and Navy Academy
Coaster-Carlsbad Village
Magee Park
Garfield St
Beech Ave
Carlsbad Blvd
Christensen Way
Ocean St
Wrightington St
Village Faire Shopping Center
Oak Park
Holiday Park
Pine Park
Chase Field
San Diego Fwy
5
50
49
Carlsbad Blvd

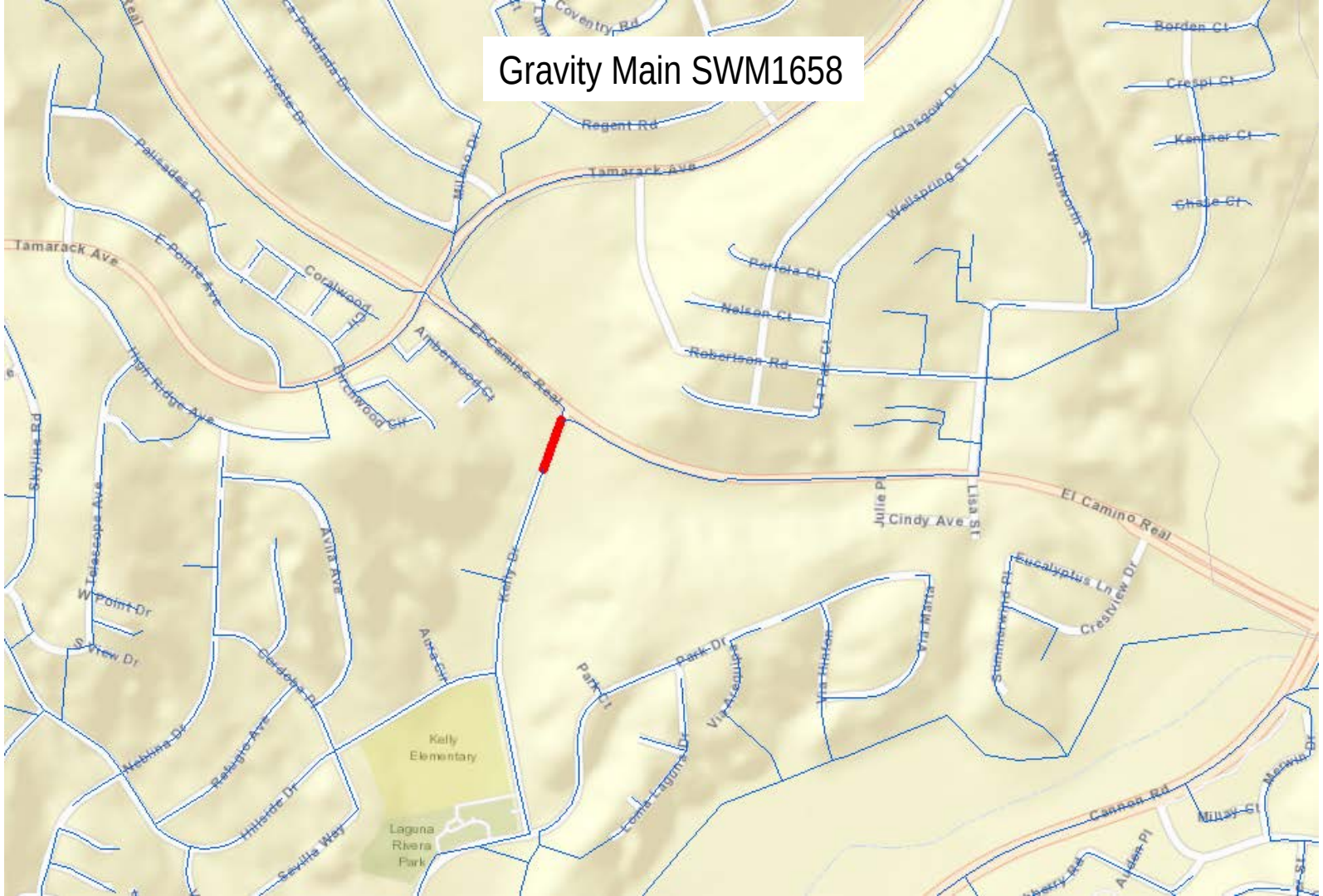
SWM4273 Existing Peak Wet Weather Flow



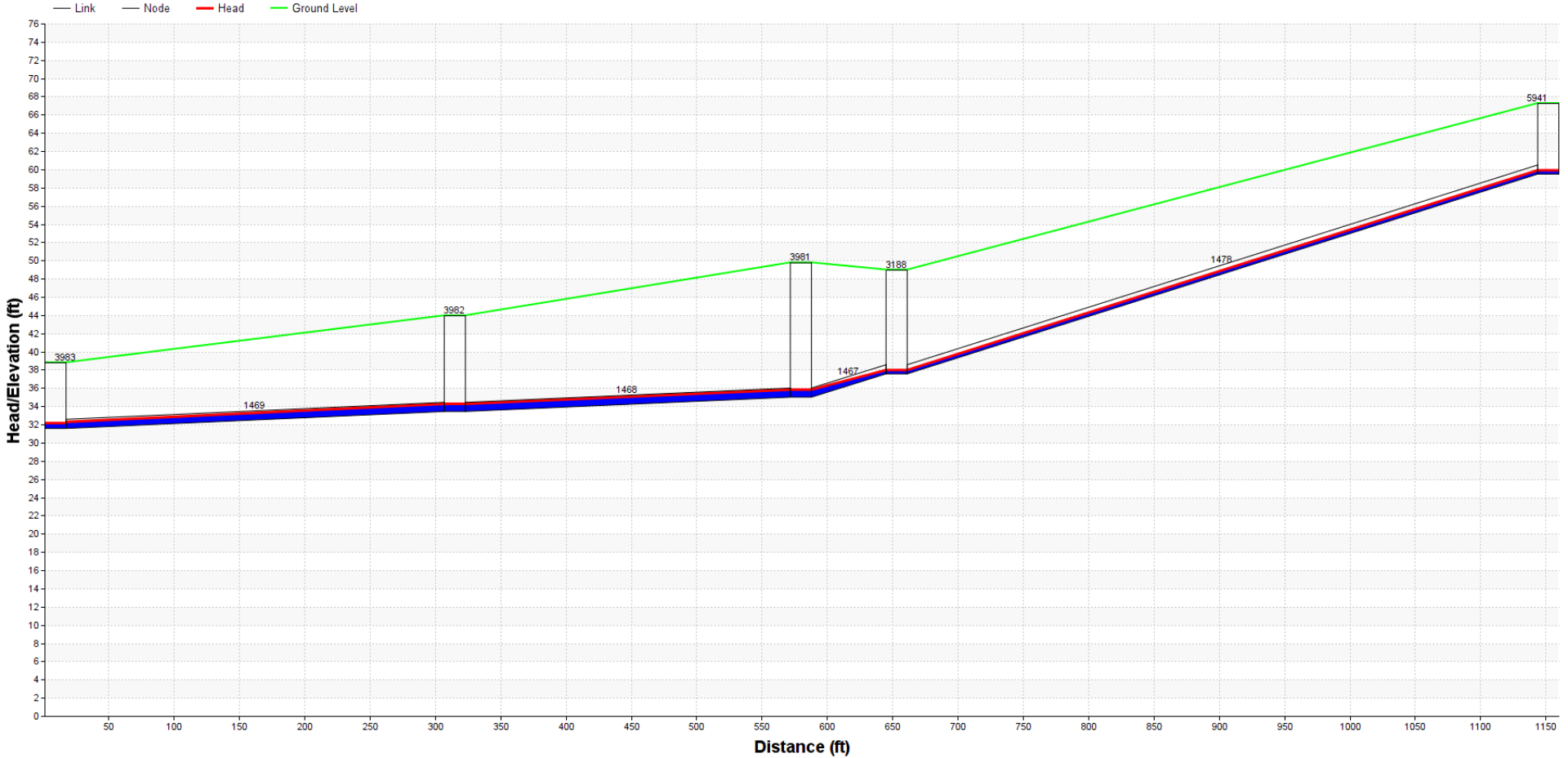

Gravity Mains SWM4793, SWM6349
Poinsettia Ln
Poinsettia Elementary
Alga Norte Community Park
Dogwood Rd
Alicante Rd
Halite Pl
Kyanite Pl
Mica Rd
Brooke Ct
Titanite Pl
Brooke Ln
Ascot Ave
Plumeria Dr
Palmetto Dr
Greenhaven Dr
Kennelane Dr
Hummingbird Dr
Heritage Dr
Alston Pl
Edenmore Pl
El Fuerte St
Ridge School
El Rancho Pancho
La Costa Ct
Cayenne Ln
La Paloma St
La Golondrina St
El Gavilan Ct
El Aguila Ln
Colibri Ln
Flamenco St
Unicornio St
Paraiso
Lapis Rd
Onyx Pl
Jade Ln
Laurel Ave
Turnstone Pl
Hummingbird Pl
Cayenne Ct
Alicante Rd
Marcasite Pl
de Mar Rd

SWM4793, SWM6349 Existing Peak Wet Weather Flow



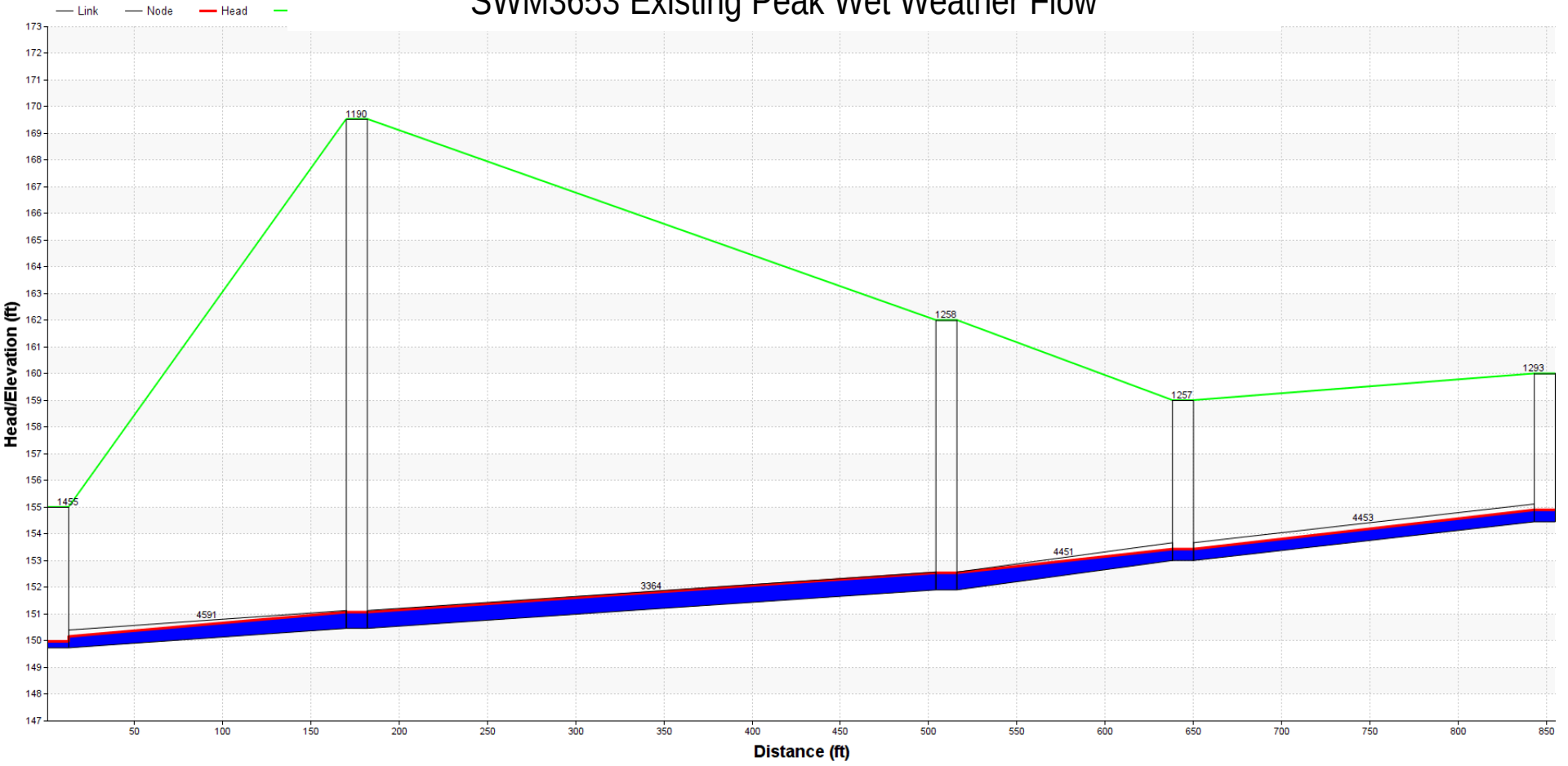

Gravity Main SWM1658
Coventry Rd
Borden Ct
Crespi Ct
Kentner Ct
Chaste Ct
Regent Rd
Tamarack Ave
Chagoy Dr
Wellspring St
Wadsworth St
Palisades Dr
Trieste Dr
Milano Dr
E Pointe Ave
Coralwood Ct
Amberwood Ct
Birchwood Ct
Portola Ct
Nelson Ct
Robertson Rd
La Paz Ct
El Camino Real
Julie Pl
Cindy Ave
Lisa St
Eucalyptus Ln
Crestview Dr
Summerwind Pl
Via Maria
Via Alegria
Via Rincon
Park Dr
Park Ct
Skyline Rd
Telescope Ave
High Ridge Ave
W Point Dr
S View Dr
Avila Ave
Kelly Dr
Anza Cir
Cordoba Dr
Mebuna Dr
Reforma Ave
Hillcrest Dr
Sevilla Way
Kelly Elementary
Laguna Rivera Park
Corte Laguna Dr
Cannon Rd
Milroy Ct
Merwin Dr
Auldee Pl

SWM1658 Existing Peak Wet Weather Flow




Gravity Main SWM3653
Carlsbad
Stratford Ln
Laguna Dr
Carlsbad Village Dr
Oak Ave
Pine Ave
Basswood Ave
Chestnut Ave
Magnolia Ave
Brady Cir
Hillview Ct
Woodhaven Way
Spanish Way
Eureka Pl
Holiday Park
Oak Park
Pine Park
Chase Field
Park Ave
Avocado Ln
Camellia Pl
Adams St
Rio Rico Dr
Highland Dr
Harding St
McKinley St
James Dr
Valley Pl
Fraser Ave
Bonita Ln
Maxwell Ln
Basswood
Maple St
Linda Ln
Gayle Way
Ann Dr
Donna Dr
Charter Oak Dr
Swim Complex
Carlsbad High School
Carlsbad High
Carlsbad Village Academy
Carlsbad Seaside Academy
Lee Ct
Chantren Cir
Dobbins Cir
Seaview Way
Westhaven Dr
Monroe St
Woodvale Dr
Magnolia Elementary
Sanderling Waldorf School
Andrea Ave
Park Dr
May Cir
Valley Middle
Magnolia Athletic Field
Tamarack Ave
Scott Dr
Kirk Pl
Joann Pl
Poinsettia Ln
Holly Dr
Margaret Pl
Avondale Cir
Bedford Cir
Jaime Way
San Diego Fwy
5
50
49

SWM3653 Existing Peak Wet Weather Flow



Appendix C-4. Buildout Capacity Analysis Results

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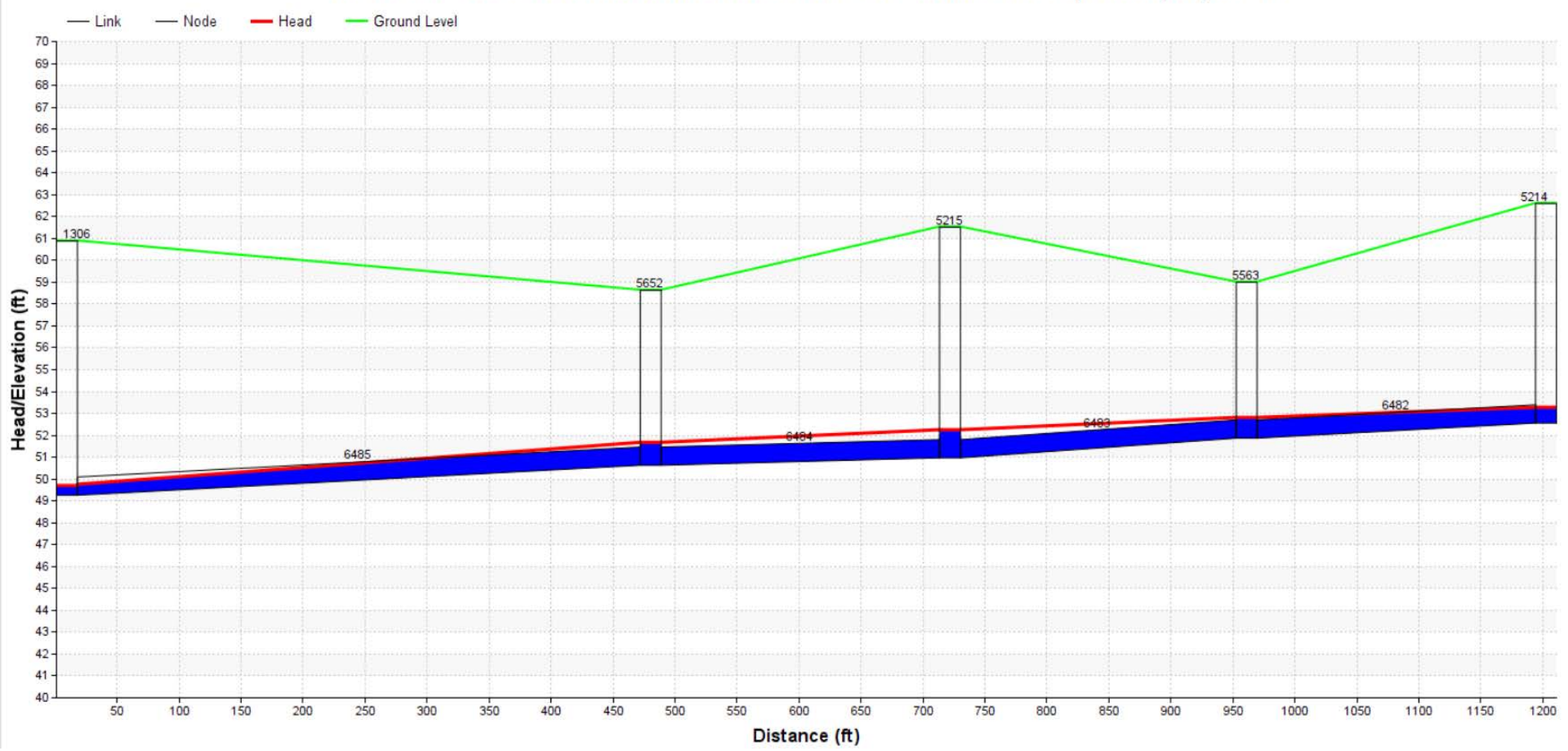
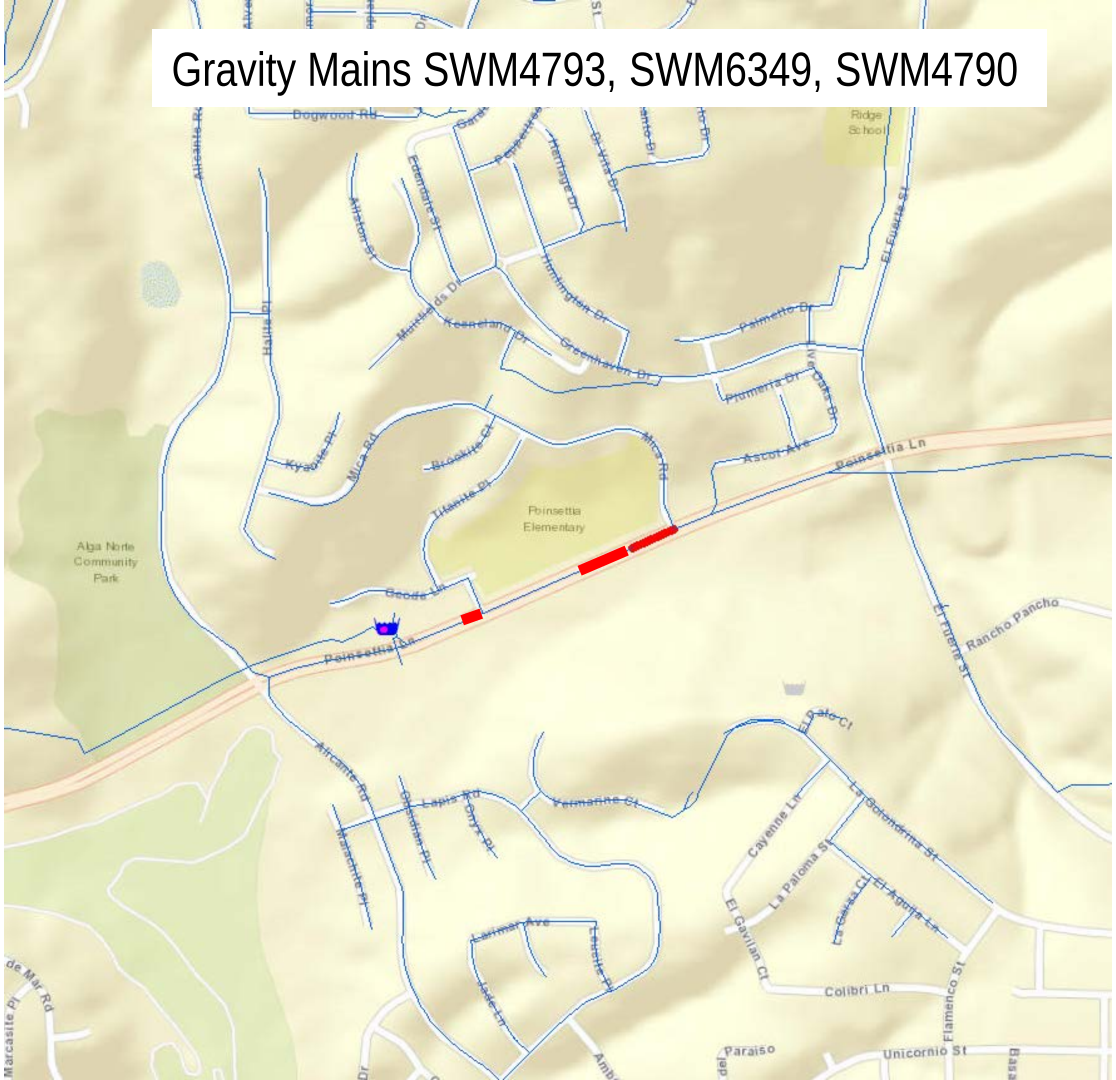
Buildout System Capacity Analysis Results


Gravity Main SWM4273
Carlsbad
Laguna Dr
Carlsbad Village Dr
Oak Ave
Pine Ave
Cypress Ave
Grand Ave
Walnut Ave
Chestnut Ave
Magnolia Ave
Palm Ave
Brassweed Ave
State St
Roosevelt St
Madison St
Harding St
Jefferson St
Tyler St
Lincoln St
Adams St
Eureka Pl
Highland Dr
McKinley St
Woodland Pkwy
Avocado Ln
Camellia Pl
Rio Rico Dr
Maxton Brown Rd
Brava Vista Cir
Kemmeyer Dr
Arbuckle Pl
Elmwood St
Newland Ct
James Dr
Valley
Home Ave
Pine Ave
Army and Navy Academy
Coaster-Carlsbad Village
Magee Park
Garfield St
Beech Ave
Carlsbad Blvd
Christensen Way
Ocean St
Wrightington St
Village Faire Shopping Center
Oak Park
Holiday Park
Pine Park
Chase Field
San Diego Fwy
5
50
49
Carlsbad Blvd

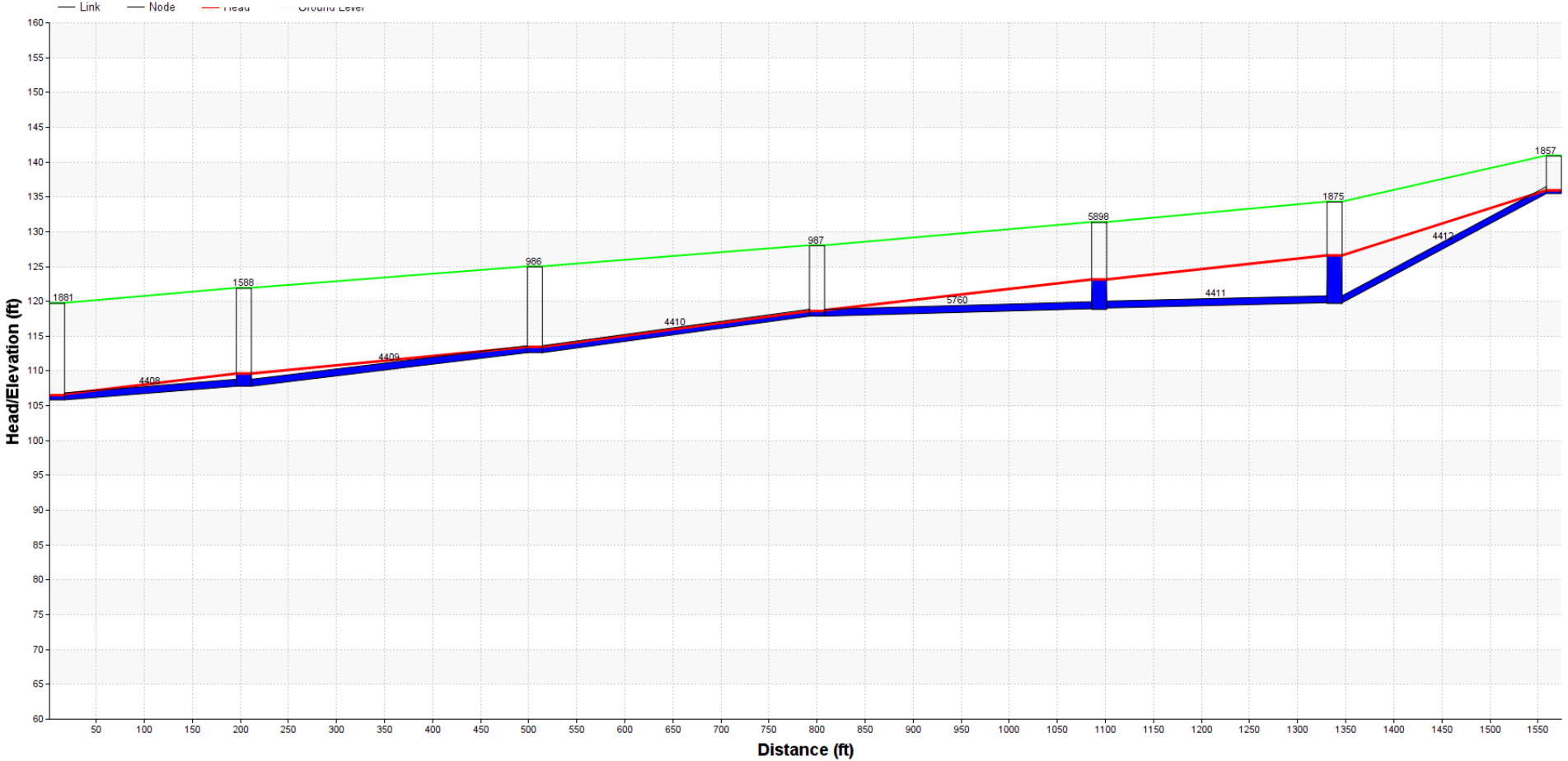
SWM4273 Buildout Peak Wet Weather Flow

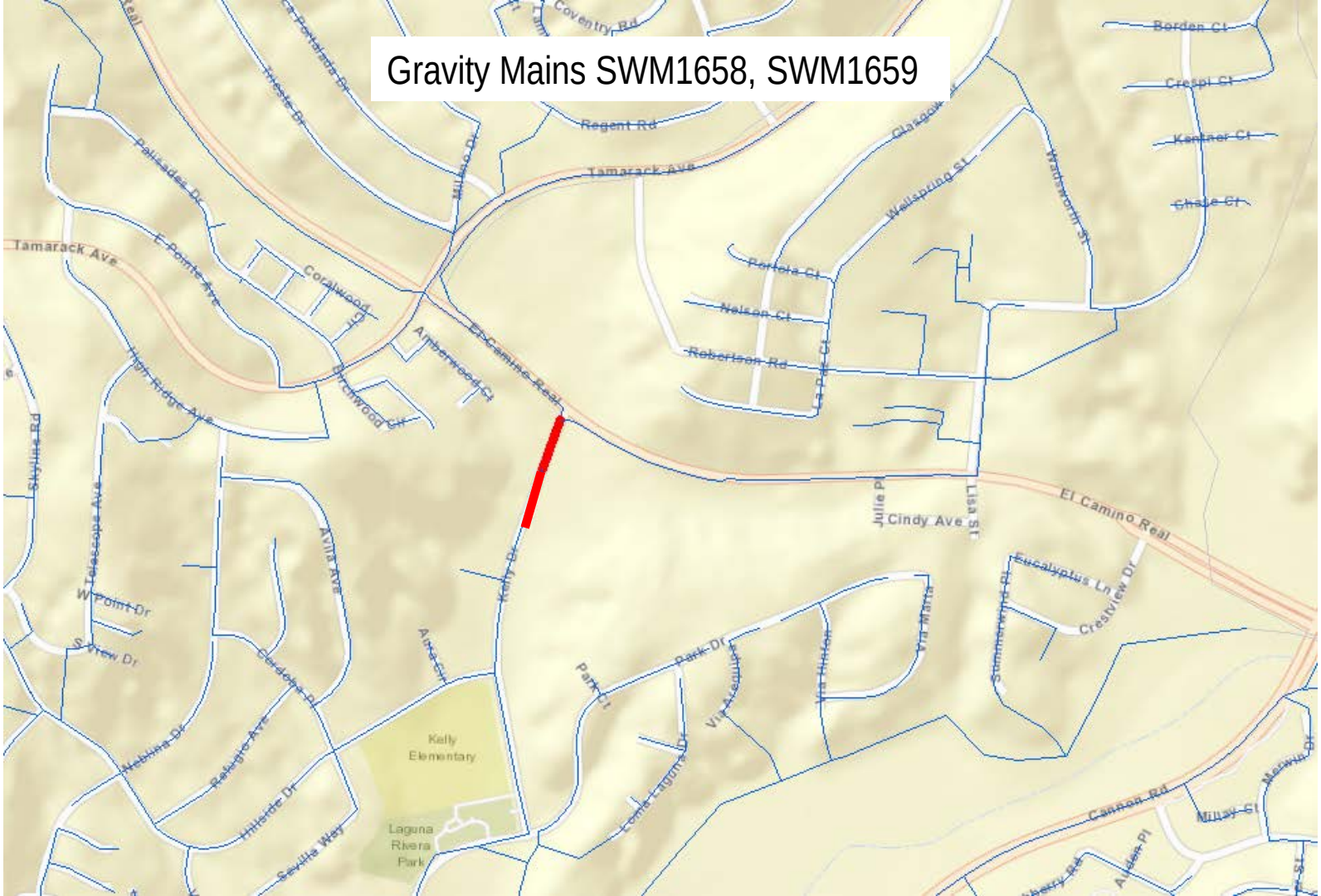


Gravity Mains SWM4793, SWM6349, SWM4790

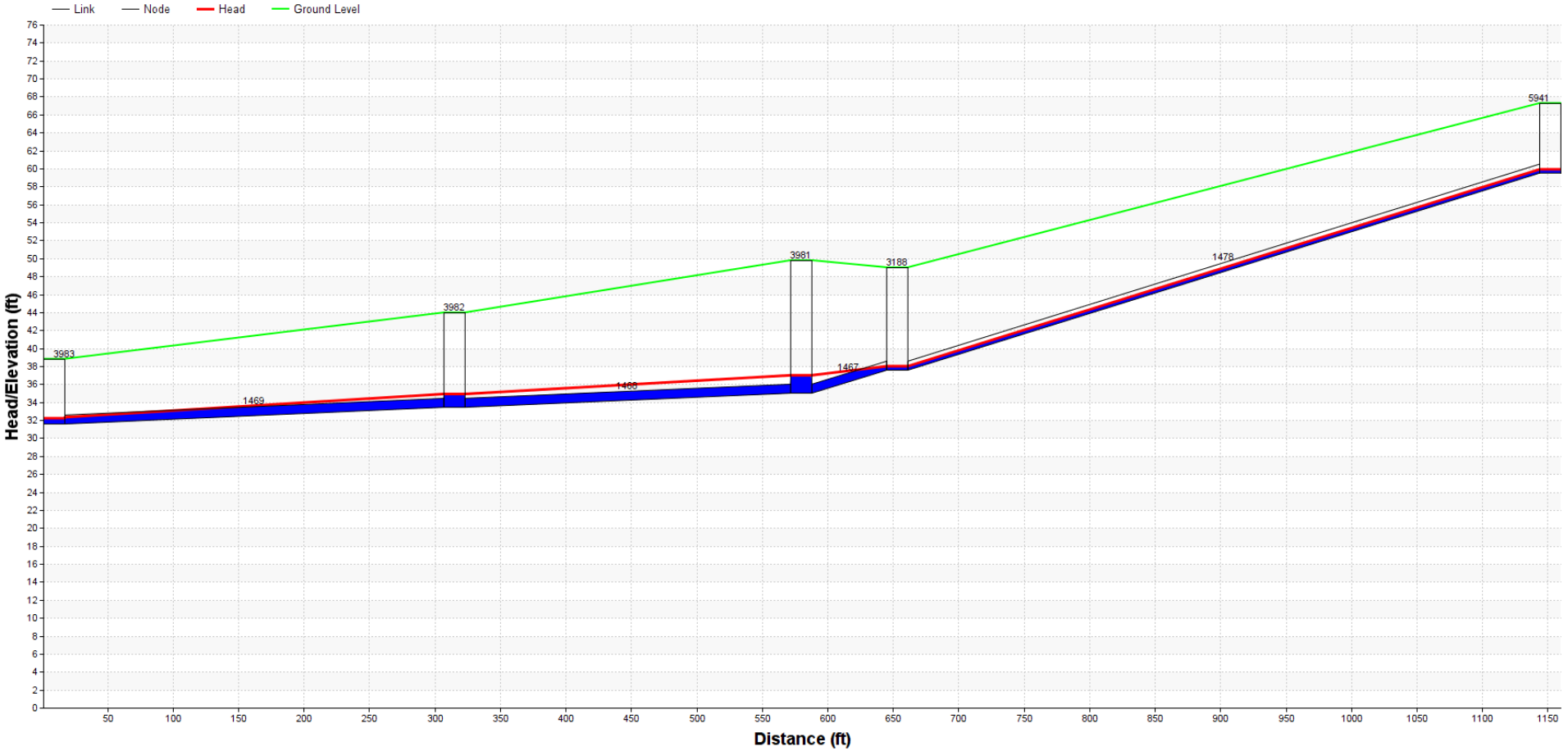

Dogwood Rd
Ridge School
Alga Norte Community Park
Poinsettia Elementary
Poinsettia Ln
Palmetto Dr
Plumeria Dr
Ascot Ave
Mica Rd
Kyanite Pl
Brookite Ct
Titanite Pl
Geode Ln
Huntington Dr
Greenhaven Dr
Keeneland Dr
Alston St
El Fuerte St
Rancho Pancho
Alicante Rd
Lapis Rd
Onyx Pl
Vermarine Ct
Cayenne Ln
La Paloma St
El Aguila Ln
La Golondrina St
El Gavilan Ct
Colibri Ln
Flamenco St
Unicornio St
Paraiso
Larimar Ave
Jade Ln
El Palo Ct
de Mar Rd
Marcasite Pl

SWM4793, SWM6349, SWM4790 Buildout Peak Wet Weather Flow



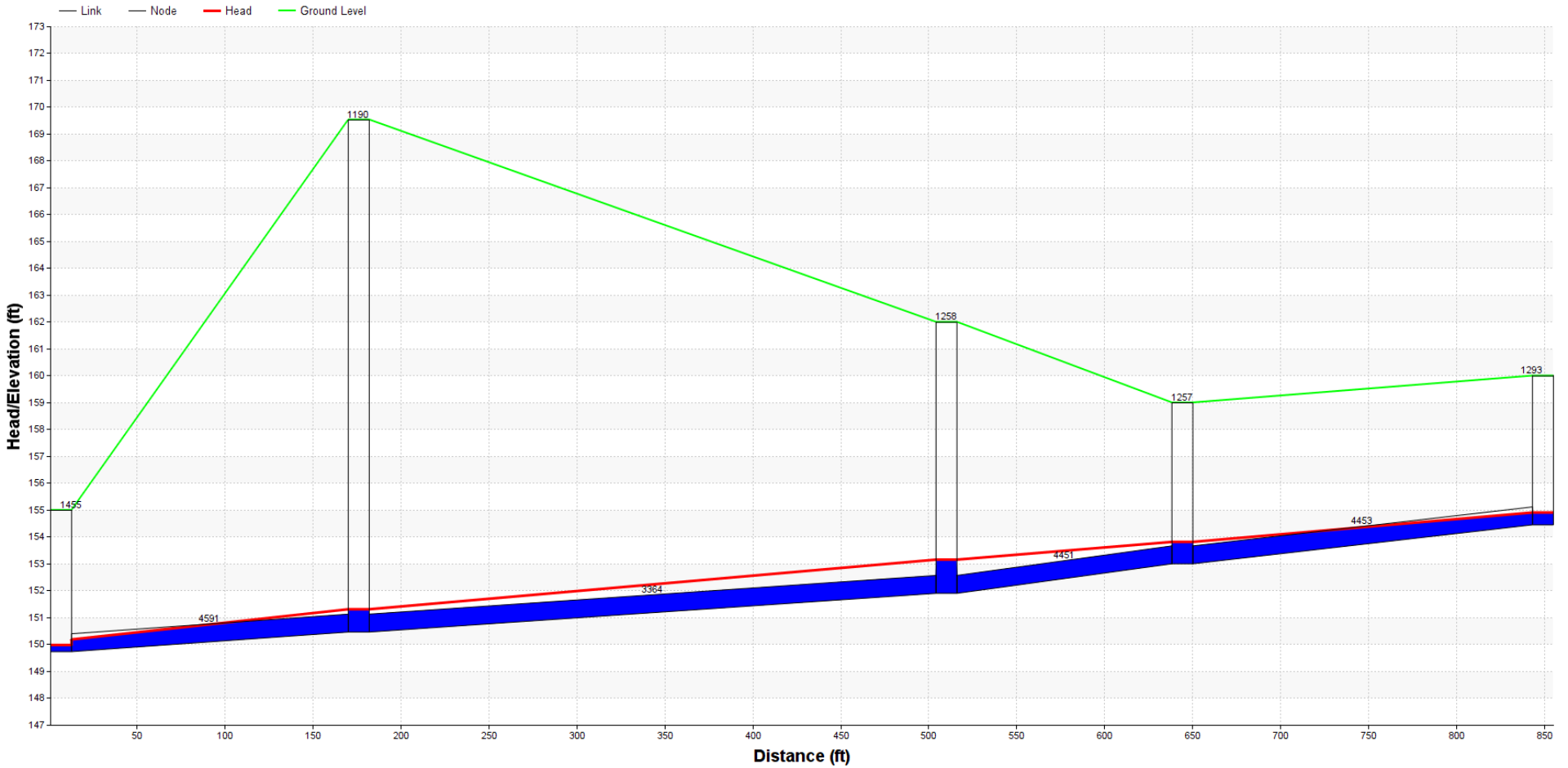

Gravity Mains SWM1658, SWM1659
Tamarack Ave
El Camino Real
Cindy Ave
Kelly Dr
Kelly Elementary
Laguna Rivera Park
Regent Rd
Coventry Rd
Borden Ct
Crespi Ct
Kestner Ct
Chaste Ct
Wellspring St
Wadsworth St
Portola Ct
Nelson Ct
Robertson Rd
La Paz Ct
Julie Pl
Lisa St
Eucalyptus Ln
Crestview Dr
Summerwind Pl
Via Maria
Via Hacienda
Via Arequipa
Park Dr
Park Ct
Corte Laguna Dr
Cannon Rd
Milroy Ct
Andaer Pl
Amherwood Ct
Coralwood Ct
Birchwood Ct
E Pointe Ave
Palisades Dr
Trieste Dr
Milano Dr
High Ridge Ave
Skyline Rd
Telescope Ave
W Point Dr
S View Dr
Avila Ave
Anza Cir
Cordoba Dr
Mebuna Dr
Relegio Ave
Hillcrest Dr
Sevilla Way

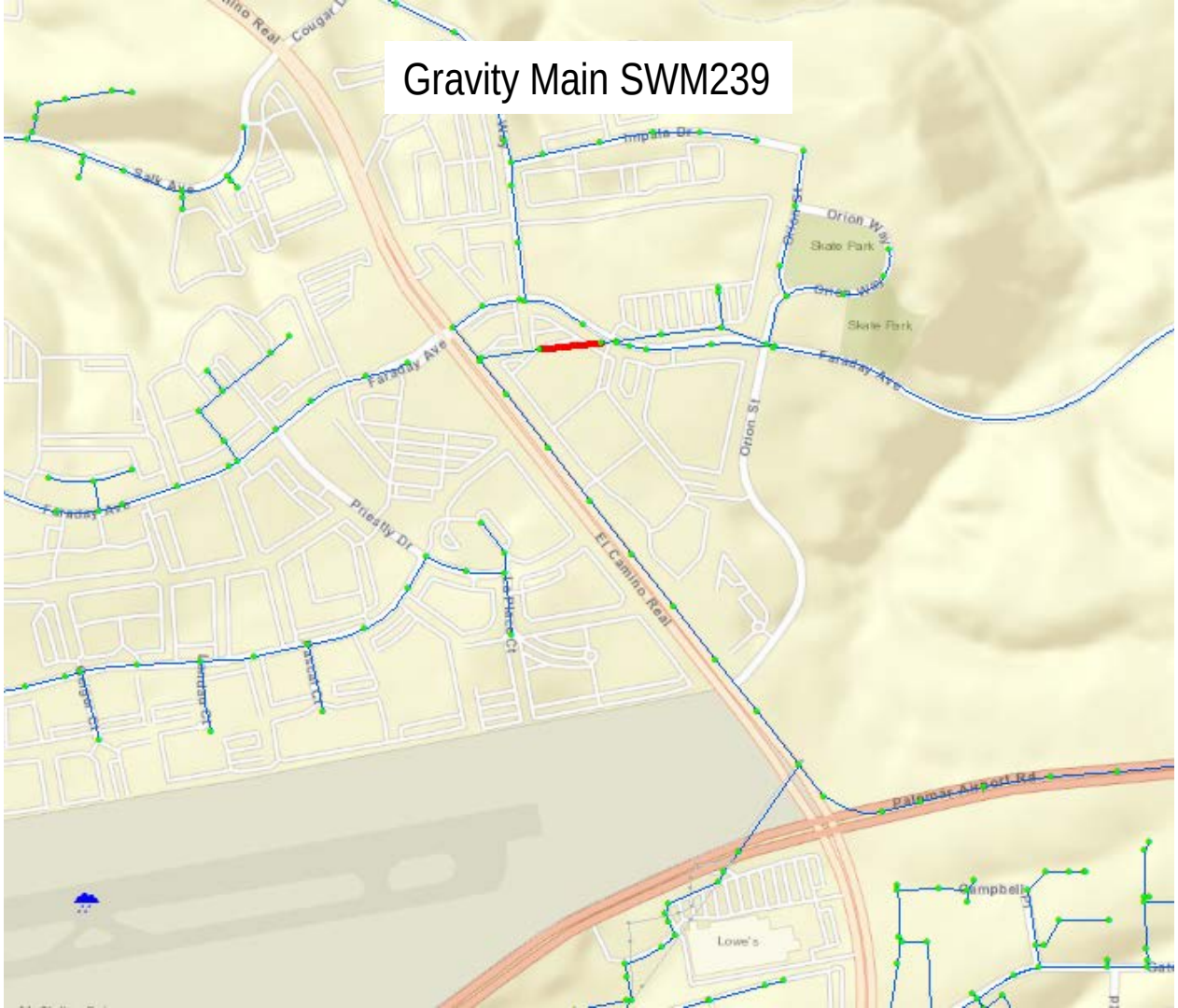
SWM1658, SWM1659 Buildout Peak Wet Weather Flow



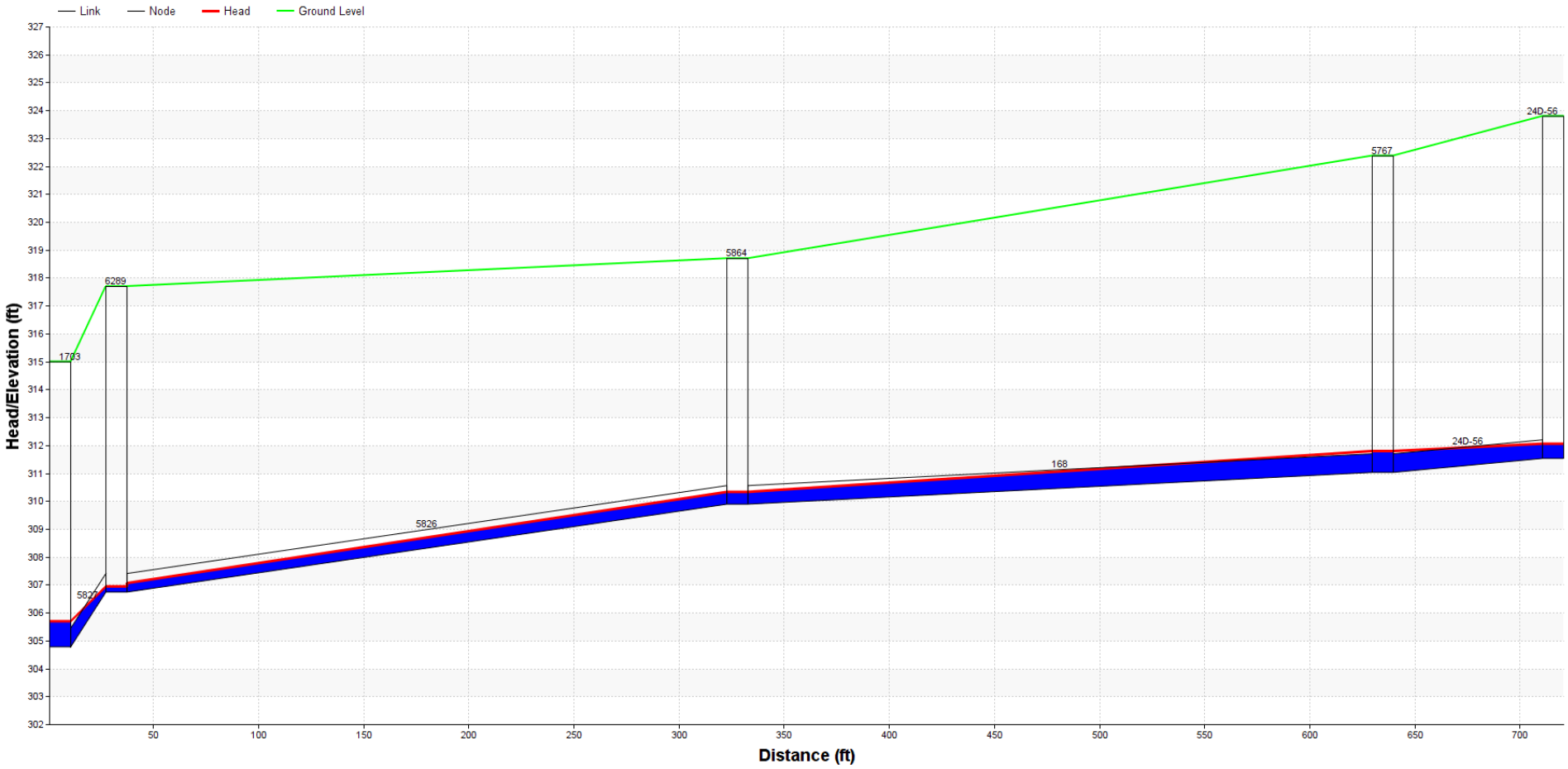

Gravity Main SWM3653
Carlsbad
Stratford Ln
Laguna Dr
Carlsbad Village Dr
Oak Ave
Pine Ave
Basswood Ave
Chestnut Ave
Magnolia Ave
Brady Cir
Hillview Ct
Woodhaven Way
Spanish Way
Eureka Pl
Holiday Park
Oak Park
Pine Park
Chase Field
Park Ave
Avocado Ln
Camellia Pl
Adams St
Rio Rico Dr
Highland Dr
Harding St
McKinley St
James Dr
Valley Pl
Fraser Ave
Bonita Ln
Maxwell Ln
Basswood
Maple St
Linda Ln
Gayle Way
Ann Dr
Donna Dr
Charter Oak Dr
Swim Complex
Carlsbad High School
Carlsbad High
Carlsbad Village Academy
Carlsbad Seaside Academy
Lee Ct
Chantren Cir
Dobbins Cir
Seaview Way
Westhaven Dr
Monroe St
Woodvale Dr
Magnolia Elementary
Sanderling Waldorf School
Andrea Ave
Park Dr
May Cir
Valley Middle
Magnolia Athletic Field
Tamarack Ave
Scott Dr
Kirk Pl
Joann Pl
Poinsettia Ln
Holly Dr
Margaret Pl
Avondale Cir
Bedford Cir
Jaime Way
San Diego Fwy
5
50
49

SWM3653 Buildout Peak Wet Weather Flow

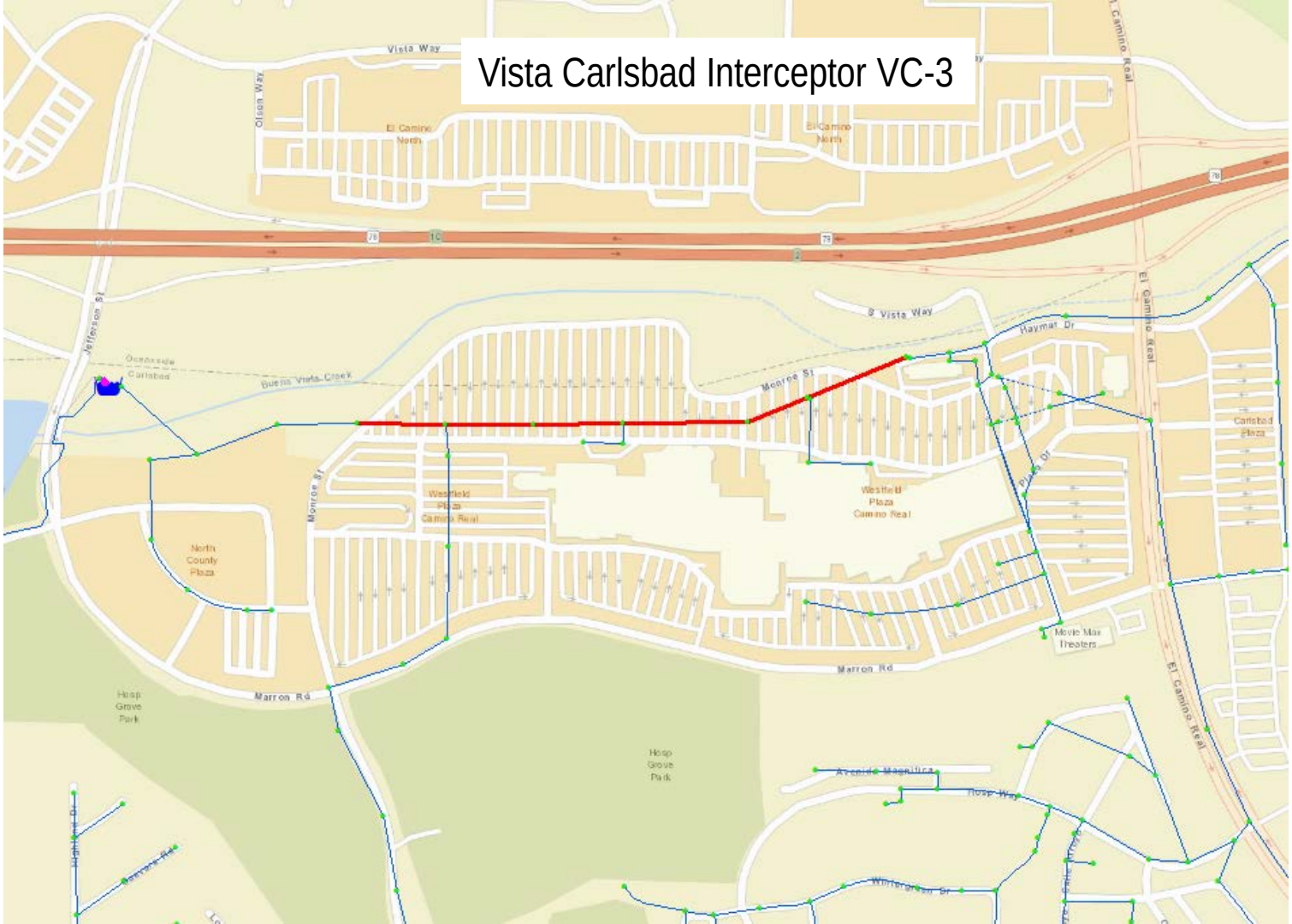



Gravity Main SWM239
Impala Dr
Orion St
Orion Way
Skate Park
Faraday Ave
Priestly Dr
El Camino Real
Palomar Airport Rd
Lowe's

SWM239 Buildout Peak Wet Weather Flow



Vista Carlsbad Interceptor VC-3



VC-3 Buildout Peak Wet Weather Flow