The City of JACKSON

Sewershed Prioritization Report

Department of Public Works
Wastewater Infrastructure Redevelopment Program

February 17, 2017

Approved-

February 7, 2018

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

FEB 07 2018

CERTIFIED MAIL 7017 1450 0000 7913 1275
RETURN RECEIPT REQUESTED

City of Jackson
c/o Mr. Robert Miller
Director
Department of Public Works
P.O. Box 17
Jackson, Mississippi 39205-0015

Re: Sewershed Prioritization Report
City of Jackson, Mississippi Consent Decree
Case No.: 3:12-cv-790 TSL-JMR

Dear Mr. Miller:

The U.S. Environmental Protection Agency Region 4 and the Mississippi Department of Environmental Quality has reviewed, and hereby approves, the City of Jackson's (the City) Sewershed Prioritization Report, dated February 17, 2017.

If you have any questions, please contact Mr. Brad Ammons at (404) 562-9769 or via email at ammons.brad@epa.gov or Mr. Dennis Sayre at (404) 562-9756 or via email at sayre.dennis@epa.gov.

Sincerely,

Maurice L. Horsey, IV, Chief
Municipal & Industrial Enforcement Section
NPDES Permitting & Enforcement Branch

cc: Mr. Les Herrington, P.E.
Mississippi Department of Environmental Quality

Mr. Terry Williamson
City of Jackson

Department of Public Works

200 South President Street
Post Office Box 17
Jackson, Mississippi 39205-0017

February 16, 2017

Chief, Environmental Enforcement Section
Environment and National Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, DC 20044-7611
Re: DOJ No. 90-5-1-1-09841

Brad Ammons
Environmental Engineer
Clean Water Enforcement Branch
Municipal & Industrial Enforcement Section
U.W. EPA Region 4
61 Forsyth St., S.W.
Atlanta, GA 30303

Karl Fingerhood
Environmental Enforcement Section
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, DC 20044-7611

RE: City of Jackson, Mississippi, EPA Consent Decree
Wastewater Infrastructure Redevelopment Program
Sewershed Prioritization Report

Dear Gentlemen,

Please find enclosed the Sewershed Prioritization Report being submitted by the City of Jackson for your review, comment, and approval. Pursuant to the Consent Decree, this report has a required submittal date no later than February 17, 2017.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Thank you for your participation and cooperation in this important program. If you have any questions, please contact me at (601)960-2091 or jsmash@jacksonms.gov.

Sincerely,

Jerriot Smash
Interim Director, Department of Public Works

cc: Les Herrington, P.E., Mississippi Department of Environmental Quality
Tony T. Yarber, Mayor, City of Jackson
Monica Joiner, City Attorney, City of Jackson
Marshand Crisler, Acting Chief Administrative Office, City of Jackson
Terry Williamson, Consent Decree Manager, City of Jackson
Public Depository, Eudora Welty Public Library

City of Jackson
Department of Public Works
Wastewater Infrastructure Redevelopment Program

Sewershed Prioritization Report

February 17, 2017

Department of Public Works
200 South President Street
P.O. Box 17
Jackson, MS 39205-0017

Sewershed Prioritization Report

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<u>Appendix</u>

1.0 Introduction

On March 1, 2013, the City of Jackson, Mississippi entered into a Consent Decree with U.S. EPA, U.S. D.O.J., and the Mississippi Department of Environmental Quality (MDEQ) to address inadequacies of the City's wastewater collection and transportation system (WCTS). This ***Sewershed Prioritization Report*** fulfills some requirements set forth in Consent Decree §25. The report describes the results of the completed sewershed evaluation activities performed pursuant to the approved ***Sewershed Evaluation Plan.*** It also provides a ranking of the sewersheds in terms of infiltration/inflow (I/I) severity and other factors following the procedure set forth in the approved ***Sewershed Prioritization Work Plan***.

1.1 Consent Decree Requirements

As stated in the Consent Decree, the Sewershed Prioritization Report shall contain the following, at a minimum:

1. The results of flow monitoring conducted pursuant to the Prioritization Work Plan and estimates of the severity of I/I within each Sewershed.
2. The computerized digital map of the Sewer System.
3. The results of the capacity assessment of the WCTS.
4. The results of the Hydraulic Model.
5. The results of applying to each Sewershed the prioritization criteria approved in the Prioritization Work Plan.
6. An organization of the Sewersheds into three (3) Sewer Groups, based upon the severity of I/I, and other criteria set forth in Sewershed Prioritization Work Plan, with the most severe being prioritized into Sewer Group 1. In addition, the Sewersheds in Group 1 shall contain at a minimum at least 30% of the estimate of total I/I within all the Sewersheds, and the Sewersheds in Group 2 shall contain at a minimum at least 40% of the estimate of total I/I within all the Sewersheds. The Prioritization Report shall also include a schedule for the Sewersheds in the Sewer Groups to be evaluated in accordance with the Sewershed Evaluation Plan, including beginning and completion dates; provided, however, that such schedule shall provide for all Sewersheds in Group 1 to be evaluated within sixty-three (63) months after the Date of Entry of the Consent Decree and all Sewersheds in Group 2 be evaluated within one hundred forty-one (141) months after the Date of Entry of the Consent Decree.

Upon approval by EPA of the Sewershed Prioritization Report, the City shall evaluate the Sewersheds in accordance with the Sewershed Evaluation Plan as approved by EPA and the prioritized schedule for the Sewersheds as set forth in the approved Prioritization Report.

1.2 Digital Mapping

A detailed digital map of the City of Jackson sewer system has been developed as required by the Consent Decree. The digital map was prepared using ArcMap 9.3 by ESRI. A copy of the City of Jackson digital sewer map is provided on a CD furnished with this report.

To develop digital maps of the Jackson wastewater collection and transportation system, boundaries were defined for each of the City's 15 sewer basins. All pipes 12-in diameter and larger, additional pipes required for the hydraulic model, manholes associated with these pipes, and all pump stations and force mains were entered into the geodatabase. Map connectivity between adjacent basins and general flow direction were confirmed, and the City's 98 pump stations are included. The majority of the manholes shown were located using as built drawings, field GPS coordinates and other available information. Field survey will be performed on manholes and pipes to confirm connectivity, top elevations, and flow lines where needed for the hydraulic model. The completed mapping system will be utilized to complete the hydraulic model network.

1.3 Hydraulic Model

A detailed hydraulic model of the City of Jackson sewer system is still under development and expected to be completed by the end of 2017. Therefore, sewershed prioritization was based on extensive flow monitoring results obtained from 46 temporary flow meters within the sewersheds and 31 permanent flow meters spaced along the West Bank Interceptor. An Addendum to this report will be issued when the hydraulic model is completed. The Addendum will contain the capacity assessment of the WCTS as determined from model simulations. Any revisions to the sewershed prioritization rankings based on the modeling results, if needed, will be provided as part of the Addendum.

The following components of the wastewater collection and transportation system will be incorporated into the hydraulic computer model:

- West Bank Interceptor
- Major gravity sewers (12-in diameter and greater, all manholes, and any pipe connecting to a pump station)
- All pump stations
- All force mains

Two requirements of the hydraulic model are that it must identify capacity issues and it must include all major gravity lines. For the City of Jackson, major gravity lines are considered pipes that are 12-in diameter and larger. Problems that occur with the smaller lines are primarily maintenance related as opposed to capacity related. When capacity issues are resolved in the 12-in and larger lines, then most of the capacity related problems in the system will be addressed. With the smaller sewer lines representing about 75% of the collection system, only about 25% of the system must be modeled to identify capacity issues.

1.4 Prioritization Report Elements

An overview of the City of Jackson Wastewater Collection and Transmission System (WCTS) is provided in Section 2 together with a description of the wastewater flow and rainfall monitoring program conducted within the sewersheds. Results of the infiltration/inflow evaluation based on the monitoring data are presented in Section 3. The capacity assessment of the WCTS based on existing information is provided in Section 4. Section 5 provides the sewershed prioritization for further evaluation based on the I/I study results and other factors as described in the ***Sewershed Prioritization Work Plan***. The schedule for implementing the ***Sewershed Prioritization Report*** and evaluating the individual sewersheds is provided in Section 6. A copy of the City of Jackson digital sewer map is provided on a CD furnished with this report.

2.0 Sewershed Flow and Rainfall Monitoring

This Section describes the wastewater flow and rainfall data collection activities performed within the Jackson sewersheds. The collected data were used to determine relative levels of dry weather and wet weather infiltration/inflow within each individual sewershed.

2.1 Jackson Sewer Basins

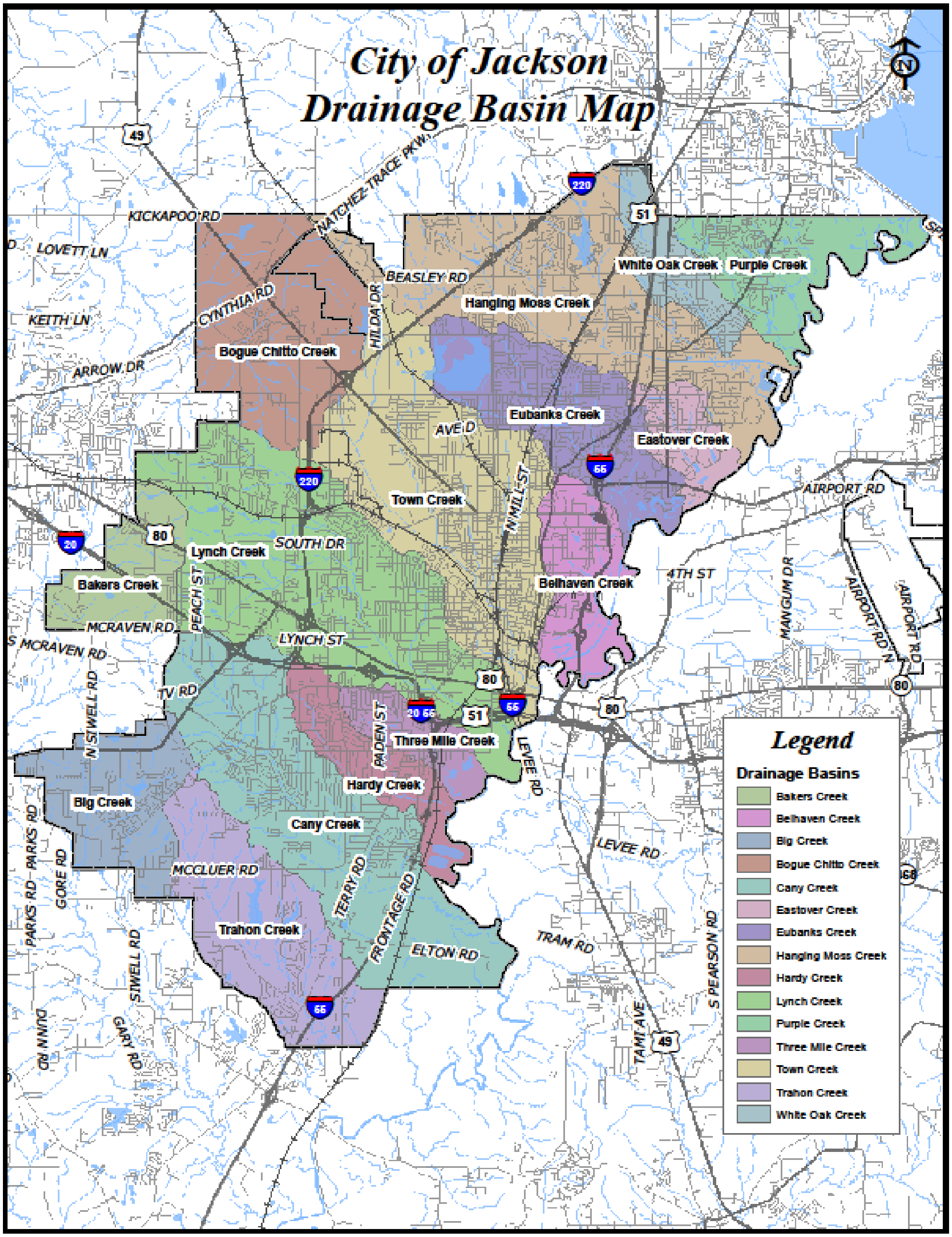
The topography of the area around the City of Jackson is interesting in that a ridge on the west side of Jackson diverts general surface water drainage to either the Big Black River, which flows to the Mississippi River, or the Pearl River, which flows to the Gulf of Mexico. Within the City of Jackson, most surface streams flow in a general southeast direction to the Pearl River. A list of the Jackson sewer basins and drainage points is provided on **Table 2-1**.

Table 2-1
City of Jackson Sewer Basins

Sewer Basin		Label	Drainage	Discharge Point
Savanna WWTP				
1	**Purple Creek**	PL	Pearl River	West Bank Interceptor
2	**White Oak Creek**	WO	Pearl River	West Bank Interceptor
3	**Hanging Moss Creek**	HM	Pearl River	West Bank Interceptor
4	**Eastover Creek**	EA	Pearl River	West Bank Interceptor
5	**Eubanks Creek**	EU	Pearl River	West Bank Interceptor
6	**Belhaven Creek**	BH	Pearl River	West Bank Interceptor
7	**Town Creek**	TN	Pearl River	West Bank Interceptor
8	**Bakers Creek**	LY	Pearl River	Lynch Creek Basin
9	**Lynch Creek**	LY	Pearl River	West Bank Interceptor
10	**Three Mile Creek**	TM	Pearl River	West Bank Interceptor
11	**Hardy Creek**	HC	Pearl River	West Bank Interceptor
12	**Cany Creek**	CY	Pearl River	Savanna WWTP
Trahon WWTP				
13	**Big Creek**	TR	Pearl River	Trahon Creek Basin
14	**Trahon Creek**	TR	Pearl River	Trahon WWTP
Presidential Hills WWTP				
15	**Bogue Chitto Creek**	BC	Big Black River	Presidential Hills WWTP

Wastewater from Basins 1-11 flow into the West Bank Interceptor and then to the Savanna Wastewater Treatment Plant (WWTP) in South Jackson which discharges to the Pearl River. The Trahon and Big Creek basins flow to the Trahon WWTP which discharges into the Pearl River further south. Two westerly Jackson drainage basins, Bogue Chitto Creek and Bakers Creek, drain to the Big Black River. The Bogue Chitto basin is served by the Presidential Hills WWTP. Bakers Creek sewer basin flows are pumped into the Lynch Creek basin and then flow to the West Bank Interceptor. A map of the Jackson sewer basins is shown on **Figure 2-1**.

Figure 2-1
City of Jackson Sewer Basins



2.2 Wastewater Flow Characterization

A wastewater flow and rainfall monitoring program was conducted to gather data necessary to identify the relative contribution of infiltration and inflow from each sewershed. In this context, a sewershed is defined as a smaller drainage area within one of the larger sewer basins shown in **Figure 2-1**. A total of 46 sewersheds were defined within the 15 Jackson sewer basins for measurement of discrete flows. The flow and rainfall monitoring data collected were used to characterize dry weather and wet weather flow conditions for each sewershed, evaluate key sewer system performance indicators, and rank the relative severity of observed rain-dependent inflow and infiltration (RDII) to prioritize the sewersheds for further evaluation and rehabilitation.

Two separate wastewater flow and rainfall monitoring programs were conducted. These were:

1. Temporary Flow Monitoring – A total of 46 meters and 4 rain gauges were distributed throughout the city to measure wastewater flow from each of the designated sewersheds. The meters were installed and operated by ADS Environmental Services, Inc. Data was collected for the period September 10, 2014 to January 25, 2015 (138 days).

2. Permanent Flow Monitoring – A total of 31 flow meters and 4 rain gauges were installed along the West Bank Interceptor (WBI) to measure flow entering the WBI from each sewer basin as well as at key points within the interceptor. The meters were installed by CSL Services, Inc. who continues to operate and maintain the meters. Monitoring commenced on April 1, 2014 and the meters are still in operation. Although the primary purpose of this metering was to characterize flows in the WBI, the data was also used in the sewershed prioritization analysis.

A map of the flow meter locations is shown on **Figure 2-2**. A map showing the boundaries of the individual sewersheds is provided on **Figure 2-3**. For each of the sewershed monitoring points, **Table 2-2** provides the assigned label, manhole designation of the meter location, pipe size, total length of gravity sewer within each sewershed, and metering point location. A schematic showing the upstream and downstream relationship between each flow monitor is provided on **Figure 2-4**, with permanent flow meters shown in grey and temporary flow meters shown in blue. The vertical line in **Figure 2-4** represents the West Bank Interceptor adjacent to the Pearl River. The northern terminus of the WBI is at the Jackson city limit where flow is received from East Madison County Sewage Disposal System, one of the Jackson wastewater system regional partners. The southern terminus of the WBI is the Savanna WWTP.

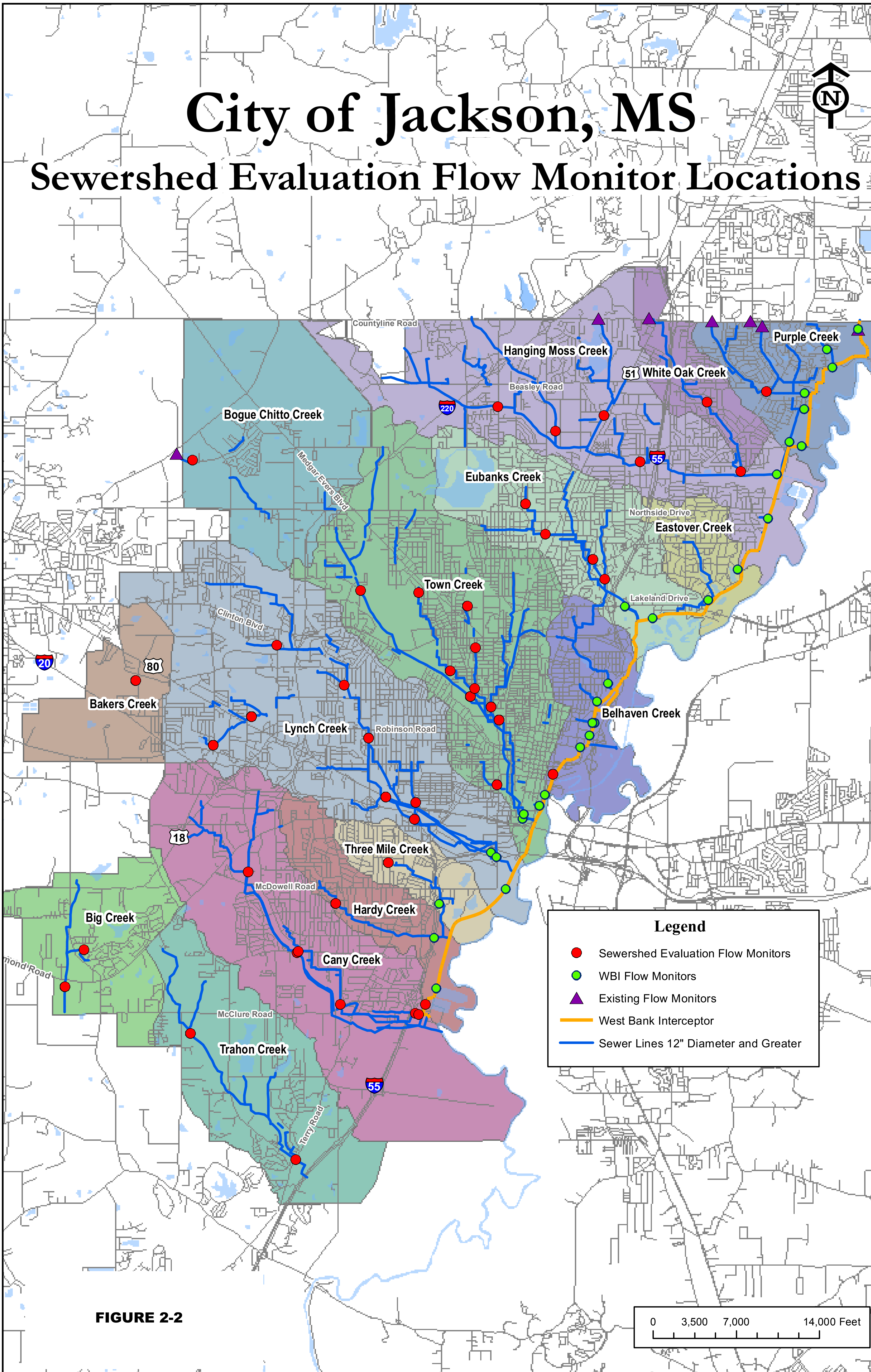
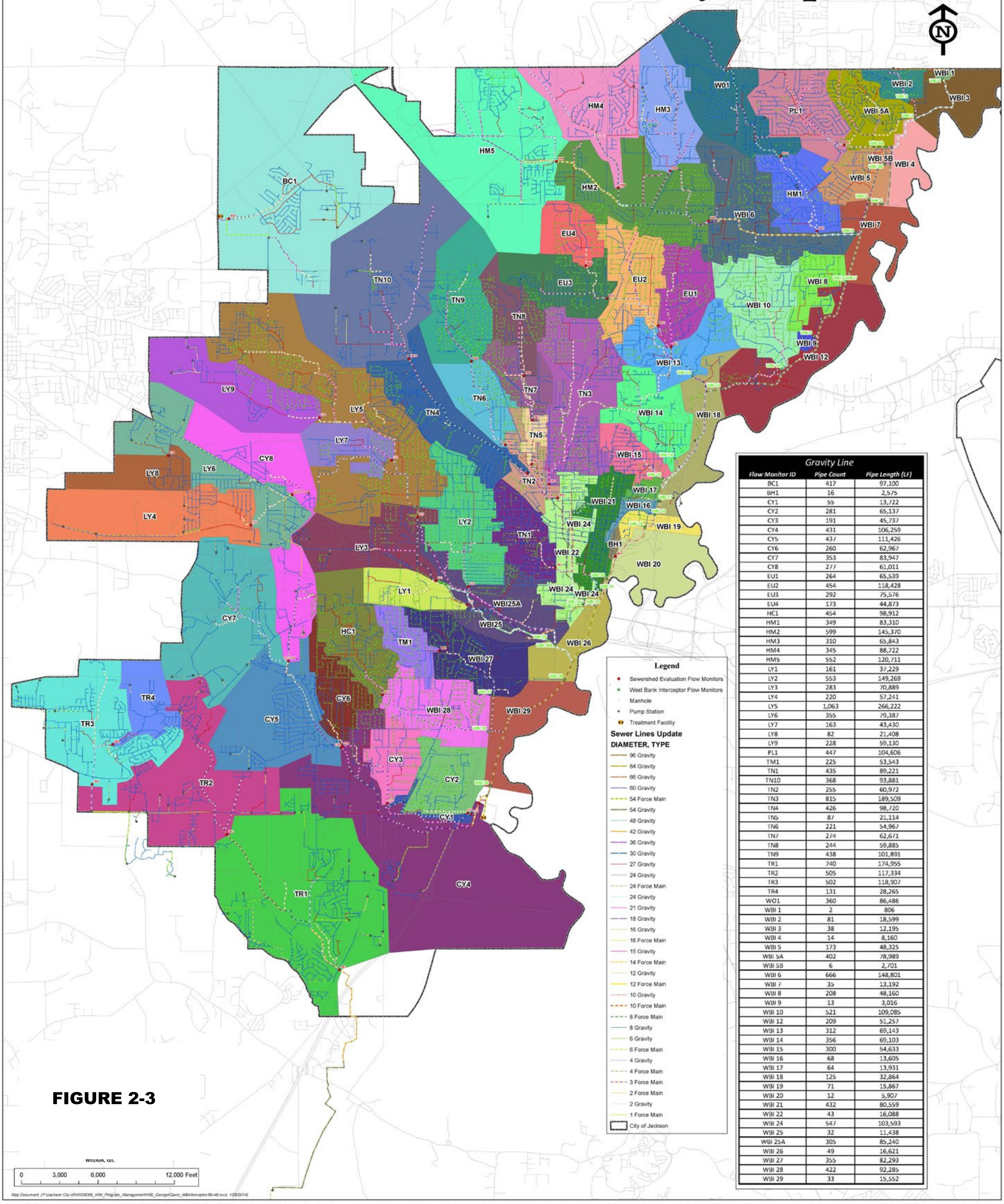


FIGURE 2-2

Map Document: (P:\Jackson City of\W009088_WW_Program_Management\WB_George\Qann_SewerShed_flowmonitor11x17.mxd) 1/23/2014

City of Jackson, MS
Flow Monitor Boundary Map



Gravity Line		
Flow Monitor ID	Pipe Count	Pipe Length (LF)
BC1	417	97,100
BH1	16	2,575
CY1	55	13,722
CY2	281	65,137
CY3	191	45,737
CY4	431	106,259
CY5	437	111,426
CY6	260	62,967
CY7	353	83,947
CY8	277	61,011
EU1	264	65,539
EU2	454	118,428
EU3	292	75,576
EU4	173	44,873
HC1	454	98,912
HM1	349	83,310
HM2	599	145,370
HM3	310	65,843
HM4	345	88,722
HM5	552	120,711
LY1	161	37,229
LY2	553	149,269
LY3	283	70,889
LY4	220	57,241
LY5	1,063	266,222
LY6	355	79,387
LY7	163	43,430
LY8	82	21,408
LY9	228	59,130
PL1	447	104,606
TM1	225	53,543
TN1	435	89,221
TN10	368	93,881
TN2	255	60,972
TN3	815	189,509
TN4	426	98,720
TN5	87	21,114
TN6	221	54,967
TN7	274	62,671
TN8	244	59,885
TN9	438	101,891
TR1	740	174,955
TR2	505	117,334
TR3	502	118,907
TR4	131	28,265
WO1	360	86,486
WBI 1	2	806
WBI 2	81	18,599
WBI 3	38	12,195
WBI 4	14	8,160
WBI 5	173	48,325
WBI 5A	402	78,989
WBI 5B	6	2,701
WBI 6	666	148,801
WBI 7	35	13,192
WBI 8	208	48,160
WBI 9	13	3,016
WBI 10	521	109,085
WBI 12	209	51,257
WBI 13	312	69,143
WBI 14	356	69,103
WBI 15	300	54,633
WBI 16	68	13,605
WBI 17	64	13,931
WBI 18	125	32,864
WBI 19	71	15,867
WBI 20	12	5,907
WBI 21	432	80,559
WBI 22	43	16,088
WBI 24	547	103,593
WBI 25	32	11,438
WBI 25A	305	85,240
WBI 26	49	16,621
WBI 27	355	82,293
WBI 28	422	92,285
WBI 29	33	15,552

FIGURE 2-3

Table 2-2
Sewershed Flow Meter and Rain Gauge Sites

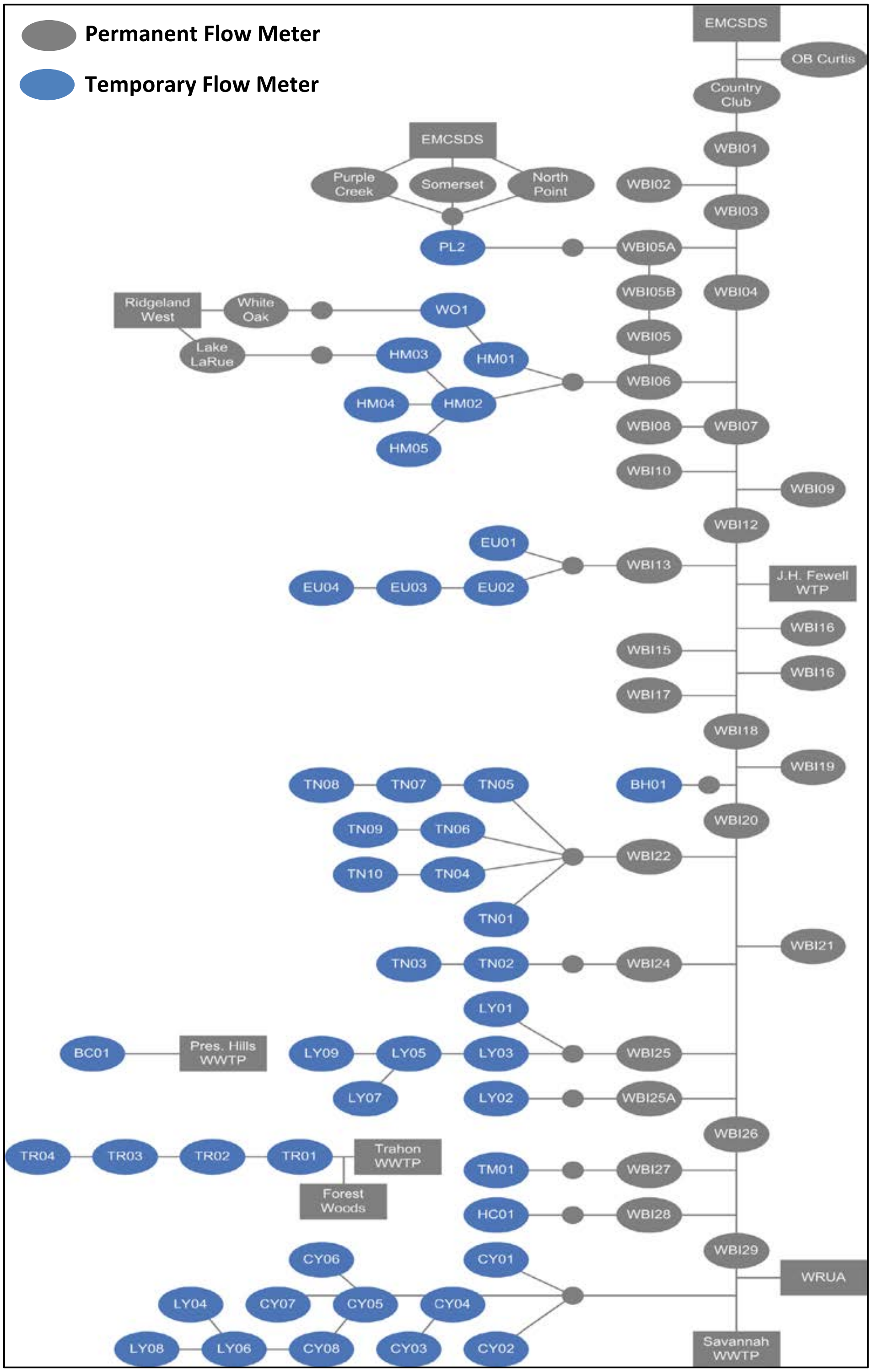
	Flow Meter/ Rain Gauge	Manhole ID	Pipe Diameter, in	Pipe Count	Basin Size, LF [1]	Location
Flow Meters						
1	BC01	BC0271	16	417	97,100	End of Roosevelt Drive at Presidential Hills WWTP
2	BH01	BH0017	18	16	2,575	Behind Entergy Bldg. at Jefferson St.
3	BH-WBI14	BH0221	30	356	69,103	End of Poplar Blvd.
4	BH-WBI15	BH0138	27	300	54,633	Off Greymont under Fortification St. bridge
5	CY01	CY0159A	30	55	13,722	NW corner of E.Com Lodge Parking Lot
6	CY02	CY0180	12	281	65,137	Entrance road to Savanna WWTP
7	CY03	CY0277	15	191	45,737	3865 Meadow Lane
8	CY04	CY0159B	42	431	106,259	Entrance road to Savanna WWTP
9	CY05	CY0846	30	437	111,689	805 Cooper Road inside Entergy substation gate
10	CY06	CY0810B	17	260	62,967	777 Cooper Road - at Oak Forest Dr.
11	CY07	CY1548	24	353	83,947	5537 Robinson Road - west side of road
12	CY08	CY1567	18	277	61,011	5537 Robinson Road - east side at carwash entrance
13	EA-WBI10	EA0002	17	524	109,762	2337 Twin Lakes Circle
14	EU01	EU0262	15	264	65,539	3604 Crane Boulevard
15	EU02	EU0396	24	454	118,428	3905 Oak Ridge
16	EU03	EU0703	21	292	75,576	Meadowbrook Rd. between N. West St. & RR track
17	EU04	EU1055	12	173	44,873	3933 Meadowbrook Rd.
18	EU-WBI13	EU0068	30	312	69,143	Highland Drive (in shoulder)
19	HC01	HC0323	15	454	98,912	2746 Shannon Drive
20	HC-WBI28	HC0005A	37	422	92,285	I-55 Eastside Frontage Road N. of Daniel Lake Blvd.
21	HM01	HM0632	24	349	83,310	5005 Meadow Oak Park Drive
22	HM02	HM0710	36	599	145,370	5155 Keele Street
23	HM03	HM0988	36	310	65,843	110 Presto
24	HM04	HM1245	30	345	88,722	308 Meadow Road
25	HM05	HM1602	36	552	120,711	5202 Watkins Dr. - N. of creek adjacent to school
26	LY01	LY0277	31	161	37,229	2457 Valley St. (near Raymond Road)
27	LY02	LY0437	18	127	39,550	1748 Hwy 80 - parking lot of Holiday Motel
28	LY03	LY0496	30	283	70,889	2232 Hwy 80 (Uhaul)
29	LY04	LY1168	12	220	57,241	Westhaven Blvd - N. side of creek adjacent to Lynch St.
30	LY05	LY1291	30	1,063	266,222	1062 Ellis Avenue
31	LY06	LY1701	18	355	79,387	4460 Highway 80 West
32	LY07	LY2311	18	163	43,430	3755 Jayne Street
33	LY08	LY2386	10	82	21,408	1333 Norman St
34	LY09	LY2767	12	228	59,130	Dixon Road - in front of Cavett Temple Preschool
35	LY-WBI25	LY0008	48	32	11,438	S. Gallatin St. adjacent to I-20 overpass
36	LY-WBI25A	LY0039	48	305	78,989	Gallatin St. & I-20 - north side of Pilot Truck Stop
37	PL02	PL0173	24	447	104,606	109 Old Canton Hill Dr.
38	PL-WBI5A	PL0167	30	402	78,989	238 River Road N.
39	TM01	TM0229	10	225	53,543	348 Colonial Dr.
40	TM-WBI27	TM0007A	24	355	82,293	I-55 Eastside Frontage Road S. of McDowell Road
41	TN01	TN4238	15	435	89,221	816 Gallatin St. at Hiawatha St.
42	TN02	TN1043	36	255	60,972	322 Garner Street
43	TN03	TN40377	15	815	189,509	Bailey Ave. at Cohea Steet
44	TN04	TN1305	36	426	98,720	650 W. Fortification St.
45	TN05	TN1404	27	87	21,114	Rondo St./Scott St. intersection
46	TN06	TN1736	28	221	54,967	1044 Randall St.

Table 2-2 (continued)

Flow Meter/ Rain Guage		Manhole ID	Pipe Diameter, in	Pipe Count	Basin Size, LF [1]	Location
47	TN07	TN1940	24	274	62,671	Rondo St./Idlewild St. intersection
48	TN08	TN2463	18	244	59,885	End of Lerida Ct.
49	TN09	TN2640	19	438	101,891	3341 Center St.
50	TN10	TN2673	27	368	93,881	In field SE of Ford Ave./Industrial Dr. intersection
51	TN-WBI21	TN4131	24	432	80,559	990 Commerce St.
52	TN-WBI22	TN4017	54	43	16,088	1466 Sidney St.
53	TN-WBI24	TN4006	48	572	109,628	Annie St. at S. West St.
54	TR01	TR0050	42	740	174,955	Adjacent to Terry Rd./Forest Hill Rd. intersection
55	TR02	TR0646	27	505	117,334	3814 Henderson Dr. - behind barn adjacent to creek
56	TR03	TR0860	24	502	118,907	S. of Raymond Rd. - bet. Stratford and Hidden Valley
57	TR04	TR1076	10	131	28,265	116 Pine Cove
58	WO01	WO0220	24	360	86,486	5529 Marblehead Dr.
Rain Gauges						
1	RG01	--	--	--	--	5810 Ridgewood Rd. - Roof of Fire Station 19
2	RG02	--	--	--	--	2659 Livingston Rd. - On old loading dock behind bldg.
3	RG03	--	--	--	--	1240 Wiggins Rd. - Cell tower roof next to Fire Station 24
4	RG04	--	--	--	--	Siwell Rd./McClure Rd. - Inside fence of pump station
5	RG-WBI1	--	--	--	--	Jackson Country Club - behind Maintenance Bldg.
6	RG-WBI2	--	--	--	--	End of Riverside Dr. at Fuell WTP
7	RB-WBI3	--	--	--	--	200 S. President St. roof
8	RG-WBI4	--	--	--	--	Savanna WWTP - N. Gate

[1] Total length of gravity sewers within the sewershed

Figure 2-4
Sewershed Flow Monitoring Schematic



2.3 Flow Monitoring Data Analysis

Sewer flow monitoring was performed using area-velocity flow meters mounted near the top of the manhole and connected to flow depth and velocity sensors positioned within the incoming sewer. Each flow meter was equipped with an ultrasonic depth sensor, a velocity sensor, and a pressure depth sensor. The ultrasonic depth reading and the measured velocity are used to compute the rate of wastewater flow during most flow conditions. The pressure sensor is primarily used to measure flow depth during surcharge conditions.

Data Collection

All meters were calibrated upon installation and then periodically thereafter. Manual data quality checks were performed at intervals throughout the monitoring period which included equipment inspections and battery checks. Flow depth (d), flow velocity (v), and flow rate (Q) data were collected at 15-minute intervals for each location and plotted on a variety of hydrographs and scattergraphs. Hydrographs display flow rate data vs. time for the duration of the observation period, together with associated rainfall data. Scattergraphs display flow depth vs. flow velocity for each location.

Appendix A contains graphs of wastewater flow and rainfall vs. time for each of the 46 sewershed monitoring points, together with the scatter graph and a composite graph of dry weather flows for each site.

Data Interpretation

The collected flow monitoring data provide information about sewer system response to dry weather and wet weather flows and how the system accommodates the observed flow rates. Dry weather flow conditions are determined from flow monitoring data observed during normal conditions, excluding wet weather events and subsequent recovery from these events. The average dry day pattern is identified as a diurnal pattern and results from the collective sewer use of residential, commercial, institutional, and industrial users located upstream from the flow monitor. Land use within the sewershed affects the shape of the diurnal pattern. An example of a representative diurnal pattern observed during the study period is shown in **Figure 2-5** for Flow Meter BC-1.

Wet weather flow conditions are characterized by evaluating flow monitor data observed during significant storm events that occurred during the study period. A wet weather storm decomposition hydrograph is provided in **Figure 2-6** and shows the observed flow rate during a storm event compared to the average dry day diurnal pattern. The difference between the two is the rainfall dependent inflow and infiltration (RDII) measured by the flow monitor. The storm event is depicted by the purple bands, and a precompensation period prior to the storm is depicted by the light gray band. Precompensation is used when needed to adjust the average dry day diurnal pattern to more closely match observed conditions prior to each storm event for proper analysis.

Figure 2-5
Example Dry Weather Hydrograph

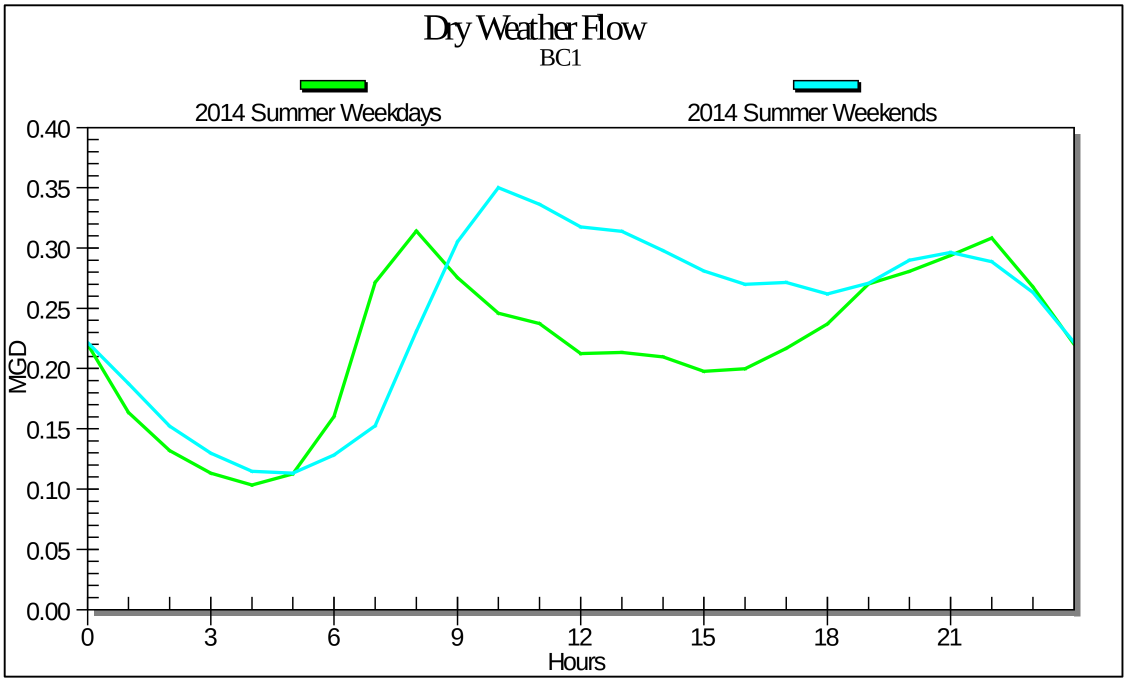
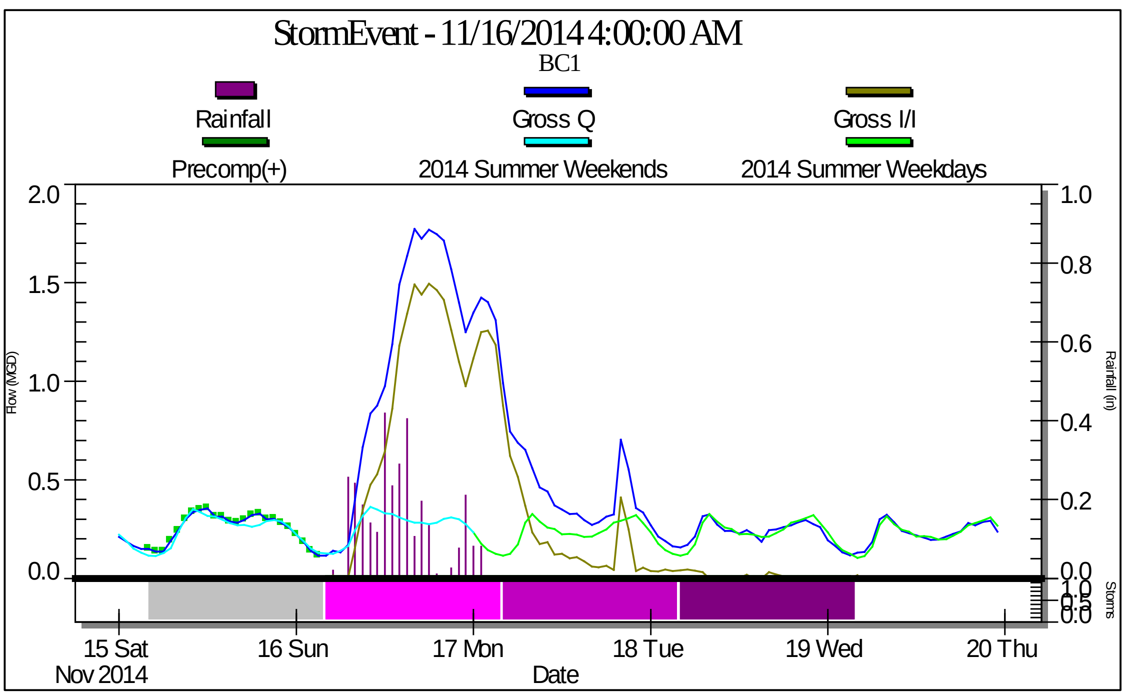


Figure 2-6
Example Wet Weather Hydrograph



Additional examples of flow meter and rain gauge data collected are provided in **Appendix B**. Results of the flow monitoring data analysis are described in the following section.

3.0 Infiltration/Inflow Analysis

The following sections present results of the evaluation of flow monitoring data observed during both dry weather and wet weather periods using a variety of performance indicators. Described are observed peaking factors, depth-to-diameter ratios, self-cleansing status, and relative RDII.

3.1 Peaking Factors

The minimum, average, and maximum dry weather flow rates ($Q_{min\text{-}D}$, $Q_{avg\text{-}D}$, and $Q_{max\text{-}D}$) were determined from the dry weather diurnal pattern for each flow monitor location and are provided in **Table 3-1**, along with the resulting dry weather Peaking Factor (PF_D). The maximum wet weather flow rate ($Q_{max\text{-}W}$) determined for each flow monitor location is also provided together with the resulting wet weather Peaking Factor (PF_W). The dry weather peaking factor is the ratio of the typical maximum hourly average dry weather flow rate compared to the average dry weather flow rate, while the wet weather peaking factor is the ratio of the maximum hourly average wet weather flow rate compared to the average dry weather flow rate.

Table 3-1

Sewershed Dry and Wet Weather Flow Peaking Factors

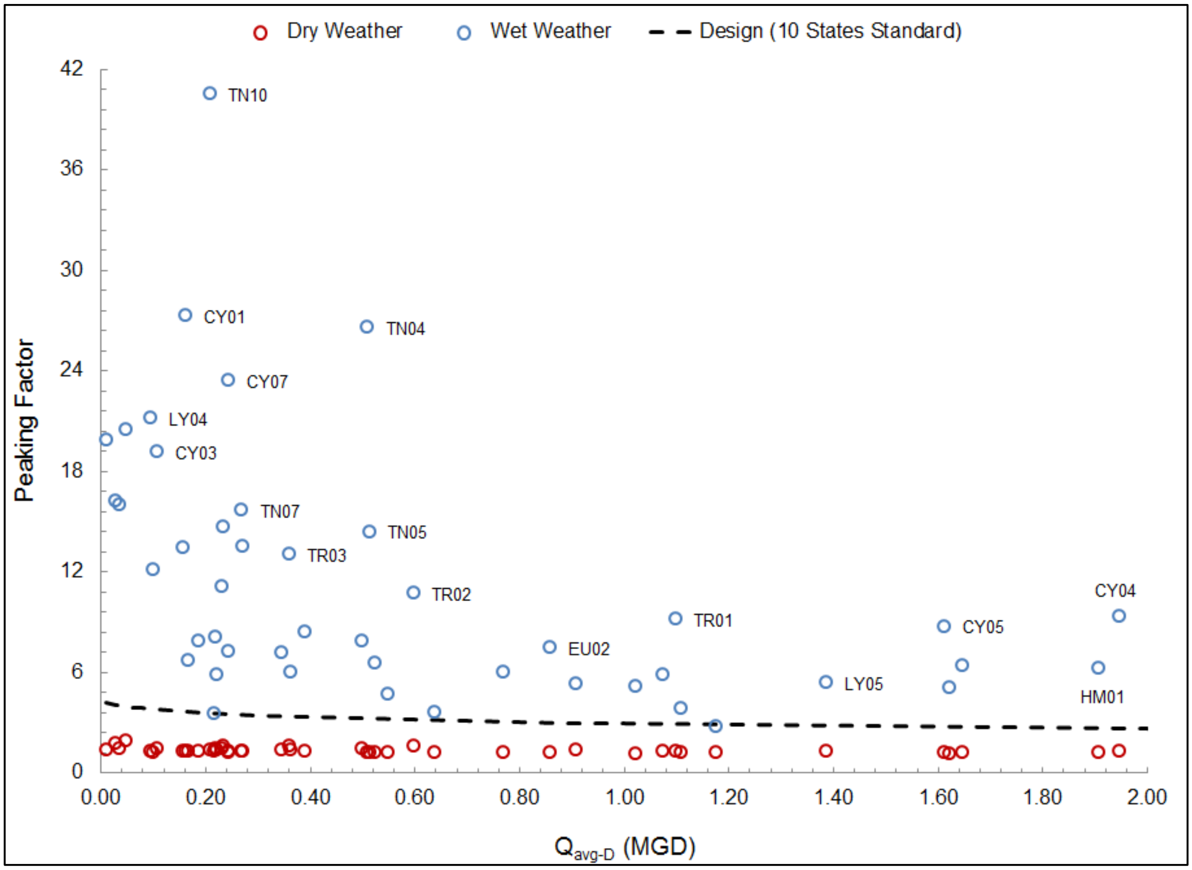
Sewershed	*$Q_{avg\text{-}D}$ (MGD)*	*$Q_{max\text{-}D}$ (MGD)*	*$Q_{max\text{-}W}$ (MGD)*	*Dry Weather Peaking Factor PF_D*	*Wet Weather Peaking Factor PF_W*
BC01	0.219	0.314	1.773	1.43	8.10
BH01	0.036	0.050	0.576	1.39	16.00
BH-WBI14	0.830	1.630	2.400	1.96	2.89
BH-WBI15	0.370	0.620	1.650	1.68	4.46
CY01	0.163	0.205	4.445	1.26	27.27
CY02	0.223	0.300	1.298	1.35	5.82
CY03	0.108	0.153	2.070	1.42	19.17
CY04	1.947	2.409	18.126	1.24	9.31
CY05	1.613	1.945	14.086	1.21	8.73
CY06	0.232	0.324	2.572	1.40	11.09
CY07	0.245	0.313	5.731	1.28	23.39
CY08	0.770	0.914	4.619	1.19	6.00
BH-WBI10	0.300	0.650	1.720	2.17	5.73
EU01	0.363	0.486	2.161	1.34	5.95
EU02	0.860	1.055	6.400	1.23	7.44
EU03	0.524	0.642	3.423	1.23	6.53
EU04	0.187	0.236	1.461	1.26	7.81
BH-WBI13	2.000	3.770	7.000	1.89	3.50
HC01	0.392	0.491	3.290	1.25	8.39
BH-WBI28	0.630	1.460	3.400	2.32	5.40
HM01	1.111	1.337	4.281	1.20	3.85
HM02	1.909	2.306	11.860	1.21	6.21

Table 3-1 (continued)

Sewershed	Q_{avg-D} (MGD)	Q_{max-D} (MGD)	Q_{max-W} (MGD)	Dry Weather Peaking Factor PF_D	Wet Weather Peaking Factor PF_W
HM03	0.500	0.708	3.937	1.42	7.87
HM04	0.236	0.378	3.453	1.60	14.63
HM05	1.023	1.160	5.284	1.13	5.17
LY01	0.029	0.051	0.471	1.76	16.24
LY02	0.244	0.297	1.765	1.22	7.23
LY03	1.649	1.927	10.502	1.17	6.37
LY04	0.097	0.125	2.055	1.29	21.19
LY05	1.388	1.744	7.409	1.26	5.34
LY06	0.273	0.343	3.683	1.26	13.49
LY07	0.100	0.122	1.212	1.22	12.12
LY08	0.011	0.015	0.218	1.36	19.82
LY09	0.168	0.214	1.120	1.27	6.67
BH-WBI25	2.190	3.930	14.800	1.79	6.76
BH-WBI25A	0.530	0.950	3.200	1.79	6.04
PL02	1.076	1.362	6.271	1.27	5.83
BH-WBI5A	1.640	2.650	5.400	1.62	3.29
TM01	0.218	0.279	0.766	1.28	3.51
BH-WBI27	0.470	1.040	1.730	2.21	3.68
TN01	0.551	0.652	2.593	1.18	4.71
TN02	1.623	1.770	8.225	1.09	5.07
TN03	1.178	1.377	3.266	1.17	2.77
TN04	0.511	0.591	13.585	1.16	26.59
TN05	0.515	0.606	7.407	1.18	14.38
TN06	0.640	0.777	2.285	1.21	3.57
TN07	0.270	0.345	4.220	1.28	15.63
TN08	0.158	0.195	2.118	1.23	13.41
TN09	0.347	0.468	2.478	1.35	7.14
TN10	0.209	0.282	8.463	1.35	40.49
BH-WBI21	0.400	0.720	2.070	1.80	5.18
BH-WBI22	1.680	2.480	15.800	1.48	9.40
BH-WBI24	2.190	3.430	15.500	1.57	7.08
TR01	1.100	1.415	10.103	1.29	9.18
TR02	0.599	0.932	6.430	1.56	10.73
TR03	0.361	0.565	4.703	1.57	13.03
TR04	0.048	0.089	0.981	1.85	20.44
WO01	0.910	1.191	4.842	1.31	5.32

Peaking factors are commonly used to estimate maximum flow rates based on average flow rate estimates and play a key role in sewer design. Peaking factors are inversely proportional to the population served and generally decrease as the average dry weather flow rate increases. Dry weather and wet weather peaking factors observed during the study period are compared with corresponding design guidance from the American Society of Civil Engineers (ASCE) and the Water Environment Federation (WEF), and the results are shown in **Figure 3-1**.

Figure 3-1
Jackson Sewer Peaking Factors Compared to Design Guidelines



Observed dry weather peaking factors fall within design guidelines, but most wet weather peaking factors are observed above these values and result from RDII originating upstream from these flow monitor locations. The smallest peaking factor observed during the study period was a value of 2.77 at Site TN03, while the largest peaking factor observed during the study period was a value of 40.49 at Site TN10. Sewersheds with high peaking factors are indicative of proportionally excessive RDII.

3.2 Self-Cleansing

Self-cleansing is an important aspect of sanitary sewer design and is desired to minimize the deposition of silt, sediment, and debris. The Tractive Force Method[1] is used to design sewers to achieve self-cleansing conditions based on a required critical shear stress (τ_c). This method is recommended by ASCE and WEF to evaluate self-cleansing conditions.

The Tractive Force Method can also be extended from the design of new sewers to the evaluation of existing sewers. This method was used to evaluate the self-cleansing status of each Jackson flow monitor location during the study period. The maximum dry weather flow depth (d_{max-D}) and flow velocity (v_{max-D}) from each flow monitor location are used to compute the actual shear stress (τ) observed at the maximum dry weather flow rate (Q_{max-D}). The results are compared to a threshold self-cleansing range, resulting in a classification of observed flow conditions. Silt observations recorded during the study period are also provided for comparison, and the results are shown on **Table 3-2**.

Table 3-2
Self-Cleansing Classification of Jackson Sewers

Sewershed	Diameter, D (in)	Dry Weather Max. Depth, d_{max-D} (in)	Dry Weather Max. Velocity, V_{max-D}/D (ft/sec)	Shear Stress, τ (lb/ft^2)	Classification[1]	Observed Silt Depth (in)
BC01	15	6.15	1.03	0.0078	3	0.00 – 1.00
BH01	18	3.32	0.39	0.0013	3	1.00 – 3.00
CY01	30	2.92	1.36	0.0164	2	–
CY02	12	5.01	1.5	0.0177	2	–
CY03	15	3.57	1.07	0.0097	3	–
CY04	42	9.96	2.12	0.0272	1	0.00 – 2.50
CY05	30	6.59	3.77	0.0983	1	–
CY06	16	3.53	2.08	0.0369	1	–
CY07	24	3.94	1.45	0.0171	2	–
CY08	18	4.12	4.65	0.1752	1	–
EU01	16	4.35	2.55	0.0522	1	–
EU02	24	5.44	2.95	0.0642	1	–
EU03	21	3.7	3.44	0.0984	1	–
EU04	12	6.99	0.76	0.0042	3	–
HC01	15	4.81	2.27	0.0404	1	–
HM01	24	15.86	0.89	0.0045	3	0.50 – 3.50
HM02	36	13.22	1.54	0.0134	3	–
HM03	36	4.75	2.09	0.0332	1	–
HM04	30	2.8	2.54	0.0581	1	–
HM05	42	6.01	2.14	0.0322	1	–
LY01	30	1.91	0.59	0.0035	3	0.00 – 0.50
LY02	18	7.08	1.67	0.0195	2	0.00 – 2.00
LY03	30	11.75	1.62	0.0155	2	–
LY04	12	3.17	1.3	0.0150	2	–

[1] Enfinger, K.L. and Mitchell, P.S. (2010). "Scattergraph Principles and Practice – Evaluating Self-Cleansing in Existing Sewers Using the Tractive Force Method," *Proceedings of the World Environmental and Water Resources Congress*, Providence, R.I. American Society of Civil Engineers: Reston, VA.

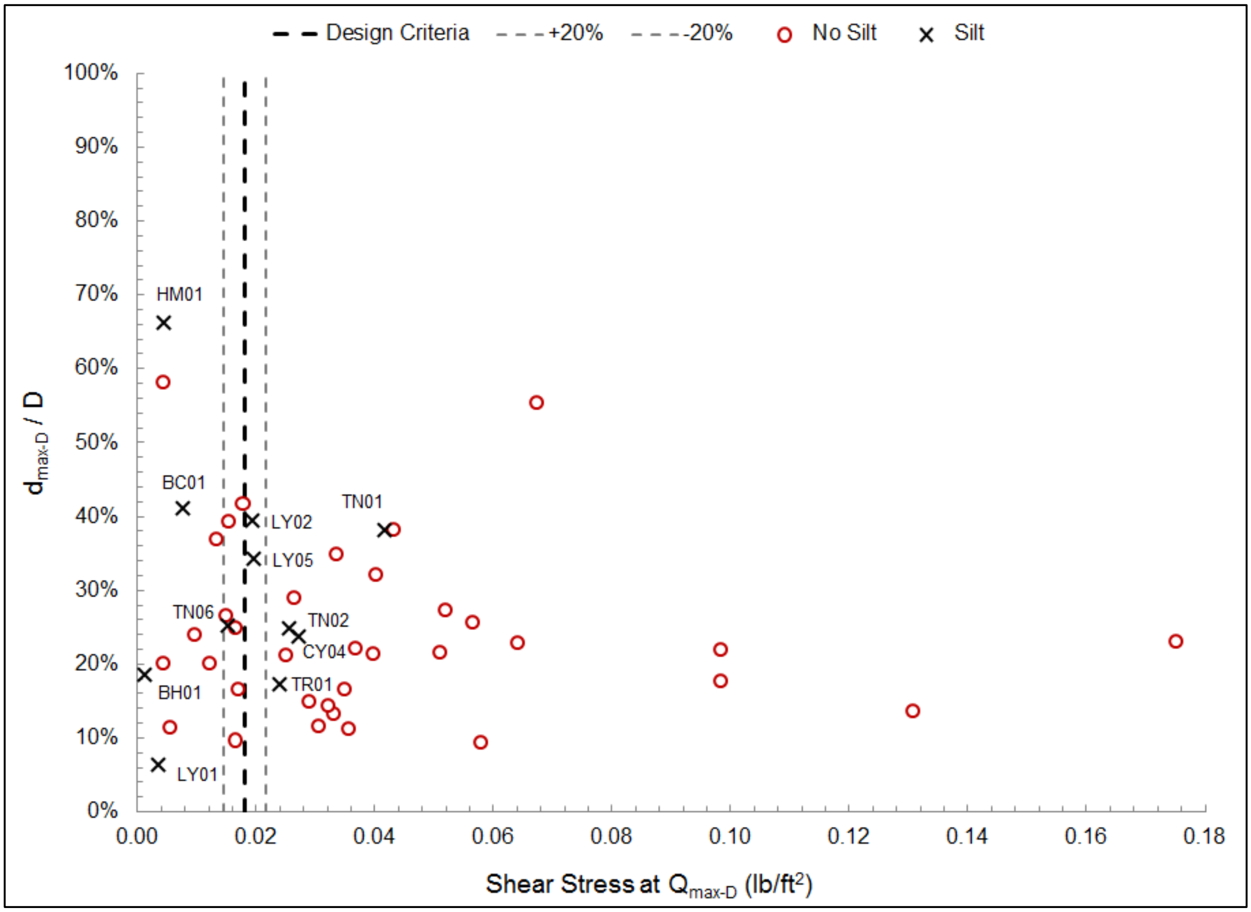
Table 3-2 (continued)

Sewershed	Diameter, D (in)	Dry Weather Max. Depth, $d_{max\text{-}D}$ (in)	Dry Weather Max. Velocity, $V_{max\text{-}D}/D$ (ft/sec)	Shear Stress, τ (lb/ft^2)	Classification[1]	Observed Silt Depth (in)
LY05	30	10.25	1.8	0.0198	2	0.00 – 4.00
LY06	18	2.42	3.71	0.1309	1	–
LY07	18	3.59	0.73	0.0045	3	–
LY08	10	1.13	0.68	0.0056	3	–
LY09	12	3.45	1.75	0.0266	1	–
PL02	24	8.33	2.27	0.0338	1	–
TM01	10	3.8	2.25	0.0434	1	–
TN01	15	5.72	2.36	0.0417	1	0.00 – 3.00
TN02	36	8.94	2.02	0.0256	1	1.00 – 3.50
TN03	15	8.29	3.13	0.0675	1	–
TN04	36	3.98	2.11	0.0357	1	–
TN05	27	4.43	2.12	0.0351	1	–
TN06	27	6.81	1.49	0.0153	2	0.00 – 1.50
TN07	24	3.53	1.86	0.0291	1	–
TN08	18	3.61	1.21	0.0123	3	–
TN09	18	3.85	2.49	0.0512	1	–
TN10	27	3.11	1.88	0.0308	1	–
TR01	42	7.2	1.9	0.0240	1	0.00 – 2.50
TR02	27	5.72	2.35	0.0400	1	–
TR03	24	5.06	1.83	0.0253	1	–
TR04	10	2.48	1.32	0.0168	2	–
WO01	24	6.13	2.82	0.0567	1	–

[1] Class 1 - Self-cleansing; Class 2 - Marginal Cleansing; Class 3 - Non-cleansing

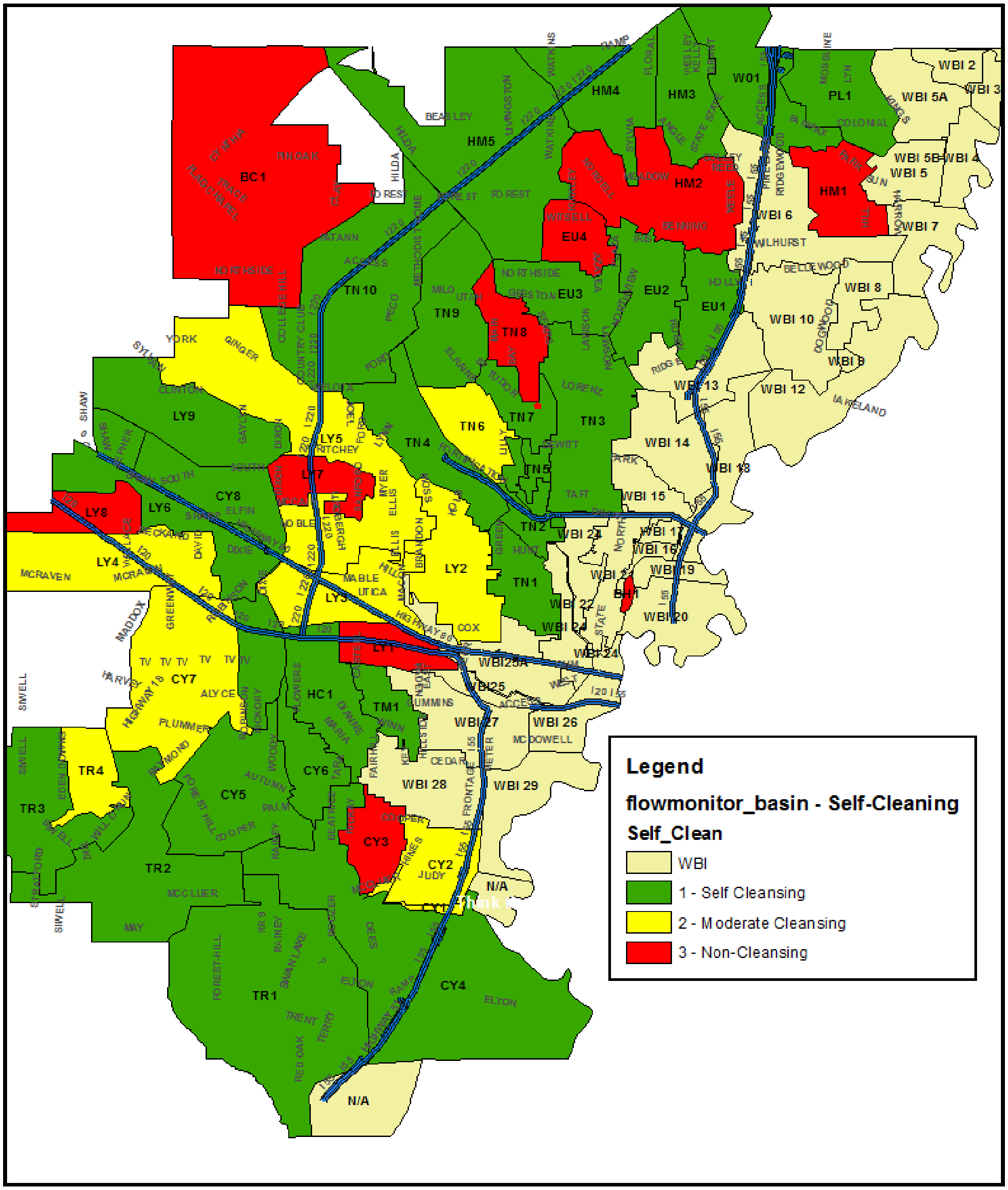
The required critical shear stress recommended by ASCE and WEF for application of the tractive force method is 0.0181 lb/ft^2. The actual shear stress achieved under normal dry weather conditions is compared to this design guidance in **Figure 3-2**. Sewers predicted to be self-cleansing are shown to the right of the recommended critical shear stress, and sewers predicted to be non-cleansing are shown to the left. Research has shown that the transition from self-cleansing to non-cleansing generally occurs within ±20% of this recommended value. As a result, the hydraulic conditions at each flow monitor location are designated as Class 1 – Self-Cleansing, Class 2 – Marginal Cleansing, or Class 3 – Non-Cleansing.

Figure 3-2
Jackson Sewer Self-Cleansing Status Compared to Design Guidelines



Based on hydraulic conditions observed during the study period, 27 locations were defined as Class 1 – Self-Cleansing, nine locations were defined as Class 2 – Marginal Cleansing, and 10 locations were defined as Class 3 – Non-Cleansing. Silt was observed during the study period at 11 flow monitor locations, including Sites BC01, BH01, CY04, HM01, LY01, LY02, LY05, TN01, TN02, TN06, and TR01. The self-cleansing classification associated with each sewershed are depicted geographically in the map shown on **Figure 3-3**. Generally, sewersheds designated as Class 2 and Class 3 should be inspected more often to determine if more frequent cleaning is required in these areas.

Figure 3-3
Jackson Sewershed Self-Cleansing Classification

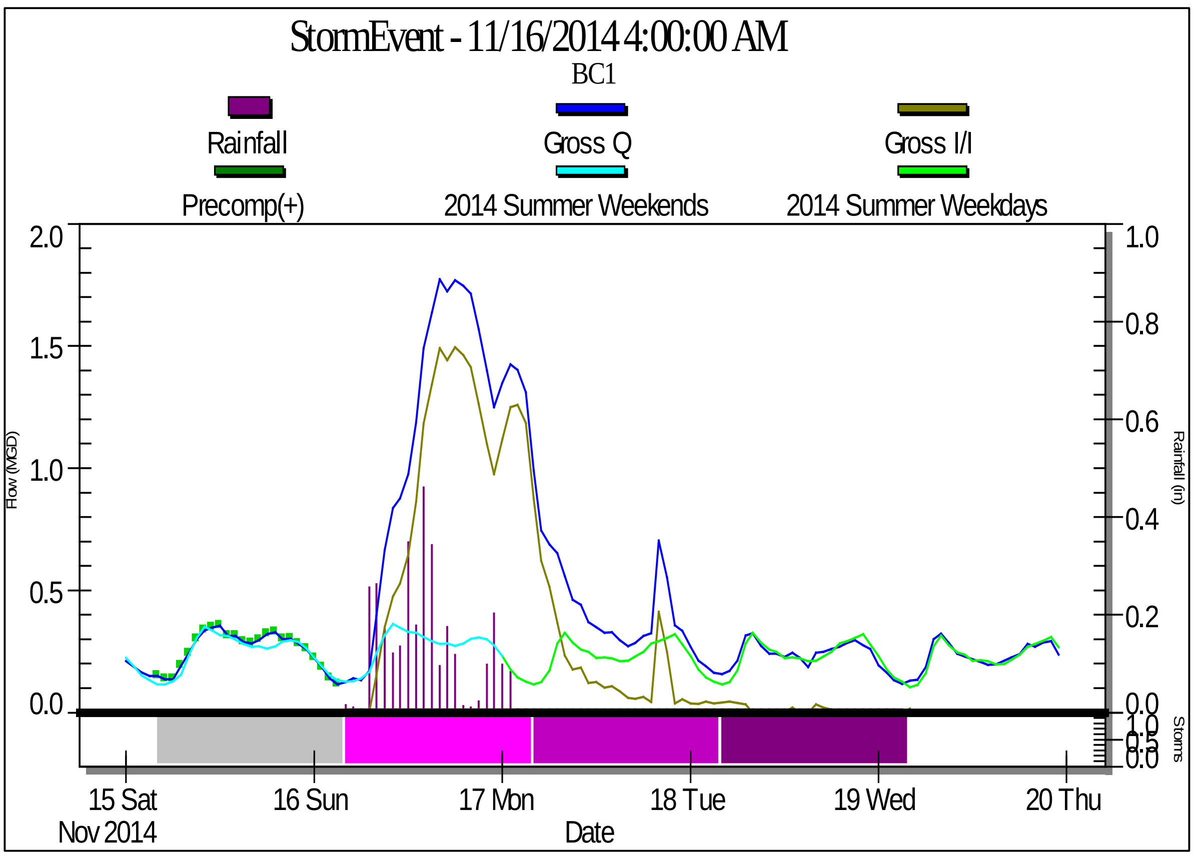


Courtesy ADS Environmental Services

3.3 Rain-Dependent Inflow and Infiltration

A comparison of flow monitor data from dry weather and wet weather periods provides a quantification of rain-dependent inflow and infiltration (RDII). The RDII is calculated by subtracting the flow during an average dry day as determined from the study period from the measured flow during a rainfall event. RDII calculations for Jackson were provided by ADS using Sli/icer®, a proprietary software application developed by ADS. An example wet weather storm decomposition hydrograph from this analysis is provided in **Figure 3-4**. The storm event is depicted by the purple bands, and a precompensation period prior to the storm is depicted by the light gray band. Adjustments to the average dry day pattern are made as needed to account for antecedent conditions prior to each storm event.

Figure 3-4
Example Storm Decomposition Hydrograph

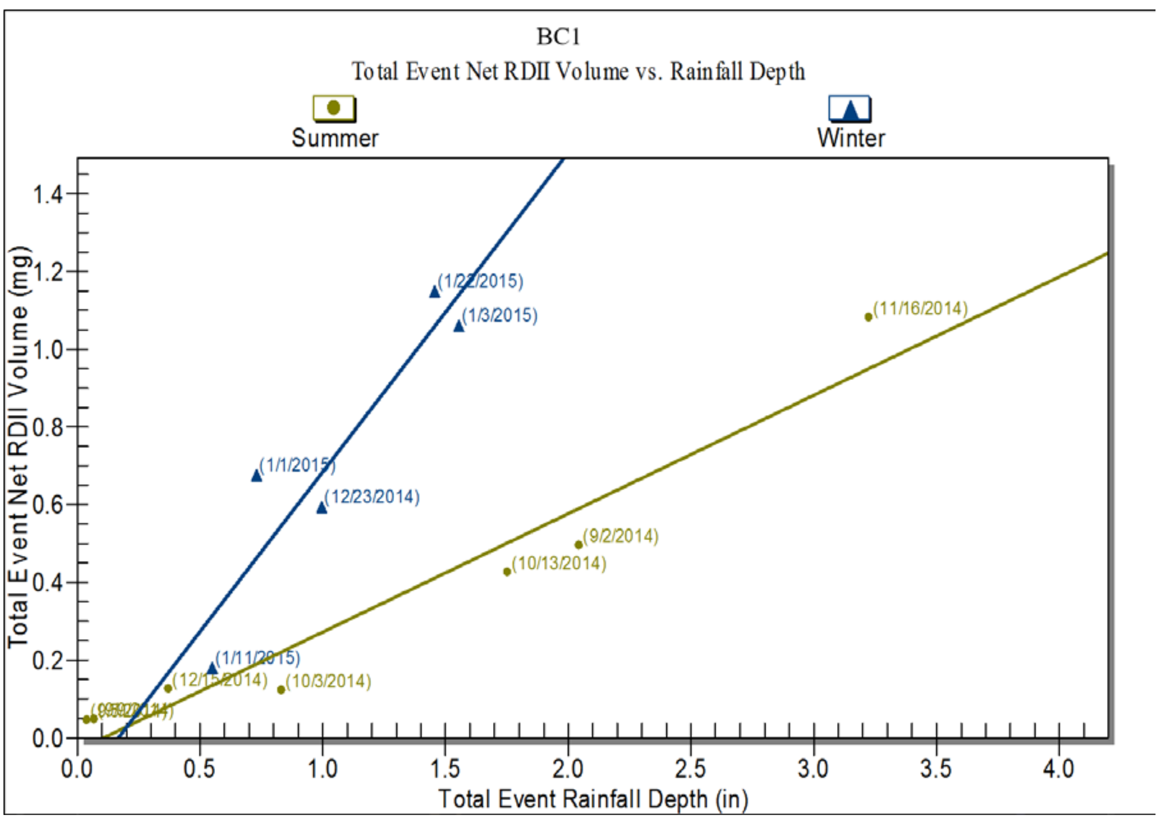


A total of 13 storm events of interest were observed at the four sewershed rain gauges during the study period, with cumulative rainfall totals ranging up to 3.48 inches. The return frequency observed at each rain gauge during each storm event was less than one year at all durations. Storm decomposition hydrographs were prepared for each flow monitor location during each of the recorded storm events, and collectively show the observed system response to rainfall during the study period.

After the RDII calculations were determined for each storm event, the results were plotted as a function of rainfall total. An example is shown in **Figure 3-5,** in which the relationship between the Storm Event RDII (MG) is plotted with respect to the Storm Event rainfall (inches) for all significant storm events during both Summer and Winter seasons. These relationships were then used to evaluate the consistency of rainfall responses within the sanitary sewer system and estimate the RDII response for various rainfall amounts. RDII vs. rainfall graphs were developed and compared for each flow monitor.

For the larger 2-year, 24-hour storm, the computer model of the collection system will be used to more accurately predict RDII volume. No storm events close to the 2-year storm were observed during the short-term flow monitoring period (which is typical). For Jackson, the 2-year, 24-hour storm would consist of 4.32 inches according to data from the National Weather Service Hydrometeorological Design Studies Center (hourly rainfall of 0.18 inches for 24 consecutive hours). The 2-year storm RDII quantity cannot be reliably estimated since there are likely unknown SSOs occurring that would need to be identified through modeling. However, calculated RDII for the 2-inch rain event does provide a good representation of the fraction of total RDII generated by individual sewersheds, which provides a sound basis for prioritization. Actual quantities of RDII to be removed will be defined by the hydraulic model.

Figure 3-5
RDII Response vs. Rainfall Depth



Based on the results obtained during the study period, Net RDII was calculated for a 2-inch storm event. Net RDII volumes were computed by subtracting the Gross RDII volume of any upstream flow monitor basin from the Gross RDII volume measured at the outlet of each flow monitor basin. Normalized Net RDII is then calculated by dividing the net RDII volume by the total length of sewer within each respective flow monitor basin. The Summer season includes storm events that occurred from the beginning of the monitoring period until the Winter Solstice on December 21, 2014, while the Winter season includes the storm events recorded after that date. The seasonal difference in RDII results from differences in seasonal groundwater levels, as well as seasonal differences in water consumption by local vegetation during growing and non-growing seasons. Net 2-inch storm RDII for both Summer and Winter Seasons for the sewersheds is summarized on **Table 3-3** and **Table 3-4**.

Table 3-3
Estimated Summer Season RDII for 2-Inch Storm

Sewershed	Net RDII (MGD)	Basin Size (LF)	Net RDII (gal/LF)
BC01	0.58	97,100	5.97
BH01	0.11	2,575	42.72
CY01	0.73	13,722	53.20
CY02	0.41	65,137	6.29
CY03	0.29	45,737	6.34
CY04	2.22	106,259	20.89
CY05	0.41	111,689	3.67
CY06	0.56	62,967	8.89
CY07	2.24	83,947	26.68
CY08	0.38	61,011	6.23
EU01	0.76	65,539	11.60
EU02	1.57	118,428	13.26
EU03	1.18	75,576	15.61
EU04	0.54	44,873	12.03
HC01	0.65	98,912	6.57
HM01	0.14	83,310	1.68
HM02	1.19	145,370	8.19
HM03	0.82	96,435	8.50
HM04	0.92	88,722	10.37
HM05	1.03	120,711	8.53
LY01	0.04	37,229	1.07
LY02	0.80	39,550	20.23
LY03	0.82	70,889	11.57
LY04	0.59	57,241	10.31
LY05	2.01	266,222	7.55
LY06	0.61	79,387	7.68
LY07	0.40	43,430	9.21
LY08	0.04	21,408	1.87
LY09	0.47	59,130	7.95
PL02	1.69	263,119	6.42
TM01	0.27	53,543	5.04
TN01	–	89,221	–

Table 3-3 (continued)

Sewershed	Net RDII (MG)	Basin Size (LF)	Net RDII (gal/LF)
TN02	2.18	60,972	35.75
TN03	1.65	189,509	8.71
TN04	1.51	98,720	15.30
TN05	0.67	21,114	31.73
TN06	0.22	54,967	4.00
TN07	0.65	62,671	10.37
TN08	0.76	59,885	12.69
TN09	1.22	101,891	11.97
TN10	3.34	93,881	35.58
TR01	0.76	174,955	4.34
TR02	0.60	117,334	5.11
TR03	0.78	118,907	6.56
TR04	0.13	28,265	4.60
WO01	0.93	212,187	4.38

Table 3-4
Estimated Winter Season RDII for 2-Inch Storm

Sewershed	Net RDII (MGD)	Basin Size (LF)	Net RDII (gal/LF)
BC01	1.51	97,100	15.55
BH01	0.15	2,575	58.25
CY01	1.70	13,722	123.89
CY02	0.70	65,137	10.75
CY03	1.05	45,737	22.96
CY04	3.81	106,259	35.86
CY05	0.57	111,689	5.10
CY06	1.15	62,967	18.26
CY07	4.78	83,947	56.94
CY08	1.08	61,011	17.70
EU01	1.26	65,539	19.23
EU02	3.10	118,428	26.18
EU03	2.09	75,576	27.65
EU04	0.78	44,873	17.38
HC01	1.47	98,912	14.86
HM01	0.35	83,310	4.20
HM02	2.85	145,370	19.61
HM03	1.27	96,435	13.17
HM04	1.28	88,722	14.43
HM05	1.96	120,711	16.24
LY01	0.11	37,229	2.95
LY02	1.38	39,550	34.89
LY03	1.48	70,889	20.88
LY04	1.11	57,241	19.39
LY05	3.99	266,222	14.99
LY06	1.03	79,387	12.97
LY07	0.84	43,430	19.34
LY08	0.04	21,408	1.87

Table 3-4 (continued)

Sewershed	*Net RDII (MG)*	*Basin Size (LF)*	*Net RDII (gal/LF)*
LY09	0.90	59,130	15.22
PL02	3.18	263,119	12.09
TM01	0.70	53,543	13.07
TN01	2.91	89,221	32.62
TN02	3.96	60,972	64.95
TN03	3.25	189,509	17.15
TN04	2.98	98,720	30.19
TN05	1.47	21,114	69.62
TN06	0.47	54,967	8.55
TN07	1.15	62,671	18.35
TN08	1.50	59,885	25.05
TN09	2.58	101,891	25.32
TN10	5.37	93,881	57.20
TR01	1.87	174,955	10.69
TR02	1.52	117,334	12.95
TR03	1.71	118,907	14.38
TR04	0.36	28,265	12.74
WO01	1.87	212,187	8.81

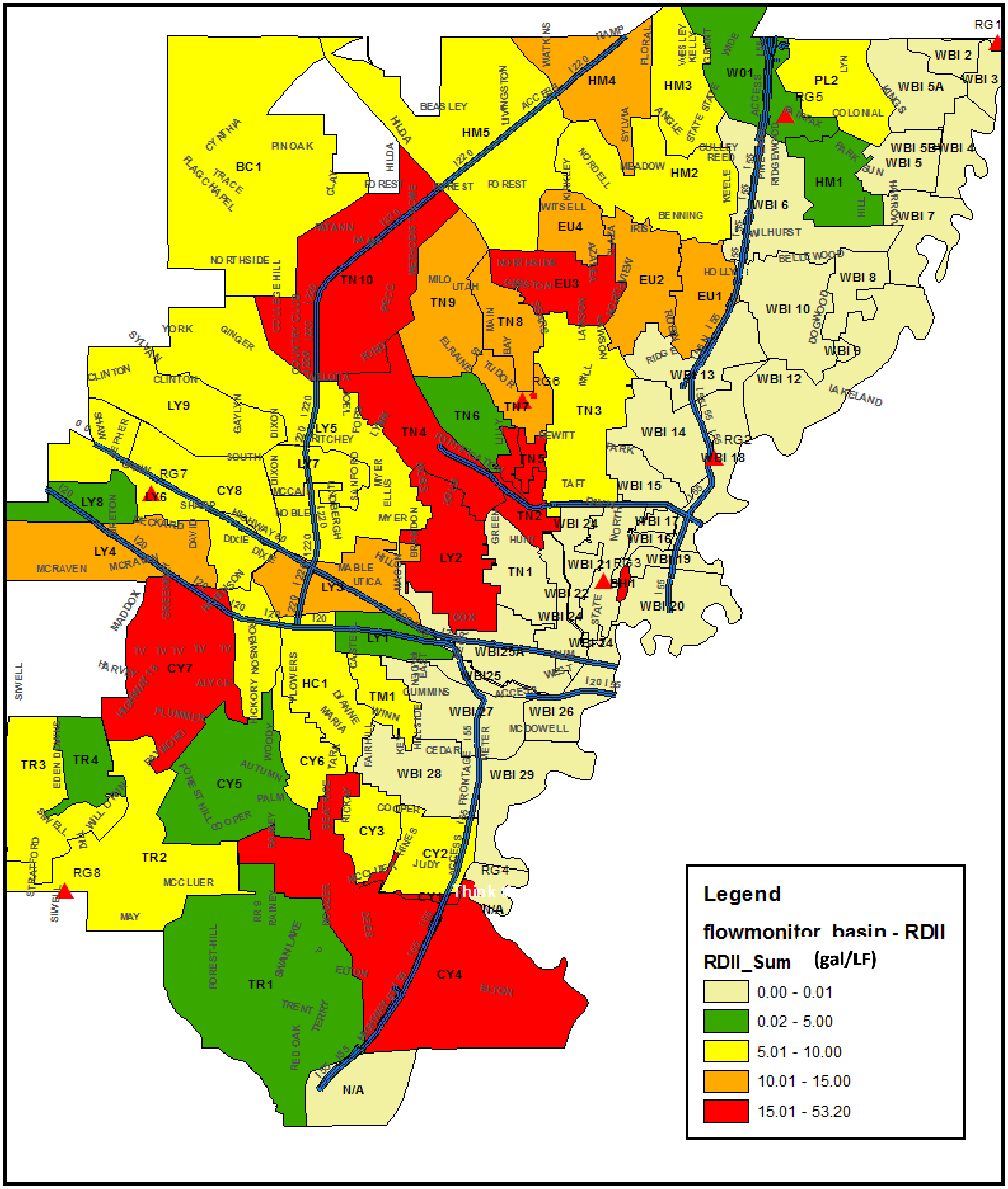
Basin CY01 is the highest (worst) ranked basin during both Summer and Winter Periods. The eight highest (worst) ranked basins are the same during both periods, and include Basins CY01, TN05, TN02, BH01, TN10, CY07, CY04, and LY02. RDII results for each flow monitor basin during the Summer and Winter seasons are depicted geographically in the maps provided in **Figure 3-6** and **Figure 3-7**, respectively. Note that basin sizes for Basins HM03, PL02, and WO1 include estimated footage for contributing sewers maintained by the City of Ridgeland and Madison County that are located outside of the Jackson city limits.

To determine the grouping categories required by EPA, the total RDII for the 2-inch storm was used as the basis. The corresponding sewer groupings in terms of total RDII contribution for the 2-inch storm are shown on **Table 3-5**. The total RDII volume shown will be updated upon completion of the hydraulic model.

Table 3-5
Sewer Group I/I Totals

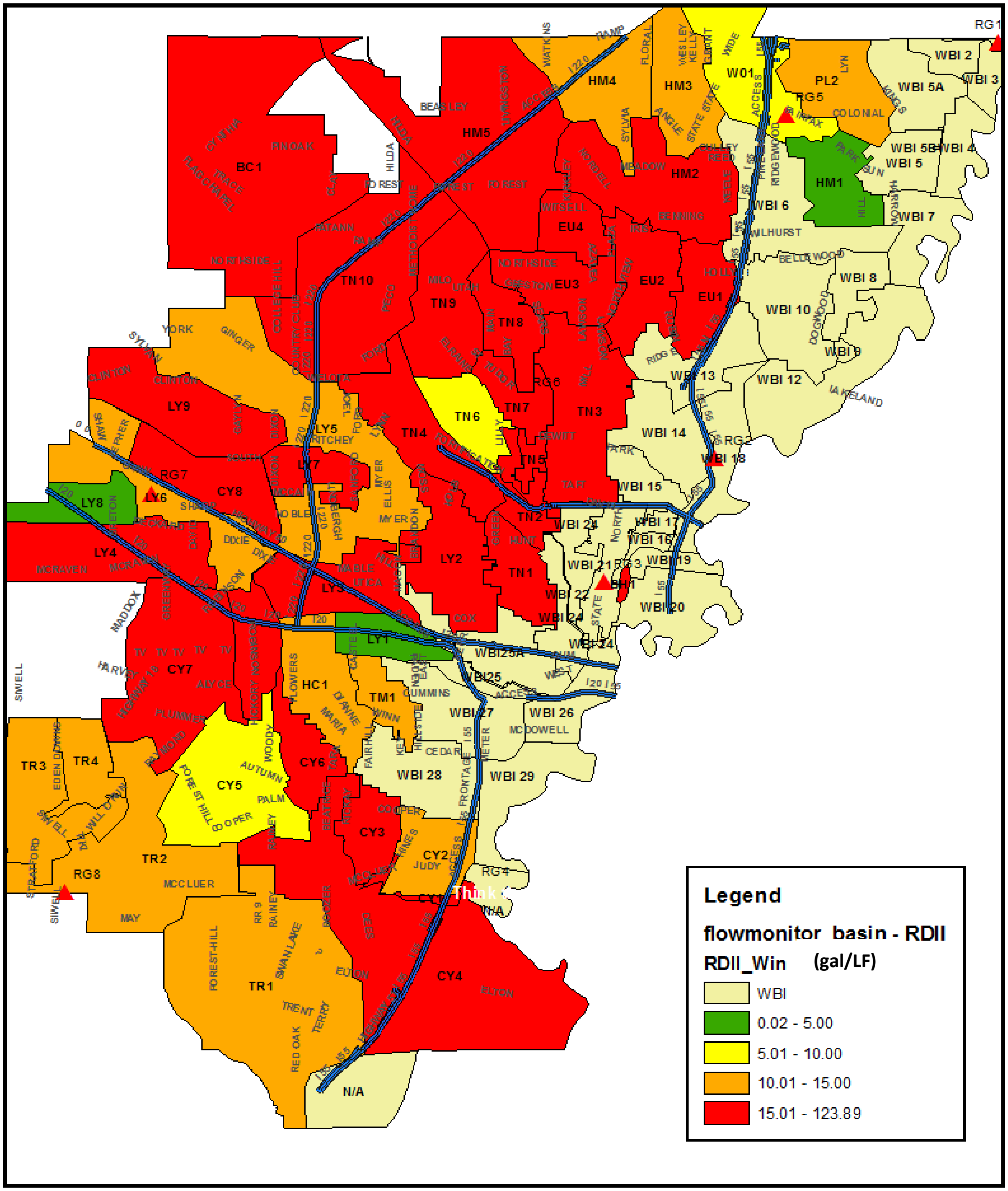
Parameter	*Value*
Season	Winter
Storm event	2-in
Total RDII, MG	109.9
30% of Total RDII, MG (Group 1)	33.0
40% of Total RDII, MG (Group 2)	44.0

Figure 3-6
Net Normalized RDII for Summer Season



Courtesy ADS Environmental Services

Figure 3-7
Net Normalized RDII for Winter Season



Courtesy ADS Environmental Services

The I/I analysis resulted in the identification of the relative contribution of RDII for each sewershed. These results were used as a primary criterion in the sewershed rehabilitation prioritization discussed in Section 5.

4.0 Capacity Assessment

This Section describes the capacity limitations of the Jackson sewer system based on existing information. This includes capacity-related information obtained from flow monitoring and consideration of parts of the system with known limited capacity and that contribute to SSOs.

4.1 Depth-to-Diameter Ratios

Dry weather and wet weather flow rates were identified through flow monitoring as described in Section 3. Using this information, the hydraulic conditions under which the peak dry and wet weather flows occurred were evaluated. The maximum flow depth observed during dry weather (d_{max-D}) and wet weather (d_{max-W}) and their corresponding depth-to-diameter (d/D) ratios observed during the study period are provided in **Table 4-1**. The maximum dry weather flow depth is the flow depth associated with the maximum dry weather flow rate and is the maximum flow depth that is consistently observed each day during normal dry weather conditions. The maximum wet weather flow depth may or may not be directly associated with the maximum wet weather flow rate, depending on the hydraulic conditions observed at a given flow monitor location.

Table 4-1
Dry and Wet Weather Sewer Depth-to-Diameter Ratios

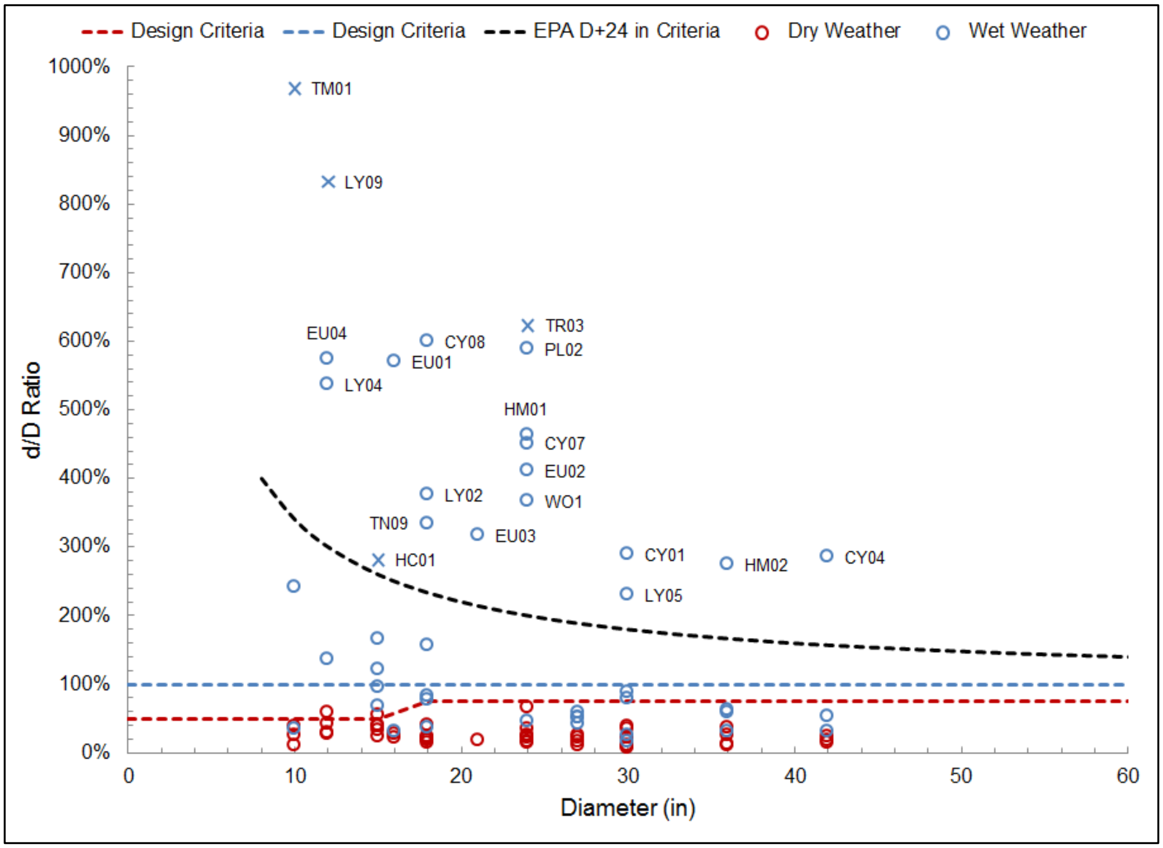
Sewershed	Diameter, D (in)	Dry Weather Max. Depth, d_{max-D} (in)	Dry Weather Max. Depth-to-Diameter Ratio, d_{max-D}/D (in)	Wet Weather Max. Depth, d_{max-W} (in)	Wet Weather Max. Depth-to-Diameter Ratio, d_{max-W}/D (in)
BC01	15	6.15	41%	18.4	122%
BH01	18	3.32	18%	28.4	158%
BH-WBI14	30	5.90	20%	14.7	49%
BH-WBI15	27	4.80	18%	12.5	46%
CY01	30	2.92	10%	86.7	289%
CY02	12	5.01	42%	16.4	137%
CY03	15	3.57	24%	10.3	69%
CY04	42	9.96	24%	120.2	286%
CY05	30	6.59	22%	23.5	78%
CY06	16	3.53	22%	4.8	30%
CY07	24	3.94	16%	107.9	450%
CY08	18	4.12	23%	108.1	600%
BH-WBI10	17	7.80	46%	68.0	400%
EU01	16	4.35	27%	91.2	570%
EU02	24	5.44	23%	98.7	411%
EU03	21	3.70	18%	66.6	317%
EU04	12	6.99	58%	68.8	573%
BH-WBI13	30	14.40	48%	157.6	525%
HC01	15	4.81	32%	42.2	281%
BH-WBI28	37	5.00	14%	130.1	352%
HM01	24	15.86	66%	111.4	464%
HM02	36	13.22	37%	98.9	275%

Table 4-1 (continued)

Sewershed	Diameter, D (in)	Dry Weather Max. Depth, d_{max-D} (in)	Dry Weather Max. Depth-to-Diameter Ratio, d_{max-D}/D (in)	Wet Weather Max. Depth, d_{max-W} (in)	Wet Weather Max. Depth-to-Diameter Ratio, d_{max-W}/D (in)
HM03	36	4.75	13%	10.9	30%
HM04	30	2.80	9%	7.7	26%
HM05	42	6.01	14%	13.0	31%
LY01	30	1.91	6%	5.1	17%
LY02	18	7.08	39%	67.9	377%
LY03	30	11.75	39%	26.4	88%
LY04	12	3.17	26%	64.4	536%
LY05	30	10.25	34%	69.0	230%
LY06	18	2.42	13%	6.5	36%
LY07	18	3.59	20%	15.0	83%
LY08	10	1.13	11%	3.4	34%
LY09	12	3.45	29%	99.9	832%
BH-WBI25	48	9.30	19%	164.5	343%
BH-WBI25A	48	4.60	10%	63.7	133%
PL02	24	8.33	35%	141.4	589%
BH-WBI5A	30	16.30	54%	102.7	342%
TM01	10	3.80	38%	96.9	969%
BH-WBI27	24	11.20	47%	52.9	220%
TN01	15	5.72	38%	14.5	97%
TN02	36	8.94	25%	22.7	63%
TN03	15	8.29	55%	25.0	167%
TN04	36	3.98	11%	21.0	58%
TN05	27	4.43	16%	15.7	58%
TN06	27	6.81	25%	11.2	41%
TN07	24	3.53	15%	10.9	45%
TN08	18	3.61	20%	13.9	77%
TN09	18	3.85	21%	60.3	335%
TN10	27	3.11	12%	13.8	51%
BH-WBI21	24	6.60	28%	22.8	95%
BH-WBI22	54	7.70	14%	185.7	344%
BH-WBI24	48	4.90	10%	103.0	215%
TR01	42	7.20	17%	22.3	53%
TR02	27	5.72	21%	13.6	50%
TR03	24	5.06	21%	149.5	623%
TR04	10	2.48	25%	24.2	242%
WO01	24	6.13	26%	88.0	367%

The d/D ratio is a performance indicator used to assess sewer capacity. Sewers are often designed to flow under open channel flow conditions with some reserve capacity. For this reason ASCE and WEF recommend that sewers with diameters up to 15 inches be designed to flow with dry weather d/D ratios of 50%, and larger diameter sewers be designed to flow with dry weather d/D ratios of 75%. EPA has also included two d/D ratio-related performance criteria in the City's Consent Decree. As stated in the Consent Decree, for the City of Jackson a sewer is considered to have insufficient capacity if surcharge flow depths are greater than 24 inches above the sewer diameter (D+24) or less than 36 inches from the rim of the adjacent manhole (R-36). The EPA performance criteria and ASCE and WEF design criteria are compared to the observed d/D ratios in **Figure 4-1**.

Figure 4-1
Depth-to-Diameter Ratios Compared to Design Guidelines

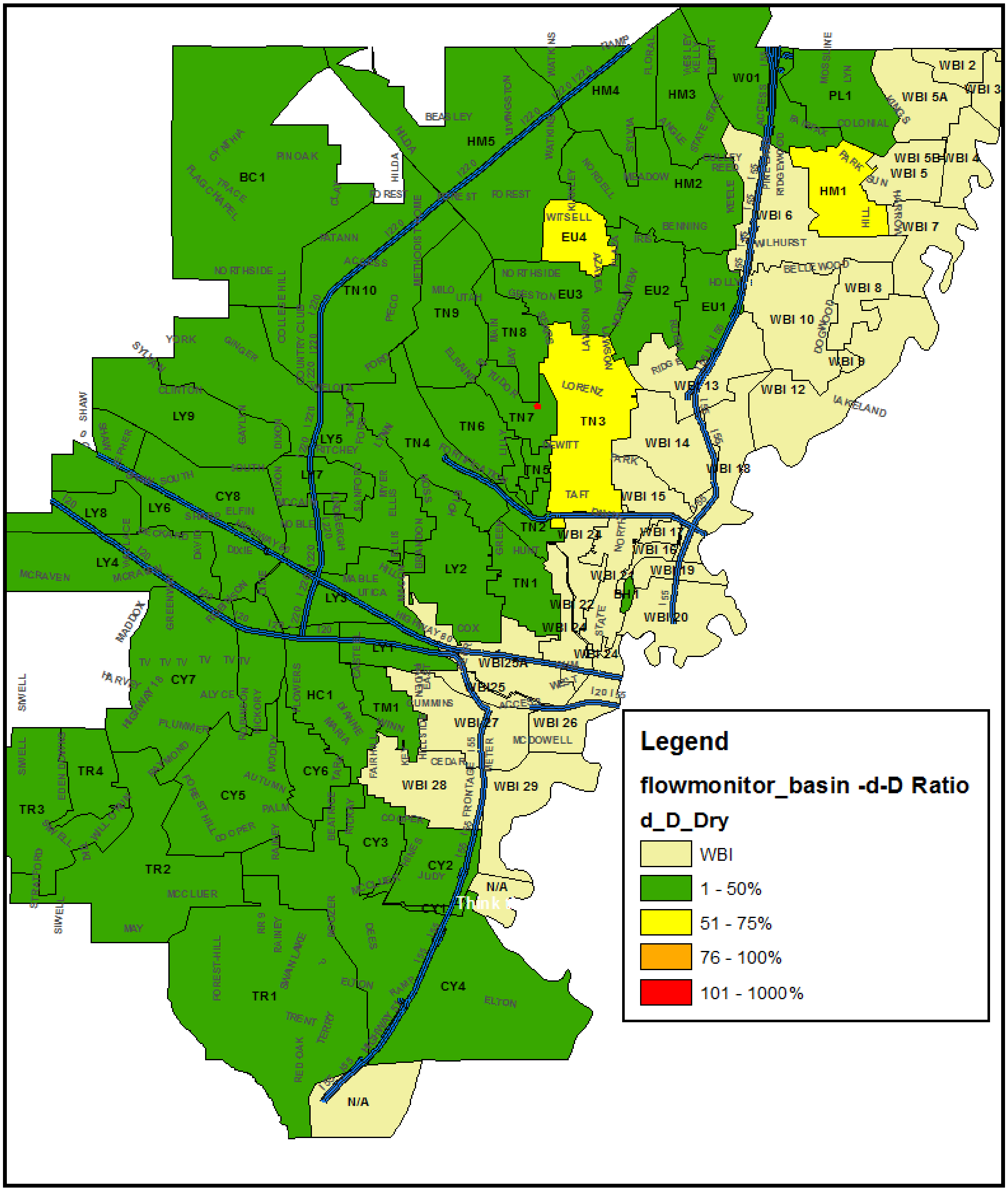


During dry weather conditions, all but two of the observed dry weather d/D ratios are within design criteria recommended by ASCE and WEF. This indicates that there is sufficient capacity to accommodate dry weather flow rates at all locations except perhaps for Sites EU04 and TN03, which are slightly above the recommended guidelines. The dry weather d/D ratios at Sites EU04 and TN03 are 58% and 55%, respectively.

Wet weather d/D ratios observed at 25 flow monitor locations are greater than 100% and are in excess of design criteria recommended by ASCE and WEF, indicating that there is insufficient capacity to accommodate maximum observed wet weather flows at these locations without surcharge conditions. Wet weather d/D ratios observed at 20 flow monitor locations are greater than the D+24 performance criteria, and four of these locations (plotted with a blue x in Figure 4-1) are also greater than the R-36 performance criteria required by EPA. All of the observed wet weather d/D ratios occurred during storm events with return frequencies less than two years at all durations, indicating that there is insufficient system capacity at these locations to convey observed wastewater flow in accordance with EPA performance criteria.

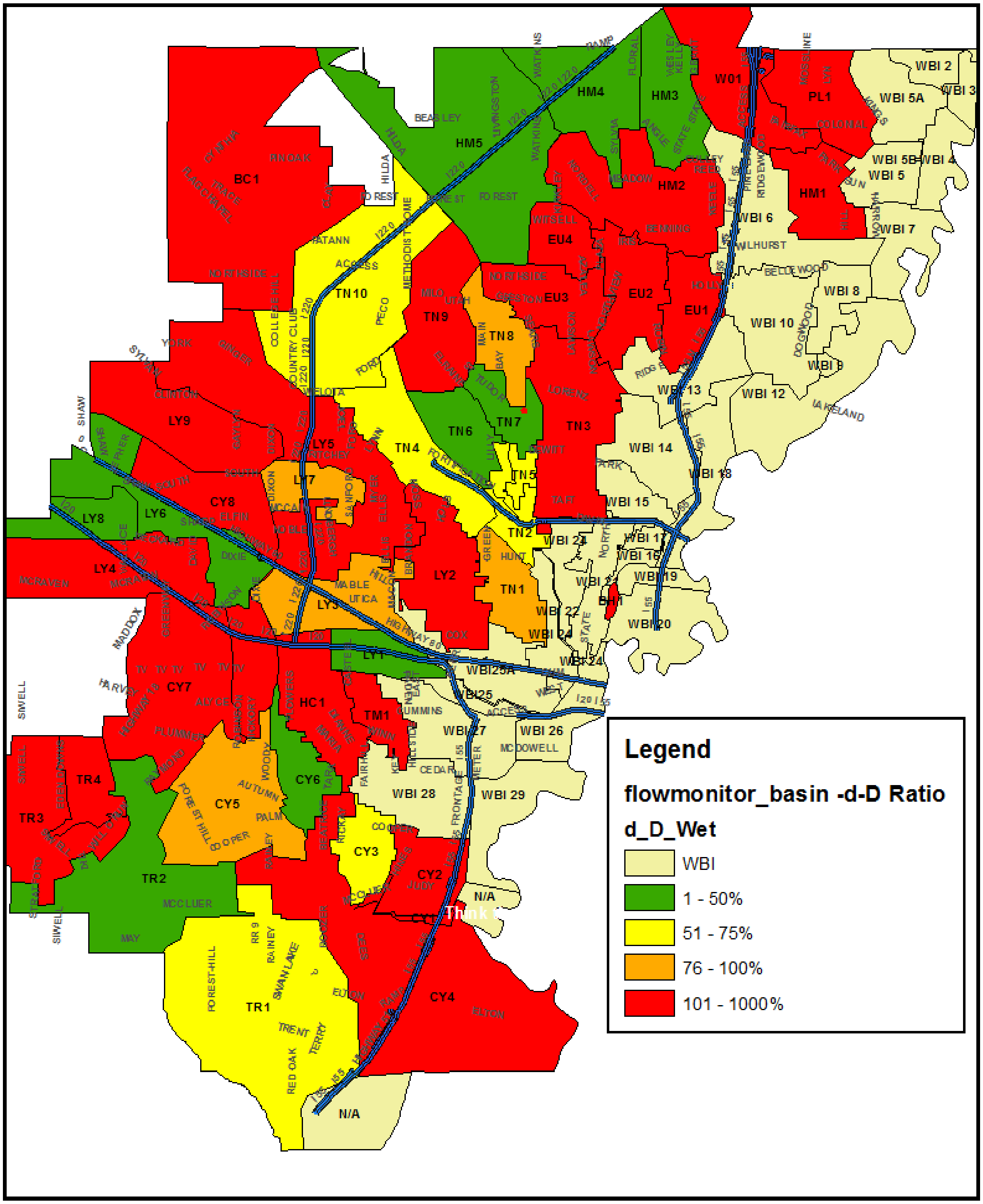
The dry weather and wet weather d/D ratios associated with each flow monitor location are depicted geographically on **Figure 4-2** and **Figure 4-3**, respectively.

Figure 4-2
Dry Weather Depth-to-Diameter Ratios



Courtesy ADS Environmental Services

Figure 4-3
Wet Weather Depth-to-Diameter Ratios



Courtesy ADS Environmental Services

Using the criteria in the Consent Decree, the 20 sewersheds with depth-to-diameter ratios shown in red above indicate they have insufficient conveyance capacity during wet weather events. On this basis, these sewersheds are candidates for further evaluation which will be considered in the overall sewershed prioritization determination.

4.2 Sewers Contributing to Wet Weather SSOs

Other limitations in the system conveyance capacity can be identified through an analysis of previous wet weather SSO locations, severity, and causes. While addressing excessive I/I is a major focus of sewer rehabilitation, it is also necessary to address the major system capacity limitations that result in wet weather SSOs. As an example, a map of wet weather SSO locations for the year 2014 is shown in **Figure 4-4**.

After a storm event, a Public Works employee will typically make a circuit of known recurring wet weather SSO sites to determine if an SSO occurred based on visible evidence, and, if feasible, to estimate the SSO volume based on standard estimating procedures. These SSO volume estimations, while useful, are not considered sufficiently reliable to evaluate SSO severity. The hydraulic model of the system will instead be used for a more accurate indicator of SSO volumes, as well as to identify any additional wet weather SSO locations not included on the City's inspection circuit.

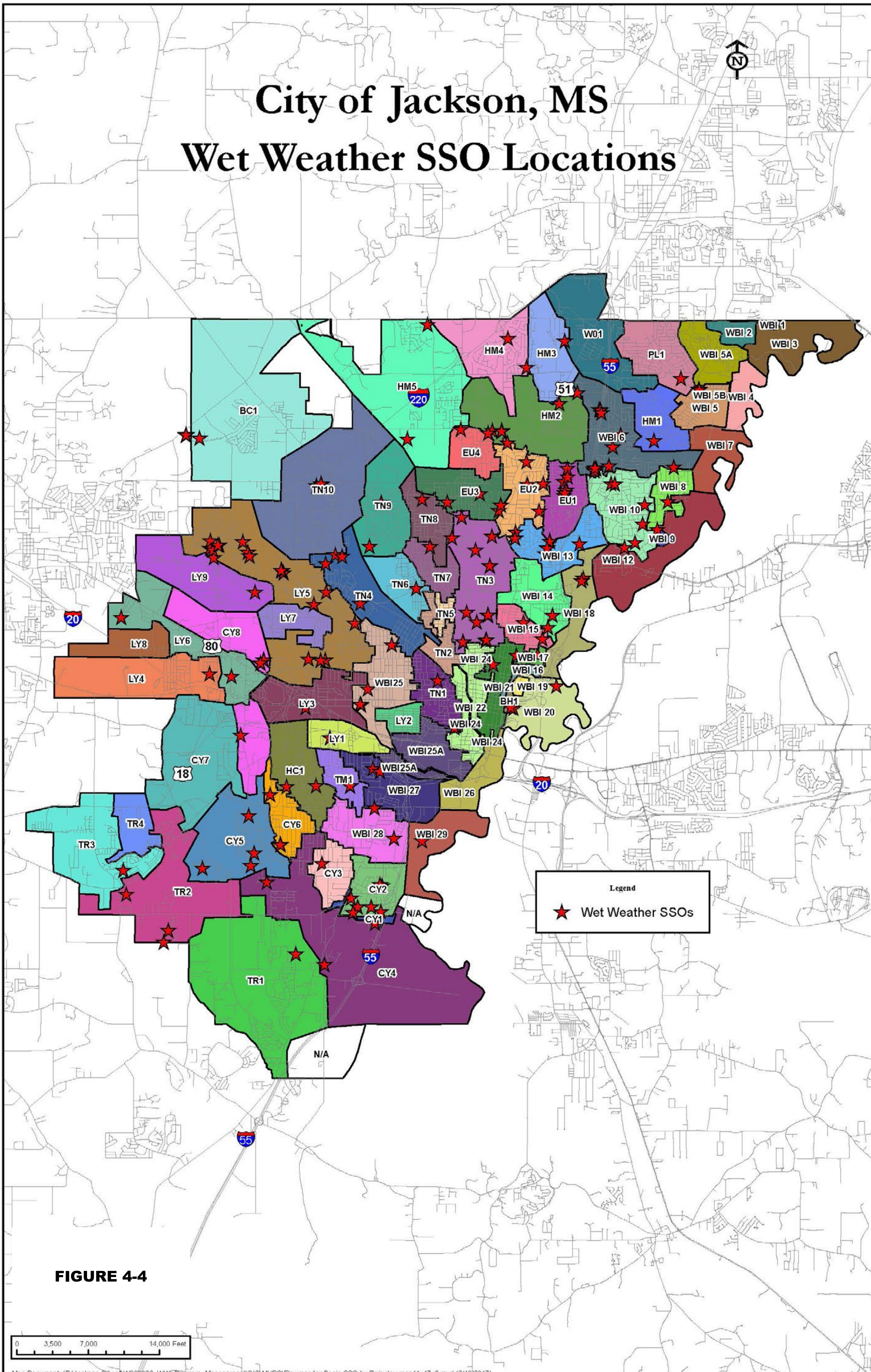
One measure of wet weather SSO severity is the SSO rate, which is the number of SSOs that occur per 100 miles of pipe. The SSO rate for the various sewersheds for the period March 2014 – February 2016 is shown on **Table 4-2**.

4.3 Sewers Contributing to Prohibited Bypasses

At present prohibited bypasses occasionally occur at the City's Savanna Wastewater Treatment Plant. These bypasses are caused in part by excessive flow in the West Bank Interceptor, the West Rankin interceptor, and, to a smaller extent, the Cany Creek interceptor. Another cause is the lack of adequate peak wet weather flow treatment and storage capacity at the plant. An increase in the peak flow handling capacity of the plant is being addressed separately as part of the ongoing Savanna WWTP Composite Correction Program. When these improvements are completed, together with rehabilitation of the West Bank Interceptor and the Group 1 and Group 2 sewersheds, future prohibited bypasses from the Savanna plant will be eliminated.

4.4 Hydraulic Modeling

A hydraulic model is currently under development to simulate the response of the WCTS to wet weather events, identify causes of SSOs, and to evaluate impacts of proposed remedial measures. The model includes the West Bank Interceptor, gravity lines 12-in and larger with associated manholes, and all pump stations and force mains. Actual flow monitoring data is being used to calibrate the model. Using the model, a more detailed evaluation of sewer conveyance capacity will be performed to determine capacity-limited sewers throughout the WCTS. The hydraulic model is expected to be completed by the end of 2017. Modeling results and interpretations regarding conveyance capacity will be submitted to EPA in a subsequent Addendum to this report.


City of Jackson, MS
Wet Weather SSO Locations
Legend
Wet Weather SSOs
BC1
TN10
HM5
HM4
HM3
W01
PL1
WBI 1
WBI 2
WBI 3
WBI 5A
WBI 5B
WBI 5
WBI 4
HM1
HM2
WBI 6
WBI 7
EU4
EU3
EU2
EU1
WBI 8
WBI 10
WBI 9
WBI 12
WBI 13
TN9
TN8
TN7
TN6
TN5
TN4
TN3
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WBI 19
WBI 20
WBI 21
WBI 22
WBI 24
BH1
WBI25
WBI25A
WBI 26
WBI 27
WBI 28
WBI 29
HC1
TM1
TR4
TR3
TR2
TR1
N/A
0 3,500 7,000 14,000 Feet
Map Document: (P:\Jackson City of\W009088_WW_Program_Management\GIS\MXDS\Flowmonitor Basin SSO by Rain day map11x17_2.mxd (2/10/2017)

FIGURE 4-4

Table 4-2
Sewershed Annual Wet Weather SSO Rate

Sewershed	Basin Size (LF)	Wet Weather SSOs [1]	Annual SSO Rate #/100 miles	Sewershed	Basin Size (LF)	Wet Weather SSOs [1]	Annual SSO Rate #/100 miles
BC01	97,100	4	10.9	LY05	266,222	22	21.8
BH01	2,575	0	0.0	LY06	79,387	2	6.7
BH-WBI14	69,103	2	7.6	LY07	43,430	0	0.0
BH-WBI15	54,633	2	9.7	LY08	21,408	0	0.0
CY01	13,722	0	0.0	LY09	59,130	1	4.5
CY02	65,137	7	28.4	LY-WBI25	11,438	4	92.3
CY03	45,737	1	5.8	LY-WBI25A	78,989	0	0.0
CY04	106,259	3	7.5	PL02	263,119	1	1.0
CY05	111,689	4	9.5	PL-WBI5A	78,989	0	0.0
CY06	62,967	3	12.6	TM01	53,543	2	9.9
CY07	83,947	0	0.0	TM-WBI27	82,293	3	9.6
CY08	61,011	12	51.9	TN01	89,221	2	5.9
EA-WBI10	109,762	6	14.4	TN02	60,972	0	0.0
EU01	65,539	8	32.2	TN03	189,509	15	20.9
EU02	118,428	8	17.8	TN04	98,720	4	10.7
EU03	75,576	4	14.0	TN05	21,114	0	0.0
EU04	44,873	1	5.9	TN06	54,967	1	4.8
EU-WBI13	69,143	4	15.3	TN07	62,671	1	4.2
HC01	98,912	2	5.3	TN08	59,885	1	4.4
HC-WBI28	92,285	1	2.9	TN09	101,891	2	5.2
HM01	83,310	7	22.2	TN10	93,881	3	8.4
HM02	145,370	7	12.7	TN-WBI21	80,559	2	6.6
HM03	96,435	0	0.0	TN-WBI22	16,088	0	0.0
HM04	88,722	2	6.0	TN-WBI24	109,628	0	0.0
HM05	120,711	3	6.6	TR01	174,955	1	1.5
LY01	37,229	1	7.1	TR02	117,334	3	6.7
LY02	39,550	0	0.0	TR03	118,907	1	2.2
LY03	70,889	1	3.7	TR04	28,265	0	0.0
LY04	57,241	1	4.6	WO01	212,187	1	1.2

[1] March 2014 - February 2016

5.0 Sewershed Prioritization

Using the results of the infiltration/inflow analysis based on flow monitoring data, the sewersheds were prioritized in terms of excessive RDII together with other performance indicators. The prioritization list will be used to guide future evaluation and rehabilitation activities planned for the sewersheds.

5.1 Prioritization Criteria

The purpose of sewershed prioritization is to provide a process for identifying and correcting, in a cost-effective manner, problems and limitations within the WCTS in the order of priority of their impact and risk to surface waters and the public. The sewersheds were prioritized in terms of their relative contribution to I/I problems within the WCTS according to the following classification:

Group 1 Sewersheds

Sewersheds with severe I/I problems that collectively contribute at least 30% of the total I/I in the entire system.

Group 2 Sewersheds

Sewersheds with significant I/I problems that collectively contribute at least 40% of total system I/I.

Group 3 Sewersheds

Sewersheds with the least I/I problems that collectively contribute no more than 30% of total system I/I.

In addition to relative I/I contribution, other factors were considered to determine the final sewershed prioritization ranking. These include frequency, volume, and environmental risk of SSOs within the sewershed; sewer age, condition, maintenance history, and failure risk; results anticipated from ongoing rehabilitation activities; and expected impact of future growth within the sewershed.

5.2 Infiltration/Inflow Analysis Results

The relative contribution of rain-derived infiltration and inflow from each sewershed was determined from the flow monitoring program. The study period was conducted from September 10, 2014 to January 25, 2015 for a total of 138 days. A total of 13 rain events of interest were observed during the period, with rainfall totals ranging up to 3.48 inches. A detailed analysis of dry weather and wet weather periods was performed to determine relative RDII amounts from each sewershed.

Dry Weather Performance

Dry weather flow depth-to-diameter (d/D) ratios were within standard design criteria recommended by ASCE and WEF at most flow monitor locations, indicating that sufficient capacity is available to accommodate dry weather flow rates observed during the study period. Slightly elevated dry weather d/D ratios were observed at Sites EU04 and TN03. Further review will be performed by the City to determine if the elevated d/D ratios at these locations result from downstream hydraulic restrictions or upstream dry weather sewer flows that are greater than anticipated.

A total of 19 flow monitor locations were defined as Class 2 – Marginal Cleansing or Class 3 – Non-Cleansing sewers. The Class 2 and Class 3 sewers will be inspected periodically by the City to determine the frequency of cleaning needed at these locations. Silt buildup was observed at 11 flow monitor locations during the study period, including four locations that are defined as Class 1 – Self-Cleansing; these four locations will be inspected further to identify if other conditions exist to cause silt, sediment, or debris accumulation in these areas. A tracking system will be developed to schedule and document the enhanced inspection required for these locations.

Wet Weather Performance

Wet weather peaking factors observed during the study period ranged from 2.77 to 40.49. The wet weather peaking factor of 2.77 was observed at Site TN03, while the wet weather peaking factor of 40.49 was observed at Site TN10. Flow increases at all flow monitor locations occur quickly during wet weather events, but also appear to quickly return to normal. This is indicative of primarily inflow sources as the main contributor to RDII.

Two wet weather flow imbalances were noted during several storm events during the study period. One wet weather flow imbalance occurred between Site WO1 and Site HM01, and the second occurred between Site TN09 and Site TN06. Wet weather flow imbalances suggest the presence of sanitary sewer overflows (SSOs) at one or more locations between two flow monitors. These areas will be further investigated to identify potential SSO locations.

Wet weather d/D ratios observed at 25 flow monitor locations are greater than 100% and are in excess of design criteria recommended by ASCE and WEF, indicating that there is insufficient capacity to accommodate maximum observed wet weather flows at these locations without surcharge conditions. Wet weather d/D ratios observed at 20 flow monitor locations are greater than the D+24 performance criteria required by EPA (surcharged 24-in above top of pipe) and occurred under storm events with return frequencies less than two years at all durations. Wet weather d/D ratios observed at four of these locations are also greater than the R-36 performance criteria required by EPA (surcharged to 36-in below manhole rim), indicating these locations operate under conditions more susceptible to SSOs. Backwater conditions were observed prior to surcharge at all four of the locations in excess of the R-36 performance criteria and at 12 of the remaining locations in excess of the D+24 performance criteria. Backwater conditions are caused by hydraulic restrictions and can exacerbate the conveyance of RDII originating from upstream sewers. The areas downstream from flow monitor locations where backwater conditions were observed will be further evaluated to determine if they are design or maintenance related. These locations include Sites CY01, CY04, CY07, CY08, EU01, EU02, EU03, HC01, HM01, LY02, LY09, PL02, TM01, TN09, TR03, and WO1.

5.3 Sewershed Ranking Based on Net RDII

Using the flow monitoring results, the 46 sewersheds were ranked in terms of relative contribution of RDII. Net RDII contribution was based on the total quantity of RDII generated with the sewershed for a 2-inch storm and the relative size of the sewershed in terms of lineal feet of gravity sewer installed. Results of the sewershed ranking based on net RDII is shown on **Table 5-1** from highest (#1) to lowest (#58). Also shown for comparison is the measured wet weather flow/dry weather flow peaking factor (PF) which is an indication of excessive RDII originating upstream, and the maximum observed depth-to-diameter (d/D) ratio for each sewershed which is an indication of capacity/conveyance issues. Also shown are the corresponding sewershed PF and d/D rankings.

Only the winter period was used in the prioritization ranking. The I/I analysis demonstrated that wet weather I/I is more severe in the winter months when rainfall tends to be greatest, soils have higher antecedent moisture, groundwater levels are higher, and plants are mostly dormant.

Table 5-1
Sewershed Prioritization Based on RDII Contribution

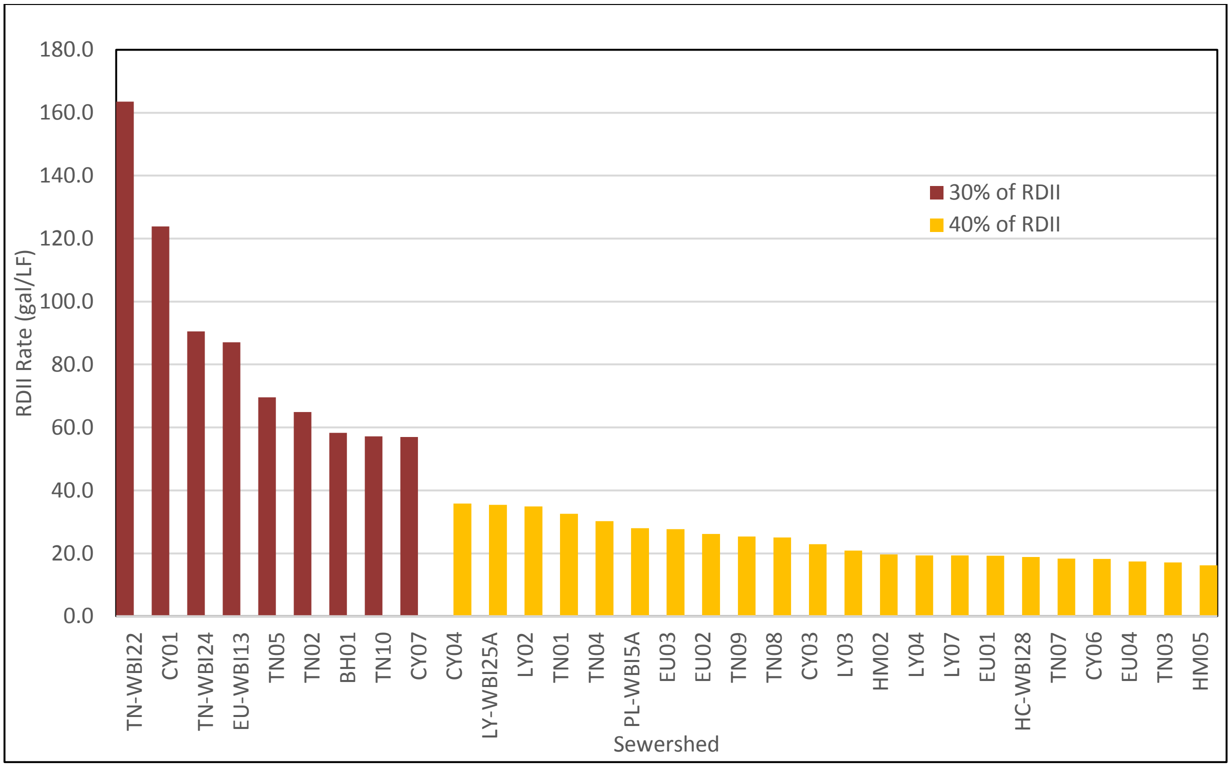
Sewershed	Basin Size (LF)	Net RDII (MGD)	Net RDII (gal/LF)	RDII Rank	Wet Weather Max. Depth-to-Diameter Ratio, $d_{max\text{-}W}/D$ (in)	$d_{max\text{-}W}/D$ Rank	Wet Weather Peaking Factor PF_W	PF_W Rank
TN-WBI22	16,088	2.63	163.5	1	344%	17	9.4	20
CY01	13,722	1.70	123.9	2	289%	22	27.3	2
TN-WBI24	109,628	9.92	90.5	3	215%	29	7.1	31
EU-WBI13	69,143	6.02	87.1	4	525%	9	3.5	55
TN05	21,114	1.47	69.6	5	58%	44	14.4	13
TN02	60,972	3.96	65.0	6	63%	42	5.1	48
BH01	2,575	0.15	58.3	7	158%	31	16.0	10
TN10	93,881	5.37	57.2	8	51%	46	40.5	1
CY07	83,947	4.78	56.9	9	450%	11	23.4	4
CY04	106,259	3.81	35.9	10	286%	23	9.3	21
LY-WBI25A	78,989	2.80	35.4	11	133%	33	6.0	37
LY02	39,550	1.38	34.9	12	377%	14	7.2	29
TN01	89,221	2.91	32.6	13	97%	35	4.7	49
TN04	98,720	2.98	30.2	14	58%	43	26.6	3
PL-WBI5A	78,989	2.21	28.0	15	342%	19	3.3	56
EU03	75,576	2.09	27.7	16	317%	21	6.5	34
EU02	118,428	3.10	26.2	17	411%	12	7.4	28
TN09	101,891	2.58	25.3	18	335%	20	7.1	30
TN08	59,885	1.50	25.1	19	77%	40	13.4	15
CY03	45,737	1.05	23.0	20	69%	41	19.2	8
LY03	70,889	1.48	20.9	21	88%	37	6.4	35
HM02	145,370	2.85	19.6	22	275%	25	6.2	36

Table 5-1 (continued)

Sewershed	Basin Size (LF)	Net RDII (MGD)	Net RDII (gal/LF)	RDII Rank	Wet Weather Max. Depth-to-Diameter Ratio, d_{max-W}/D (in)	d_{max-W}/D Rank	Wet Weather Peaking Factor PF_W	PF_W Rank
LY04	57,241	1.11	19.4	23	536%	8	21.2	5
LY07	43,430	0.84	19.3	24	83%	38	12.1	17
EU01	65,539	1.26	19.2	25	570%	7	6.0	39
HC-WBI28	92,285	1.74	18.8	26	352%	16	5.4	43
TN07	62,671	1.15	18.4	27	45%	50	15.6	11
CY06	62,967	1.15	18.3	28	30%	55	11.1	18
CY08	61,011	1.08	17.7	29	600%	4	6.0	38
EU04	44,873	0.78	17.4	30	573%	6	7.8	27
TN03	189,509	3.25	17.2	31	167%	30	2.8	58
HM05	120,711	1.96	16.2	32	31%	54	5.2	47
BC01	97,100	1.51	15.6	33	122%	34	8.1	25
LY09	59,130	0.90	15.2	34	832%	2	6.7	33
LY05	266,222	3.99	15.0	35	230%	27	5.3	44
HC01	98,912	1.47	14.9	36	281%	24	8.4	24
HM04	88,722	1.28	14.4	37	26%	57	14.6	12
TR03	118,907	1.71	14.4	38	623%	3	13.0	16
LY-WBI25	11,438	0.66	13.6	39	343%	18	6.8	32
HM03	96,435	1.27	13.2	40	30%	56	7.9	26
TM01	53,543	0.70	13.1	41	969%	1	3.5	54
LY06	79,387	1.03	13.0	42	36%	52	13.5	14
TR02	117,334	1.52	13.0	43	50%	47	10.7	19
TR04	28,265	0.36	12.7	44	242%	26	20.4	6
TN-WBI21	80,559	0.99	12.2	45	95%	36	5.2	46
PL02	263,119	3.18	12.1	46	589%	5	5.8	40
EA-WBI10	109,762	1.19	10.9	47	400%	13	5.7	42
CY02	65,137	0.70	10.8	48	137%	32	5.8	41
TR01	174,955	1.87	10.7	49	53%	45	9.2	22
BH-WBI15	54,633	0.56	10.2	50	46%	49	4.5	50
WO01	212,187	1.87	8.8	51	367%	15	5.3	45
TN06	54,967	0.47	8.6	52	41%	51	3.6	53
TM-WBI27	82,293	0.64	7.8	53	220%	28	3.7	52
BH-WBI14	69,103	0.44	6.4	54	49%	48	2.9	57
CY05	111,689	0.57	5.1	55	78%	39	8.7	23
HM01	83,310	0.35	4.2	56	464%	10	3.9	51
LY01	37,229	0.11	3.0	57	17%	58	16.2	9
LY08	21,408	0.04	1.9	58	34%	53	19.8	7

A graphical representation of the top 32 sewersheds generating 70% of the net RDII is shown on **Figure 5-1**.

Figure 5-1
Sewersheds with Highest Net RDII



5.4 Sewershed Ranking Based on SSO Rate

As discussed in Section 4, another measure of sewershed rehabilitation need is the SSO rate, or the number of wet weather SSOs that occur per 100 miles of sewer pipe. Using SSO data for the years 2013-2014, the sewershed rankings in terms of SSO severity are shown on **Table 5-2**.

Table 5-2
Sewershed Ranking Based on Annual Wet Weather SSO Rate

Sewershed	Wet Weather SSOs [1]	Annual SSO Rate #/100 miles	SSO Rank	Sewershed	Wet Weather SSOs	Annual SSO Rate #/100 miles	SSO Rank
LY-WBI25	4	92.3	1	EU04	1	5.9	30
CY08	12	51.9	2	CY03	1	5.8	31
EU01	8	32.2	3	HC01	2	5.3	32
CY02	7	28.4	4	TN09	2	5.2	33
HM01	7	22.2	5	TN06	1	4.8	34
LY05	22	21.8	6	LY04	1	4.6	35
TN03	15	20.9	7	LY09	1	4.5	36
EU02	8	17.8	8	TN08	1	4.4	37
EU-WBI13	4	15.3	9	TN07	1	4.2	38
EA-WBI10	6	14.4	10	LY03	1	3.7	39
EU03	4	14.0	11	HC-WBI28	1	2.9	40
HM02	7	12.7	12	TR03	1	2.2	41
CY06	3	12.6	13	TR01	1	1.5	42
BC01	4	10.9	14	WO01	1	1.2	43
TN04	4	10.7	15	PL02	1	1.0	44
TM01	2	9.9	16	BH01	0	0.0	45
BH-WBI15	2	9.7	17	CY01	0	0.0	46
TM-WBI27	3	9.6	18	CY07	0	0.0	47
CY05	4	9.5	19	HM03	0	0.0	48
TN10	3	8.4	20	LY02	0	0.0	49
BH-WBI14	2	7.6	21	LY07	0	0.0	50
CY04	3	7.5	22	LY08	0	0.0	51
LY01	1	7.1	23	LY-WBI25A	0	0.0	52
TR02	3	6.7	24	PL-WBI5A	0	0.0	53
LY06	2	6.7	25	TN02	0	0.0	54
HM05	3	6.6	26	TN05	0	0.0	55
TN-WBI21	2	6.6	27	TN-WBI22	0	0.0	56
HM04	2	6.0	28	TN-WBI24	0	0.0	57
TN01	2	5.9	29	TR04	0	0.0	58

[1] March 2014 - February 2016

5.5 Other Sewershed Evaluation Factors

The initial sewer groupings based on RDII can be modified to account for critical system operation, maintenance, or other issues that also need to be considered. Additional evaluation factors established in the ***Sewershed Prioritization Work Plan*** are:

1. **Environmental Risk** – Factors considered were presence of schools, parks, bikeways, lakes, repetitive SSO sites, and potential to discharge above the water treatment plant intake. Rated as high (1), medium (2), or low (3).

2. **Failure Risk** – A measure of the potential impact of structural failures of critical sewers based on nature of affected facilities such as industrial centers, commercial centers, and major healthcare facilities. Rated as high (1), medium (2), or low (3).

3. **Current Rehab Activities** –Expected results of ongoing or scheduled rehabilitation projects or other corrective action work within the sewershed. Rated as positive (0) or neutral (1). All basins are rated neutral since no significant rehab is currently underway or planned within any of the sewersheds.

4. **Maintenance History** – Frequency and severity of previous repairs within the sewershed as experienced by Jackson Public Works Department staff. Based on service calls over the period March 2013-December 2016. Rated as 1 (greater than 300 calls), 2 (150 to 300 calls) or 3 (less than 150 calls).

5. **Future Development** – The potential or plans for future development and growth within the sewershed. Rated as positive (0) or neutral (1). Where future development is identified, downstream sewersheds are also included to assure adequate future conveyance capacity.

6. **Sewer Condition** – A general measure of the condition of sewers within the sewershed based on available pipe age data. Pipe age of >60 years rated as 1, pipe age of 45-60 years rated as 2, and pipe age <45 years rated as 3.

These criteria were applied to the Jackson sewersheds based on input from City Public Works and Planning Department staff. Also included in the evaluation is the relative wet weather peaking factor rate for the individual sewersheds, which is an added criterion.

5.6 Sewershed Evaluation Results

A weighting procedure was used to compare the RDII, wet weather peaking factor, and SSO rate having a ranking of 1 through 58 to the above qualitative evaluation factors rated as 0, 1, or 2. First, each evaluation category was normalized by dividing the individual sewershed rating by the column total. Second, a weighting factor was applied to each evaluation category based on its relative importance.

Results of the evaluation are shown on **Table 5-3**. The table shows the individual rank/rating for each category together with the weighting factor used. The last column shows the resulting cumulative ranking score for each sewershed, listed from worst to best.

During the evaluation process, a series of different weighting factors were considered to test the sensitivity of the analysis procedure. The alternative outcomes were compared in a review meeting with Public Works staff. **Table 5-3** reflects the scenario that best describes the overall relative ranking of each sewershed in terms of rehabilitation need. It also includes a manual adjustment to the rankings to include four additional sewersheds within the top 12. These four sewersheds were initially ranked lower, but were moved up in priority because they consisted of the top three sewersheds with the highest wet weather SSO rate (LY-WBI25, EU01, and CY08) and Sewershed LY05, which has severe needs due to the widespread presence of old 6-in sewers that cannot be properly maintained.

Table 5-3
Sewershed Evaluation Results

Sewershed	RDII Rank	Peaking Factor Rank	SSO Rate Rank	Env. Risk Rating	Failure Risk Rating	Current Rehab Rating	Maint. History Rating	Future Development Rating	Sewer Condition Rating	Cumulative Score	Rank
Weighting	40%	20%	15%	5%	5%	0%	5%	5%	5%	100%	
TN10	8	1	20	2	2	0	1	1	3	0.88	1
TN04	14	3	15	2	2	0	1	1	2	0.95	2
TN-WBI22	1	20	45	3	2	0	1	0	1	0.98	3
CY04	10	21	22	2	2	0	1	0	3	1.03	4
EU02	17	28	8	2	2	0	1	0	1	1.06	5
CY01	2	2	45	3	2	0	3	1	2	1.06	6
EU-WBI13	4	55	9	2	1	0	1	0	2	1.08	7
CY07	9	4	45	3	2	0	3	0	3	1.15	8
LY-WBI25	39	32	1	1	1	0	1	1	2	1.66	9
EU01	25	39	3	2	2	0	1	1	1	1.48	10
CY08	29	38	2	3	2	0	1	0	3	1.53	11
LY05	35	44	6	1	2	0	1	1	2	1.80	12
HM02	22	36	12	1	1	0	1	0	2	1.26	13
BH01	7	10	45	3	1	0	3	1	1	1.18	14
TN-WBI24	3	31	45	2	1	0	3	0	2	1.19	15
TN05	5	13	45	3	2	0	2	1	2	1.22	16
EU03	16	34	11	3	2	0	1	1	1	1.32	17
TN01	13	49	29	1	1	0	2	0	1	1.36	18
LY02	12	29	45	3	1	0	3	0	1	1.38	19
CY03	20	8	31	2	2	0	3	1	2	1.38	20
CY06	28	18	13	2	2	0	1	1	1	1.39	21
LY-WBI25A	11	37	45	2	1	0	3	0	1	1.41	22
LY04	23	5	35	2	2	0	1	1	3	1.41	23
TN02	6	48	45	2	2	0	2	0	1	1.42	24
TN08	19	15	37	3	2	0	3	1	2	1.54	25
TN07	27	11	38	1	2	0	2	1	2	1.56	26
TN09	18	30	33	3	2	0	2	1	1	1.57	27
BC01	33	25	14	1	2	0	2	1	3	1.69	28
LY07	24	17	45	3	2	0	3	1	1	1.71	29
TN03	31	58	7	1	1	0	3	0	1	1.73	30
LY06	42	14	25	3	2	0	1	0	3	1.77	31
EU04	30	27	30	2	2	0	2	1	2	1.79	32
LY03	21	35	39	2	2	0	2	1	3	1.80	33
HM04	37	12	28	2	2	0	2	1	3	1.80	34
HC01	36	24	32	1	2	0	1	1	2	1.83	35
TR03	38	16	41	2	3	0	2	0	3	1.90	36
PL-WBI5A	15	56	45	1	2	0	3	1	2	1.92	37
HM05	32	47	26	2	2	0	2	0	3	1.93	38
TR02	43	19	24	2	3	0	3	0	3	1.93	39
HC-WBI28	26	43	40	2	2	0	2	1	2	1.97	40
TR04	44	6	45	2	3	0	3	0	3	2.00	41
CY05	55	23	19	1	2	0	1	0	3	2.04	42
EA-WBI10	47	42	10	1	2	0	2	1	1	2.09	43
TN-WBI21	45	46	27	2	1	0	2	0	1	2.10	44
CY02	48	41	4	2	2	0	2	1	2	2.13	45
LY09	34	33	36	3	2	0	3	1	3	2.13	46
TM01	41	54	16	2	2	0	1	1	1	2.14	47
LY01	57	9	23	3	2	0	3	1	1	2.18	48
HM03	40	26	45	2	1	0	3	1	3	2.19	49
BH-WBI15	50	50	17	3	1	0	2	0	1	2.21	50
TR01	49	22	42	2	3	0	3	0	3	2.27	51
LY08	58	7	45	3	2	0	1	1	3	2.39	52
BH-WBI14	54	57	21	1	1	0	3	0	2	2.43	53
HM01	56	51	5	2	1	0	3	1	2	2.44	54
TM-WBI27	53	52	18	2	2	0	1	1	2	2.46	55
PL02	46	40	44	2	2	0	3	1	2	2.49	56
TN06	52	53	34	2	2	0	3	1	1	2.64	57
WO01	51	45	43	2	1	0	3	1	3	2.65	58

5.7 Sewershed Rehabilitation Groupings

With the overall rankings defined, the sewershed groupings required by the Consent Decree were selected. Group 1 must have a minimum of 30% of total I/I included. The Group 1 sewersheds proposed will target 34% of the total I/I and will address the most critical areas of rehabilitation need. Group 2 sewersheds must include at least 40% of the total I/I. The Group 2 sewersheds proposed include an additional 47% total I/I. Accordingly, the proposed groupings exceed the minimum requirements of the Consent Decree. Further refinement of the Group 1/Group 2 sewershed list is anticipated upon completion of the hydraulic model.

The proposed sewershed groupings are shown on **Table 5-4**. Also included is the total amount of I/I within each group and the total sewer length included.

Table 5-4
Sewershed Rehabilitation Groups

GROUP 1		
Sewershed	*Basin Size (LF)*	*Net RDII (Basin %)*
TN10	93,881	4.9%
TN04	98,720	2.7%
TN-WBI22	16,088	2.4%
CY04	106,259	3.5%
EU02	118,428	2.8%
CY01	13,722	1.5%
EU-WBI13	69,143	5.5%
CY07	83,947	4.3%
LY-WBI25	11,438	0.1%
EU01	65,539	1.1%
CY08	61,011	1.0%
LY05	266,222	3.6%
Subtotal	1,004,398	-
% of Total	19.3%	33.5%

GROUP 2		
Sewershed	*Basin Size (LF)*	*Net RDII (Basin %)*
HM02	145,370	2.6%
BH01	2,575	0.1%
TN-WBI24	109,628	9.0%
TN05	21,114	1.3%
EU03	75,576	1.9%
TN01	89,221	2.6%
LY02	39,550	1.3%
CY03	45,737	1.0%
CY06	62,967	1.0%
LY-WBI25A	78,989	2.5%
LY04	57,241	1.0%
TN02	60,972	3.6%
TN08	59,885	1.4%
TN07	62,671	1.0%
TN09	101,891	2.3%
BC01	97,100	1.4%
LY07	43,430	0.8%
TN03	189,509	3.0%
LY06	79,387	0.9%
EU04	44,873	0.7%
LY03	70,889	1.3%
HM04	88,722	1.2%
HC01	98,912	1.3%
TR03	118,907	1.6%
PL-WBI5A	78,989	2.0%
Subtotal	1,924,105	-
% of Total	37.0%	47.0%

While the sewer groupings were based primarily on relative I/I contribution, Group 1 and Group 2 also include sewersheds with 7 of the top 10 wet weather peaking factors which is characteristic of excessive I/I. Groups 1 and 2 also include 6 of the top 10 sewersheds with high wet weather depth-to-diameter ratios resulting from excessive surcharging, indicating insufficient sewer conveyance capacity. Additionally, sewersheds with 6 of the top 10 SSO rates are included, with all but one of these a part of Group 1. The final groupings proposed for Group 1 and Group 2 are those that will best meet the sewer rehabilitation needs of the City of Jackson.

Ten of the City's 14 sewer basins will require rehabilitation as listed on **Table 5-5**. Generally, these basins are in the oldest parts of the City as would be expected.

Table 5-5
Sewershed Rehabilitation by Basin

	No. of Sewersheds	
Basin	Group 1	Group 2
Town Creek	3	8
Caney Creek	4	2
Lynch Creek	2	6
Eubanks Creek	3	2
Belhaven Creek	0	1
Hanging Moss Creek	0	2
Hardy Creek	0	1
Purple Creek	0	1
Trahon Creek	0	1
Bogue Chitto	0	1
Total Sewersheds	12	25

In summary, 37 of the City's 58 sewersheds are being targeted to address at least 70% of total I/I, with up to 80% of the total I/I targeted. Twelve sewersheds comprise the initial group containing 19% of the total collection system by length. Group 2 contains an additional 37% of the collection system by length. When both sewer groups are addressed, up to 56% of the total collection system will be rehabilitated.

The plan for implementing the required rehabilitation in these basins is provided in the following section.

6.0 Sewershed Evaluation

SSES studies will be performed in the Group 1 and Group 2 sewersheds to evaluate I/I sources and develop rehabilitation plans. The plan for implementing the required evaluation activities is described below.

6.1 SSES Approach

The City intends to engage one or more qualified professional services firms to perform the Sewer System Evaluation Survey (SSES) studies within the Group 1 and Group 2 sewersheds. The techniques to be used include manhole inspection, smoke testing, closed-circuit television (CCTV) inspection, and, where needed, selective flow monitoring. The proposed evaluation methods, decision-making criteria, procedures, and protocols to be used in performing the SSES activities were described in the ***Sewershed Evaluation Plan*** approved by EPA on June 17, 2014.

Results of the SSES Studies will provide detailed information on the sources and quantities of infiltration/inflow (I/I) within each study area, together with information on the structural condition and location of defects. A Rehabilitation Plan will then be prepared to correct the excessive I/I sources and repair the structural defects. Pump stations and force mains within the prioritized sewersheds are being evaluated separately, and will be included as part of the proposed rehabilitation.

6.2 SSES Schedule

The ***Sewershed Prioritization Report*** is developed to serve as a guide in performing SSES studies within each Group 1 and Group 2 sewershed. The Group 1 and Group 2 sewersheds are defined as follows:

- Group 1 sewersheds are those with severe I/I that collectively contribute at least 30% of the total I/I in the entire system. Sewershed Evaluation Survey (SSES) studies must be completed within 63 months of date of entry of the Consent Decree, or June 1, 2018.

- Group 2 sewersheds are those with significant I/I that collectively contribute at least 40% of total system I/I. Sewershed Evaluation Survey (SSES) studies must be completed within 141 months of date of entry of the Consent Decree, or December 1, 2024.

The remaining sewersheds are those with the least I/I problems that collectively contribute no more than 30% of total system I/I.

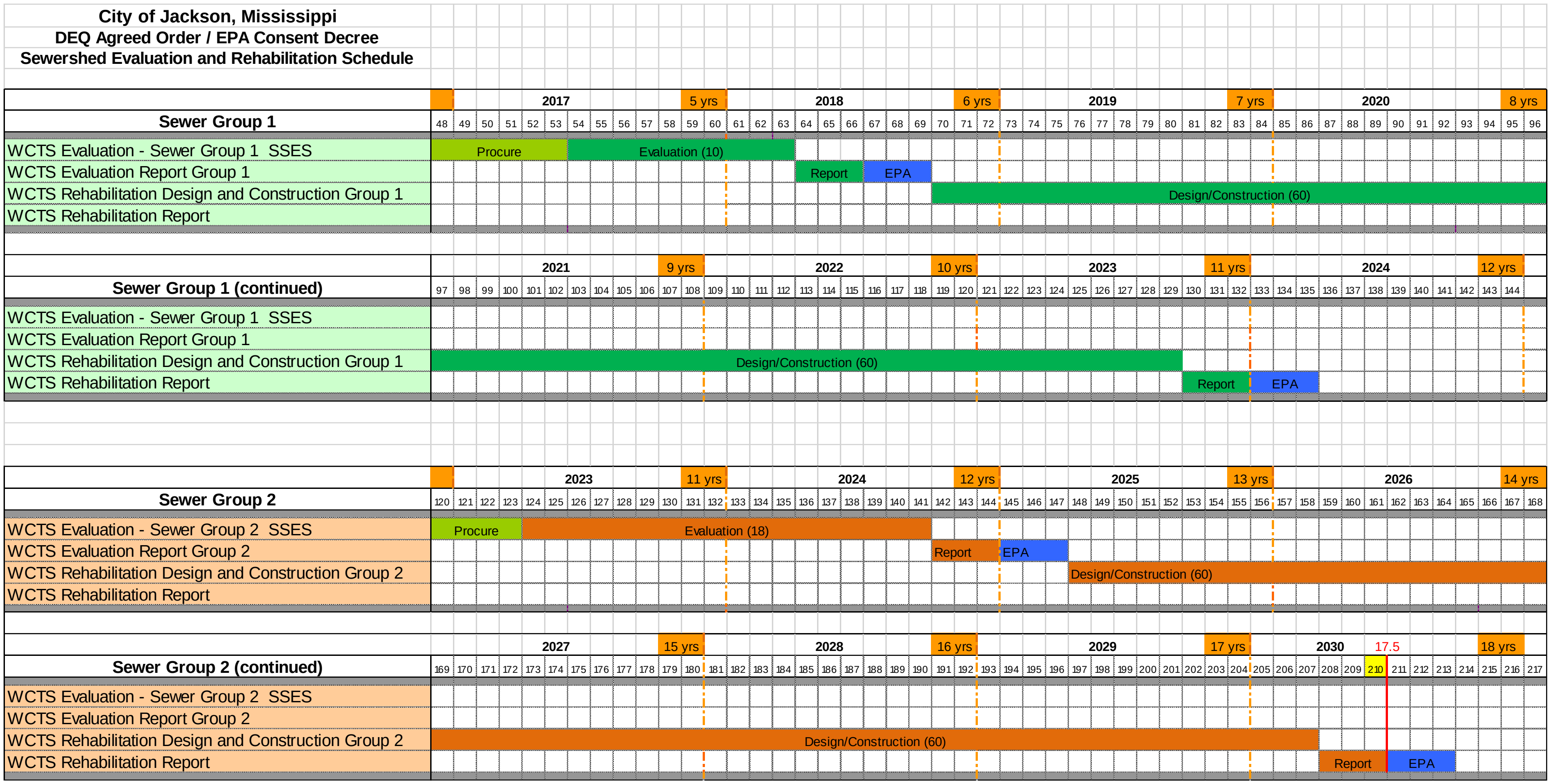
The City of Jackson sewershed evaluation work will be performed over an eight-year period to meet the requirements of the Consent Decree. Required dates for completion of sewershed evaluations and subsequent rehabilitation are listed on **Table 6-1**. The schedule for the Group 1 and Group 2 sewershed evaluation and rehabilitation activities is shown on **Figure 6-1**.

Table 6-1
Jackson Sewershed Evaluation and Rehabilitation Requirements

Activity	Group 1 Sewersheds		Group 2 Sewersheds	
	Required Time to Complete	Calendar Date	Required Time to Complete	Calendar Date
Complete SSES Evaluations	63 mo. from CD Date of Entry[1]	6/1/2018	141 mo. from CD Date of Entry	12/1/2024
Submit Evaluation Reports	3 mo. after completion of each SSES	TBD	3 mo. after completion of each SSES	TBD
Complete Rehabilitation Design & Construction	129 mo. from CD Date of Entry	12/1/2023	207 mo. from CD Date of Entry	6/1/1930
Submit Rehabilitation Reports	3 mo. after completion of remedial measures in each sewershed	TBD	3 mo. after completion of remedial measures in each sewershed	TBD

[1] Consent Decree date of entry March 1, 2013.

Figure 6-1
Proposed Sewershed Evaluation and Rehabilitation Schedule



Appendix A
Example Flow Meter Site Reports

Flow Meter BC-1 Site Report

Flow Meter BH-1 Site Report

Flow Meter HM-4 Site Report

Flow Meter TN-1 Site Report

Flow Meter CY-7 Site Report

Flow Meter WBI-05A Site Report

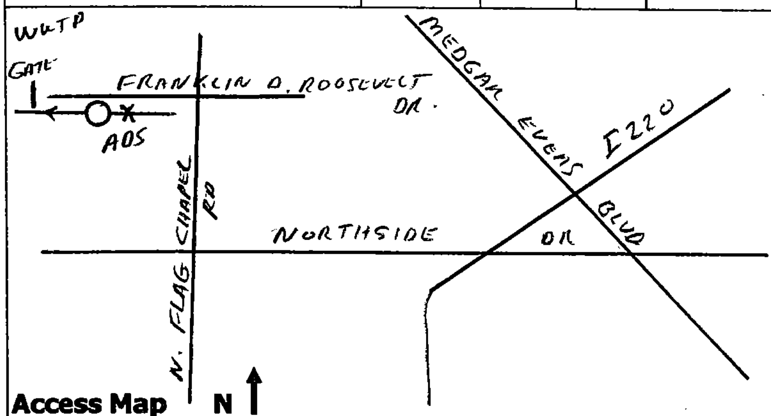
Flow Meter WBI-15 Site Report

Flow Meter WBI-24 Site Report

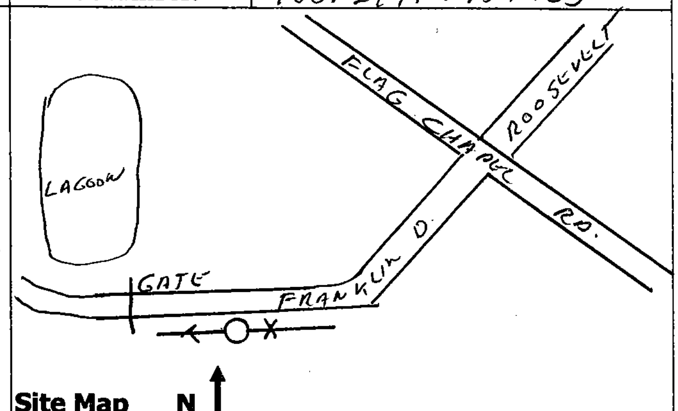
ADS ENVIRONMENTAL SERVICES®

ADS Site Report — Quality Form

Project Name: JACKSON MS TEMP 2014	City/State: JACKSON MS		FM Initials: MWD
Site Name: BC1	Monitor Series:	Monitor S/N:	21367
Address / Location: END OF FRANKLIN D. ROOSEVELT DR - MH ON SOUTH SIDE OF ROAD IN GRASS - 200 FT BEFORE GATE		Manhole #:	
		Map Page #:	
Access: DRIVE MH BESIDE ROAD	Type of System: Sanitary ☒ Storm ☐ Combined ☐	Pipe Height:	15.13
		Pipe Width:	15.00
		Phone Number:	166.219.175.123



Access Map N ↑



Site Map N ↑

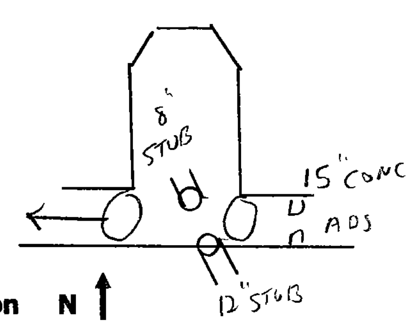
Investigation Information:

Date/ Time of Investigation:	8-28-14 9:30 AM
Site Hydraulics:	SMOOTH SLOW FLOW - VEL. & PRESS ROTATED DUE TO 1.00" SILT
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	DID NOT LOCATE
Downstream Manhole:	DID NOT OPEN
Depth of Flow (Wet Dof): 10:30	6.0 +/- .125
Range (Air Dof):	7.5 +/- .25
Peak Velocity:	1.01 fps
Silt: 1.00"	1.10 Inches

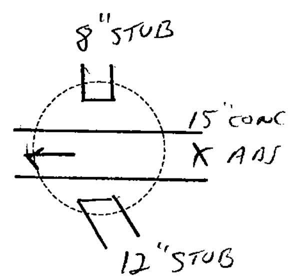
Manhole Information:

Manhole Depth:	11.20 Feet
Manhole Material / Condition:	PRECAST, FAIR STEPS
Pipe Material / Condition:	15" CONC - FAIR
Mini System Character:	Residential ☒ Commercial ☒ Industrial ☐ Other
Telephone Information:	N/A
Access Pole #:	
Distance From Manhole:	Feet
Road Cut Length:	Feet
Trench Length:	Feet

Other Information



Cross Section N ↑



Planar N ↑

Installation Information	
Installation Type:	RING
Sensors/Devices:	U V P
Surcharge Height:	9.00 Feet
Rain Gauge Zone:	

Backup	~~Yes~~	No	?	Distance
Trunk	☐	☒		
Lift/Pump Station	☐	☒		
WWTP	☐	☒		
Other	☐	☒		

Additional Site Information/Comments:

1.5 2.0

F1483 AREA
F1484 PIPE
F1485 PIPE

N 32° 22.043
W 090° 16.531

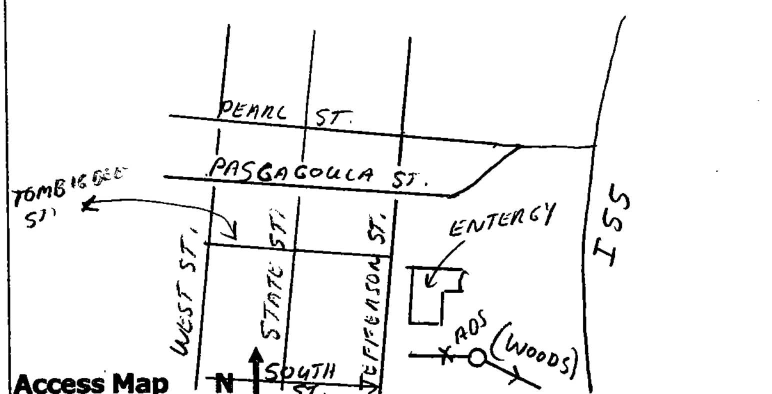
QF 675007 *Rev A0*
Effective Date 09/9/2003

Uncontrolled Copy

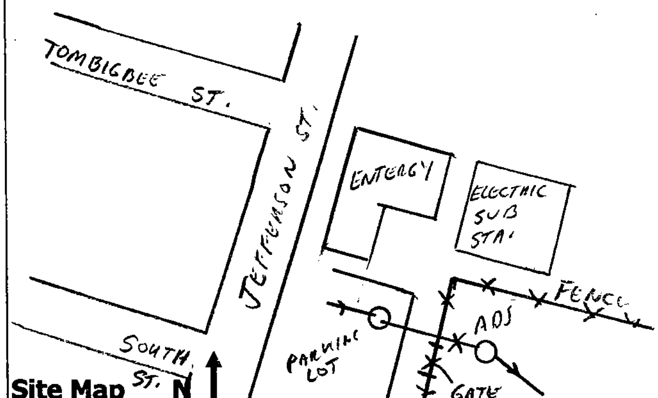
ADS Environmental Services — ADS Site Report — Quality Form

Project Name: JACKSON MS TEMP 2014	**City/State:** JACKSON MS.		**FM Initials:** MWB
Site Name: BH1	**Monitor Series:** FLOWSHARK	**Monitor S/N:**	21624
Address / Location: JEFFERSON ST. BEHIND BEHIND ENTERGY (NEAR JEFF. ST & TOMBIGBEE ST)		**Manhole #:**	BH0017
		Map Page #:	
Access: WALK W/IN ESMT.	**Type of System:** Sanitary [X] Storm [ ] Combined [ ]	**Pipe Height:**	17.50
		Pipe Width:	18.00
		Phone Number:	166.213.158.36

Access Map N ↑



Site Map N ↑



Investigation Information:

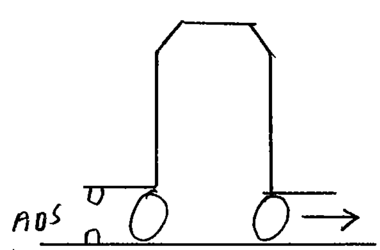
Date/ Time of Investigation:	8-19-14 15:00
Site Hydraulics:	SMOOTH SLOW FLOW - 2" SILT IN PIPE SENSORS ROTATED
Upstream Input: (L/S, P/S)	
Upstream Manhole:	CANT USE - OUTSIDE DROP ALSO HAS DROP [illegible]
Downstream Manhole:	DID NOT LOCATE
Depth of Flow (Wet Dof):	2.5 +/- .25
Range (Air Dof):	12.25 +/- .25
Peak Velocity:	0.52 fps
Silt:	2.0 Inches

Manhole Information:

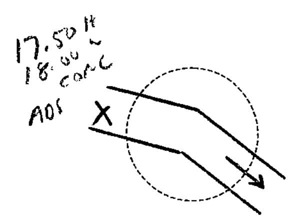
Manhole Depth:	15.10 Feet
Manhole Material / Condition:	PRECAST CONCRETE / GOOD
Pipe Material / Condition:	CONCRETE / DETER.
Mini System Character:	Residential [X] Commercial [X] Industrial [ ] Other
Telephone Information:	
Access Pole #:	
Distance From Manhole:	Feet
Road Cut Length:	Feet
Trench Length:	Feet

Other Information

Cross Section N ↑



Planar N ↑



Installation Information	
Installation Type:	RING
Sensors/Devices:	U, V, P
Surcharge Height:	14.0 Feet
Rain Gauge Zone:	

Backup	Yes	No	?	Distance
Trunk	[ ]	[X]		
Lift/Pump Station	[ ]	[X]		
WWTP	[ ]	[X]		
Other	[ ]	[X]		

Additional Site Information/Comments:

P.O. 1.50 PRESS 1.50

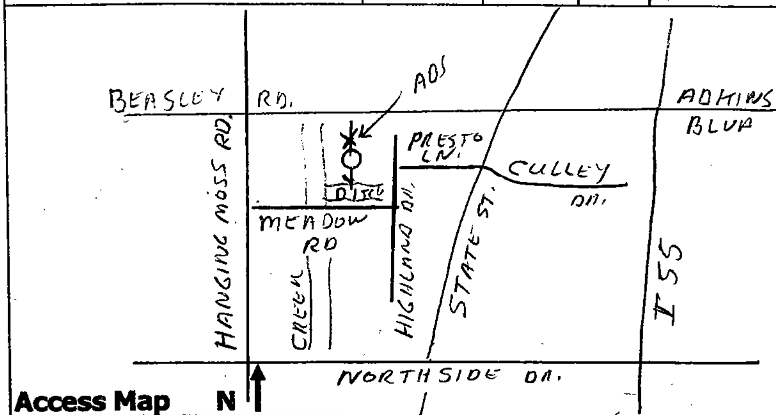
N 32° 17.676 F 1442 AREA
W 090° 10.656 F 1443 PIPE

ADS ENVIRONMENTAL SERVICES

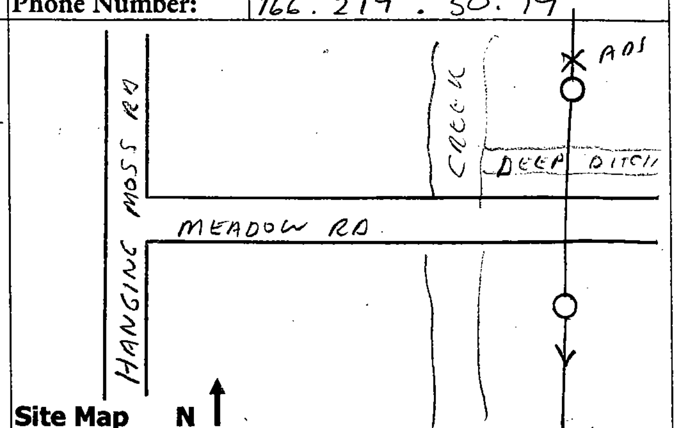
ADS Site Report — Quality Form

Project Name: JACKSON MS	City/State: JACKSON MS,		FM Initials:	MWB
Site Name: HM4	Monitor Series: FLOWSHARK		Monitor S/N:	20746
Address / Location: 308 MEADOW ROAD MH IN WOODS ACROSS DEEP DITCH APPROX 50 FT OFF ROAD			Manhole #:	HM 1245
			Map Page #:	
Access: WALK - MH IN WOODS	Type of System:	Sanitary ☒ Storm ☐ Combined ☐	Pipe Height:	29.88
			Pipe Width:	29.88
			Phone Number:	166.219.50.79

Access Map N



Site Map N

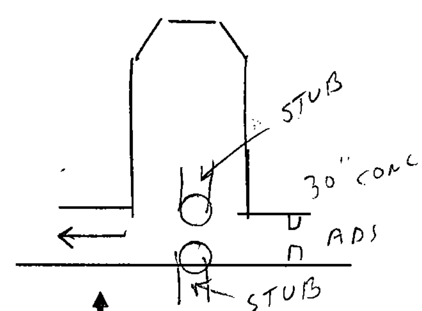


Investigation Information / Manhole Information

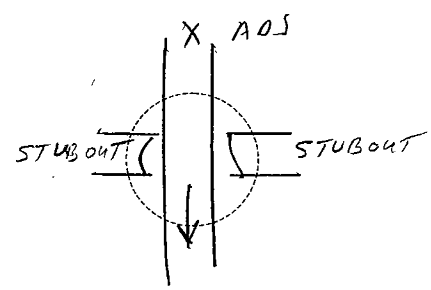
Date/ Time of Investigation:	9-3-14 9:30	Manhole Depth:	17.25 Feet
Site Hydraulics:	SMOOTH, STEADY FLOW	Manhole Material / Condition:	PRECAST MH GOOD STEPS
Upstream Input: (L/S, P/S)	N/A	Pipe Material / Condition:	
Upstream Manhole:	DID NOT LOCATE	Mini System Character:	Residential ☒ Commercial ☐ Industrial ☐ Other
Downstream Manhole:	DID NOT LOCATE	Telephone Information:	N/A
Depth of Flow (Wet DoF): 10:28	2.63 +/- .25	Access Pole #:	
Range (Air DoF):	26.13 +/- .25	Distance From Manhole:	Feet
Peak Velocity:	2.58 fps	Road Cut Length:	Feet
Silt:	0 Inches	Trench Length:	Feet

Other Information

Cross Section N



Planar N



Installation Information		Backup	Yes	No	?	Distance
Installation Type:	RING	Trunk	☐	☒		
Sensors/Devices:	UVP	Lift/Pump Station	☐	☒		
Surcharge Height:	14.60 EST Feet	WWTP	☐	☒		
Rain Gauge Zone:		Other	☐	☒		

Additional Site Information/Comments:

P... 38 ... 1.10

F1493 AREA
F1494 PIPE

N 32° 22.453
W 090° 10.612

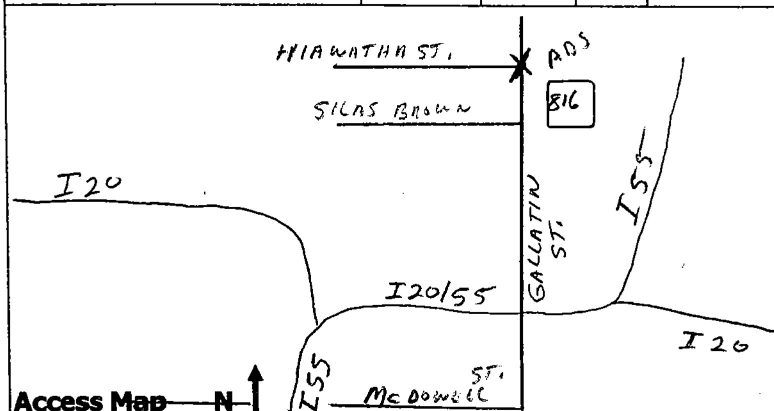
QF 675007 *Rev A0*
Effective Date 09/9/2003

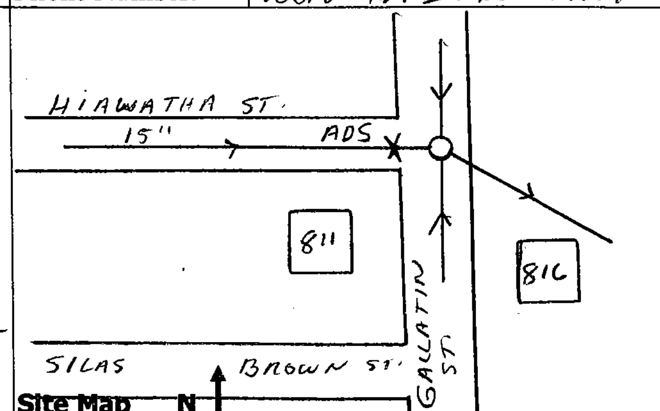
Uncontrolled Copy

ADS ENVIRONMENTAL SERVICES®

ADS Site Report — Quality Form

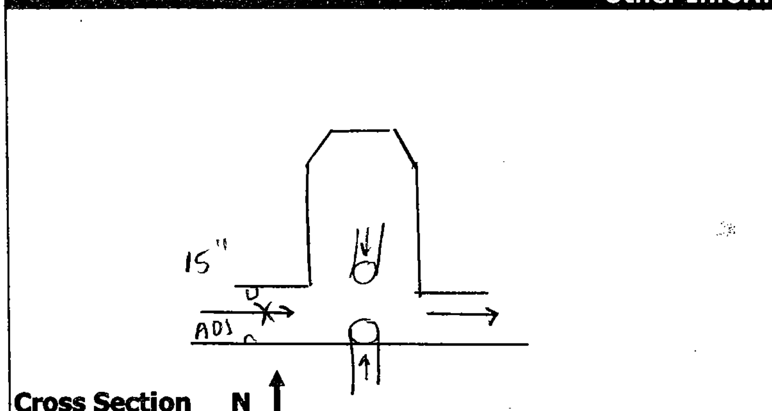
Project Name: JACKSON MS TEMP 2014	City/State: JACKSON MS		FM Initials: MWB	
Site Name: TN 1	Monitor Series: FLOWSHARK		Monitor S/N:	~~21827~~
Address / Location: 816 GALLATIN ST, GALLATIN ST & HIAWATHA ST			Manhole #:	TN 4238
			Map Page #:	
Access: DRIVE MH IN STREET	Type of System: Sanitary ☒ Storm ☐ Combined ☐		Pipe Height:	15.25
			Pipe Width:	15.0
			Phone Number:	166.219.1~~[illegible]~~ 171.43

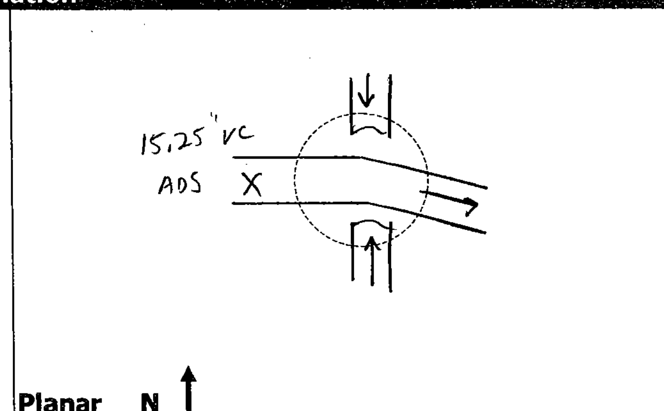




Investigation Information:		Manhole Information:	
Date/ Time of Investigation:	8-20-14 17:15	Manhole Depth:	5.80 Feet
Site Hydraulics:	FAST, FLOW. 3-4" GRAVEL IN LINE NEEDS CLEANING	Manhole Material / Condition:	BRICK - STEPS BROKEN [illegible]
Upstream Input: (L/S, P/S)	N/A	Pipe Material / Condition:	
Upstream Manhole:	DID NOT LOCATE	Mini System Character:	Residential ☒ Commercial ☒ Industrial ☐ Other
Downstream Manhole:	OUT OF SYSTEM	Telephone Information:	N/A
Depth of Flow (Wet Dof):	6.75 +/- .25	Access Pole #:	
Range (Air Dof):	7.0 +/- .25	Distance From Manhole:	Feet
Peak Velocity:	2.80 fps	Road Cut Length:	Feet
Silt:	.0 Inches	Trench Length:	Feet

Other Information





Installation Information		Backup	Yes	~~No~~	?	Distance
Installation Type:	RING	Trunk	☐	☒		
Sensors/Devices:	U V P	Lift/Pump Station	☐	☒		
Surcharge Height: NONE	Feet	WWTP	☐	☒		
Rain Gauge Zone:		Other	☐	☒		

Additional Site Information/Comments:

2.0 1.63
PRESS 3.10
30642

F 1451 AREA
~~F 1482 PIPE~~
F 1488 PIPE

N 32° 17.536
W 090° 11.571

24'

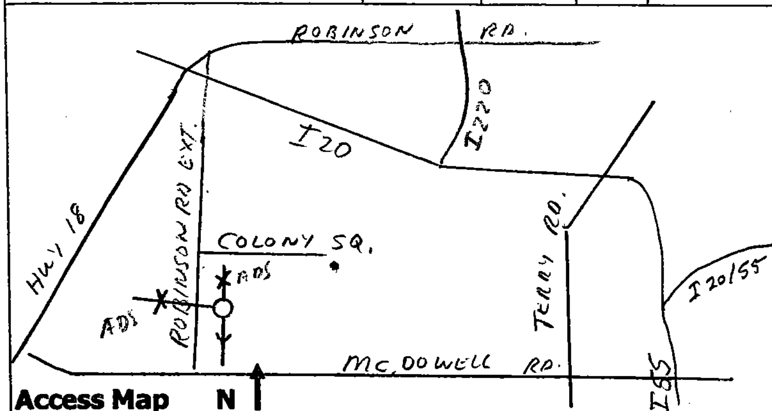
2 MONITORS SAME MH

ADS ENVIRONMENTAL SERVICES

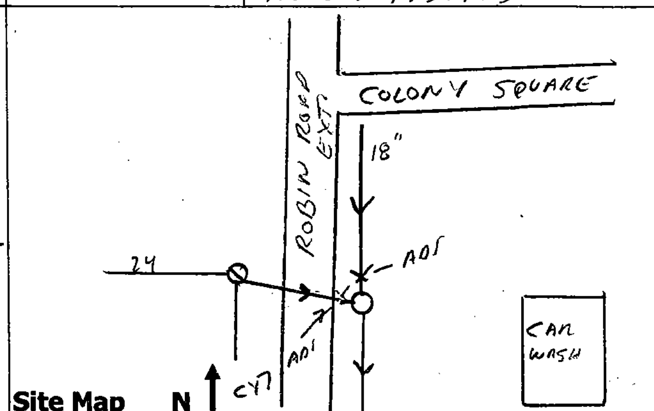
ADS Site Report Quality Form

Project Name: JACKSON MS TEMP 2014		City/State: JACKSON MS		FM Initials: MWA	
Site Name: CY7	Monitor Series:			Monitor S/N:	21222
Address / Location: 5537 ROBINSON ROAD EXT. AT ENTRANCE TO CAR WASH MH SIDE OF ROAD				Manhole #:	CY0007
				Map Page #:	
Access: DRIVE -	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height: 24.0
				Pipe Width:	23.75
				Phone Number:	166.219.175.133

Access Map N ↑



Site Map N ↑



Investigation Information:

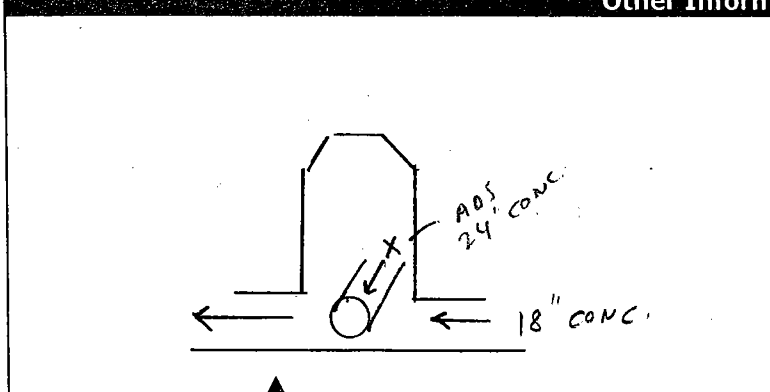
Date/ Time of Investigation:	8-21-14 17:30
Site Hydraulics:	SMOOTH, SLOW FLOW
Upstream Input: (L/S, P/S)	N/A
Upstream Manhole:	DID NOT LOCATE
Downstream Manhole:	DID NOT LOCATE
Depth of Flow (Wet Dof): 6.36	3.75 +/- .25
Range (Air Dof):	19.25 +/-
Peak Velocity:	1.30 fps
Silt:	0 Inches

Manhole Information:

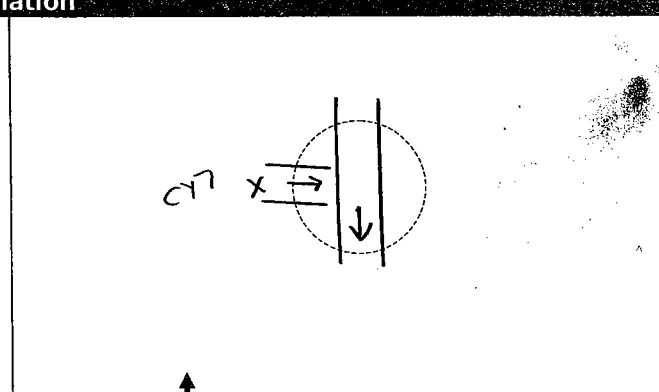
Manhole Depth:	12.10 Feet
Manhole Material / Condition:	PRECAST CONCRETE / GOOD
Pipe Material / Condition:	CONC. - GOOD
Mini System Character:	Residential ☒ Commercial ☒ Industrial ☐ Other
Telephone Information:	N/A
Access Pole #:	
Distance From Manhole:	Feet
Road Cut Length:	Feet
Trench Length:	Feet

Other Information

Cross Section N ↑



Planar N ↑



Installation Information	
Installation Type:	RING
Sensors/Devices:	U V P
Surcharge Height:	N/A Feet
Rain Gauge Zone:	

Backup	Yes	No	?	Distance
Trunk	☐	☒		
Lift/Pump Station	☐	☒		
WWTP	☐	☒		
Other	☐	☒		

Additional Site Information/Comments:

P.O = 1.38

PRESS = 1.0

F 1457 AREA

F 1458 PIPE - FOGGY

F 1459 PIPE - GOOD PHOTO

N 32° 16.332

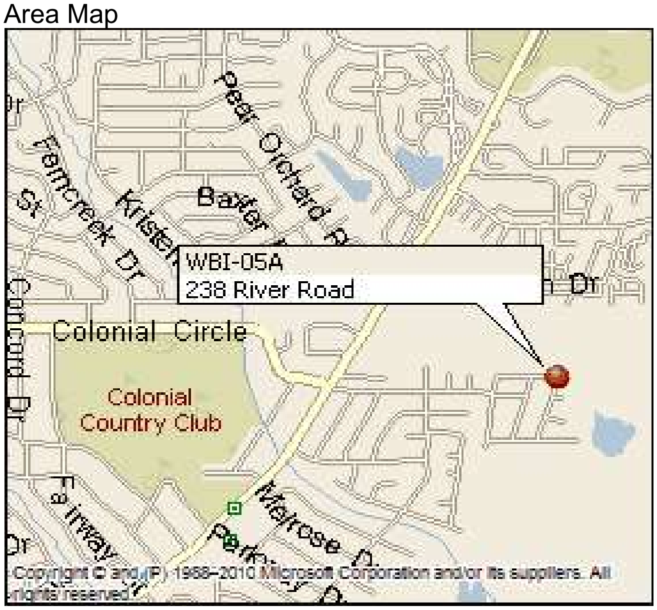
W 096° 15.635

SITE REPORT

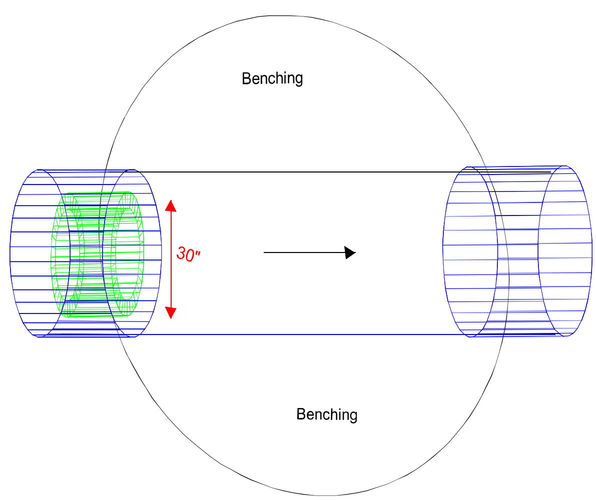
Project: Jackson West Bank Interceptor Flow Monitoring		Date: 8/25/14	Name: B. Brasher
Manhole #: WBI-05A	Pipe Diameter: 30"	Pipe Material: RCP	
Address/Location: 238 River Road (behind the house with pool)			
Town: Jackson			
Latitude: N 32°22.917'	Longitude: W 90°06.526'	Access: Walk	
Safety: Standard CSE		Manhole Depth: 12'	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Standard	
Flow Meter: FloWav	Serial #: 293939	Sensor Configuration: Pressure Depth, Doppler Velocity	

Site Comments: Evidence of surcharge. Sensor is installed in the upstream pipe.	
Silt: None	

Area Map



Detail Map

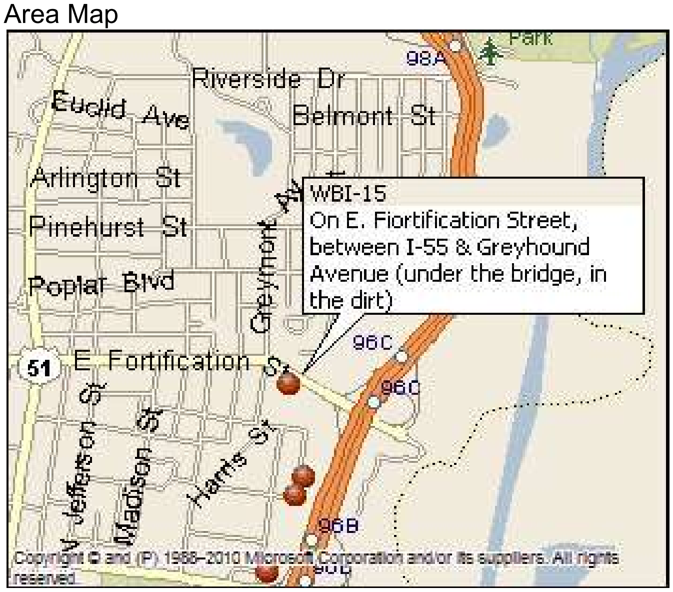


SITE REPORT

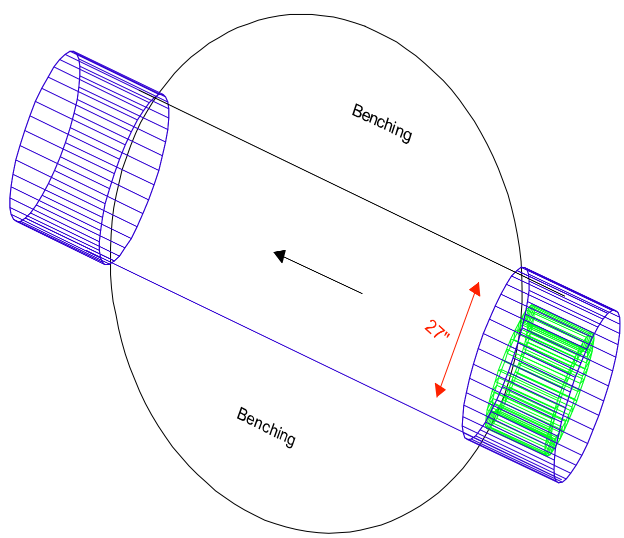
Project: Jackson West Bank Interceptor Flow Monitoring		Date: 3/17/14	Name: B. Brasher
Manhole #: WBI-15	Pipe Diameter: 27"	Pipe Material: Ductile Iron	
Address/Location: On E. Fortification Street, between I-55 & Greyhound Avenue (under the bridge, in the dirt)			
Town: Jackson			
Latitude: N 32°18.710'	Longitude: W 90°09.980'	Access: Walk	
Safety: Standard CSE		Manhole Depth: 12' 8"	
Gas Investigation: Good	Manhole Condition: Good	Traffic: Standard	
Flow Meter: FloWav	Serial #: 391217	Sensor Configuration: Pressure Depth, Doppler Velocity	

Site Comments: Sensor is installed in the drop-in pipe.
Silt: None

Area Map



Detail Map

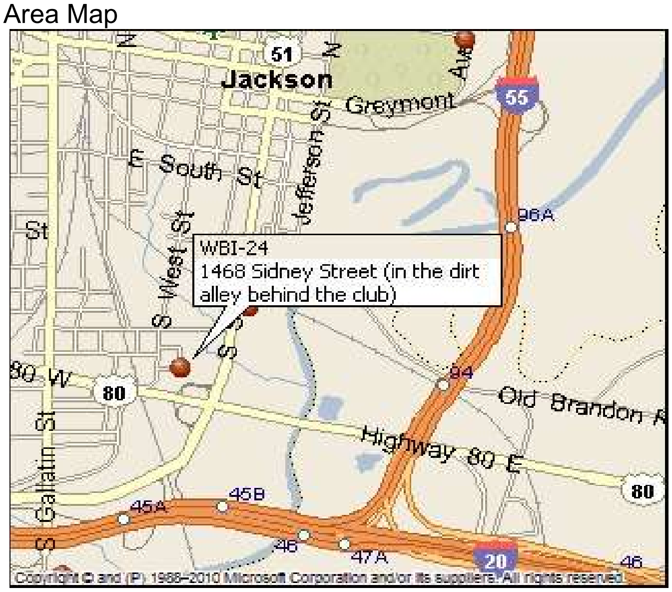


SITE REPORT

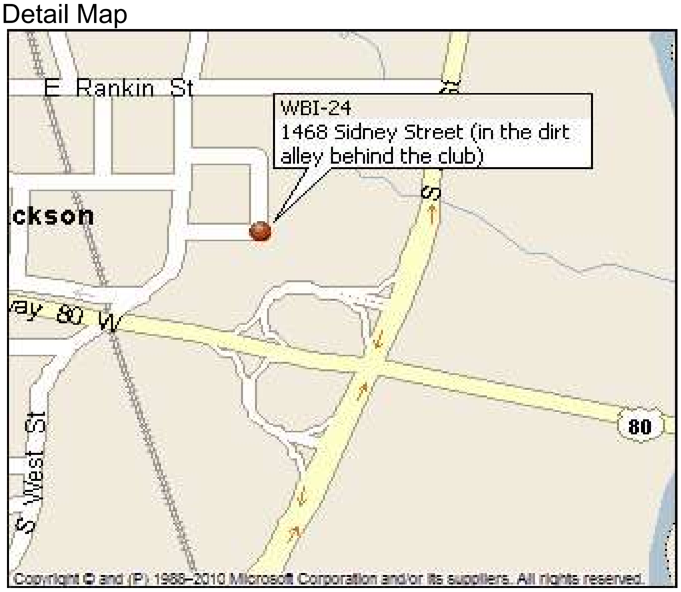
Project: Jackson West Bank Interceptor Flow Monitoring			Date: 3/19/14	Name: B. Brasher	
Manhole #: WBI-24	Pipe Diameter: 48”		Pipe Material: RCP		
Address/Location: 1468 Sidney Street (behind the club, in the dirt alley)					
Town: Jackson					
Latitude: N 32°17.057’		Longitude: W 90°11.150’		Access: Drive	
Safety: Standard CSE				Manhole Depth: 15’ 2”	
Gas Investigation: Good	Manhole Condition: Fair			Traffic: Standard	
Flow Meter: FloWav	Serial #: 391200	Sensor Configuration: Pressure Depth, Doppler Velocity			

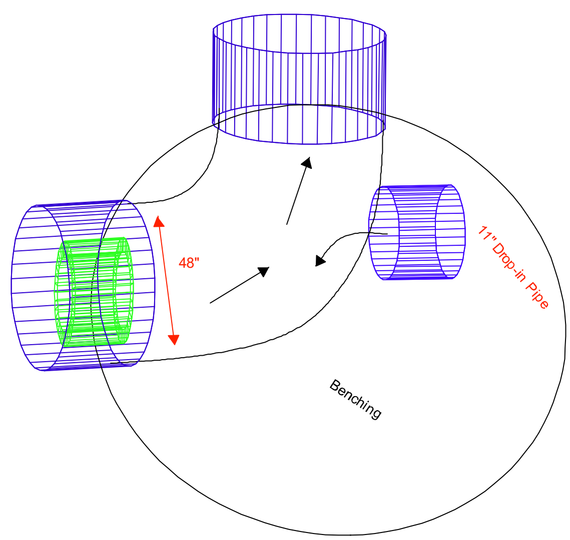
Site Comments: Evidence of surcharge. Sensor is installed in the upstream pipe.
Silt: None

Area Map



Detail Map





Appendix B
Flow Meter and Rain Gauge Data Examples

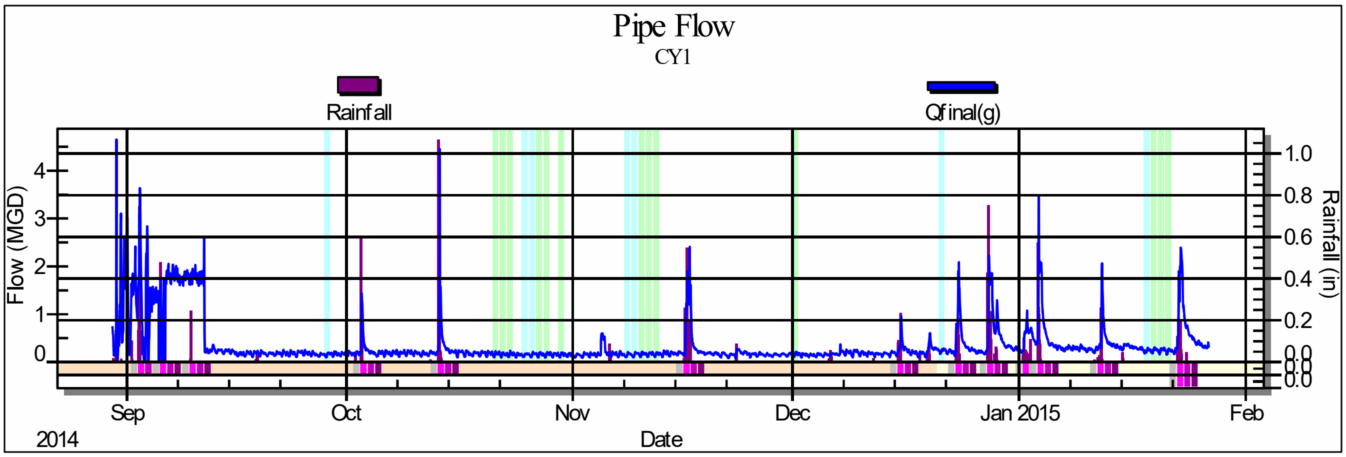
Flow Meter CY01

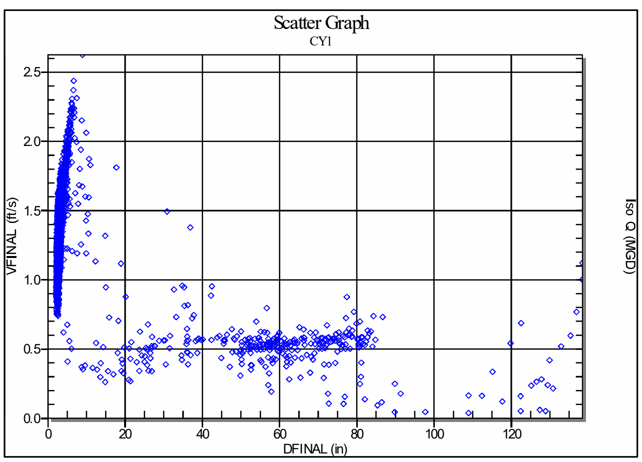
Flow Meter TN05

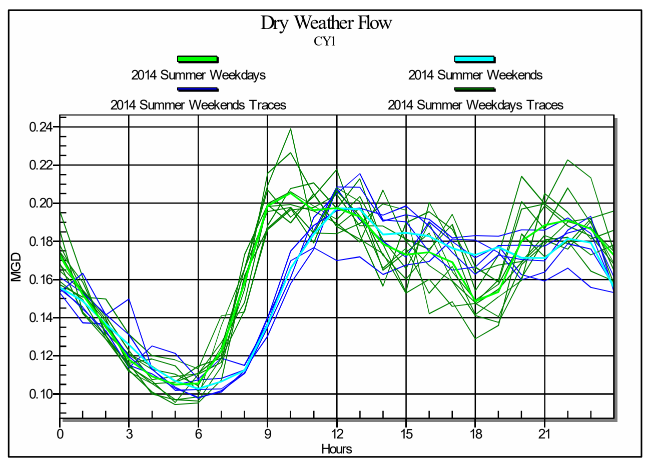
Flow Meter TN02

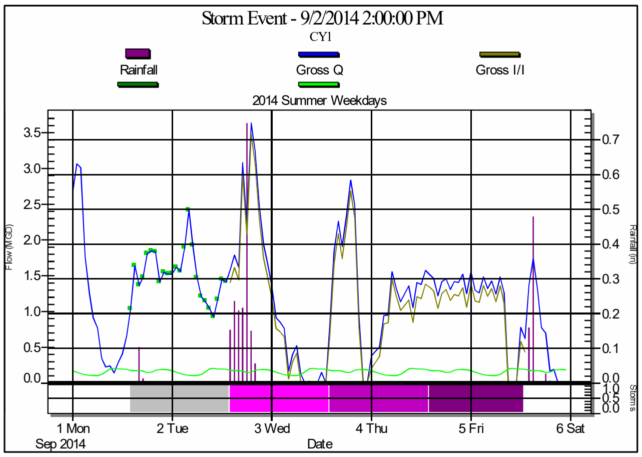
Flow Meter BH01

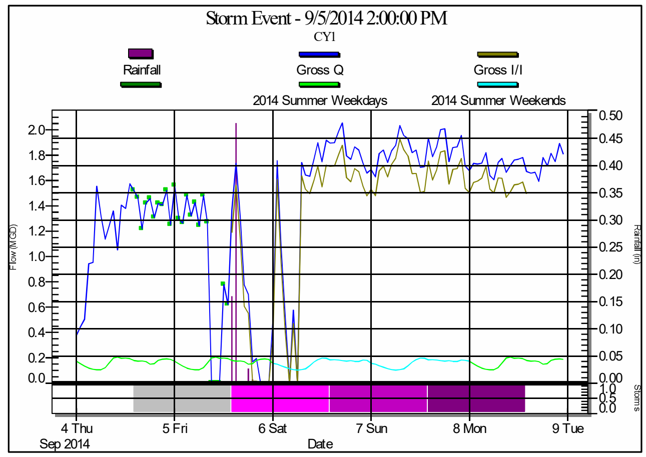
Flow Meter TN10

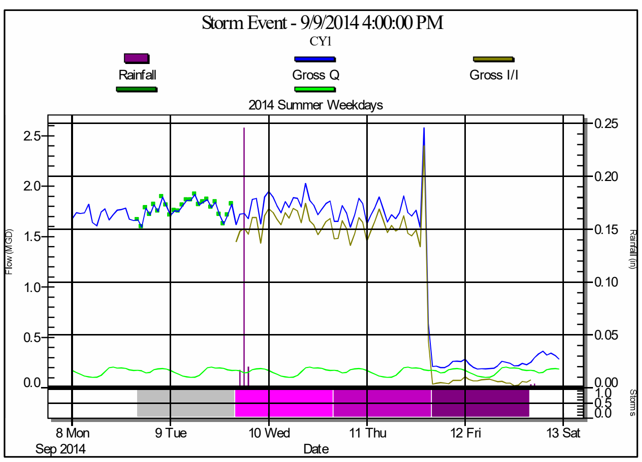

Pipe Flow
CY1
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date

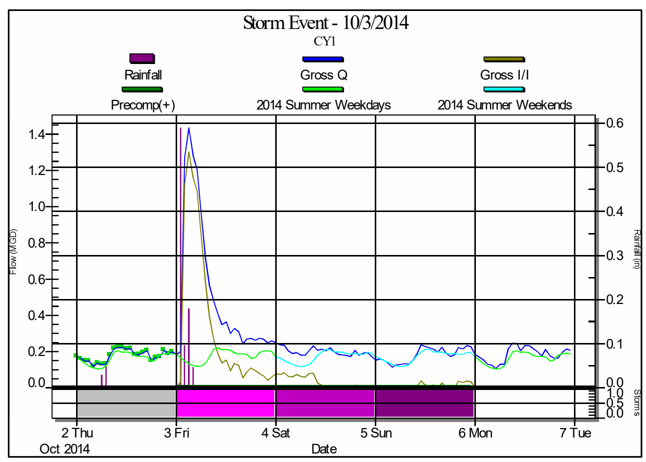

Scatter Graph
CY1
VFINAL (ft/s)
DFINAL (in)
Iso Q (MGD)

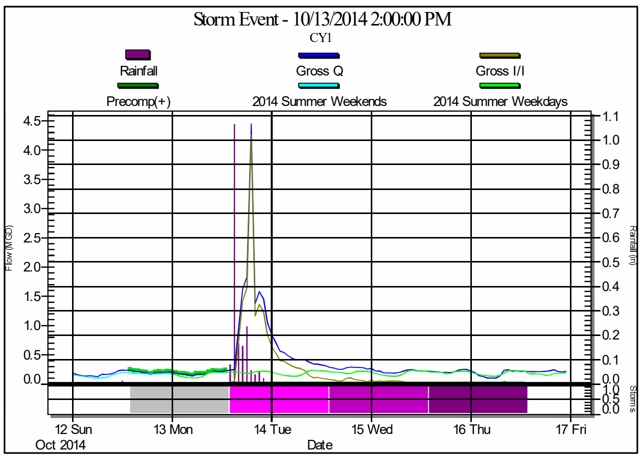

Dry Weather Flow
CY1
2014 Summer Weekdays
2014 Summer Weekends
2014 Summer Weekends Traces
2014 Summer Weekdays Traces
MGD
Hours

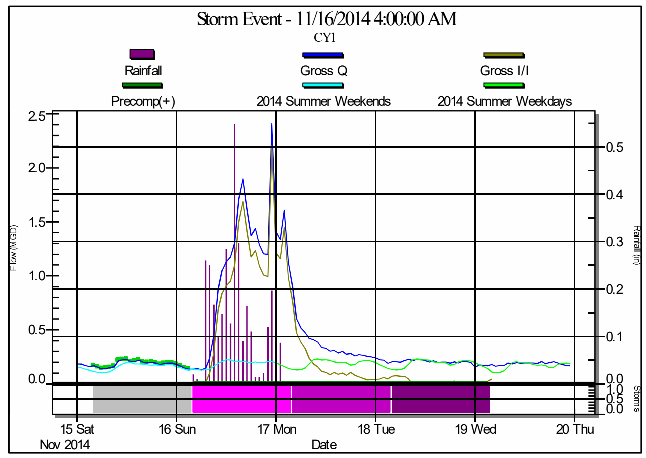

Storm Event - 9/2/2014 2:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
1 Mon
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Sep 2014
Date

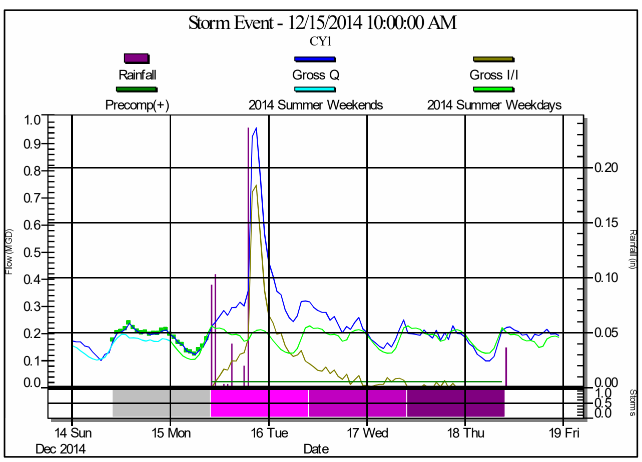

Storm Event - 9/5/2014 2:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
4 Thu
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Sep 2014
Date

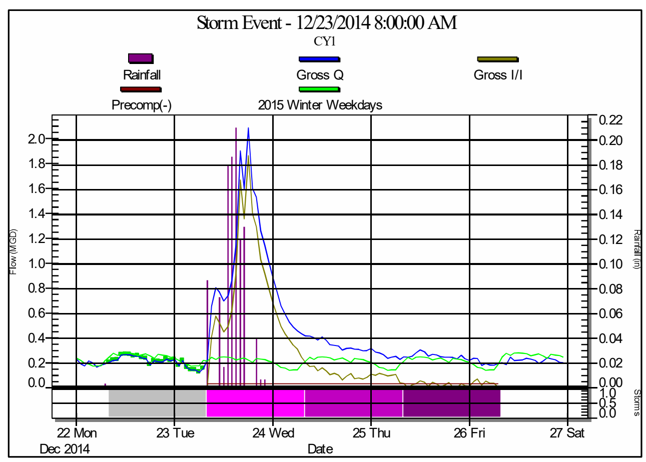

Storm Event - 9/9/2014 4:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
8 Mon
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Sep 2014
Date

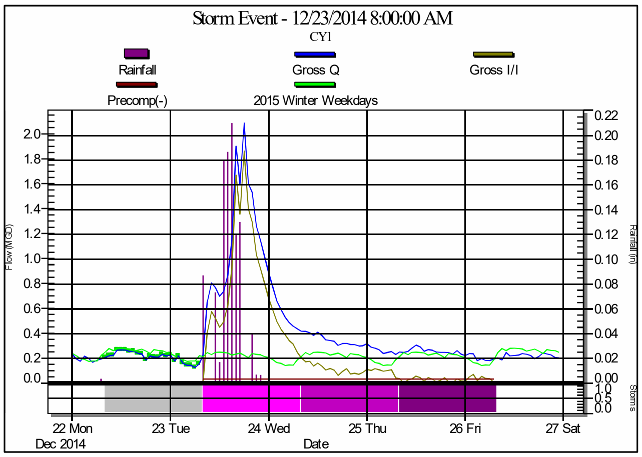

Storm Event - 10/3/2014
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Thu
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Oct 2014
Date

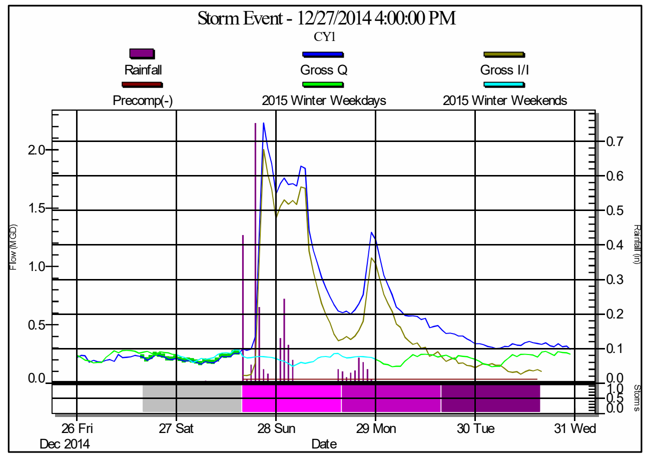

Storm Event - 10/13/2014 2:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
Oct 2014
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Date

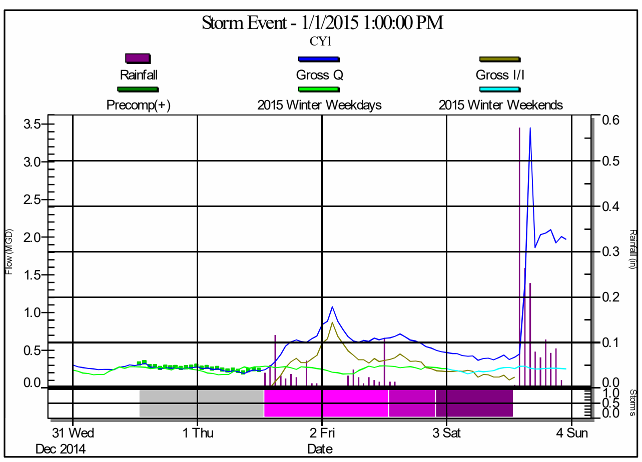

Storm Event - 11/16/2014 4:00:00 AM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
Nov 2014
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Date

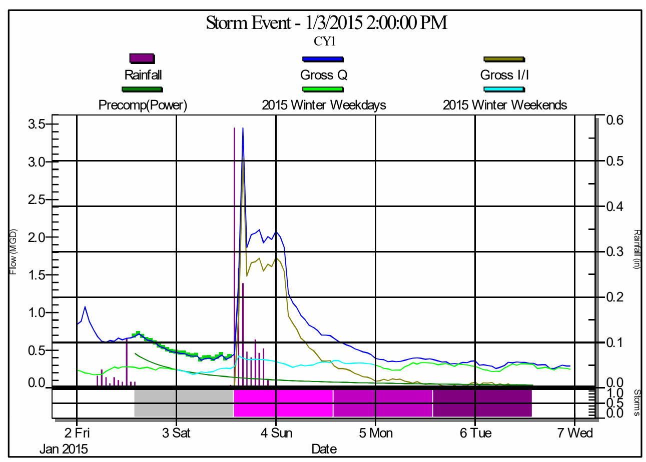

Storm Event - 12/15/2014 10:00:00 AM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
Dec 2014
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Date

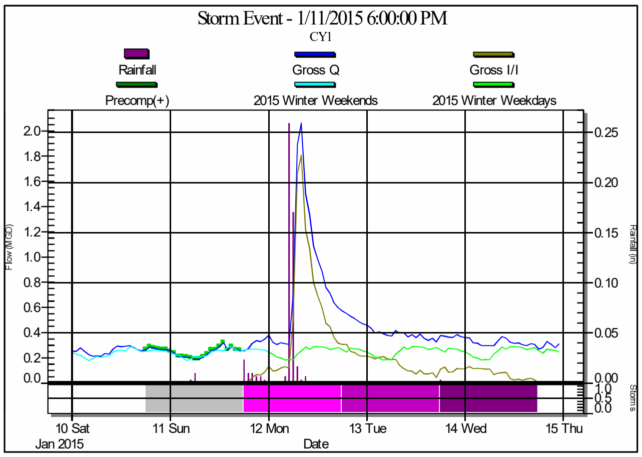

Storm Event - 12/23/2014 8:00:00 AM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
Dec 2014
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Date


Storm Event - 12/23/2014 8:00:00 AM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
Dec 2014
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Date

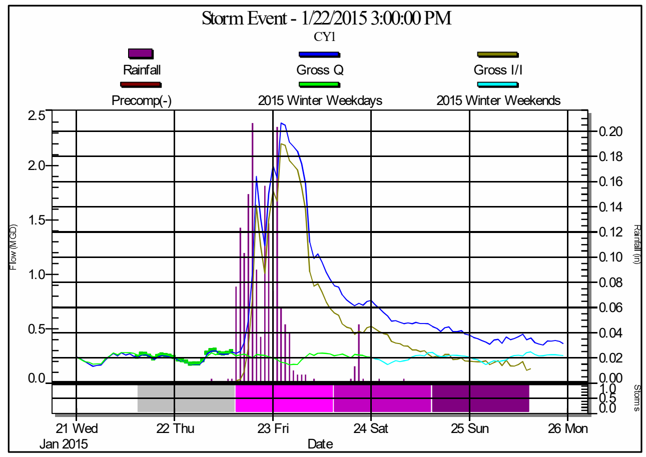

Storm Event - 12/27/2014 4:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
Dec 2014
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Date


Storm Event - 1/1/2015 1:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
Dec 2014
1 Thu
2 Fri
3 Sat
4 Sun
Date

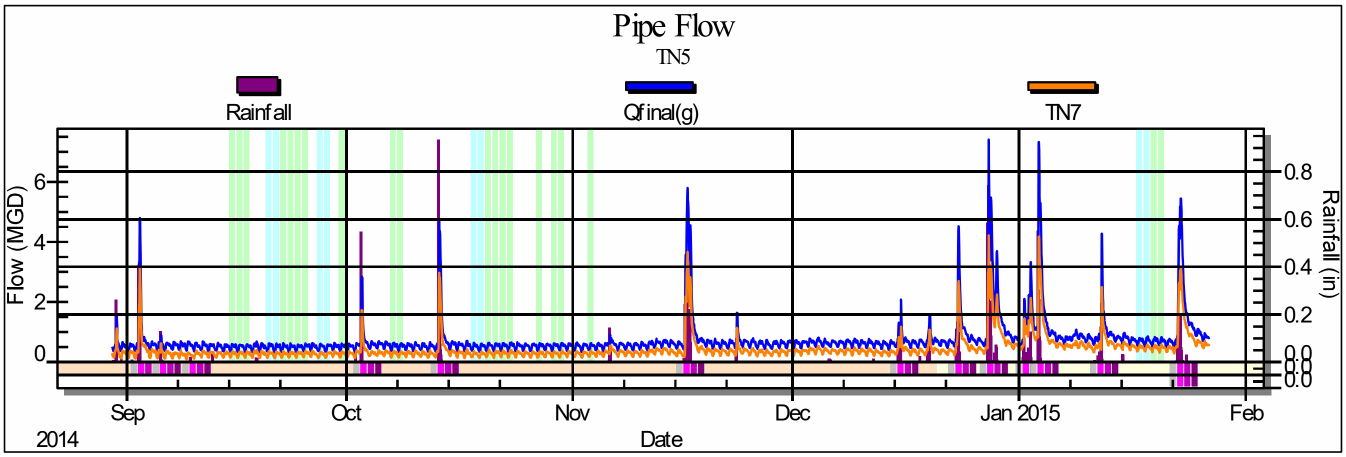

Storm Event - 1/3/2015 2:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(Power)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
Jan 2015
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Date



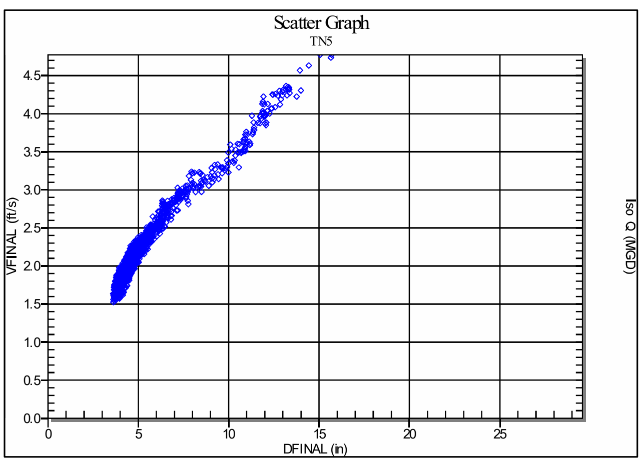
Storm Event - 1/11/2015 6:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
10 Sat
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu
Jan 2015
Date



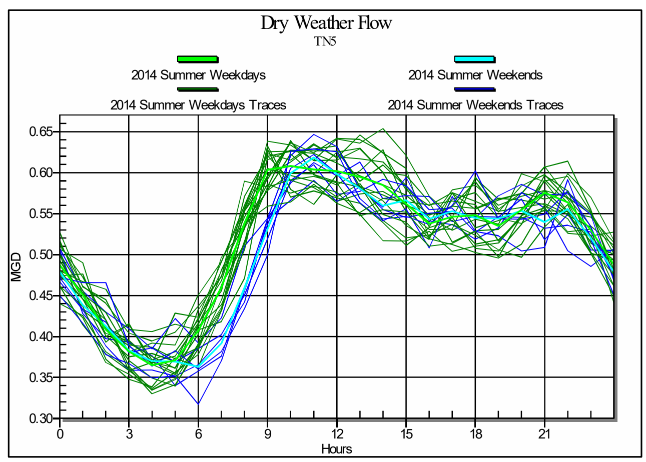
Storm Event - 1/22/2015 3:00:00 PM
CY1
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
21 Wed
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon
Jan 2015
Date



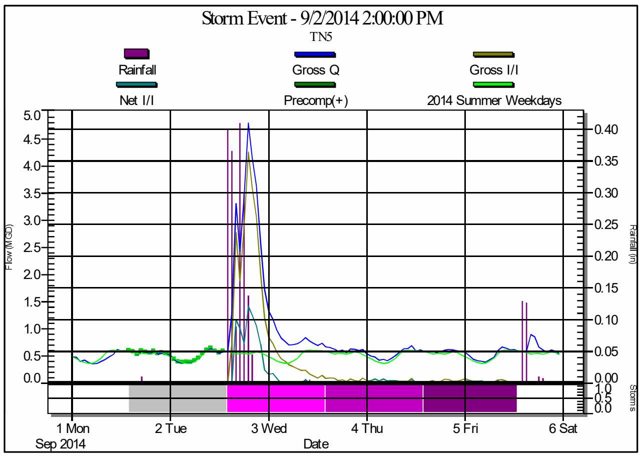
Pipe Flow
TN5
Rainfall
Qfinal(g)
TN7
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date

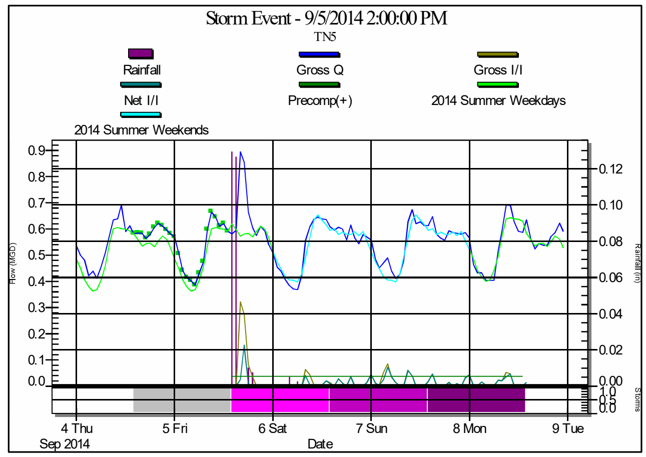


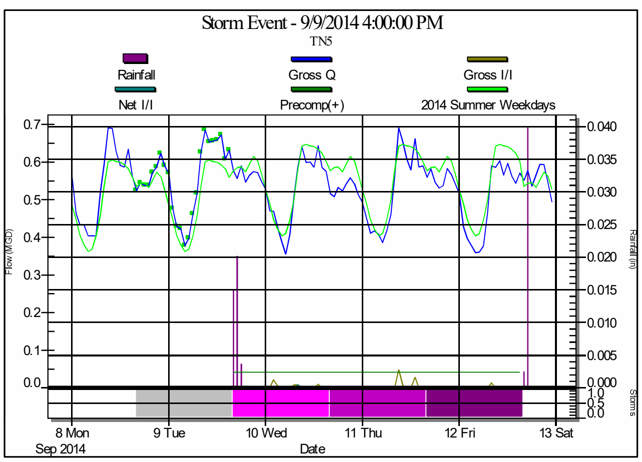
Scatter Graph
TN5
VFINAL (ft/s)
DFINAL (in)
Iso Q (MGD)

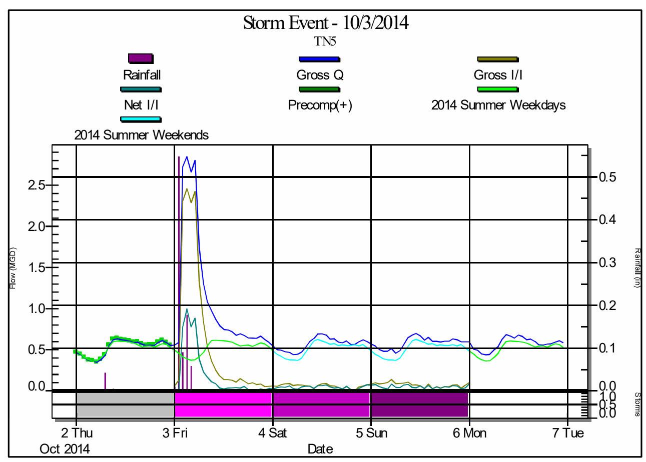


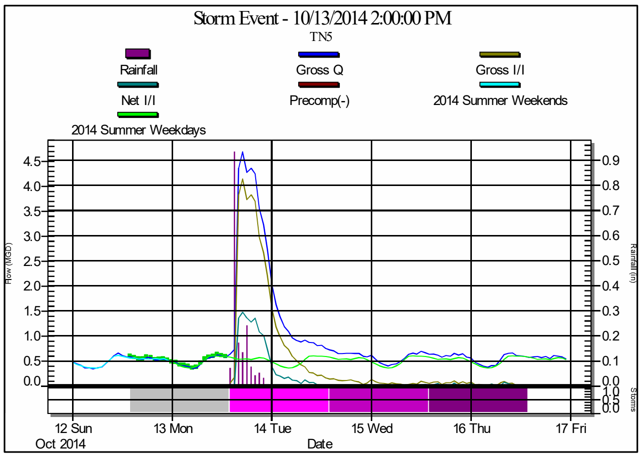
Dry Weather Flow
TN5
2014 Summer Weekdays
2014 Summer Weekends
2014 Summer Weekdays Traces
2014 Summer Weekends Traces
MGD
Hours

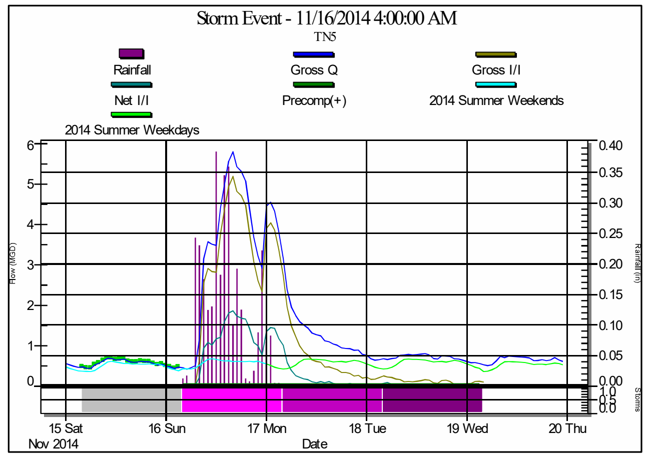

Storm Event - 9/2/2014 2:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
1 Mon
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Sep 2014
Date

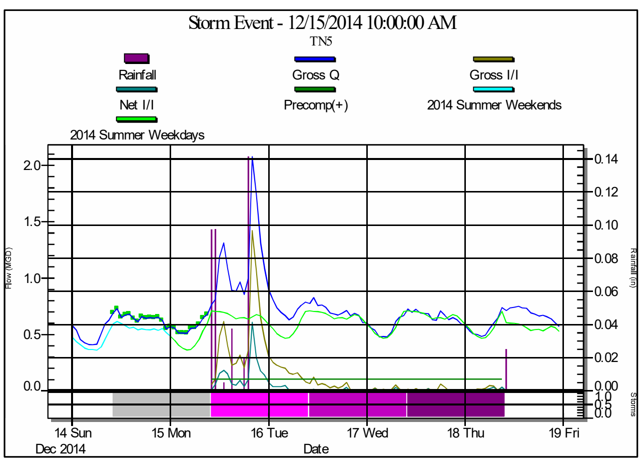

Storm Event - 9/5/2014 2:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
4 Thu
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Sep 2014
Date

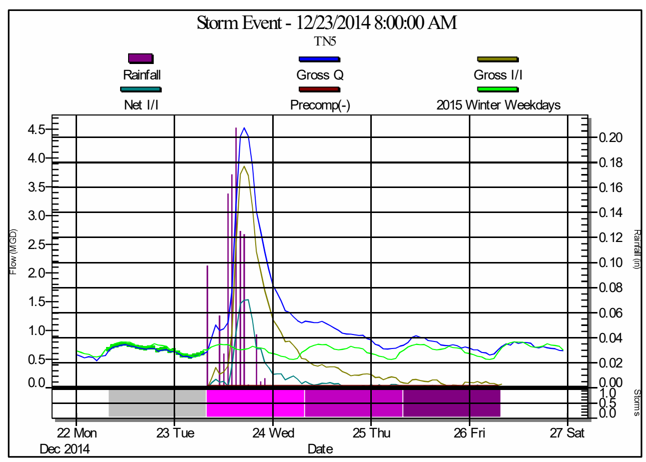

Storm Event - 9/9/2014 4:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
8 Mon
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Sep 2014
Date

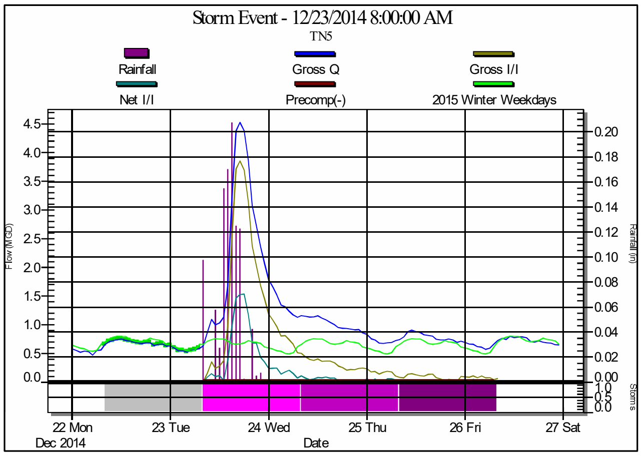

Storm Event - 10/3/2014
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
0.0
0.5
1.0
1.5
2.0
2.5
0.1
0.2
0.3
0.4
0.5
2 Thu
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Oct 2014
Date

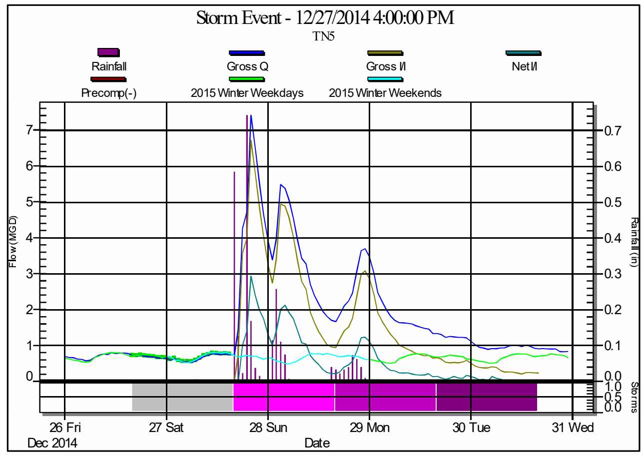

Storm Event - 10/13/2014 2:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Oct 2014
Date

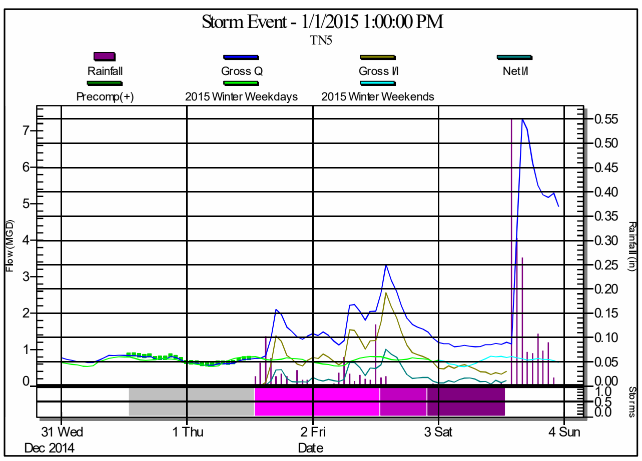

Storm Event - 11/16/2014 4:00:00 AM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Nov 2014
Date

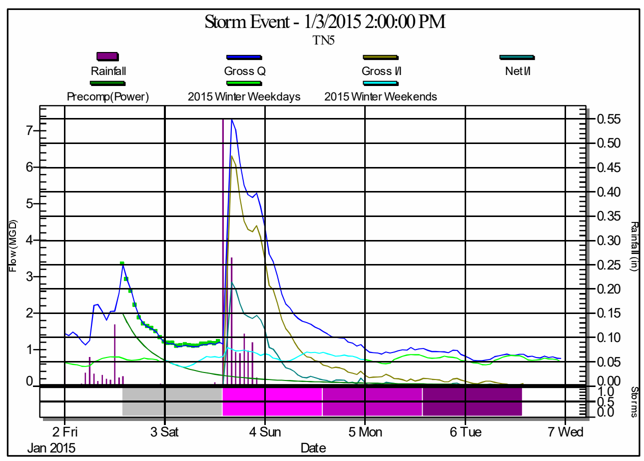

Storm Event - 12/15/2014 10:00:00 AM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Dec 2014
Date

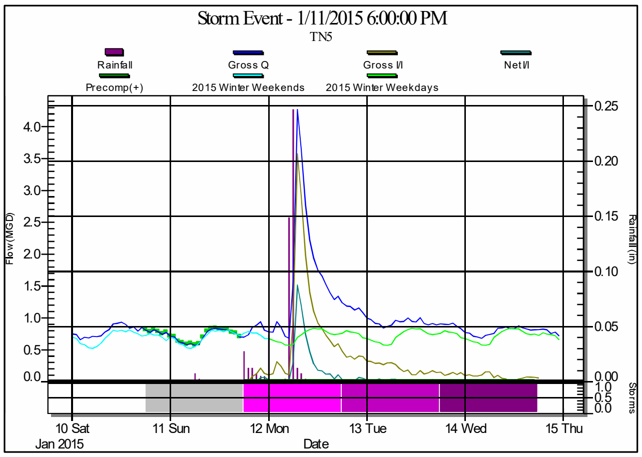

Storm Event - 12/23/2014 8:00:00 AM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

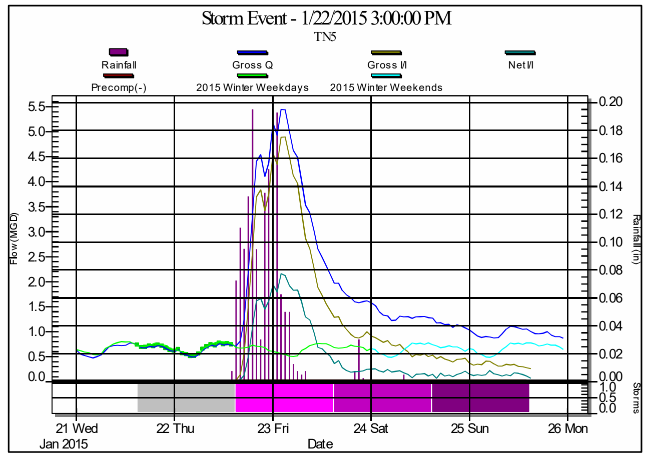

Storm Event - 12/23/2014 8:00:00 AM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

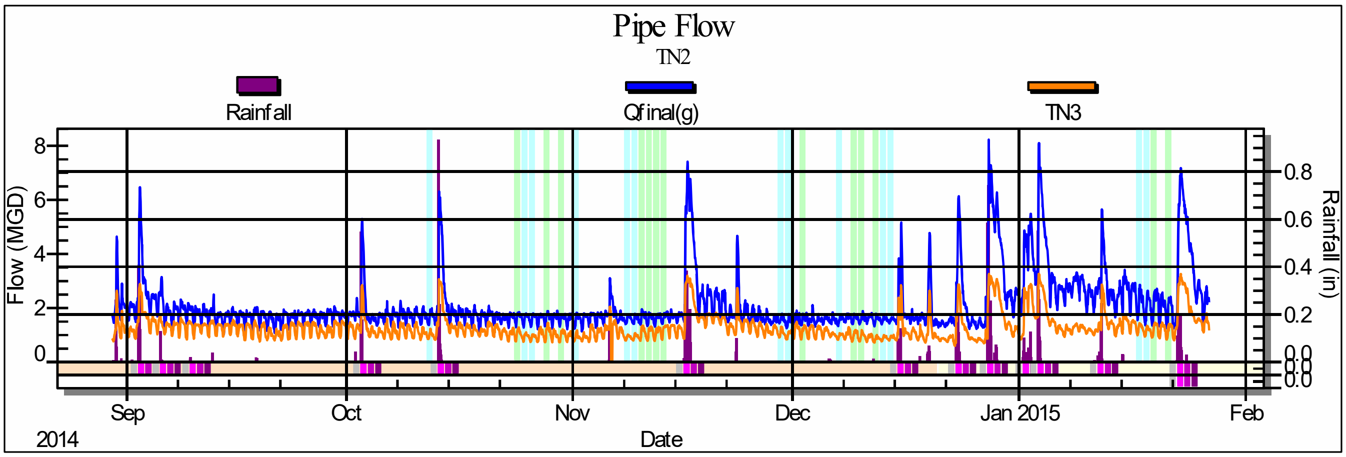

Storm Event - 12/27/2014 4:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Dec 2014
Date

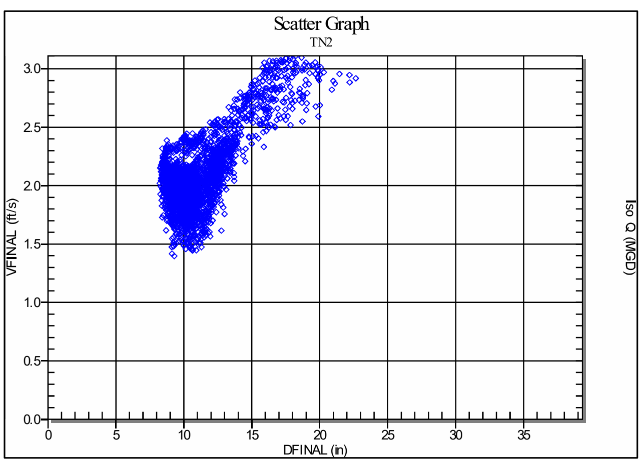

Storm Event - 1/1/2015 1:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
1 Thu
2 Fri
3 Sat
4 Sun
Dec 2014
Date

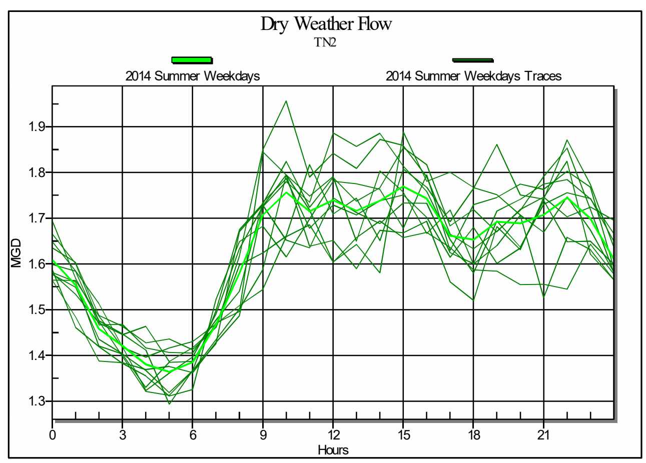

Storm Event - 1/3/2015 2:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(Power)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Jan 2015
Date

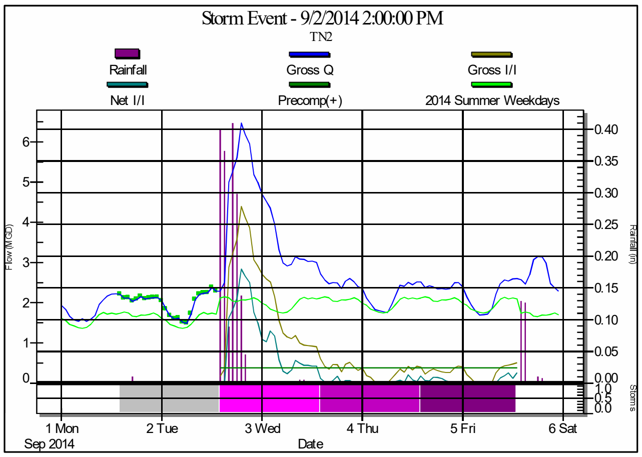

Storm Event - 1/11/2015 6:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
10 Sat
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu
Jan 2015
Date

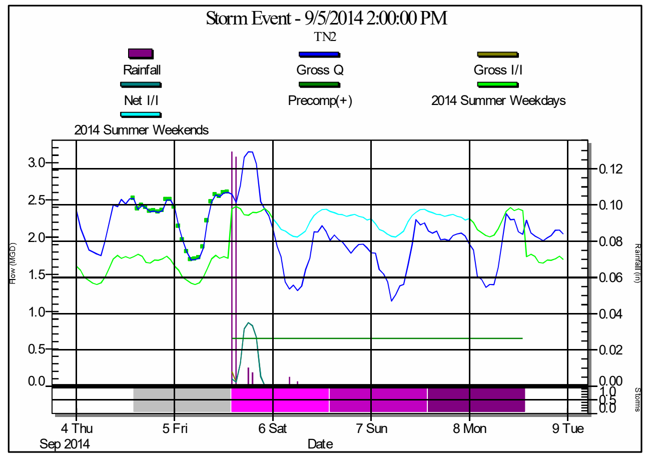

Storm Event - 1/22/2015 3:00:00 PM
TN5
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
21 Wed
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon
Jan 2015
Date

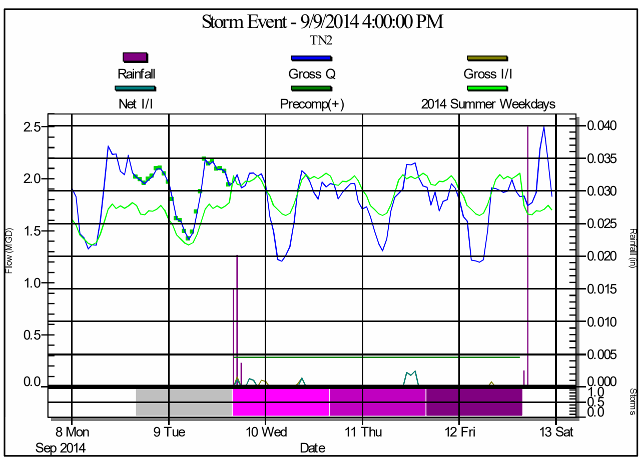

Pipe Flow
TN2
Rainfall
Qfinal(g)
TN3
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date

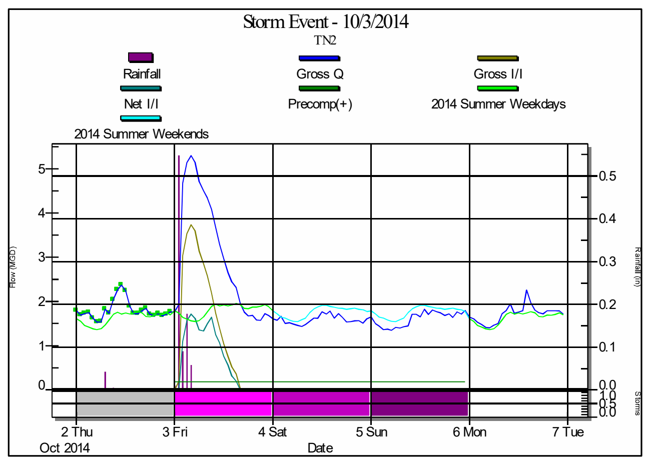

Scatter Graph
TN2
VFINAL (ft/s)
Iso Q (MGD)
DFINAL (in)

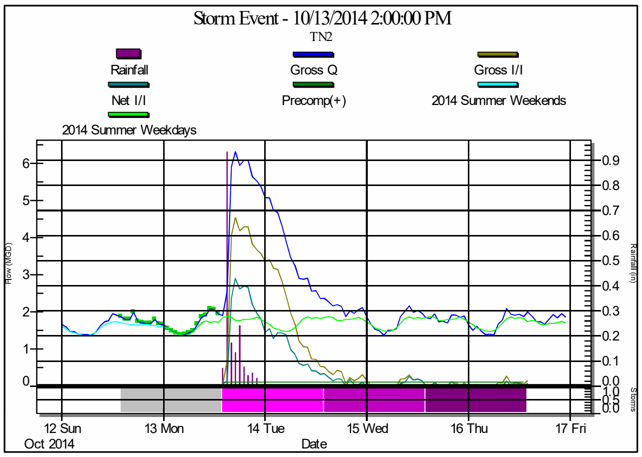

Dry Weather Flow
TN2
2014 Summer Weekdays
2014 Summer Weekdays Traces
MGD
Hours


Storm Event - 9/2/2014 2:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
1 Mon
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Sep 2014
Date

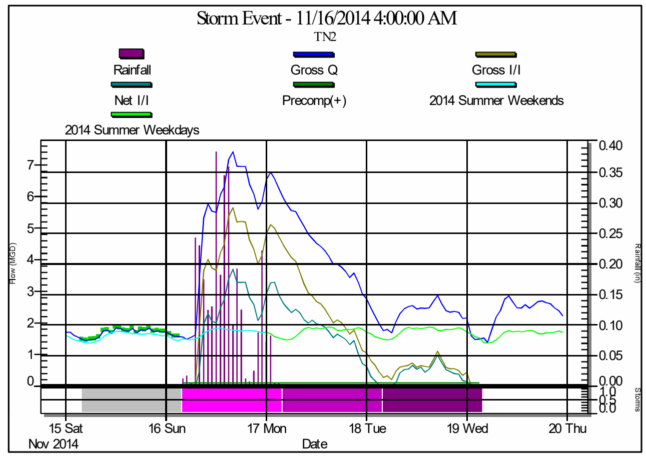

Storm Event - 9/5/2014 2:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
4 Thu
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Sep 2014
Date


Storm Event - 9/9/2014 4:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
8 Mon
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Sep 2014
Date

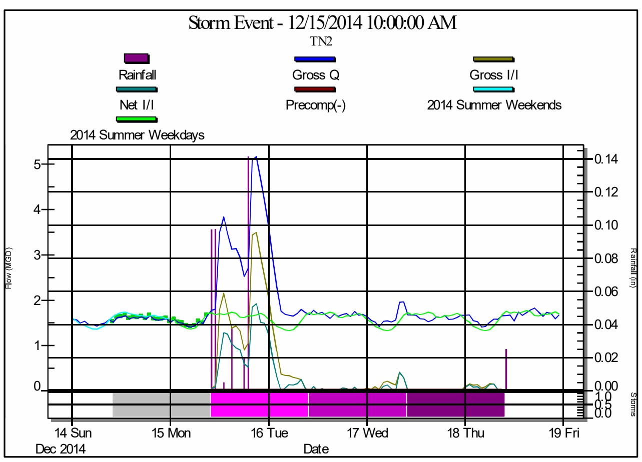

Storm Event - 10/3/2014
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Thu
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Oct 2014
Date



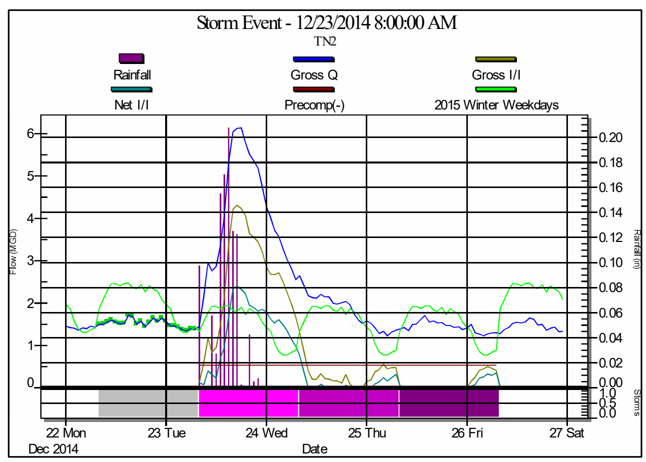
Storm Event - 10/13/2014 2:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Oct 2014
Date



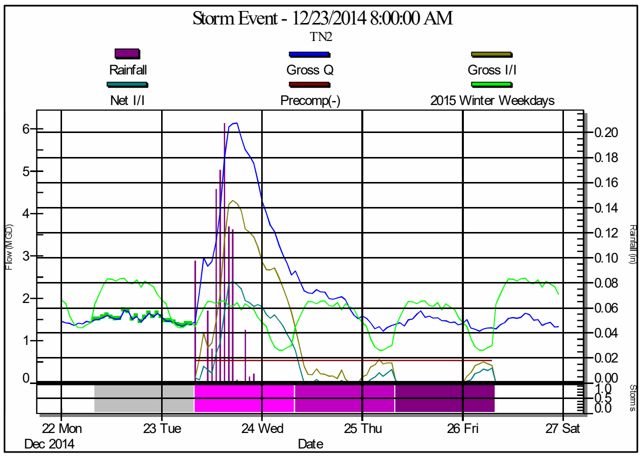
Storm Event - 11/16/2014 4:00:00 AM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Nov 2014
Date

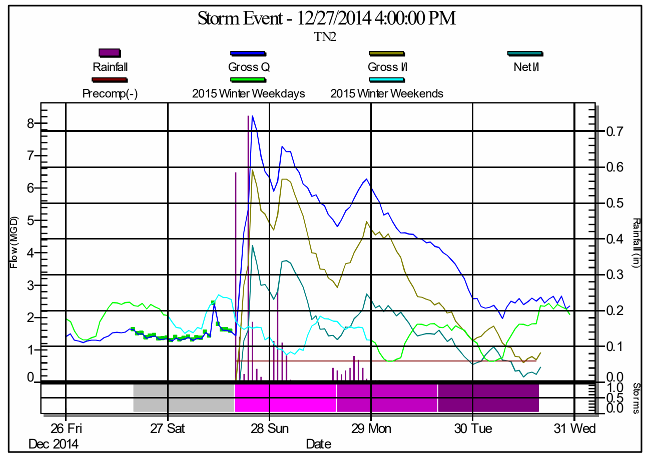


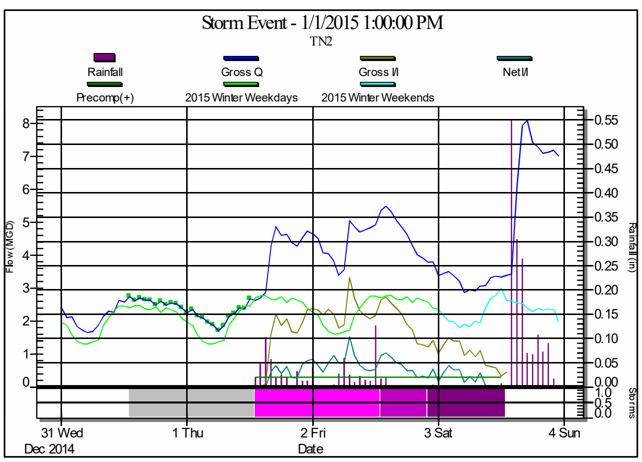
Storm Event - 12/15/2014 10:00:00 AM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Dec 2014
Date

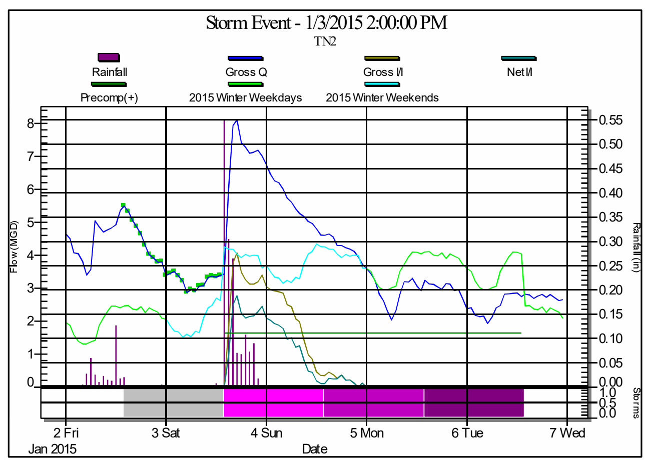


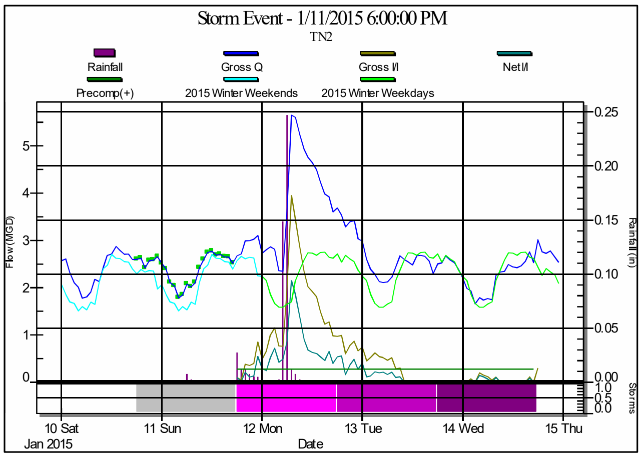
Storm Event - 12/23/2014 8:00:00 AM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

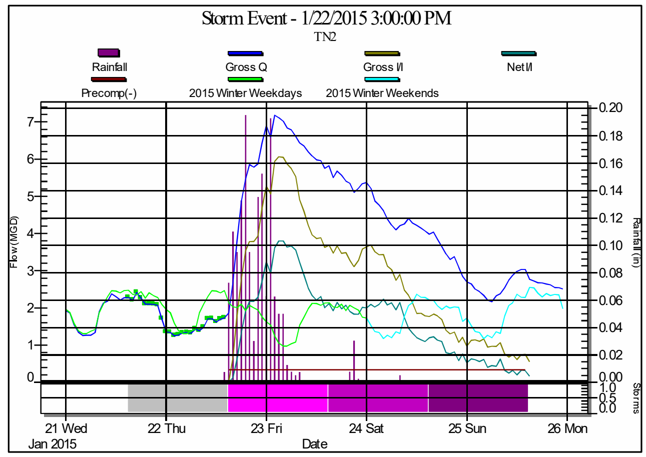

Storm Event - 12/23/2014 8:00:00 AM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

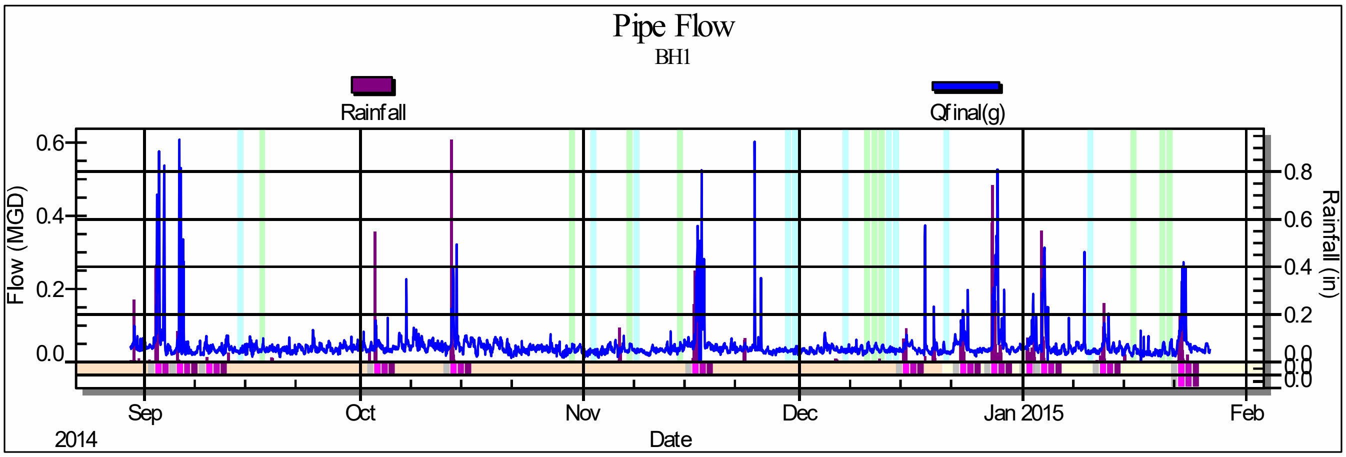

Storm Event - 12/27/2014 4:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Dec 2014
Date

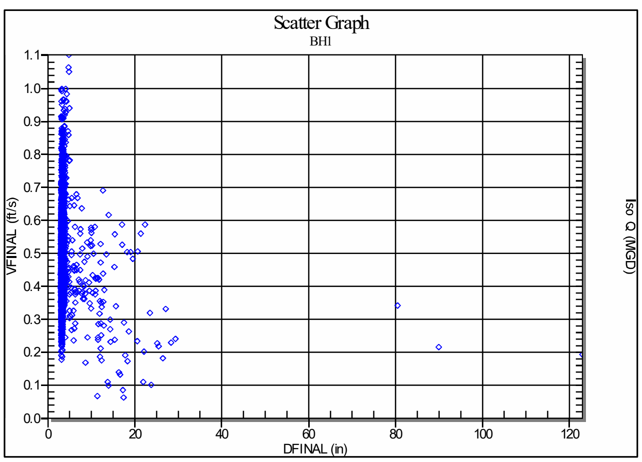

Storm Event - 1/1/2015 1:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
1 Thu
2 Fri
3 Sat
4 Sun
Dec 2014
Date

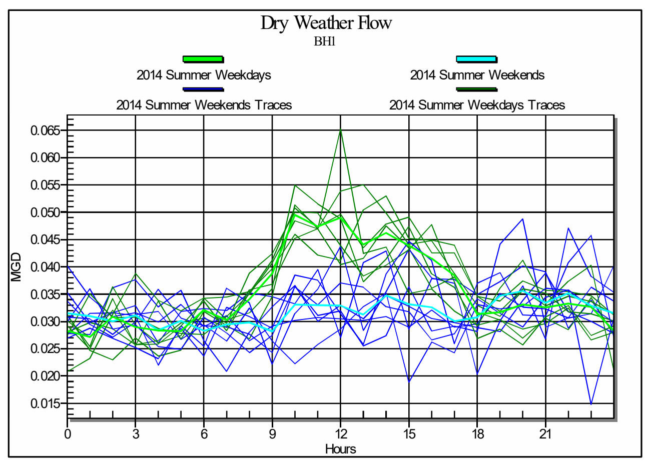

Storm Event - 1/3/2015 2:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Jan 2015
Date

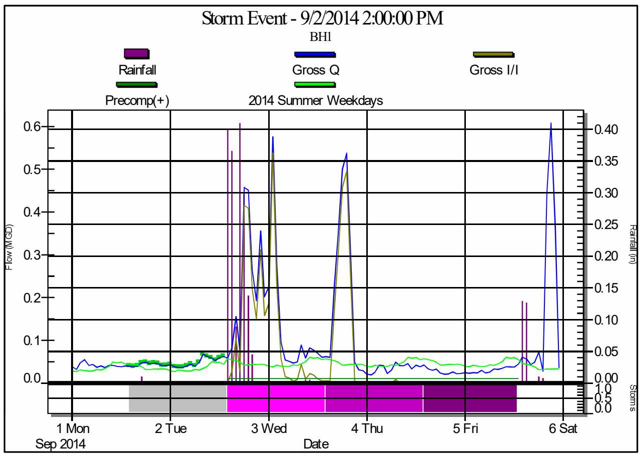

Storm Event - 1/11/2015 6:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(+)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
10 Sat
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu
Jan 2015
Date

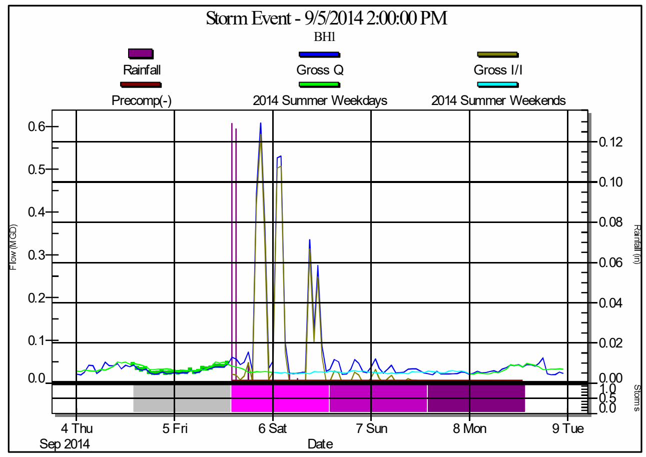

Storm Event - 1/22/2015 3:00:00 PM
TN2
Rainfall
Gross Q
Gross I/I
Net I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
21 Wed
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon
Jan 2015
Date

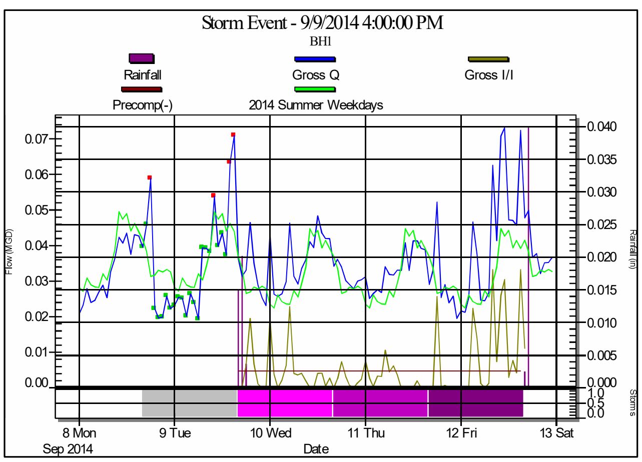

Pipe Flow
BH1
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date

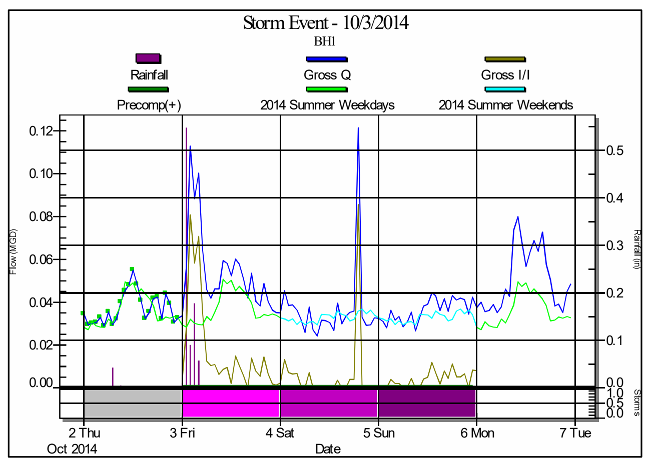

Scatter Graph
BH1
VFINAL (ft/s)
Iso Q (MGD)
DFINAL (in)

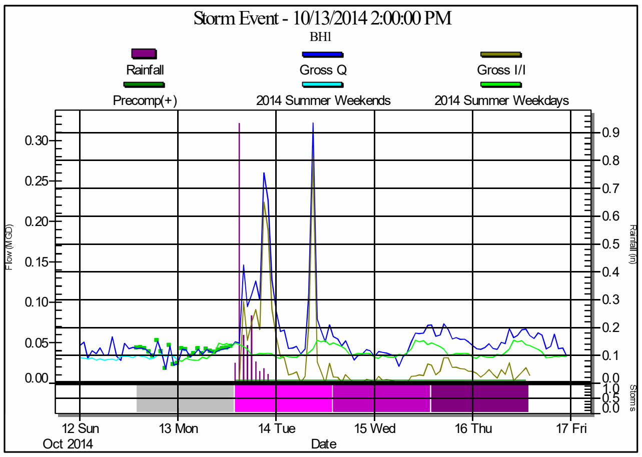

Dry Weather Flow
BH1
2014 Summer Weekdays
2014 Summer Weekends
2014 Summer Weekends Traces
2014 Summer Weekdays Traces
MGD
Hours

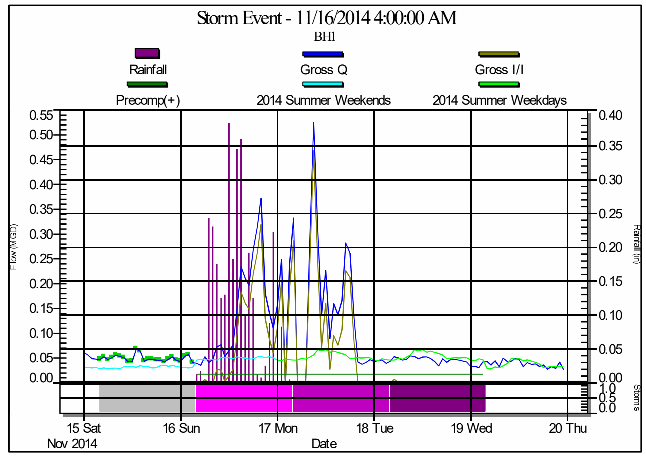

Storm Event - 9/2/2014 2:00:00 PM
BHI
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
1 Mon
Sep 2014
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Date

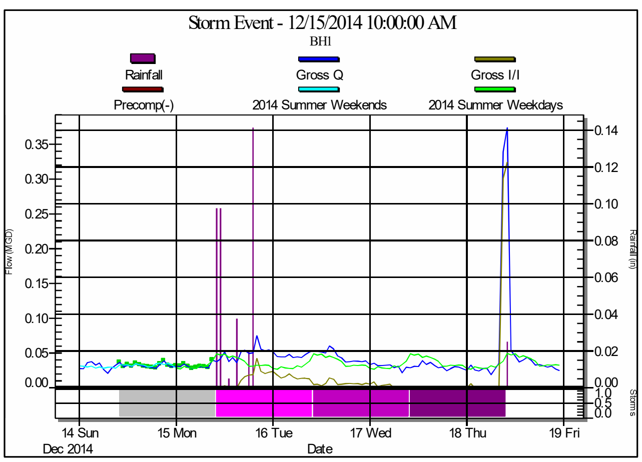

Storm Event - 9/5/2014 2:00:00 PM
BHI
Rainfall
Gross Q
Gross I/I
Precomp(-)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
4 Thu
Sep 2014
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Date

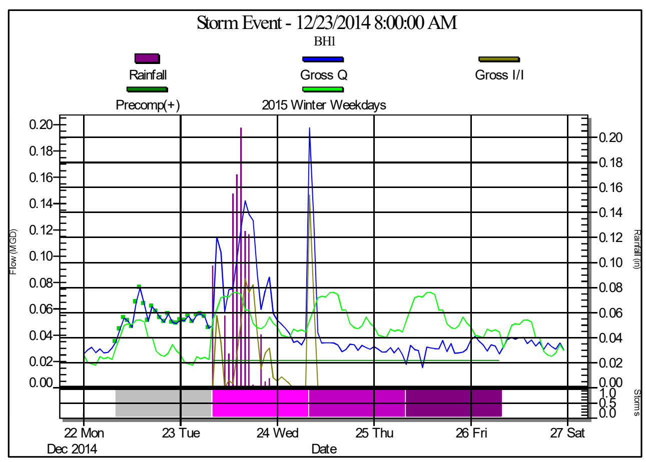

Storm Event - 9/9/2014 4:00:00 PM
BHI
Rainfall
Gross Q
Gross I/I
Precomp(-)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
8 Mon
Sep 2014
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Date

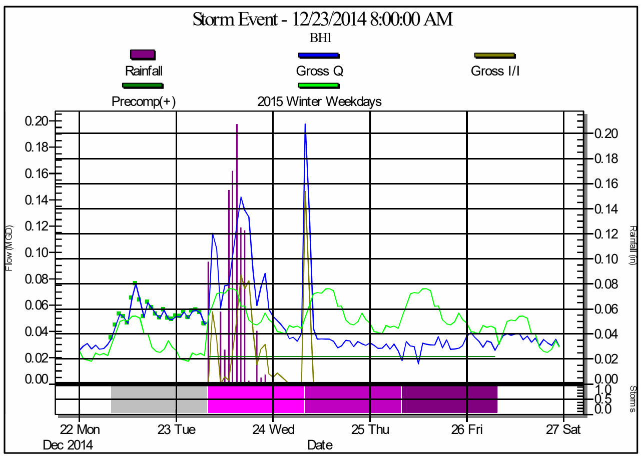

Storm Event - 10/3/2014
BHI
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Thu
Oct 2014
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Date

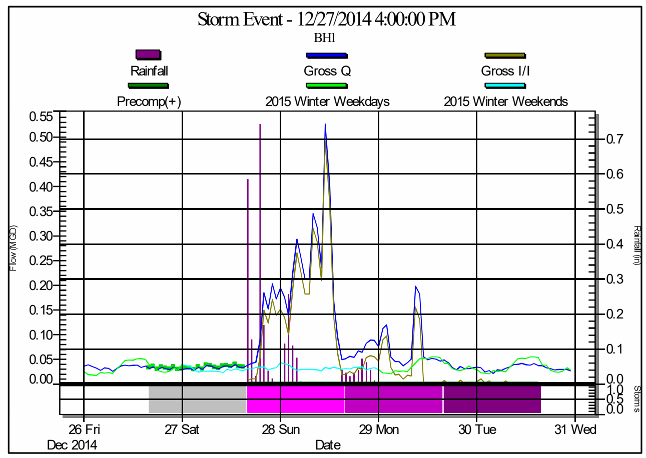

Storm Event - 10/13/2014 2:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Oct 2014
Date

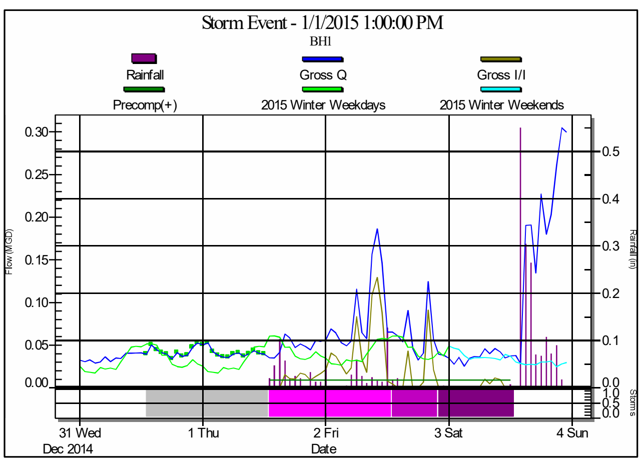

Storm Event - 11/16/2014 4:00:00 AM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Nov 2014
Date

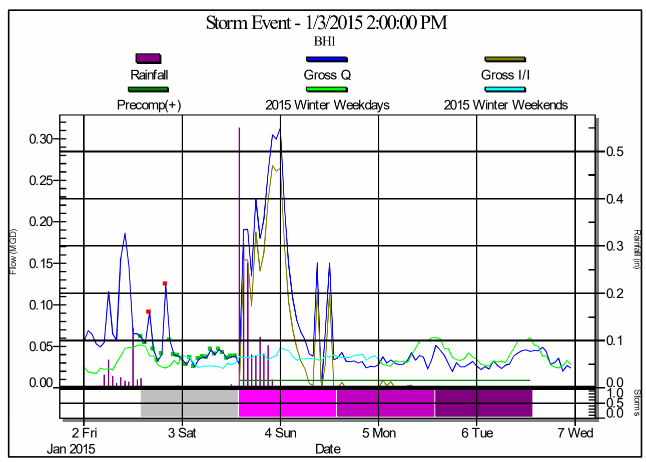

Storm Event - 12/15/2014 10:00:00 AM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(-)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Dec 2014
Date

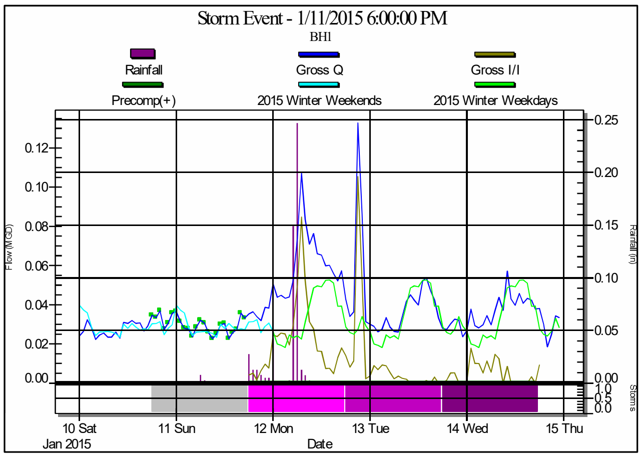

Storm Event - 12/23/2014 8:00:00 AM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

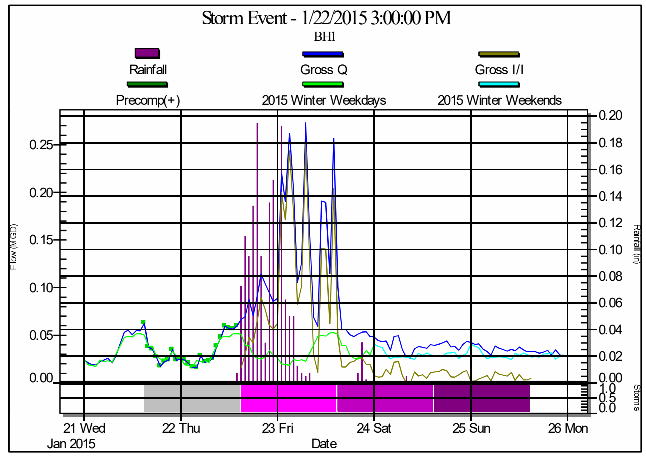

Storm Event - 12/23/2014 8:00:00 AM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

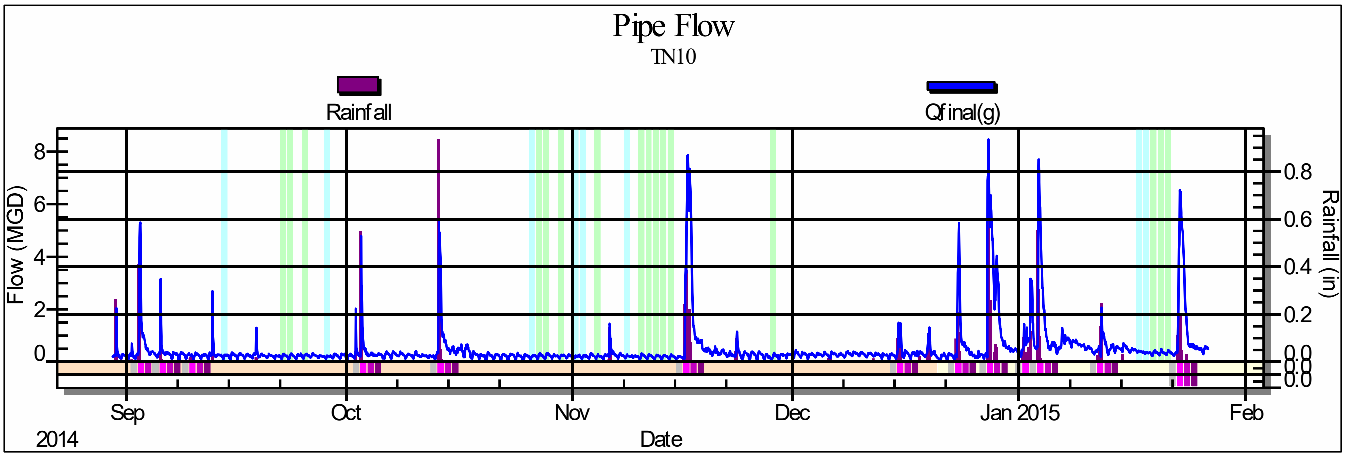

Storm Event - 12/27/2014 4:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Dec 2014
Date


Storm Event - 1/1/2015 1:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
1 Thu
2 Fri
3 Sat
4 Sun
Dec 2014
Date

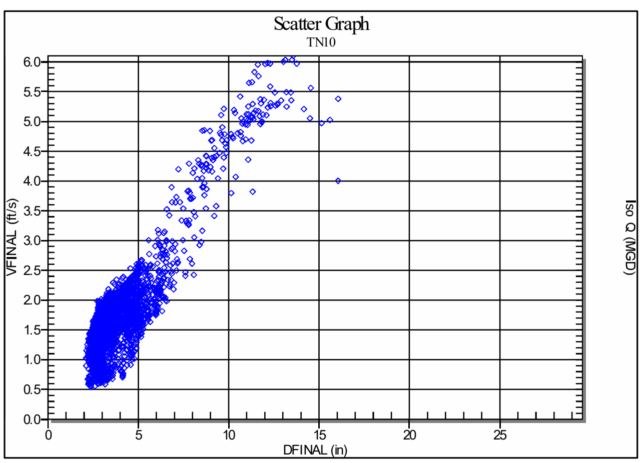

Storm Event - 1/3/2015 2:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Jan 2015
Date


Storm Event - 1/11/2015 6:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
Date
10 Sat
Jan 2015
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu

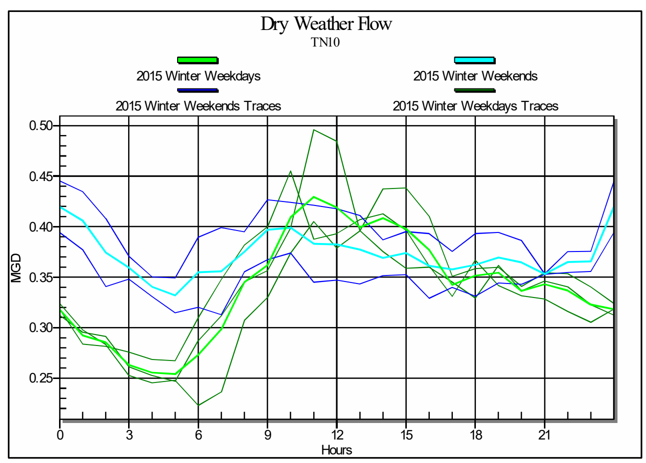

Storm Event - 1/22/2015 3:00:00 PM
BH1
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
Date
21 Wed
Jan 2015
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon



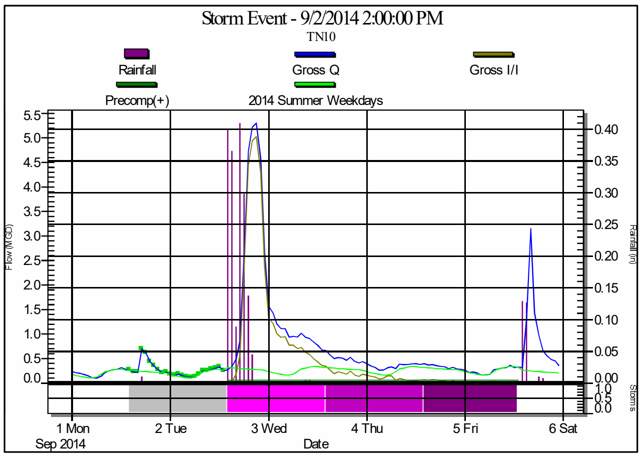
Pipe Flow
TN10
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date



Scatter Graph
TN10
VFINAL (ft/s)
DFINAL (in)
Iso Q (MGD)



Dry Weather Flow
TN10
2015 Winter Weekdays
2015 Winter Weekends
2015 Winter Weekends Traces
2015 Winter Weekdays Traces
MGD
Hours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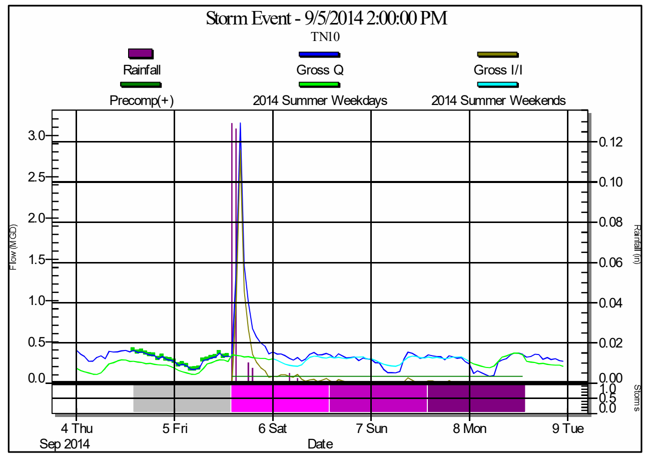
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
1 Mon
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Sep 2014
Date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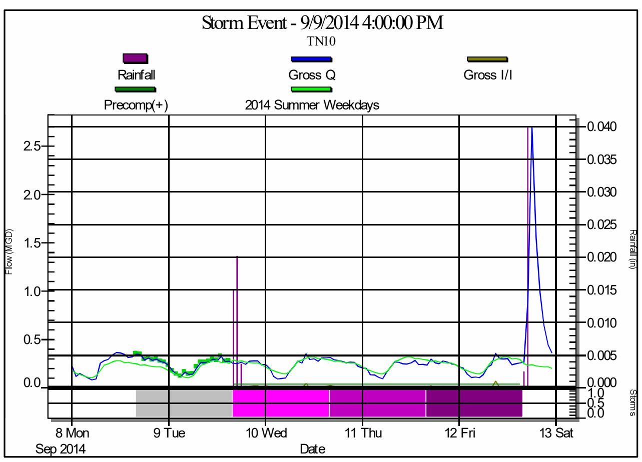
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
4 Thu
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Sep 2014
Date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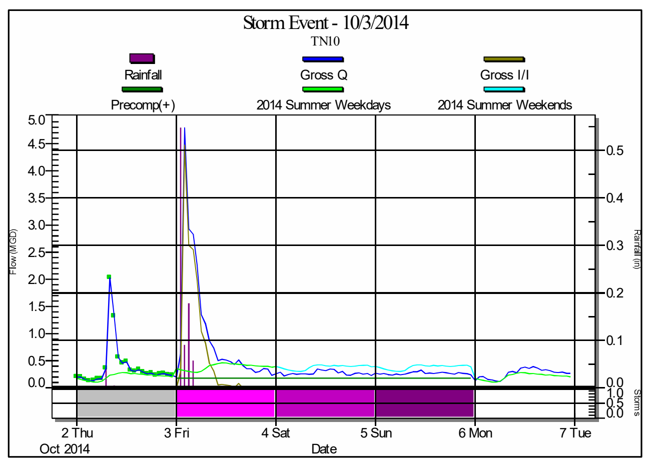
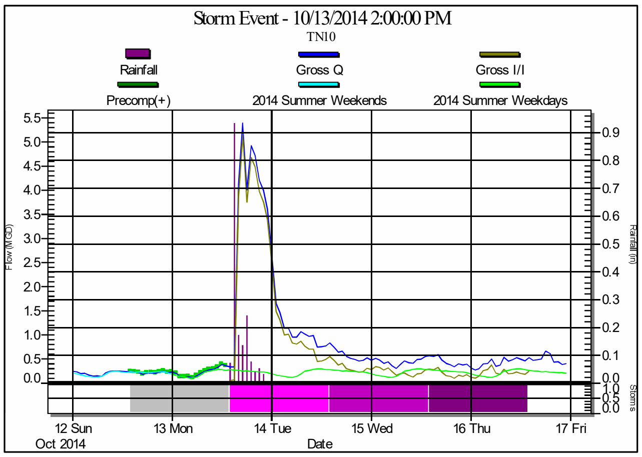
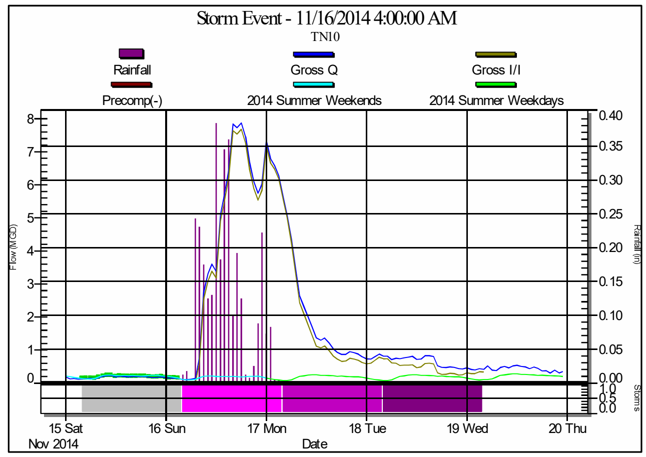
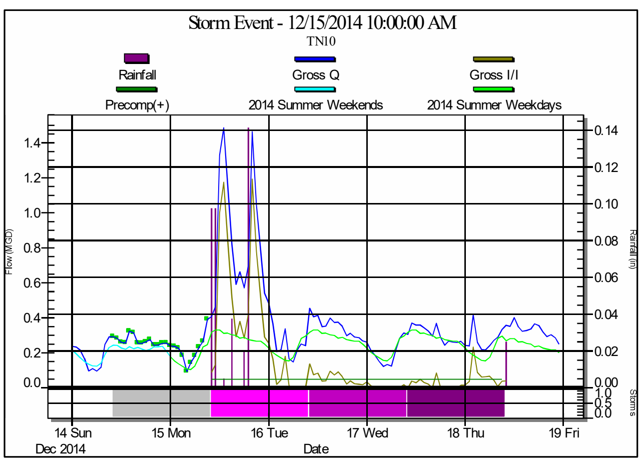
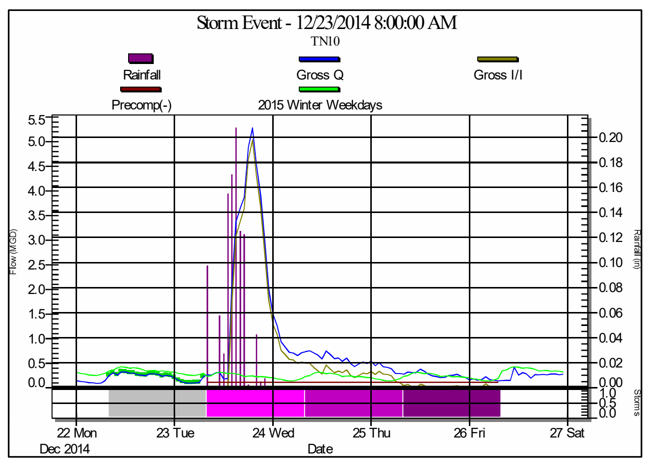
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
8 Mon
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Sep 2014
Date

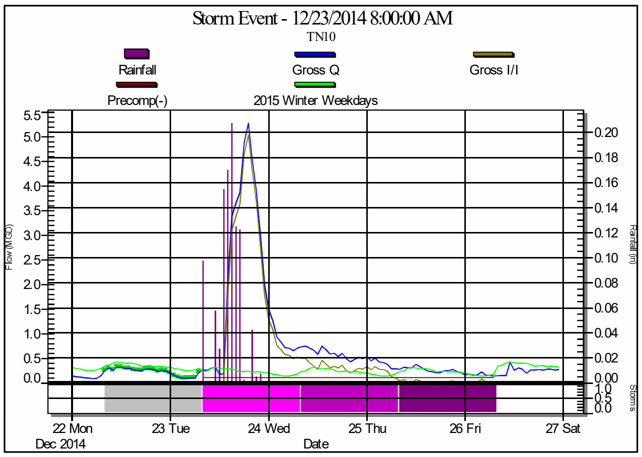

Storm Event - 10/3/2014
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Thu
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Oct 2014
Date

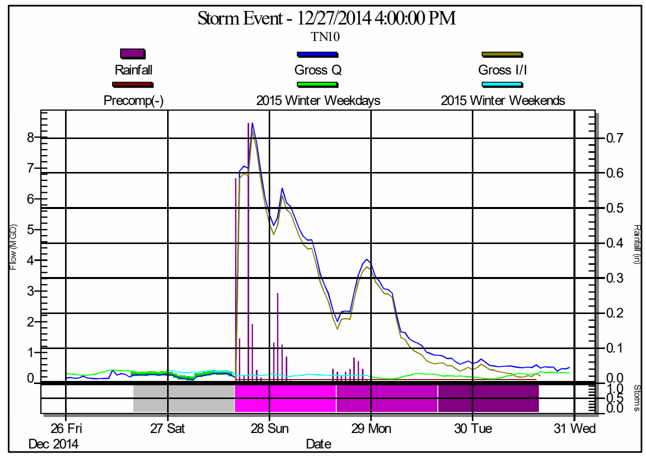

Storm Event - 10/13/2014 2:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Oct 2014
Date

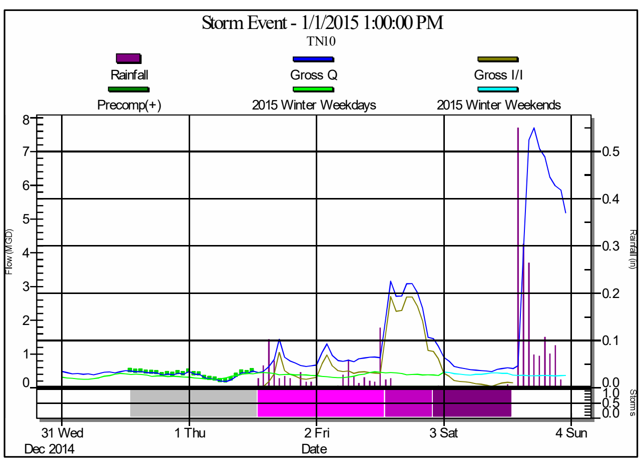

Storm Event - 11/16/2014 4:00:00 AM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(-)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Nov 2014
Date

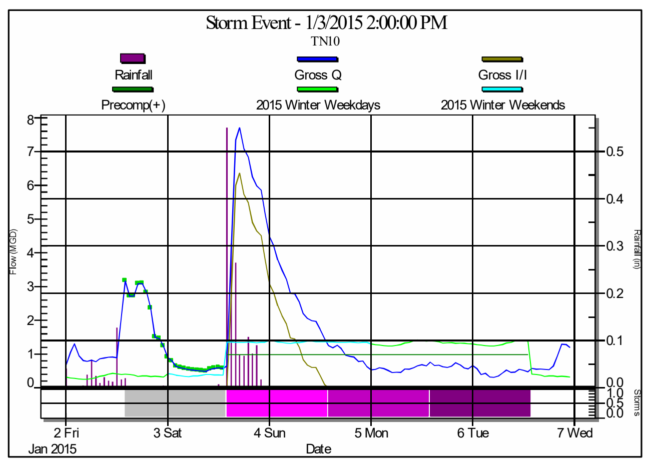

Storm Event - 12/15/2014 10:00:00 AM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Dec 2014
Date

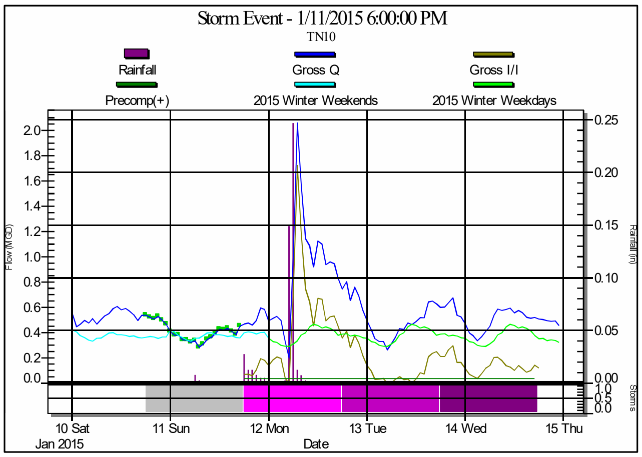

Storm Event - 12/23/2014 8:00:00 AM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date

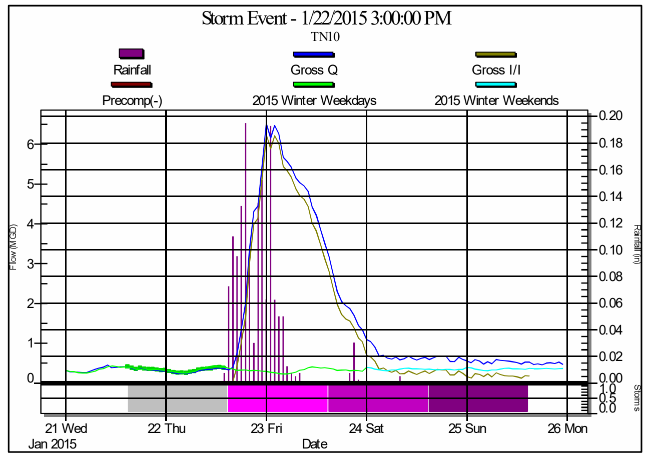

Storm Event - 12/23/2014 8:00:00 AM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
Dec 2014
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Date

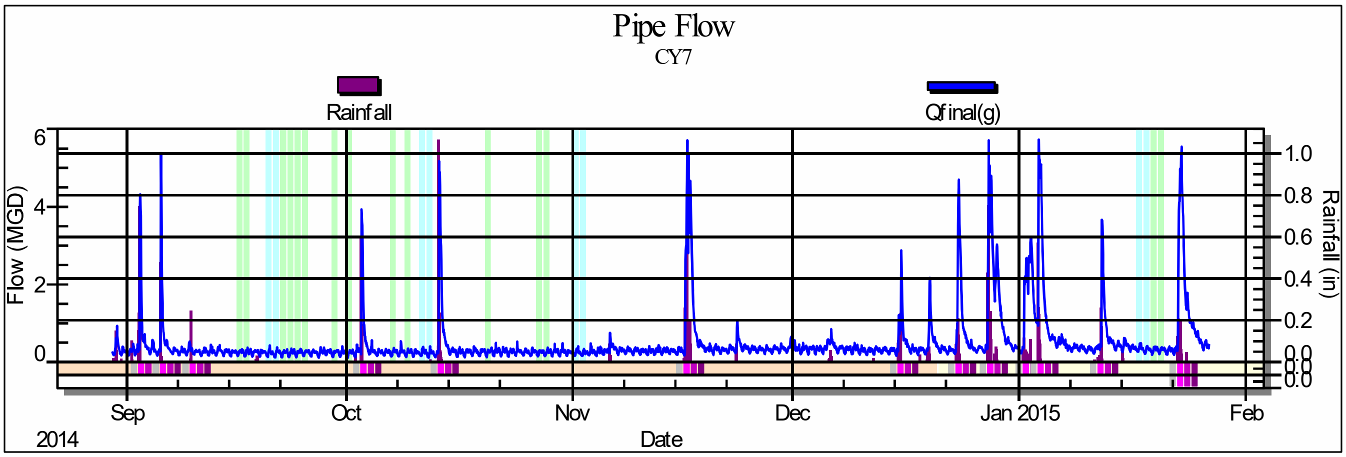

Storm Event - 12/27/2014 4:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
Dec 2014
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Date

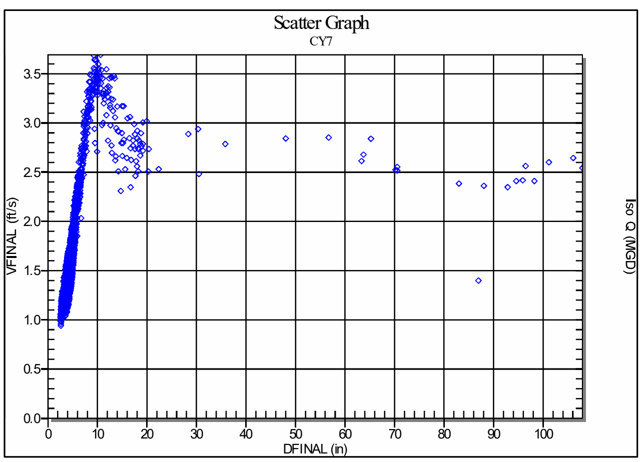

Storm Event - 1/1/2015 1:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
Dec 2014
1 Thu
2 Fri
3 Sat
4 Sun
Date

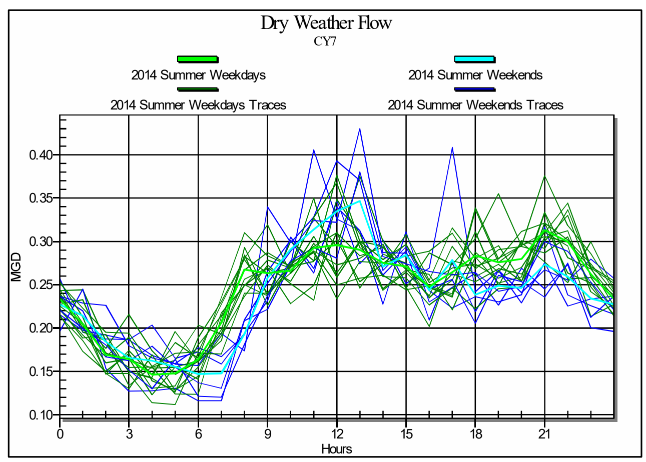

Storm Event - 1/3/2015 2:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
Jan 2015
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Date

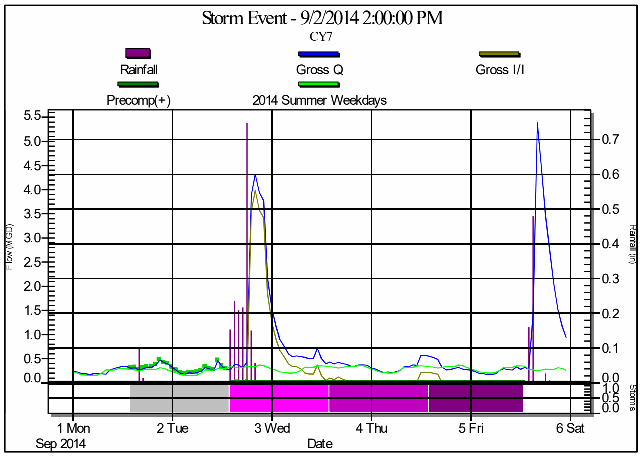

Storm Event - 1/11/2015 6:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
10 Sat
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu
Jan 2015
Date

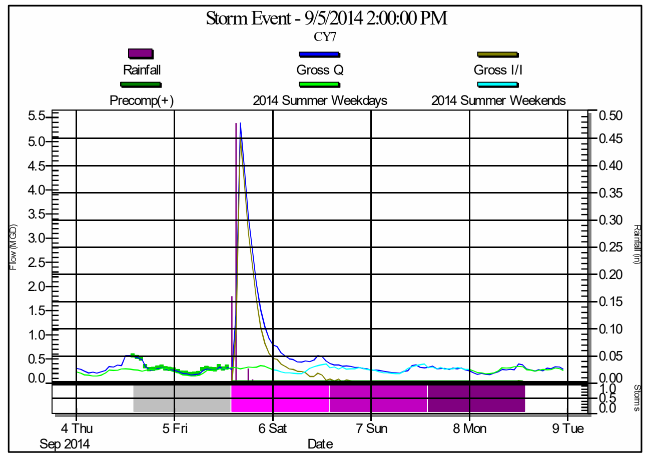

Storm Event - 1/22/2015 3:00:00 PM
TN10
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
21 Wed
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon
Jan 2015
Date

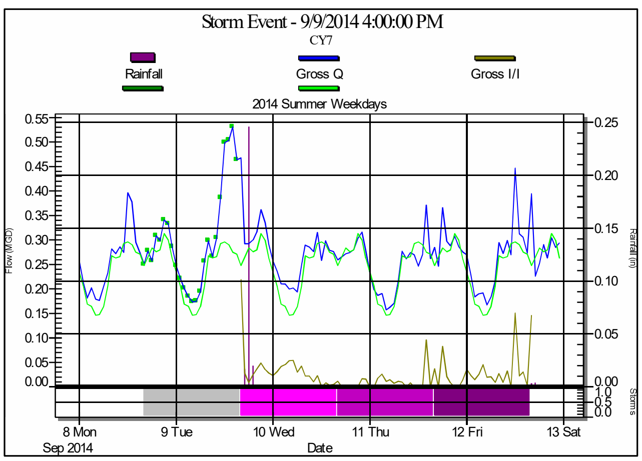

Pipe Flow
CY7
Rainfall
Qfinal(g)
Flow (MGD)
Rainfall (in)
Sep
Oct
Nov
Dec
Jan 2015
Feb
2014
Date

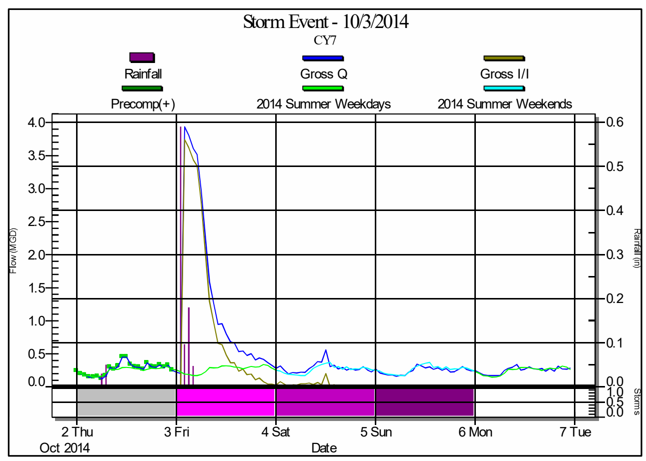

Scatter Graph
CY7
VFINAL (ft/s)
DFINAL (in)
Iso Q (MGD)

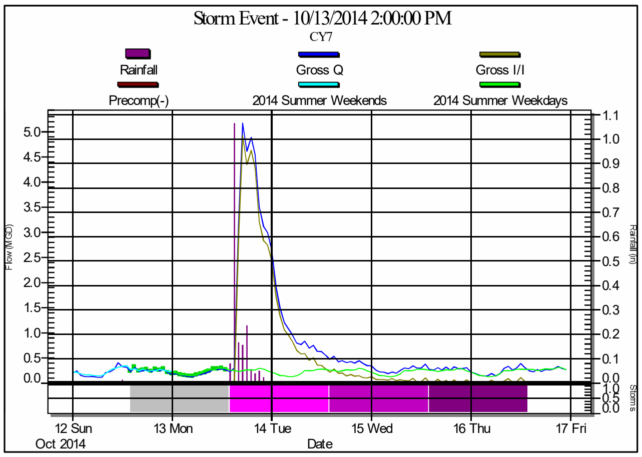

Dry Weather Flow
CY7
2014 Summer Weekdays
2014 Summer Weekends
2014 Summer Weekdays Traces
2014 Summer Weekends Traces
MGD
Hours

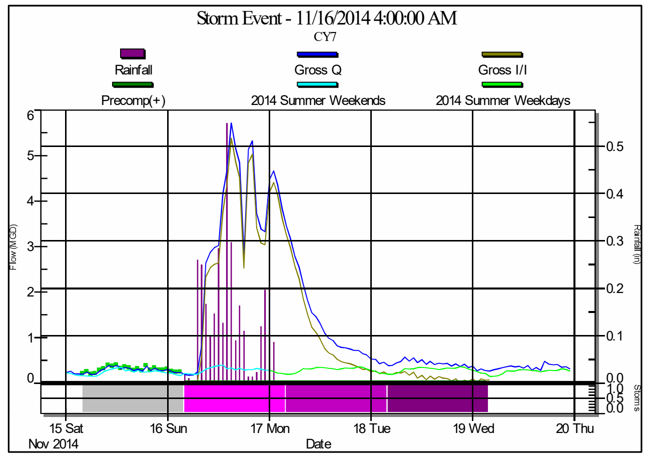

Storm Event - 9/2/2014 2:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
1 Mon
Sep 2014
2 Tue
3 Wed
4 Thu
5 Fri
6 Sat
Date

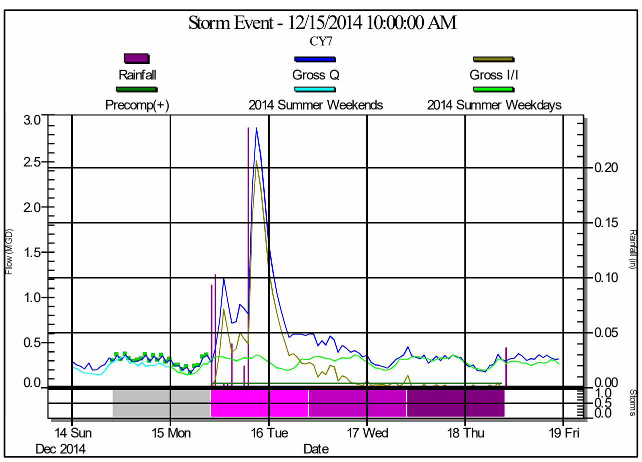

Storm Event - 9/5/2014 2:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
4 Thu
Sep 2014
5 Fri
6 Sat
7 Sun
8 Mon
9 Tue
Date

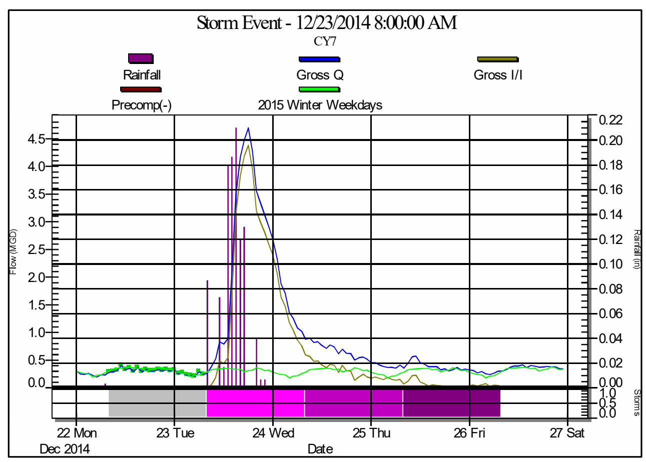

Storm Event - 9/9/2014 4:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
8 Mon
Sep 2014
9 Tue
10 Wed
11 Thu
12 Fri
13 Sat
Date

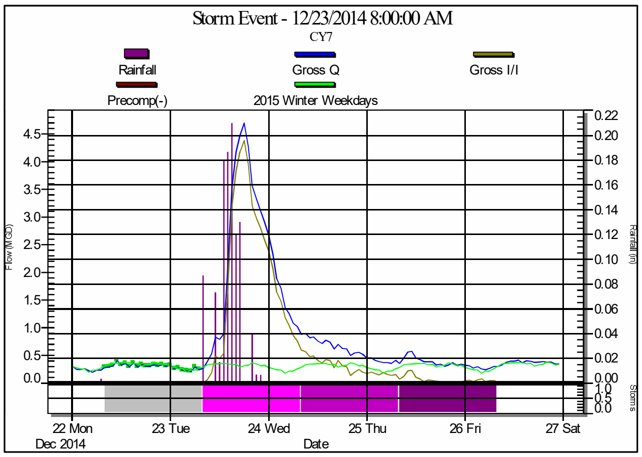

Storm Event - 10/3/2014
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekdays
2014 Summer Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Thu
Oct 2014
3 Fri
4 Sat
5 Sun
6 Mon
7 Tue
Date


Storm Event - 10/13/2014 2:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(-)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
12 Sun
13 Mon
14 Tue
15 Wed
16 Thu
17 Fri
Oct 2014
Date

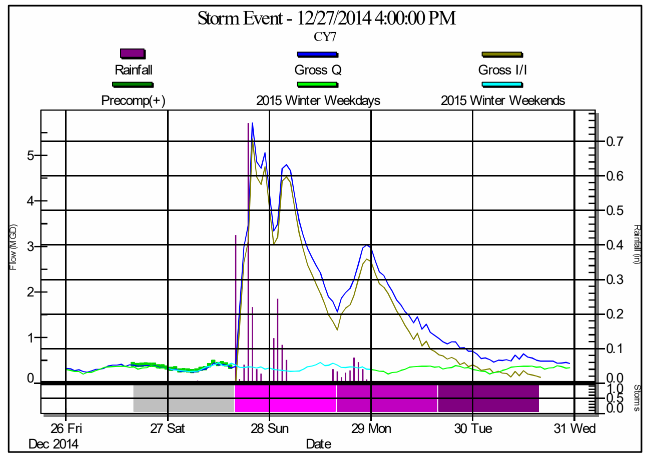

Storm Event - 11/16/2014 4:00:00 AM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
15 Sat
16 Sun
17 Mon
18 Tue
19 Wed
20 Thu
Nov 2014
Date


Storm Event - 12/15/2014 10:00:00 AM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2014 Summer Weekends
2014 Summer Weekdays
Flow (MGD)
Rainfall (in)
Storms
14 Sun
15 Mon
16 Tue
17 Wed
18 Thu
19 Fri
Dec 2014
Date

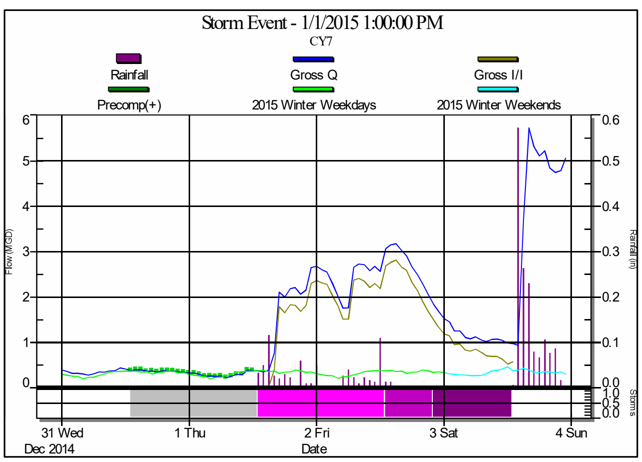

Storm Event - 12/23/2014 8:00:00 AM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Dec 2014
Date



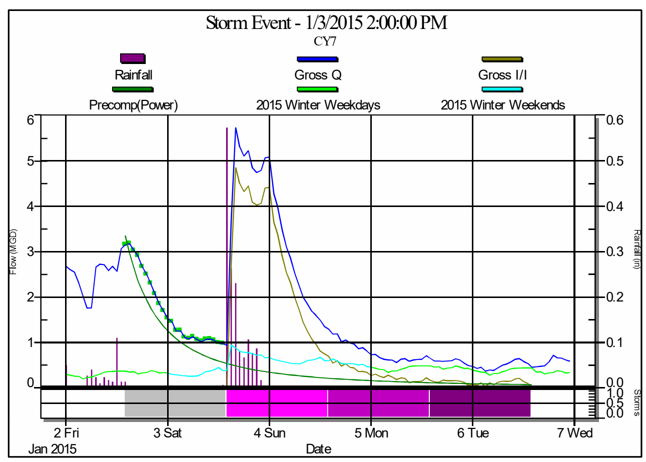
Storm Event - 12/23/2014 8:00:00 AM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
22 Mon
Dec 2014
23 Tue
24 Wed
25 Thu
26 Fri
27 Sat
Date



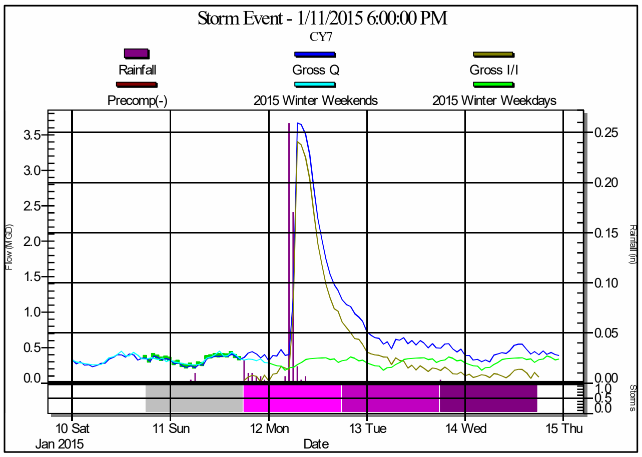
Storm Event - 12/27/2014 4:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
26 Fri
Dec 2014
27 Sat
28 Sun
29 Mon
30 Tue
31 Wed
Date



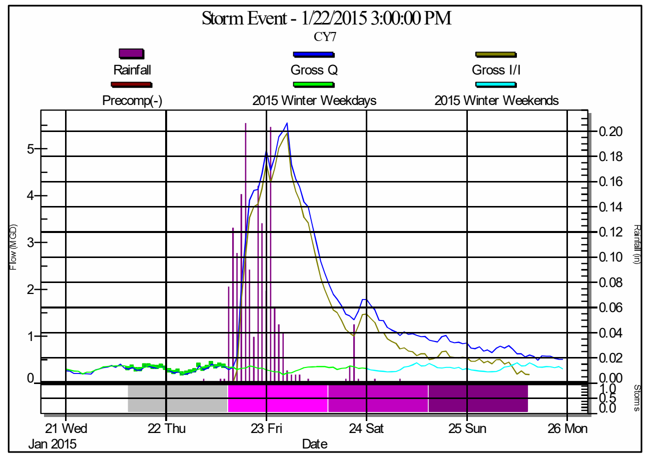
Storm Event - 1/1/2015 1:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(+)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
31 Wed
Dec 2014
1 Thu
2 Fri
3 Sat
4 Sun
Date



Storm Event - 1/3/2015 2:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(Power)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
2 Fri
Jan 2015
3 Sat
4 Sun
5 Mon
6 Tue
7 Wed
Date



Storm Event - 1/11/2015 6:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekends
2015 Winter Weekdays
Flow (MGD)
Rainfall (in)
Storms
10 Sat
11 Sun
12 Mon
13 Tue
14 Wed
15 Thu
Jan 2015
Date

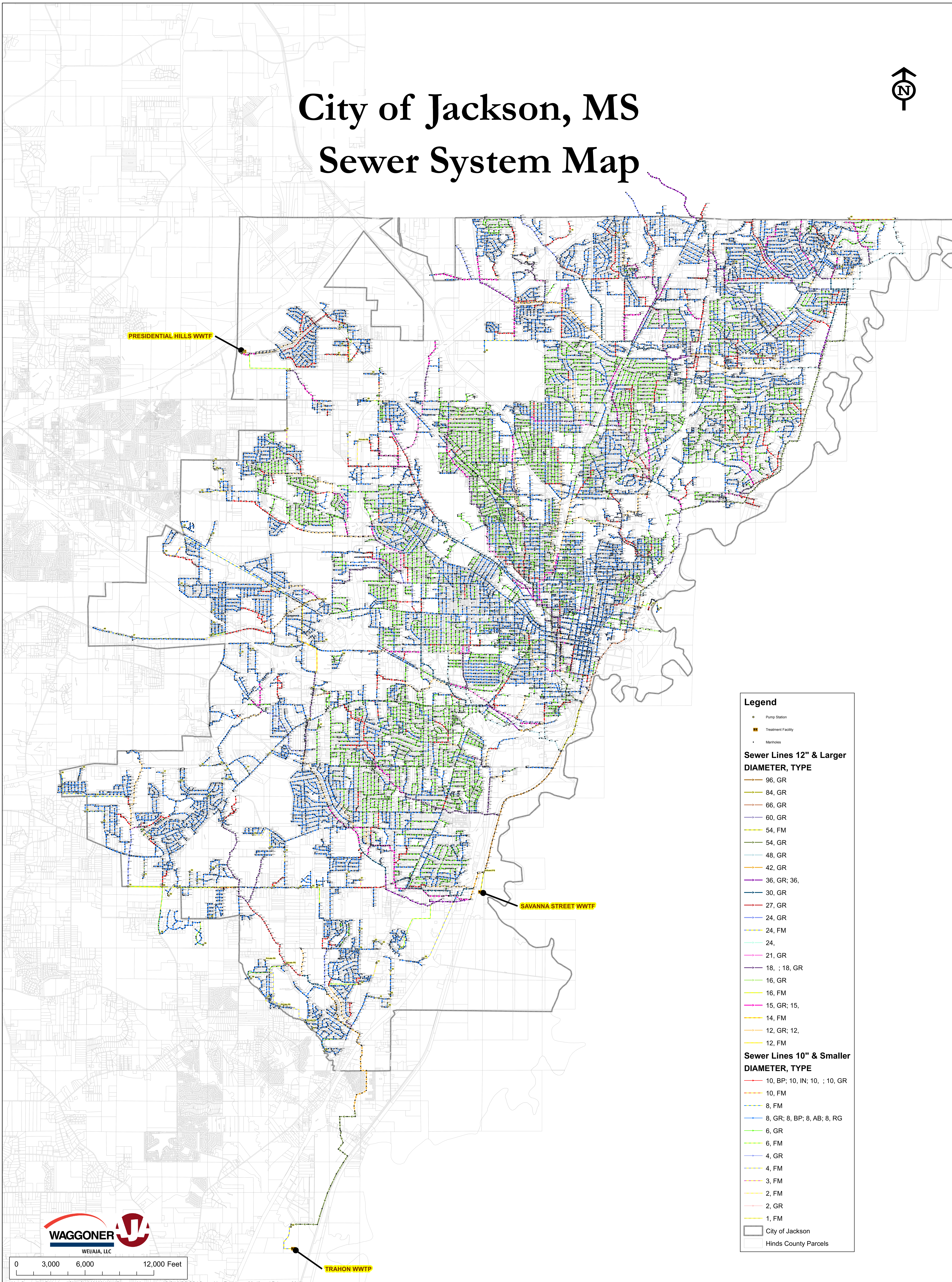


Storm Event - 1/22/2015 3:00:00 PM
CY7
Rainfall
Gross Q
Gross I/I
Precomp(-)
2015 Winter Weekdays
2015 Winter Weekends
Flow (MGD)
Rainfall (in)
Storms
21 Wed
22 Thu
23 Fri
24 Sat
25 Sun
26 Mon
Jan 2015
Date

Appendix C

City of Jackson Digital Sewer Map

City of Jackson, MS
Sewer System Map



Map Document: P:\Jackson City of\W009088_WW_Program_Management\GIS\MXDS\COJ Sewer Map Exhibit map36x48.mxd February 2017)