Wayne County Downriver Sewage Disposal System

Annual System Monitoring Report for 2015

Report to Wayne County and Communities

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and

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Engineering Services Group

March 23, 2016

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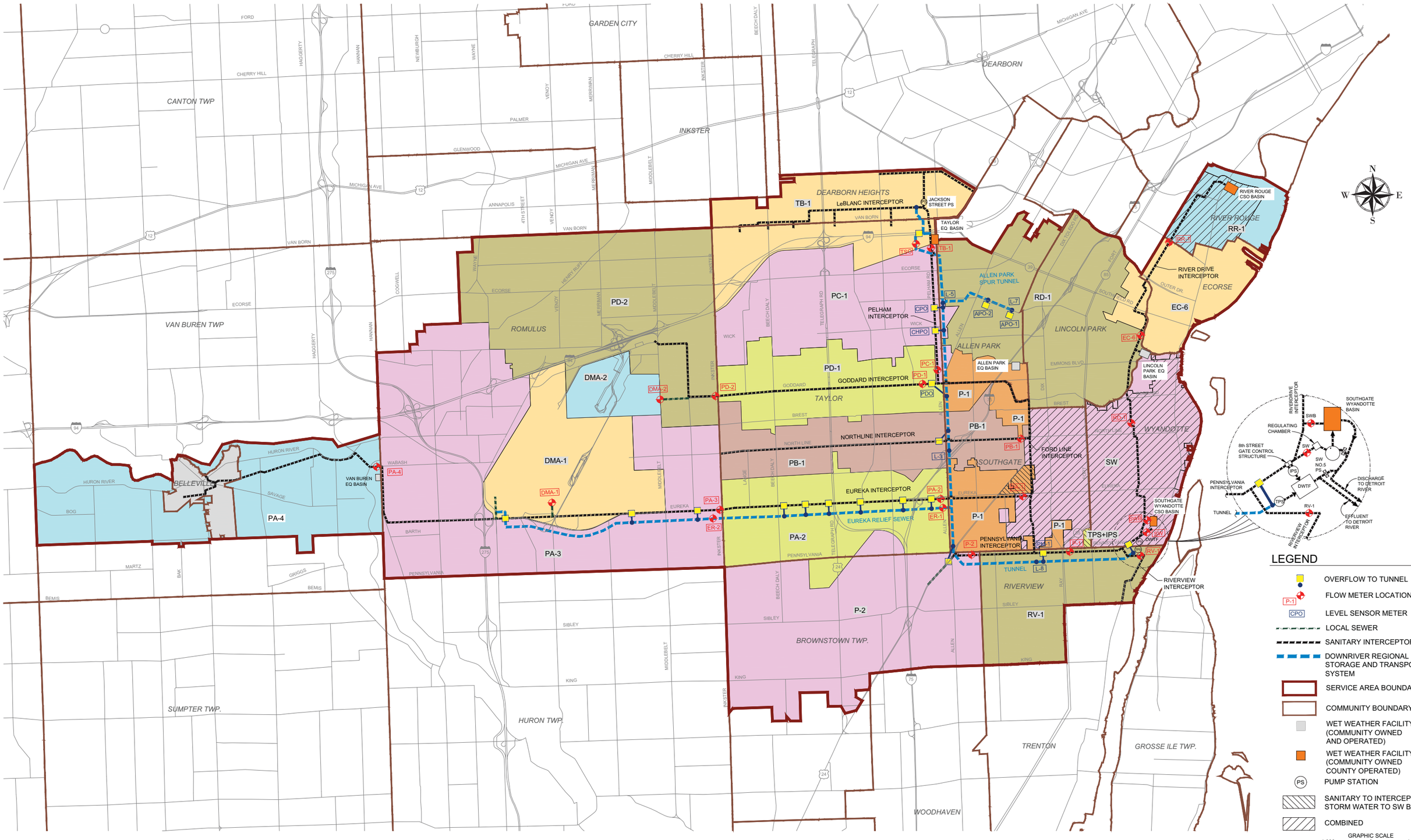
1. INTRODUCTION

This annual report provides a summary of the flow monitoring data for Wayne County's Downriver Sewage Disposal System (DSDS) for January through December 2015. This report supersedes the six (6) bi-monthly reports previously issued for 2015 and is intended to provide the best available estimate of flow rates for each meter district and community during the dry and wet weather conditions that occurred in 2015. For some meter districts and communities, the data have been revised from the bi-monthly reports.

Figure 1 presents a map of the DSDS showing the flow meter and level sensor locations, incremental meter districts, and the interceptors and Downriver Regional Storage and Transport System (DRSTS). Figure 2 presents the location of rain gages within and surrounding the DSDS service area.

The DSDS system monitoring program was strengthened during the year. Several meters and rain gages were replaced with new equipment where needed corrective maintenance of the old equipment was not cost effective. In these cases, the new equipment has significantly lower on-going maintenance costs than the old equipment. Dye-dilution testing, a highly accurate and independent method for estimating meter accuracy and bias, was performed for selected flow meters in 2015. For meters where dye-dilution testing was performed, the data were adjusted for meter bias using the dye-dilution test results.

The 2015 DSDS flow monitoring data were reviewed, edited and filled-in to provide a complete data set. Missing or erroneous data have been estimated using technically sound fill-in techniques.



LEGEND

- OVERFLOW TO TUNNEL
- FLOW METER LOCATION
- LEVEL SENSOR METER
- LOCAL SEWER
- SANITARY INTERCEPTOR
- DOWNRIVER REGIONAL STORAGE AND TRANSPORT SYSTEM
- SERVICE AREA BOUNDARY
- COMMUNITY BOUNDARY
- WET WEATHER FACILITY (COMMUNITY OWNED AND OPERATED)
- WET WEATHER FACILITY (COMMUNITY OWNED COUNTY OPERATED)
- PUMP STATION
- SANITARY TO INTERCEPTOR STORM WATER TO SW BASIN
- COMBINED

GRAPHIC SCALE
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1" = 4,000'

UPDATED: MARCH 30, 2016

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E				
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C				
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A				
	REVISIONS			

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DRAFTING DAH
CHECKED JMP
APPROVED KER
ISSUE DATE JAN 2012

DOWNRIVER
SEWAGE DISPOSAL SYSTEM

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Phone: (313) 567-3990 Fax: (313) 567-3750

INCREMENTAL METER DISTRICTS & INTERCEPTOR & METER LOCATIONS FOR 2013-2015 SYSTEM MONITORING PLAN

SCALE: 1" = 4000'
JOB No. ASI #1230
FILE No.

FIGURE 1

Mar. 30, 2016 – 3:15pm
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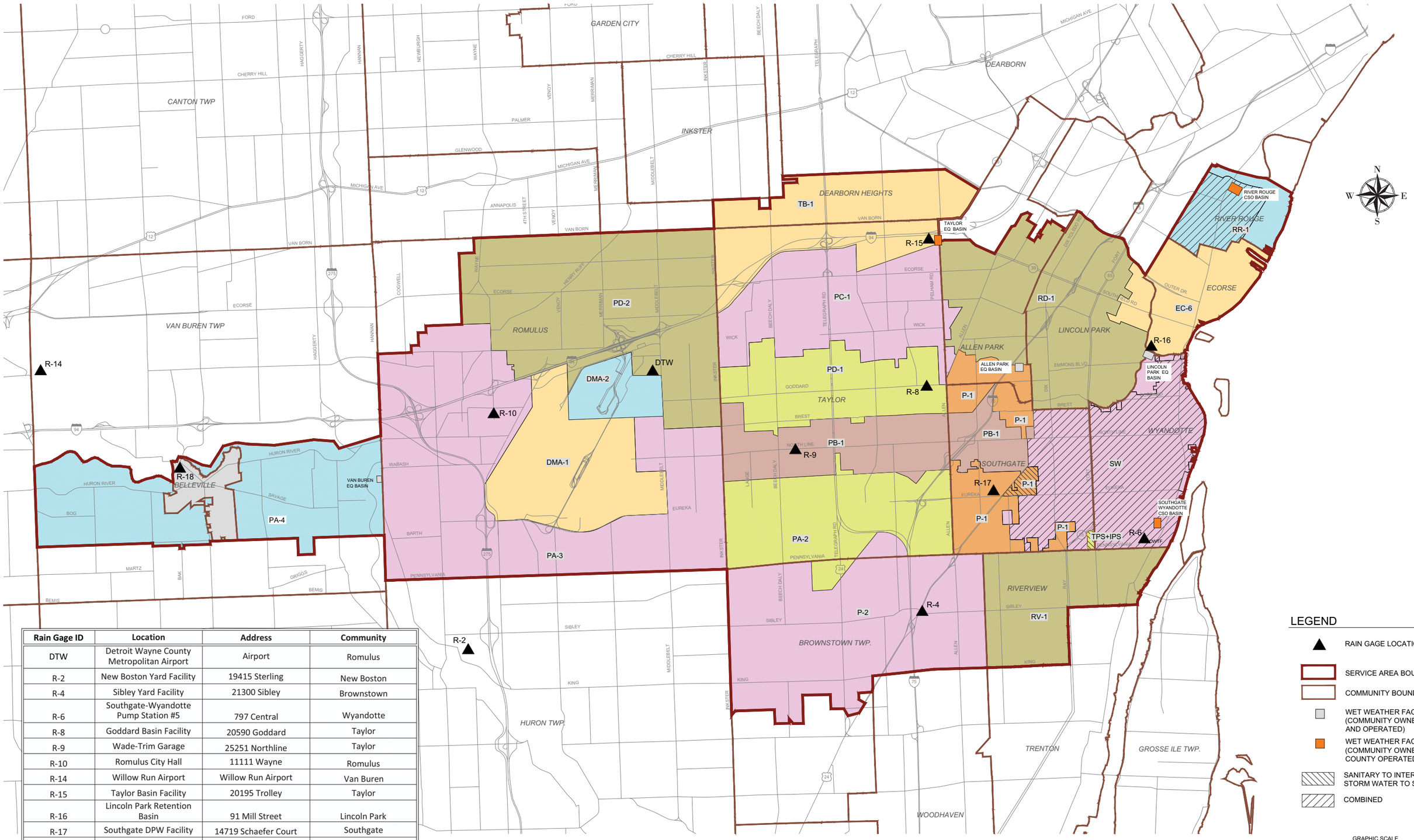

Rain Gage ID	Location	Address	Community
DTW	Detroit Wayne County Metropolitan Airport	Airport	Romulus
R-2	New Boston Yard Facility	19415 Sterling	New Boston
R-4	Sibley Yard Facility	21300 Sibley	Brownstown
R-6	Southgate-Wyandotte Pump Station #5	797 Central	Wyandotte
R-8	Goddard Basin Facility	20590 Goddard	Taylor
R-9	Wade-Trim Garage	25251 Northline	Taylor
R-10	Romulus City Hall	11111 Wayne	Romulus
R-14	Willow Run Airport	Willow Run Airport	Van Buren
R-15	Taylor Basin Facility	20195 Trolley	Taylor
R-16	Lincoln Park Retention Basin	91 Mill Street	Lincoln Park
R-17	Southgate DPW Facility	14719 Schaefer Court	Southgate
R-18	Belleville Fire Station	130 4th Street	Belleville

LEGEND

- RAIN GAGE LOCATION
- SERVICE AREA BOUNDARY
- COMMUNITY BOUNDARY
- WET WEATHER FACILITY (COMMUNITY OWNED AND OPERATED)
- WET WEATHER FACILITY (COMMUNITY OWNED COUNTY OPERATED)
- SANITARY TO INTERCEPTOR STORM WATER TO SW BASIN
- COMBINED

GRAPHIC SCALE
4,000 0 4,000
1" = 4,000'

UPDATED: MARCH 23,2016

	DESCRIPTION	CHECKED	APRVD	DATE
F				
E				
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B				
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	REVISIONS			

DESIGN JMP
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RAIN GAGE LOCATION MAP FOR 2013-2015 SYSTEM MONITORING PLAN

SCALE: 1" = 4000'
JOB No. ASI #1230
FILE No.

FIGURE 2

Mar 23, 2016 - 12:54pm
K:\DWGfiles\2012\1230\Rain Gage Map (Feb2014).dwg

2. FINDINGS FROM 2015 DSDS SYSTEM MONITORING PLAN

The major findings from the DSDS 2015 system monitoring plan are presented below.

a. Over the year, the flow meters and level sensors in the DSDS operated and provided useful data for 94.4% of the period.

b. The total precipitation at the Detroit Metropolitan Wayne County Airport (DTW) for the year was 30.32 inches, which is 3.15 inches below normal. There were ten (10) significant storms in 2015. Significant storm events are defined as those with at least 0.5 inches of rainfall occurring on a single day with an event total of at least 1.0 inch of rainfall. Significant storm events are separated by at least 2 consecutive days without precipitation over 0.1 inches. This storm event definition is based on the arithmetic mean of the rainfall recorded by all rain gages used in the analysis for that storm. Of the significant storms, two (2) of the largest were also defined as major storms. Major storm events are a subgroup of significant storm events which result in the peak hourly influent flow rate to the Downriver Wastewater Treatment Facility (DWTF) reaching or exceeding 175 million gallons per day (MGD). The average rainfall depths at DTW for the major storms are listed in Table 1.

Table 1
Downriver Sewage Disposal System
Rainfall Depths at DTW for Significant Storms during 2015 in the DSDS Service Area

Major Storm Event	Significant Storm Event	Event Dates	Peak 24-hour Rainfall Depth (inches)	Total Rainfall Depth (inches)
A	3	5/29/2015 - 6/2/2015	2.17	2.34
B	10	12/28-29/2015	1.18	1.18

c. The controlled flow communities are tributary to the Riverdrive Interceptor and their peak flow rates into the interceptor are required to be regulated to maximum flow limits. The peak hourly flow rates for the controlled flow communities during significant/major storm events during 2015 are summarized in Table 2.

- The Meter RR-1 district includes all of River Rouge. The flow rates estimated for the Meter RR-1 district for the significant storms during 2015 were below to the maximum flow limit for six of the ten events and slightly exceeded the maximum flow limit for four of the ten events. Flow from River Rouge is pumped. The pumps are operated to maintain a maximum level in the Riverdrive Interceptor immediately downstream of the River Rouge CSO Basin. This sometimes results in a slight exceedence of the maximum flow limit.

Table 2
Downriver Sewage Disposal System
Peak Hourly Flow Rates for Controlled Flow Communities
During 2015 Significant/Major Storm Events

Meter District =	RR-1	EC-6	RD-1	SW
Location =	River Rouge CSO Basin Outlet	Riverdrive Interceptor South of Southfield Road	Riverdrive Interceptor North of Northline Road	SWRDDD Connection
Incremental Flow Formula =	[RR-1]	[EC-6] - [RR-1r]	[RD-1] - [EC-6r]	[SW] + [SWB]
Communities Included in Incremental Flow =	River Rouge	Ecorse & Lincoln Park (part)	Lincoln Park (part) & Allen Park (part)	Southgate (part) & Wyandotte
Proposed Maximum Flow Limit[1] =	**7.28**	**7.18**	**28.09**	**20.51**
Event 1 (4/7-10/2015)	6.75	9.90	37.04	21.17[2]
Event 2 (5/4-7/2015)	6.43	9.35	35.63	17.27
Event 3 / Major Event A (5/29/2015 – 6/2/2015)	7.56	12.66	42.22	20.04
Event 4 (6/13-18/2015)	6.99	9.76	42.68	25.59[2]
Event 5 (6/23-24/2015)	7.48	11.39	35.14	15.04
Event 6 (6/27-29/2015)	6.46	6.96	37.32	30.08[2]
Event 7 (8/2-4/2015)	7.12	11.82	41.18	18.94
Event 8 (8/19-21/2015)	8.00	8.01	39.58	25.75[2]
Event 9 (10/27-28/2015)	4.27	7.95	41.36	57.50[2]
Event 10 / Major Event B (12/28-29/2015)	7.31	11.73	37.46	57.03[2]

Notes:

1. The Maximum Wet Weather Flow Limits for Controlled Flow Communities are from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). These flow limits are specified in the existing service agreement, adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding. The communities are responsible for regulating their flow rates to the Riverdrive Interceptor to the these flow limits.
2. Exceedance of the proposed maximum flow limits occurred primarily after the peak of the storm event and are due to Wayne County dewatering operations at the SWRDDD facilities to minimize discharges to the Detroit River from the SWRDDD.

Legend:

XX.XX	Exceeds maximum flow limit by 0 to 20%
XX.XX	Exceeds maximum flow limit by > 20%

- The Meter EC-6 district includes all of the City of Ecorse and a section of Lincoln Park. The incremental flow rates estimated for the Meter EC-6 district for the significant storms during 2015 were below to the maximum flow limit for one of the ten events, slightly exceeded the maximum flow limit for two of the ten events and significantly exceeded the maximum flow limit for seven of the ten events.

- The Meter RD-1 district includes most of Allen Park and most of Lincoln Park. The incremental flow rates estimated for the Meter RD-1 district for the significant storms during 2015 significantly exceeded the maximum flow limit for all of the ten events.

Lincoln Park owns and/or operates the regulated connections to the Riverdrive Interceptor for the Meter RD-1 district as well as a connection from a wastewater equalization basin.

- The Meter SW district serves the Southgate-Wyandotte Relief Drains Drainage District (SWRDDD). The SWRDDD is a combined sewer area that includes part of Southgate and all of Wyandotte. Flow limit exceedences occurred primarily after the peak of the storm event during dewatering operations of the SWRDDD CSO retention treatment facility, which were coordinated with DWTF operations to minimize bypass operations at DWTF and discharges to Detroit River from SWRDDD.

d. The non-controlled flow communities are tributary to both the Pennsylvania Interceptor system and the DRSTS and have allowable peak 96-hour volumes that were established for the 4.42 inch design storm. The estimated peak 96-hour total volumes for the 2015 significant storm events are listed in Table 3. None of the Downriver Communities are estimated to have exceeded the allowable peak 96-hour total volumes during 2015. The DRSTS worked as intended for all of the storm events during 2015.

Table 3
Downriver Sewage Disposal System
Peak 96 Hour Total Volumes for Non-Controlled Flow Communities
During 2015 Major Storm Events

Community	Total Volume (MG)		
	4.42 inch Design Storm	Major Storm Event	
		Event A May 29 - June 2, 2015 2.56 inches	Event B December 28-29, 2015 1.28 inches
Allen Park (part)	29.23	24.20	14.83
Belleville	4.86	3.84	2.51
Brownstown Twp.	20.90	9.10	6.99
Dearborn Heights	43.76	33.56	27.04
Riverview	28.30	19.48	14.89
Romulus	88.43	38.82	32.41
Southgate (part)	31.24	19.40	15.09
Taylor	164.45	74.29	60.95
Van Buren Twp.	7.04	5.51	3.60
Total	418.21	228.20	178.31

Legend:

XX.XX	Exceeds design storm volume by 0 to 20%
XX.XX	Exceeds design storm volume by > 20%

e. In addition, the non-controlled flow communities have proposed maximum allowable average daily dry weather flow rate limits. Belleville was the only non-controlled flow community to exceed these limits during 2015. Belleville slightly exceeded its proposed dry weather flow limit in June 2015. This exceedence of the proposed dry weather flow limit was likely due to dewatering flow rates from the Van Buren equalization basin and the meter math formula used to split flow rates between Belleville and Van Buren Township for meter district PA-4. It is recommended that the maximum allowable average daily dry weather flow rate limits and the estimated flow rate split between Belleville and Van Buren Township for meter district PA-4, be reviewed for 2016.

f. A summary of relief structure discharges into the DRSTS during significant storm events for 2015 are listed in Table 4. At least one of the relief structures discharged into the DRSTS during all of the significant storm events in 2015. The relief structure at Meter CHPO discharged most frequently.

Table 4
Downriver Sewage Disposal System
Downriver Regional Storage and Transport System Usage
during 2015 Significant Storm Events

Storm Event	Meter									
	TPS	TSO	CHPO	CPO	PDO	ER-2	ER-1	APO-2	APO-1	PM-1
Event 1 (4/7-10/2015)	✓	✓	✓	✓	×	✓	✓	✓	×	×
Event 2 (5/4-7/2015)	✓	×	✓	✓	×	✓	✓	✓	×	×
Event 3 / Major Event A (5/29/2015 – 6/2/2015)	✓	✓	✓	✓	×	✓	✓	✓	✓	×
Event 4 (6/13-18/2015)	✓	✓	✓	✓	×	✓	✓	✓	✓	×
Event 5 (6/23-24/2015)	✓	✓	✓	✓	×	✓	✓	✓	✓	×
Event 6 (6/27-29/2015)	✓	✓	✓	×	×	✓	✓	×	×	×
Event 7 (8/2-4/2015)	✓	✓	✓	✓	×	×	✓	✓	×	×
Event 8 (8/19-21/2015)	✓	✓	✓	✓	×	×	✓	✓	×	×
Event 9 (10/27-28/2015)	✓	×	✓	×	×	×	×	×	×	×
Event 10 / Major Event B (12/28-29/2015)	✓	✓	✓	✓	×	✓	✓	✓	✓	×
Number of Overflow Events	10/10	8/10	10/10	8/10	0/10	7/10	9/10	8/10	4/10	0/10

Legend:

✓	Discharge to DRSTS
×	No discharge to DRSTS

3. SUMMARY BY COMMUNITY

Table 5 presents the estimated average monthly flow rate for each community in the DSDS for each month in 2015. The average monthly flow rate includes all days – both dry and wet weather. Table 5 also shows the percentages for each community of the incoming flow rate to the DWTF; these percentages are also plotted on Figure 3.

The incoming flow rate to the DWTF is based on the interceptor system flow meters. Table 5 presents both the incoming flow rate and the average monthly influent pumping rate at the DWTF. The DWTF influent pumping rate includes recycle flow rates, whereas the incoming flow rate measured by the interceptor system meters does not include DWTF recycle flow rates. Therefore, it is expected that the incoming flow rate measured by the sum of the interceptor system meters will be slightly less than the DWTF influent flow rate.

The average monthly flow rates are subtotaled for controlled flow communities and for non-controlled flow communities. Tables 6 and 7 provide the average monthly flow rates during 2015 for the controlled flow communities and non-controlled flow communities, respectively.

Table 8 shows the 2015 incremental monthly flow rates for each community summarized by meter district component. Incremental average daily flow rates are given along with an estimate of the average daily dry weather flow rates. The Year 2010 residential population is given on Table 8 and it is used to estimate per-capita dry weather flow rates.

In addition, Table 8 shows the maximum dry weather flow limits for each community from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). For the controlled flow communities, maximum flow limits are specified in the existing service agreement and were adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding. The peak flow rates for these communities are required to be regulated to these maximum values.

For non-controlled communities, the existing service agreement does not contain dry weather flow limits for the non-controlled communities. The proposed maximum allowable average daily dry weather flow limits for the non-controlled flow communities shown in Table 8 were proposed in the December 4, 2014 version of a new Downriver Sewage Disposal System Service Agreement. Values are shown for informational purposes only as agreement on the flow limits has not yet been reached and a new service agreement has not yet been executed.

Appendix A contains a set of tables that further support the results presented on Tables 5, 6, 7 and 8.

Table 5
Downriver Sewage Disposal System
Average Monthly Flow Rates by Community for 2015

Community	Flow Rate (MGD)												
	January	February	March	April	May	June	July	August	September	October	November	December	Average Annual
Allen Park	3.03	2.41	4.17	4.15	4.59	6.74	3.19	3.36	2.62	2.55	2.62	4.21	3.64
Belleville	0.48	0.45	0.52	0.81	0.77	0.85	0.47	0.40	0.41	0.42	0.48	0.47	0.54
Brownstown Twp.	1.03	0.95	1.15	1.13	1.33	1.40	1.01	0.89	0.86	0.84	0.91	1.09	1.05
Dearborn Hts.	2.57	2.06	3.27	3.51	3.42	4.85	2.44	2.23	1.97	1.81	2.21	2.97	2.78
Ecorse	1.04	0.78	1.36	1.36	1.48	1.53	1.06	0.98	0.95	0.85	0.92	1.16	1.13
Lincoln Park	5.08	3.99	7.17	7.04	6.94	10.60	5.49	5.85	4.55	4.40	4.38	6.68	6.02
River Rouge	1.94	1.66	2.03	2.41	2.34	3.47	2.27	2.08	1.83	1.41	1.36	1.81	2.05
Riverview	1.08	0.96	1.52	1.38	2.09	2.03	1.20	1.25	1.12	1.09	1.31	1.61	1.39
Romulus	5.25	4.40	6.00	6.24	7.09	7.97	4.66	3.87	3.52	3.47	4.76	4.61	5.15
Southgate	5.40	4.49	6.85	6.29	7.03	8.20	5.92	5.19	4.77	4.61	5.58	5.94	5.86
Taylor	6.93	5.63	8.12	8.32	8.42	10.96	6.26	5.67	5.18	4.94	6.07	7.56	7.01
Van Buren Twp.	0.69	0.65	0.75	1.16	1.10	1.22	0.67	0.58	0.58	0.60	0.68	0.67	0.78
Wyandotte	6.28	5.15	8.23	7.07	8.07	9.30	7.40	6.43	5.93	5.74	6.92	7.07	6.98
Subtotal Controlled Flow Communities	20.38	16.46	26.98	25.34	26.80	35.48	23.13	21.90	18.83	17.82	19.65	24.04	23.10
Subtotal Non-Controlled Flow Communities	20.41	17.12	24.16	25.52	27.89	33.63	18.92	16.90	15.45	14.91	18.55	21.81	21.28
Total Incoming Flow Rate	40.78	33.58	51.14	50.86	54.69	69.11	42.05	38.79	34.28	32.73	38.20	45.86	44.39
DWTF Including Recycle (IPS + TPS)	47.93	39.08	57.21	57.54	62.17	77.71	49.69	46.79	42.22	38.46	44.71	51.90	51.34
Total Precipitation DTW (inches) =	1.45	1.35	0.80	2.61	5.54	5.32	1.76	3.16	1.29	1.97	2.06	3.01	30.32

Percentage of Total Incoming Flow Rate by Community for 2015

Community	January	February	March	April	May	June	July	August	September	October	November	December	Average Annual
Allen Park	7.4%	7.2%	8.2%	8.2%	8.4%	9.7%	7.6%	8.7%	7.6%	7.8%	6.9%	9.2%	8.1%
Belleville	1.2%	1.4%	1.0%	1.6%	1.4%	1.2%	1.1%	1.0%	1.2%	1.3%	1.2%	1.0%	1.2%
Brownstown Twp.	2.5%	2.8%	2.3%	2.2%	2.4%	2.0%	2.4%	2.3%	2.5%	2.6%	2.4%	2.4%	2.4%
Dearborn Hts.	6.3%	6.1%	6.4%	6.9%	6.3%	7.0%	5.8%	5.7%	5.8%	5.5%	5.8%	6.5%	6.2%
Ecorse	2.5%	2.3%	2.7%	2.7%	2.7%	2.2%	2.5%	2.5%	2.8%	2.6%	2.4%	2.5%	2.5%
Lincoln Park	12.4%	11.9%	14.0%	13.8%	12.7%	15.3%	13.0%	15.1%	13.3%	13.4%	11.5%	14.6%	13.4%
River Rouge	4.7%	4.9%	4.0%	4.7%	4.3%	5.0%	5.4%	5.4%	5.3%	4.3%	3.6%	4.0%	4.6%
Riverview	2.6%	2.9%	3.0%	2.7%	3.8%	2.9%	2.9%	3.2%	3.3%	3.3%	3.4%	3.5%	3.1%
Romulus	12.9%	13.1%	11.7%	12.3%	13.0%	11.5%	11.1%	10.0%	10.3%	10.6%	12.4%	10.0%	11.6%
Southgate	13.2%	13.4%	13.4%	12.4%	12.9%	11.9%	14.1%	13.4%	13.9%	14.1%	14.6%	12.9%	13.3%
Taylor	17.0%	16.8%	15.9%	16.4%	15.4%	15.9%	14.9%	14.6%	15.1%	15.1%	15.9%	16.5%	15.8%
Van Buren Twp.	1.7%	1.9%	1.5%	2.3%	2.0%	1.8%	1.6%	1.5%	1.7%	1.8%	1.8%	1.5%	1.7%
Wyandotte	15.4%	15.3%	16.1%	13.9%	14.8%	13.5%	17.6%	16.6%	17.3%	17.5%	18.1%	15.4%	16.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 3
Downriver Sewage Disposal System
Percentage of Incoming Flow for 2015

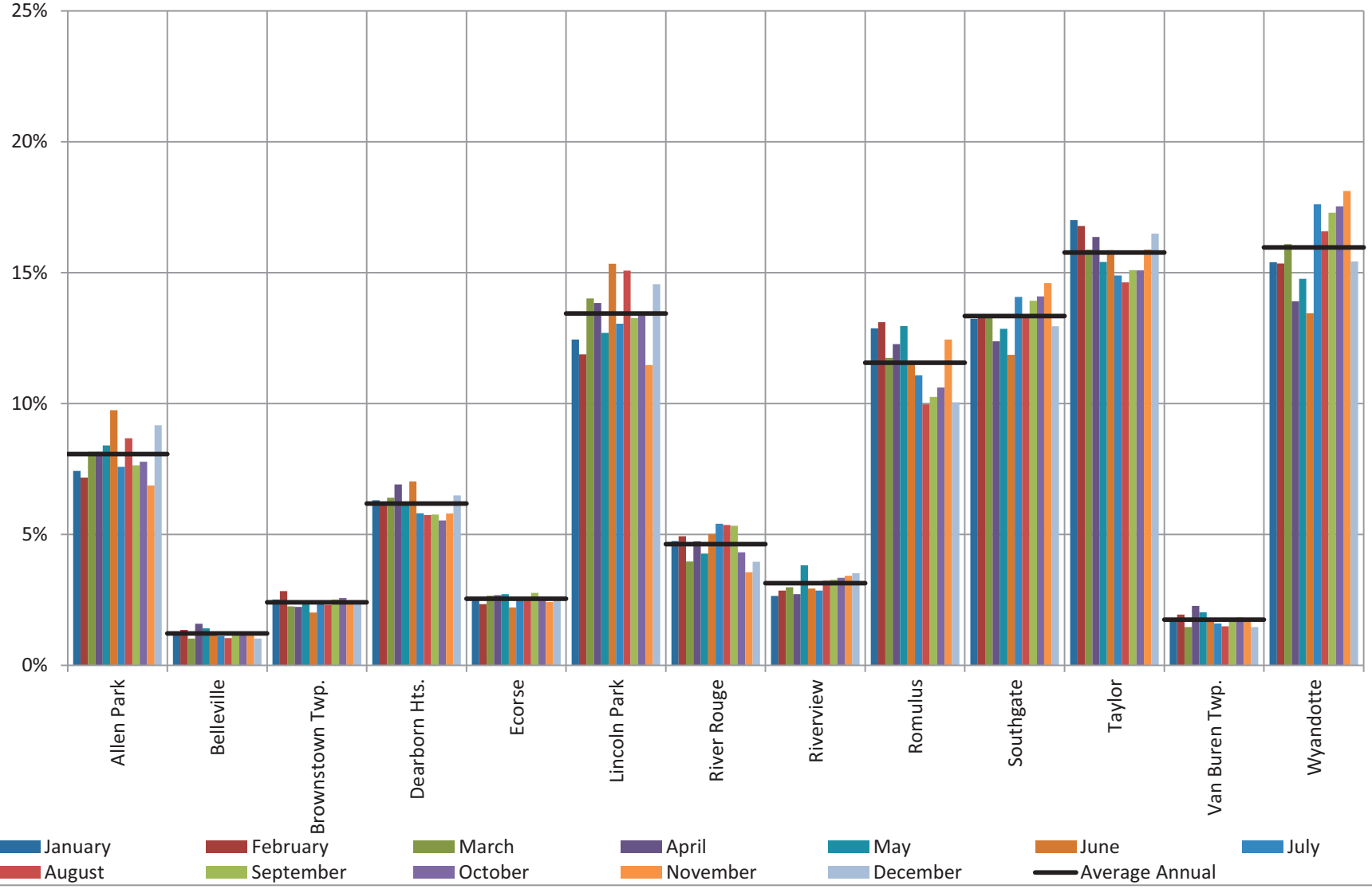


Table 6
Downriver Sewage Disposal System
Average Monthly Flow Rates for Controlled Flow Communities for 2015

Community	Flow Rate (MGD)												
	January	February	March	April	May	June	July	August	September	October	November	December	Average Annual
Allen Park (part)	2.47	1.95	3.51	3.44	3.36	5.29	2.68	2.89	2.21	2.15	2.12	3.29	2.95
Ecorse	1.04	0.78	1.36	1.36	1.48	1.53	1.06	0.98	0.95	0.85	0.92	1.16	1.13
Lincoln Park	5.08	3.99	7.17	7.04	6.94	10.60	5.49	5.85	4.55	4.40	4.38	6.68	6.02
River Rouge	1.94	1.66	2.03	2.41	2.34	3.47	2.27	2.08	1.83	1.41	1.36	1.81	2.05
Southgate - Wyandotte RDDD	9.86	8.09	12.92	11.10	12.68	14.59	11.62	10.10	9.30	9.01	10.87	11.10	10.95
Total	20.38	16.46	26.98	25.34	26.80	35.48	23.13	21.90	18.83	17.82	19.65	24.04	23.10
Total Precipitation DTW (inches) =	1.45	1.35	0.80	2.61	5.54	5.32	1.76	3.16	1.29	1.97	2.06	3.01	30.32

Table 7
Downriver Sewage Disposal System
Average Monthly Flow Rates for Non-Controlled Flow Communities for 2015

Community	Flow Rate (MGD)												
	January	February	March	April	May	June	July	August	September	October	November	December	Average Annual
Allen Park (part)	0.56	0.46	0.67	0.71	1.23	1.45	0.51	0.48	0.41	0.40	0.50	0.92	0.69
Belleville	0.48	0.45	0.52	0.81	0.77	0.85	0.47	0.40	0.41	0.42	0.48	0.47	0.54
Brownstown Twp.	1.03	0.95	1.15	1.13	1.33	1.40	1.01	0.89	0.86	0.84	0.91	1.09	1.05
Dearborn Hts.	2.57	2.06	3.27	3.51	3.42	4.85	2.44	2.23	1.97	1.81	2.21	2.97	2.78
Riverview	1.08	0.96	1.52	1.38	2.09	2.03	1.20	1.25	1.12	1.09	1.31	1.61	1.39
Romulus	5.25	4.40	6.00	6.24	7.09	7.97	4.66	3.87	3.52	3.47	4.76	4.61	5.15
Southgate (part)	1.82	1.55	2.16	2.26	2.43	2.90	1.70	1.53	1.40	1.34	1.63	1.91	1.89
Taylor	6.93	5.63	8.12	8.32	8.42	10.96	6.26	5.67	5.18	4.94	6.07	7.56	7.01
Van Buren Twp.	0.69	0.65	0.75	1.16	1.10	1.22	0.67	0.58	0.58	0.60	0.68	0.67	0.78
Total	20.41	17.12	24.16	25.52	27.89	33.63	18.92	16.90	15.45	14.91	18.55	21.81	21.28
Total Precipitation DTW (inches) =	1.45	1.35	0.80	2.61	5.54	5.32	1.76	3.16	1.29	1.97	2.06	3.01	30.32

Table 8
Downriver Sewage Disposal System
Monthly Incremental Flow Rates Summarized by Community

Community	Sewage Flow Meter Math	Meter District	Year 2010 Incremental Population	January 2015			February 2015			March 2015			April 2015			May 2015			June 2015			July 2015			August 2015			September 2015			October 2015			November 2015			December 2015			Proposed Maximum Allowable Dry Weather Flow Limits for Controlled Flow Communities[1] (MGD)	Proposed Maximum Allowable Dry Weather Flow Limits for Non-Controlled Flow Communities[1] (MGD)
				Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather			
				Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)		
Allen Park	3.8%([PC-1]+[CPO]+[CHPO]-[TB-1]) + 23.9%([P-1]+[PM-1]-[P-2]-[PA-2]-[PB-1]-[PD-1]-[PC-1]) + 34.6%([RD-1]-[EC-6]) + ([APO-1] + [APO-2])	PC-1	1,019	0.11	0.10	98	0.09	0.08	82	0.14	0.11	107	0.14	0.11	112	0.15	0.11	105	0.20	0.13	124	0.10	0.09	85	0.09	0.07	69	0.08	0.07	70	0.08	0.06	64	0.10	0.08	79	0.13	0.09	90	-	0.26
		P-1	3,332	0.45	0.42	127	0.38	0.37	112	0.53	0.46	137	0.56	0.50	149	0.60	0.50	151	0.74	0.55	166	0.41	0.38	114	0.36	0.33	99	0.33	0.32	96	0.32	0.30	89	0.40	0.37	110	0.47	0.38	114	-	0.95
		RD-1	18,179	2.47	2.09	115	1.95	1.88	104	3.51	2.25	124	3.44	2.44	134	3.36	2.41	133	5.29	2.82	155	2.68	2.18	120	2.89	1.97	108	2.21	1.70	93	2.15	1.56	86	2.12	1.46	80	3.29	2.03	112	11.12	-
		APO-1 + APO-2	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.48	0.00	-	0.52	0.00	-	0.00	0.00	--	0.02	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	--	0.32	0.00	-	-	-
		Total	22,531	3.03	2.61	116	2.41	2.34	104	4.17	2.82	125	4.15	3.05	136	4.59	3.02	134	6.74	3.50	155	3.19	2.64	117	3.36	2.37	105	2.62	2.09	93	2.55	1.92	85	2.62	1.91	85	4.21	2.50	111	-	1.21
Belleville	41.1%[PA-4]	PA-4	3,993	0.48	0.46	116	0.45	0.45	114	0.52	0.50	125	0.81	0.78	194	0.77	0.74	184	0.85	***0.82***	206	0.47	0.46	114	0.40	0.39	98	0.41	0.40	101	0.42	0.40	101	0.48	0.46	116	0.47	0.43	108	-	0.79
Brownstown Twp.	97.5%[P-2] + 1.8%([PA-2]+[ER-1]-[PA-3]-[ER-2])	P-2	10,397	1.00	0.98	94	0.93	0.93	90	1.13	1.03	99	1.11	1.06	102	1.31	1.10	106	1.37	1.11	107	1.00	0.96	92	0.88	0.83	80	0.85	0.82	79	0.83	0.79	76	0.90	0.84	81	1.07	0.96	92	-	2.36
		PA-2	248	0.02	0.02	85	0.02	0.02	71	0.02	0.02	85	0.02	0.02	84	0.03	0.02	88	0.03	0.02	77	0.02	0.02	66	0.02	0.02	65	0.02	0.02	64	0.02	0.02	61	0.02	0.02	71	0.02	0.02	77	-	0.04
		Total	10,645	1.03	1.00	94	0.95	0.95	89	1.15	1.05	99	1.13	1.08	102	1.33	1.13	106	1.40	1.13	106	1.01	0.98	92	0.89	0.84	79	0.86	0.84	79	0.84	0.80	76	0.91	0.86	81	1.09	0.97	92	-	2.40
Dearborn Hts.	78.2%([TB-1]+[TSO])	TB-1	19,152	2.57	2.35	123	2.06	2.03	106	3.27	2.64	138	3.51	2.97	155	3.42	2.74	143	4.85	3.17	165	2.44	2.16	113	2.23	1.94	101	1.97	1.79	94	1.81	1.62	85	2.21	1.84	96	2.97	2.27	119	-	4.95
Ecorse	71.5%([EC-6]-[RR-1])	EC-6	9,515	1.04	0.94	99	0.78	0.77	81	1.36	1.12	118	1.36	1.14	120	1.48	1.16	121	1.53	1.18	124	1.06	1.05	110	0.98	0.84	88	0.95	0.86	90	0.85	0.73	77	0.92	0.83	87	1.16	0.89	94	5.95	-
Lincoln Park	28.5%([EC-6]-[RR-1]) + 65.4%([RD-1]-[EC-6])	EC-6	3,795	0.41	0.37	99	0.31	0.31	81	0.54	0.45	118	0.54	0.45	120	0.59	0.46	121	0.61	0.47	124	0.42	0.42	110	0.39	0.33	88	0.38	0.34	90	0.34	0.29	77	0.37	0.33	87	0.46	0.36	94	1.23	-
		RD-1	34,347	4.66	3.95	115	3.67	3.56	104	6.63	4.25	124	6.49	4.62	134	6.35	4.56	133	9.99	5.33	155	5.06	4.11	120	5.46	3.72	108	4.17	3.21	93	4.06	2.95	86	4.01	2.76	80	6.22	3.83	112	16.97	-
		Total	38,142	5.08	4.33	113	3.99	3.87	101	7.17	4.70	123	7.04	5.07	133	6.94	5.02	132	10.60	5.80	152	5.49	4.53	119	5.85	4.05	106	4.55	3.55	93	4.40	3.24	85	4.38	3.09	81	6.68	4.19	110	18.20	-
River Rouge	[RR-1]	RR-1	7,903	1.94	1.79	226	1.66	1.65	209	2.03	1.68	213	2.41	2.08	263	2.34	1.94	245	3.47	2.29	290	2.27	2.02	256	2.08	1.64	208	1.83	1.56	197	1.41	1.15	146	1.36	1.15	145	1.81	1.31	166	7.28	-
Riverview	[RV-1]	RV-1	12,486	1.08	0.97	78	0.96	0.93	75	1.52	1.11	89	1.38	1.15	92	2.09	1.44	115	2.03	1.20	96	1.20	1.05	84	1.25	1.07	86	1.12	1.00	80	1.09	0.90	72	1.31	1.07	86	1.61	1.13	91	-	1.72
Romulus	[DMA-1] + ([PA-3]+[ER-2]-[PA-4]-[DMA-1] + [DMA-2] + ([PD-2] - [DMA-2])	DMA-1	0	0.39	0.38	-	0.44	0.44	-	0.46	0.45	-	0.46	0.45	-	0.50	0.48	-	0.63	0.57	-	0.57	0.57	-	0.64	0.56	-	0.54	0.57	-	0.50	0.50	-	0.45	0.44	-	0.49	0.47	-	-	3.85
		PA-3	11,371	2.33	2.24	197	2.07	2.06	181	2.78	2.54	223	2.40	2.22	195	2.47	2.19	192	3.07	2.28	200	2.36	2.18	192	1.64	1.62	143	1.51	1.49	131	1.48	1.46	128	1.60	1.54	135	2.00	1.77	155	-	
		DMA-2	0	0.72	0.62	-	0.39	0.39	-	0.60	0.55	-	0.99	1.00	-	1.72	1.89	-	1.28	1.93	-	0.10	0.10	-	0.12	0.12	-	0.10	0.10	--	0.24	0.10	-	1.08	1.22	-	0.53	0.44	-	-	5.44
		PD-2	9,532	1.80	1.70	178	1.51	1.51	158	2.16	1.85	195	2.39	2.14	225	2.40	2.21	232	2.99	2.58	271	1.63	1.56	163	1.46	1.39	146	1.37	1.34	140	1.25	1.16	122	1.62	1.62	170	1.60	1.36	143	-	
		Total	20,904	5.25	4.94	236	4.40	4.40	210	6.00	5.39	258	6.24	5.81	278	7.09	6.77	324	7.97	7.36	352	4.66	4.41	211	3.87	3.69	176	3.52	3.49	167	3.47	3.22	154	4.76	4.82	230	4.61	4.05	194	-	9.29
Southgate	76.1%([P-1]+[PM-1]-[P-2]-[PA-2]-[PB-1]-[PD-1]-[PC-1]) + 40%[PB-1] + 36.3%([SW]+[SWB]) + 1.4%([P-1]+[PM-1]-[P-2]-[PA-2]-[PB-1]-[PD-1]-[PC-1])	P-1	10,637	1.44	1.35	127	1.20	1.19	112	1.68	1.45	137	1.79	1.59	149	1.92	1.60	151	2.35	1.77	166	1.32	1.22	114	1.16	1.05	99	1.06	1.02	96	1.03	0.94	89	1.28	1.17	110	1.50	1.21	114	-	2.21
		PB-1	4,459	0.35	0.34	75	0.33	0.32	73	0.44	0.38	85	0.44	0.39	88	0.48	0.39	88	0.51	0.38	86	0.35	0.33	73	0.34	0.31	69	0.31	0.30	68	0.30	0.28	62	0.33	0.30	67	0.38	0.31	70	-	0.86
		SW	14,752	3.58	3.11	211	2.94	2.86	194	4.69	3.12	211	4.03	3.09	210	4.60	4.37	296	5.30	4.58	311	4.22	3.26	221	3.67	3.11	211	3.38	2.99	203	3.27	2.62	177	3.94	2.89	196	4.03	2.75	187	7.45	-
		TPS+IPS	199	0.03	0.03	127	0.02	0.02	112	0.03	0.03	137	0.03	0.03	149	0.04	0.03	151	0.04	0.03	166	0.02	0.02	114	0.02	0.02	99	0.02	0.02	96	0.02	0.02	89	0.02	0.02	110	0.03	0.02	114	-	0.04
		Total	30,047	5.40	4.82	160	4.49	4.40	146	6.85	4.98	166	6.29	5.11	170	7.03	6.39	213	8.20	6.76	225	5.92	4.83	161	5.19	4.49	149	4.77	4.33	144	4.61	3.85	128	5.58	4.38	146	5.94	4.30	143	-	3.11
Taylor	2.5%[P-2] + 98.2%([PA-2]+[ER-1]-[PA-3]-[ER-2]) + 60%[PB-1] + 21.8%([TB-1]+[TSO]) + 96.2%([PC-1]+[CPO]+[CHPO]-[TB-1]) + ([PD-1]-[PD-2])	P-2	262	0.03	0.02	94	0.02	0.02	90	0.03	0.03	99	0.03	0.03	102	0.03	0.03	106	0.03	0.03	107	0.03	0.02	92	0.02	0.02	80	0.02	0.02	79	0.02	0.02	76	0.02	0.02	81	0.03	0.02	92	-	0.05
		PA-2	13,270	1.19	1.12	85	0.96	0.95	71	1.33	1.13	85	1.26	1.12	84	1.44	1.16	88	1.45	1.02	77	0.95	0.88	66	0.92	0.86	65	0.87	0.85	64	0.87	0.81	61	1.01	0.95	71	1.21	1.03	77	-	1.45
		PB-1	6,462	0.53	0.50	78	0.49	0.49	75	0.67	0.57	88	0.65	0.59	91	0.72	0.59	91	0.76	0.57	89	0.53	0.49	76	0.52	0.46	72	0.47	0.46	71	0.44	0.41	64	0.49	0.45	70	0.57	0.47	73	-	1.30
		TB-1	5,339	0.72	0.65	123	0.57	0.57	106	0.91	0.74	138	0.98	0.83	155	0.95	0.76	143	1.35	0.88	165	0.68	0.60	113	0.62	0.54	101	0.55	0.50	94	0.50	0.45	85	0.62	0.51	96	0.83	0.63	119	-	1.38
		PC-1	25,700	2.80	2.51	98	2.15	2.12	82	3.50	2.75	107	3.64	2.87	112	3.76	2.71	105	4.99	3.19	124	2.44	2.18	85	2.22	1.78	69	2.02	1.80	70	1.93	1.64	64	2.50	2.02	79	3.21	2.32	90	-	6.65
		PD-1	12,100	1.67	1.66	137	1.44	1.43	118	1.69	1.62	134	1.76	1.59	131	1.53	1.26	105	2.37	1.58	130	1.63	1.52	126	1.38	1.31	108	1.25	1.23	102	1.17	1.12	92	1.43	1.20	99	1.72	1.49	123	-	2.42
		Total	63,131	6.93	6.47	103	5.63	5.57	88	8.12	6.83	108	8.32	7.02	111	8.42	6.52	103	10.96	7.27	115	6.26	5.69	90	5.67	4.97	79	5.18	4.85	77	4.94	4.45	71	6.07	5.16	82	7.56	5.96	94	-	13.25
Van Buren Twp.	58.9%[PA-4]	PA-4	5,719	0.69	0.66	116	0.65	0.65	114	0.75	0.72	125	1.16	1.11	194	1.10	1.05	184	1.22	1.18	206	0.67	0.65	114	0.58	0.56	98	0.58	0.58	101	0.60	0.58	101	0.68	0.66	116	0.67	0.62	108	-	1.43
Wyandotte	63.7%([SW]+[SWB])	SW	25,883	6.28	5.46	211	5.15	5.01	194	8.23	5.47	211	7.07	5.43	210	8.07	7.66	296	9.30	8.04	311	7.40	5.73	221	6.43	5.45	211	5.93	5.24	203	5.74	4.59	177	6.92	5.07	196	7.07	4.83	187	13.06	-
Subtotal Controlled Flow Communities			114,374	20.38	17.72	155	16.46	16.05	140	26.98	18.34	160	25.34	19.25	168	26.80	22.56	197	35.48	24.71	216	23.13	18.77	164	21.90	17.06	149	18.83	15.89	139	17.82	13.89	121	19.65	14.49	127	24.04	16.00	140	63.06	-
Subtotal Non-Controlled Flow Communities			155,677	20.41	19.09	123	17.12	17.00	109	24.16	20.67	133	25.51	22.54	145	27.41	23.01	148	33.11	24.99	161	18.92	17.44	112	16.87	15.25	98	15.45	14.69	94	14.91	13.58	87	18.55	16.81	108	21.49	17.45	112	-	38.15
Total Incoming Flow			270,052	40.78	36.80	136	33.58	33.05	122	51.14	39.00	144	50.86	41.79	155	54.69	45.56	169	69.11	49.70	184	42.05	36.20	134	38.79	32.31	120	34.28	30.58	113	32.73	27.47	102	38.20	31.30	116	45.86	33.45	124	-	-
DWTF Including Recycle (IPS + TPS)			270,052	47.93	42.24	156	39.08	38.56	143	57.21	44.25	164	57.54	47.34	175	62.17	53.11	197	77.71	56.77	210	49.69	42.93	159	46.79	39.18	145	42.22	37.90	140	38.46	32.54	120	44.71	36.97	137	51.90	38.28	142	-	-

Note:
1) Maximum flow limits from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). These values are specified in the existing service agreement and were adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding.
2) Proposed maximum dry weather flow limits from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). Values are shown for informational purposes only as agreement on the flow limits has not yet been reached.
3) The maximum flow limit for each community component of Meter Distict SW is population weighted. Southgate and Wyandotte have maximum flow limits of 4.96 and 15.55 MGD, respectively. Therefore, the combined maximum flow limit is 20.51 MGD. The population weighted maximum flow limit for Southgate and Wyandotte are allocated to be 7.45 and 13.06 MGD, respectively.
4) The meter district flow rates are split into community components based on relative 2010 residential population.

Legend:

XX.XX	Exceeds the maximum flow limit (for the controlled flow communities) or the maximum allowable average daily dry weather flow rate (for the non-controlled flow communities) by 0 to 20%
XX.XX	Exceeds the maximum flow limit (for the controlled flow communities) or the maximum allowable average daily dry weather flow rate (for the non-controlled flow communities) by greater than 20%

4. 2015 DSDS SYSTEM MONITORING PLAN UPDATES

The DSDS System Monitoring Plan was updated in April 2015, and is available online at http://www.waynecounty.com/doe/1108.htm. Modifications to the DSDS System Monitoring Plan, since April 2015, are summarized below.

Appendix B presents detailed 2015 flow monitoring data for each meter in the DSDS system monitoring plan and other related information.

Meter District Changes

Meter districts PF-2 and PA-1 are included in meter district P-1. Data collection at Meter PF-2 was suspended in October 2013. Meter PA-1 data was not being used in the meter district or community calculations due to the small incremental flow rates being measured.

Meter district PB-2 is included in meter district PB-1. Data collection at Meter PB-2 was suspended in January 2013.

Meter System Changes

A new PD-1 flow meter was installed in March 2015. The new flow meter is an ADS Model Triton+. The new equipment replaced an Accusonic flow meter that had been in-service for over 10 years and required significant and costly corrective maintenance. The Accusonic meter was kept in-service until April 2015 when it was removed. For clarity in this report, the new ADS flow meter is designated as Meters PD-1 (ADS) and the Accusonic flow meter is designated as Meters PD-1 (Accusonic). The best available dataset presented in this report is a combination of the Accusonic and ADS meter data.

A new PA-4 flow meter was installed in March 2015. The new flow meter is an ADS Model Triton+. The new equipment replaced an Accusonic flow meter that had been in-service for over 10 years and required significant and costly corrective maintenance. The Accusonic meter was kept in-service until April 2015 when it was removed. For clarity in this report, the new ADS flow meter is designated as Meters PA-4 (ADS) and the Accusonic flow meter is designated as Meters PA-4 (Accusonic). The best available dataset presented in this report is a combination of the Accusonic and ADS meter data.

The abandoned equipment from sites PB-2, PBO, and PM-2 have been salvaged and inventoried for spare parts.

The monitors at Meters DMA-1, ER-1, ER-2, PA-1, and TSO have been replaced or upgraded to ADS Model Triton+.

The rain gages at R-9, R-14, R-17, and R-18 were replaced with new Novalynx 260-2500 tipping bucket rain gage equipment.

Meter SW is not set-up to account for sludge deposits and consequently the raw flow rate for the meter is over estimated. Prior to this 2015 annual report, the flow rates at Meter SW have been recalculated using the raw velocity and depth data and an estimated sludge depth of 2 feet. Sludge profile measurements are conducted at Meter SW quarterly, and the 2013 and 2014 measurements confirm that the estimated sludge depth of 2 feet was reasonable prior to 2015.

In 2015, the sludge profile measurements were more variable with an average depth of 1.2 to 2.4 feet. As a result, the flow rates at Meter SW have been recalculated using the raw velocity and depth data and an improved time-varying sludge depth estimate in this 2015 annual report. The new sludge depth estimation methodology improves the estimated flow rates at Meter SW by more accurately estimating the cross sectional area used in the flow rate computation than the previous static assumption of 2 feet of sludge. Using the new sludge depth estimation methodology, the average estimated sludge depth at Meter SW was 2.24 feet during 2015.

Dye-Dilution Tests

Dye-dilution testing occurred during 2015 to verify meter accuracy and estimate meter bias for Meters PA-4 (ADS), and PD-1 (ADS). The dye test results were used to adjust the flow meter data to provide more reasonable estimates of flow rates for the meters, meter districts, and communities. Some of the dye tests which occurred in 2013 and 2014 were used to adjust the data for 2015. The results of these dye tests and meter adjustment factors are shown in Table 9.

In an audit of recent dye dilution test results, it was found that the previously presented Meter PA-2 adjustment factor for the August 19, 2015 lithium-dilution test were impacted by analytical laboratory errors. Meter PA-2 is scheduled to be retested in 2016. The test will be replaced at no cost to the DSDS.

Table 9

Downriver Sewage Disposal System

Dye-Dilution Test Summary for DSDS Flow Meters during 2013-2015

Meter	Date	Adjustment Factor	Period Adjustment Factor
DMA-2	9/24/2014	0.86	0.86
EC-6	2/18/2014	0.70	0.70
P-1	9/16/2013	0.99	0.99
PA-1	11/6/2013	0.93	0.93
PA-2	11/4/2013	0.86	0.86
PA-3	11/5/2013	1.00	1.00
PA-4 (ADS)	8/18/2015	0.81	0.81
PB-1 (ADS)	9/18/2014	0.86	0.86
PB-1 (Accusonic)	7/3/2014	0.92	0.92
PC-1	9/25/2014	0.93	0.93
PD-1 (ADS)	8/18/2015	0.76	0.76
PD-1 (Accusonic)	3/10/2014	0.78	0.78
PD-2	11/26/2013	0.97	0.97
RD-1	9/17/2009	1.14	1.05
	12/14/2009	1.05	
	7/24/2013	1.05	
	9/23/2014	0.96	
RR-1	2/19/2014	0.97	0.97
SW	11/12/2013	1.00 (with sludge accounted for)	1.00
TB-1	11/10/2014	1.05	1.05

5. 2015 PRECIPITATION DATA

Table 10 lists the monthly precipitation at DTW, the departure from normal, and the number of wet/dry days included for each month.

Table 10
Downriver Sewage Disposal System
Dry/Wet Weather Day Count by Month and Monthly Precipitation at DTW for 2015

Month	Number of Dry Weather Days	Number of Wet Weather Days	Monthly Total Precipitation (in)	
			DTW[1]	Departure From Normal[2]
January	21	10	1.45	-0.51
February	25	3	1.35	-0.67
March	14	17	0.80	-1.48
April	18	12	2.61	-0.29
May	19	12	5.54	+2.16
June	10	20	5.32	+1.80
July	12	19	1.76	-1.61
August	18	13	3.16	+0.16
September	20	10	1.29	-1.98
October	21	10	1.97	-0.55
November	18	12	2.06	-0.73
December	14	17	3.01	+0.55
Total	210	155	30.32	-3.15

Notes:
1. Detroit Metropolitan Wayne County Airport (DTW)
2. Normal is a period mean computed by the National Climatic Data Center (NCDC) for a National Weather Service (NWS) observing station from a period comprising three consecutive 10-year decadal periods (for example, 1981-2010)

Significant storm events are defined as those with at least 0.5 inches of rainfall occurring on a single day with an event total of at least 1.0 inch of rainfall. Significant storm events are separated by at least 2 consecutive days without precipitation over 0.1 inches. This storm event definition is based on the arithmetic mean of the rainfall recorded by all rain gages used in the analysis for that storm. Major storm events are a subgroup of significant storm events which result in the peak hourly influent flow rate to the DWTF reaching or exceeding 175 MGD.

There were ten significant storm events in 2015. Of these ten events, two were also considered major storm events. The precipitation data for the significant/major storm events are further summarized in Appendix C. None of these events equaled or exceeded the 25-year, 24-hour design storm rainfall of 4.42 inches on which the DRSTS was based.

An additional quality assurance (QA) and quality control (QC) review of the Wayne County rain gage data was performed and involved a review of the maintenance logs and a comparison of the recorded precipitation to other nearby rain gages. The maintenance logs indentified rain gage issues which were detected during site visits. In almost all cases these issues were resolved during the site visit. In general, when a rain gage had an issue, it recorded zero precipitation. All rain gage data with documented maintenance log issues were flagged. The precipitation total for any month with flagged data was omitted from the summary table.

For the seven (7) DSDS rain gages with complete data for 2015, the minimum, average, and maximum recorded annual precipitation for 2015 were 29.18, 33.01, and 37.56 inches, respectively. The precipitation data are further summarized in Appendix C.

6. SUMMARY OF 2015 DSDS DRY WEATHER FLOWS

A single set of dry days was used to estimate the dry weather flow rates for all of the meters. The dry weather days were determined by analyzing the daily flow rate traces for meters near the downstream end of the interceptor system. The meters used for this analysis include: [P-1], [PA-1], [PC-1], [EC-6], and [RD-1]. These meters were chosen because they are near the downstream end of the interceptor system, include some dewatering flow rates, and provide a well-defined sort of dry/wet days. Two methods were used for screening out dry and wet weather days using average daily flow rates.

The first method was designed to flag days that exhibited abrupt changes in average daily flow rate from the preceding or following days. This criterion was selected because wet weather events will significantly raise the average daily flow rate when compared to the preceding day. Likewise, the average daily flow rate on the day following a wet weather event will exhibit a decrease as the flow rates subside.

The second method was designed to flag additional wet weather days that were typically found during large, multiple day events that elevated the metered flow rates for a few days. When this happens, the days in the middle of the event are not flagged by the first method because there is no change in the already elevated flow rate. For this method, the average daily flow rate on dry days was constrained to remain below two standard deviations of the two month average flow rate. Any day with a daily average above this was flagged as a wet day. The monitoring period data was analyzed in two month increments: January-February, March-April, May-June, July-August, September-October, and November-December.

7. SUMMARY OF 2015 DSDS WET WEATHER FLOWS

Appendix D contains detailed summary tables and figures for the two major storm events which occurred in 2015. Peak hourly flow rates, peak 96-hour volumes, and peak hydraulic gradelines are tabulated for each meter. For the controlled flow communities, the incremental peak hourly flow rates are summarized by meter district. For the non-controlled flow communities, the peak 96-hour volumes are summarized for each meter district and for each community. In addition, the total 96-hour volumes versus precipitation for both major storm events are compared to the 4.42 inch design event for the non-controlled flow communities.

Controlled Flow Communities

Surcharging was recorded at all four of the flow meters along the Riverdrive Interceptor (Meters RR-1, EC-6, RD-1, and SW) for both significant storm events. Surcharging at Meter SW normally occurs and is due to backwater from the Influent Pump Station at the DWTF. There was no reverse flow from the DSDS into the SWRDDD system during any 2015 storm events. Reverse flow occurs as hydraulically necessary for emergency operating conditions and/or storms greater than the design storm. The surcharging at Meters RR-1, EC-6 and RD-1 highlight the exceedence and capacity issues along the Riverdrive Interceptor.

Incremental peak hourly flow rates for Meter EC-6 were determined by routing Meter RR-1 flow rates through the Riverdrive Interceptor to the location of Meter EC-6 using the SWMM5 mini-model. The routed RR-1 flow rates were subtracted from the EC-6 flow rates to get the incremental EC-6 flow rates. RD-1 incremental peak hourly flow rates were determined in the same manner as EC-6 incremental flow rates, using the routed EC-6 flow rates and RD-1 flow rates.

The maximum flow limit for the Southgate-Wyandotte meter district is 20.52 MGD. The total flow rate for the district is the sum of Meters SW and SWB. Meter SW is located on the connection between the Drainage District Number 5 pump station and IPS and carries dry weather flow. Meter SWB is located on the dewatering line from the Southgate-Wyandotte CSO Retention Basin and operates intermittently. The flow rate at Meter SW is typically throttled to a maximum of about 20.52 MGD by a gate at an upstream regulating chamber. This gate uses the raw flow rate data from Meter SW to control the throttling. However, the raw flow rate data from Meter SW does not account for sludge deposits in the pipe. Therefore, the actual flow rate is controlled to about 17 MGD.

Non-Controlled Flow Communities

Surcharging was recorded for both of the major storm events. For Event A, surcharging was recorded at Meter P-1 and RV-1 along the Pennsylvania Interceptor. For Event B, surcharging was recorded at Meter RV-1 along the Pennsylvania Interceptor.

The peak 96-hour wet weather volumes for the non-controlled flow communities during the significant storm events that occurred in 2015 were estimated using the flow monitoring data set. These volumes were compared to those for the 4.42 inch storm event used in the design of the DRSTS. None of the communities exceeded their allocated peak 96-hour volumes during the major storm events for this 2015 reporting period.

Appendix A

Additional Monthly Summary Tables, 2015 DSDS System Monitoring Plan

Table A-1
Downriver Sewage Disposal System
Incremental Flow Rates Summarized by Meter District with Community Components

Meter District	Community	Year 2010 Incremental Population	Meter District Percentage	January 2015			February 2015			March 2015		
				Total	Dry Weather		Total	Dry Weather		Total	Dry Weather	
				Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)
	Dearborn Heights	19,152	78.2%	2.57	2.35		2.06	2.03		3.27	2.64	
TB-1	Taylor	5,339	21.8%	0.72	0.65	123	0.57	0.57	106	0.91	0.74	138
	Total	24,491	100.0%	3.29	3.00		2.63	2.60		4.18	3.37	
	Allen Park	1,019	3.8%	0.11	0.10		0.09	0.08		0.14	0.11	
PC-1	Taylor	25,700	96.2%	2.80	2.51	98	2.15	2.12	82	3.50	2.75	107
	Total	26,719	100.0%	2.91	2.61		2.24	2.20		3.64	2.86	
DMA-2	Romulus	0	100.0%	0.72	0.62	--	0.39	0.39	--	0.60	0.55	--
PD-2	Romulus	9,532	100.0%	1.80	1.70	178	1.51	1.51	158	2.16	1.85	195
PD-1	Taylor	12,100	100.0%	1.67	1.66	137	1.44	1.43	118	1.69	1.62	134
	Taylor	6,462	60.0%	0.53	0.50	78	0.49	0.49	75	0.67	0.57	88
PB-1[1]	Southgate	4,459	40.0%	0.35	0.34	75	0.33	0.32	73	0.44	0.38	85
	Total	10,921	100.0%	0.88	0.84	77	0.81	0.81	74	1.11	0.95	87
	Belleville	3,993	41.1%	0.48	0.46		0.45	0.45		0.52	0.50	
PA-4	Van Buren Twp	5,719	58.9%	0.69	0.66	116	0.65	0.65	114	0.75	0.72	125
	Total	9,712	100.0%	1.17	1.13		1.10	1.10		1.27	1.22	
DMA-1	Romulus (Airport)	0	100.0%	0.39	0.38	--	0.44	0.44	--	0.46	0.45	--
PA-3	Romulus	11,371	100.0%	2.33	2.24	197	2.07	2.06	181	2.78	2.54	223
	Taylor	13,270	98.2%	1.19	1.12		0.96	0.95		1.33	1.13	
PA-2	Brownstown Twp	248	1.8%	0.02	0.02	85	0.02	0.02	71	0.02	0.02	85
	Total	13,517	100.0%	1.21	1.14		0.98	0.96		1.35	1.15	
	Brownstown Twp	10,397	97.5%	1.00	0.98		0.93	0.93		1.13	1.03	
P-2	Taylor	262	2.5%	0.03	0.02	94	0.02	0.02	90	0.03	0.03	99
	Total	10,659	100.0%	1.03	1.00		0.96	0.96		1.16	1.06	
	Allen Park	3,332	23.9%	0.45	0.42		0.38	0.37		0.53	0.46	
P-1	Southgate	10,637	76.1%	1.44	1.35	127	1.20	1.19	112	1.68	1.45	137
	Total	13,969	100.0%	1.89	1.77		1.58	1.57		2.21	1.91	
RV-1	Riverview	12,486	100.0%	1.08	0.97	78	0.96	0.93	75	1.52	1.11	89
RR-1	River Rouge	7,903	100.0%	1.94	1.79	226	1.66	1.65	209	2.03	1.68	213
	Ecorse	9,515	71.5%	1.04	0.94		0.78	0.77		1.36	1.12	
EC-6	Lincoln Park	3,795	28.5%	0.41	0.37	99	0.31	0.31	81	0.54	0.45	118
	Total	13,310	100.0%	1.45	1.31		1.10	1.08		1.90	1.57	
	Allen Park	18,179	34.6%	2.47	2.09		1.95	1.88		3.51	2.25	
RD-1	Lincoln Park	34,347	65.4%	4.66	3.95	115	3.67	3.56	104	6.63	4.25	124
	Total	52,526	100.0%	7.13	6.04		5.62	5.44		10.13	6.50	
	Southgate	14,752	36.3%	3.58	3.11		2.94	2.86		4.69	3.12	
SW + SWB	Wyandotte	25,883	63.7%	6.28	5.46	211	5.15	5.01	194	8.23	5.47	211
	Total	40,635	100.0%	9.86	8.57		8.09	7.87		12.92	8.58	
APO-1 + APO-2	Allen Park	0	100.0%	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--
TPS+IPS	Southgate	199	100.0%	0.03	0.03	127	0.02	0.02	112	0.03	0.03	137
Subtotal Controlled Flow Communities		114,374	42.4%	20.38	17.72	155	16.46	16.05	140	26.98	18.34	160
ubtotal Non-Controlled Flow Communitie		155,677	57.6%	20.41	19.09	123	17.12	17.00	109	24.16	20.67	133
Total Incoming Flow		270,052	100.0%	40.78	36.80	136	33.58	33.05	122	51.14	39.00	144
DWTF Including Recycle (IPS + TPS)		270,052	100.0%	47.93	42.24	156	39.08	38.56	143	57.21	44.25	164

Meter District	Community	April 2015			May 2015			June 2015			July 2015		
		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather	
		Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)
	Dearborn Heights	3.51	2.97		3.42	2.74		4.85	3.17		2.44	2.16	
TB-1	Taylor	0.98	0.83	155	0.95	0.76	143	1.35	0.88	165	0.68	0.60	113
	Total	4.49	3.80		4.37	3.50		6.21	4.05		3.12	2.76	
	Allen Park	0.14	0.11		0.15	0.11		0.20	0.13		0.10	0.09	
PC-1	Taylor	3.64	2.87	112	3.76	2.71	105	4.99	3.19	124	2.44	2.18	85
	Total	3.79	2.98		3.91	2.82		5.19	3.31		2.54	2.26	
DMA-2	Romulus	0.99	1.00	--	1.72	1.89	--	1.28	1.93	--	0.10	0.10	--
PD-2	Romulus	2.39	2.14	225	2.40	2.21	232	2.99	2.58	271	1.63	1.56	163
PD-1	Taylor	1.76	1.59	131	1.53	1.26	105	2.37	1.58	130	1.63	1.52	126
	Taylor	0.65	0.59	91	0.72	0.59	91	0.76	0.57	89	0.53	0.49	76
PB-1[1]	Southgate	0.44	0.39	88	0.48	0.39	88	0.51	0.38	86	0.35	0.33	73
	Total	1.09	0.98	90	1.19	0.98	90	1.26	0.96	88	0.89	0.82	75
	Belleville	0.81	0.78		0.77	0.74		0.85	0.82		0.47	0.46	
PA-4	Van Buren Twp	1.16	1.11	194	1.10	1.05	184	1.22	1.18	206	0.67	0.65	114
	Total	1.96	1.89		1.88	1.79		2.08	2.00		1.14	1.11	
DMA-1	Romulus (Airport)	0.46	0.45	--	0.50	0.48	--	0.63	0.57	--	0.57	0.57	--
PA-3	Romulus	2.40	2.22	195	2.47	2.19	192	3.07	2.28	200	2.36	2.18	192
	Taylor	1.26	1.12		1.44	1.16		1.45	1.02		0.95	0.88	
PA-2	Brownstown Twp	0.02	0.02	84	0.03	0.02	88	0.03	0.02	77	0.02	0.02	66
	Total	1.28	1.14		1.46	1.19		1.47	1.04		0.97	0.90	
	Brownstown Twp	1.11	1.06		1.31	1.10		1.37	1.11		1.00	0.96	
P-2	Taylor	0.03	0.03	102	0.03	0.03	106	0.03	0.03	107	0.03	0.02	92
	Total	1.14	1.09		1.34	1.13		1.40	1.14		1.02	0.98	
	Allen Park	0.56	0.50		0.60	0.50		0.74	0.55		0.41	0.38	
P-1	Southgate	1.79	1.59	149	1.92	1.60	151	2.35	1.77	166	1.32	1.22	114
	Total	2.35	2.09		2.52	2.10		3.08	2.32		1.73	1.60	
RV-1	Riverview	1.38	1.15	92	2.09	1.44	115	2.03	1.20	96	1.20	1.05	84
RR-1	River Rouge	2.41	2.08	263	2.34	1.94	245	3.47	2.29	290	2.27	2.02	256
	Ecorse	1.36	1.14		1.48	1.16		1.53	1.18		1.06	1.05	
EC-6	Lincoln Park	0.54	0.45	120	0.59	0.46	121	0.61	0.47	124	0.42	0.42	110
	Total	1.90	1.59		2.08	1.62		2.14	1.65		1.49	1.47	
	Allen Park	3.44	2.44		3.36	2.41		5.29	2.82		2.68	2.18	
RD-1	Lincoln Park	6.49	4.62	134	6.35	4.56	133	9.99	5.33	155	5.06	4.11	120
	Total	9.93	7.06		9.71	6.98		15.28	8.15		7.74	6.29	
	Southgate	4.03	3.09		4.60	4.37		5.30	4.58		4.22	3.26	
SW + SWB	Wyandotte	7.07	5.43	210	8.07	7.66	296	9.30	8.04	311	7.40	5.73	221
	Total	11.10	8.52		12.68	12.03		14.59	12.62		11.62	8.99	
APO-1 + APO-2	Allen Park	0.00	0.00	--	0.48	0.00	--	0.52	0.00	--	0.00	0.00	--
TPS+IPS	Southgate	0.03	0.03	149	0.04	0.03	151	0.04	0.03	166	0.02	0.02	114
Subtotal Controlled Flow Communities		25.34	19.25	168	26.80	22.56	197	35.48	24.71	216	23.13	18.77	164
ubtotal Non-Controlled Flow Communitie		25.51	22.54	145	27.41	23.01	148	33.11	24.99	161	18.92	17.44	112
Total Incoming Flow		50.86	41.79	155	54.21	45.56	169	68.60	49.70	184	42.05	36.20	134
DWTF Including Recycle (IPS + TPS)		57.54	47.34	175	62.17	53.11	197	77.71	56.77	210	49.69	42.93	159

Meter District	Community	August 2015			September 2015			October 2015			November 2015			December 2015		
		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather	
		Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)
	Dearborn Heights	2.23	1.94		1.97	1.79		1.81	1.62		2.21	1.84		2.97	2.27	
TB-1	Taylor	0.62	0.54	101	0.55	0.50	94	0.50	0.45	85	0.62	0.51	96	0.83	0.63	119
	Total	2.85	2.48		2.52	2.29		2.32	2.08		2.83	2.36		3.80	2.90	
	Allen Park	0.09	0.07		0.08	0.07		0.08	0.06		0.10	0.08		0.13	0.09	
PC-1	Taylor	2.22	1.78	69	2.02	1.80	70	1.93	1.64	64	2.50	2.02	79	3.21	2.32	90
	Total	2.30	1.85		2.10	1.87		2.01	1.70		2.60	2.10		3.34	2.41	
DMA-2	Romulus	0.12	0.12	--	0.10	0.10	--	0.24	0.10	--	1.08	1.22	--	0.53	0.44	--
PD-2	Romulus	1.46	1.39	146	1.37	1.34	140	1.25	1.16	122	1.62	1.62	170	1.60	1.36	143
PD-1	Taylor	1.38	1.31	108	1.25	1.23	102	1.17	1.12	92	1.43	1.20	99	1.72	1.49	123
	Taylor	0.52	0.46	72	0.47	0.46	71	0.44	0.41	64	0.49	0.45	70	0.57	0.47	73
PB-1[1]	Southgate	0.34	0.31	69	0.31	0.30	68	0.30	0.28	62	0.33	0.30	67	0.38	0.31	70
	Total	0.86	0.77	71	0.78	0.76	70	0.74	0.69	63	0.82	0.75	69	0.95	0.78	72
	Belleville	0.40	0.39		0.41	0.40		0.42	0.40		0.48	0.46		0.47	0.43	
PA-4	Van Buren Twp	0.58	0.56	98	0.58	0.58	101	0.60	0.58	101	0.68	0.66	116	0.67	0.62	108
	Total	0.98	0.96		0.99	0.98		1.01	0.98		1.16	1.12		1.14	1.05	
DMA-1	Romulus (Airport)	0.64	0.56	--	0.54	0.57	--	0.50	0.50	--	0.45	0.44	--	0.49	0.47	--
PA-3	Romulus	1.64	1.62	143	1.51	1.49	131	1.48	1.46	128	1.60	1.54	135	2.00	1.77	155
	Taylor	0.92	0.86		0.87	0.85		0.87	0.81		1.01	0.95		1.21	1.03	
PA-2	Brownstown Twp	0.02	0.02	65	0.02	0.02	64	0.02	0.02	61	0.02	0.02	71	0.02	0.02	77
	Total	0.93	0.87		0.89	0.86		0.89	0.83		1.03	0.96		1.23	1.05	
	Brownstown Twp	0.88	0.83		0.85	0.82		0.83	0.79		0.90	0.84		1.07	0.96	
P-2	Taylor	0.02	0.02	80	0.02	0.02	79	0.02	0.02	76	0.02	0.02	81	0.03	0.02	92
	Total	0.90	0.85		0.87	0.84		0.85	0.81		0.92	0.86		1.10	0.98	
	Allen Park	0.36	0.33		0.33	0.32		0.32	0.30		0.40	0.37		0.47	0.38	
P-1	Southgate	1.16	1.05	99	1.06	1.02	96	1.03	0.94	89	1.28	1.17	110	1.50	1.21	114
	Total	1.53	1.38		1.40	1.34		1.35	1.24		1.68	1.53		1.97	1.59	
RV-1	Riverview	1.25	1.07	86	1.12	1.00	80	1.09	0.90	72	1.31	1.07	86	1.61	1.13	91
RR-1	River Rouge	2.08	1.64	208	1.83	1.56	197	1.41	1.15	146	1.36	1.15	145	1.81	1.31	166
	Ecorse	0.98	0.84		0.95	0.86		0.85	0.73		0.92	0.83		1.16	0.89	
EC-6	Lincoln Park	0.39	0.33	88	0.38	0.34	90	0.34	0.29	77	0.37	0.33	87	0.46	0.36	94
	Total	1.37	1.17		1.33	1.20		1.19	1.02		1.29	1.16		1.62	1.25	
	Allen Park	2.89	1.97		2.21	1.70		2.15	1.56		2.12	1.46		3.29	2.03	
RD-1	Lincoln Park	5.46	3.72	108	4.17	3.21	93	4.06	2.95	86	4.01	2.76	80	6.22	3.83	112
	Total	8.35	5.69		6.38	4.90		6.21	4.52		6.14	4.22		9.51	5.86	
	Southgate	3.67	3.11		3.38	2.99		3.27	2.62		3.94	2.89		4.03	2.75	
SW + SWB	Wyandotte	6.43	5.45	211	5.93	5.24	203	5.74	4.59	177	6.92	5.07	196	7.07	4.83	187
	Total	10.10	8.56		9.30	8.23		9.01	7.20		10.87	7.96		11.10	7.58	
APO-1 + APO-2	Allen Park	0.02	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.32	0.00	--
TPS+IPS	Southgate	0.02	0.02	99	0.02	0.02	96	0.02	0.02	89	0.02	0.02	110	0.03	0.02	114
Subtotal Controlled Flow Communities		21.90	17.06	149	18.83	15.89	139	17.82	13.89	121	19.65	14.49	127	24.04	16.00	140
ubtotal Non-Controlled Flow Communitie		16.87	15.25	98	15.45	14.69	94	14.91	13.58	87	18.55	16.81	108	21.49	17.45	112
Total Incoming Flow		38.77	32.31	120	34.28	30.58	113	32.73	27.47	102	38.20	31.30	116	45.54	33.45	124
DWTF Including Recycle (IPS + TPS)		46.79	39.18	145	42.22	37.90	140	38.46	32.54	120	44.71	36.97	137	51.90	38.28	142

Notes:
1) PB-1 flow rates were estimated to be 60% Taylor and 40% Southgate of the total Meter PB-1 flow rates.

Table A-2
Downriver Sewage Disposal System
Incremental Flow Rates by Meter District

Meter District	Incremental Meter District Formula	Year 2010 Incremental Population	January 2015			February 2015			March 2015			April 2015		
			Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)
TB-1	[TB-1]+[TSO]	24,491	3.29	3.00	123	2.63	2.60	106	4.18	3.37	138	4.49	3.80	155
PC-1	[PC-1]+[CPO] +[CHPO]-[TB-1]	26,719	2.91	2.61	98	2.24	2.20	82	3.64	2.86	107	3.79	2.98	112
DMA-2	[DMA-2]	0	0.72	0.62	-	0.39	0.39	-	0.60	0.55	-	0.99	1.00	-
PD-2	[PD-2] - [DMA-2]	9,532	1.80	1.70	178	1.51	1.51	158	2.16	1.85	195	2.39	2.14	225
PD-1	[PD-1]-[PD-2]+[PDO]	12,100	1.67	1.66	137	1.44	1.43	118	1.69	1.62	134	1.76	1.59	131
PB-1	[PB-1]	10,921	0.88	0.84	77	0.81	0.81	74	1.11	0.95	87	1.09	0.98	90
PA-4	[PA-4]	9,712	1.17	1.13	116	1.10	1.10	114	1.27	1.22	125	1.96	1.89	194
DMA-1	[DMA-1]	0	0.39	0.38	-	0.44	0.44	-	0.46	0.45	-	0.46	0.45	-
PA-3	[PA-3]+[ER-2] -[PA-4]-[DMA-1]	11,371	2.33	2.24	197	2.07	2.06	181	2.78	2.54	223	2.40	2.22	195
PA-2	[PA-2]+[ER-1] -[PA-3]-[ER-2]	13,517	1.21	1.14	85	0.98	0.96	71	1.35	1.15	85	1.28	1.14	84
P-2	[P-2]	10,659	1.03	1.00	94	0.96	0.96	90	1.16	1.06	99	1.14	1.09	102
P-1	[P-1]+[PM-1]-[P-2] -[PA-2]-[PB-1]-[PD-1]-[PC-1]	13,969	1.89	1.77	127	1.58	1.57	112	2.21	1.91	137	2.35	2.09	149
RV-1	[RV-1]	12,486	1.08	0.97	78	0.96	0.93	75	1.52	1.11	89	1.38	1.15	92
RR-1	[RR-1]	7,903	1.94	1.79	226	1.66	1.65	209	2.03	1.68	213	2.41	2.08	263
EC-6	[EC-6]-[RR-1]	13,310	1.45	1.31	99	1.10	1.08	81	1.90	1.57	118	1.90	1.59	120
RD-1	[RD-1]-[EC-6]	52,526	7.13	6.04	115	5.62	5.44	104	10.13	6.50	124	9.93	7.06	134
APO-1 + APO-2	[APO-1]+[APO-2]	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
SW+SWB	[SW]+[SWB]	40,635	9.86	8.57	211	8.09	7.87	194	12.92	8.58	211	11.10	8.52	210
TPS+IPS[1]	Population Ratio of Meter District P-1	199	0.03	0.03	127	0.02	0.02	112	0.03	0.03	137	0.03	0.03	149

Meter District	May 2015			June 2015			July 2015			August 2015		
	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)
TB-1	4.37	3.50	143	6.21	4.05	165	3.12	2.76	113	2.85	2.48	101
PC-1	3.91	2.82	105	5.19	3.31	124	2.54	2.26	85	2.30	1.85	69
DMA-2	1.72	1.89	-	1.28	1.93	-	0.10	0.10	-	0.12	0.12	-
PD-2	2.40	2.21	232	2.99	2.58	271	1.63	1.56	163	1.46	1.39	146
PD-1	1.53	1.26	105	2.37	1.58	130	1.63	1.52	126	1.38	1.31	108
PB-1	1.19	0.98	90	1.26	0.96	88	0.89	0.82	75	0.86	0.77	71
PA-4	1.88	1.79	184	2.08	2.00	206	1.14	1.11	114	0.98	0.96	98
DMA-1	0.50	0.48	-	0.63	0.57	-	0.57	0.57	-	0.64	0.56	-
PA-3	2.47	2.19	192	3.07	2.28	200	2.36	2.18	192	1.64	1.62	143
PA-2	1.46	1.19	88	1.47	1.04	77	0.97	0.90	66	0.93	0.87	65
P-2	1.34	1.13	106	1.40	1.14	107	1.02	0.98	92	0.90	0.85	80
P-1	2.52	2.10	151	3.08	2.32	166	1.73	1.60	114	1.53	1.38	99
RV-1	2.09	1.44	115	2.03	1.20	96	1.20	1.05	84	1.25	1.07	86
RR-1	2.34	1.94	245	3.47	2.29	290	2.27	2.02	256	2.08	1.64	208
EC-6	2.08	1.62	121	2.14	1.65	124	1.49	1.47	110	1.37	1.17	88
RD-1	9.71	6.98	133	15.28	8.15	155	7.74	6.29	120	8.35	5.69	108
APO-1 + APO-2	0.48	0.00	-	0.52	0.00	-	0.00	0.00	-	0.02	0.00	-
SW+SWB	12.68	12.03	296	14.59	12.62	311	11.62	8.99	221	10.10	8.56	211
TPS+IPS[1]	0.04	0.03	151	0.04	0.03	166	0.02	0.02	114	0.02	0.02	99

Meter District	September 2015			October 2015			November 2015			December 2015		
	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)	Total Average Daily Flow Rate (MGD)	Dry Weather Average Daily Flow Rate (MGD)	Dry Weather Average Per Capita Flow Rate (gpcd)
TB-1	2.52	2.29	94	2.32	2.08	85	2.83	2.36	96	3.80	2.90	119
PC-1	2.10	1.87	70	2.01	1.70	64	2.60	2.10	79	3.34	2.41	90
DMA-2	0.10	0.10	-	0.24	0.10	-	1.08	1.22	-	0.53	0.44	-
PD-2	1.37	1.34	140	1.25	1.16	122	1.62	1.62	170	1.60	1.36	143
PD-1	1.25	1.23	102	1.17	1.12	92	1.43	1.20	99	1.72	1.49	123
PB-1	0.78	0.76	70	0.74	0.69	63	0.82	0.75	69	0.95	0.78	72
PA-4	0.99	0.98	101	1.01	0.98	101	1.16	1.12	116	1.14	1.05	108
DMA-1	0.54	0.57	-	0.50	0.50	-	0.45	0.44	-	0.49	0.47	-
PA-3	1.51	1.49	131	1.48	1.46	128	1.60	1.54	135	2.00	1.77	155
PA-2	0.89	0.86	64	0.89	0.83	61	1.03	0.96	71	1.23	1.05	77
P-2	0.87	0.84	79	0.85	0.81	76	0.92	0.86	81	1.10	0.98	92
P-1	1.40	1.34	96	1.35	1.24	89	1.68	1.53	110	1.97	1.59	114
RV-1	1.12	1.00	80	1.09	0.90	72	1.31	1.07	86	1.61	1.13	91
RR-1	1.83	1.56	197	1.41	1.15	146	1.36	1.15	145	1.81	1.31	166
EC-6	1.33	1.20	90	1.19	1.02	77	1.29	1.16	87	1.62	1.25	94
RD-1	6.38	4.90	93	6.21	4.52	86	6.14	4.22	80	9.51	5.86	112
APO-1 + APO-2	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.32	0.00	-
SW+SWB	9.30	8.23	203	9.01	7.20	177	10.87	7.96	196	11.10	7.58	187
TPS+IPS[1]	0.02	0.02	96	0.02	0.02	89	0.02	0.02	110	0.03	0.02	114

Notes:
1) ([TPS+IPS] Inc. Flow Rate) = (TPS-IPS Inc. Pop. / P-1 Inc. Pop.) x ([P-1] Inc. Flow Rate)

Table A-3

Downriver Sewage Disposal System

Monthly Flow Rates by Meter for 2015

System	Meter	Location	Year 2010 Cumulative Population	Average Flow Rates (MGD)												
				January	February	March	April	May	June	July	August	September	October	November	December	Average Annnual
Tunnel (Non-Controlled)	TB-1	Taylor Basin	24,491	3.29	2.63	4.18	4.49	4.18	5.90	3.12	2.84	2.52	2.32	2.83	3.80	3.51
	PC-1	Pelham Interceptor North of Goddard Road	51,210	6.20	4.87	7.80	8.14	7.71	10.65	5.66	5.10	4.60	4.29	5.43	6.91	6.45
	DTW Pond 3 West	Detroit Metro Airport	0	0.64	0.15	0.28	0.99	1.87	1.54	0.00	0.00	0.00	0.23	1.30	0.55	0.63
	DMA-2	Detroit Metro Airport	0	0.72	0.39	0.60	0.99	1.72	1.28	0.10	0.12	0.10	0.24	1.08	0.53	0.66
	PD-2	Goddard Interceptor West of Inkster Road	9,532	2.53	1.90	2.76	3.38	4.12	4.27	1.74	1.58	1.47	1.50	2.70	2.12	2.51
	PD-1[1]	Goddard Interceptor West of Allen Road	21,632	4.20	3.33	4.45	5.14	5.65	6.65	3.37	2.96	2.72	2.67	4.13	3.85	4.09
	PB-1	Northline Interceptor West of Fordline Road	10,921	0.88	0.81	1.11	1.09	1.19	1.26	0.89	0.86	0.78	0.74	0.82	0.95	0.95
	PA-4[2]	Eureka Interceptor near Hannan Road	9,712	1.17	1.10	1.27	1.96	1.88	2.08	1.14	0.98	0.99	1.01	1.16	1.14	1.32
	DMA-1	Detroit Metro Airport Connection to the Eureka Interceptor	0	0.39	0.44	0.46	0.46	0.50	0.63	0.57	0.64	0.54	0.50	0.45	0.49	0.50
	PA-3	Eureka Interceptor at Inkster Road	21,084	3.89	3.61	4.51	4.82	4.83	5.73	4.07	3.26	3.04	2.99	3.21	3.62	3.96
	PA-2	Eureka Interceptor at Allen Road	34,601	5.10	4.58	5.86	6.09	6.29	7.15	5.03	4.20	3.93	3.87	4.24	4.85	5.10
	PA-1	Eureka Interceptor West of Fordline Road	38,730	5.83	5.41	6.69	6.84	7.39	8.57	5.52	4.64	4.25	4.15	4.58	5.93	5.82
	P-2	Pennsylvania Interceptor East of Dix-Toledo Road	10,659	1.03	0.96	1.16	1.14	1.34	1.40	1.02	0.90	0.87	0.85	0.92	1.10	1.06
	P-1	Pennsylvania Interceptor East of Fort Street	142,992	19.30	16.14	22.58	23.96	24.69	30.20	17.70	15.55	14.29	13.77	17.22	19.61	19.59
	RV-1	Pennsylvania Interceptor West of Jefferson Avenue	12,486	1.08	0.96	1.52	1.38	2.09	2.03	1.20	1.25	1.12	1.09	1.31	1.61	1.39
Riverdrive (Controlled)	RR-1	River Rouge CSO Basin Outlet	7,903	1.94	1.66	2.03	2.41	2.34	3.47	2.27	2.08	1.83	1.41	1.36	1.81	2.05
	EC-6	Riverdrive Interceptor South of Southfield Road	21,213	3.38	2.75	3.93	4.31	4.41	5.61	3.76	3.45	3.15	2.61	2.65	3.43	3.63
	RD-1	Riverdrive Interceptor North of Northline Road	73,739	10.52	8.37	14.07	14.24	14.12	20.89	11.50	11.80	9.53	8.81	8.78	12.94	12.15
	SW	On Southgate-Wyandotte Connection	40,635	9.39	8.02	12.35	10.17	11.04	13.02	10.05	8.68	8.42	8.05	10.27	10.58	10.02
	SWB	Southgate-Wyandotte Basin	0	0.47	0.07	0.57	0.93	1.64	1.57	1.58	1.42	0.89	0.96	0.59	0.52	0.94
Tunnel Connection Meters	TSO	Connection to Tunnel at Pelham Basin	0	0.00	0.00	0.00	0.00	0.19	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	APO-1	Allen Park Connection to Tunnel at Belmont and Rosedale Road	0	0.00	0.00	0.00	0.00	0.27	0.29	0.00	0.01	0.00	0.00	0.00	0.18	0.06
	APO-2	Allen Park Connection to Tunnel at Belmont and Quandt Road	0	0.00	0.00	0.00	0.00	0.21	0.23	0.00	0.01	0.00	0.00	0.00	0.14	0.05
	CHPO	Pelham Interceptor Connection to Tunnel North of Haskell Road	0	0.00	0.00	0.02	0.13	0.32	0.37	0.00	0.04	0.01	0.03	0.00	0.20	0.09
	CPO	Pelham Interceptor Connection to Tunnel South of R.R.	0	0.00	0.00	0.00	0.01	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.04	0.02
	PDO	Goddard Interceptor Connection to Tunnel at Allen Road	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ER-2	Eureka Relief Sewer Extention Connection to Tunnel at Inkster Road	0	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ER-1	Eureka Relief Sewer Connection to Tunnel at Allen Road	0	0.00	0.00	0.00	0.01	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	PM-1	Pennsylvania Interceptor Connection to Tunnel at Fordline Road	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DWTF	P-1+RD-1+RV-1+SW+SWB +Tunnel Connections	End of Interceptor System Meters	269,853	40.76	33.56	51.11	50.82	54.65	69.07	42.03	38.77	34.26	32.71	38.18	45.83	44.36
	IPS+TPS	DWTF	270,052	47.93	39.08	57.21	57.54	62.17	77.71	49.69	46.79	42.22	38.46	44.71	51.90	51.34

Notes:

1) Meter PD-1 (Accusonic) data was used for January through March 2015. Meter PD-1 (ADS) data was used for April through December 2015.

2) Meter PA-4 (Accusonic) data was used for January through March 2015. Meter PA-4 (ADS) data was used for April through December 2015.

Table A-4
Downriver Sewage Disposal System
Average Flow Rates by Meter

System	Meter	Year 2010 Cumulative Population	January 2015			February 2015			March 2015			April 2015			May 2015			June 2015		
			Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather	
			Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)
Tunnel (Non-Controlled)	TB-1	24,491	3.29	3.00	123	2.63	2.60	106	4.18	3.37	138	4.49	3.80	155	4.18	3.50	143	5.90	4.05	165
	PC-1	51,210	6.20	5.61	110	4.87	4.81	94	7.80	6.24	122	8.14	6.78	132	7.71	6.31	123	10.65	7.36	144
	DTW Pond 3 West	0	0.64	0.56	-	0.15	0.16	-	0.28	0.29	-	0.99	0.99	-	1.87	2.10	-	1.54	2.40	-
	DMA-2	0	0.72	0.62	-	0.39	0.39	-	0.60	0.55	-	0.99	1.00	-	1.72	1.89	-	1.28	1.93	-
	PD-2	9,532	2.53	2.32	243	1.90	1.90	200	2.76	2.41	253	3.38	3.15	330	4.12	4.10	430	4.27	4.51	474
	PD-1[1]	21,632	4.20	3.98	184	3.33	3.33	154	4.45	4.03	186	5.14	4.73	219	5.65	5.36	248	6.65	6.09	282
	PB-1	10,921	0.88	0.84	77	0.81	0.81	74	1.11	0.95	87	1.09	0.98	90	1.19	0.98	90	1.26	0.96	88
	PA-4[2]	9,712	1.17	1.13	116	1.10	1.10	114	1.27	1.22	125	1.96	1.89	194	1.88	1.79	184	2.08	2.00	206
	DMA-1	0	0.39	0.38	-	0.44	0.44	-	0.46	0.45	-	0.46	0.45	-	0.50	0.48	-	0.63	0.57	-
	PA-3	21,084	3.89	3.74	178	3.61	3.60	171	4.51	4.20	199	4.82	4.55	216	4.83	4.46	212	5.73	4.84	230
	PA-2	34,601	5.10	4.89	141	4.58	4.56	132	5.86	5.35	155	6.09	5.69	164	6.29	5.64	163	7.15	5.88	170
	PA-1	38,730	5.83	5.55	143	5.41	5.38	139	6.69	5.92	153	6.84	6.09	157	7.39	6.34	164	8.57	6.39	165
	P-2	10,659	1.03	1.00	94	0.96	0.96	90	1.16	1.06	99	1.14	1.09	102	1.34	1.13	106	1.40	1.14	107
	P-1[3]	142,992	19.30	18.09	127	16.14	16.04	112	22.58	19.53	137	23.96	21.36	149	24.69	21.54	151	30.20	23.75	166
	RV-1	12,486	1.08	0.97	78	0.96	0.93	75	1.52	1.11	89	1.38	1.15	92	2.09	1.44	115	2.03	1.20	96
Riverdrive (Controlled)	RR-1	7,903	1.94	1.79	226	1.66	1.65	209	2.03	1.68	213	2.41	2.08	263	2.34	1.94	245	3.47	2.29	290
	EC-6	21,213	3.38	3.10	146	2.75	2.74	129	3.93	3.25	153	4.31	3.67	173	4.41	3.56	168	5.61	3.94	186
	RD-1	73,739	10.52	9.14	124	8.37	8.18	111	14.07	9.75	132	14.24	10.73	146	14.12	10.53	143	20.89	12.09	164
	SW (with sludge depth)	40,635	9.39	8.43	208	8.02	7.79	192	12.35	8.53	210	10.17	8.05	198	11.04	10.15	250	13.02	11.05	272
	SWB	0	0.47	0.14	-	0.07	0.08	-	0.57	0.05	-	0.93	0.47	-	1.64	1.88	-	1.57	1.57	-
Tunnel Connection Meters	TSO	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.19	0.00	-	0.31	0.00	-
	APO-1[4]	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.27	0.00	-	0.29	0.00	-
	APO-2	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.21	0.00	-	0.23	0.00	-
	CHPO	0	0.00	0.00	-	0.00	0.00	-	0.02	0.00	-	0.13	0.00	-	0.32	0.00	-	0.37	0.00	-
	CPO	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.01	0.00	-	0.07	0.00	-	0.07	0.00	-
	PDO	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
	ER-2	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.01	0.00	-	0.04	0.00	-
	ER-1	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.01	0.00	-	0.02	0.00	-	0.09	0.00	-
	PM-1	0	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
	Total	0	0.00	0.00	-	0.00	0.00	-	0.02	0.00	-	0.14	0.00	-	1.08	0.00	-	1.36	0.00	-
DWTF	P-1+RV-1+RD-1+SW+SWB +Tunnel Connections	269,853	40.76	36.78	136	33.56	33.03	122	51.11	38.98	144	50.82	41.76	155	54.65	45.53	169	69.07	49.67	184
	IPS+TPS	270,052	47.93	42.24	156	39.08	38.56	143	57.21	44.25	164	57.54	47.34	175	62.17	53.11	197	77.71	56.77	210

Meter	July 2015			August 2015			September 2015			October 2015			November 2015			December 2015		
	Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather		Total	Dry Weather	
	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)	Average Daily Flow Rate (MGD)	Average Daily Flow Rate (MGD)	Average Per Capita Flow Rate (gpcd)
TB-1	3.12	2.76	113	2.84	2.48	101	2.52	2.29	94	2.32	2.08	85	2.83	2.36	96	3.80	2.90	119
PC-1	5.66	5.03	98	5.10	4.33	85	4.60	4.16	81	4.29	3.78	74	5.43	4.46	87	6.91	5.31	104
DTW Pond 3 West	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.23	0.00	-	1.30	1.54	-	0.55	0.45	-
DMA-2	0.10	0.10	-	0.12	0.12	-	0.10	0.10	-	0.24	0.10	-	1.08	1.22	-	0.53	0.44	-
PD-2	1.74	1.66	174	1.58	1.51	158	1.47	1.43	150	1.50	1.26	132	2.70	2.84	298	2.12	1.81	189
PD-1[1]	3.37	3.18	147	2.96	2.82	130	2.72	2.67	123	2.67	2.38	110	4.13	4.04	187	3.85	3.29	152
PB-1	0.89	0.82	75	0.86	0.77	71	0.78	0.76	70	0.74	0.69	63	0.82	0.75	69	0.95	0.78	72
PA-4[2]	1.14	1.11	114	0.98	0.96	98	0.99	0.98	101	1.01	0.98	101	1.16	1.12	116	1.14	1.05	108
DMA-1	0.57	0.57	-	0.64	0.56	-	0.54	0.57	-	0.50	0.50	-	0.45	0.44	-	0.49	0.47	-
PA-3	4.07	3.86	183	3.26	3.14	149	3.04	3.04	144	2.99	2.95	140	3.21	3.10	147	3.62	3.29	156
PA-2	5.03	4.76	138	4.20	4.01	116	3.93	3.90	113	3.87	3.77	109	4.24	4.07	117	4.85	4.34	125
PA-1	5.52	5.11	132	4.64	4.35	112	4.25	4.18	108	4.15	3.96	102	4.58	4.18	108	5.93	5.13	133
P-2	1.02	0.98	92	0.90	0.85	80	0.87	0.84	79	0.85	0.81	76	0.92	0.86	81	1.10	0.98	92
P-1[3]	17.70	16.36	114	15.55	14.16	99	14.29	13.67	96	13.77	12.66	89	17.22	15.71	110	19.61	16.30	114
RV-1	1.20	1.05	84	1.25	1.07	86	1.12	1.00	80	1.09	0.90	72	1.31	1.07	86	1.61	1.13	91
RR-1	2.27	2.02	256	2.08	1.64	208	1.83	1.56	197	1.41	1.15	146	1.36	1.15	145	1.81	1.31	166
EC-6	3.76	3.49	165	3.45	2.81	133	3.15	2.76	130	2.61	2.17	102	2.65	2.31	109	3.43	2.56	121
RD-1	11.50	9.78	133	11.80	8.50	115	9.53	7.66	104	8.81	6.69	91	8.78	6.53	89	12.94	8.42	114
SW (with sludge depth)	10.05	8.68	214	8.68	7.21	177	8.42	7.32	180	8.05	6.66	164	10.27	7.96	196	10.58	7.48	184
SWB	1.58	0.31	-	1.42	1.35	-	0.89	0.91	-	0.96	0.54	-	0.59	0.01	-	0.52	0.10	-
TSO	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
APO-1[4]	0.00	0.00	-	0.01	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.18	0.00	-
APO-2	0.00	0.00	-	0.01	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.14	0.00	-
CHPO	0.00	0.00	-	0.04	0.00	-	0.01	0.00	-	0.03	0.00	-	0.00	0.00	-	0.20	0.00	-
CPO	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.04	0.00	-
PDO	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
ER-2	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
ER-1	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
PM-1	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
Total	0.00	0.00	-	0.07	0.00	-	0.01	0.00	-	0.03	0.00	-	0.00	0.00	-	0.56	0.00	-
P-1+RV-1+RD-1+SW+SWB +Tunnel Connections	42.03	36.18	134	38.77	32.29	120	34.26	30.56	113	32.71	27.46	102	38.18	31.28	116	45.83	33.43	124
IPS+TPS	49.69	42.93	159	46.79	39.18	145	42.22	37.90	140	38.46	32.54	120	44.71	36.97	137	51.90	38.28	142

Notes:
1) Meter PD-1 (Accusonic) data was used for January through March 2015. Meter PD-1 (ADS) data was used for April through December 2015.
2) Meter PA-4 (Accusonic) data was used for January through March 2015. Meter PA-4 (ADS) data was used for April through December 2015.
4) [P-1] = [P-2] + [PA-2] + [PB-1] + [PC-1] + [PD-1] + (P-1 Inc. Pop. / (P-2 Cum. Pop. + PA-2 Cum. Pop. + PB-1 Cum. Pop. + PC-1 Cum. Pop. + PD-1 Cum. Pop.)) x ([P-2] + [PA-2] + [PB-1] + [PC-1] + [PD-1] + [TSO]+ [CPO] + [CHPO] + [PDO] + [APO-1] + [APO-2] + [ER-1])
4) [APO-1] = 1.29 x [APO-2].

Appendix B

Data Summaries for 2015 DSDS Meters

METER DATA SUMMARY

This appendix summarizes the DSDS flow monitoring data for 2015, provides average daily flow rate plots for each meter, and includes charts detailing data and meter maintenance issues that occurred during 2015. The flow monitoring data were reviewed and edited as summarized on Table B-1.

Data for each DSDS meter was carried through the analysis with the following exceptions:

- The incremental flow rates for Meter TPS+IPS district cannot be confidently and accurately calculated because they are too small relative to the total flow rate. Therefore, the incremental flow rates for the Meter TPS+IPS district were estimated using a ratio of incremental population for Meter TPS+IPS to the incremental population of the upstream Meter P-1 multiplied by the incremental Meter P-1 district flow rates.

- The incremental flow rates for Meter P-1 cannot be confidently and accurately calculated because they are too small relative to the total flow rate. Therefore, the incremental flow rates for the Meter P-1 district were estimated using a ratio of incremental population for Meter P-1 to the cumulative population of the upstream meters (Meters PC-1, PD-1, PB-1, PA-2 and P-2) multiplied by the sum of the cumulative district flow rates for Meters PC-1, PD-1, PB-1, PA-2 and P-2.

- Meter PA-4 (ADS) was installed in March 2015 and there were velocity issues until August 2015 when the velocity sensor was replaced. Significant amounts of debris were removed from the metering location during site visits. This debris altered the hydraulics and metering results. This reach of interceptor is scheduled to be cleaned in 2016. A rating curve was used to estimate the flow rate from March through August 2015.

- Meter PD-1 (ADS) was installed in March 2015 and dye dilution tested in August 2015. The dye dilution test was conducted during a period of low flow. The dye dilution adjustment factor is correct during periods of low flow, but underestimates the flow rate during periods of high flow. Therefore, a variable adjustment factor is recommended to be developed for this site. A high flow rate dye dilution test will be schedule in 2016. A rating curve was used to estimate the flow rates for March, April, May, November and December when flows rates from Meter DMA-2 were high.

- Overflows to the DRSTS were calculated using the level sensor data and the previously developed ratings curves except for Meter TSO. The flow rates calculated with the area-velocity measurements were used for Meter TSO.

Downriver Sewage Disposal System
2015 Data Flags

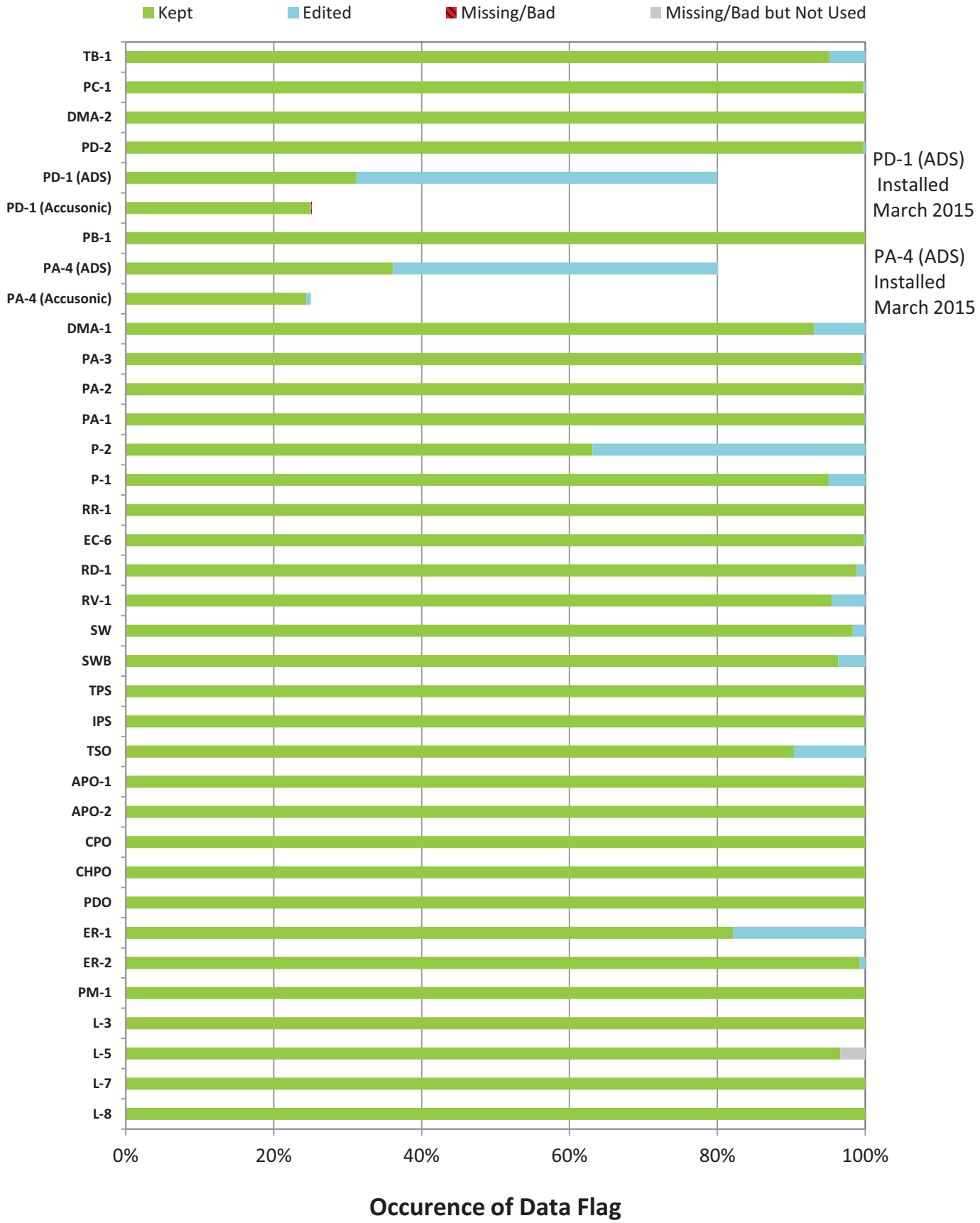


Table B-1
Downriver Sewage Disposal System
Meter Data Review and Fixes for 2015

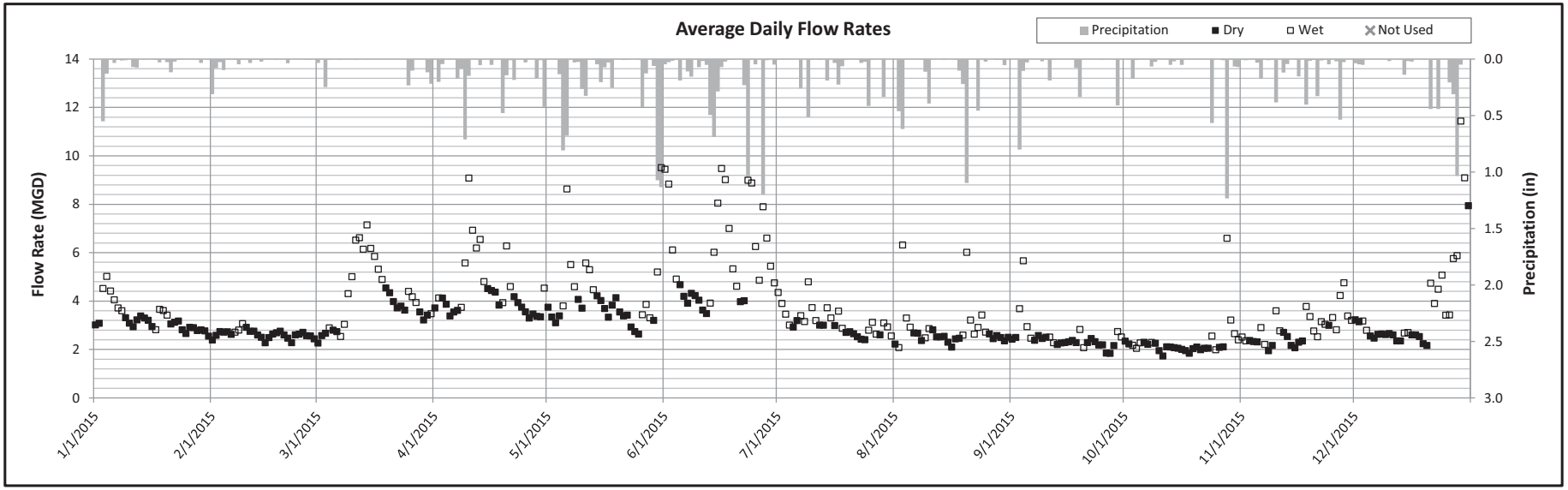
Meter	Start	Stop	Description of the Problem	Dry Period	Wet Period	Fix
DMA-1	3/2/2015	3/13/2015	Meter locked up and stopped storing data.	X	X	Diurnal Pattern. The meter was replaced.
	5/4/2015	5/18/2015	Meter stopped storing data.	X	X	The meter was replaced. A diurnal pattern was used to estimate the missing data period.
EC-6	6/27/2015	6/28/2015	CPU locked up. No data.		X	Correlation to Meter RD-1.
ER-1	8/28/2015	9/10/2015	AC power was turned off. Meter stopped storing data.	X		Zero flow rate assumed for this period. A battery was installed for this meter.
ER-2	8/9/2015	8/11/2015	AC power was turned off. Meter stopped storing data.	X	X	Zero flow rate assumed for this period.
P-1	3/23/2015	4/6/2015	The UPS failed. As a result the meter lost power and no data was recorded.	X	X	Correlation to Meters: P-2, PA-1, PB-1, PC-1, PD-1, PDO, TSO, APO-1, APO-2, CHPO, CPO, and ER-1. The UPS was replaced.
	12/1/2015	12/5/2015	Velocity path 1 had erratic values.	X	X	Rating curve to depth.
P-2	1/5/2015	2/27/2015	Path 1 velocity had intermittent drop outs.	X	X	Rating curve to flow depth.
	8/29/2015	9/29/2015	Data logging card failed.	X		Data logging card replaced. Correlation to Meter PB-1.
	9/29/2015	12/31/2015	Velocity path 1 is no longer functioning.	X	X	Rating curve to depth.
PA-4 (ADS)	3/13/2016	8/21/2015	Velocity sensor erratic.	X	X	Velocity sensor replaced. Rating curve to depth.
PD-1 (ADS)	3/13/2016	7/6/2016	The dye dilution test adjustment factor is not applicable when flow rates are high.	X	X	Rating curve to depth.
	10/29/2016	12/31/2016	The dye dilution test adjustment factor is not applicable when flow rates are high.	X	X	Rating curve to depth.
RV-1	2/9/2015	2/24/2015	UPS battery failed.	X		A new UPS battery was installed. Diurnal pattern.
SW	1/13/2015	1/15/2015	Communication issue. MCS visited the site several times to troubleshoot communications issues, and collect data.	X		The modem was replaced. Diurnal pattern.
SWB	6/22/2015	6/29/2015	Power-up cold start. No data.	X	X	Zero flow rate assummed for most of this period. Estimated basin dewatering on 6/26/2015.
	9/17/2015	9/23/2015	Power-up cold start. No data.	X	X	Zero flow rate assumed for this period. MCS reprogrammed the meter.
TB-1	7/17/2015	7/27/2015	SCADA system down.	X	X	Correlation to Meter PC-1.
	11/1/2015	11/6/2015	SCADA system down.	X	X	Correlation to Meter PC-1.
TSO	4/21/2015	5/27/2015	Meter stopped communicating wirelessly and attemped site visits were unsuccessful due to access issues.	X	X	Minimal wet weather during this period. Therefore, the flow rate was assumed to be zero during this period.

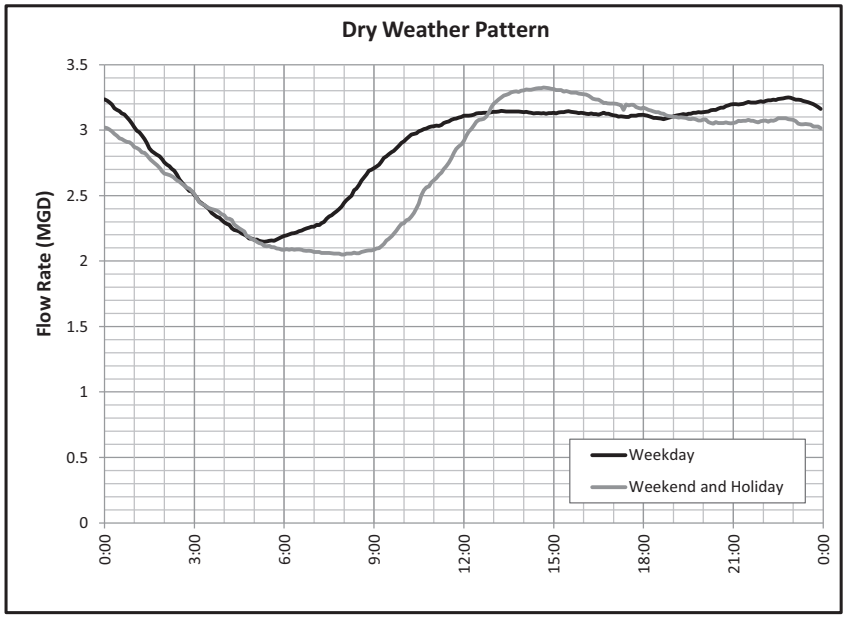
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: TB-1
Location: Taylor Basin
Type: Magmeter
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	3.3	101.9	3.0	93.1	21	10
Feb-15	2.6	73.6	2.6	72.9	25	3
Mar-15	4.2	129.7	3.4	104.6	14	17
Apr-15	4.5	134.7	3.8	113.9	18	12
May-15	4.2	129.7	3.5	108.4	19	12
Jun-15	5.9	176.9	4.0	121.4	10	20
Jul-15	3.1	96.8	2.8	85.7	12	19
Aug-15	2.8	88.2	2.5	76.9	18	13
Sep-15	2.5	75.6	2.3	68.8	20	10
Oct-15	2.3	71.8	2.1	64.4	21	10
Nov-15	2.8	85.0	2.4	70.7	12	18
Dec-15	3.8	117.9	2.9	90.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	10.3	5/31/2015 20:35	-	-
B	1.28	12/28/2015	12/29/2016	12.5	12/29/2015 0:10	-	-

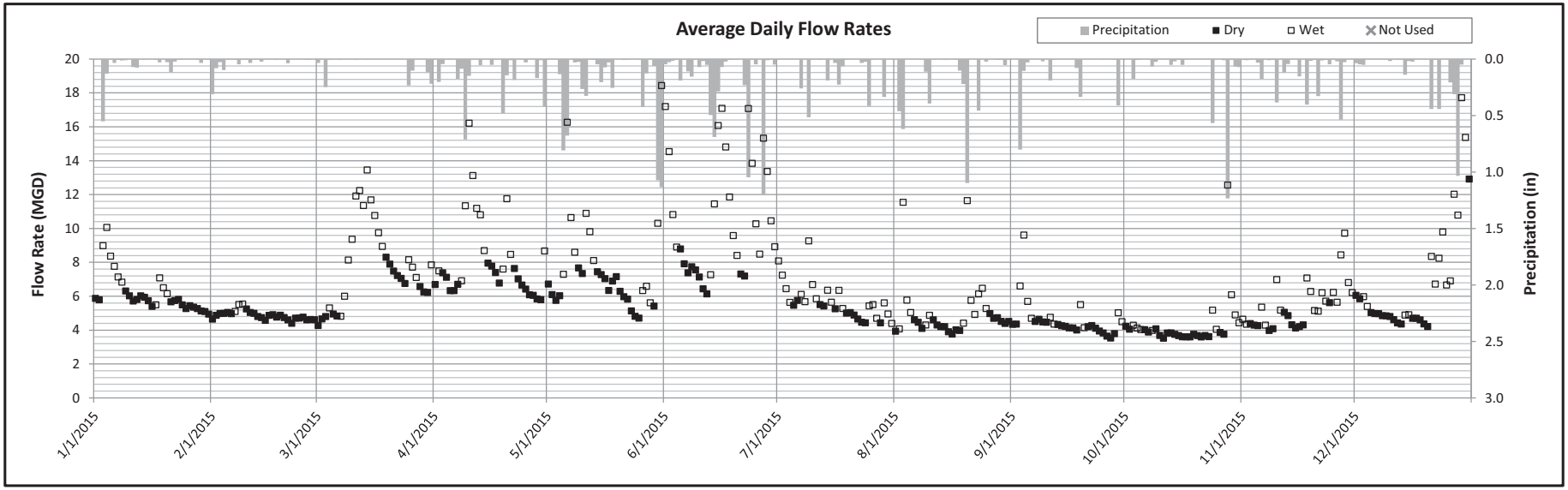
Downriver Sewage Disposal System

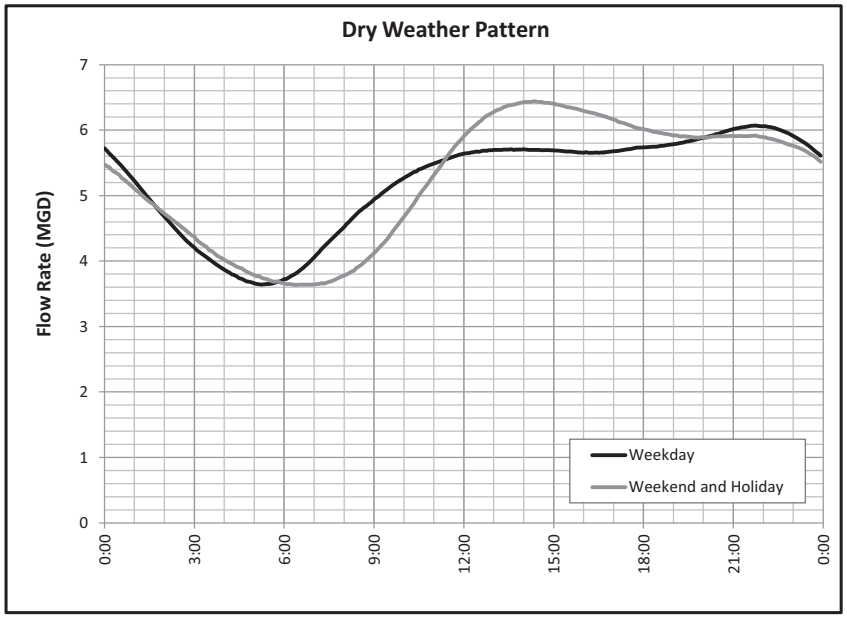
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PC-1
Type: Accusonic 7510

Location: Pelham Interceptor North of Goddard Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	6.2	192.3	5.6	174.0	21	10
Feb-15	4.9	136.3	4.8	134.6	25	3
Mar-15	7.8	241.9	6.2	193.3	14	17
Apr-15	8.1	244.3	6.8	203.3	18	12
May-15	7.7	238.9	6.3	195.7	19	12
Jun-15	10.6	319.4	7.4	220.8	10	20
Jul-15	5.7	175.6	5.0	155.9	12	19
Aug-15	5.1	158.2	4.3	134.2	18	13
Sep-15	4.6	138.1	4.2	124.8	20	10
Oct-15	4.3	133.0	3.8	117.1	21	10
Nov-15	5.4	162.9	4.5	133.8	12	18
Dec-15	6.9	214.1	5.3	164.7	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	19.3	5/30/2015 22:40	4.2	5/31/2015 12:40
B	1.28	12/28/2015	12/29/2016	18.6	12/28/2015 21:15	3.9	12/29/2015 0:50

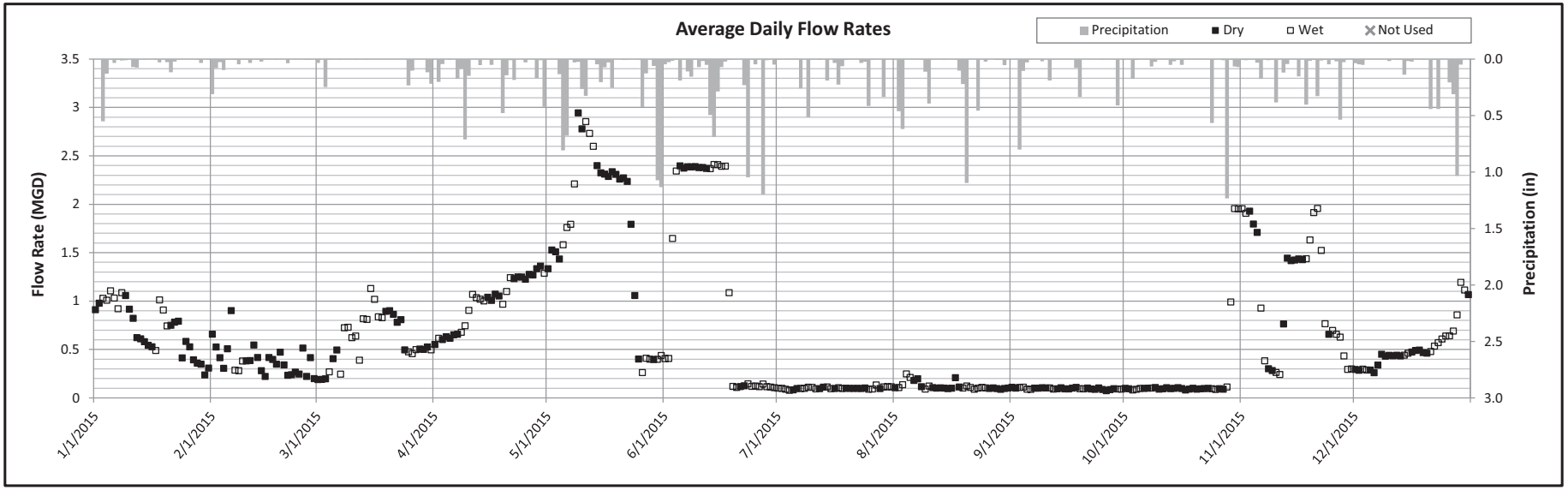
Downriver Sewage Disposal System

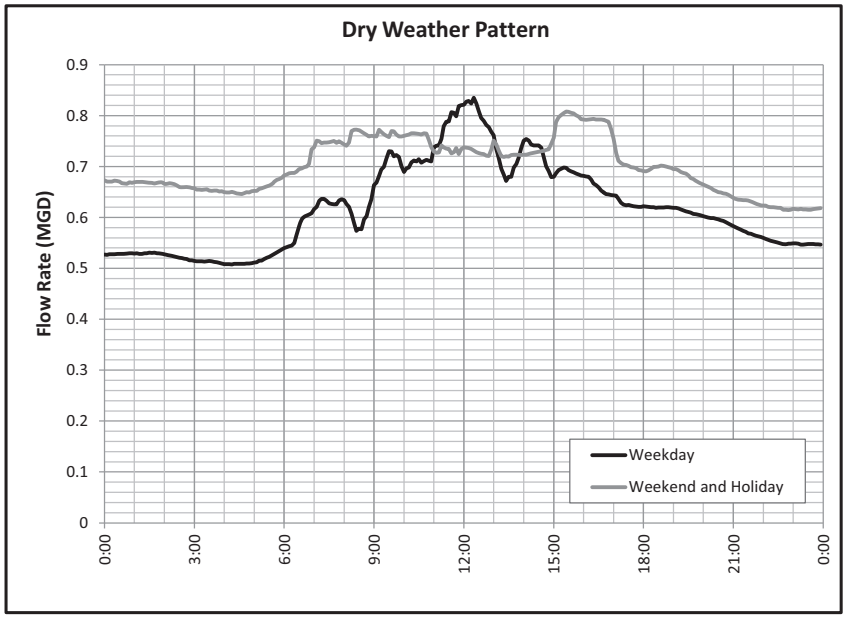
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: DMA-2
Type: ADS Triton

Location: Detroit Metro Airport
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.7	22.4	0.6	19.3	21	10
Feb-15	0.4	10.8	0.4	11.0	25	3
Mar-15	0.6	18.7	0.6	17.2	14	17
Apr-15	1.0	29.7	1.0	30.1	18	12
May-15	1.7	53.4	1.9	58.6	19	12
Jun-15	1.3	38.4	1.9	57.9	10	20
Jul-15	0.1	3.1	0.1	3.0	12	19
Aug-15	0.1	3.8	0.1	3.6	18	13
Sep-15	0.1	2.9	0.1	2.9	20	10
Oct-15	0.2	7.6	0.1	3.0	21	10
Nov-15	1.1	32.5	1.2	36.5	12	18
Dec-15	0.5	16.4	0.4	13.8	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	0.5	5/31/2015 8:30	0.6	5/31/2015 8:35
B	1.28	12/28/2015	12/29/2016	1.3	12/29/2015 0:20	0.9	12/29/2015 0:30

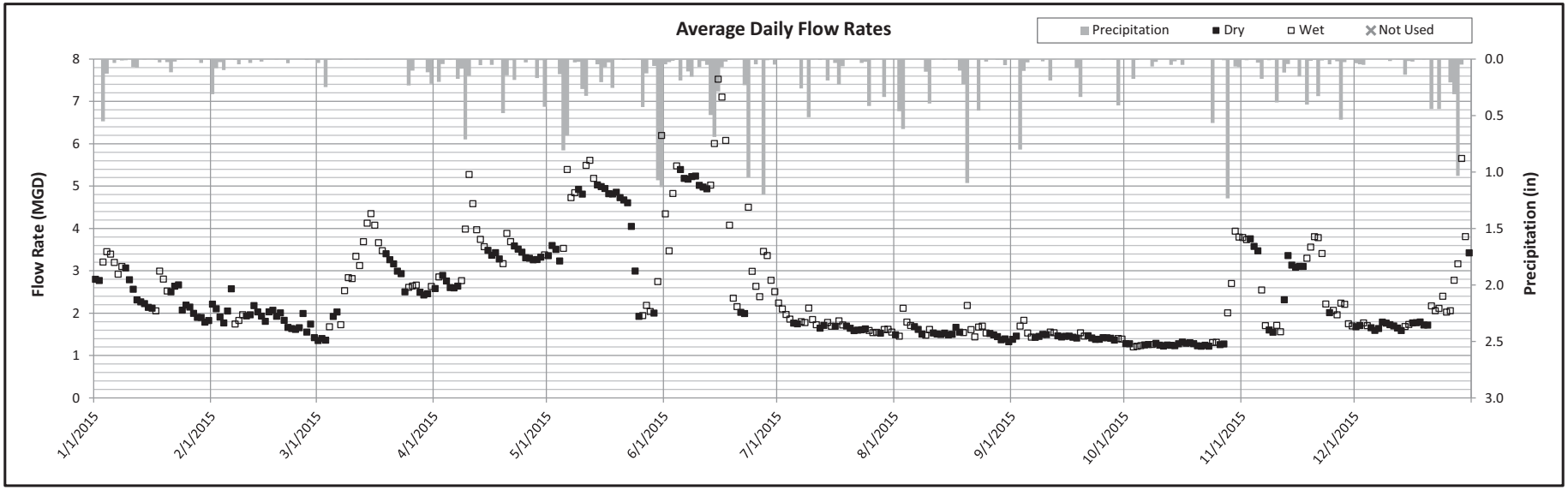
Downriver Sewage Disposal System

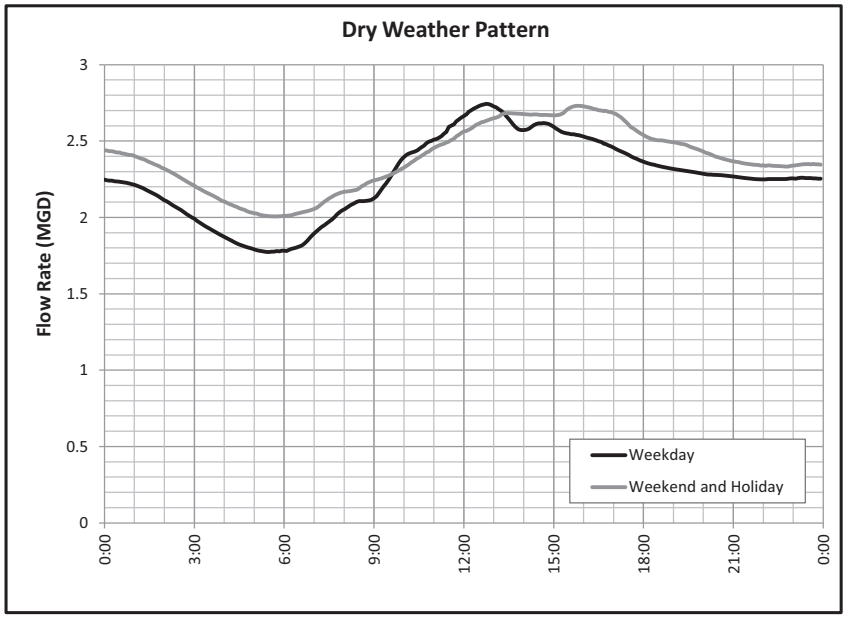
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PD-2
Type: Accusonic 7510

Location: Goddard Interceptor West of Inkster Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	2.5	78.3	2.3	71.9	21	10
Feb-15	1.9	53.2	1.9	53.3	25	3
Mar-15	2.8	85.7	2.4	74.7	14	17
Apr-15	3.4	101.5	3.1	94.4	18	12
May-15	4.1	127.7	4.1	127.0	19	12
Jun-15	4.3	128.2	4.5	135.4	10	20
Jul-15	1.7	53.8	1.7	51.3	12	19
Aug-15	1.6	49.0	1.5	46.7	18	13
Sep-15	1.5	44.0	1.4	43.0	20	10
Oct-15	1.5	46.4	1.3	39.1	21	10
Nov-15	2.7	81.1	2.8	85.2	12	18
Dec-15	2.1	65.8	1.8	56.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	8.6	5/31/2015 10:15	1.7	5/31/2015 10:50
B	1.28	12/28/2015	12/29/2016	7.9	12/29/2015 1:30	1.6	12/29/2015 2:10

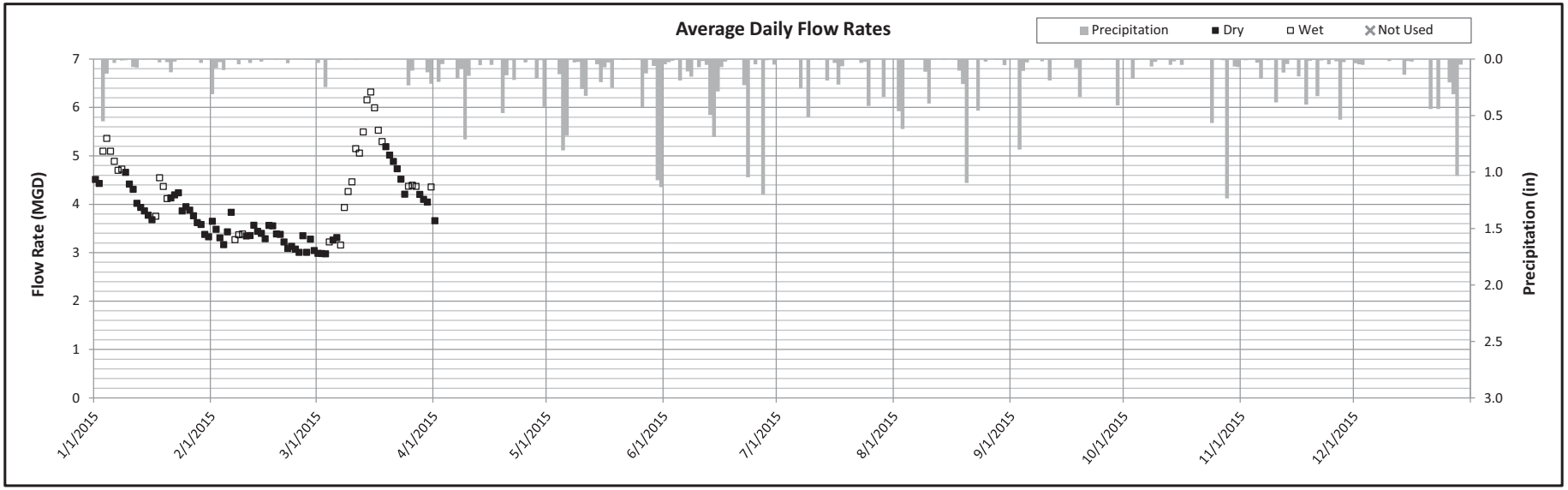
Downriver Sewage Disposal System

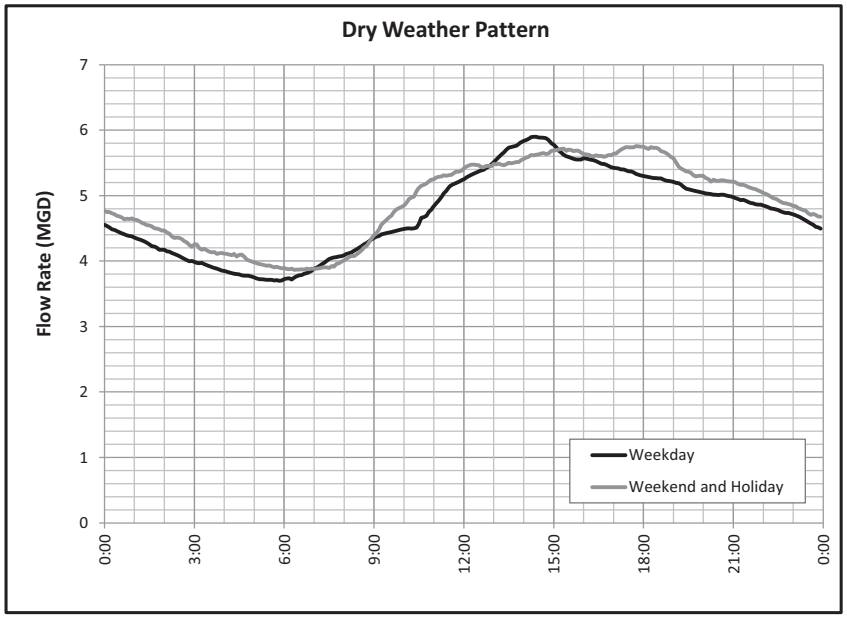
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PD-1 (Accusonic)
Type: Accusonic 7510

Location: Goddard Interceptor West of Allen Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	4.2	130.2	4.0	123.3	21	10
Feb-15	3.3	93.4	3.3	93.3	25	3
Mar-15	4.5	138.0	4.0	124.9	14	17
Apr-15	3.7	109.8	3.7	109.8	1	0
May-15	--	--	--	--	--	--
Jun-15	--	--	--	--	--	--
Jul-15	--	--	--	--	--	--
Aug-15	--	--	--	--	--	--
Sep-15	--	--	--	--	--	--
Oct-15	--	--	--	--	--	--
Nov-15	--	--	--	--	--	--
Dec-15	--	--	--	--	--	--

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	-	-	-	-
B	1.28	12/28/2015	12/29/2016	-	-	-	-

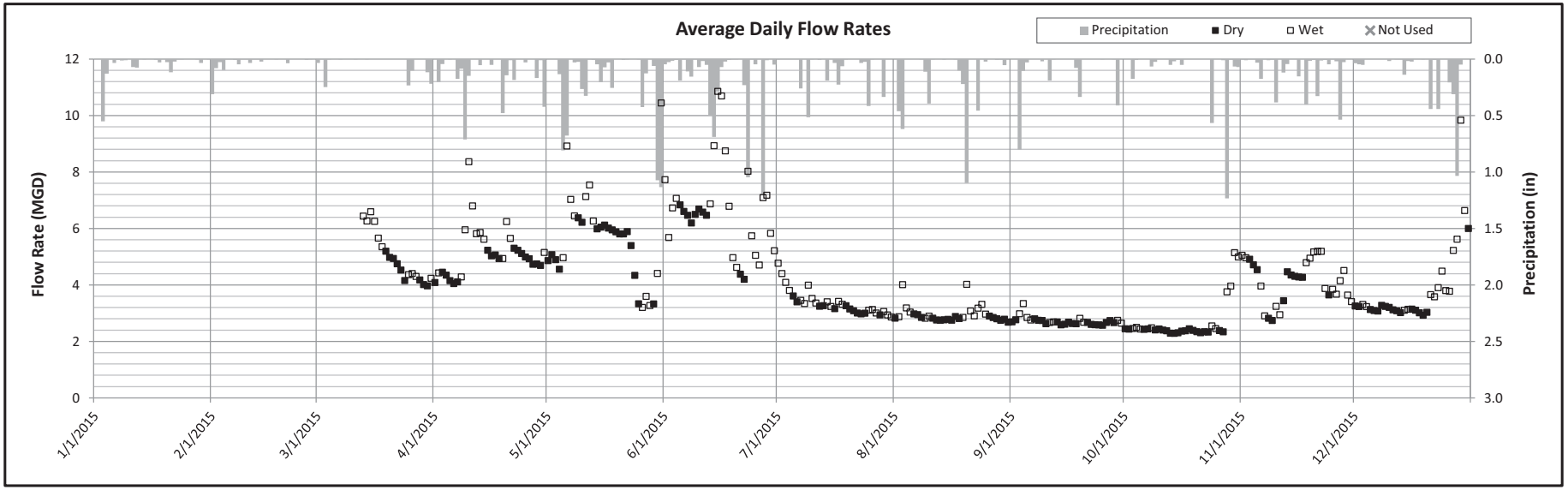
Downriver Sewage Disposal System

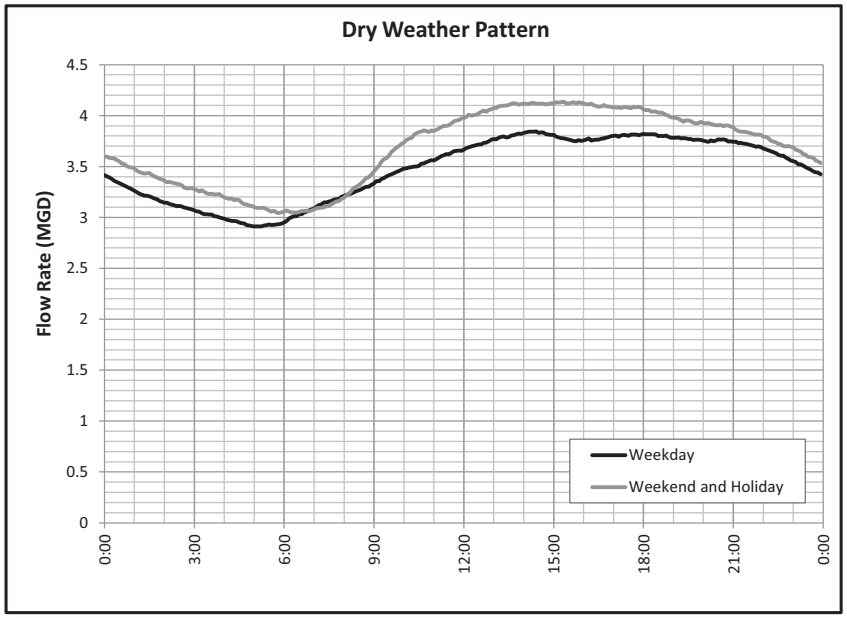
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PD-1 (ADS)
Type: ADS Triton+

Location: Goddard Interceptor West of Allen Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	--	--	--	--	--	--
Feb-15	--	--	--	--	--	--
Mar-15	5.0	154.3	4.5	140.2	9	10
Apr-15	5.1	154.3	4.7	142.0	18	12
May-15	5.6	175.1	5.4	166.2	19	12
Jun-15	6.6	199.4	6.1	182.8	10	20
Jul-15	3.4	104.3	3.2	98.4	12	19
Aug-15	3.0	91.8	2.8	87.3	18	13
Sep-15	2.7	81.5	2.7	80.0	20	10
Oct-15	2.7	82.6	2.4	73.7	21	10
Nov-15	4.1	124.0	4.0	121.2	12	18
Dec-15	3.8	119.3	3.3	102.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	14.5	5/31/2015 12:15	2.0	5/31/2015 12:45
B	1.28	12/28/2015	12/29/2016	13.5	12/29/2015 1:10	1.9	12/29/2015 1:30

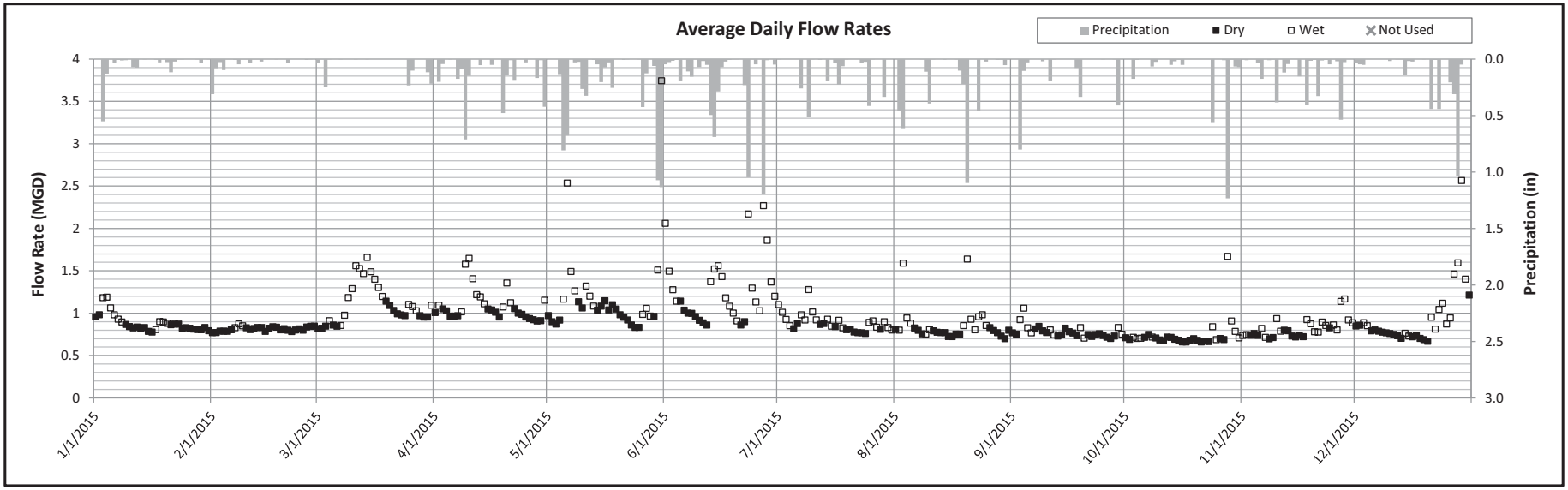
Downriver Sewage Disposal System

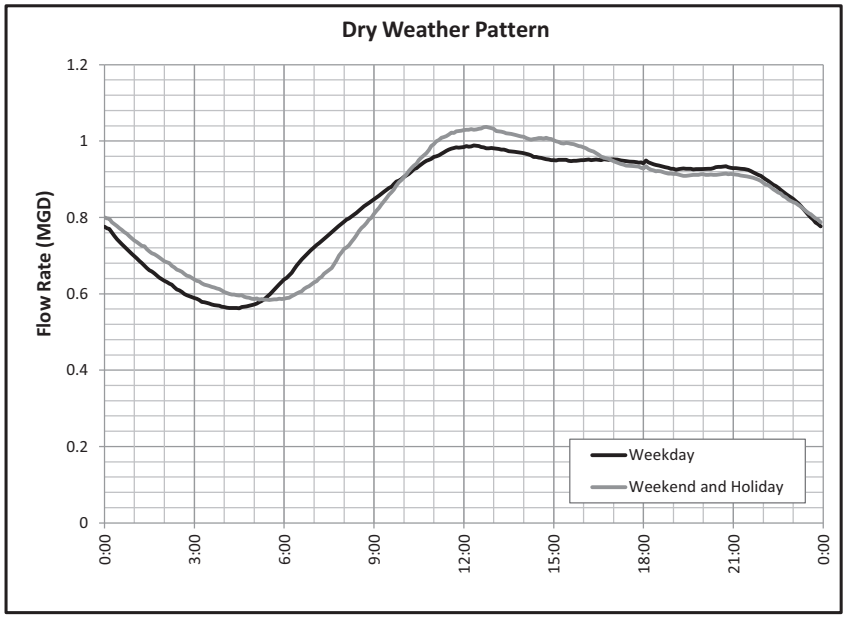
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PB-1
Type: ADS Triton

Location: Northline Interceptor West of Fordline Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.9	27.4	0.8	26.1	21	10
Feb-15	0.8	22.8	0.8	22.7	25	3
Mar-15	1.1	34.4	0.9	29.4	14	17
Apr-15	1.1	32.7	1.0	29.5	18	12
May-15	1.2	37.0	1.0	30.4	19	12
Jun-15	1.3	37.9	1.0	28.7	10	20
Jul-15	0.9	27.5	0.8	25.3	12	19
Aug-15	0.9	26.7	0.8	23.9	18	13
Sep-15	0.8	23.4	0.8	22.8	20	10
Oct-15	0.7	23.0	0.7	21.4	21	10
Nov-15	0.8	24.6	0.7	22.5	12	18
Dec-15	0.9	29.3	0.8	24.3	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	6.0	5/31/2015 9:15	1.8	5/31/2015 9:35
B	1.28	12/28/2015	12/29/2016	4.8	12/29/2015 0:00	1.6	12/29/2015 0:30

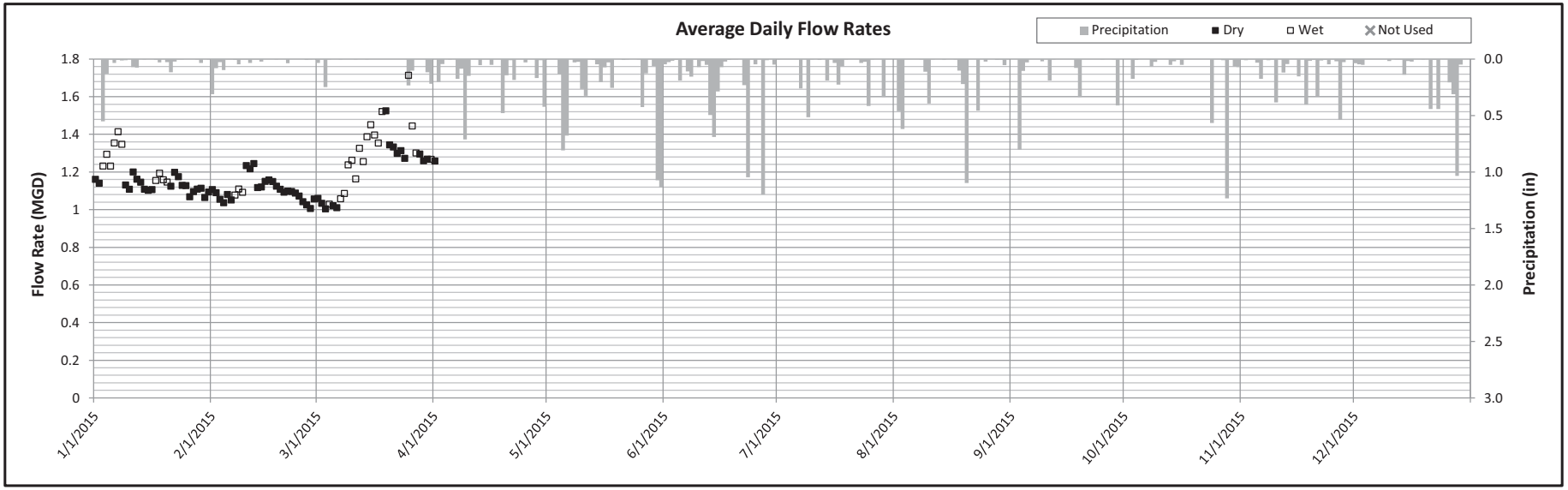
Downriver Sewage Disposal System

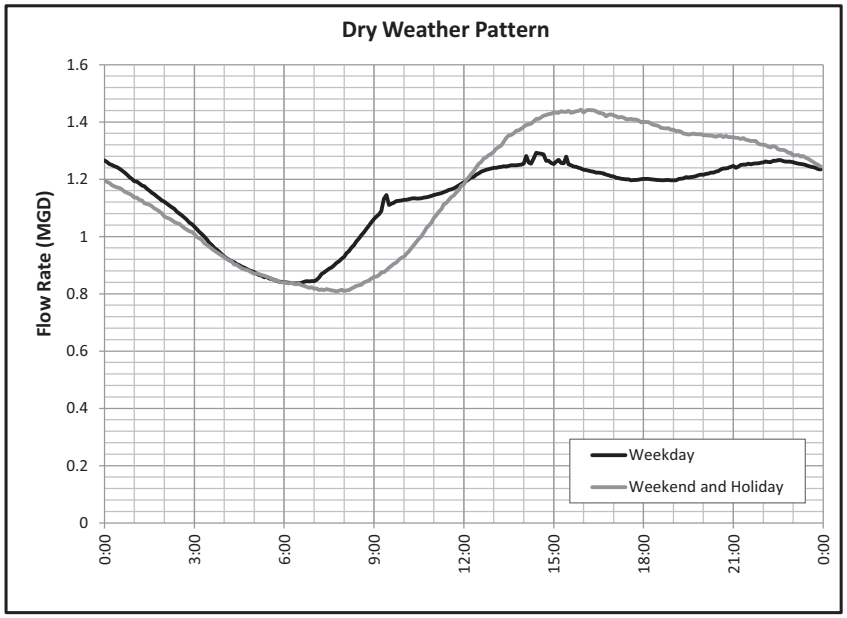
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PA-4 (Accusonic)
Type: Accusonic 7510

Location: Eureka Interceptor near Hannan Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	1.2	36.2	1.1	34.9	21	10
Feb-15	1.1	30.9	1.1	30.9	25	3
Mar-15	1.3	39.3	1.2	37.7	14	17
Apr-15	1.3	37.8	1.3	37.8	1	0
May-15	--	--	--	--	--	--
Jun-15	--	--	--	--	--	--
Jul-15	--	--	--	--	--	--
Aug-15	--	--	--	--	--	--
Sep-15	--	--	--	--	--	--
Oct-15	--	--	--	--	--	--
Nov-15	--	--	--	--	--	--
Dec-15	--	--	--	--	--	--

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	-	-	-	-
B	1.28	12/28/2015	12/29/2016	-	-	-	-

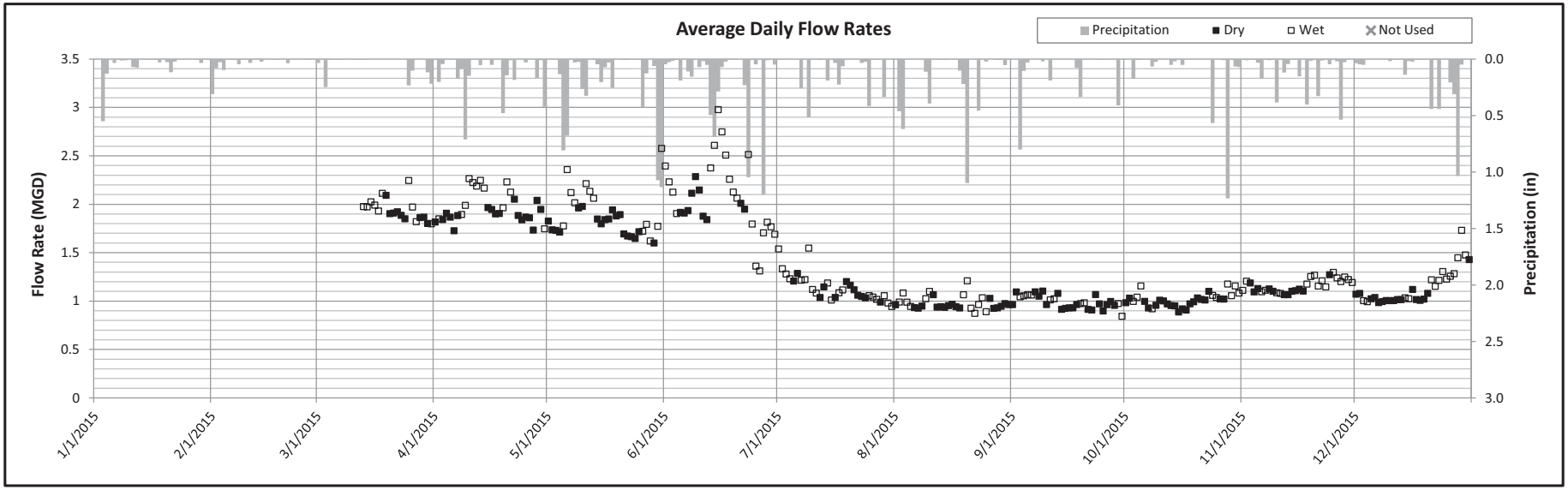
Downriver Sewage Disposal System

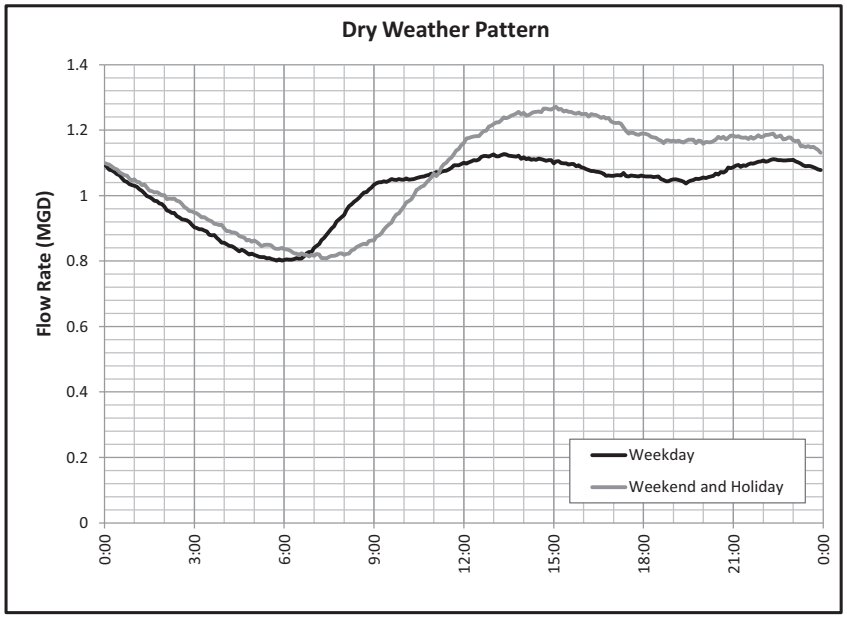
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PA-4 (ADS)
Type: ADS Triton+

Location: Eureka Interceptor near Hannan Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	--	--	--	--	--	--
Feb-15	--	--	--	--	--	--
Mar-15	1.9	60.3	1.9	58.9	9	10
Apr-15	2.0	58.9	1.9	56.6	18	12
May-15	1.9	58.2	1.8	55.5	19	12
Jun-15	2.1	62.3	2.0	60.0	10	20
Jul-15	1.1	35.4	1.1	34.4	12	19
Aug-15	1.0	30.3	1.0	29.6	18	13
Sep-15	1.0	29.7	1.0	29.5	20	10
Oct-15	1.0	31.3	1.0	30.5	21	10
Nov-15	1.2	34.8	1.1	33.7	12	18
Dec-15	1.1	35.3	1.1	32.7	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	3.1	5/31/2015 13:45	1.3	5/31/2015 14:05
B	1.28	12/28/2015	12/29/2016	2.0	12/29/2015 18:40	1.2	12/29/2015 19:45

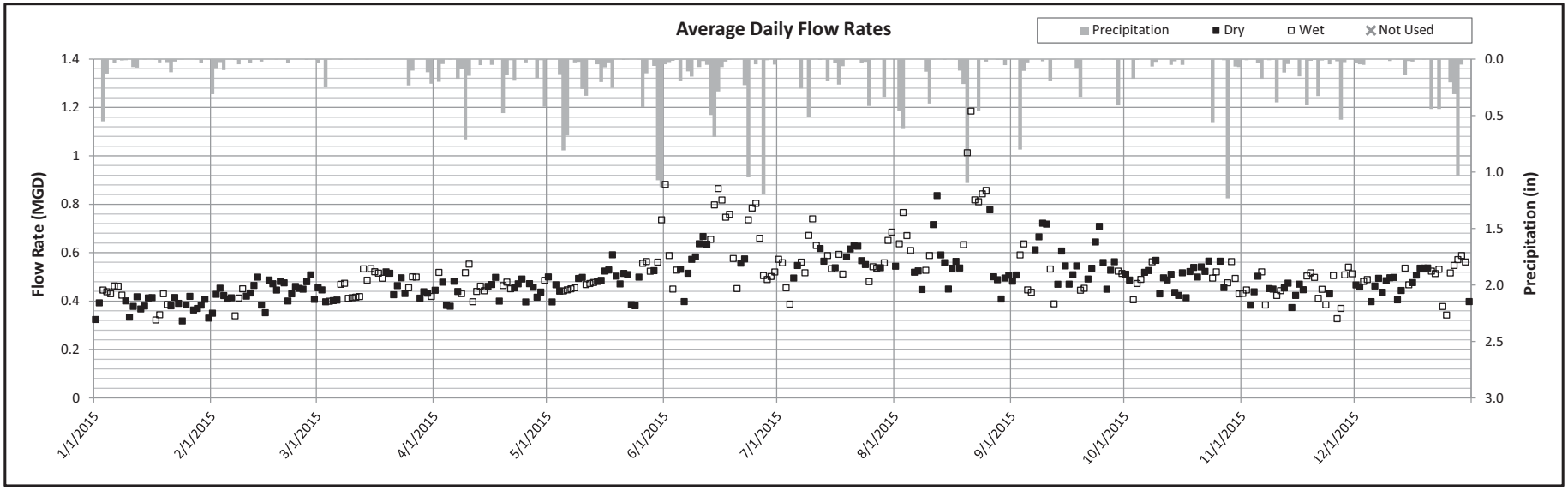
Downriver Sewage Disposal System

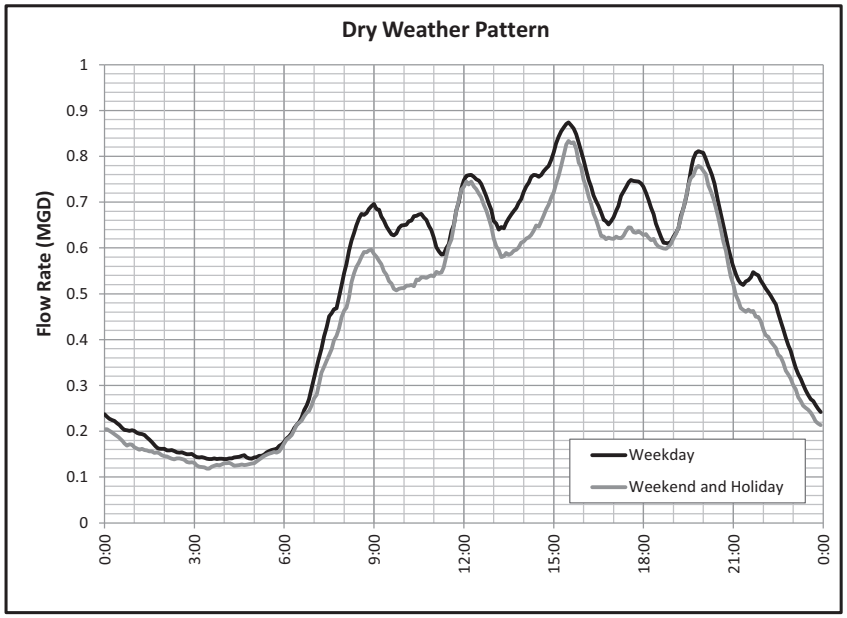
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: DMA-1
Type: ADS 4000

Location: Detroit Metro Airport outlet at Eureka
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.4	12.1	0.4	11.8	21	10
Feb-15	0.4	12.2	0.4	12.3	25	3
Mar-15	0.5	14.2	0.4	13.8	14	17
Apr-15	0.5	13.7	0.4	13.4	18	12
May-15	0.5	15.3	0.5	15.0	19	12
Jun-15	0.6	18.8	0.6	17.0	10	20
Jul-15	0.6	17.6	0.6	17.8	12	19
Aug-15	0.6	20.0	0.6	17.2	18	13
Sep-15	0.5	16.3	0.6	17.0	20	10
Oct-15	0.5	15.4	0.5	15.6	21	10
Nov-15	0.4	13.5	0.4	13.2	12	18
Dec-15	0.5	15.1	0.5	14.7	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	1.3	5/31/2015 19:40	0.9	5/31/2015 20:00
B	1.28	12/28/2015	12/29/2016	1.0	12/29/2015 15:00	0.7	12/31/2015 15:35

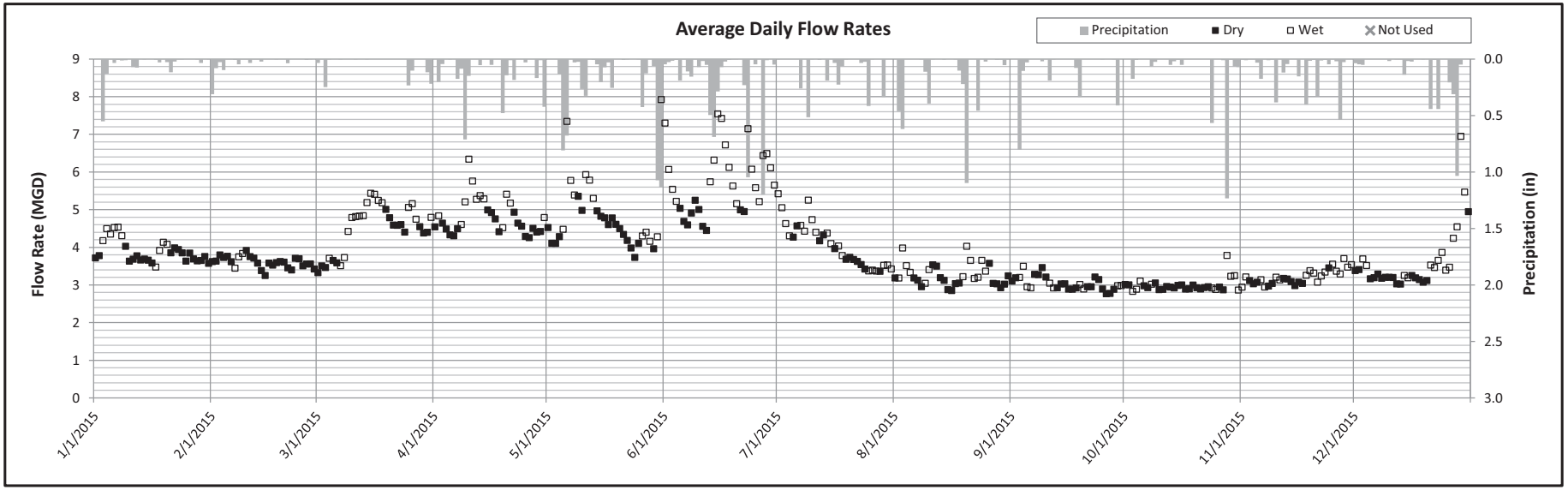
Downriver Sewage Disposal System

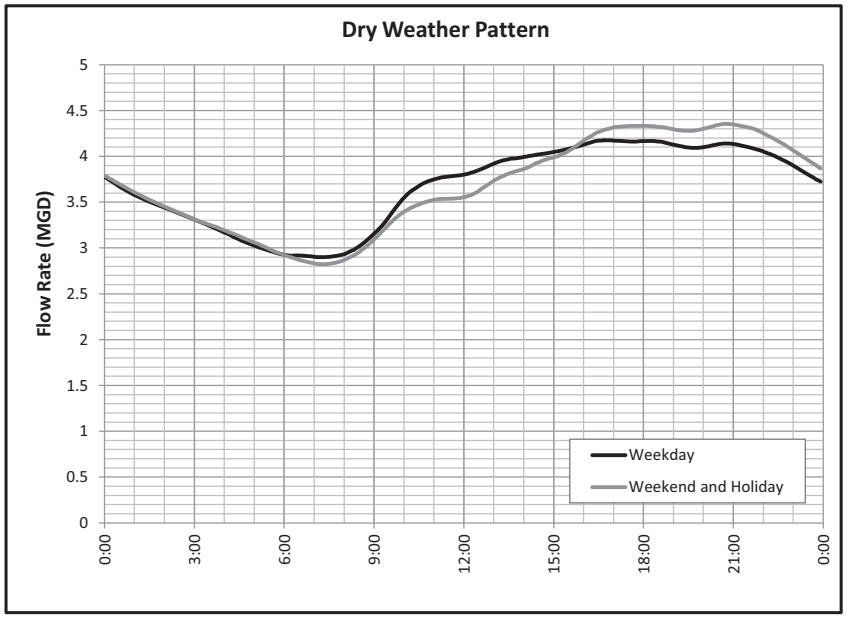
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PA-3
Type: Accusonic 7510

Location: Eureka Interceptor at Inkster Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	3.9	120.6	3.7	116.1	21	10
Feb-15	3.6	101.0	3.6	100.8	25	3
Mar-15	4.5	139.7	4.2	130.3	14	17
Apr-15	4.8	144.5	4.5	136.5	18	12
May-15	4.8	149.8	4.5	138.2	19	12
Jun-15	5.7	171.9	4.8	145.3	10	20
Jul-15	4.1	126.1	3.9	119.7	12	19
Aug-15	3.3	101.2	3.1	97.2	18	13
Sep-15	3.0	91.2	3.0	91.2	20	10
Oct-15	3.0	92.6	2.9	91.3	21	10
Nov-15	3.2	96.3	3.1	93.0	12	18
Dec-15	3.6	112.2	3.3	102.1	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	9.8	5/31/2015 13:50	1.9	5/31/2015 15:00
B	1.28	12/28/2015	12/29/2016	8.7	12/29/2015 1:00	1.8	12/29/2015 1:35

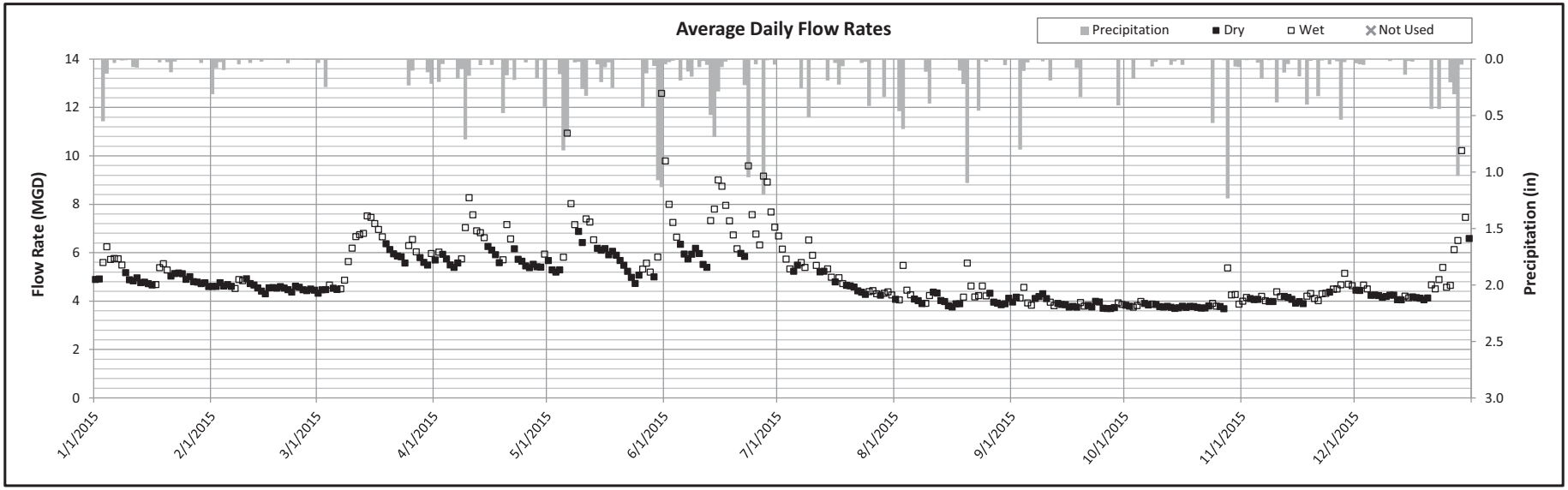
Downriver Sewage Disposal System

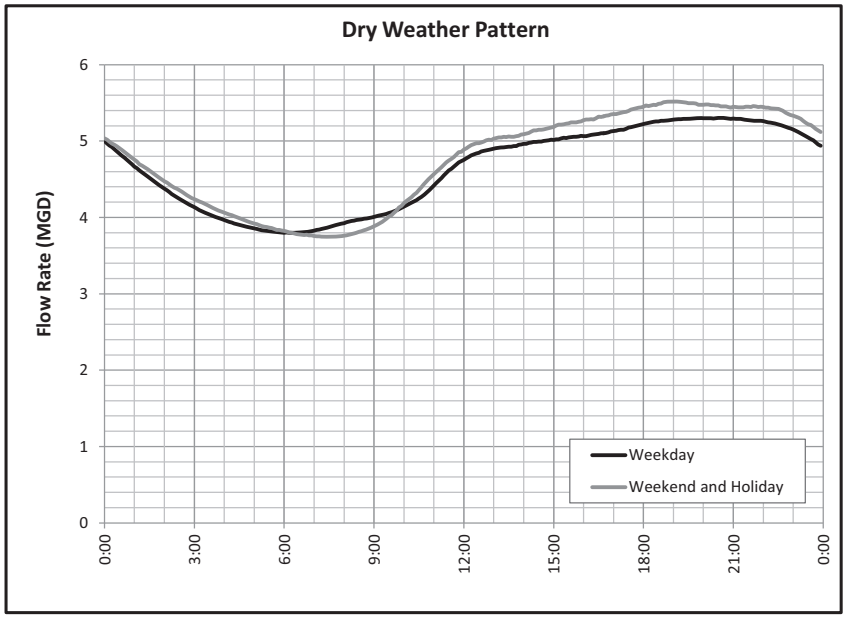
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PA-2
Type: ADS Triton

Location: Eureka Interceptor at Allen Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	5.1	158.1	4.9	151.5	21	10
Feb-15	4.6	128.4	4.6	127.8	25	3
Mar-15	5.9	181.6	5.3	165.8	14	17
Apr-15	6.1	182.8	5.7	170.7	18	12
May-15	6.3	194.9	5.6	175.0	19	12
Jun-15	7.2	214.6	5.9	176.5	10	20
Jul-15	5.0	156.0	4.8	147.6	12	19
Aug-15	4.2	130.1	4.0	124.3	18	13
Sep-15	3.9	117.8	3.9	117.1	20	10
Oct-15	3.9	120.1	3.8	116.9	21	10
Nov-15	4.2	127.1	4.1	122.0	12	18
Dec-15	4.8	150.3	4.3	134.5	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	16.4	5/31/2015 13:30	3.0	5/31/2015 13:40
B	1.28	12/28/2015	12/29/2016	13.6	12/29/2015 1:00	2.6	12/29/2015 1:35

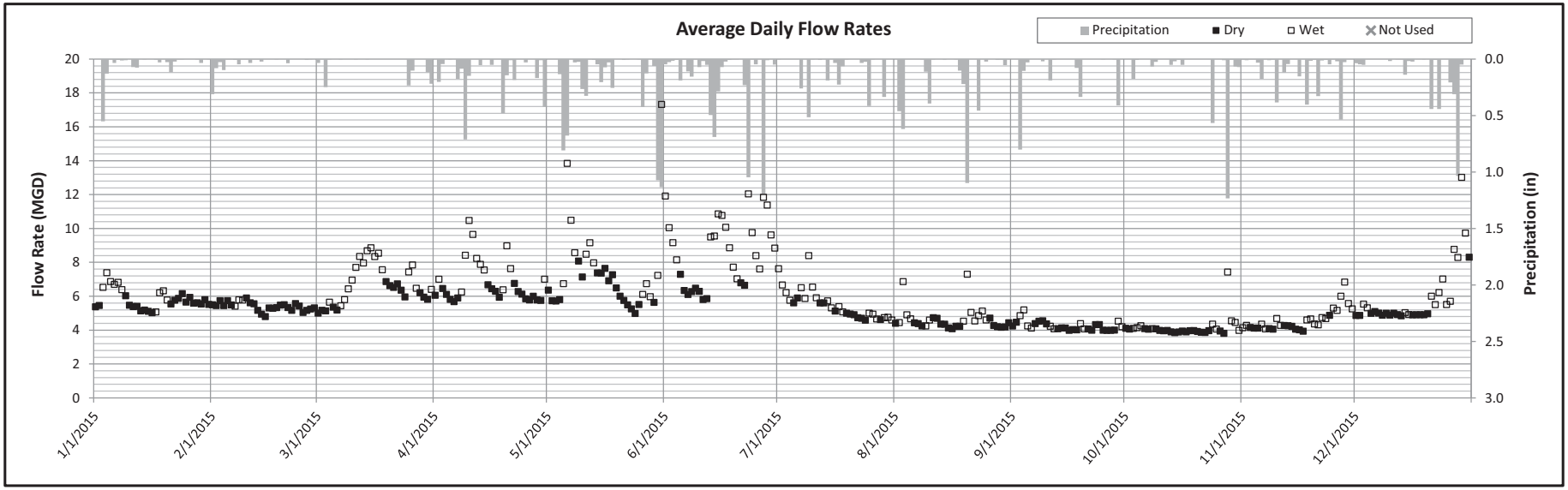
Downriver Sewage Disposal System

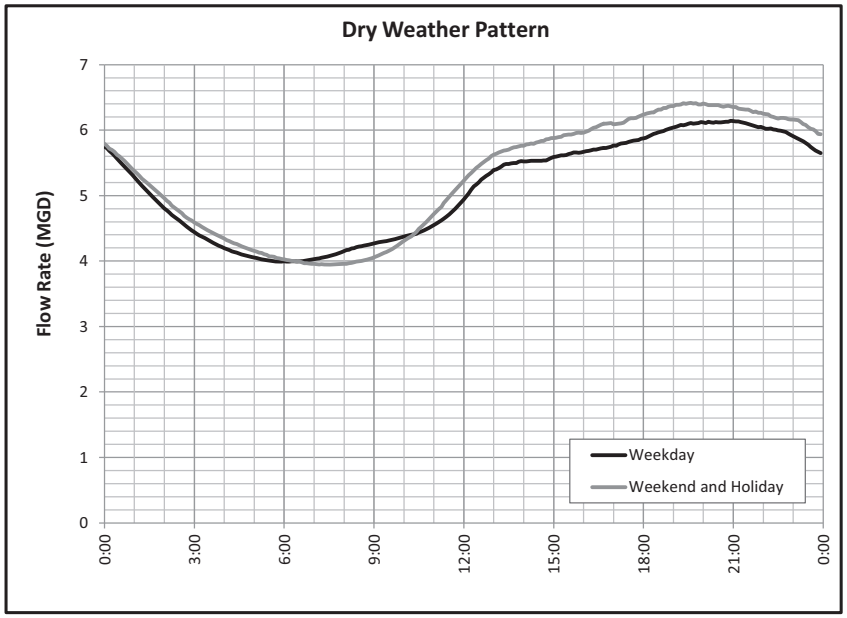
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PA-1
Type: ADS Triton

Location: Eureka Interceptor West of Fordline Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	5.8	180.6	5.6	172.1	21	10
Feb-15	5.4	151.5	5.4	150.6	25	3
Mar-15	6.7	207.3	5.9	183.5	14	17
Apr-15	6.8	205.2	6.1	182.8	18	12
May-15	7.4	229.2	6.3	196.7	19	12
Jun-15	8.6	257.0	6.4	191.7	10	20
Jul-15	5.5	171.0	5.1	158.5	12	19
Aug-15	4.6	144.0	4.3	134.8	18	13
Sep-15	4.3	127.5	4.2	125.4	20	10
Oct-15	4.1	128.6	4.0	122.7	21	10
Nov-15	4.6	137.5	4.2	125.5	12	18
Dec-15	5.9	183.8	5.1	159.1	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	23.3	5/31/2015 12:50	2.7	5/31/2015 11:45
B	1.28	12/28/2015	12/29/2016	18.8	12/29/2015 0:50	2.3	12/29/2015 1:25

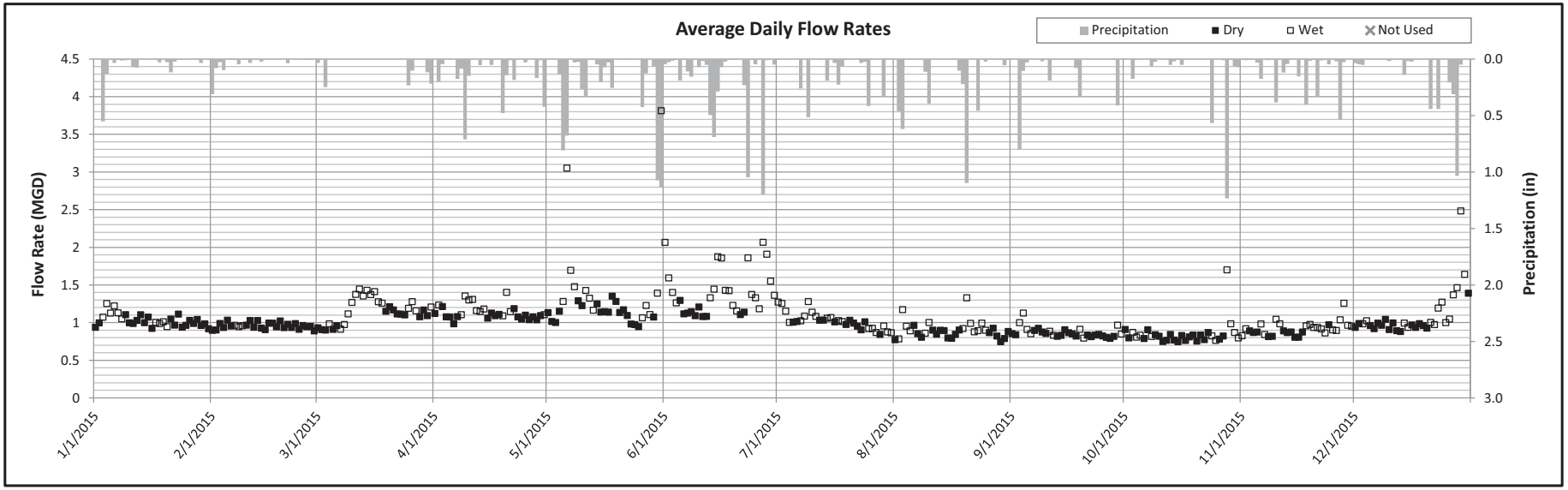
Downriver Sewage Disposal System

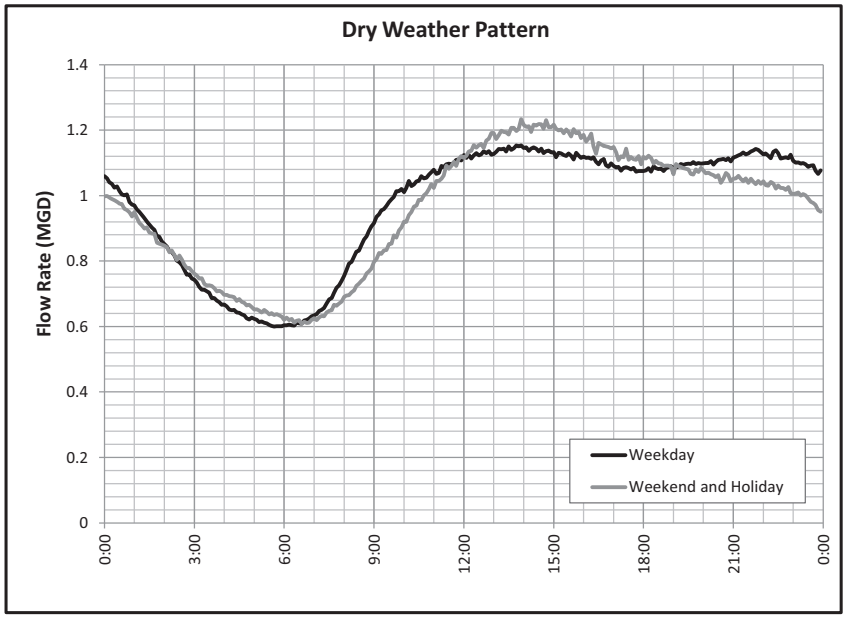
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: P-2
Type: Accusonic 7510

Location: Pennsylvania Interceptor East of Dix-Toledo Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	1.0	31.9	1.0	31.2	21	10
Feb-15	1.0	26.8	1.0	26.8	25	3
Mar-15	1.2	35.8	1.1	32.8	14	17
Apr-15	1.1	34.1	1.1	32.6	18	12
May-15	1.3	41.5	1.1	35.1	19	12
Jun-15	1.4	42.1	1.1	34.2	10	20
Jul-15	1.0	31.7	1.0	30.5	12	19
Aug-15	0.9	27.9	0.8	26.3	18	13
Sep-15	0.9	26.0	0.8	25.3	20	10
Oct-15	0.8	26.3	0.8	25.1	21	10
Nov-15	0.9	27.5	0.9	25.9	12	18
Dec-15	1.1	34.0	1.0	30.4	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	6.2	5/31/2015 10:00	1.8	5/31/2015 10:25
B	1.28	12/28/2015	12/29/2016	4.3	12/29/2015 0:30	1.3	12/29/2015 0:55

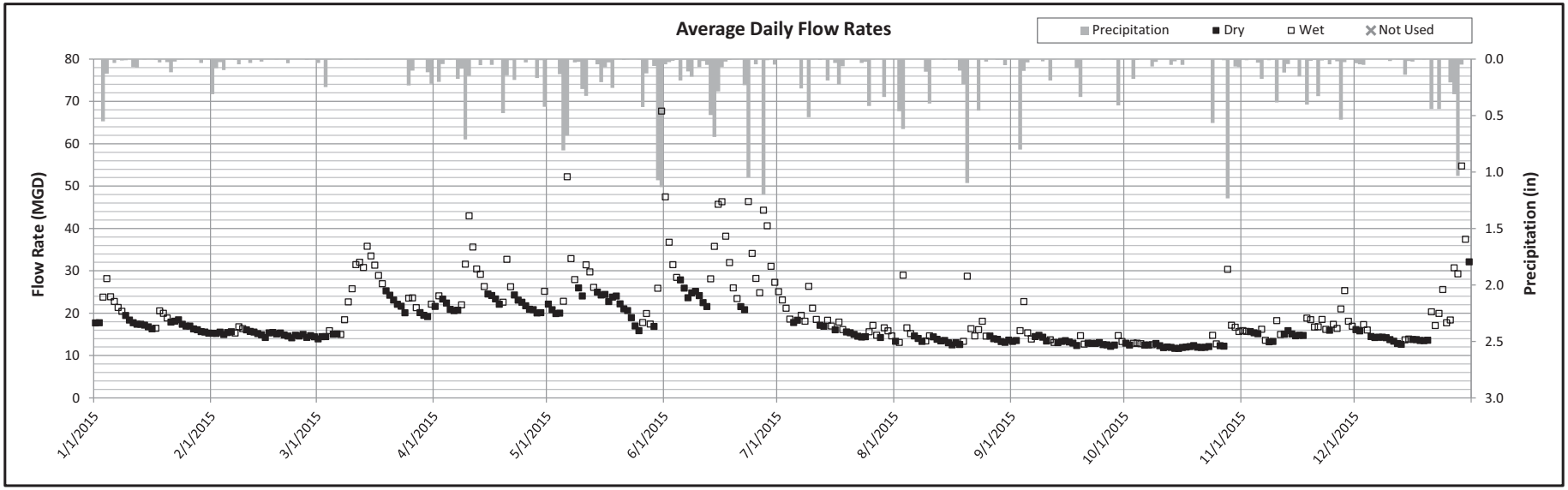
Downriver Sewage Disposal System

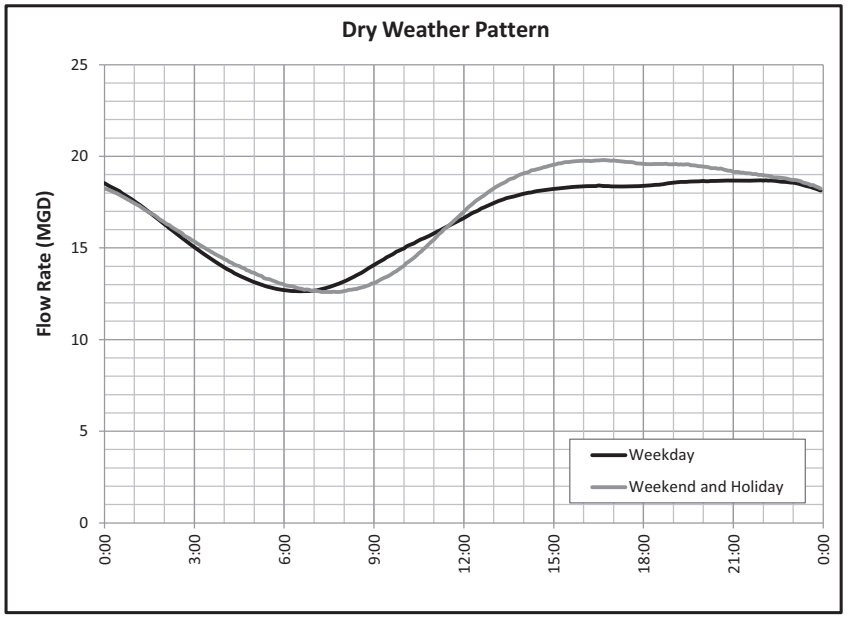
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: P-1
Type: Accusonic 7510

Location: Pennsylvania Interceptor East of Fort Street
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	18.6	576.9	17.2	532.4	21	10
Feb-15	15.2	424.8	15.1	421.5	25	3
Mar-15	22.8	707.5	19.2	594.1	14	17
Apr-15	24.9	746.3	22.1	662.3	18	12
May-15	25.2	781.6	21.6	668.5	19	12
Jun-15	31.1	934.3	23.8	713.9	10	20
Jul-15	17.6	545.4	15.8	490.5	12	19
Aug-15	15.1	468.0	13.6	420.7	18	13
Sep-15	13.8	413.9	13.2	395.7	20	10
Oct-15	13.4	414.2	12.2	377.3	21	10
Nov-15	16.5	494.2	14.9	447.3	12	18
Dec-15	19.0	588.8	15.1	467.9	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	86.9	5/31/2015 14:25	6.7	5/31/2015 12:35
B	1.28	12/28/2015	12/29/2016	74.1	12/29/2015 1:20	5.5	12/29/2015 1:50

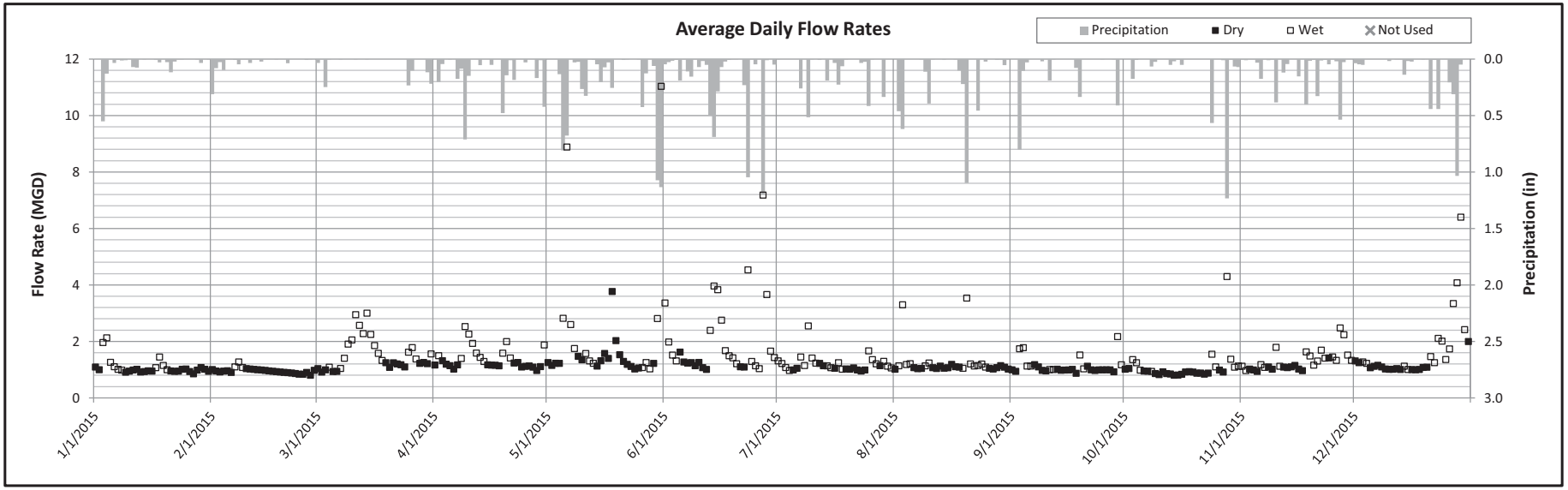
Downriver Sewage Disposal System

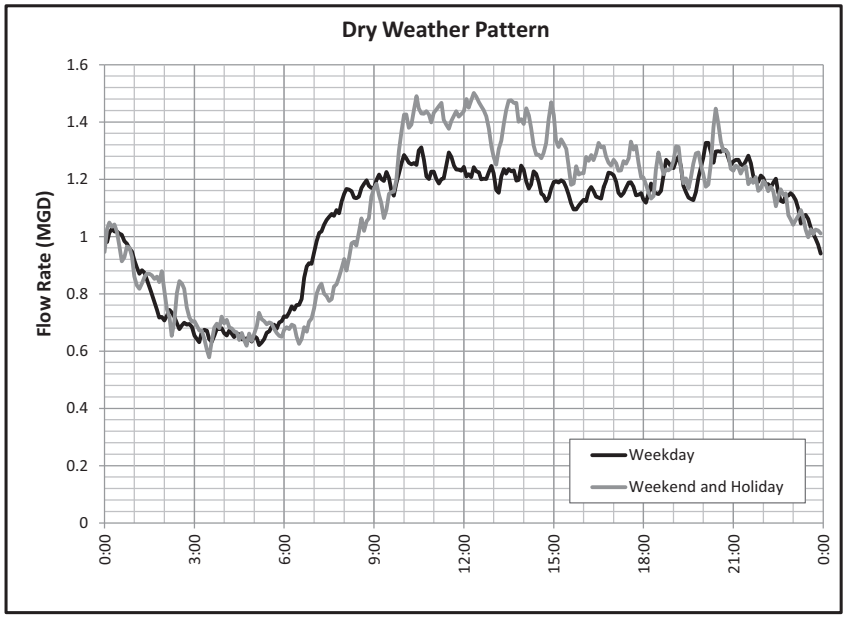
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: RV-1
Type: Accusonic 7510

Location: Pennsylvania Interceptor West of Jefferson Avenue
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	1.1	33.5	1.0	30.1	21	10
Feb-15	1.0	26.8	0.9	26.2	25	3
Mar-15	1.5	47.2	1.1	34.4	14	17
Apr-15	1.4	41.4	1.1	34.4	18	12
May-15	2.1	64.7	1.4	44.6	19	12
Jun-15	2.0	60.9	1.2	36.1	10	20
Jul-15	1.2	37.2	1.1	32.6	12	19
Aug-15	1.3	38.8	1.1	33.2	18	13
Sep-15	1.1	33.7	1.0	30.0	20	10
Oct-15	1.1	33.9	0.9	27.8	21	10
Nov-15	1.3	39.2	1.1	32.2	12	18
Dec-15	1.6	50.0	1.1	35.1	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	22.0	5/31/2015 9:40	4.2	5/31/2015 12:10
B	1.28	12/28/2015	12/29/2016	16.5	12/29/2015 0:05	3.9	12/29/2015 0:55

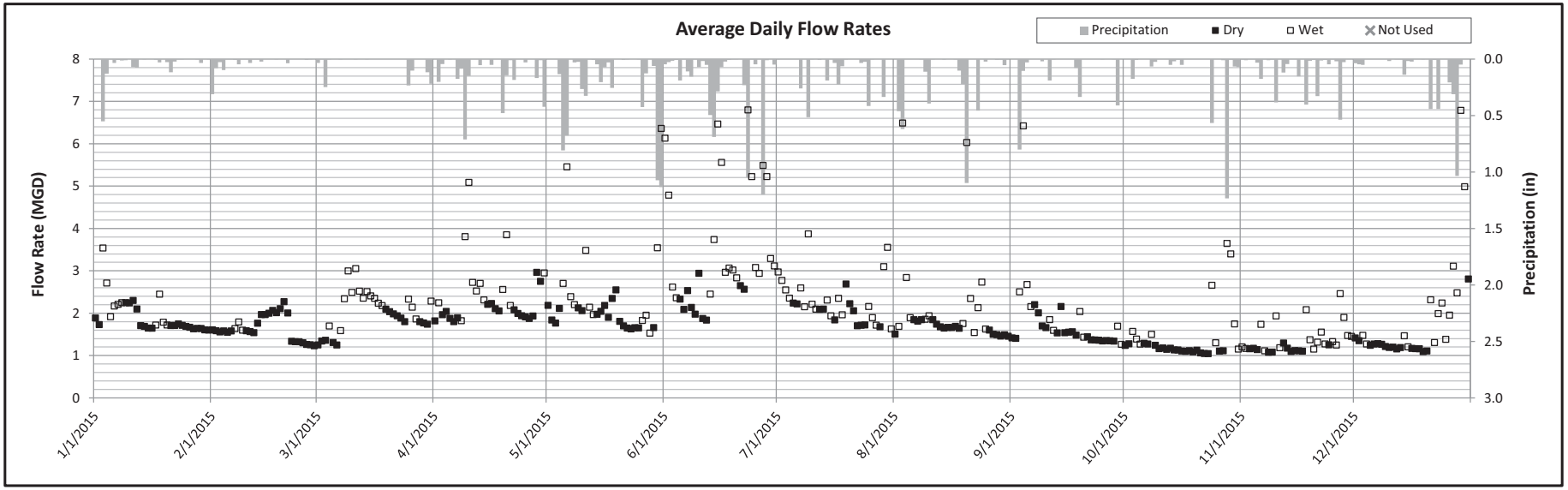
Downriver Sewage Disposal System

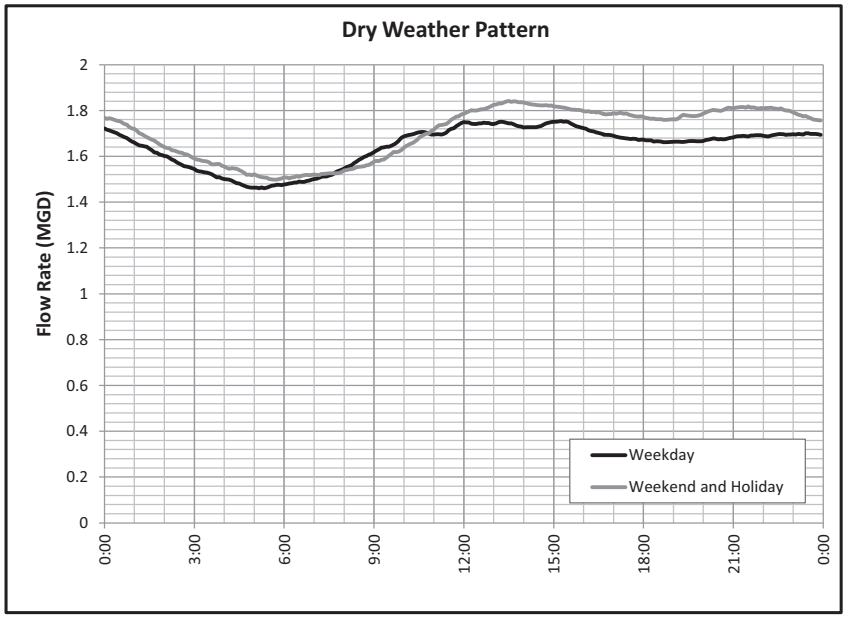
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: RR-1
Type: ADS Triton

Location: 17th Street near Visger Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	1.9	60.0	1.8	55.4	21	10
Feb-15	1.7	46.4	1.7	46.3	25	3
Mar-15	2.0	62.9	1.7	52.2	14	17
Apr-15	2.4	72.2	2.1	62.4	18	12
May-15	2.3	72.4	1.9	60.1	19	12
Jun-15	3.5	104.1	2.3	68.8	10	20
Jul-15	2.3	70.5	2.0	62.7	12	19
Aug-15	2.1	64.5	1.6	51.0	18	13
Sep-15	1.8	54.8	1.6	46.7	20	10
Oct-15	1.4	43.8	1.2	35.7	21	10
Nov-15	1.4	40.7	1.1	34.5	12	18
Dec-15	1.8	56.3	1.3	40.6	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	7.6	5/30/2015 22:10	7.8	5/31/2015 13:25
B	1.28	12/28/2015	12/29/2016	7.3	12/29/2015 10:35	6.8	12/29/2015 1:10

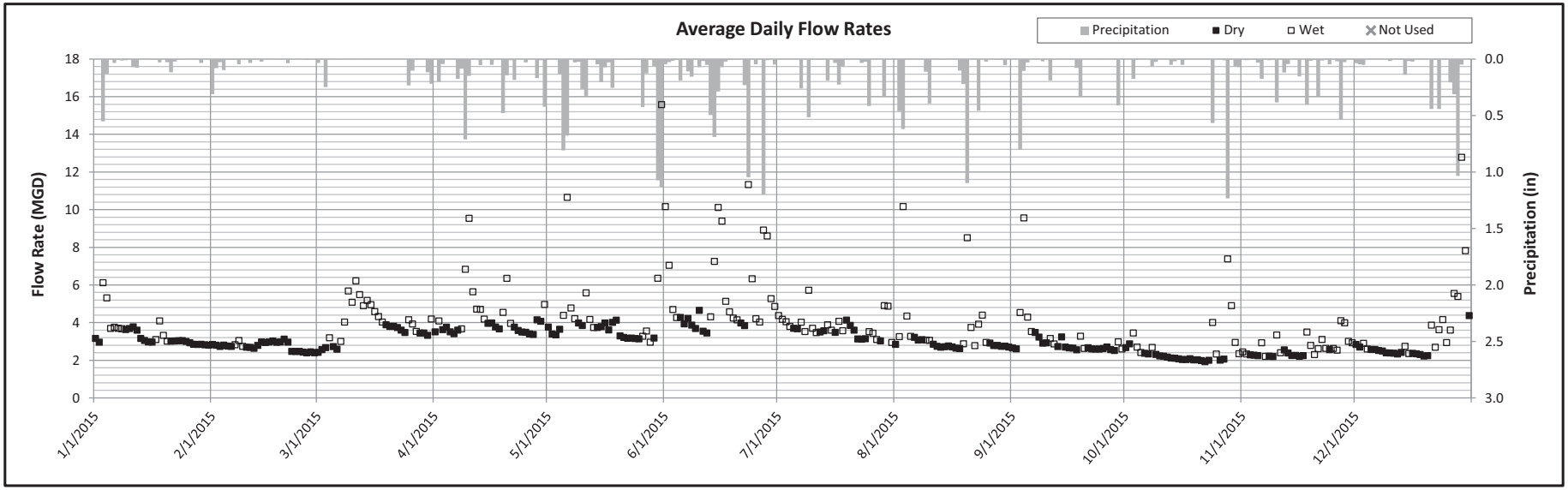
Downriver Sewage Disposal System

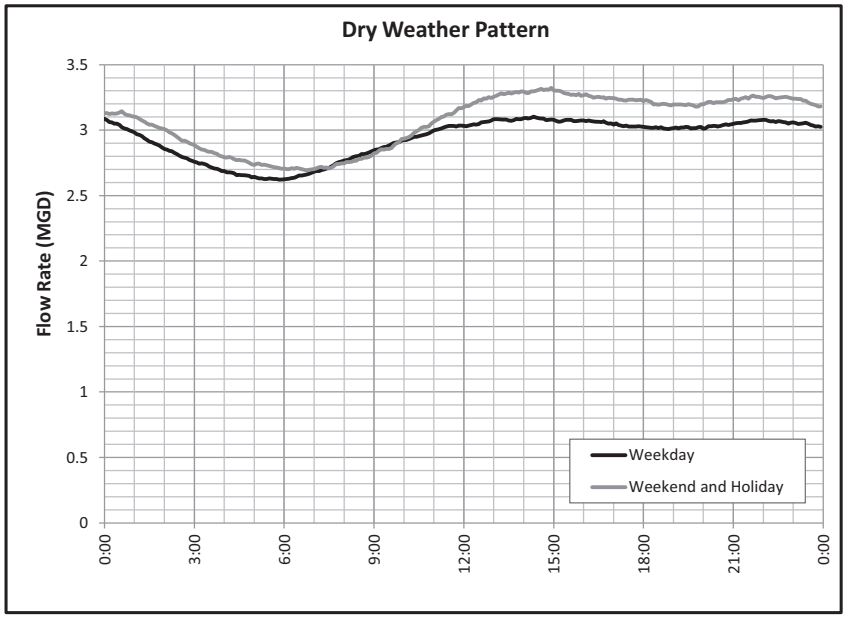
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: EC-6
Type: ADS Triton

Location: Riverdrive Interceptor South of Southfield Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	3.4	104.9	3.1	96.2	21	10
Feb-15	2.8	77.1	2.7	76.7	25	3
Mar-15	3.9	121.9	3.2	100.7	14	17
Apr-15	4.3	129.3	3.7	110.2	18	12
May-15	4.4	136.8	3.6	110.2	19	12
Jun-15	5.6	168.3	3.9	118.3	10	20
Jul-15	3.8	116.6	3.5	108.3	12	19
Aug-15	3.5	107.0	2.8	87.2	18	13
Sep-15	3.2	94.6	2.8	82.8	20	10
Oct-15	2.6	80.8	2.2	67.4	21	10
Nov-15	2.6	79.5	2.3	69.2	12	18
Dec-15	3.4	106.5	2.6	79.3	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	17.9	5/31/2015 11:30	12.8	5/31/2015 12:40
B	1.28	12/28/2015	12/29/2016	17.3	12/29/2015 1:10	11.5	12/29/2015 0:00

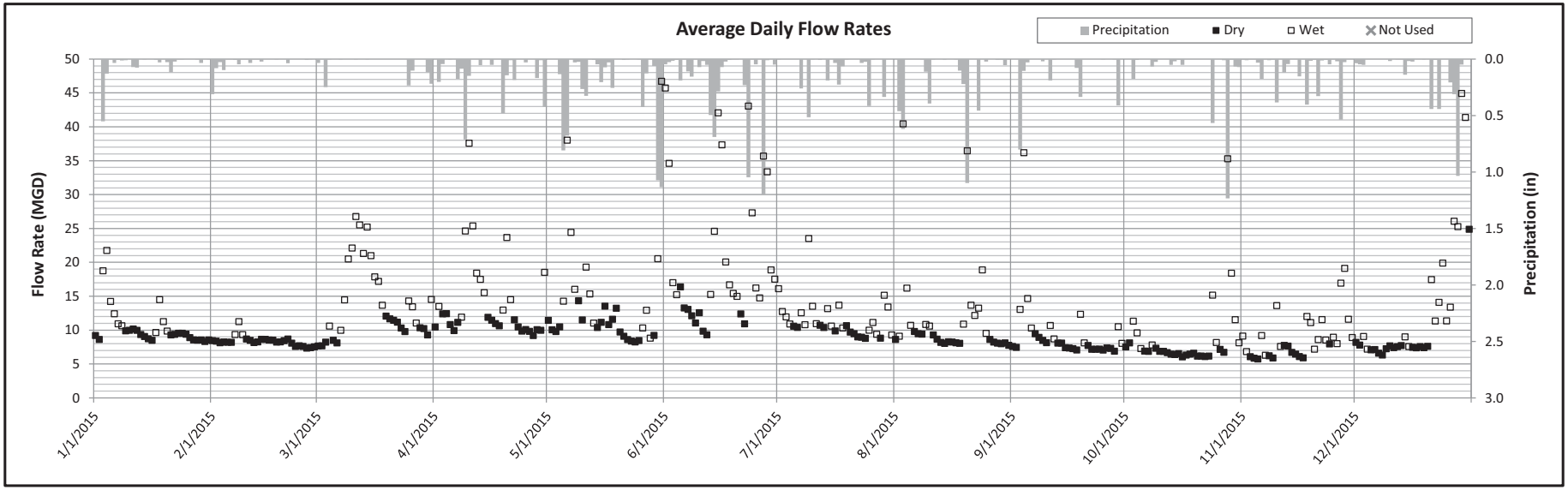
Downriver Sewage Disposal System

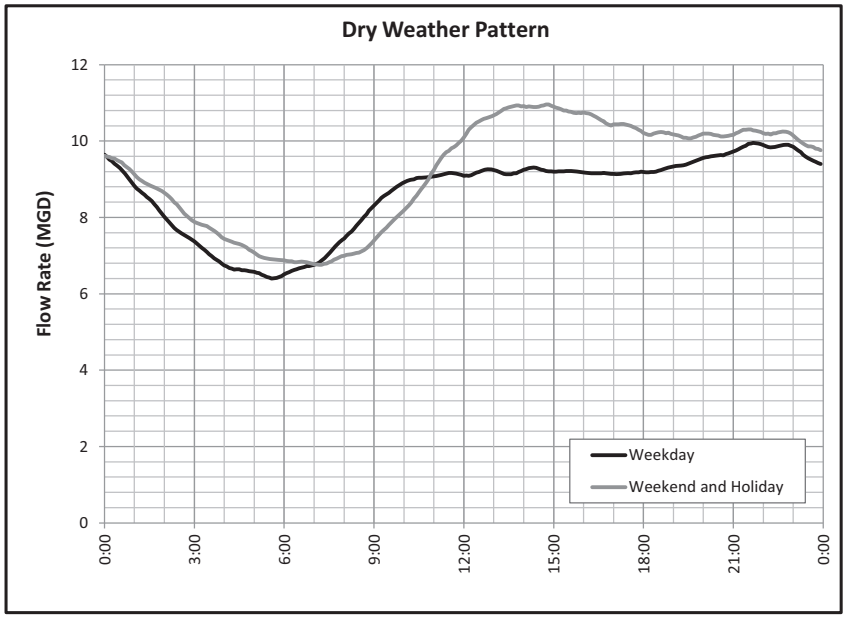
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: RD-1
Type: Accusonic 7510

Location: Riverdrive Interceptor North of Northline Road
System Meter Type: Interceptor Flow Meter





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	10.5	326.0	9.1	283.5	21	10
Feb-15	8.4	234.4	8.2	229.0	25	3
Mar-15	14.1	436.0	9.8	302.3	14	17
Apr-15	14.2	427.2	10.7	321.9	18	12
May-15	14.1	437.8	10.5	326.5	19	12
Jun-15	20.9	626.7	12.1	362.8	10	20
Jul-15	11.5	356.5	9.8	303.2	12	19
Aug-15	11.8	365.8	8.5	263.5	18	13
Sep-15	9.5	285.9	7.7	229.9	20	10
Oct-15	8.8	273.2	6.7	207.4	21	10
Nov-15	8.8	263.5	6.5	195.8	12	18
Dec-15	12.9	401.2	8.4	261.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	48.3	5/31/2015 12:55	9.9	5/31/2015 12:30
B	1.28	12/28/2015	12/29/2016	46.7	12/29/2015 0:45	9.6	12/29/2015 1:00

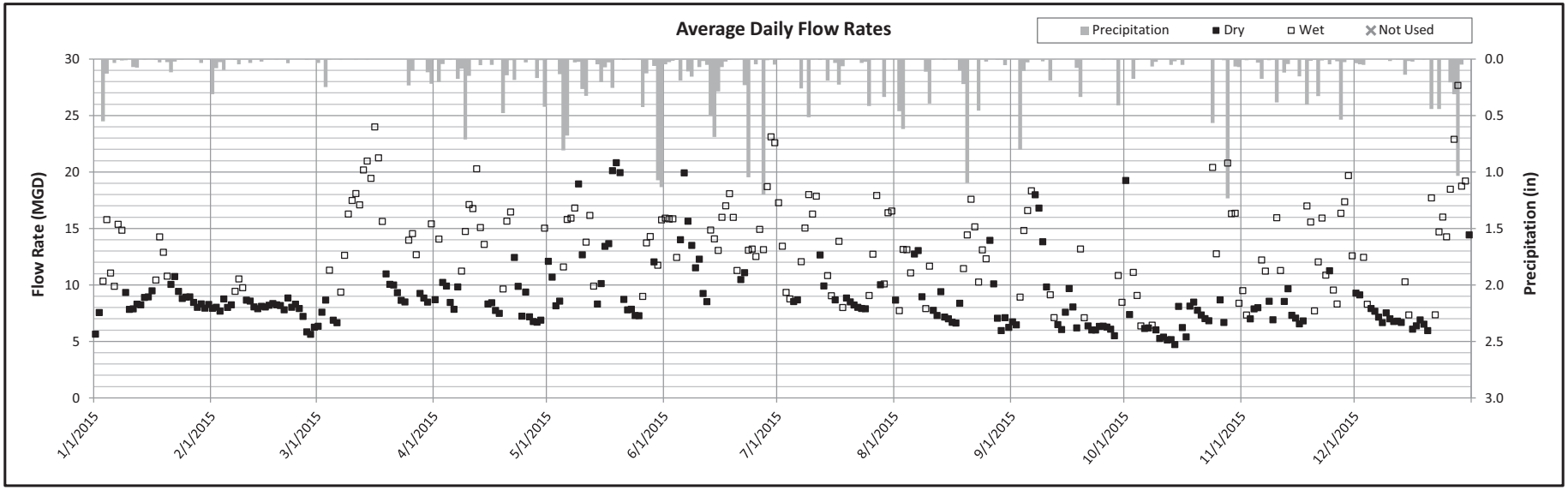
Downriver Sewage Disposal System

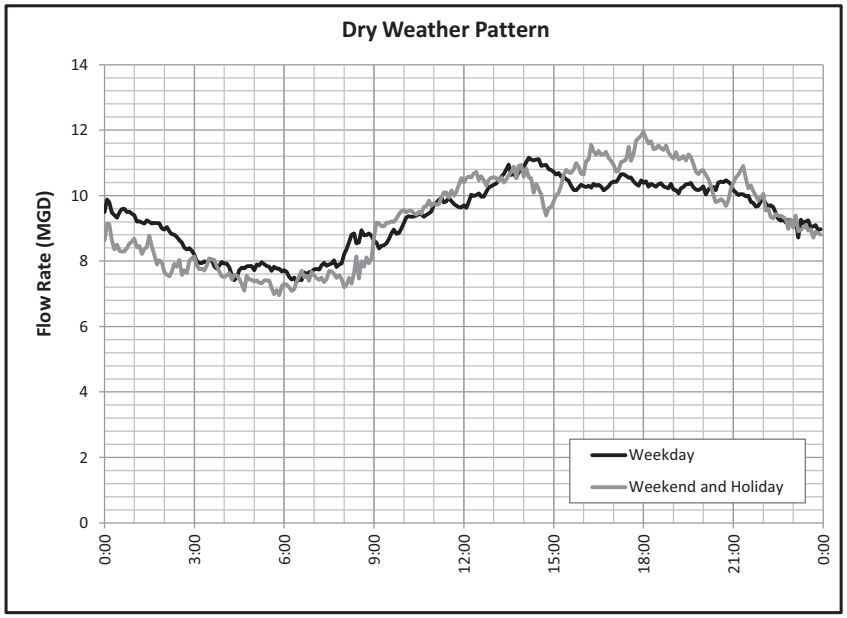
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: SW+SWB
Type: Accusonic 7510 (SW) & Telog 3314 (SWB)

Location: Southgate / Wyandotte
System Meter Type: Total for SWDDD





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	9.9	305.7	8.6	265.8	21	10
Feb-15	8.1	226.5	7.9	220.4	25	3
Mar-15	12.9	400.5	8.6	266.1	14	17
Apr-15	11.1	333.0	8.5	255.6	18	12
May-15	12.7	392.9	12.0	372.8	19	12
Jun-15	14.6	437.8	12.6	378.6	10	20
Jul-15	11.6	360.4	9.0	278.6	12	19
Aug-15	10.1	313.0	8.6	265.4	18	13
Sep-15	9.3	279.1	8.2	246.9	20	10
Oct-15	9.0	279.3	7.2	223.3	21	10
Nov-15	10.9	326.0	8.0	238.9	12	18
Dec-15	11.1	344.2	7.6	235.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	20.0	5/30/2015 13:10	10.4	5/31/2015 12:15
B	1.28	12/28/2015	12/29/2016	57.0	12/28/2015 18:35	11.0	12/28/2015 22:55

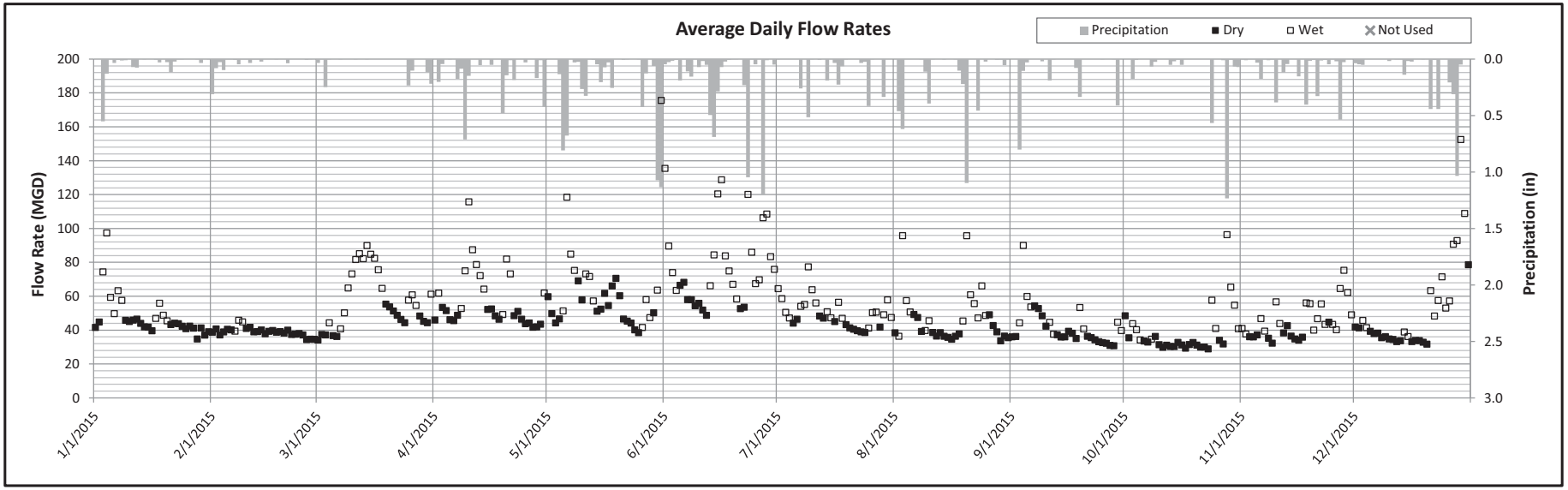
Downriver Sewage Disposal System

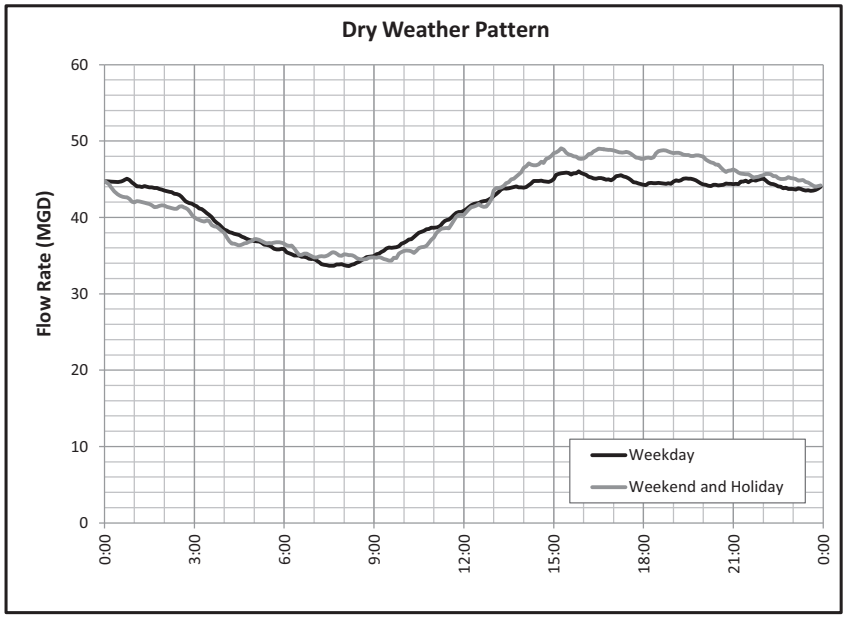
Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: IPS+TPS
Type: Magmeters

Location: Main Influent Pump Station and Tunnel Pump Station
System Meter Type: DWTF





Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	47.9	1485.8	42.2	1309.5	21	10
Feb-15	39.1	1094.2	38.6	1079.8	25	3
Mar-15	57.2	1773.6	44.3	1371.8	14	17
Apr-15	57.5	1726.3	47.3	1420.2	18	12
May-15	62.2	1927.2	53.1	1646.3	19	12
Jun-15	77.7	2331.4	56.8	1703.1	10	20
Jul-15	49.7	1540.5	42.9	1330.7	12	19
Aug-15	46.8	1450.5	39.2	1214.6	18	13
Sep-15	42.2	1266.5	37.9	1136.9	20	10
Oct-15	38.5	1192.2	32.5	1008.7	21	10
Nov-15	44.7	1341.2	37.0	1109.2	12	18
Dec-15	51.9	1608.8	38.3	1186.8	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	218.8	5/31/2015 14:10	18.1	5/31/2015 16:00
B	1.28	12/28/2015	12/29/2016	186.6	12/29/2015 1:25	14.3	12/30/2015 18:00

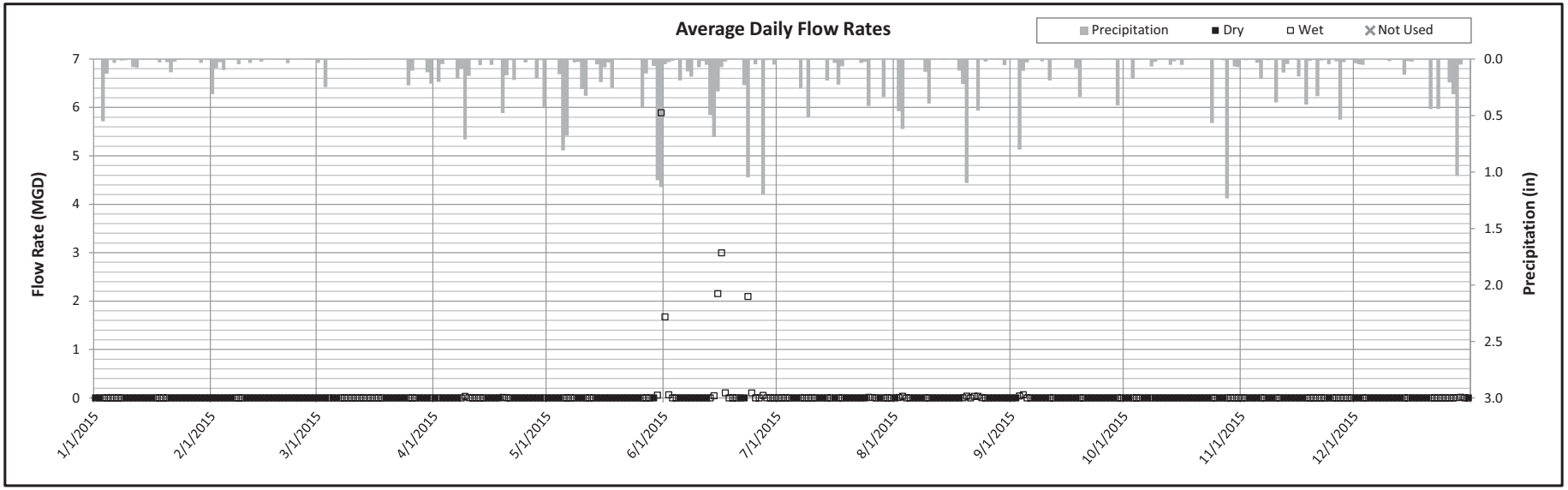
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: TSO
Type: ADS 4000

Location: At Pelham Basin
System Meter Type: Tunnel System Flow Meter



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.0	0.0	0.0	18	12
May-15	0.2	5.9	0.0	0.0	19	12
Jun-15	0.3	9.3	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.1	0.0	0.0	18	13
Sep-15	0.0	0.1	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.0	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	12.5	5/31/2015 14:00	1.9	5/31/2015 14:40
B	1.28	12/28/2015	12/29/2016	0.1	12/28/2015 22:30	0.3	12/29/2015 4:55

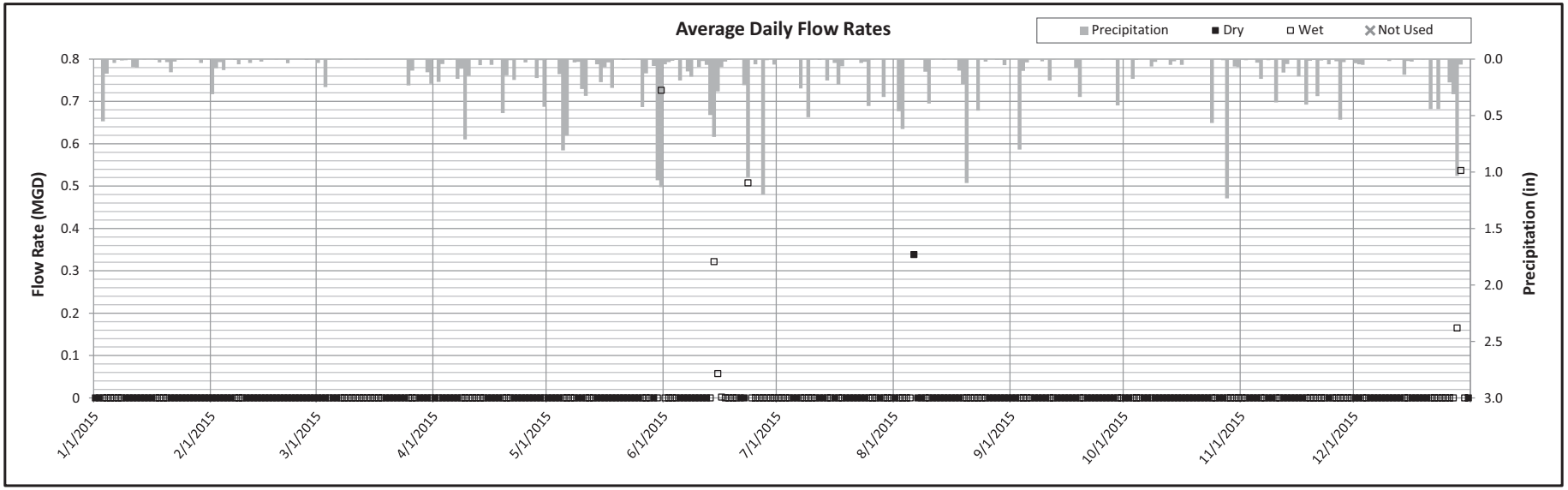
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: APO-1
Type: Telog 3307

Location: Belmont and Rosedale
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.0	0.0	0.0	18	12
May-15	0.0	0.7	0.0	0.0	19	12
Jun-15	0.0	0.9	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.3	0.0	0.6	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.7	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	27.7	5/31/2015 9:50	10.2	5/31/2015 12:25
B	1.28	12/28/2015	12/29/2016	14.7	12/28/2015 23:30	10.2	12/29/2015 0:20

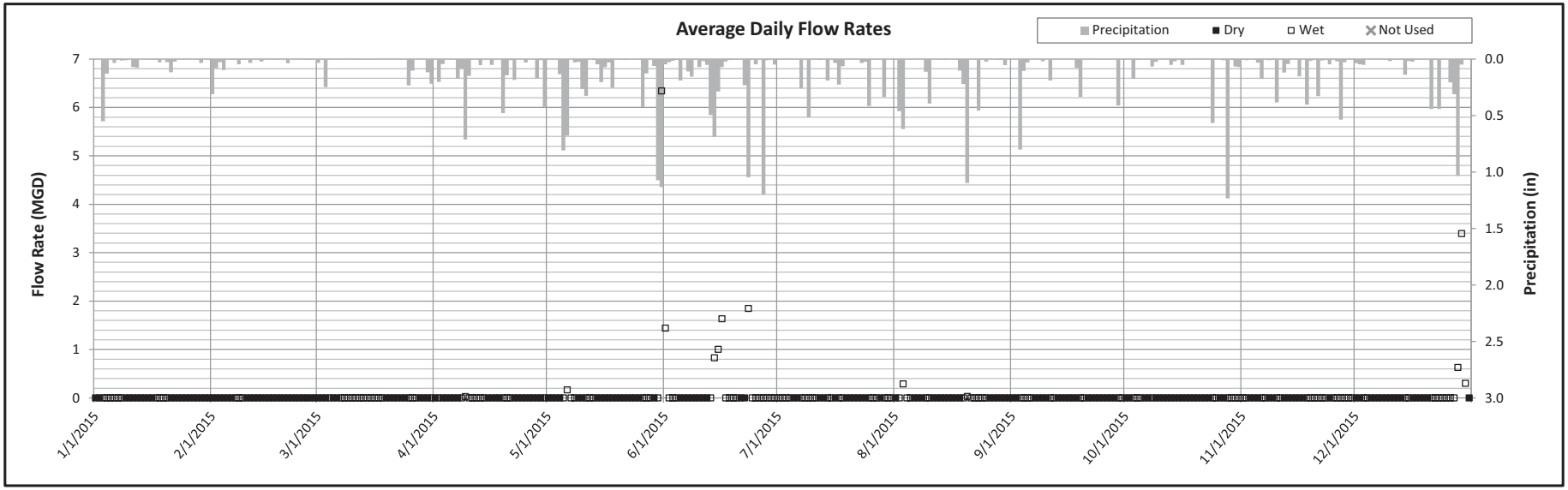
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: APO-2
Type: Telog 3307

Location: Belmont and Quandt
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.0	0.0	0.0	18	12
May-15	0.2	6.5	0.0	0.0	19	12
Jun-15	0.2	6.8	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.3	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.1	4.3	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	21.5	5/31/2015 9:50	4.4	5/31/2015 10:15
B	1.28	12/28/2015	12/29/2016	11.4	12/28/2015 23:30	4.0	12/28/2015 23:45

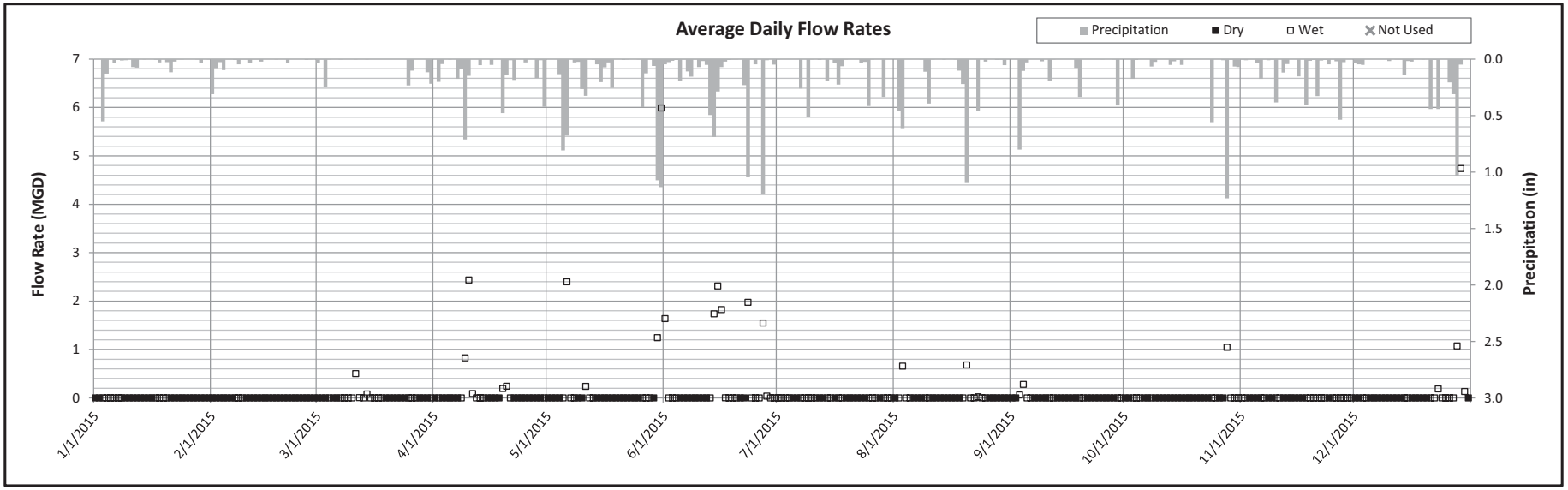
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: CHPO
Type: Telog 3307

Location: Pelham Road North of Haskell
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.6	0.0	0.0	14	17
Apr-15	0.1	3.8	0.0	0.0	18	12
May-15	0.3	9.9	0.0	0.0	19	12
Jun-15	0.4	11.1	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	1.4	0.0	0.0	18	13
Sep-15	0.0	0.3	0.0	0.0	20	10
Oct-15	0.0	1.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.2	6.1	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	8.8	5/31/2015 10:00	4.3	5/31/2015 10:10
B	1.28	12/28/2015	12/29/2016	8.3	12/29/2015 0:05	4.2	12/29/2015 0:20

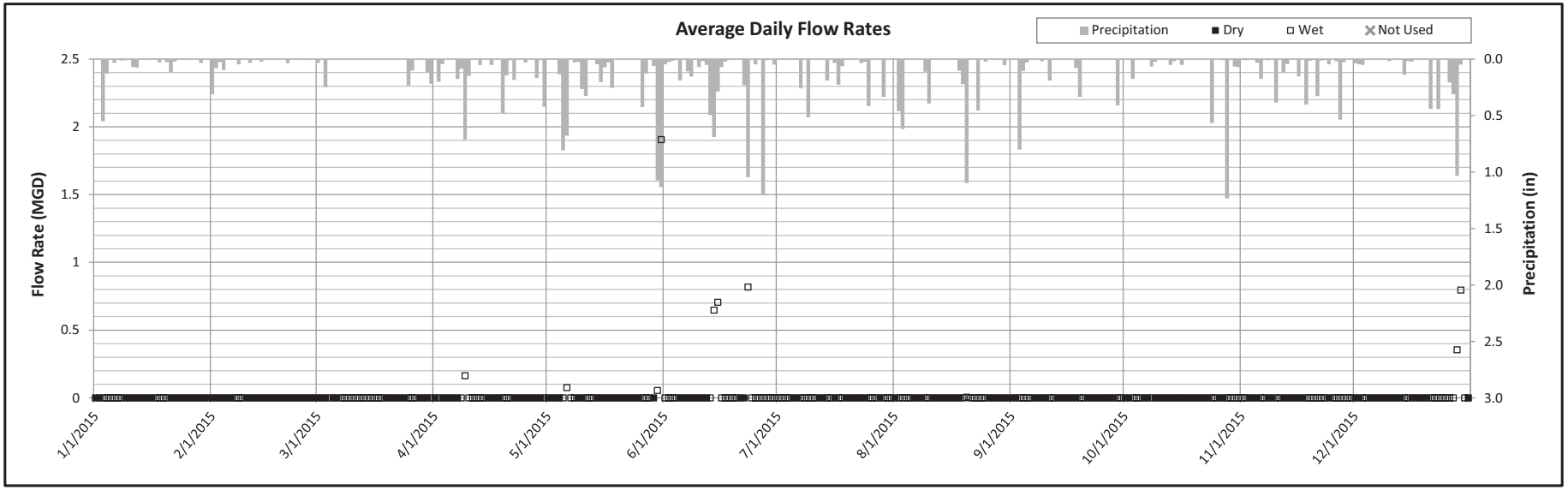
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: CPO
Type: Telog 3307

Location: Pelham Road South of R.R.
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.2	0.0	0.0	18	12
May-15	0.1	2.0	0.0	0.0	19	12
Jun-15	0.1	2.2	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.0	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	1.2	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	8.5	5/31/2015 10:05	4.4	5/31/2015 10:30
B	1.28	12/28/2015	12/29/2016	6.8	12/29/2015 0:10	4.3	12/29/2015 0:30

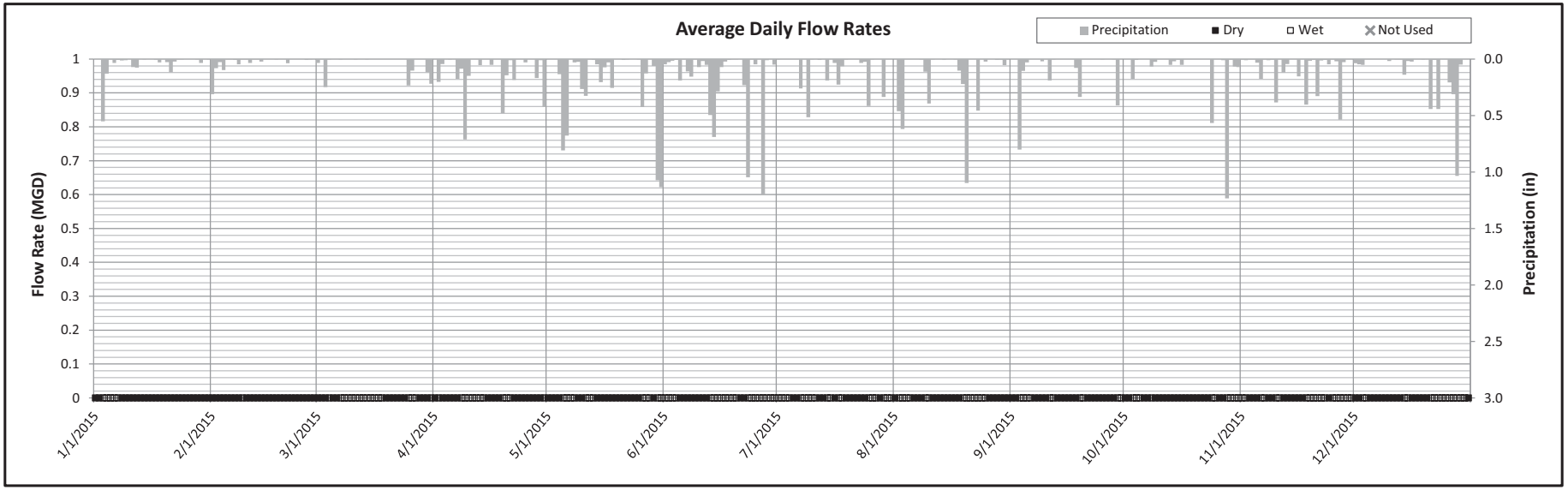
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PDO
Type: Telog 3307

Location: Allen Road and Goddard
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	26	5
Feb-15	0.0	0.0	0.0	0.0	27	1
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.0	0.0	0.0	18	12
May-15	0.0	0.0	0.0	0.0	19	12
Jun-15	0.0	0.0	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.0	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.0	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	0.0	-	1.7	5/31/2015 7:45
B	1.28	12/28/2015	12/29/2016	0.0	-	0.8	12/28/2015 17:00

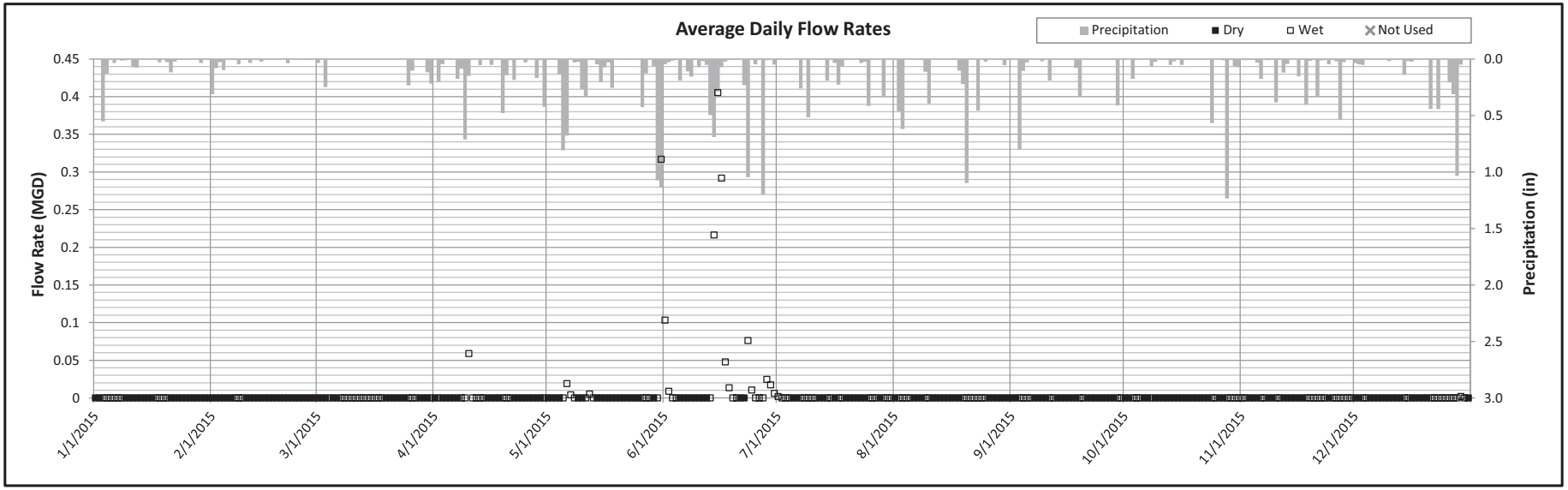
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: ER-2
Type: ADS 4000

Location: Eureka Road and Inkster
System Meter Type: Tunnel System Flow Meter



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.1	0.0	0.0	18	12
May-15	0.0	0.3	0.0	0.0	19	12
Jun-15	0.0	1.2	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.0	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.0	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	1.0	5/31/2015 15:55	0.7	5/31/2015 16:45
B	1.28	12/28/2015	12/29/2016	0.0	12/29/2015 12:25	0.3	12/29/2015 14:30

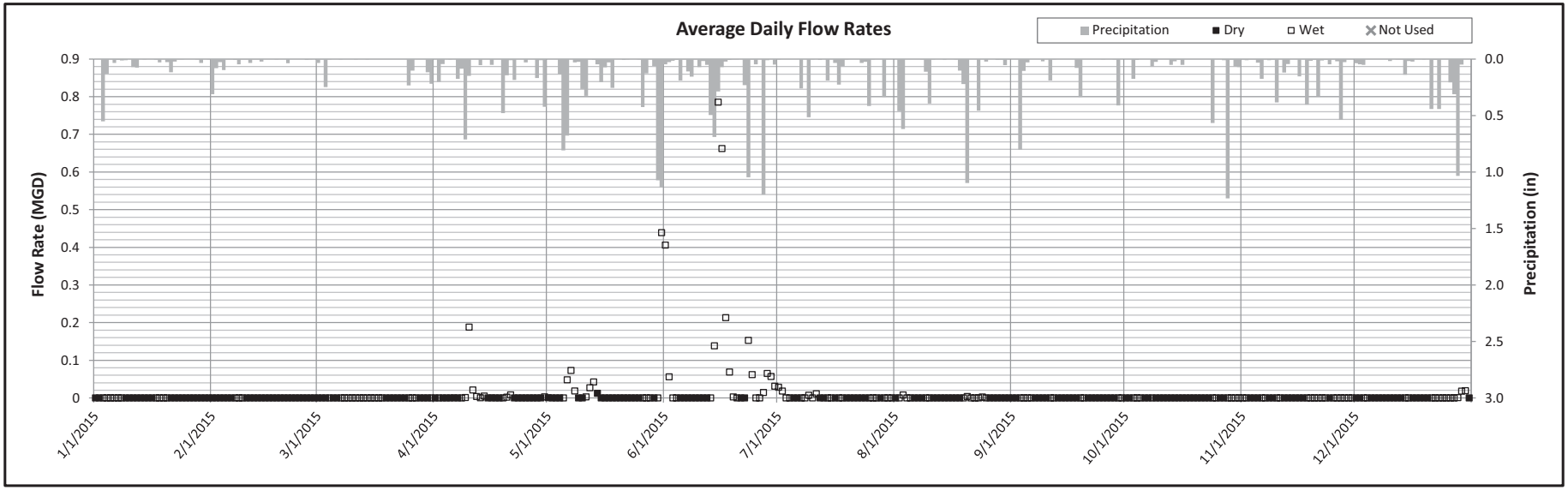
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: ER-1
Type: ADS 4000

Location: Allen Road and Eureka Road
System Meter Type: Tunnel System Flow Meter



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.2	0.0	0.0	18	12
May-15	0.0	0.7	0.0	0.0	19	12
Jun-15	0.1	2.7	0.0	0.0	10	20
Jul-15	0.0	0.1	0.0	0.0	12	19
Aug-15	0.0	0.0	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.0	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	2.0	5/31/2015 18:20	0.5	5/31/2015 18:45
B	1.28	12/28/2015	12/29/2016	0.1	12/29/2015 23:35	0.2	12/29/2015 23:50

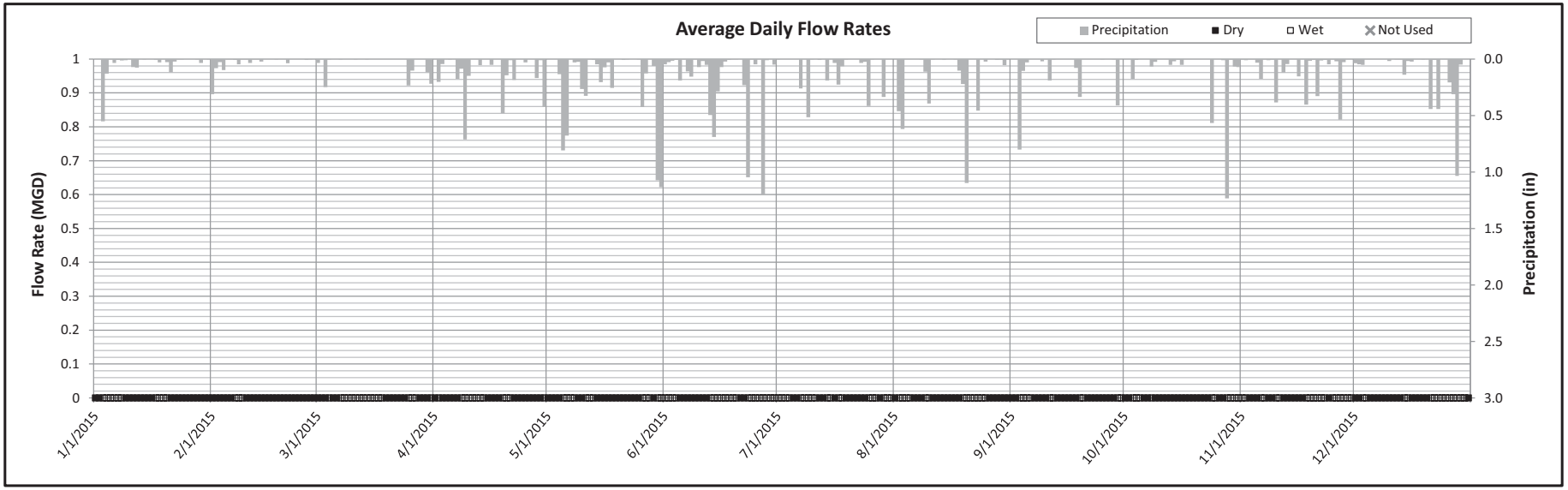
Downriver Sewage Disposal System

Annual Meter Report

Period: 1/1/2015 through 12/31/2015

Meter: PM-1
Type: Telog 3307

Location: Pennsylvania Ave. at Fordline
System Meter Type: Tunnel Diversion Chamber Level Sensor



Dry weather pattern not applicable to this meter

Monthly Statistics

Month	All Days		Dry Days			
	Avg. (MGD)	Vol. (MG)	Avg. (MGD)	Vol. (MG)	# Dry Days	# Wet Days
Jan-15	0.0	0.0	0.0	0.0	21	10
Feb-15	0.0	0.0	0.0	0.0	25	3
Mar-15	0.0	0.0	0.0	0.0	14	17
Apr-15	0.0	0.0	0.0	0.0	18	12
May-15	0.0	0.0	0.0	0.0	19	12
Jun-15	0.0	0.0	0.0	0.0	10	20
Jul-15	0.0	0.0	0.0	0.0	12	19
Aug-15	0.0	0.0	0.0	0.0	18	13
Sep-15	0.0	0.0	0.0	0.0	20	10
Oct-15	0.0	0.0	0.0	0.0	21	10
Nov-15	0.0	0.0	0.0	0.0	12	18
Dec-15	0.0	0.0	0.0	0.0	17	14

Statistics for Major Wet Weather Events

Event No.	Rainfall (in)	Start Date	End Date	Flow Rate		Depth	
				Max. Hour (MGD)	Date/Time	Max. (ft)	Date/Time
A	2.50	5/29/2015	6/2/2015	0.0	-	5.4	5/31/2015 13:45
B	1.28	12/28/2015	12/29/2016	0.0	-	4.1	12/29/2015 1:45

Appendix C

2015 Precipitation Data

Table C-1
Downriver Sewage Disposal System
Summary of Precipitation Data for Significant Storm Events

Period: 1/1/2015 through 12/31/2015

Significant Event No.[1]	Major Storm Event[2]	DWTF Peak Hourly Flow Rate (MGD)	Start Date	Stop Date	Preceding Week Rainfall (inches)	Event Precipitation Depth (inches)				Coefficient of Variation[4]
						Minimum	Average[3]	Maximum	Std. Dev	
1	-	123	4/7/15	4/11/15	0.47	0.86	1.12	1.43	0.19	17%
2	-	144	5/4/15	5/7/15	0.60	1.20	1.62	2.88	0.46	28%
3	A	219	5/29/15	6/2/15	0.53	1.93	2.50	3.59	0.50	20%
4	-	167	6/13/15	6/18/15	0.41	1.55	2.05	2.81	0.37	18%
5	-	148	6/23/15	6/24/15	0.33	0.99	1.14	1.48	0.14	12%
6	-	142	6/27/15	6/29/15	1.31	0.93	1.21	1.74	0.26	22%
7	-	128	8/2/15	8/4/15	0.34	0.74	1.08	1.46	0.26	24%
8	-	127	8/19/15	8/21/15	0.11	0.87	1.32	1.79	0.27	21%
9	-	130	10/27/15	10/28/15	0.57	1.10	1.27	1.45	0.11	9%
10	B	187	12/28/15	12/29/15	1.26	1.10	1.28	1.48	0.13	10%

1) Significant storm events are defined as those with at least 0.5 inches of rainfall occurring on a single day with an event total of at least 1.0 inch of rainfall. Significant storm events are separated by at least 2 consecutive days without precipitation over 0.1 inches. This storm event definition is based on the arithmetic mean of the rainfall recorded by all rain gages used in the analysis for that storm.

2) Major storm events are a subgroup of significant storm events which result in the peak hourly influent flow rate to the DWTF reaching or exceeding 175 MGD.

3) The average precipitation value is an arithmetic average of the collection of point gages listed on Table C-2.

4) The coefficient of variation is the ratio of the standard deviation to the average. It provides a normalized assessment of the degree of spatial variability for a given event. This allows comparisons to be made between events regarding their uniformity over the service area independent of the magnitude of each event. A low coefficient of variation means the storm event was spatially uniform over the district, high coefficient of variation means the storm event was highly variable over the district.

5) Table C-2 provides the recorded precipitation at each rain gage for these significant/major storm events.

Table C-2
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 1

Start Date: 4/7/2015

Stop Date: 4/11/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.49	0.56	0.57	0.73	0.88	1.22
R18	0.22	0.24	0.25	0.43	0.51	0.92
R02	0.21	0.24	0.25	0.40	0.57	1.11
R10	0.52	0.53	0.54	0.78	1.02	1.43
DTW	0.48	0.50	0.53	0.66	0.97	1.34
R09	0.18	0.21	0.21	0.41	0.58	0.93
R04	0.21	0.22	0.22	0.33	0.37	0.92
R08	0.34	0.34	0.37	0.56	0.84	1.19
R15	0.47	0.48	0.49	0.62	0.89	1.29
R17	0.25	0.29	0.29	0.43	0.55	0.86
R06	0.31	0.37	0.39	0.52	0.56	1.02
R16	0.40	0.40	0.43	0.55	0.82	1.20

Minimum (in):	**0.86**
Average (in):	**1.12**
Maximum (in):	**1.43**
Standard Deviation (in):	**0.19**
Coefficient of Variation:	**17%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 2

Start Date: 5/4/2015

Stop Date: 5/7/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.27	0.57	0.92	1.23	1.39	1.47
R18	0.27	0.57	0.82	1.16	1.32	1.42
R02	0.31	0.73	1.04	1.68	1.82	1.98
R10	0.30	0.61	0.96	1.30	1.44	1.58
DTW	0.25	0.56	0.88	1.14	1.26	1.36
R09	0.21	0.52	0.86	1.18	1.29	1.34
R04	0.52	0.85	1.40	2.12	2.27	2.88
R08	0.27	0.65	0.95	1.22	1.35	1.43
R15	0.27	0.61	0.84	1.01	1.11	1.20
R17	0.28	0.61	1.03	1.40	1.54	1.60
R06	0.30	0.70	1.24	1.71	1.84	1.89
R16	0.24	0.59	0.84	1.06	1.19	1.29

Minimum (in):	**1.20**
Average (in):	**1.62**
Maximum (in):	**2.88**
Standard Deviation (in):	**0.46**
Coefficient of Variation:	**28%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Major Storm Event A

Significant Storm Event 3

Start Date: 5/29/2015

Stop Date: 6/2/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.35	0.58	0.88	1.32	2.20	2.28
R18	0.39	0.57	0.83	1.31	2.08	2.12
R02	0.40	0.62	0.83	1.30	2.23	2.24
R10	0.02*	0.05*	0.08*	0.13*	0.22*	0.22*
DTW	0.47	0.65	0.82	1.33	2.17	2.34
R09	0.35	0.64	0.82	1.23	2.01	2.05
R04	0.52	1.06	1.46	1.79	3.36	3.59
R08	0.12	0.31	0.49	0.87	1.48	2.53
R15	0.42	0.51	0.90	1.33	1.77	1.93
R17	0.42	0.91	1.24	1.59	2.95	3.16
R06	0.34	0.79	1.19	1.47	2.60	2.81
R16	0.29	0.56	0.87	1.22	2.34	2.49

Minimum (in):	**1.93**
Average (in):	**2.50**
Maximum (in):	**3.59**
Standard Deviation (in):	**0.50**
Coefficient of Variation:	**20%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 4

Start Date: 6/13/2015

Stop Date: 6/18/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.32	0.49	0.66	0.75	0.81	1.55
R18	0.61	0.75	0.87	0.87	0.87	2.09
R02	0.60	0.94	1.07	1.07	1.07	2.81
R10	0*	0*	0*	0*	0*	0*
DTW	0.93	1.04	1.08	1.33	1.37	2.28
R09	0.36	0.62	0.76	0.77	0.77	1.92
R04	0.39	0.63	0.65	0.80	0.80	2.22
R08	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
R15	0.04*	0.08*	0.11*	0.12*	0.14*	0.31*
R17	0.43	0.75	0.78	0.85	0.85	1.92
R06	0.62	0.77	0.79	0.92	0.93	1.99
R16	0.44	0.76	0.77	0.87	0.88	1.68

Minimum (in):	**1.55**
Average (in):	**2.05**
Maximum (in):	**2.81**
Standard Deviation (in):	**0.37**
Coefficient of Variation:	**18%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 5

Start Date: 6/23/2015

Stop Date: 6/24/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	1.13	1.13	1.14	1.14	1.14	1.14
R18	1.03	1.04	1.04	1.04	1.04	1.04
R02	1.09	1.11	1.11	1.11	1.11	1.11
R10	1.05	1.05	1.05	1.05	1.05	1.05
DTW	1.00	1.00	1.00	1.00	1.00	1.08
R09	1.14	1.14	1.14	1.14	1.14	1.14
R04	0.01*	0.01*	0.01*	0.02*	0.03*	0.03*
R08	1.04	1.04	1.04	1.04	1.04	1.04
R15	1.47	1.48	1.48	1.48	1.48	1.48
R17	1.28	1.29	1.29	1.29	1.29	1.29
R06	0.98	0.98	0.98	0.99	0.99	0.99
R16	1.17	1.18	1.18	1.18	1.18	1.18

Minimum (in):	**0.99**
Average (in):	**1.14**
Maximum (in):	**1.48**
Standard Deviation (in):	**0.14**
Coefficient of Variation:	**12%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 6

Start Date: 6/27/2015

Stop Date: 6/29/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.24	0.52	0.64	0.75	1.02	1.02
R18	0.30	0.56	0.70	0.78	1.06	1.07
R02	0.29	0.57	0.80	1.00	1.25	1.25
R10	0.26	0.56	0.74	0.85	1.07	1.08
DTW	0.21	0.53	0.72	0.80	0.97	0.98
R09	0.30	0.58	0.78	0.86	0.97	0.97
R04	0.46	0.89	1.17	1.30	1.74	1.74
R08	0.29	0.58	0.79	0.89	1.18	1.18
R15	0.24	0.50	0.67	0.75	0.93	0.93
R17	0.45	0.80	1.03	1.14	1.60	1.60
R06	0.40	0.80	1.05	1.17	1.47	1.47
R16	0.32	0.60	0.80	0.91	1.22	1.22

Minimum (in):	**0.93**
Average (in):	**1.21**
Maximum (in):	**1.74**
Standard Deviation (in):	**0.26**
Coefficient of Variation:	**22%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 7

Start Date: 8/2/2015

Stop Date: 8/4/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.59	0.91	0.91	0.91	0.91	0.91
R18	0.46	0.79	0.80	0.80	0.80	0.80
R02	0.42	0.72	0.74	0.74	0.74	0.74
R10	0.41	0.79	0.80	0.81	0.81	0.81
DTW	0.30	0.69	0.82	0.82	0.82	0.82
R09	0.58	0.96	0.98	0.98	0.98	0.98
R04	0.75	1.15	1.23	1.23	1.23	1.23
R08	0.83	1.20	1.28	1.28	1.28	1.28
R15	0.79	1.17	1.24	1.25	1.25	1.25
R17	0.81	1.21	1.29	1.29	1.29	1.29
R06	0.97	1.37	1.46	1.46	1.46	1.46
R16	0.96	1.30	1.41	1.41	1.41	1.41

Minimum (in):	**0.74**
Average (in):	**1.08**
Maximum (in):	**1.46**
Standard Deviation (in):	**0.26**
Coefficient of Variation:	**24%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 8

Start Date: 8/19/2015

Stop Date: 8/21/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.44	0.96	1.17	1.19	1.21	1.21
R18	0.50	0.77	0.88	0.95	1.28	1.28
R02	0.52	0.75	0.87	0.87	0.95	0.95
R10	0.52	0.72	0.82	0.82	0.87	0.87
DTW	0.36	0.70	0.96	0.96	1.03	1.03
R09	0.68	0.92	1.09	1.15	1.28	1.28
R04	0.61	0.95	1.28	1.60	1.79	1.79
R08	0.77	1.08	1.29	1.51	1.62	1.62
R15	0.76	1.06	1.24	1.32	1.45	1.45
R17	0.53	0.84	1.07	1.33	1.44	1.44
R06	0.78	1.24	1.46	1.48	1.50	1.50
R16	0.64	1.02	1.23	1.34	1.41	1.41

Minimum (in):	**0.87**
Average (in):	**1.32**
Maximum (in):	**1.79**
Standard Deviation (in):	**0.27**
Coefficient of Variation:	**21%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Significant Storm Event 9

Start Date: 10/27/2015

Stop Date: 10/28/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.31	0.66	0.88	1.19	1.30	1.30
R18	0.28	0.60	0.88	1.17	1.29	1.29
R02	0.19	0.47	0.75	1.03	1.10	1.10
R10	0.19	0.49	0.79	1.08	1.16	1.16
DTW	0.20	0.50	0.81	1.10	1.17	1.18
R09	0.21	0.53	0.91	1.23	1.28	1.28
R04	0.22	0.55	1.00	1.32	1.42	1.42
R08	0.20	0.51	0.87	1.15	1.18	1.18
R15	0.09*	0.23*	0.43*	0.71*	0.90*	0.87*
R17	0.22	0.55	0.98	1.29	1.36	1.36
R06	0.25	0.64	1.09	1.39	1.45	1.45
R16	0.22	0.54	0.94	1.22	1.29	1.29

Minimum (in):	**1.10**
Average (in):	**1.27**
Maximum (in):	**1.45**
Standard Deviation (in):	**0.11**
Coefficient of Variation:	**9%**

X.XX* Missing or suspect data (not used).

Table C-2 continued
Downriver Sewage Disposal System
Rainfall Event Summary Table

Major Storm Event B

Significant Storm Event 10

Start Date: 12/28/2015

Stop Date: 12/29/2015

Gage ID	Peak Hour (in)	Peak 3 Hour (in)	Peak 6 Hour (in)	Peak 12 Hour (in)	Peak 24 Hour (in)	Event Total (in)
R14	0.00*	0.00*	0.00*	0.01*	0.01*	0.00*
R18	0.04*	0.07*	0.09*	0.18*	0.18*	0.18*
R02	0.23	0.42	0.81	1.15	1.23	1.23
R10	0.25	0.48	0.89	1.19	1.22	1.22
DTW	0.20	0.42	0.80	1.11	1.18	1.18
R09	0.23	0.42	0.74	1.05	1.10	1.10
R04	0.28	0.54	0.95	1.42	1.48	1.48
R08	0.24	0.45	0.84	1.19	1.22	1.22
R15	0.27	0.51	0.91	1.22	1.24	1.24
R17	0.30	0.55	0.97	1.40	1.47	1.47
R06	0.26	0.61	1.16	1.43	1.43	1.43
R16	0.22	0.45	0.82	1.19	1.22	1.22

Minimum (in):	**1.10**
Average (in):	**1.28**
Maximum (in):	**1.48**
Standard Deviation (in):	**0.13**
Coefficient of Variation:	**10%**

X.XX* Missing or suspect data (not used).

Table C-3
Downriver Sewage Disposal System
Monthly Precipitation for 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
1/1/2015	0.80	0.77	1.11	1.09	1.45	0.82	1.64	1.27	1.11	0.78	1.43	1.36	28	14	21
1/2/2015	0.09	0.13	0.98	0.46	1.35	0.27	0.83	0.92	0.31	1.39	0.46	1.06	23	5	14
1/3/2015	0.77	0.75*	0.73	1.36	0.80	0.79	1.04	1.75	0.86	0.71	1.05	0.94	44	25	35
1/4/2015	2.60	2.49	2.91	2.65	2.61	2.72	3.06	2.68	3.43	2.64	3.19	3.92	61	39	50
1/5/2015	5.11	4.67	6.50	3.61*	5.54	5.13	8.84	5.11	5.00	6.40	6.87	5.65	75	54	65
1/6/2015	5.17	5.59	6.22	4.06*	5.32	4.56	4.64	2.77*	4.00*	5.41	5.37	4.88	78	60	69
1/7/2015	1.68	1.92	1.73	2.34	1.76	2.20	2.72	2.44	2.34	2.24	1.73	2.23	83	63	73
1/8/2015	3.87	3.91	2.90	3.57	3.16	3.23	3.57	3.83	3.92	3.50	3.35	3.86	81	63	72
1/9/2015	2.20	1.92	2.42	1.69	1.29	1.57	2.28	1.67	2.19	1.63	2.79	2.10	79	59	69
1/10/2015	2.42	2.02	1.86	2.00	1.97	2.83	2.53	2.36	2.01*	2.92	2.46	2.62	64	45	55
1/11/2015	1.27*	3.72	2.10	2.44	2.06	2.14	2.87	2.45	2.21*	2.17	2.42	2.34	55	37	46
1/12/2015	1.49*	0.92*	2.77	3.12	3.01	2.92	3.54	2.95	3.30	3.37	3.31	3.25	47	35	41
Total	27.47*	28.81*	32.23	28.39*	30.32	29.18	37.56	30.20*	30.68*	33.16	34.43	34.21	60	42	51

* Missing or suspect data.

Table C-4
Downriver Sewage Disposal System
Daily Precipitation for January 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
1/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	31	17	24
1/2/2015	0	0	0	0	0	0	0	0	0	0	0	0	36	26	31
1/3/2015	0.59	0.55	0.52	0.52	0.52	0.48	0.67	0.53	0.55	0.47	0.65	0.57	35	27	31
1/4/2015	0.10	0.08	0.12	0.11	0.12	0.12	0.17	0.16	0.12	0.10	0.18	0.16	36	19	28
1/5/2015	0	0	0	0	T	0	0.01	0	0	0	0	0	19	8	14
1/6/2015	0	0	0.06	0.06	0.08	0	0.08	0.07	0.02	0.01	0	0.03	18	7	13
1/7/2015	0	0	0.01	0	0.05	0	0.02	0	0	0	0	0	13	2	8
1/8/2015	0	0	0.02	0	0.14	0	0	0	0	0	0	0	14	-2	6
1/9/2015	0	0	0.02	0	0.03	0	0.06	0	0	0	0	0.02	18	3	11
1/10/2015	0	0	0	0	T	0	0	0	0	0	0	0	16	-1	8
1/11/2015	0	0	0.07	0.09	0.13	0	0.12	0.10	0.12	0.06	0.01	0.15	31	16	24
1/12/2015	0	0	0.08	0.09	0.09	0	0.10	0.11	0.10	0.01	0.22	0.11	30	13	22
1/13/2015	0	0	0	0	T	0	0	0	0	0	0	0	13	3	8
1/14/2015	0	0	0	0	0.01	0	0	0	0	0	0	0	17	4	11
1/15/2015	0	0	0	0	T	0	0	0	0	0	0	0	26	3	15
1/16/2015	0	0	0	0	0	0	0	0	0	0	0	0	29	18	24
1/17/2015	0.02	0.05	0	0	0	0	0	0	0	0	0	0	42	16	29
1/18/2015	0.05	0.03	0.03	0.02	0.03	0	0.04	0.02	0.06	0	0.04	0.03	41	33	37
1/19/2015	0	0	0	0	T	0	0	0	0	0	0	0	35	29	32
1/20/2015	0.01	0.01	0.01	0.04	0.04	0.03	0.04	0.04	0.03	0.02	0.04	0.03	31	24	28
1/21/2015	0	0	0.13	0.12	0.16	0.16	0.26	0.20	0.08	0.09	0	0.21	26	22	24
1/22/2015	0	0	0	0	T	0	0	0	0	0	0.24	0	30	19	25
1/23/2015	0	0.01	0	0	0	0	0	0	0	0	0	0	31	16	24
1/24/2015	0.01	0.01	0	0	T	0	0	0	0	0	0	0	36	24	30
1/25/2015	0	0	0	0	T	0	0	0	0	0	0	0	34	18	26
1/26/2015	0	0	0	0	0	0	0	0	0	0	0	0	27	11	19
1/27/2015	0	0	0	0	0	0	0	0	0	0	0	0	29	11	20
1/28/2015	0.01	0.01	0	0	0	0	0	0	0	0	0	0	29	11	20
1/29/2015	0	0	0.04	0.04	0.05	0.03	0.07	0.04	0.03	0.02	0.05	0.05	35	25	30
1/30/2015	0	0	0	0	T	0	0	0	0	0	0	0	29	12	21
1/31/2015	0.01	0.02	0	0	0	0	0	0	0	0	0	0	35	11	23
Total	0.80	0.77	1.11	1.09	1.45	0.82	1.64	1.27	1.11	0.78	1.43	1.36	28	14	21

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for February 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
2/1/2015	0	0	0.60	0.19	0.70	0.02	0.24	0.60	0.06	1.07	0	0.26	32	17	25
2/2/2015	0	0	0.08	0.03	0.16	0	0.07	0.04	0.01	0.18	0	0.41	19	5	12
2/3/2015	0	0	0.05	0.03	0.05	0.03	0.05	0.03	0.03	0.01	0	0.05	26	2	14
2/4/2015	0	0	0.09	0.08	0.12	0.19	0.18	0.09	0.05	0.04	0.21	0.11	32	15	24
2/5/2015	0	0	0	0	0	0	0	0	0	0	0.01	0	18	3	11
2/6/2015	0	0	0	0	0	0.02	0	0	0	0	0.01	0	29	7	18
2/7/2015	0.01	0.09	0	0	0	0	0	0	0	0	0	0	39	22	31
2/8/2015	0.04	0.04	0.06	0.05	0.04	0.01	0.09	0.05	0.05	0.04	0.02	0.06	43	24	34
2/9/2015	0	0	0	0	T	0	0	0	0.01	0	0.01	0	27	17	22
2/10/2015	0.01	0	0	0	T	0	0	0	0	0	0.02	0	28	14	21
2/11/2015	0.01	0	0.03	0.02	0.06	0	0.06	0.04	0.05	0.02	0.07	0.05	34	19	27
2/12/2015	0	0	0	0.01	T	0	0.01	0	0	0	0	0	29	5	17
2/13/2015	0	0	0	0	0.01	0	0	0	0	0	0	0	23	-1	11
2/14/2015	0	0	0.02	0.02	0.09	0	0.05	0.02	0.02	0.01	0	0.05	25	1	13
2/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	7	-9	-1
2/16/2015	0	0	0	0	0	0	0	0	0	0	0	0	8	-9	0
2/17/2015	0	0	0	0	T	0	0	0	0	0	0	0	21	-2	10
2/18/2015	0	0	0	0	0.03	0	0	0	0	0	0	0	18	4	11
2/19/2015	0	0	0	0	0	0	0	0	0	0	0	0	7	-5	1
2/20/2015	0	0	0	0	T	0	0	0	0	0	0	0	14	-13	1
2/21/2015	0.02	0	0.04	0.03	0.06	0	0.07	0.03	0.02	0.02	0.10	0.05	24	14	19
2/22/2015	0	0	0	0	T	0	0	0	0	0	0	0	30	8	19
2/23/2015	0	0	0	0	0	0	0	0	0	0	0	0	12	-5	4
2/24/2015	0	0	0	0	T	0	0	0	0	0	0	0	23	-2	11
2/25/2015	0	0	0	0	T	0	0	0	0	0	0	0	24	9	17
2/26/2015	0	0	0.01	0	0.03	0	0.01	0.02	0.01	0	0	0.02	17	6	12
2/27/2015	0	0	0	0	0	0	0	0	0	0	0.01	0	20	-4	8
2/28/2015	0	0	0	0	T	0	0	0	0	0	0	0	21	-2	10
Total	0.09	0.13	0.98	0.46	1.35	0.27	0.83	0.92	0.31	1.39	0.46	1.06	23	5	14

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for March 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
3/1/2015	0.01	0*	0.03	0.03	0.06	0.04	0.07	0.03	0.02	0.01	0.08	0.04	25	15	20
3/2/2015	0.02	0.01*	0	0	T	0	0	0	0	0	0	0	33	20	27
3/3/2015	0.15	0.1*	0.24	0.28	0.26	0.26	0.31	0.26	0.24	0.25	0.32	0.31	37	22	30
3/4/2015	0	0.04*	0	0	0	0	0	0	0	0	0	0	36	17	27
3/5/2015	0	0*	0	0	0	0	0	0	0	0	0	0	19	7	13
3/6/2015	0	0*	0	0	0	0	0	0	0	0	0	0	24	0	12
3/7/2015	0	0.01*	0	0	0	0	0	0	0	0	0	0	41	18	30
3/8/2015	0	0*	0	0	0	0	0	0	0	0	0	0	43	25	34
3/9/2015	0	0*	0	0	0	0	0	0	0	0	0	0	48	24	36
3/10/2015	0	0*	0	0	0	0	0	0	0	0	0	0	48	29	39
3/11/2015	0	0.01*	0	0	0	0	0	0	0	0	0	0	55	33	44
3/12/2015	0	0*	0	0	0	0	0	0	0	0	0	0	45	31	38
3/13/2015	0	0*	0	0	T	0	0	0	0	0	0	0	53	30	42
3/14/2015	0	0.01*	0	0	0	0	0	0	0	0	0	0	53	38	46
3/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	55	35	45
3/16/2015	0	0	0	0	0	0	0	0	0	0	0	0	62	40	51
3/17/2015	0	0	0	0	0	0	0	0	0	0	0	0	54	29	42
3/18/2015	0	0	0	0	0	0	0	0	0	0	0	0	50	26	38
3/19/2015	0	0	0	0	0	0	0	0	0	0	0	0	41	27	34
3/20/2015	0	0	0	0	0	0	0	0	0	0	0	0	51	32	42
3/21/2015	0	0	0	0	T	0	0	0	0	0	0	0	52	30	41
3/22/2015	0	0	0	0	0	0	0	0	0	0	0	0	40	23	32
3/23/2015	0	0	0	0	0	0	0	0	0	0	0	0	31	21	26
3/24/2015	0	0	0	0	0	0	0	0	0	0	0	0	41	19	30
3/25/2015	0.28	0.26	0.18	0.23	0.20	0.20	0.25	0.25	0.25	0.19	0.26	0.24	54	29	42
3/26/2015	0.04	0.06	0.11	0.08	0.07	0.09	0.21	0.10	0.09	0.09	0.17	0.11	46	35	41
3/27/2015	0	0	0	0	T	0	0	0	0	0	0	0	35	17	26
3/28/2015	0	0	0	0	0	0	0	0	0	0	0	0	39	15	27
3/29/2015	0	0	0	0	T	0	0	0	0	0	0	0	47	20	34
3/30/2015	0	0	0	0.51	0	0	0	0.90	0	0	0	0	59	38	49
3/31/2015	0.27	0.25	0.17	0.23	0.21	0.20	0.20	0.21	0.26	0.17	0.22	0.24	48	32	40
Total	0.77	0.75*	0.73	1.36	0.80	0.79	1.04	1.75	0.86	0.71	1.05	0.94	44	25	35

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for April 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
4/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	61	32	47
4/2/2015	0.23	0.18	0.21	0.22	0.21	0.20	0.24	0.17	0.19	0.16	0.22	0.20	65	40	53
4/3/2015	0.04	0.01	0.01	0.01	0.02	0.03	0.06	0.06	0.09	0.04	0.06	0.11	59	38	49
4/4/2015	0	0	0	0	0	0	0	0	0	0	0	0	54	25	40
4/5/2015	0.01	0.01	0	0.01	0.01	0	0	0	0	0	0.01	0	63	37	50
4/6/2015	0	0	0	0	T	0	0	0	0	0	0	0	60	32	46
4/7/2015	0.17	0.24	0.23	0.20	0.20	0.13	0.17	0.14	0.21	0.10	0.16	0.14	50	39	45
4/8/2015	0.03	0.06	0.18	0.05	0.04	0.12	0.16	0.07	0.03	0.06	0.15	0.08	47	38	43
4/9/2015	0.88	0.51	0.57	1.02	0.97	0.58	0.37	0.83	0.88	0.55	0.56	0.82	67	39	53
4/10/2015	0.14	0.11	0.13	0.16	0.13	0.10	0.22	0.15	0.17	0.15	0.15	0.16	68	43	56
4/11/2015	0	0	0	0	0	0	0	0	0	0	0	0	63	36	50
4/12/2015	0	0	0	0	0	0	0	0	0	0	0	0	65	37	51
4/13/2015	0.02	0.01	0.02	0.02	0.04	0.04	0.13	0.05	0.03	0.10	0.07	0.11	75	44	60
4/14/2015	0	0	0	0	0	0	0	0	0	0	0	0	63	43	53
4/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	64	41	53
4/16/2015	0.02	0.03	0.03	0.06	0.04	0.06	0.03	0.07	0.07	0.04	0.10	0.07	63	44	54
4/17/2015	0	0	0	0	0	0	0	0	0	0	0	0	75	50	63
4/18/2015	0	0	0	0	0	0	0	0	0	0	0	0	76	48	62
4/19/2015	0.40	0.46	0.52	0.47	0.51	0.45	0.47	0.47	0.54	0.42	0.51	0.52	63	46	55
4/20/2015	0.25	0.14	0.09	0.13	0.11	0.10	0.19	0.12	0.16	0.12	0.20	0.12	66	46	56
4/21/2015	0.03	0	0	0.01	0.01	0	0	0.01	0.04	0.01	0	0.01	54	41	48
4/22/2015	0.01	0	0.51	0	T	0	0.52	0	0	0.50	0.50	0	44	37	41
4/23/2015	0	0	0	0	T	0	0	0	0	0	0	0	43	31	37
4/24/2015	0	0	0	0	0	0	0	0	0	0	0	0	60	29	45
4/25/2015	0.06	0.06	0.04	0.05	0.02	0.02	0.03	0.02	0.01	0.01	0.02	0.01	54	41	48
4/26/2015	0	0	0	0	0	0	0	0	0	0	0	0	60	36	48
4/27/2015	0	0	0	0	T	0	0	0	0	0	0	0	52	39	46
4/28/2015	0	0.48	0	0	0	0.48	0	0	0	0	0	1.07	65	35	50
4/29/2015	0.06	0	0	0	T	0	0	0.03	0.01	0	0	0	68	42	55
4/30/2015	0.25	0.19	0.37	0.24	0.30	0.41	0.47	0.49	1.00	0.38	0.48	0.50	57	46	52
Total	2.60	2.49	2.91	2.65	2.61	2.72	3.06	2.68	3.43	2.64	3.19	3.92	61	39	50

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for May 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
5/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	75	46	61
5/2/2015	0	0	0	0	0	0	0	0	0	0	0	0	77	50	64
5/3/2015	0	0	0	0	0	0	0	0	0	0	0	0	82	52	67
5/4/2015	0.08	0.10	0.16	0.14	0.10	0.05	0.61	0.08	0.09	0.06	0.05	0.09	77	61	69
5/5/2015	0.86	0.73	1.07	0.84	0.81	0.70	1.33	0.65	0.50	0.80	0.85	0.57	64	51	58
5/6/2015	0.53	0.59	0.75	0.60	0.45	0.59	0.94	0.70	0.61	0.74	0.99	0.63	72	51	62
5/7/2015	0	0	0	0	0	0	0	0	0	0	0	0	82	54	68
5/8/2015	0.01	0	0.14	0.10	0.08	0.03	0	0	0	0	0	0	87	59	73
5/9/2015	0.02	0.01	0.01	0	T	0	0.09	0	0	0.09	0.02	0.02	83	60	72
5/10/2015	0.25	0.31	0.57	0.26	0.46	0.41	0.05	0.29	0.29	0.11	0.05	0.14	79	59	69
5/11/2015	0.14	0.15	0.51	0.46	0.48	0.36	0.26	0.23	0.51	0.25	0.29	0.28	85	62	74
5/12/2015	0	0	0	0	T	0	0	0.01	0	0	0	0	65	49	57
5/13/2015	0	0	0	0.02	0.01	0.01	0.02	0	0	0.01	0.01	0	55	44	50
5/14/2015	0	0	0.10	0.09	0	0	0.09	0	0	0.09	0.09	0.09	63	39	51
5/15/2015	0.08	0.09	0.21	0.09	0.18	0.26	0.44	0.19	0.08	0.19	0.35	0.30	79	52	66
5/16/2015	0.07	0.06	0.05	0.06	0.06	0.15	0.06	0.15	0.06	0.04	0.06	0.06	78	63	71
5/17/2015	0	0.01	0.07	0.03	0.04	0	0.16	0	0.06	0	0	0	81	63	72
5/18/2015	0.15	0.02	0.05	0.07	0.16	0.09	0.39	0.19	0.27	0.33	1.03	0.32	85	65	75
5/19/2015	0	0	0	0	0	0	0	0	0	0	0	0	65	46	56
5/20/2015	0	0	0	0	T	0	0	0	0	0	0	0	60	41	51
5/21/2015	0.01	0.01	0.02	0.01	0.01	0	0	0.01	0.01	0	0	0	66	49	58
5/22/2015	0	0	0	0	0.01	0.01	0	0.01	0	0.01	0.01	0	68	46	57
5/23/2015	0	0	0	0	0	0	0	0	0	0	0	0	76	41	59
5/24/2015	0	0	0	0	T	0	0	0	0	0	0	0	79	53	66
5/25/2015	0	0.01	0	0	T	0	0	0	0	0	0	0	84	65	75
5/26/2015	0.57	0.45	0.54	0.72	0.35	0.42	0.51	0.42	0.55	0.33	0.10	0.13	83	64	74
5/27/2015	0.06	0.01	0.01	0.02	T	0	0.30	0.01	0.10	0.19	0.17	0.53	81	64	73
5/28/2015	0	0	0	0	0	0	0	0	0	0	0	0	77	58	68
5/29/2015	0	0	0.01	0*	0.01	0.01	0.17	0.07	0.05	0.13	0.17	0.10	83	63	73
5/30/2015	1.27	1.11	1.06	0.07*	1.39	0.95	1.55	0.63	1.25	1.36	1.11	1.12	83	54	69
5/31/2015	1.01	1.01	1.17	0.03*	0.94	1.09	1.87	1.47	0.57	1.67	1.52	1.27	54	49	52
Total	5.11	4.67	6.50	3.61*	5.54	5.13	8.84	5.11	5.00	6.40	6.87	5.65	75	54	65

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for June 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
6/1/2015	0	0	0	0.12*	0	0	0	0.36*	0.06*	0	0.01	0	65	47	56
6/2/2015	0	0	0.10	0.2*	0	0	0	0*	0.04*	0	0	0	73	46	60
6/3/2015	0	0	0	0.09*	0	0	0	0*	0.08*	0	0	0	74	50	62
6/4/2015	0	0	0	0.01*	0	0	0	0*	0.07*	0	0	0	79	60	70
6/5/2015	0.56	0.25	0.21	0.01*	0.05	0.06	0.14	0.08*	0.12*	0.20	0.36	0.24	80	61	71
6/6/2015	0	0	0	0*	0	0	0	0.01*	0.01*	0	0	0	72	54	63
6/7/2015	0.24	0.23	0.16	0*	0.15	0.12	0.11	0*	0.05*	0.07	0.08	0.12	82	51	67
6/8/2015	0.26	0.64	0.16	0*	0.45	0.14	0.07	0.01*	0.02*	0.02	0.04	0.06	80	62	71
6/9/2015	0	0	0	0.01*	0	0	0	0*	0.01*	0	0	0	78	60	69
6/10/2015	0.12	0.03	0.16	0*	0.04	0.03	0.08	0*	0.03*	0.08	0.14	0.15	90	64	77
6/11/2015	0.08	0	0.01	0*	0.01	0.02	0.04	0*	0.01*	0.01	0.02	0.01	73	63	68
6/12/2015	0.12	0.06	0.09	0*	0.24	0.04	0.02	0*	0*	0.04	0.02	0	82	59	71
6/13/2015	0.48	0.87	1.07	0*	0.27	0.76	0.65	0*	0.04*	0.78	0.71	0.32	71	58	65
6/14/2015	0.81	0.86	0.87	0*	1.37	0.77	0.80	0.01*	0.13*	0.85	0.93	0.87	83	63	73
6/15/2015	0.23	0.24	0.71	0*	0.51	0.28	0.58	0*	0.12*	0.19	0.25	0.32	83	71	77
6/16/2015	0.02	0.10	0.13	0*	0.09	0.08	0.18	0*	0.01*	0.05	0.05	0.14	82	65	74
6/17/2015	0.01	0.02	0.03	0*	0.03	0.03	0.01	0*	0.01*	0.05	0.05	0.03	73	61	67
6/18/2015	0.02	0.02	0.02	0*	0.01	0	0	0.01*	0*	0	0	0	82	65	74
6/19/2015	0	0	0	0*	0	0	0	0*	0.01*	0	0	0	75	59	67
6/20/2015	0	0	0.01	0*	T	0.01	0.01	0*	0*	0	0	0	77	56	67
6/21/2015	0	0	0	0*	0	0	0	0*	0*	0	0	0	84	68	76
6/22/2015	0.03	0	0	1.38*	T	0	0.01	0*	0.74*	0.06	0.23	0.10	85	64	75
6/23/2015	1.14	1.04	1.11	1.05	1.08	1.14	0.03	1.04	1.48	1.29	0.99	1.18	81	65	73
6/24/2015	0	0	0	0	0	0	0.01	0	0	0	0	0	80	58	69
6/25/2015	0	0.10	0	0	T	0.10	0.11	0	0	0.10	0	0.10	73	63	68
6/26/2015	0	0	0	0	T	0	0	0	0	0	0	0	76	61	69
6/27/2015	1.02	1.06	1.25	1.06	0.97	0.97	1.73	1.16	0.92	1.59	1.45	1.21	68	56	62
6/28/2015	0	0.01	0	0.02	0.01	0	0.01	0.02	0.01	0.01	0.02	0.01	77	59	68
6/29/2015	0	0	0	0	T	0	0	0	0	0	0	0	77	61	69
6/30/2015	0.03	0.06	0.13	0.11	0.04	0.01	0.05	0.07	0.03	0.02	0.02	0.02	77	63	70
Total	5.17	5.59	6.22	4.06*	5.32	4.56	4.64	2.77*	4.00*	5.41	5.37	4.88	78	60	69

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for July 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
7/1/2015	0	0	0.01	0	0	0	0	0	0	0	0.01	0	74	61	68
7/2/2015	0	0	0	0	0	0	0	0	0	0	0	0	76	58	67
7/3/2015	0	0	0	0	0	0	0	0	0	0	0	0	77	53	65
7/4/2015	0	0	0	0	0	0	0	0	0	0	0	0	81	57	69
7/5/2015	0	0	0	0	0	0	0	0	0	0	0	0	82	60	71
7/6/2015	0	0	0	0	0	0	0	0	0	0	0	0	85	61	73
7/7/2015	0.13	0.17	0.36	0.18	0.17	0.30	0.53	0.25	0.16	0.51	0.04	0.32	79	63	71
7/8/2015	0	0	0	0	0	0	0	0	0	0	0	0	67	56	62
7/9/2015	0.50	0.48	0.55	0.53	0.53	0.50	0.63	0.56	0.56	0.53	0.28	0.52	76	63	70
7/10/2015	0	0.01	0.01	0	0	0	0	0	0	0	0.01	0	80	58	69
7/11/2015	0	0	0	0	0	0	0	0	0	0	0	0	83	60	72
7/12/2015	0.03	0.01	0	0.02	0.01	0.01	0	0	0	0.01	0	0	78	66	72
7/13/2015	0	0	0	0	T	0	0	0	0	0	0	0	82	63	73
7/14/2015	0.12	0.28	0.12	0.27	0.22	0.26	0.25	0.11	0.35	0.08	0	0.23	83	67	75
7/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	78	58	68
7/16/2015	0	0	0	0	0	0	0.10	0.10	0	0.10	0.10	0	76	54	65
7/17/2015	0.31	0.25	0.19	0.24	0.21	0.19	0.25	0.22	0.23	0.18	0.24	0.20	88	67	78
7/18/2015	0.05	0.07	0.22	0.05	0.04	0.04	0.08	0.04	0.04	0.04	0.05	0.03	91	71	81
7/19/2015	0	0	0	0.01	T	0	0	0	0	0	0	0	91	68	80
7/20/2015	0	0	0	0	0	0	0	0	0	0	0	0	86	61	74
7/21/2015	0	0	0	0	0	0	0	0	0	0	0	0	81	66	74
7/22/2015	0	0	0	0	0	0	0	0	0	0	0	0	81	59	70
7/23/2015	0.10	0.10	0.10	0	0	0	0	0	0.10	0	0	0	86	61	74
7/24/2015	0	0	0	0.10	0	0.11	0	0	0	0	0	0.10	89	66	78
7/25/2015	0.11	0.09	0	0.49	0.23	0.64	0.76	0.90	0.51	0.57	0.57	0.12	88	68	78
7/26/2015	0	0	0	0.01	0	0	0	0.01	0	0	0	0	86	70	78
7/27/2015	0	0	0	0	0	0	0	0	0	0	0	0	89	66	78
7/28/2015	0	0	0	0	0	0	0	0	0	0	0	0	90	69	80
7/29/2015	0.33	0.46	0.17	0.44	0.35	0.15	0.12	0.25	0.39	0.22	0.43	0.71	91	69	80
7/30/2015	0	0	0	0	0	0	0	0	0	0	0	0	87	64	76
7/31/2015	0	0	0	0	0	0	0	0	0	0	0	0	88	66	77
Total	1.68	1.92	1.73	2.34	1.76	2.20	2.72	2.44	2.34	2.24	1.73	2.23	83	63	73

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for August 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
8/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	85	63	74
8/2/2015	0.37	0.26	0.10	0.10	0.50	0.40	0.61	0.65	0.72	0.54	0.44	0.86	92	62	77
8/3/2015	0.54	0.54	0.64	0.71	0.32	0.58	0.62	0.63	0.53	0.75	1.02	0.55	84	63	74
8/4/2015	0	0	0	0	0	0	0	0	0	0	0	0	82	60	71
8/5/2015	0	0	0	0	0	0	0	0	0	0	0	0	81	58	70
8/6/2015	0	0	0	0	0	0	0	0	0	0	0	0	77	60	69
8/7/2015	0	0	0	0	T	0	0	0	0	0	0	0	79	59	69
8/8/2015	0	0	0	0	0.01	0	0	0	0.01	0	0.01	0.01	78	66	72
8/9/2015	0.23	0.21	0.20	0.04	T	0	0.07	0	0.35	0	0	0.14	80	68	74
8/10/2015	1.07	0.85	0.49	0.46	0.41	0.28	0.32	0.19	0.14	0.20	0.20	0.11	78	69	74
8/11/2015	0	0	0.01	0	T	0	0	0	0	0	0	0	82	65	74
8/12/2015	0	0	0	0	0	0	0	0	0	0	0	0	78	59	69
8/13/2015	0	0	0	0	0	0	0	0	0	0	0	0	86	60	73
8/14/2015	0	0	0	0	T	0	0	0	0.05	0	0	0.01	87	69	78
8/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	85	65	75
8/16/2015	0	0	0	0	0	0	0	0	0	0	0	0	89	68	79
8/17/2015	0	0	0.01	0	T	0	0	0	0	0	0	0	89	70	80
8/18/2015	0.04	0.19	0.15	0.50	0.14	0	0	0.10	0	0.10	0	0	83	69	76
8/19/2015	0.06	0.25	0.08	0.05	0.43	0.19	0.50	0.33	0.20	0.36	0.03	0.17	87	71	79
8/20/2015	1.15	1.03	0.87	0.82	0.60	1.09	1.29	1.29	1.25	1.08	1.47	1.24	77	64	71
8/21/2015	0	0	0	0	0	0	0	0	0	0	0	0	79	57	68
8/22/2015	0	0	0	0	0	0	0	0	0	0	0	0	80	60	70
8/23/2015	0.28	0.58	0.35	0.55	0.56	0.53	0.16	0.60	0.49	0.47	0.17	0.73	82	60	71
8/24/2015	0	0	0	0	T	0	0	0	0	0	0	0	76	56	66
8/25/2015	0.12	0	0	0.01	0.01	0	0	0.01	0.10	0	0.01	0	66	58	62
8/26/2015	0	0	0	0	0	0	0	0	0	0	0	0	69	58	64
8/27/2015	0	0	0	0	0	0	0	0	0	0	0	0	69	54	62
8/28/2015	0	0	0	0	0	0.10	0	0	0	0	0	0	76	54	65
8/29/2015	0	0	0	0.01	0.01	0	0	0.02	0	0	0	0.03	78	64	71
8/30/2015	0.01	0	0	0.31	0.17	0.06	0	0.01	0.08	0	0	0.01	85	68	77
8/31/2015	0	0	0	0.01	0	0	0	0	0	0	0	0	85	66	76
Total	3.87	3.91	2.90	3.57	3.16	3.23	3.57	3.83	3.92	3.50	3.35	3.86	81	63	72

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for September 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
9/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	90	67	79
9/2/2015	0	0	0	0	0	0	0	0	0	0	0	0	91	70	81
9/3/2015	1.00	0.80	0.86	0.70	0.42	0.61	0.89	0.60	1.16	0.60	0.95	1.04	89	67	78
9/4/2015	0.09	0.18	0.10	0.08	0.09	0.21	0.02	0.09	0.14	0.09	0.07	0.11	85	69	77
9/5/2015	0	0	0	0	0.01	0.06	0.02	0.03	0.02	0	0.14	0.08	81	69	75
9/6/2015	0	0	0	0	0	0	0	0	0	0	0	0	89	66	78
9/7/2015	0	0	0	0	0	0	0	0	0	0	0	0	92	70	81
9/8/2015	0	0	0	0	T	0	0	0	0	0	0	0	90	72	81
9/9/2015	0.03	0.02	0.03	0.01	0.01	0.02	0.03	0.02	0.03	0.01	0.02	0.02	80	63	72
9/10/2015	0	0	0	0	0	0	0	0	0	0	0	0	79	56	68
9/11/2015	0.11	0.29	0.19	0.36	0.19	0.11	0.11	0.23	0.14	0.13	0.23	0.19	68	58	63
9/12/2015	0	0	0	0	0	0	0	0	0	0	0	0.01	64	49	57
9/13/2015	0	0	0	0	0	0	0	0	0	0	0	0	68	47	58
9/14/2015	0	0	0	0	0	0	0	0	0	0	0	0	78	47	63
9/15/2015	0	0	0	0	0	0	0	0	0	0	0	0	83	60	72
9/16/2015	0	0	0	0	0	0	0	0	0	0	0	0	82	58	70
9/17/2015	0	0	0	0	0	0	0	0	0	0	0	0	84	58	71
9/18/2015	0.27	0.13	0.13	0.02	0.14	0.06	0.16	0	0.03	0	0	0	79	63	71
9/19/2015	0.32	0.32	0.27	0.36	0.26	0.26	0.43	0.32	0.31	0.35	0.53	0.31	73	55	64
9/20/2015	0	0	0	0	0	0	0	0	0	0	0	0	71	48	60
9/21/2015	0	0	0	0	0	0	0	0	0	0	0	0	73	52	63
9/22/2015	0	0	0	0	0	0	0	0	0	0	0	0	78	51	65
9/23/2015	0	0	0	0	0	0	0	0	0	0	0	0	79	53	66
9/24/2015	0	0	0	0	0	0	0	0	0	0	0	0	79	56	68
9/25/2015	0	0	0.01	0	0	0	0	0	0	0	0	0	80	59	70
9/26/2015	0	0	0	0	0	0	0	0	0	0	0	0	76	62	69
9/27/2015	0	0	0	0	0	0	0	0	0	0	0	0	77	61	69
9/28/2015	0.01	0	0.01	0	T	0	0	0	0	0	0	0	78	67	73
9/29/2015	0.37	0.18	0.82	0.16	0.17	0.24	0.62	0.38	0.36	0.45	0.85	0.34	74	57	66
9/30/2015	0	0	0	0	0	0	0	0	0	0	0	0	66	52	59
Total	2.20	1.92	2.42	1.69	1.29	1.57	2.28	1.67	2.19	1.63	2.79	2.10	79	59	69

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for October 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
10/1/2015	0	0	0	0	0	0	0	0	0	0	0	0	61	46	54
10/2/2015	0	0	0	0	0	0	0	0	0	0	0	0	57	46	52
10/3/2015	0.08	0.10	0.14	0.10	0.13	0.15	0.29	0.19	0.21	0.20	0.29	0.23	52	47	50
10/4/2015	0.01	0	0.01	0	T	0.01	0.01	0.01	0	0.01	0.01	0.01	61	48	55
10/5/2015	0	0	0	0	0	0	0	0	0	0	0	0	72	57	65
10/6/2015	0	0	0	0	0	0	0	0	0	0	0	0	69	56	63
10/7/2015	0	0	0	0	0	0	0	0	0	0	0	0	75	52	64
10/8/2015	0	0.02	0.01	0.09	0.11	0.06	0	0.15	0.20	0.03	0	0.11	74	48	61
10/9/2015	0.01	0.03	0.03	0.03	0.03	0.02	0.01	0.05	0.05	0.01	0.01	0.03	67	47	57
10/10/2015	0	0	0	0	0	0	0	0	0	0	0	0	65	43	54
10/11/2015	0	0	0	0	0	0	0	0	0	0	0	0	76	45	61
10/12/2015	0	0	0	0	0	0	0	0	0	0	0	0	78	52	65
10/13/2015	0.57	0	0	0	T	0	0	0	0	0	0	0	63	50	57
10/14/2015	0	0	0.01	0.10	T	0	0	0.10	0	0	0	0	60	41	51
10/15/2015	0	0	0.01	0	T	0	0.02	0	0	0.01	0.01	0.01	67	40	54
10/16/2015	0	0	0	0	T	0.56	0	0	0	0	0	0	57	36	47
10/17/2015	0	0	0	0	T	0	0	0	0	0	0	0	48	31	40
10/18/2015	0	0	0	0	T	0	0	0	0	0	0	0	52	33	43
10/19/2015	0	0	0	0	0	0	0	0	0	0	0	0	68	33	51
10/20/2015	0	0	0	0	T	0	0	0	0	0	0	0	77	55	66
10/21/2015	0	0	0	0	T	0	0	0	0	0	0	0	75	54	65
10/22/2015	0	0	0	0	0	0	0	0	0	0	0	0	68	49	59
10/23/2015	0	0	0	0	T	0	0	0	0	0	0	0	60	45	53
10/24/2015	0.36	0.50	0.49	0.44	0.44	0.67	0.71	0.62	0.57	0.63	0.62	0.75	71	52	62
10/25/2015	0	0	0	0	T	0	0	0	0	0	0	0	63	46	55
10/26/2015	0	0	0	0	0	0	0	0	0	0	0	0	59	39	49
10/27/2015	0	0.01	0.01	0.01	0.05	0.01	0.01	0	0	0	0.01	0	59	45	52
10/28/2015	1.30	1.28	1.09	1.15	1.13	1.27	1.41	1.18	0.9*	1.36	1.44	1.29	63	50	57
10/29/2015	0	0	0	0	T	0.01	0	0	0.03*	0	0	0.01	53	39	46
10/30/2015	0	0	0	0	T	0	0	0	0.03*	0.59	0	0.10	52	41	47
10/31/2015	0.09	0.08	0.06	0.08	0.08	0.07	0.07	0.06	0.02*	0.08	0.07	0.08	52	42	47
Total	2.42	2.02	1.86	2.00	1.97	2.83	2.53	2.36	2.01*	2.92	2.46	2.62	64	45	55

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for November 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
11/1/2015	0	0	0.01	0	T	0	0	0	0.05*	0	0	0.01	66	45	56
11/2/2015	0	0	0	0	0	0	0	0	0.02*	0	0.10	0	71	37	54
11/3/2015	0	0	0	0	0	0	0	0	0.01*	0	0	0	76	45	61
11/4/2015	0	0	0	0	0	0	0	0	0.01*	0	0.01	0	77	46	62
11/5/2015	0	0	0.10	0.10	T	0	0.11	0	0.01*	0	0.02	0	74	52	63
11/6/2015	0.21	0.13	0.15	0.22	0.15	0.20	0.21	0.19	0.07*	0.17	0.18	0.21	66	50	58
11/7/2015	0	0	0	0	T	0	0	0	0.04*	0	0	0	55	38	47
11/8/2015	0	0	0	0	0	0	0	0	0.11*	0	0	0	52	33	43
11/9/2015	0	0.01	0	0	0.01	0	0.02	0.01	0.01*	0.01	0	0	55	31	43
11/10/2015	0.29	0.30	0.33	0.44	0.41	0.45	0.43	0.42	0.37*	0.38	0.42	0.37	48	42	45
11/11/2015	0	0	0	0	T	0	0	0	0*	0	0	0	57	35	46
11/12/2015	0.19	0.12	0.10	0.10	0.14	0.08	0.18	0.09	0.08*	0.09	0.15	0.11	55	45	50
11/13/2015	0.02	0.03	0.03	0.05	0.04	0.04	0.07	0.04	0.04*	0.04	0.05	0.07	46	37	42
11/14/2015	0	0	0	0	0	0	0	0	0*	0	0	0	51	38	45
11/15/2015	0	0	0	0	0	0	0	0	0*	0	0	0	65	39	52
11/16/2015	0.10	1.75	0	0	0	0	0	0	0*	0	0	0	63	35	49
11/17/2015	0	0	0	0	0	0	0	0	0*	0	0	0	62	46	54
11/18/2015	0.44	0.50	0.31	0.42	0.35	0.52	0.48	0.41	0.22*	0.43	0.34	0.43	64	56	60
11/19/2015	0.01	0	0	0	0	0	0	0	0.18*	0	0	0	61	37	49
11/20/2015	0	0	0	0	0	0	0	0	0.09*	0	0	0	46	33	40
11/21/2015	0*	0.35	0.39	0.49	0.43	0.16	0.60	0.43	0.11*	0.16	0.40	0.43	39	29	34
11/22/2015	0*	0	0	0	T	0.02	0	0.03	0*	0	0.10	0	33	20	27
11/23/2015	0.01*	0	0	0	T	0	0	0.07	0*	0	0	0	34	21	28
11/24/2015	0*	0	0	0	0	0.09	0	0.10	0.09*	0.19	0	0.10	40	23	32
11/25/2015	0*	0	0	0	0	0	0	0	0	0.03	0	0	54	30	42
11/26/2015	0*	0.04	0.06	0.02	0.02	0.02	0	0.02	0.05	0.01	0	0	62	44	53
11/27/2015	0*	0.46	0.60	0.56	0.49	0.54	0.74	0.61	0.59	0.64	0.62	0.58	61	35	48
11/28/2015	0*	0.03	0.02	0.04	0.02	0.02	0.03	0.03	0.06	0.02	0.03	0.03	39	29	34
11/29/2015	0*	0	0	0	0	0	0	0	0	0	0	0	40	23	32
11/30/2015	0*	0	0	0	0	0	0	0	0	0	0	0	47	28	38
Total	1.27*	3.72	2.10	2.44	2.06	2.14	2.87	2.45	2.21*	2.17	2.42	2.34	55	37	46

* Missing or suspect data.

Table C-4 continued
Downriver Sewage Disposal System
Daily Precipitation for December 2015

Date	Daily Precipitation (inches)												DTW Daily Temperature (°F)		
	R-14	R-18	R-02	R-10	DTW	R-09	R-04	R-08	R-15	R-17	R-06	R-16	Max.	Min.	Avg.
12/1/2015	0*	0.04	0.03	0.04	0.05	0.03	0.06	0.04	0.03	0.04	0.05	0.04	50	34	42
12/2/2015	0*	0.05	0.05	0.03	0.05	0.04	0.05	0.06	0.08	0.04	0.04	0.07	43	28	36
12/3/2015	0*	0.01	0.03	0.03	0.04	0.05	0.08	0.08	0.06	0.06	0.09	0.09	46	33	40
12/4/2015	0*	0	0	0	0	0	0	0	0	0	0	0	45	31	38
12/5/2015	0*	0	0	0	0	0	0	0	0	0	0	0	33	28	31
12/6/2015	0*	0	0	0	0	0	0	0	0	0	0	0	40	28	34
12/7/2015	0*	0	0	0	0	0	0	0	0	0	0	0	40	27	34
12/8/2015	0	0	0	0	0	0	0	0	0	0	0	0	46	34	40
12/9/2015	0	0	0	0	0	0	0	0	0	0	0	0	51	37	44
12/10/2015	0.10	0.10	0	0	0	0	0	0	0	0	0	0	54	35	45
12/11/2015	0	0	0	0	0	0	0	0	0	0	0	0	57	44	51
12/12/2015	0	0	0	0	T	0	0.03	0	0	0	0	0	63	48	56
12/13/2015	0	0	0	0	0.01	0	0.01	0	0.02	0	0	0	62	51	57
12/14/2015	0.15	0.15	0.12	0.22	0.12	0.10	0.12	0.09	0.13	0.12	0.18	0.16	59	45	52
12/15/2015	0	0	0	0	0	0	0	0	0.11	0	0	0.11	48	42	45
12/16/2015	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.01	0.04	0.02	0.01	0.03	53	42	48
12/17/2015	0	0	0	0	0	0	0	0	0	0	0	0	51	34	43
12/18/2015	0	0	0	0	T	0	0	0	0	0	0	0	34	27	31
12/19/2015	0	0	0	0	0.01	0	0	0	0	0	0	0	31	24	28
12/20/2015	0	0	0	0	0	0	0	0	0	0	0	0	43	21	32
12/21/2015	0.69	0.18	0.39	0.61	0.52	0.46	0.40	0.41	0.53	0.38	0.34	0.40	52	39	46
12/22/2015	0	0	0.01	0.01	T	0	0.02	0	0	0.01	0.03	0.01	53	40	47
12/23/2015	0.52	0.16	0.32	0.39	0.45	0.48	0.61	0.37	0.45	0.57	0.50	0.49	59	40	50
12/24/2015	0	0	0	0	T	0	0	0	0	0	0	0	58	42	50
12/25/2015	0	0	0	0	T	0	0	0	0	0	0	0	50	34	42
12/26/2015	0*	0.03*	0.21	0.22	0.24	0.26	0.24	0.26	0.26	0.25	0.26	0.24	44	34	39
12/27/2015	0.01*	0.01*	0.35	0.33	0.31	0.37	0.41	0.41	0.35	0.41	0.38	0.39	44	35	40
12/28/2015	0*	0.18*	1.20	1.18	1.14	1.05	1.43	1.15	1.18	1.41	1.34	1.14	38	29	34
12/29/2015	0.01*	0*	0.03	0.04	0.04	0.05	0.05	0.07	0.06	0.06	0.09	0.08	45	32	M
12/30/2015	0*	0*	0	0	0	0	0	0	0	0	0	0	37	32	35
12/31/2015	0*	0*	0	0	T	0	0	0	0	0	0	0	36	31	34
Total	1.49*	0.92*	2.77	3.12	3.01	2.92	3.54	2.95	3.30	3.37	3.31	3.25	47	35	41

* Missing or suspect data.

Appendix D

Supplemental Information, DSDS Response to 2015 Significant Storm Events

SUMMARY OF RIVERDRIVE INTERCEPTOR AND OPERATION

This appendix includes hydrographs at select locations for the major storm events. Flow limits shown for each community on the hydrographs presented in Appendix D are from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). For the controlled flow communities, maximum flow limits are specified in the existing service agreement, adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding.

In addition, this appendix includes figures and tables comparing the total 96-hour volumes and precipitation for the three significant storm events to the 4.42 inch design event for the non-controlled flow communities.

Table D-1
Downriver Sewage Disposal System
Controlled Flow Communities
Peak Hourly Flow Rates for Significant/Major Storm Events for 2015

Meter District =		RR-1		EC-6		RD-1		SW	
Location =		River Rouge CSO Basin Outlet		Riverdrive Interceptor South of Southfield Road		Riverdrive Interceptor North of Northline Road		SWRDDD Connection	
Total Flow Formula =		[RR-1]		[EC-6]		[RD-1]		[SW] + [SWB]	
Communities Included in Total Flow =		River Rouge		River Rouge, Ecorse, & Lincoln Park (part)		River Rouge, Ecorse, Lincoln Park (part), & Allen Park (part)		Southgate (part) & Wyandotte	
Incremental Flow Formula =		[RR-1]		[EC-6] - [RR-1r]		[RD-1] - [EC-6r]		[SW] + [SWB]	
Communities Included in Incremental Flow =		River Rouge		Ecorse & Lincoln Park (part)		Lincoln Park (part) & Allen Park (part)		Southgate (part) & Wyandotte	
		Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume
Propsoed Maximum Wet Weather Flow Limits for Controlled Flow Communities									
Total Peak Hourly Flow Rate		--	7.28 MGD	--	14.46 MGD	--	42.55 MGD	--	20.51 MGD
Incremental Peak Hourly Flow Rate		--	7.28 MGD	--	7.18 MGD	--	28.09 MGD	--	20.51 MGD
Significant Storm Event 1 - April 7-10, 2015									
Total	Start of First Exceedence	--	--	--	--	--	--	4/10/2015 19:20	--
	End of Last Exceedence	--	--	--	--	--	--	4/10/2015 19:35	--
	Total Time of Exceedence	--	--	--	--	--	--	0:20	--
	Total Volume Above Maximum Flow Limit	--	--	--	--	--	--	--	0.01 MG
	Peak Hourly Flow Rate	4/10/2015 2:30	6.75 MGD	4/9/2015 21:00	13.97 MGD	4/9/2015 22:30	41.23 MGD	4/10/2015 19:25	21.17 MGD [4]
Incremental	Start of First Exceedence	--	--	4/9/2015 20:05	--	4/9/2015 19:55	--	4/10/2015 19:20	--
	End of Last Exceedence	--	--	4/9/2015 22:00	--	4/10/2015 21:45	--	4/10/2015 19:35	--
	Total Time of Exceedence	--	--	2:00	--	15:15	--	0:20	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.12 MG	--	1.22 MG	--	0.01 MG
	Peak Hourly Flow Rate	4/10/2015 2:30	6.75 MGD	4/9/2015 20:45	9.90 MGD	4/9/2015 20:55	37.04 MGD	4/10/2015 19:25	21.17 MGD [4]
Significant Storm Event 2 - May 4-7, 2015									
Total	Start of First Exceedence	--	--	--	--	--	--	--	--
	End of Last Exceedence	--	--	--	--	--	--	--	--
	Total Time of Exceedence	--	--	--	--	--	--	--	--
	Total Volume Above Maximum Flow Limit	--	--	--	--	--	--	--	--
	Peak Hourly Flow Rate	5/6/2015 5:05	6.43 MGD	5/6/2015 1:20	13.71 MGD	5/6/2015 3:05	42.10 MGD	5/7/2015 0:35	17.27 MGD
Incremental	Start of First Exceedence	--	--	5/5/2015 23:50	--	5/5/2015 23:40	--	--	--
	End of Last Exceedence	--	--	5/6/2015 4:50	--	5/6/2015 7:55	--	--	--
	Total Time of Exceedence	--	--	3:40	--	4:25	--	--	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.14 MG	--	0.79 MG	--	--
	Peak Hourly Flow Rate	5/6/2015 5:05	6.43 MGD	5/6/2015 0:35	9.35 MGD	5/6/2015 0:35	35.63 MGD	5/7/2015 0:35	17.27 MGD
Significant Storm Event 3 / Major Storm Event A - May 29 - June 2, 2015									
Total	Start of First Exceedence	5/30/2015 21:35	--	5/31/2015 6:20	--	5/30/2015 19:30	--	--	--
	End of Last Exceedence	5/31/2015 6:20	--	5/31/2015 21:20	--	6/2/2015 1:30	--	--	--
	Total Time of Exceedence	8:05	--	15:05	--	54:05	--	--	--
	Total Volume Above Maximum Flow Limit	--	0.04 MG	--	1.45 MG	--	7.74 MG	--	--
	Peak Hourly Flow Rate	5/30/2015 22:10	7.56 MGD	5/31/2015 11:30	17.94 MGD	5/31/2015 12:55	48.26 MGD	5/30/2015 13:10	20.04 MGD
Incremental	Start of First Exceedence	5/30/2015 21:35	--	5/31/2015 6:20	--	5/30/2015 16:15	--	--	--
	End of Last Exceedence	5/31/2015 6:20	--	5/31/2015 23:10	--	6/2/2015 13:10	--	--	--
	Total Time of Exceedence	8:05	--	16:55	--	69:00	--	--	--
	Total Volume Above Maximum Flow Limit	--	0.04 MG	--	2.30 MG	--	12.62 MG	--	--
	Peak Hourly Flow Rate	5/30/2015 22:10	7.56 MGD	5/31/2015 11:55	12.66 MGD	5/30/2015 21:45	42.22 MGD	5/30/2015 13:10	20.04 MGD
Significant Storm Event 4 - June 13-18, 2015									
Total	Start of First Exceedence	--	--	6/14/2015 15:20	--	6/14/2015 15:10	--	6/16/2015 15:00	--
	End of Last Exceedence	--	--	6/14/2015 15:45	--	6/16/2015 10:05	--	6/16/2015 19:50	--
	Total Time of Exceedence	--	--	0:30	--	34:40	--	4:55	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.00 MG	--	2.45 MG	--	0.79 MG
	Peak Hourly Flow Rate	6/14/2015 19:10	6.99 MGD	6/14/2015 15:20	14.61 MGD	6/14/2015 16:05	46.00 MGD	6/16/2015 16:20	25.59 MGD [4]
Incremental	Start of First Exceedence	--	--	6/14/2015 14:40	--	6/14/2015 14:35	--	6/16/2015 15:00	--
	End of Last Exceedence	--	--	6/15/2015 15:10	--	6/16/2015 13:55	--	6/16/2015 19:50	--
	Total Time of Exceedence	--	--	2:35	--	45:50	--	4:55	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.13 MG	--	7.55 MG	--	0.79 MG
	Peak Hourly Flow Rate	6/14/2015 19:10	6.99 MGD	6/14/2015 15:30	9.76 MGD	6/14/2015 15:25	42.68 MGD	6/16/2015 16:20	25.59 MGD [4]
Significant Storm Event 5 - June 23-24, 2015									
Total	Start of First Exceedence	6/23/2015 6:25	--	6/23/2015 1:40	--	6/23/2015 1:50	--	--	--
	End of Last Exceedence	6/23/2015 18:20	--	6/23/2015 4:55	--	6/23/2015 23:40	--	--	--
	Total Time of Exceedence	12:00	--	3:20	--	21:55	--	--	--
	Total Volume Above Maximum Flow Limit	--	0.05 MG	--	0.11 MG	--	2.96 MG	--	--
	Peak Hourly Flow Rate	6/23/2015 8:10	7.48 MGD	6/23/2015 1:50	15.86 MGD	6/23/2015 12:05	47.75 MGD	6/23/2015 0:30	15.04 MGD
Incremental	Start of First Exceedence	6/23/2015 6:25	--	6/23/2015 1:25	--	6/23/2015 1:40	--	--	--
	End of Last Exceedence	6/23/2015 18:20	--	6/23/2015 5:05	--	6/24/2015 2:55	--	--	--
	Total Time of Exceedence	12:00	--	3:45	--	25:20	--	--	--
	Total Volume Above Maximum Flow Limit	--	0.05 MG	--	0.30 MG	--	4.86 MG	--	--
	Peak Hourly Flow Rate	6/23/2015 8:10	7.48 MGD	6/23/2015 2:00	11.39 MGD	6/23/2015 2:05	35.14 MGD	6/23/2015 0:30	15.04 MGD

Notes:

1. The Maximum Wet Weather Flow Limits for Controlled Flow Communities are from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). These flow limits are specified in the existing service agreement, adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding. The communities are responsible for regulating their flow rates to the Riverdrive Interceptor to the these flow limits. The flow limits for each community are listed below:

   i. The flow rate limit for River Rouge at RR-1 is 11.26 cfs (7.28 MGD).

   ii. The flow rate limit for Ecorse at EC-6 is 9.20 cfs (5.95 MGD).

   iii. The flow rate limit for Lincoln Park is 28.16 cfs (18.20 MGD).

   iv. The flow rate limit for Lincoln Park is divided between two meters 1.90 cfs (1.23 MGD) at EC-6 and 26.26 cfs (16.97 MGD) at RD-1.

   v. The flow rate limit for Allen Park at RD-1 (via Lincoln Park) is 17.20 cfs (11.12 MGD).

2. Significant storm events are defined as those with at least 0.5 inches of rainfall occurring on a single day with an event total of at least 1.0 inch of rainfall. Significant storm events are separated by at least 2 consecutive days without precipitation over 0.1 inches. This storm event definition is based on the arithmetic mean of the rainfall recorded by all rain gages used in the analysis for that storm.

3. Major storm events are a subgroup of significant storm events which result in the peak hourly influent flow rate to the DWTF reaching or exceeding 175 MGD.

4. Exceedance of the proposed maximum flow limits due to Wayne County coordination of dewatering flows from the SWRDDD facilities to the DWTF to minimize discharges to the Detroit River from the SWRDDD.

Legend:

XX.XX	Exceeds maximum flow limit by 0 to 20%
XX.XX	Exceeds maximum flow limit by > 20%

Table D-1 continued
Downriver Sewage Disposal System
Controlled Flow Communities
Peak Hourly Flow Rates for Significant/Major Storm Events for 2015

Meter District =		RR-1		EC-6		RD-1		SW	
Location =		River Rouge CSO Basin Outlet		Riverdrive Interceptor South of Southfield Road		Riverdrive Interceptor North of Northline Road		SWRDDD Connection	
Total Flow Formula =		[RR-1]		[EC-6]		[RD-1]		[SW] + [SWB]	
Communities Included in Total Flow =		River Rouge		River Rouge, Ecorse, & Lincoln Park (part)		River Rouge, Ecorse, Lincoln Park (part), & Allen Park (part)		Southgate (part) & Wyandotte	
Incremental Flow Formula =		[RR-1]		[EC-6] - [RR-1r]		[RD-1] - [EC-6r]		[SW] + [SWB]	
Communities Included in Incremental Flow =		River Rouge		Ecorse & Lincoln Park (part)		Lincoln Park (part) & Allen Park (part)		Southgate (part) & Wyandotte	
		Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume	Date/Time of Occurrence	Flow Rate/Volume
Propsoed Maximum Wet Weather Flow Limits for Controlled Flow Communities									
Total Peak Hourly Flow Rate		--	7.28 MGD	--	14.46 MGD	--	42.55 MGD	--	20.51 MGD
Incremental Peak Hourly Flow Rate		--	7.28 MGD	--	7.18 MGD	--	28.09 MGD	--	20.51 MGD
Significant Storm Event 6 - June 27-29, 2015									
Total	Start of First Exceedence	--	--	--	--	6/27/2015 8:10	--	6/28/2015 7:50	--
	End of Last Exceedence	--	--	--	--	6/28/2015 3:45	--	6/28/2015 12:25	--
	Total Time of Exceedence	--	--	--	--	19:40	--	4:40	--
	Total Volume Above Maximum Flow Limit	--	--	--	--	--	1.36 MG	--	1.17 MG
	Peak Hourly Flow Rate	6/27/2015 10:15	6.46 MGD	6/27/2015 8:25	11.49 MGD	6/27/2015 9:20	45.41 MGD	6/28/2015 9:00	30.08 MGD [4]
Incremental	Start of First Exceedence	--	--	--	--	6/27/2015 6:05	--	6/28/2015 7:50	--
	End of Last Exceedence	--	--	--	--	6/28/2015 8:20	--	6/28/2015 12:25	--
	Total Time of Exceedence	--	--	--	--	26:20	--	4:40	--
	Total Volume Above Maximum Flow Limit	--	--	--	--	--	4.97 MG	--	1.17 MG
	Peak Hourly Flow Rate	6/27/2015 10:15	6.46 MGD	6/27/2015 6:20	6.96 MGD	6/27/2015 7:05	37.32 MGD	6/28/2015 9:00	30.08 MGD [4]
Significant Storm Event 7 - August 2-4, 2015									
Total	Start of First Exceedence	--	--	8/2/2015 23:15	--	8/2/2015 23:50	--	--	--
	End of Last Exceedence	--	--	8/3/2015 2:15	--	8/3/2015 11:45	--	--	--
	Total Time of Exceedence	--	--	3:00	--	12:00	--	--	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.10 MG	--	1.53 MG	--	--
	Peak Hourly Flow Rate	8/3/2015 3:00	7.12 MGD	8/2/2015 23:45	16.31 MGD	8/3/2015 1:35	47.55 MGD	8/4/2015 15:20	18.94 MGD
Incremental	Start of First Exceedence	--	--	8/2/2015 22:50	--	8/2/2015 23:30	--	--	--
	End of Last Exceedence	--	--	8/3/2015 2:30	--	8/3/2015 17:55	--	--	--
	Total Time of Exceedence	--	--	3:45	--	18:30	--	--	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.32 MG	--	2.78 MG	--	--
	Peak Hourly Flow Rate	8/3/2015 3:00	7.12 MGD	8/2/2015 23:40	11.82 MGD	8/3/2015 0:20	41.18 MGD	8/4/2015 15:20	18.94 MGD
Significant Storm Event 8 - August 19-21, 2015									
Total	Start of First Exceedence	8/20/2015 2:30	--	--	--	8/20/2015 2:25	--	8/19/2015 23:25	--
	End of Last Exceedence	8/20/2015 9:25	--	--	--	8/20/2015 10:50	--	8/21/2015 20:55	--
	Total Time of Exceedence	6:25	--	--	--	8:30	--	12:10	--
	Total Volume Above Maximum Flow Limit	--	0.11 MG	--	--	--	0.89 MG	--	1.12 MG
	Peak Hourly Flow Rate	8/20/2015 4:20	8.00 MGD	8/20/2015 2:35	13.66 MGD	8/20/2015 7:30	46.97 MGD	8/21/2015 20:30	25.75 MGD [4]
Incremental	Start of First Exceedence	8/20/2015 2:30	--	8/20/2015 0:30	--	8/20/2015 0:55	--	8/19/2015 23:25	--
	End of Last Exceedence	8/20/2015 9:25	--	8/20/2015 2:25	--	8/20/2015 15:40	--	8/21/2015 20:55	--
	Total Time of Exceedence	6:25	--	2:00	--	14:50	--	12:10	--
	Total Volume Above Maximum Flow Limit	--	0.11 MG	--	0.04 MG	--	2.20 MG	--	1.12 MG
	Peak Hourly Flow Rate	8/20/2015 4:20	8.00 MGD	8/20/2015 1:00	8.01 MGD	8/20/2015 2:30	39.58 MGD	8/21/2015 20:30	25.75 MGD [4]
Significant Storm Event 9 - October 27-28, 2015									
Total	Start of First Exceedence	--	--	--	--	10/28/2015 7:15	--	10/28/2015 1:05	--
	End of Last Exceedence	--	--	--	--	10/28/2015 14:00	--	10/30/2015 18:55	--
	Total Time of Exceedence	--	--	--	--	6:50	--	26:00	--
	Total Volume Above Maximum Flow Limit	--	--	--	--	--	0.36 MG	--	7.67 MG
	Peak Hourly Flow Rate	10/28/2015 8:50	4.27 MGD	10/28/2015 8:20	11.00 MGD	10/28/2015 11:35	44.43 MGD	10/28/2015 3:10	57.50 MGD [4]
Incremental	Start of First Exceedence	--	--	10/28/2015 6:10	--	10/28/2015 4:40	--	10/28/2015 1:05	--
	End of Last Exceedence	--	--	10/28/2015 7:35	--	10/28/2015 22:35	--	10/30/2015 18:55	--
	Total Time of Exceedence	--	--	1:30	--	18:00	--	26:00	--
	Total Volume Above Maximum Flow Limit	--	--	--	0.03 MG	--	3.36 MG	--	7.67 MG
	Peak Hourly Flow Rate	10/28/2015 8:50	4.27 MGD	10/28/2015 6:50	7.95 MGD	10/28/2015 7:00	41.36 MGD	10/28/2015 3:10	57.50 MGD [4]
Significant Storm Event 10 / Major Storm Event B - December 28-29, 2015									
Total	Start of First Exceedence	12/29/2015 10:10	--	12/28/2015 22:30	--	12/28/2015 21:10	--	12/28/2015 7:40	--
	End of Last Exceedence	12/29/2015 10:50	--	12/29/2015 5:30	--	12/30/2015 7:20	--	12/31/2015 13:25	--
	Total Time of Exceedence	0:40	--	7:00	--	34:10	--	23:15	--
	Total Volume Above Maximum Flow Limit	--	0.00 MG	--	0.51 MG	--	3.17 MG	--	10.22 MG
	Peak Hourly Flow Rate	12/29/2015 10:35	7.31 MGD	12/29/2015 1:10	17.29 MGD	12/29/2015 0:45	46.74 MGD	12/28/2015 18:35	57.03 MGD [4]
Incremental	Start of First Exceedence	12/29/2015 10:10	--	12/28/2015 19:30	--	12/28/2015 19:10	--	12/28/2015 7:40	--
	End of Last Exceedence	12/29/2015 10:50	--	12/29/2015 5:55	--	12/31/2015 0:30	--	12/31/2015 13:25	--
	Total Time of Exceedence	0:40	--	9:20	--	53:20	--	23:15	--
	Total Volume Above Maximum Flow Limit	--	0.00 MG	--	0.92 MG	--	9.19 MG	--	10.22 MG
	Peak Hourly Flow Rate	12/29/2015 10:35	7.31 MGD	12/28/2015 23:25	11.73 MGD	12/28/2015 20:25	37.46 MGD	12/28/2015 18:35	57.03 MGD [4]

Notes:

1. The Maximum Wet Weather Flow Limits for Controlled Flow Communities are from the proposed new Downriver Sewage Disposal System Service Agreement (December 4, 2014). These flow limits are specified in the existing service agreement, adjusted in April 2014 to reflect increases in DWTF capacity, transfers that have occurred between communities and proper conversions from cfs to MGD, consistent significant figures and appropriate rounding. The communities are responsible for regulating their flow rates to the Riverdrive Interceptor to the these flow limits. The flow limits for each community are listed below:

   i. The flow rate limit for River Rouge at RR-1 is 11.26 cfs (7.28 MGD).

   ii. The flow rate limit for Ecorse at EC-6 is 9.20 cfs (5.95 MGD).

   iii. The flow rate limit for Lincoln Park is 28.16 cfs (18.20 MGD).

   iv. The flow rate limit for Lincoln Park is divided between two meters 1.90 cfs (1.23 MGD) at EC-6 and 26.26 cfs (16.97 MGD) at RD-1.

   v. The flow rate limit for Allen Park at RD-1 (via Lincoln Park) is 17.20 cfs (11.12 MGD).

2. Significant storm events are defined as those with at least 0.5 inches of rainfall occurring on a single day with an event total of at least 1.0 inch of rainfall. Significant storm events are separated by at least 2 consecutive days without precipitation over 0.1 inches. This storm event definition is based on the arithmetic mean of the rainfall recorded by all rain gages used in the analysis for that storm.

3. Major storm events are a subgroup of significant storm events which result in the peak hourly influent flow rate to the DWTF reaching or exceeding 175 MGD.

4. Exceedance of the proposed maximum flow limits due to Wayne County coordination of dewatering flows from the SWRDDD facilities to the DWTF to minimize discharges to the Detroit River from the SWRDDD.

Legend:

XX.XX	Exceeds maximum flow limit by 0 to 20%
XX.XX	Exceeds maximum flow limit by > 20%

Table D-2
Downriver Sewage Disposal System
Peak 96 Hour Total Volumes for Significant Storm Events Summarized by Community

Community	Meter District	Year 2010 Incremental Population	Major Storm Event A May 29 - June 2, 2015 2.50 inches		Major Storm Event B December 28-29, 2015 1.28 inches	
			Total Peak 96 Hour Incremental Volume (MG)	Peak 96 Hour Incremental Volume (MG)	Total Peak 96 Hour Incremental Volume (MG)	Peak 96 Hour Incremental Volume (MG)
Allen Park	PC-1	1,019	39.8	1.5	29.4	1.1
	P-1	3,332	20.4	4.9	15.9	3.8
	RD-1	18,179	112.6	39.0	105.9	36.7
	APO-1 + APO-2	0	17.8	17.8	9.9	9.9
	Total	22,531	190.6	63.2	161.1	51.5
Belleville	PA-4	3,993	9.3	3.8	6.1	2.5
Brownstown Twp.	P-2	10,397	9.1	8.9	7.0	6.8
	PA-2	248	11.4	0.2	8.7	0.2
	Total	10,645	20.5	9.1	15.7	7.0
Dearborn Hts.	TB-1	19,152	42.9	33.6	34.6	27.0
Ecorse	EC-6	9,515	18.7	13.4	13.0	9.3
Lincoln Park	EC-6	3,795	18.7	5.3	13.0	3.7
	RD-1	34,347	112.6	73.6	105.9	69.2
	Total	38,142	131.2	78.9	118.9	73.0
River Rouge	RR-1	7,903	21.5	21.5	17.6	17.6
Riverview	RV-1	12,486	19.5	19.5	14.9	14.9
Romulus	DMA-1	0	2.8	2.8	2.1	2.1
	PA-3	11,371	15.1	15.1	13.9	13.9
	DMA-2	0	8.8	8.8	4.5	4.5
	PD-2	9,532	12.1	12.1	11.9	11.9
	Total	20,904	38.8	38.8	32.4	32.4
Southgate	P-1	10,637	20.4	15.5	15.9	12.1
	PB-1	4,459	9.0	3.6	6.8	2.7
	SW	14,752	63.8	23.2	80.0	29.1
	TPS+IPS	199	0.3	0.3	0.2	0.2
	Total	30,047	93.5	42.6	103.0	44.1
Taylor	P-2	262	9.1	0.2	7.0	0.2
	PA-2	13,270	11.4	11.2	8.7	8.6
	PB-1	6,462	9.0	5.4	6.8	4.1
	TB-1	5,339	42.9	9.4	34.6	7.5
	PC-1	25,700	39.8	38.3	29.4	28.3
	PD-1	12,100	9.8	9.8	12.3	12.3
	Total	63,131	122.1	74.3	98.8	60.9
Van Buren Twp.	PA-4	5,719	9.3	5.5	6.1	3.6
Wyandotte	SW	25,883	63.8	40.7	80.0	51.0

Notes:

1) [P-1] = [P-2] + [PA-2] + [PB-1] + [PC-1] + [PD-1] + (P-1 Inc. Pop. / (P-2 Cum. Pop. + P2-1 Cum. Pop. + PB-1 Cum. Pop. + PC-1 Cum. Pop. + PD-1 Cum. Pop.)) x ([P-2] + [PA-2] + [PB-1] + [PC-1] + [PD-1] + [TSO]+ [CPO] + [CHPO] + [PDO] + [APO-1] + [APO-2] + [ER-1])

2) [TPS+IPS] = (TPS+TPS Inc. Pop. / P-1 Inc. Pop.) x [P-1]

Table D-3
Downriver Sewage Disposal System
Peak Flow Rates for Significant Storm Events

System	Meter	Location	Major Storm Event A May 29 - June 2, 2015 2.50 inches				Major Storm Event B December 28-29, 2015 1.28 inches			
			Peak Hour		Peak 96 Hour		Peak Hour		Peak 96 Hour	
			Date/Time	Flow Rate (MGD)	Date/Time	Cumulative Volume (MG)	Date/Time	Flow Rate (MGD)	Date/Time	Cumulative Volume (MG)
Tunnel (Non-Controlled)	TB-1	Taylor Basin	5/31/15 20:35	10.3	5/30/15 15:25	35.2	12/29/15 0:10	12.5	12/28/15 18:50	34.6
	PC-1	Pelham Interceptor North of Goddard Road	5/30/15 22:40	19.3	5/30/15 14:15	64.2	12/28/15 21:15	18.6	12/28/15 6:10	56.9
	DMA-2	Goddard near Harrison	5/31/15 8:30	0.5	6/2/15 23:55	8.8	12/29/15 0:20	1.3	12/28/15 15:15	4.5
	PD-2	Goddard Interceptor West of Inkster Road	5/31/15 10:15	8.6	6/2/15 23:55	20.9	12/29/15 1:30	7.9	12/28/15 15:50	16.4
	PD-1 (ADS)	Goddard Interceptor West of Allen Road	5/31/15 12:15	14.5	5/30/15 22:15	30.7	12/29/15 1:10	13.5	12/28/15 18:40	28.7
	PB-1	Northline Interceptor West of Fordline Road	5/31/15 9:15	6.0	5/30/15 13:40	9.0	12/29/15 0:00	4.8	12/28/15 6:25	6.8
	PA-4 (ADS)	Eureka Interceptor near Hannan Road	5/31/15 13:45	3.1	5/30/15 18:40	9.3	12/29/15 18:40	2.0	12/28/15 8:45	6.1
	DMA-1	Detroit Metropolitan Airport	5/31/15 19:40	1.3	5/29/15 13:30	2.8	12/29/15 15:00	1.0	12/28/15 0:00	2.1
	PA-3	Eureka Interceptor at Inkster Road	5/31/15 13:50	9.8	5/30/15 22:40	26.9	12/29/15 1:00	8.7	12/28/15 18:55	22.1
	PA-2	Eureka Interceptor at Allen Road	5/31/15 13:30	16.4	5/30/15 19:50	37.8	12/29/15 1:00	13.6	12/28/15 13:10	30.8
	PA-1	Eureka Interceptor West of Fordline Road	5/31/15 12:50	23.3	5/30/15 19:45	48.9	12/29/15 0:50	18.8	12/28/15 0:00	39.3
	P-2	Pennsylvania Interceptor East of Dix-Toledo Road	5/31/15 10:00	6.2	5/30/15 13:25	9.1	12/29/15 0:30	4.3	12/28/15 7:40	7.0
	P-1	Pennsylvania Interceptor East of Fort Street	5/31/15 14:25	86.9	5/30/15 16:20	188.0	12/29/15 1:20	74.1	12/28/15 18:35	154.5
	RV-1	Pennsylvania Interceptor West of Jefferson Avenue	5/31/15 9:40	22.0	5/30/15 12:15	19.5	12/29/15 0:05	16.5	12/28/15 0:00	14.9
Riverdrive (Controlled)	RR-1	River Rouge CSO Basin Outlet Jefferson North of Victoria	5/30/15 22:10	7.6	5/30/15 14:20	21.5	12/29/15 10:35	7.3	12/28/15 18:55	17.6
	EC-6	Riverdrive Interceptor South of Southfield Road	5/31/15 11:30	17.9	5/30/15 14:10	40.2	12/29/15 1:10	17.3	12/28/15 13:35	30.6
	RD-1	Riverdrive Interceptor North of Northline Road	5/31/15 12:55	48.3	5/30/15 14:20	152.8	12/29/15 0:45	46.7	12/28/15 0:00	136.5
	SW+SWB	Southgate-Wyandotte Connection	5/30/15 13:10	20.0	5/30/15 12:55	63.8	12/28/15 18:35	57.0	12/28/15 0:00	80.0
Tunnel Connection Meters	TSO	At Pelham Basin	5/31/15 14:00	12.5	5/29/15 8:00	7.7	12/28/15 22:30	0.1	12/28/15 0:00	0.0
	APO-1	Belmont and Rosedale	5/31/15 9:50	27.7	5/29/15 0:00	10.0	12/28/15 23:30	14.7	12/28/15 0:00	5.6
	APO-2	Belmont and Quandt	5/31/15 9:50	21.5	5/29/15 0:00	7.8	12/28/15 23:30	11.4	12/28/15 0:00	4.3
	CHPO	Pelham Road South of R.R.	5/31/15 10:00	8.8	5/29/15 0:00	8.9	12/29/15 0:05	8.3	12/28/15 0:00	5.9
	CPO	Pelham Road North of Haskell	5/31/15 10:05	8.5	5/29/15 0:00	2.0	12/29/15 0:10	6.8	12/28/15 0:00	1.2
	PDO	Allen Road and Goddard	-	-	-	-	-	-	-	-
	ER-2	Eureka Road and Inkster	5/31/15 15:55	1.0	5/29/15 18:30	0.4	12/29/15 12:25	0.0	12/28/15 0:00	0.0
	ER-1	Allen Road and Eureka Road	5/31/15 18:20	2.0	5/29/15 18:50	0.9	12/29/15 23:35	0.1	12/28/15 0:00	0.0
	PM-1	Pennsylvania Ave. at Fordline	-	-	-	-	-	-	-	-
DWTF	IPS+TPS	DWTF Influent	5/31/15 14:10	218.8	5/30/15 16:40	486.8	12/29/15 1:25	186.6	12/28/15 8:25	433.0

Notes:

1) Meter APO-1 data was estimated as [APO-1] = 1.29 x [APO-2].

Table D-4
Downriver Sewage Disposal System
Peak Hydraulic Grade Lines for Significant Storm Events

System	Meter	Location	Rim Elevation (ft)	Invert Elevation (ft)	Diameter (ft)	Major Storm Event A May 29 - June 2, 2015 2.50 inches				Major Storm Event B December 28-29, 2015 1.28 inches			
						Date/Time of Occurrence	Peak Depth (ft)	Peak HGL (ft)		Date/Time of Occurrence	Peak Depth (ft)	Peak HGL (ft)	
Tunnel (Non-Controlled)	PC-1	Pelham Interceptor North of Goddard Road	601.95	564.96	4.5	5/31/15 12:40	4.2	569.1	○	12/29/15 0:50	3.9	568.9	○
	PD-2	Goddard Interceptor West of Inkster Road	623.35	598.32	4.5	5/31/15 10:50	1.7	600.0	○	12/29/15 2:10	1.6	599.9	○
	PD-1	Goddard Interceptor West of Allen Road	602.25	575.55	4.0	5/31/15 12:45	2.0	577.5	○	12/29/15 1:30	1.9	577.5	○
	PB-1	Northline Interceptor West of Fordline Road	596.15	569.55	3.0	5/31/15 9:35	1.8	571.3	○	12/29/15 0:30	1.6	571.1	○
	PA-4	Eureka Interceptor near Hannan Road	656.95	635.14	3.5	5/31/15 14:05	1.3	636.4	○	12/29/15 19:45	1.2	636.4	○
	PA-3	Eureka Interceptor at Inkster Road	622.65	601.02	3.5	5/31/15 15:00	1.9	602.9	○	12/29/15 1:35	1.8	602.8	○
	PA-2	Eureka Interceptor at Allen Road	601.55	576.18	4.0	5/31/15 13:40	3.0	579.2	○	12/29/15 1:35	2.6	578.7	○
	PA-1	Eureka Interceptor West of Fordline Road	594.95	570.40	4.0	5/31/15 11:45	2.7	573.1	○	12/29/15 1:25	2.3	572.7	○
	P-2	Pennsylvania Interceptor East of Dix-Toledo Road	598.95	577.35	3.0	5/31/15 10:25	1.8	579.1	○	12/29/15 0:55	1.3	578.7	○
	P-1	Pennsylvania Interceptor East of Fort Street	591.45	545.45	6.5	5/31/15 12:35	6.7	552.1	◉	12/29/15 1:50	5.5	551.0	○
	RV-1	Pennsylvania Interceptor West of Jefferson Avenue	578.33	544.07	3.5	5/31/15 12:10	4.2	548.3	◉	12/29/15 0:55	3.9	548.0	◉
Riverdrive (Controlled)	RR-1	Riverdrive Interceptor South of Visger Road	582.25	566.21	3.0	5/31/15 13:25	7.8	574.0	◉	12/29/15 1:10	6.8	573.0	◉
	EC-6	Riverdrive Interceptor South of Southfield Road	579.35	554.54	4.5	5/31/15 12:40	12.8	567.3	◉	12/29/15 0:00	11.5	566.1	◉
	RD-1	Riverdrive Interceptor North of Northline Road	577.85	550.66	6.0	5/31/15 12:30	9.9	560.5	◉	12/29/15 1:00	9.6	560.2	◉
	SW	On Southgate-Wyandotte Connection	578.00	538.00	6.5	5/31/15 12:15	10.4	548.4	◉	12/28/15 22:55	11.0	549.0	◉
Tunnel Connection Meters	TSO	Connection to Tunnel at Pelham Basin	609.16	585.34	4.0	5/31/15 14:40	1.9	587.3	○	12/29/15 4:55	0.3	585.7	○
	APO-1	Allen Park Overflow at Belmont Road and Rosedale Road	594.56	565.46	3.0	5/31/15 12:25	10.2	575.7	◉	12/29/15 0:20	10.2	575.7	◉
	APO-2	Allen Park Overflow at Belmont Road and Quandt Road	597.16	571.00	3.0	5/31/15 10:15	4.4	575.4	◉	12/28/15 23:45	4.0	575.0	◉
	CHPO	Pelham Interceptor South of R.R.	602.96	566.46	4.5	5/31/15 10:10	4.3	570.7	○	12/29/15 0:20	4.2	570.7	○
	CPO	Pelham Interceptor North of Haskell Road	601.46	568.00	4.5	5/31/15 10:30	4.4	572.4	○	12/29/15 0:30	4.3	572.3	○
	PDO	Goddard Interceptor at Allen Road	601.96	569.97	4.0	5/31/15 7:45	1.7	571.6	○	12/28/15 17:00	0.8	570.8	○
	ER-2	Eureka Relief Sewer Extention on Eureka Road at Inkster	623.73	591.48	4.5	5/31/15 16:45	0.7	592.1	○	12/29/15 14:30	0.3	591.8	○
	ER-1	Eureka Relief Sewer at Allen Road	602.81	560.47	4.5	5/31/15 18:45	0.5	561.0	○	12/29/15 23:50	0.2	560.6	○
	PM-1	Pennsylvania Interceptor at Fordline Road	593.06	548.92	6.5	5/31/15 13:45	5.4	554.4	○	12/29/15 1:45	4.1	553.0	○
Tunnel Level Sensors	L-3	Allen and I-75 (North)	602.56	543.04	7.0	5/31/15 15:15	5.3	548.4	○	12/29/15 2:45	2.8	545.8	○
	L-5	Pelham and Champaign	601.35	546.84	7.0	5/31/15 12:15	10.0	556.9	⊘	12/29/15 1:45	4.3	551.1	○
	L-7	Rosedale and Belmont	593.21	552.86	6.5	5/31/15 14:30	10.0	562.9	⊘	12/28/15 23:45	9.4	562.2	◉
	L-8	Pennsylvania Ave. at Fordline	592.21	537.49	7.5	5/31/15 15:00	4.8	542.2	○	12/29/15 3:30	2.6	540.1	○
DWTF	IPS	Main Influent Pump Station Wet Well	-	528.46	NA	6/1/15 5:35	15.5	544.0	○	12/29/15 2:20	15.4	543.9	○
	TPS	Tunnel Pump Station Wet Well	-	524.71	NA	5/31/15 16:00	18.1	542.8	○	12/30/15 18:00	14.3	539.0	○

Notes:

1) Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

Key

Within sewer: ○
Surcharging sewer, grade elevation unknown: ⊗
Surcharging sewer, surcharging level exceeded top of range for level sensor: ⊘
Surcharging sewer, grade elevation known: ◉
Above grade: ●
Data not available: -

Figure D-1
Downriver Wastewater Treatment Facility
Major Storm Event A - 5/29/2015 - 6/2/2015

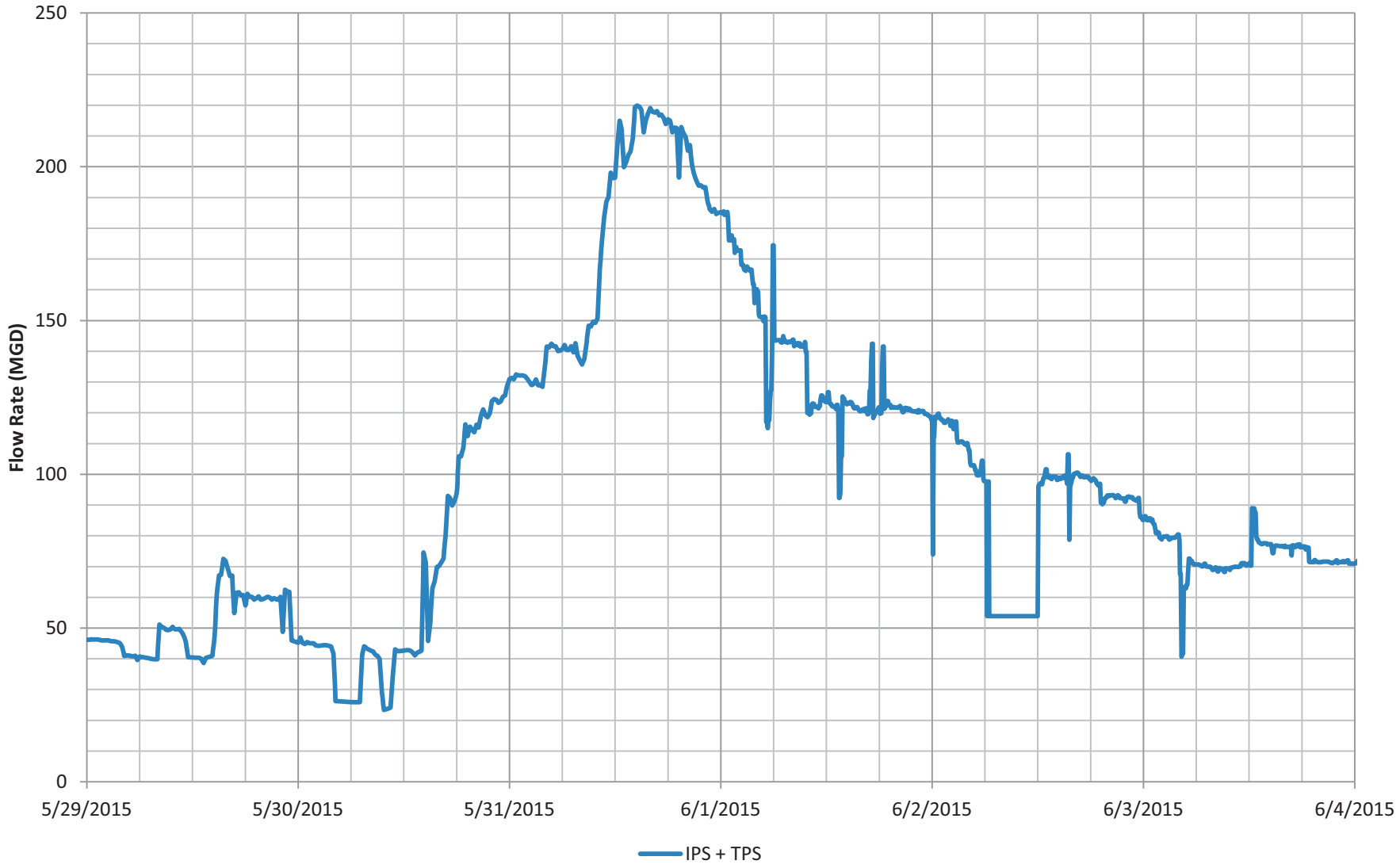


Figure D-2
Riverdrive Interceptor
Major Storm Event A - 5/29/2015 - 6/2/2015

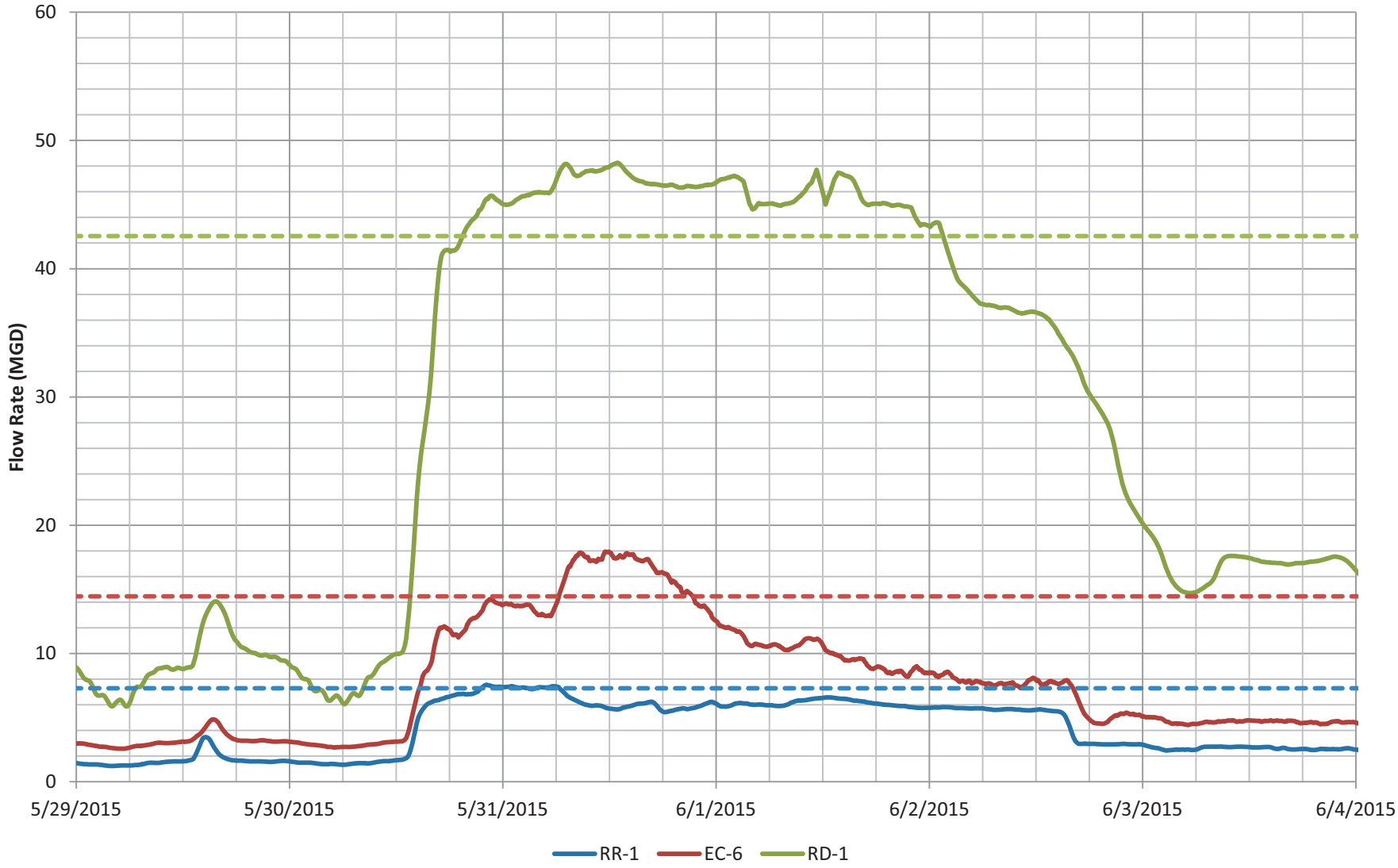


Figure D-3
Riverdrive Interceptor
Major Storm Event A - 5/29/2015 - 6/2/2015

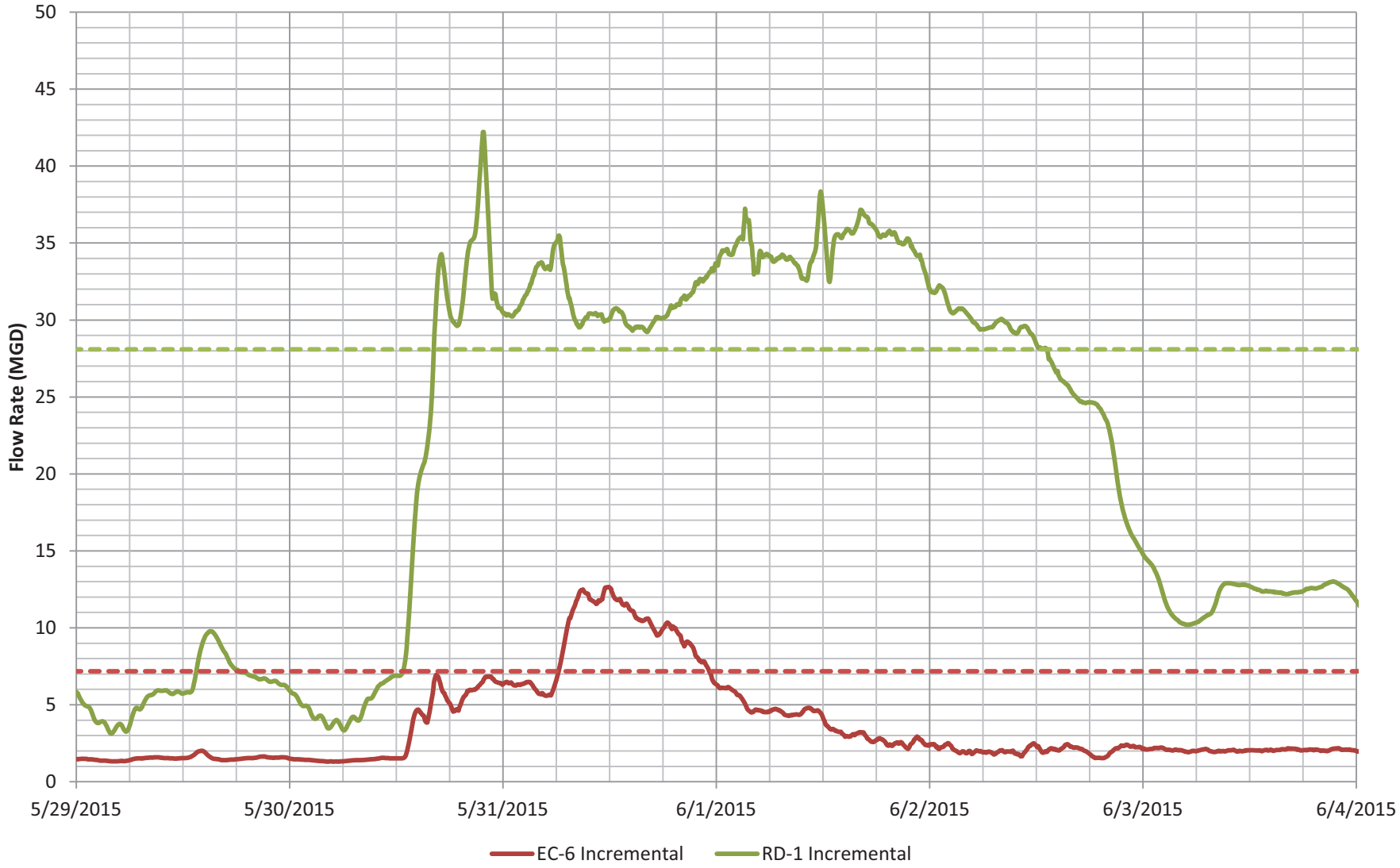


Figure D-4
SWRDDD Connection
Major Storm Event A - 5/29/2015 - 6/2/2015

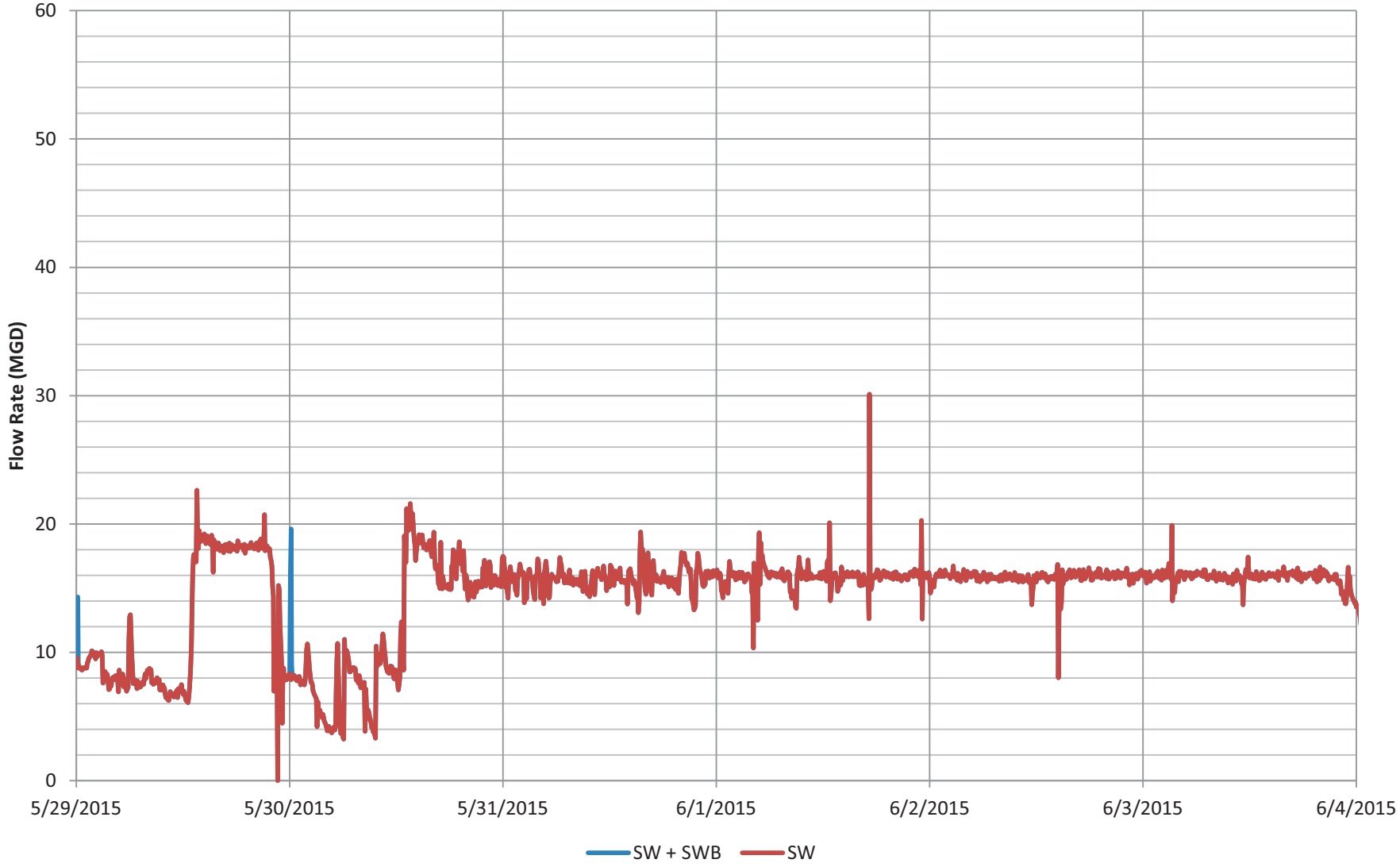


Figure D-5
Downriver Wastewater Treatment Facility
Major Storm Event B - 12/28-29/2015

Figure D-6
Riverdrive Interceptor
Major Storm Event B - 12/28-29/2015

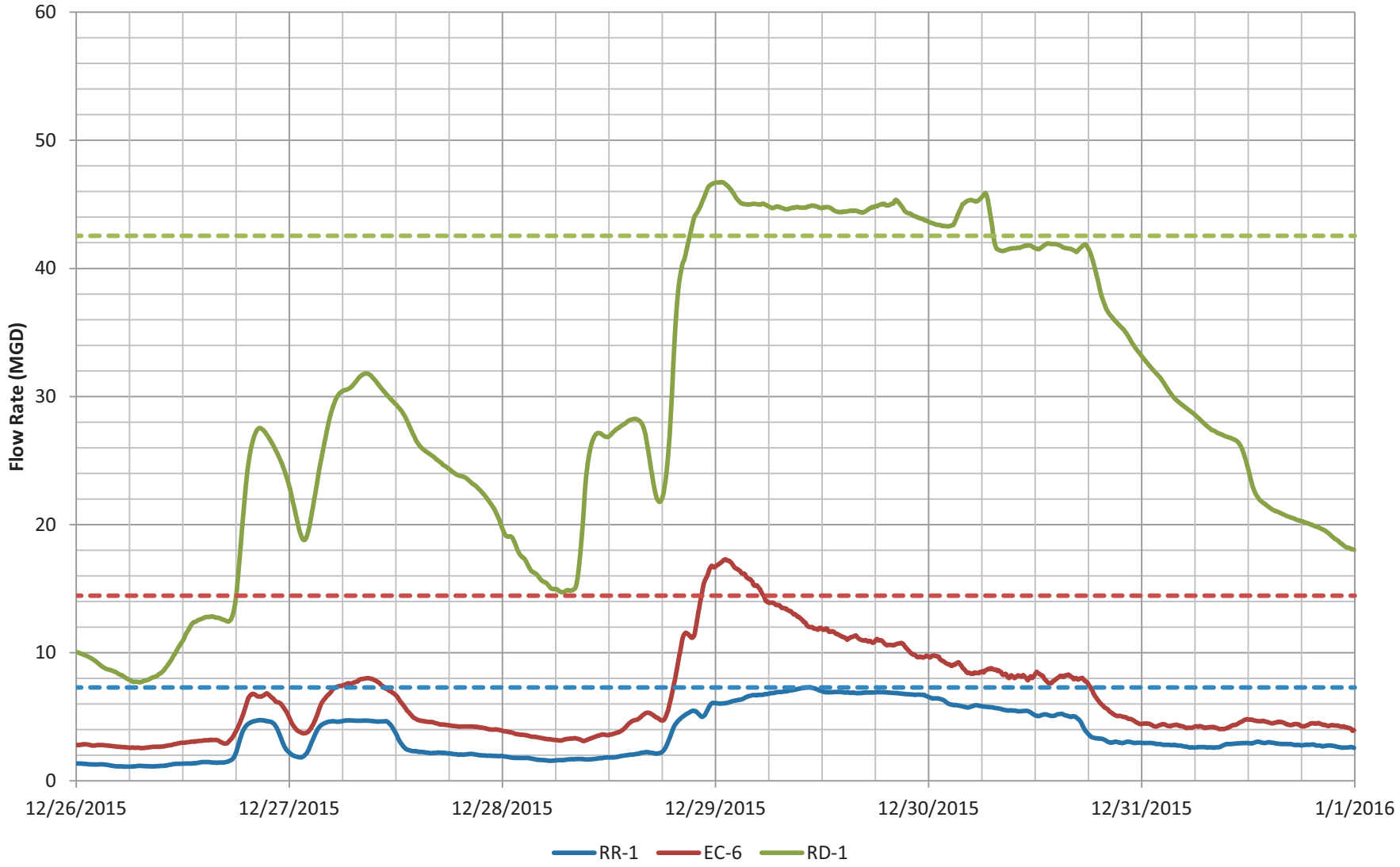


Figure D-7
Riverdrive Interceptor
Major Storm Event B - 12/28-29/2015

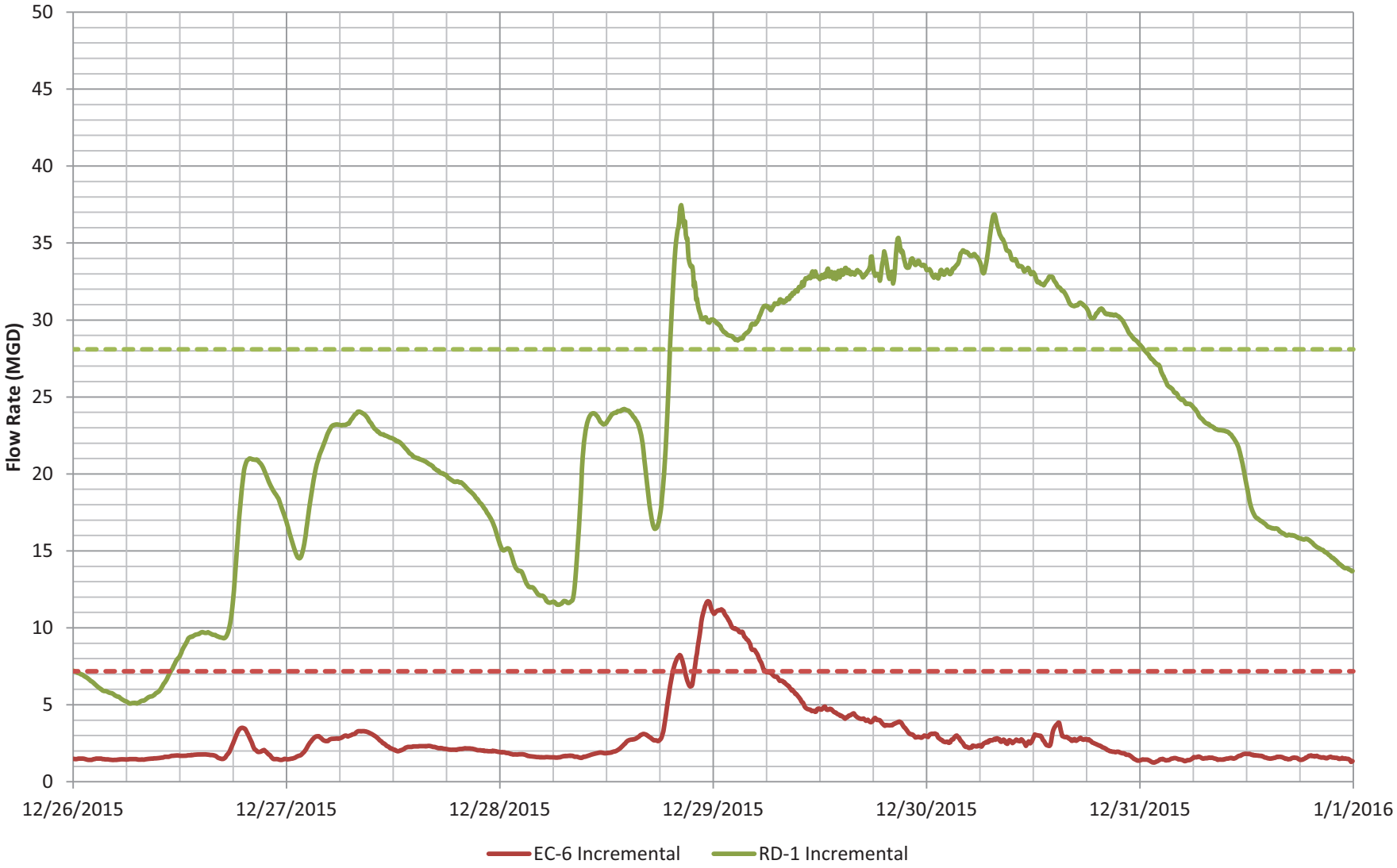


Figure D-8
SWRDDD Connection
Major Storm Event B - 12/28-29/2015

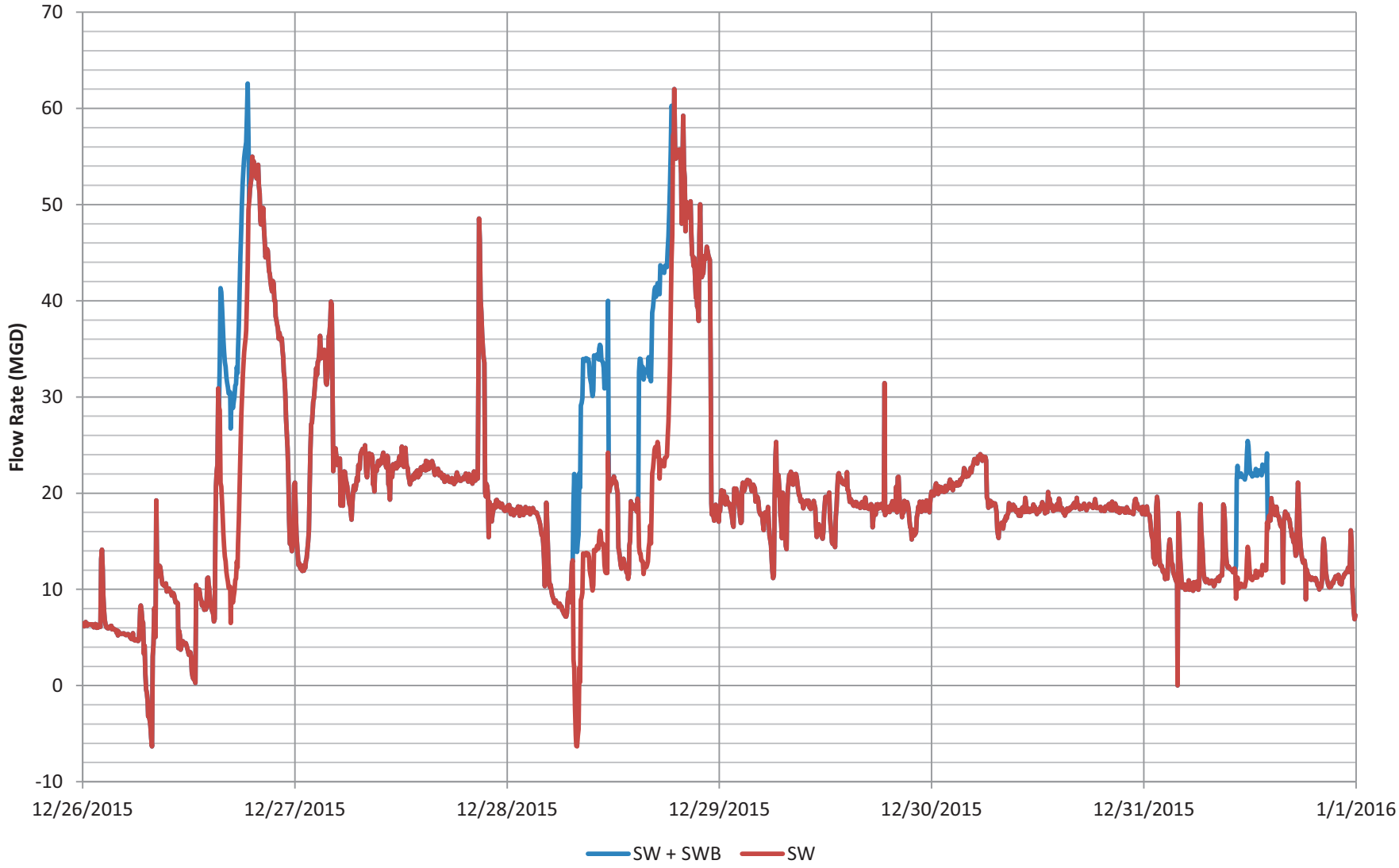
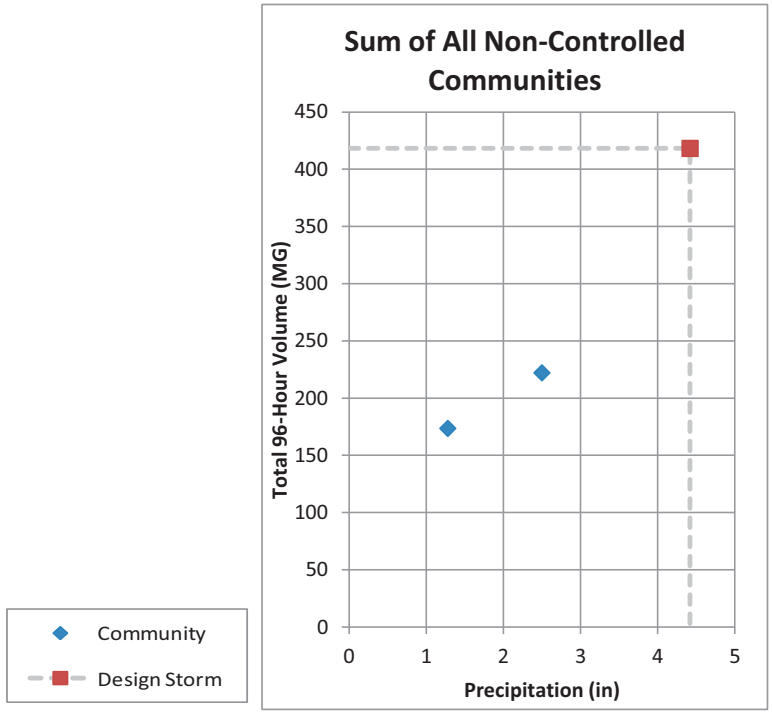


Figure D-9
Downriver Sewage Disposal System
Total 96-Hour Volume and Precipitation for Major Storm Events Summarized by Community for 2015

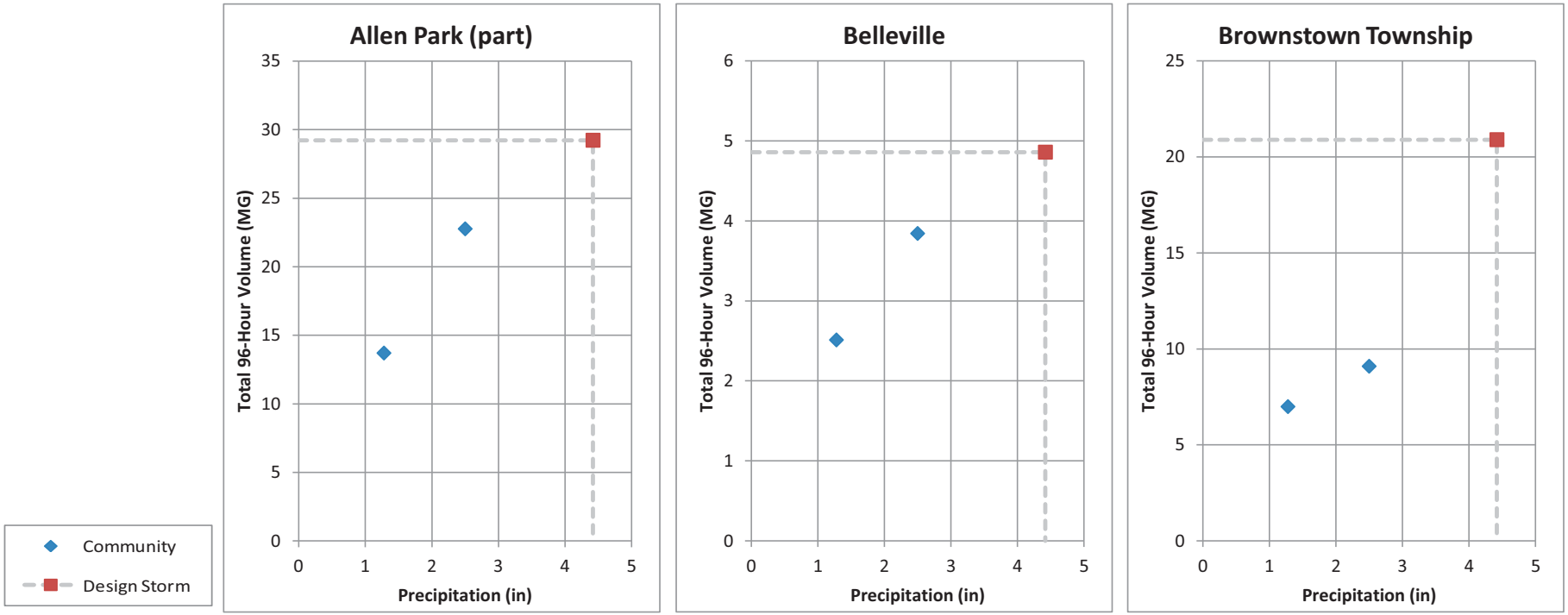


2015 Major Storm Event	Sum of All Non-Controlled Communities	
	DTW Precipitation (in)	96-hour Volume (MG)
A	2.50	222.10
B	1.28	173.53
Design Storm	4.42	418.21

Notes

1. A Major storm event has a peak 24 hour rainfall depth of at least 0.5 inches, an event total of at least 1.0 inch, and the peak hourly flow rate at DWTF reaches or exceeds 175 MGD.
2. The 4.42 inch storm event used in the design of the Downriver Regional Storage and Transport System.

Figure D-10
Downriver Sewage Disposal System
Total 96-Hour Volume and Precipitation for Major Storm Events Summarized by Community for 2015

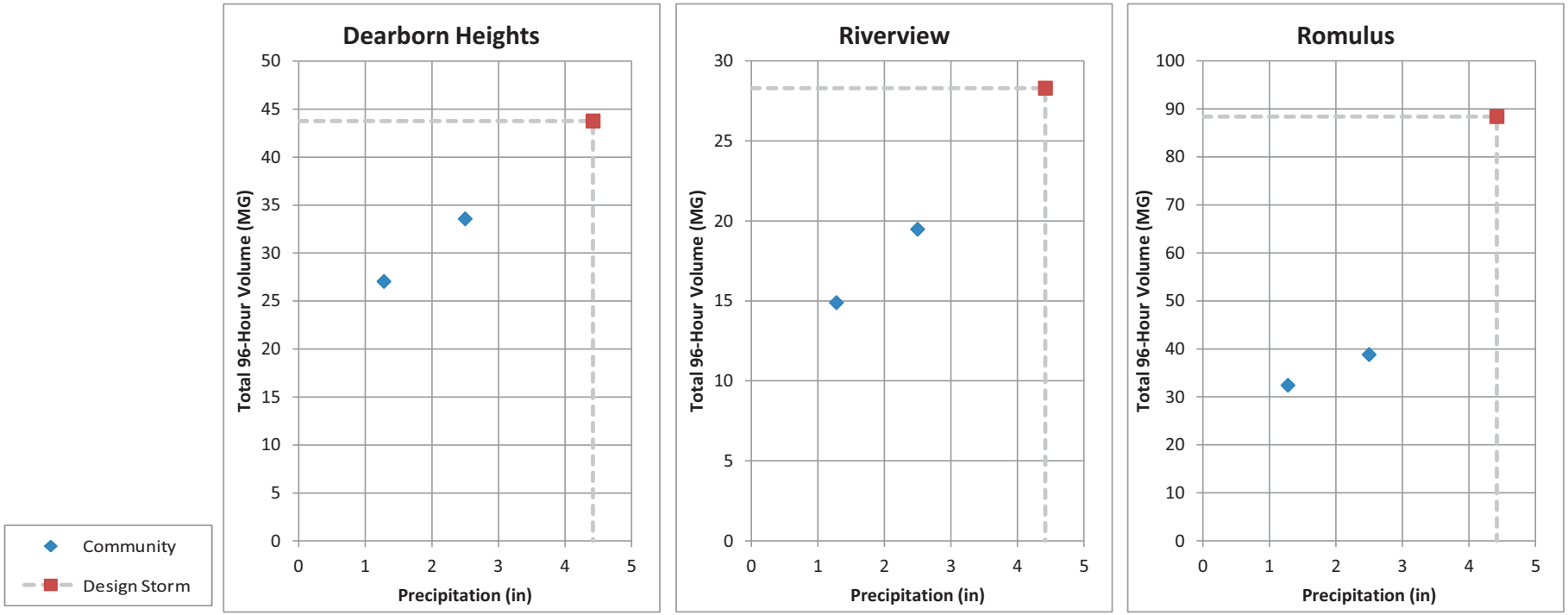


2015 Major Storm Event	Allen Park (part)		Belleville		Brownstown Township	
	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)
A	2.50	22.77	2.50	3.84	2.50	9.10
B	1.28	13.71	1.28	2.51	1.28	6.99
Design Storm	4.42	29.23	4.42	4.86	4.42	20.90

Notes

1. A Major storm event has a peak 24 hour rainfall depth of at least 0.5 inches, an event total of at least 1.0 inch, and the peak hourly flow rate at DWTF reaches or exceeds 175 MGD.
2. The 4.42 inch storm event used in the design of the Downriver Regional Storage and Transport System.

Figure D-11
Downriver Sewage Disposal System
Total 96-Hour Volume and Precipitation for Major Storm Events Summarized by Community for 2015

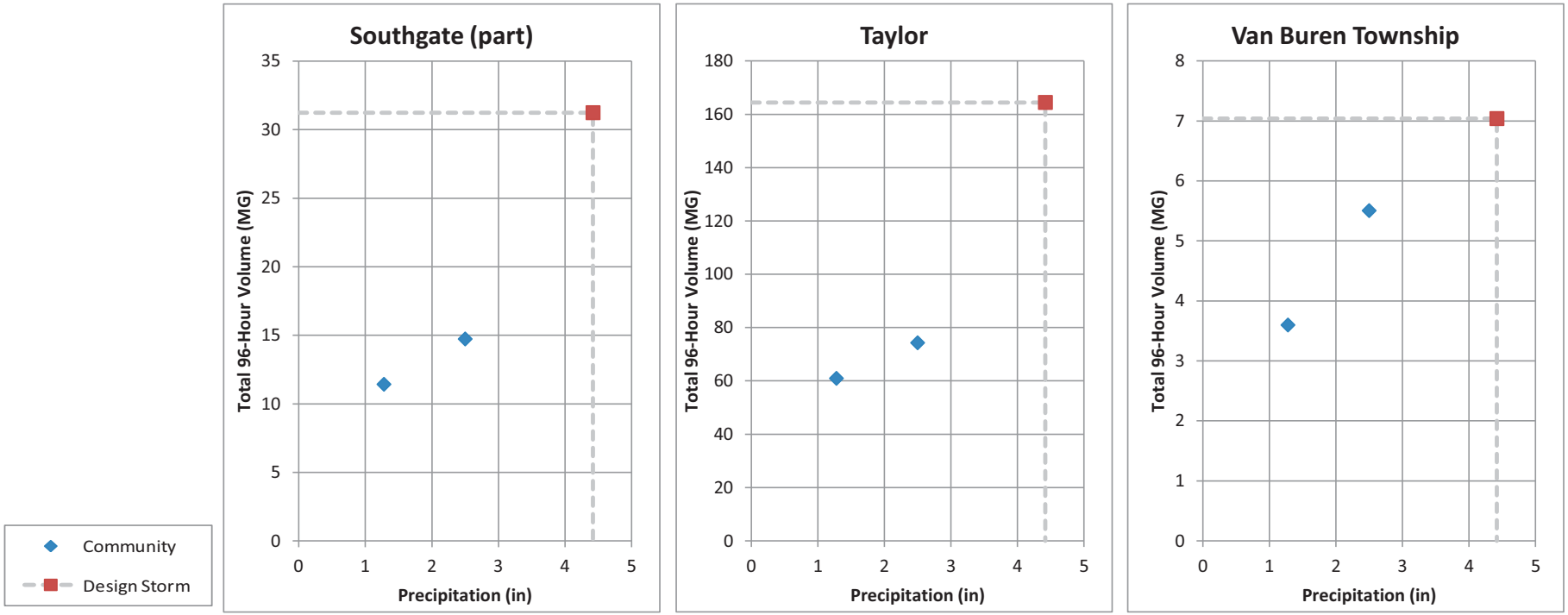


2015 Major Storm Event	Dearborn Heights		Riverview		Romulus	
	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)
A	2.50	33.56	2.50	19.48	2.50	38.82
B	1.28	27.04	1.28	14.89	1.28	32.41
Design Storm	4.42	43.76	4.42	28.30	4.42	88.43

Notes

1. A Major storm event has a peak 24 hour rainfall depth of at least 0.5 inches, an event total of at least 1.0 inch, and the peak hourly flow rate at DWTF reaches or exceeds 175 MGD.
2. The 4.42 inch storm event used in the design of the Downriver Regional Storage and Transport System.

Figure D-12
Downriver Sewage Disposal System
Total 96-Hour Volume and Precipitation for Major Storm Events Summarized by Community for 2015



2015 Major Storm Event	Southgate (part)		Taylor		Van Buren Township	
	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)	DTW Precipitation (in)	96-hour Volume (MG)
A	2.50	14.73	2.50	74.29	2.50	5.51
B	1.28	11.43	1.28	60.95	1.28	3.60
Design Storm	4.42	31.24	4.42	164.45	4.42	7.04

Notes

1. A Major storm event has a peak 24 hour rainfall depth of at least 0.5 inches, an event total of at least 1.0 inch, and the peak hourly flow rate at DWTF reaches or exceeds 175 MGD.
2. The 4.42 inch storm event used in the design of the Downriver Regional Storage and Transport System.