City of Florence, South Carolina

Sewer Collection System Master Plan

September 2025

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FLORENCE
SOUTH CAROLINA

Sewer Collection System Master Plan
City of Florence

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Executive Summary

The City of Florence (City) owns and operates a separate sanitary sewer system that discharges to the Florence Regional Wastewater Management Facility (WWMF), a 22 million gallons per day (MGD) facility located in the eastern part of the City. As the City continues to grow, system capacity and performance have become increasingly important. Hydraulic evaluations have identified areas where the system may be stressed during major rainfall events, prompting the need for strategic improvements.

Looking ahead, the City anticipates significant growth with average daily flow (ADF) projected to increase from 7.5 MGD in present-day (2025) to 23.5 MGD by 2045.

Background

According to the City's sewer account data as of 08/02/2023, the sewer collection system serves approximately 54,000 residents through 22,661 connections and consists of roughly 380 miles of gravity pipelines, 114 miles of force mains, 130 pump stations, and 7,000 manholes.

Previous planning studies identified capacity constraints and SSOs in critical areas, particularly within the Jeffries Creek sewershed, highlighting the need for a comprehensive system assessment.

To take a proactive approach in managing its sewer infrastructure, the City sought the development of a Sewer Collection Master Plan (Master Plan). This plan provides a comprehensive evaluation of the existing system, identifies infrastructure limitations, and outlines necessary improvements.

Master Plan

The Master Plan examines major sewersheds (shown in **Figure ES-1**), key infrastructure components – including 50 pump stations (PS) and primary interceptors – and potential new facilities to support industrial and residential growth. It establishes a long-term framework for system improvements, incorporating population and flow projections through 2045.

As a result of the Master Plan, a Capital Improvements Program (CIP) was developed to prioritize projects that will address existing deficiencies and ensure reliable service for future customers. Hydraulic modeling, field data collection, and flow monitoring were conducted to assess system performance and develop recommendations.

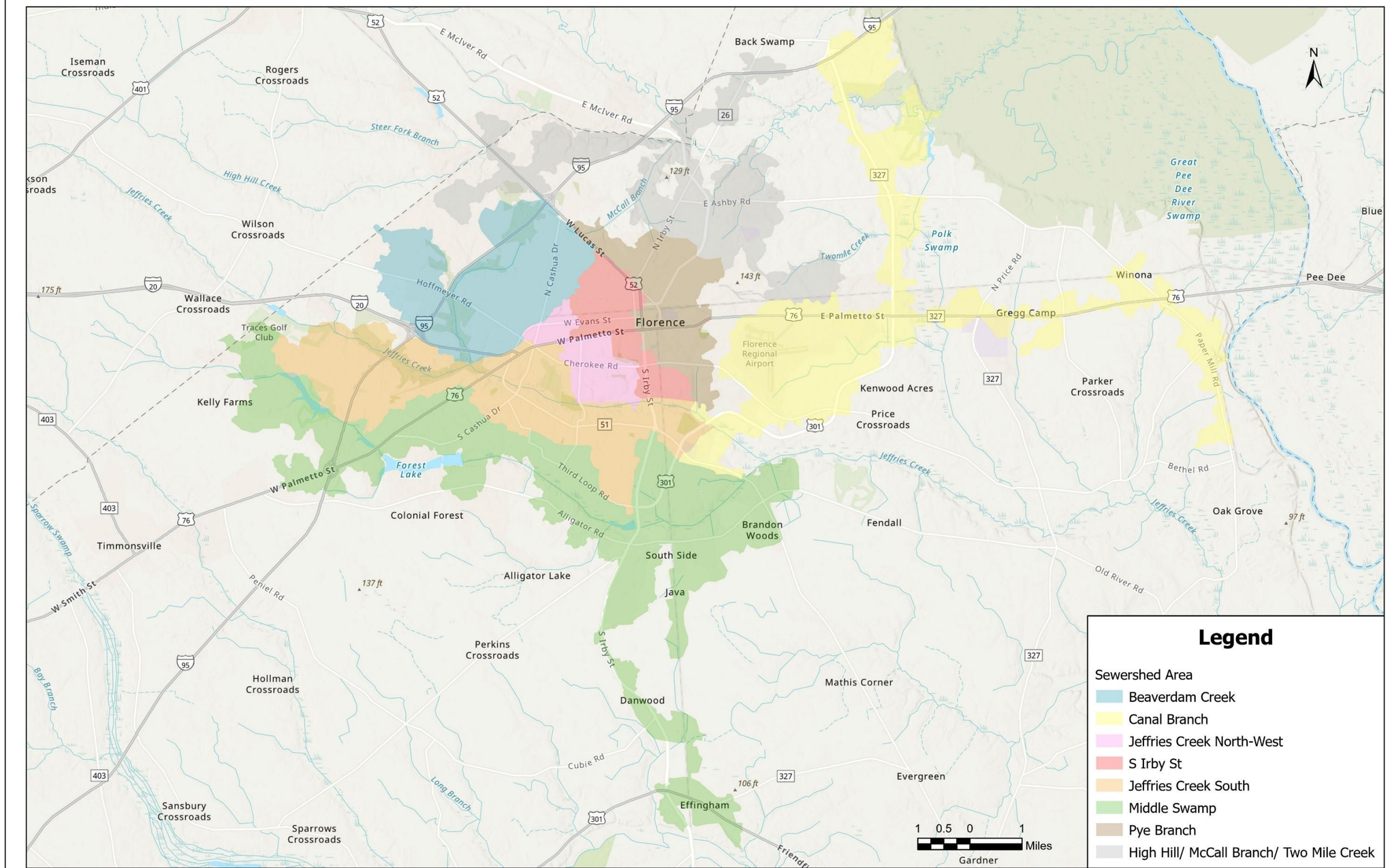

Figure ES-1: Sewershed Areas

This Master Plan presents the findings and recommendations regarding the existing and projected conditions of the City's sanitary sewer system. The following scope was performed to develop a comprehensive 20-year CIP for the City's sewer system:

1) **Existing system characterization:**
   Evaluation of available GIS data, record plans and other physical data sets gathered for input to a wastewater conveyance model of the City's sanitary sewer collection system.
2) **Hydraulic modeling and analysis:**
   Collection of flow monitoring data and development of a planning-level trunk main hydraulic model to evaluate capacity related deficiencies in major sanitary force mains and gravity interceptors.
3) **Future growth and flow projections:**
   Development of anticipated growth and flow projections for three planning horizons over the 20-year planning period (through 2045).
4) **Development and prioritization of potential CIP projects:**
   Identification of CIP projects to address existing capacity limitations and to provide adequate conveyance capacity under future flow conditions with zero SSOs during the 2-year, 6-hour design storm.

Capital Improvement Program

The CIP serves as the critical implementation component of the Master Plan, translating long-term planning goals into actionable infrastructure projects. **Table ES-1** and **Figure ES-2** present the recommended CIP projects, which have been prioritized and phased over the following planning horizons to ensure a systematic and fiscally responsible approach to sewer system improvements:

- **Early Action Projects**
  (to be completed in the next 2 years)
- **Short-Term Projects**
  (to be completed by 2030)
- **Intermediate Projects**
  (to be completed by 2035)
- **Long-Term Projects**
  (to be completed by 2045)

The phased implementation strategy ensures that critical infrastructure needs identified in the Master Plan are addressed in a logical and financially sustainable manner. The Early Action and Short-Term projects prioritize

immediate system deficiencies and high-risk infrastructure, while Intermediate and Long-Term projects focus on capacity enhancements, system resiliency, and accommodating future growth.

The 20-year implementation schedule (**Table ES-1**) remains a flexible planning tool, subject to adjustments based on City staff feedback, funding availability, and evolving infrastructure priorities.

Additionally, as part of the CIP, an Inflow and Infiltration (I/I) Reduction Program is recommended to minimize the volume of stormwater entering the sanitary sewer system. This initiative is particularly critical in aging areas of the City's system and low-lying regions susceptible to surface water intrusion. The total OPCC for this program is estimated at $56.8 million, based on high-level assumptions regarding lateral lining, mainline cured-in-place pipe (CIPP) rehabilitation, and manhole improvements. Of the total estimated cost and scope, 48% is allocated to the intermidate planning horizon and 52% to the long-term planning horizon. Further data collection and flow monitoring will be crucial to help refine the targeted areas and potentially reduce estimated costs. The effectiveness of the I/I Reduction Program may lead to the refinement of certain CIP projects, further optimizing the City's investment in infrastructure upgrades.

The sizing and extents of the recommended conveyance upgrades are considered planning-level estimates and are subject to refinement based on the findings from the Early Action Flow Verification and Programmatic Review Project. The opinion of probable cost for these efforts is $535,000 which equates to approximately 0.25% of the total opinion of probable constrution cost for the 20-year CIP program. The findings from these efforts may significantly reduce the overall cost of the 20-year CIP program, therefore it is recommended that the CIP projects included in this plan be re-evaluated following the completion of the Flow Verification and Programmatic Review Project.

Table ES-1: Recommended CIP Projects and Schedule

	CIP Project	Year	Description	OPCC (Million)
Early Action Projects				
	Flow Verification and Programmatic Review	2027	• Additional flow monitoring and field investigations (CCTV, survey) to confirm capacity limitations. • Data collection and analysis at HWY 301, Roche Carolina, Fairgrounds, Police Cabin, Paper Mill, Summit at Oakdale, Adams Creek and Black Creek, at an OPC value of $25,000 per pump station (PS). • Programmatic review of CIP projects. • I/I Reduction Analysis.	$0.54[1]
	North JCI Upgrades	Under Design[2]	• Upsize 7,800 LF of existing sewer along North JCI. • Brunwood Drive structure modifications. • Oleander/Wisteria/Santee/Park sewer improvements. • Construct Country Club PS. • Upsize 1,500 LF of existing sewer near Fairway Drive.	$13.18[3]
Conveyance Upgrades[4]				
Short Term	HWY 301 PS Upgrades and Force Main	2030	• Upgrades at HWY 301 PS and 33,300 LF of new force main to WWMF.	$27.09
	West Palmetto Street Pump Station and Second Loop Interceptor Upgrades	2030	• Construct 10 MGD PS and 22,170 LF new force main or sewer along Second Loop to North JCI. • Upsize 3,500 LF of existing sewer from Woody Jones to US 76/ Palmetto Street.	$20.86[3]
	Lower South Jeffries Creek Interceptor (JCI) Upgrades Phase I	2030	• Upsize 7,000 LF of existing sewer from Jeffries Ln to WWMF.	$11.09[3]
Intermediate	I/I Reduction Program Phase I	2035	• Perform I/I reduction for 48% of the targeted I/I area.	$27.26
	East Palmetto St Upgrades	2035	• Upgrades at Fairgrounds & Roche Carolina PSs.	$5.23
	Lower South JCI Upgrades Phase II	2035	• Upsize 20,780 LF of existing sewer from West Palmetto PS to Jeffries Lane.	$12.21
	Beaverdam Creek Upgrades Phase I	2035	• Upsize 7,100 LF of existing sewer along western Beaverdam Creek Interceptor (BCI). • Upsize 9,300 LF of existing sewer along Lower BCI. • Rehab 3,450 LF of existing sewer parallel to Lower BCI.	$12.89
	East JCI Upgrades	2035	• Upsize 7,170 LF of existing sewer along East JCI.	$9.27
Long Term	I/I Reduction Program Phase II	2045	• Perform I/I reduction for 52% of the targeted I/I area.	$29.54
	Highway 327 Upgrades	2045	• Upgrades at Black Creek & Adams Branch PS's. • Upsize 12,970 LF of force main along HWY 327.	$13.01
	Beaverdam Creek Upgrades Phase II	2045	• Upgrades to Cashua Dr PS and force main. • Upsize 13,100 LF of existing gravity sewer.	$15.40
	Pye Branch Upgrades	2045	• Upsize or rehabilitate 15,930 LF of existing sewer.	$14.20
	South Irby/Timrod Park Upgrades	2045	• Upsize or rehabilitate 7,000 LF of existing sewer.	$3.55
	Upper South JCI Upgrades	2045	• Upsize 12,010 LF of existing sewer.	$9.56
			Total Opinion of Probable Construction Costs (Million)[5]:	**$224.9**

[1] Refer to **Section 5.2** for detailed breakdown of opinion of probable costs for Flow Verification and Programmatic Review project.
[2] The City is currently in design phases to replace the downstream portion of the Lower South JCI.
[3] OPCCs for Lower JCI Upgrades Phase I, North JCI Upgrades and West Palmetto PS & Second Loop Interceptor projects were derived by escalating OPCCs from JCI Improvements Study (CDM Smith, 2022) to 2025 dollars based on an estimated inflation rate of 7% per year. The OPCCs also include 25% construction contingency.
[4] Recommended conveyance improvements projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
[5] The OPCC does not include expenses such as engineering fees, construction administration/observation, permitting, and property acquisition. A planning-level contingency of 25% has been incorporated to account for uncertainties in market conditions and construction costs.

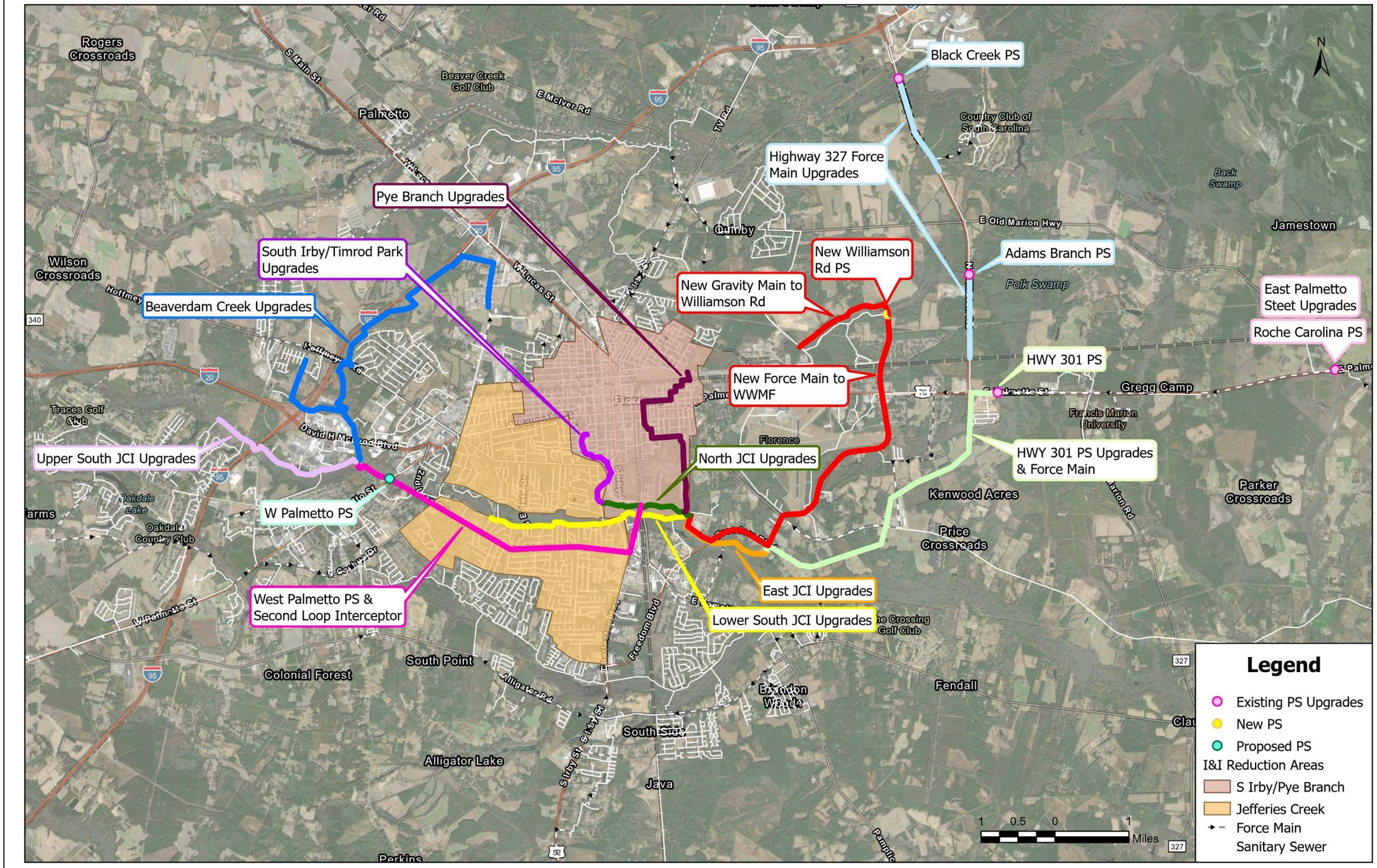

Figure ES-2: Capital Improvement Program Projects

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Acronyms and Abbreviations

ADF	Average Day Flow
ADWF	Average Dry Weather Flow
AECOM	AECOM Technical Services
BCI	Beaverdam Creek Interceptor
CAD	Computer-Aided Design
CCTV	Closed-Circuit Television
CIP	Capital Improvement Program
CIPP	Cured-in-Place Pipe
City	City of Florence
DCWSA	Darlington County Water and Sewer Authority
DEM	Digital Elevation Model
DWF	Dry Weather Flow
FM	Force Main
FMU	Francis Marion University
WWMF	Florence Regional Wastewater Management Facility
GIS	Geographic Information System
GPD	Gallons per Day
H&H	Hydrologic and Hydraulic
HGL	Hydraulic Grade Line
I/I	Inflow and Infiltration
JCI	Jeffries Creek Interceptor
LF	Linear Feet
LiDAR	Light Detection and Ranging
LOS	Level of Service
Master Plan	Sewer Collection System Master Plan
MH	Manhole
MGD	Million Gallons per Day
OPC	Opinion of Probable Cost
OPCC	Opinion of Probable Construction Cost
PS	Pump Station
RDII	Rain Derived Inflow and Infiltration
SCADA	Supervisory Control and Data Acquisition
SCDES	South Carolina Department of Environmental Services
SSOs	Sanitary Sewer Overflows

1 Introduction

1.1 Background

The City of Florence's sewer collection system currently serves a population of approximately 54,000 residential customers through 22,661 connections, based on the sewer account data as of 08/02/2023. The City's collection system consists of approximately 380 miles of gravity pipelines, 114 miles of force mains, 130 pump stations, and 7,000 sewer manholes. Flows collected in the City's system are treated at the Florence Regional Wastewater Management Facility (WWMF).

In addition to the City's collection system detailed above, the City owns and operates a system in Timmonsville consisting of 22 miles of gravity pipelines, 15 miles of force mains, and 19 pump stations. Currently, these flows are treated at the Timmonsville Wastewater Treatment Plant. Therefore, this system was not included in the City's master plan. Future plans are to convert the Timmonsville facility to a transfer pump station and convey these flows for treatment at the WWMF.

The study area included in this Master Plan focused on major infrastructure within the City's sanitary sewer system including 50 pump stations and main interceptors which serve the City's customers.

1.1.1 Previous Studies

Over the years, the City has studied various improvements to the existing sanitary sewer collection system in response to observed sanitary sewer overflows (SSOs) and apparent conveyance capacity limitations in specific areas. The following subsections discuss key findings from these studies.

1.1.1.1 Jeffries Creek Interceptors Improvements

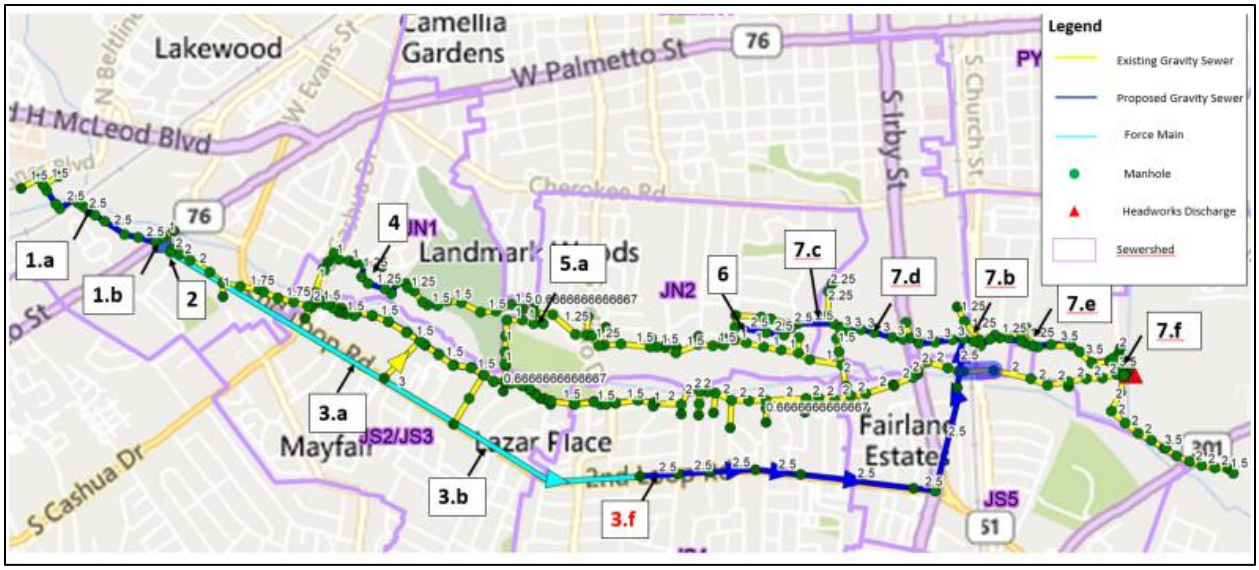
The City contracted CDM Smith in 2017 and again in 2022 to evaluate conceptual alternatives for improving the hydraulic capacity of the Jeffries Creek Interceptors (JCIs), which consist of the "southern JCI" and the "northern JCI." The studies were initiated in response to SSOs in the area. The preferred strategy to address SSOs involved the following items:

1. Increase conveyance capacity of the existing northern JCI.
2. Redirect a portion of sanitary flows from the existing southern JCI near US 76/Palmetto Street to the upsized northern JCI.
3. Modify existing interconnections to redirect a portion of flows from the southern JCI to the northern JCI.

Table 1-1 shows a summary of the items included in the recommended alternative from the 2022 study and Opinion of Probable Construction Costs (OPCC) for each major project. **Figure 1-1** shows an overview of the recommended alternative included in the 2022 study.

Table 1-1: Summary of Recommended Jeffries Creek Interceptors (JCIs) Improvements (CDM Smith, 2022)

Project		Description	Status	OPCC (2022 $)
1	Palmetto Street Sewer Improvements	Replace 3,500 LF of 20-inch gravity sewer with 30-inch sewer from Woody Jones to US 76/ Palmetto Street and install 170 LF of new 30- or 36-inch sewer from US 76/Palmetto Street to West Palmetto PS.	Not Started	$2.49M
2/3	West Palmetto Pump Station and Second Loop Sanitary Sewer	Recommended 8.1 MGD pump station near US 76 / West Palmetto Street to convey flows from the west portion of the southern JCI to the upsized northern JCI.	Not Started	$2.80M
		Recommended 12,000 LF of 20-inch force main and 10,000 LF of 30-inch gravity main to convey flows from the recommended West Palmetto PS to the upsized northern JCI and accept flow from existing sewers south of Second Loop Road.	Not Started	$8.33M
4	Fairway Drive Improvements	Replace 1,500 LF of existing 12-inch gravity sewer to 15-inch sewer near Fairway Drive.	Not Started	$0.37M
5	Brunwood Drive Structure Modifications	Lower the existing diversion wall at South Brunwood Drive that connects the 18-inch portion of the northern JCI to the southern JCI.	Not Started	$0.01M
6	Oleander/Wisteria/ Santee/Park Sewer Improvements	Install 1,500 LF of 24-inch sewer to replace existing 18-inch sewer between Wisteria Drive and Oleander Drive.	Not Started	$0.63M
7	Northern Interceptor Upgrades	Upsize 7,800 LF of the existing 18-27-inch sewer to 42-54-inch sewer from Santee Drive to the Plant and construct 120 LF of 15-inch sewer to divert flow from the 15-inch sewer to the recommended 42-54 sewer.	In Design	$5.19M
8	Southern Interceptor Upgrades	Construct 3000 LF of 36-inch diameter sewer replacement and 4000 LF of 42-48-inch diameter sewer replacement along the southern JCI from north of Jeffries Lane to the Plant.	Not Started	$7.24M
9	Country Club Pump Station	Construct a 1.5 MGD pump station to convey flow from the North JCI west of the Florence Country Club and construct 14,000 LF of 4-inch force main to convey flow to the northern JCI west of South Irby Street.	Not Started	$2.41M
			Subtotal OPCC (2022 USD):	**$19.02M**
			Design and Engineering (10%):	$1.90M
			Construction Contingency (25%):	$4.75M
			Total Budget (2022 USD):	**$25.68M**



Source: CDM Smith, 2022

Figure 1-1: Recommended Jeffries Creek Interceptors (JCIs) Improvements Alternative 5E (CDM Smith, 2022)

Of the nine major projects recommended by CDM Smith, one project is currently in design phases – the Northern Interceptor Upgrades, and the remaining projects have not yet been initiated. The recommended improvements which are currently in planning-level were re-evaluated and incorporated into the CIP plan.

1.1.1.2 Timmonsville Rehabilitation Program

Following the acquisition of Timmonsville utility systems, the City has undertaken a rehabilitation program for the Timmonsville collection system. This program was based upon the Preliminary Engineering Report submitted to the South Carolina Department of Environmental Services (SCDES)[1] in 2018. Phase II of this program was completed in early 2023. The City will be pursuing funding to implement the program next year (2026). Therefore, based upon discussions with City staff, the Timmonsville collection system was not included in this planning effort.

1.2 Purpose

The purpose for this project is to develop a comprehensive Sewer Collection System Master Plan (Master Plan) for a 20-year planning period (through 2045) that will identify strategies for planning, budgeting, maintaining, and improving the City's collection system based on current flows and future growth. This Master Plan provides the basis for a Capital Improvements Program (CIP) for the City's collection system with a list of prioritized projects, complete with detailed descriptions and cost estimates.

[1] On July 1, 2024, the South Carolina Department of Health and Environmental Control (SCDHEC) was dissolved into two agencies, the Department of Public Health (DPH) and the Department of Environmental Services (DES). SCDES oversees the protection and preservation of South Carolina's environment and natural resources.

This Master Plan focuses on identifying improvements required to address existing system deficiencies in the following major sewer sheds:

- Beaverdam Creek
- Canal Branch
- Jefferies Creek North-West
- South Irby Street
- Jefferies Creek South
- Middle Swamp
- Pye Branch
- High Hill/ McCall Branch/ Two-mile Creek

The Master Plan also evaluates the need for potential new facilities required to serve existing and proposed areas for industrial development and residential growth. The intent of this document is to establish a baseline to guide the City's planning activities for the wastewater collection system program.

1.3 Scope

The following tasks outline the scope of services developed for this study:

Task 1: Project Initiation and Coordination
AECOM initiated the project by collecting data and establishing operational criteria for the City's sewer system. A kickoff meeting was held on August 29, 2023 to define project goals, communication plans, and field data collection strategies. AECOM requested GIS, CAD, as-builts, and other system data, which were reviewed for gaps. Meetings were conducted as needed to provide progress updates and facilitate decision-making.

Task 2: Population and Flow Projections
AECOM analyzed current population data and wastewater flows to develop future projections through 2045, considering City growth trends and planned developments. Data from census reports, land use plans, and economic forecasts were used to estimate residential and industrial wastewater flows. Population and flow projections were developed for three planning horizons:

- Short-term (5 years to 2030).
- Intermediate (10 years to 2035).
- Long-term (20 years to 2045).

This task also established Level of Service (LOS) criteria to assess infrastructure needs based on technical, municipal, and regulatory perspectives.

Task 3: Field Work and Flow Monitoring

Field inspections and data collection were conducted to verify sewer system connectivity and measure flows along critical interceptors. AECOM installed eight flow monitors and collected data over a 3-month period to understand flow variations and performance of major interceptors. Findings from these inspections helped refine the hydraulic model and guide system improvements.

Task 4: Sewer Collection and Conveyance Analysis

A hydraulic model of the City's primary sewer infrastructure was developed using GIS data, available pump station records, and supervisory control and data acquisition (SCADA) system inputs. The model was calibrated using real-time flow and depth data to simulate current conditions and assess future capacity needs. Deficiencies in the system were identified, and improvement alternatives were explored to find the recommended projects to provide reliable service to existing and future sanitary sewer customers.

Task 5: Capital Improvement Program (CIP) and Funding

AECOM used the system analysis results to develop a prioritized list of infrastructure improvement projects to meet the LOS criteria selected by the City (Task 2). Each project included cost estimates based on historical and market data. A ranking system was established to prioritize projects based on City needs, and the methodology was refined through discussions with City staff. Once the projects were ranked, they were categorized into the planning time periods.

Task 6: Final Report

AECOM prepared a draft report summarizing the work completed for this study, the results and findings from this work, and a summary of recommended CIP improvements categorized into the appropriate time period increments. The draft report was submitted to the City in electronic format for review and comments.

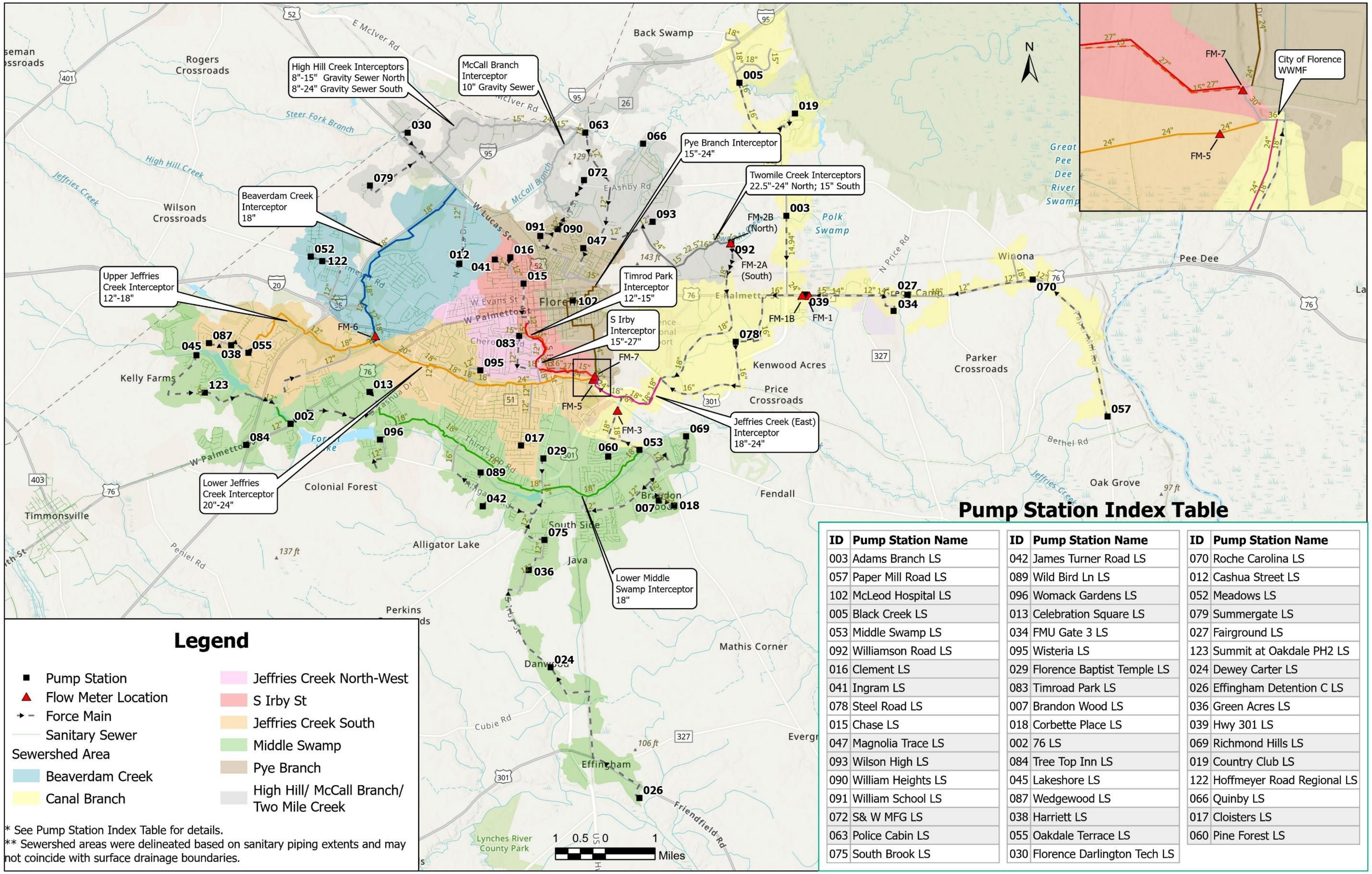
Following review, AECOM met with City staff to receive and discuss comments. These comments were incorporated into a final report and submitted to the City.

2 Existing System

2.1 Existing System Overview

Figure 2-1 shows an overview of the City's existing sanitary sewer collection and conveyance system evaluated in this Master Plan which includes the following:

- **Wastewater Treatment Plant:** The Florence Regional Wastewater Management Facility (WWMF) was commissioned in 1950 and underwent upgrades in 2013. As part of the 2013 upgrades, the WWMF design capacity was expanded from a maximum month flow capacity of 15 MGD to 22 MGD.
- **Pump Stations:** A total of 50 (out of 130) pump stations were included in the Master Plan study area as well as approximately 59 miles of associated force main, limited to those with diameters of 8 inches or greater, which convey sanitary flow towards the major interceptors and ultimately to the WWMF. Refer to **Appendix A** for a detailed list of pump station characteristics including existing pump make and model, number of pumps, wet well data, pump operating points and motor data.
- **Sewershed Area:** A total sanitary sewershed area of approximately 71.5 square miles, was delineated to represent the City's existing service area within the study limits. This area does not include the Darlington County Water and Sewer Authority (DCWSA) or Timmonsville sanitary service area. **Table 2-1** provides a breakdown of the sanitary sewershed area tributary to each major interceptor.
- **Gravity Sewer:** Out of the total approximate 469 miles of gravity sewer throughout the City, the Master Plan study area included approximately 132 miles of gravity sewer making up the major interceptors which convey sanitary flow towards the WWMF, shown in **Figure 2-1** and summarized in **Table 2-1**.



Pump Station Index Table

ID	Pump Station Name	ID	Pump Station Name	ID	Pump Station Name
003	Adams Branch LS	042	James Turner Road LS	070	Roche Carolina LS
057	Paper Mill Road LS	089	Wild Bird Ln LS	012	Cashua Street LS
102	McLeod Hospital LS	096	Womack Gardens LS	052	Meadows LS
005	Black Creek LS	013	Celebration Square LS	079	Summergate LS
053	Middle Swamp LS	034	FMU Gate 3 LS	027	Fairground LS
092	Williamson Road LS	095	Wisteria LS	123	Summit at Oakdale PH2 LS
016	Clement LS	029	Florence Baptist Temple LS	024	Dewey Carter LS
041	Ingram LS	083	Timroad Park LS	026	Effingham Detention C LS
078	Steel Road LS	007	Brandon Wood LS	036	Green Acres LS
015	Chase LS	018	Corbette Place LS	039	Hwy 301 LS
047	Magnolia Trace LS	002	76 LS	069	Richmond Hills LS
093	Wilson High LS	084	Tree Top Inn LS	019	Country Club LS
090	William Heights LS	045	Lakeshore LS	122	Hoffmeyer Road Regional LS
091	William School LS	087	Wedgewood LS	066	Quinby LS
072	S& W MFG LS	038	Harriett LS	017	Cloisters LS
063	Police Cabin LS	055	Oakdale Terrace LS	060	Pine Forest LS
075	South Brook LS	030	Florence Darlington Tech LS		

Figure 2-1: Existing System Overview

Table 2-1 shows a summary of the major interceptors which serve the City's sanitary collection system.

Table 2-1: Summary of Existing Major Interceptors

Interceptor(s)*		Diameter (in)	Sewershed Area (sq mi)	Year Installed	Material	Tie-In Location
Beaverdam Creek		18	7.9	Unknown	Unknown	Jeffries Creek Lower South
East Palmetto Street		12-15	0.8	1992-1995	Unknown	Hwy 301 PS
High Hill Creek	North	8-15	1.2	1986	PVC	Police Cabin PS
	South	8-24	4.1	Unknown	Unknown	Police Cabin PS
Highway 327		24	4.3	1999-2002	Unknown	Hwy 301 PS
Jeffries Creek	North	15-30	4.6	1951	VCP	WWMF
	Lower South	18-24	10.4	Unknown	Unknown	WWMF
	Upper South	10-18	2.0	Unknown	Unknown	Jefferies Creek Lower South
	East	18-24	5.0	Unknown	Unknown	WWMF
Middle Swamp		18	19.6	1986	PVC	WWMF
Pye Branch		15-24	4.2	1951	VCP	WWMF
Two-mile Creek	North	15	0.9	1986	PVC	Williamson Rd PS
	South	22.5-24	10.2	Unknown	Unknown	Williamson Rd PS
McCall Branch		8-10	2.2	Unknown	Unknown	Police Cabin PS

* Table 2-1 refers to the gravity main of each interceptor labelled and identified in Figure 2-1. The force main downstream of High Hill Creek and Two-mile Creek was installed in 2004 and 2013 respectively.

2.2 Reported Sanitary Sewer Overflows

The City provided historical data summarizing SSOs reported between July 2005 to April 2023. To better understand which SSO locations were associated with potential conveyance capacity limitations, the reported data was evaluated and filtered into the following categories:

- **Suspected capacity limitation or "priority" locations:**
  City staff identified the cause of SSO event to be attributed to excessive inflow into the collection system. These events were flagged as suspected capacity limitations and considered "priority" SSO locations to be used for confirmation of model-predicted SSO locations.
- **Known emergency event:**
  Reported SSO event was a result of a known emergency condition such as a pump station failure (i.e. power outage, pump maintenance) or reported SSO event was a result of a known sewer maintenance issue (i.e. mainline clogging, etc.).
- **Unknown cause:**
  Cause of SSO event was not reported by City staff.

Appendix B shows the detailed lists of reported SSOs broken into the three categories described above. The locations of interest were identified based on having a concentration of two or more reported SSOs which were caused by apparent capacity limitations.

Figure 2-2, below, shows the priority SSO locations and locations of interest where SSO occurrences were frequent, based on historical data.

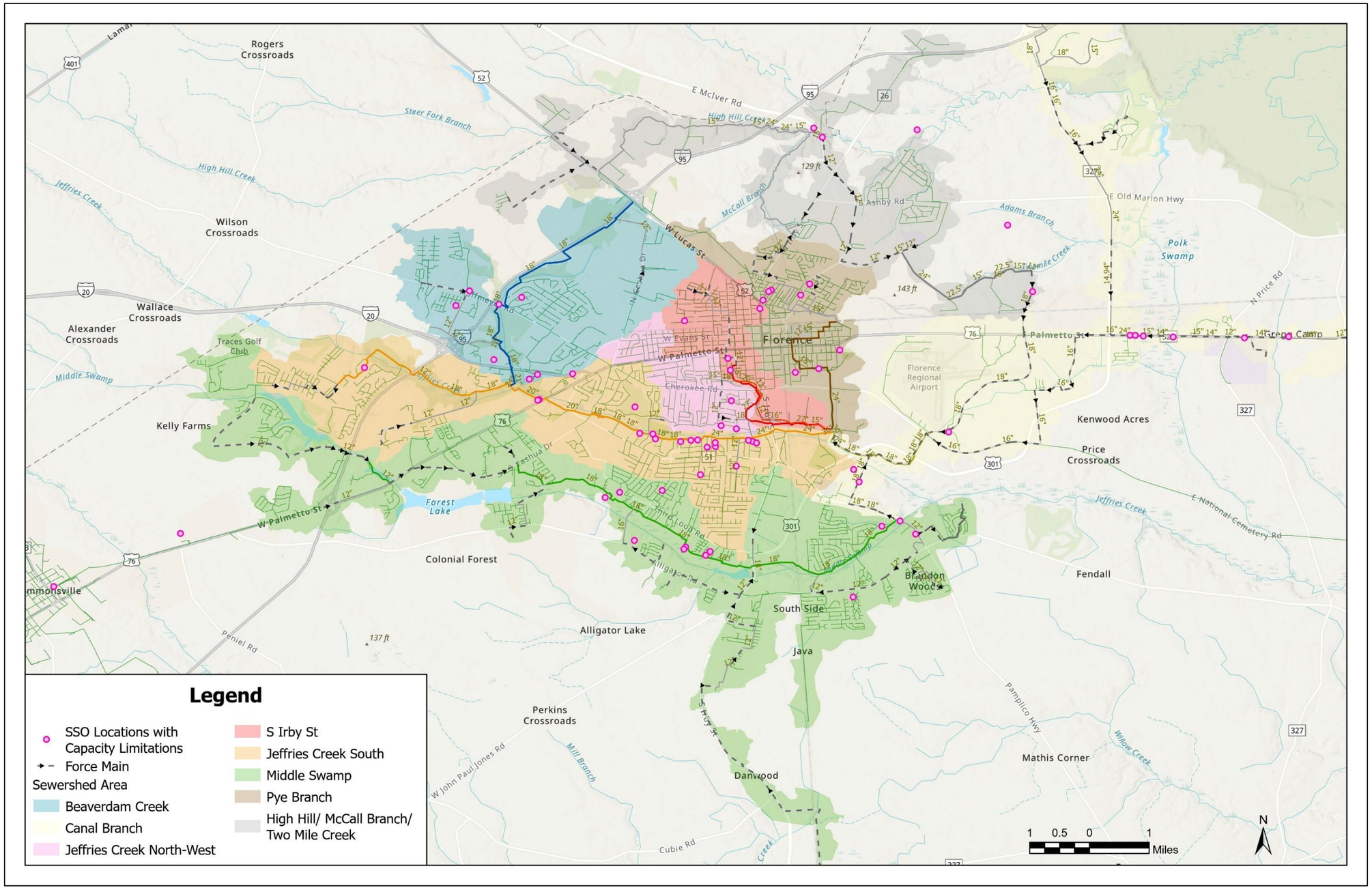


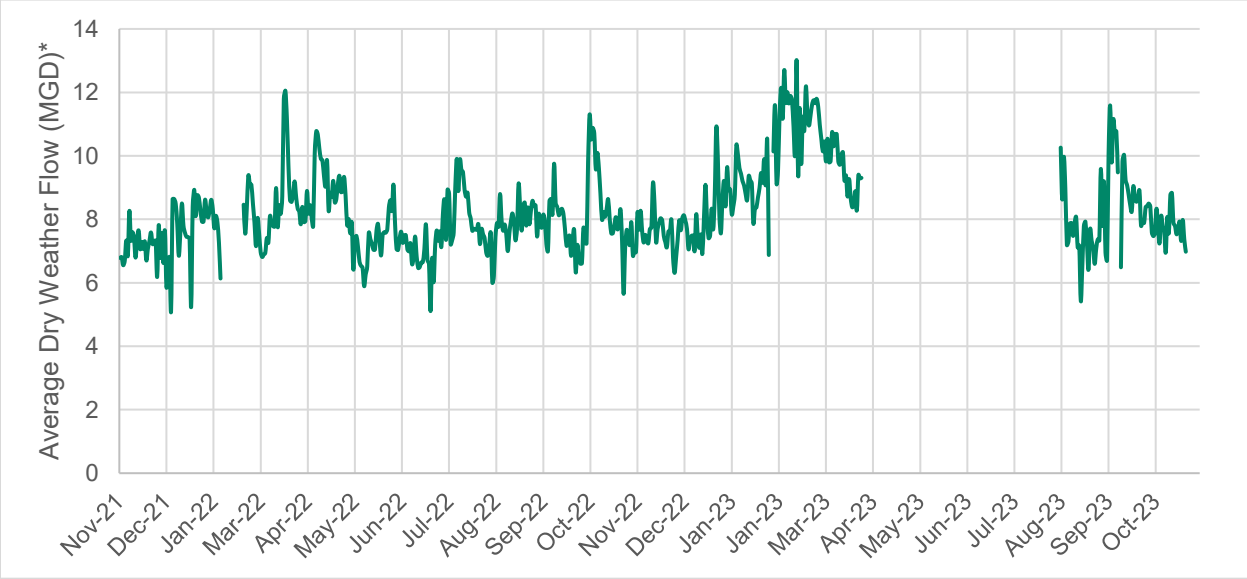
Figure 2-2: Reported SSOs With Suspected Capacity Limitation

3 Existing and Future Flows

3.1 Historical Dry Weather Flow Evaluation

AECOM analyzed hourly plant influent flow data from the WWMF to determine the average peak flow factor for incorporation into existing and future flow projections.

Daily precipitation data was used to extract values without the influence of rainfall (i.e. days without reported precipitation plus a 2-day buffer to account for increased flows during antecedent moisture conditions). **Figure 3-1** shows the plant influent average dry weather flow (DWF) across the evaluation period from November 2021 through October 2023.



*Daily average dry weather flow values were obtained using daily precipitation data to extract values without the influence of rainfall.
**Hourly plant influent flow data was not available for the period from April 2023 through August 2023.

Figure 3-1: Historical WWMF Influent Dry Weather Flow (11/30/21 – 10/31/23)**

The daily flow values shown in **Figure 3-1** were further characterized to determine the overall average DWF, maximum DWF and calculated peak flow factor across the evaluation timeframe. These values are summarized in **Table 3-1**.

Table 3-1: Historical WWMF Influent Dry Weather Flow Summary- 11/30/21 – 10/31/23

Parameter	Value*
Average Dry Weather Flow:	**8.26 MGD**
Maximum Dry Weather Flow:	**13.02 MGD**
Peak Flow Factor:	**1.58**

* Flow values represent 24-hour average day values during dry weather conditions

3.2 Existing Flow Characterization

AECOM used historical billing data to estimate the existing average wastewater flow and to characterize the contribution from each customer class (i.e. industrial, residential, commercial and wholesale customers). This analysis was reflective of City sewer accounts and average water usage rates as of August 2, 2023.

The following methodology was used to determine the existing average day flow (ADF) for each customer class:

- **Residential.** Residential ADF was calculated by multiplying the total number of residential sewer accounts by the estimated average water usage rate of 155 gallons per day (gpd) per residential account.
- **Industrial.** For purposes of this study, it was assumed that as of August 2023, the City served one industrial customer referred to as Pee Dee Commerce Park (refer to **Figure 3-2** for geospatial location). This assumption was made such that future industrial growth was considered as future flow. The estimated ADF from Pee Dee Commerce Park during this time was assumed to be 90% of the estimated water usage rate, or 720,000 gpd.
- **Commercial.** Commercial ADF was calculated by multiplying the total number of business accounts, as per sewer account data as of August 2023, by the average water usage rate of 1,698 gpd per business account.
- **Darlington County Sewer and Water District (DCWSA).** The estimated existing ADF from DCWSA was 404,000 gpd.

Max day flow (MDF) estimates were then determined by multiplying the historical peak day factor of 1.58 (refer to **Section 3.1** for details) by the ADF for each customer class, with the exception of industrial and DCWSA users which were assumed to have a peak day factor of 1.0.

Table 3-2 shows the breakdown of existing ADF and MDF values for each customer class.

Table 3-2: Existing Sanitary Flow Breakdown

User Class	Calculated Average Day Flow (MGD)	Calculated Max Day Flow (MGD)
Industrial	0.72 (10%)[1]	0.72[2] (6%)
Residential	3.32 (44%)	5.31 (47%)
Commercial	3.06 (41%)	4.90 (43%)
DCWSA	0.40 (5%)	0.40[2] (4%)
Total	**7.50**	**11.33**

[1] The percentages shown in parentheses represent each user class's contribution to the total calculated average/max day flows.
[2] A max day peaking factor of 1 was utilized for the Industrial and DCWSA user classes.

3.3 Future Growth and Flow Projections

Future growth areas were evaluated to determine projected flows to the City's sanitary collection system over the short-term (5-year), intermediate (10-year) and long term (20-year) planning horizons. New development areas were provided by the City's economic planning department. **Figure 3-2** shows an overview of the future growth areas which are broken down into two major categories – industrial growth areas and residential growth areas. In areas of the existing system where new development is not anticipated, future sanitary flows were assumed to remain constant.

The City provided the planning status for residential development areas. For purposes of this Master Plan, these status categories were used to determine the respective planning horizon (short term, intermediate, or long term). **Table 3-3** summarizes the various planning status types and the respective planning horizons assumed for each category.

Table 3-3: Future Growth Planning Status Summary

Planning Status	Planning Horizon
Under Review	Short term (Anticipated completion prior to 2030)
Under Construction	Short term (Anticipated completion prior to 2030)
New/Proposed	Intermediate (Anticipated completion prior to 2035)
Future Project	Long term (Anticipated completion prior to 2045)

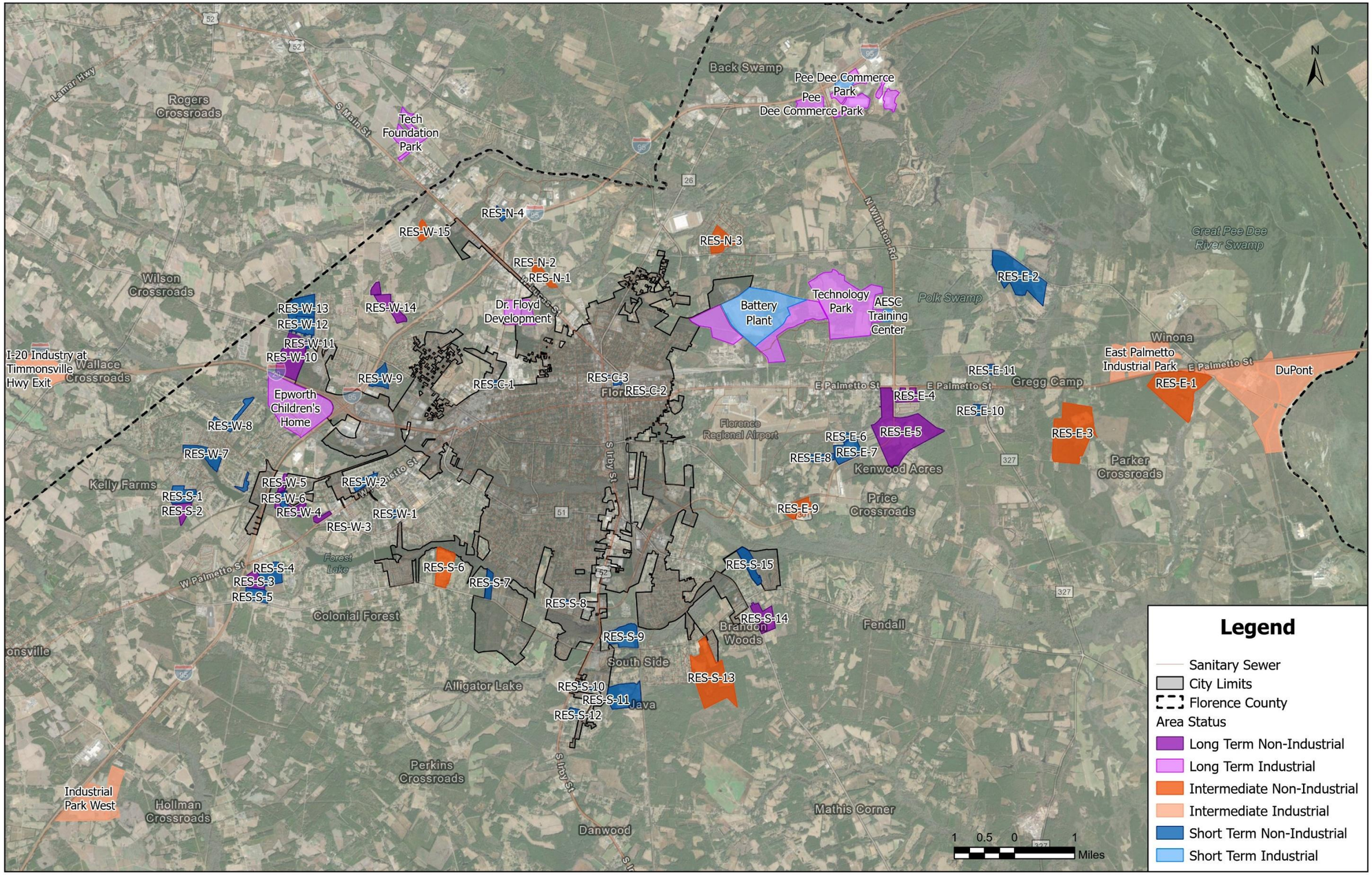


Figure 3-2: Future Growth Area Overview

3.3.1 Industrial Growth

There are currently nine industrial areas which are expected to result in increased wastewater flows into the City's sanitary system over the course of the 20-year planning period. The following assumptions were made during the development of industrial flow projections:

- **Existing industrial flow.** Of the nine industrial areas, only one (Pee Dee Commerce Park) was assumed to be operational during 2025 and at an existing flow of 0.72 MGD.
- **Basis of industrial flow projections.** Projected wastewater flows were assumed to equal 90-percent of the anticipated drinking water demand included in the City's Water Distribution Master Plan (AECOM, 2025) and assumed to be a fixed rate (i.e. peaking factor was not applied to the flows listed in in this section).
- **Exclusion of Technology Park industrial flows.** It was assumed that projected flows from Technology Park and the flow upstream of Williamson Pump Station will be conveyed directly to the WWMF via a new 24" force main. The proposed system serving Technology Park was not included in the collection system master planning effort and should be revisited during the Flow Verification and Programmatic Review phase.

Table 3-4 presents the projected flows from each industrial area over the 20-year planning period in 5-year increments.

Table 3-4: Industrial Flow Projections

Industrial Area Name	Area (ac)	Projected Flow (MGD)				
		2025	2030	2035	2040	2045
DuPont Site	909	-	-	-	0.60	1.20
Industrial Park West	321	-	0.90	0.90	0.90	0.90
East Palmetto	327	-	0.90	0.90	1.80	1.80
Tech Foundation Park	122	-	-	-	-	0.05
I-20 at Timmonsville Hwy Exit	164	-	-	-	-	0.20
Pee Dee Commerce Park	282	0.72	1.90	1.90	1.90	1.90
Technology Park	1,430	-	1.80	2.70	2.70	2.70
Dr. Floyd Development	188	-	-	-	-	3.15
Epworth Children's Home	260	-	-	-	-	2.25
Total Projected Industrial Flow (MGD):		**0.72**	**5.50**	**6.40**	**7.90**	**14.15**

3.3.2 Residential Growth

Projected flows for residential growth areas were calculated based on planned development boundaries shown in **Figure 3-2** and the following assumptions:

- Average residential lot size of 1/3 of an acre in planned development areas with an average capita of 2.5 persons per residential lot.
- Average day sanitary flow of 75 gallons per capita per day.

Based on the methodology described above, over the course of the 20-year planning period, the total estimated increase in residential customers is 27,432 capita and the estimated increase in residential flow is 2.21 MGD. A detailed breakdown of the residential growth areas and corresponding flow projections is included in **Appendix C**.

Table 3-5 shows the anticipated residential flow increase separated into short-term (2030), intermediate (2035), and long-term (2045) timelines.

Table 3-5: Residential Flow Projections

Value	Unit	2025	2030	2035	2045
Residential Customer Increase	capita	-	+10,665	+9,599	+7,168
Residential Flow Increase	MGD	-	+0.95	+0.72	+0.54
Total Projected Residential Flow (MGD):		**3.32***	**4.27**	**4.99**	**5.53**

* Average existing residential flow based on City billing data (August, 2023)

3.3.3 Projected Flow Summary

In addition to the residential and industrial growth areas, the City is expecting an increase in wastewater flow from DCWSA, from the existing ADD of 404,000 gpd to a total ADD of 750,000 gpd over the 20-year planning period. The anticipated increase in flows from DCWSA is presented in **Table 3-6**.

Table 3-6 and **Figure 3-3** present the projected flows for the short term (2030), intermediate (2035), and long term (2045) planning horizons based on the methodology described in the previous sections. The majority of future sanitary flow increases are attributed to the 13.43 MGD increase from industrial users, which makes up 60.2% of the total projected flow in 2045.

Table 3-6: Projected Flow Summary, 2025-2045

Customer Class	Projected Flow (MGD)			
	2025	2030	2035	2045
Industrial	**0.72** (10%)[1]	**5.50** (41%)	**6.40** (42%)	**14.15** (60%)
Residential	**3.32** (44%)	**4.27** (32%)	**4.99** (33%)	**5.53** (24%)
Commercial[2]	**3.06** (41%)	**3.06** (23%)	**3.06** (20%)	**3.06** (13%)
DCWSA	**0.40** (5%)	**0.60** (4%)	**0.75** (5%)	**0.75** (3%)
Total Projected Flow (MGD):	**7.50**	**13.43**	**15.20**	**23.49**

[1] The percentages shown in parentheses represent each customer class's contribution to the total projected flow for the corresponding planning year.
[2] The projected commercial flows were assumed to remain constant over the 20-year planning period.

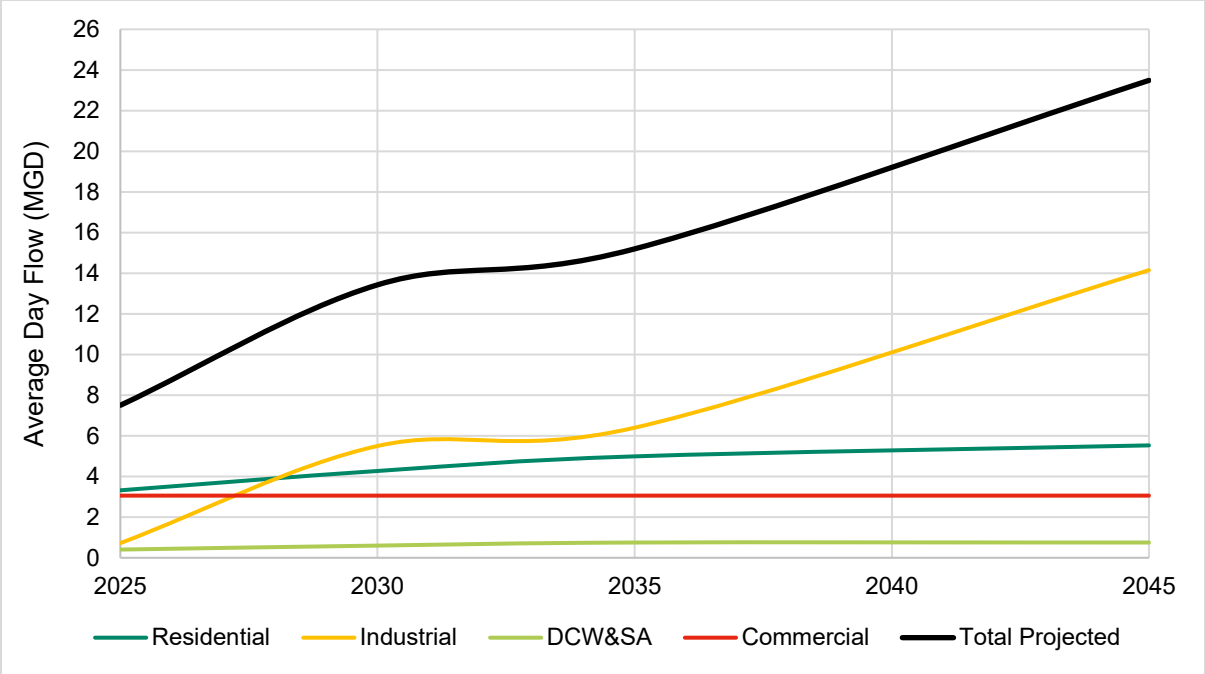


Figure 3-3: Flow Projections By Customer Class, 2025-2045

4 Hydraulic Modeling and Analysis

4.1 Flow Monitoring

AECOM installed eight flow monitors and two rain gauges in various areas of the sanitary sewer system from June through August 2023 to understand flow variations within the major interceptors during various conditions. Further details on the flow monitoring collection and evaluation are included as **Appendix D**.

4.2 Model Development

A hydraulic model of the City's existing sewer collection system was developed and calibrated using Bentley SewerGEMS 2024 in accordance with the Chartered Institute of Water and Environmental Management (CIWEM) Integrated Urban Drainage Modelling Guide.

The developed tool is considered a skeletal model and includes major components of the existing system including the major interceptors, pump stations and force main shown in **Figure 4-1**.

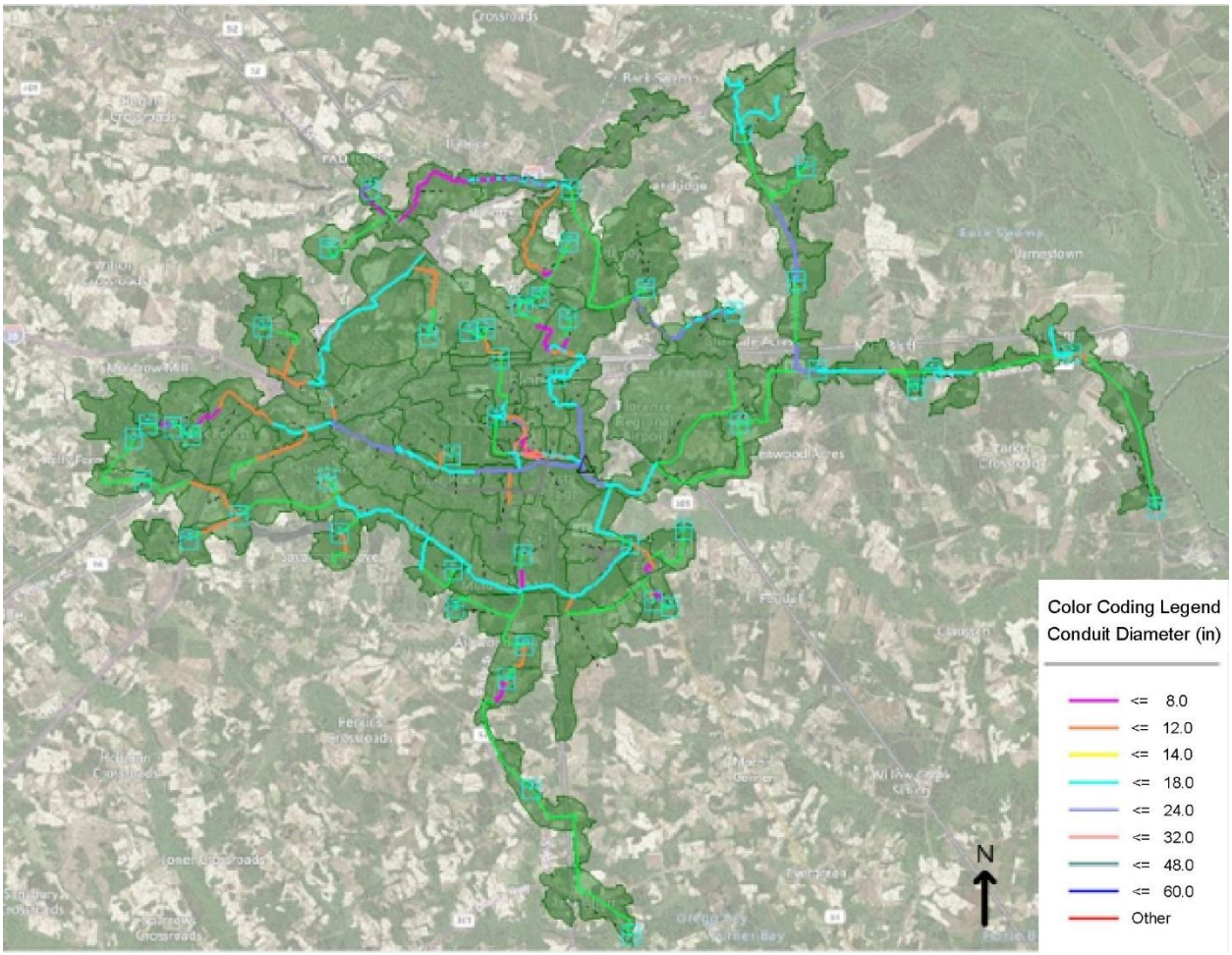


Figure 4-1: Hydraulic Model Overview Map

Key components of the hydraulic model development process included:

- **Construction of hydraulic network**. Available data from the City's GIS database was imported into the model and supplemented with record drawings where available. Where limited sewer depth data was available, 1-meter DEM data was used to estimate manhole rim elevations and invert elevations.
- **Hydraulic adjustments to Jeffries Creek Interceptors (JCIs) and Beaverdam Creek Interceptor (BCI).** Available field data from the JCI Improvements Study (refer to **Section 1.1.1.1**) was provided by CDM Smith and incorporated into the skeletal model along the JCI extents. This process resulted in elevation differences in the range of 5 to 10 vertical feet between the City GIS invert elevations and the sewer invert elevation data collected during the JCI Improvements Study field data. After importing the field data from the JCI Improvements Study into the model, hydraulic adjustments were required along the BCI and the Upper JCI to allow for positive slope and to more accurately reflect the observed flow data collected during the flow monitoring period. Depth-to-invert measurements were obtained at several manholes in this area and used to interpolate pipe slopes where record plans were lacking. Additionally, the hydraulic model calibration required representation of sedimentation in areas of the JCIs to more accurately represent flow monitoring data.
- **Catchment delineation.** GIS data including existing sewers, parcels, and LiDAR data was used to define the boundaries of the sanitary sewer system and its respective service areas. Catchments were further broken down by each associated sanitary interceptor or pump station. Catchments were used for weighted flow distribution into the sanitary system based on tributary area.
- **Simulation of rain derived inflow and infiltration (RDII).** Typically, RDII response is a major component of peak flows and is responsible for capacity-related issues in sanitary sewers. RDII was incorporated into the sanitary model by adjusting hydrologic parameters including percent impervious and flow length to accurately represent observed flow data.
- **Development of dry weather flow (DWF) patterns.** Flow monitoring data was evaluated to develop diurnal dry weather flow patterns for each flow monitoring location. DWF distribution involved distributing the observed DWF into nodes within each tributary flow meter area. A weighting was assigned to each node based on its delineated tributary area.
- **Pump station characteristics.** Wet well dimensions and elevations, pump curves, and pump setpoints ("On" and "Off" levels) were obtained from the City and incorporated into the model. Available drawdown testing was used to adjust pump affinity curves as necessary. Each pump station was assumed to have one standby pump.

4.2.1 Model Calibration

Model calibration was based on the flow monitoring data collected during the 2023 flow monitoring period from June through August 2023. The dry weather flow (DWF) calibration was conducted using observed data from the dry weather period June 13-16, 2023. The wet weather flow calibration was

performed for the storms listed in **Table 4-1**. The objective of the calibration process was to simulate the system performance within the range of -15% and +25% of observed peak flow and -10% and +20% of observed peak depth for a minimum of 75% of the events at each monitoring location.

Table 4-1: Model Calibration Wet Weather Event Summary

Event #	Start Date/Time	Duration (hr)	Rainfall Depth (in)	Peak Hourly Intensity (in/hr)	Rainfall Recurrence Interval*
1	6/11/2023 14:00	4.58	0.89	0.38	<1-year 6-hour
2	7/14/2023 16:00	23.08	2.35	1.16	<1-year 24-hour
3	7/23/2023 16:00	1.67	4.15	3.96	<100-year 1- hour
4	7/31/2023 14:00	2.00	1.15	1.10	<1-year 6- hour

* Rainfall recurrence in accordance with NOAA Atlas 14 Point Precipitation index.

Plots showing metered vs. modeled flow and depths for each of the calibration events are included as **Appendix E**.

4.2.2 Limitations

The hydraulic model constructed under this study is considered a simplified version of the City's sanitary system and is to be used for high-level planning purposes. As such, the following assumptions and limitations are noted:

- **Upstream areas with reduced model accuracy.** The accuracy of the skeletal model is limited in upstream areas of the sanitary system (specifically areas greater than 2 miles upstream of the flow meters used during model calibration). Dry weather and wet weather flows for these areas were estimated based on the delineated catchment area and may not reflect actual flow distribution across the system. Similarly, to simulate RDII in upstream areas of the system, hydrologic parameters were estimated based on that of "calibrated" areas of the system and may not reflect actual RDII distribution across the system. Further flow verification is required to more accurately determine flow distribution across these areas. A recommended flow verification program to improve model accuracy in targeted areas is discussed in **Section 5.2.**
- **Simplified pump station and force main performance.** The skeletal model was built to include limited detail at pump stations. Factors including force main Hazen Williams factor and station minor losses were assumed based on typical values and were not field verified.
- **Middle Swamp Interceptor model limitations.** The accuracy of the predicted flows from the skeletal model for the existing Middle Swamp Interceptor is limited due to the availability of only limited flow monitoring data. This accuracy can be improved through additional flow verification efforts, as discussed in **Section 5.2**.
- **Potential variations in elevation data.** 1-meter DEM data was used to estimate manhole rim elevations and invert elevations in areas with missing elevation data or where record

plans were lacking. In areas with recent development, the land surface may vary from these values.

- **Connectivity assumptions.** The City's sanitary system is comprised of several interconnections, namely in the older parts of the City served by the JCIs, along the Pye Branch interceptor, and along the BCI. The distribution of flows across these interconnecting sewers was estimated based on available as-builts and was not field verified as part of this study.

4.3 Level of Service (LOS) and Evaluation Criteria

The level of service (LOS) is a critical component of the Master Plan development because it is used for:

- Evaluating the conveyance capacity of the current system under existing and future flows.
- Determining required sizing of new or existing infrastructure to meet anticipated flows.

For purposes of this study, the 2-year 6-hour design storm was selected to avoid oversizing infrastructure and to identify critical deficiencies in the City's system.

Table 4-2 shows the total rainfall and peak rainfall intensity for the selected design storm. Rainfall depths were obtained from NOAA Atlas 14 and applied to the SCS Type-II rainfall distribution.

Table 4-2: Design Storm Summary for Florence County (North), SC

Recurrence Interval	Total Rainfall (inches)	Peak Rainfall Intensity (in/hr)
2-year 6-hour	2.7	4.1

The following evaluation criteria were used to identify potential capacity limitations across the City's existing sanitary sewer system based on the 2-year 6-hour LOS:

- **Sanitary Sewer Overflows (SSO):** SSOs occurring at existing sanitary manholes during the selected 2-year 6-hour design storm.
- **Velocity Exceedances:** Sanitary sewer with velocities exceeding the recommended design velocity of 8 ft/s during the 2-year 6-hour design storm to avoid pipe deterioration. Minimum self-cleaning velocity of 2 ft/s was also considered for identifying sewers which are potentially oversized.
- **Pump Station Capacity:** Pump stations with standby pumps operating for more than 15-minutes during the selected design storm were flagged as having potential capacity limitations. For purposes of this study, the standby pump ON elevation was set to 5-feet above the lag pump or lead pump ON elevation, whichever is higher, to more accurately predict pump station capacity issues.

4.4 Existing Capacity Limitations

The calibrated hydraulic model was used to evaluate the existing collection system performance under various conditions.

Figure 4-2 presents the overall map showing locations of flooded manholes during the 2-year 6-hour event in the existing system. There were approximately 91 flooded manholes predicted.

Table 4-3 provides a summary of the average dry weather flow (ADWF) for each major interceptor.

Each area showing manhole flooding is further reviewed in the following subsections based on the 2-year 6-hour event to determine potential causes of capacity limitations and SSOs. **Appendix F** provides model-predicted peak hydraulic grade (HGL) profiles for the same areas of interest during dry weather flow conditions.

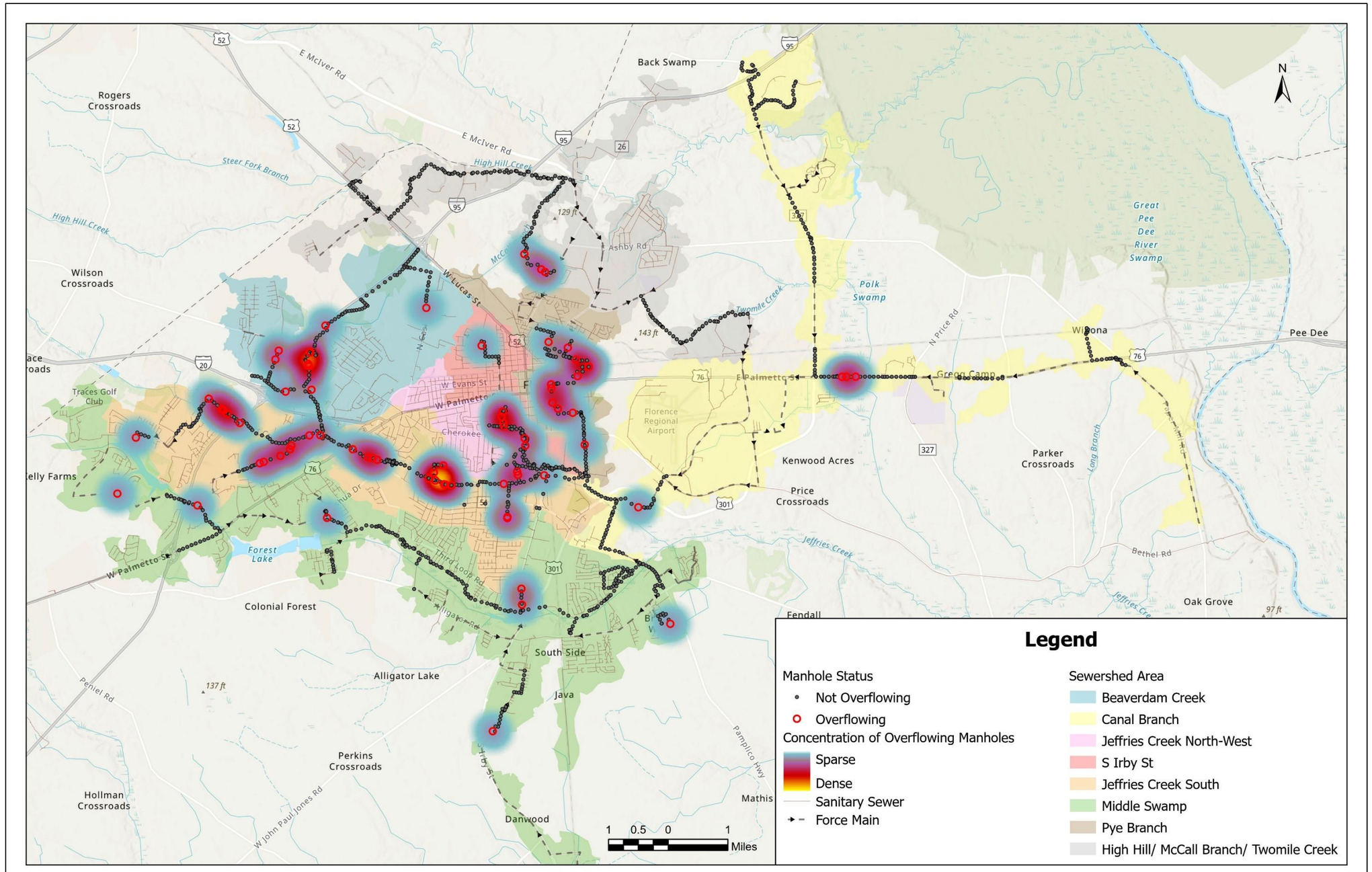


Figure 4-2: Flooded Manholes During 2-Yr Event – Existing System

Table 4-3: Summary of Existing Flows and Capacity – Major Interceptors

Area Name		Interceptor Diam (in)	Associated Pump Stations	Associated FM	ADWF (MGD)
Beaverdam Creek		18	-	FM-6	0.92
East Palmetto Street		12-15	HWY 301 PS	FM-1	0.10
High Hill Creek	North	8-15	Police Cabin PS	N/A	0.15[1]
	South	8-24	Police Cabin PS	N/A	0.18[1]
Highway 327		24	HWY 301 PS	FM-1B	1.13
Jeffries Creek	North	15-30	-	FM-7	3.00
	South	18-24	-	FM-5	2.91
Middle Swamp		18	-	N/A	1.69[1]
Pye Branch		15-24	-	N/A	2.44[1]
Two-mile Creek	North	15	Williamson Rd PS	FM-2B	N/A[2]
	South	22.5-24	Williamson Rd PS	FM-2	0.47

[1] Location was not included during 2023 flow monitoring period. Therefore, flow parameters were estimated based on skeletal model results during DWF conditions.
[2] The 2023 flow monitoring data analysis indicated that Two-mile Creek North Interceptor exhibits negative flows during both dry weather and wet weather conditions. Therefore, ADWF and Peak Flow parameters were considered inconclusive.

4.4.1 Beaverdam Creek

Observed and predicted SSOs along the BCI are likely a result of several apparent issues which are discussed in this section.

Figure 4-3 depicts the BCI extents from the southern JCI to West Sumter Street and the peak hydraulic grade line (HGL) during the 2-year event.

The western portion of the BCI which runs along North Ebenezer Road was also identified as having potential conveyance deficiencies as evidenced by reported SSOs concentrated in the area surrounding Merioneth Road.

Figure 4-4 shows the peak HGL profile of the western BCI during the 2-year event where manhole flooding was predicted at Manhole (MH) 4294 along North Ebenezer Road.

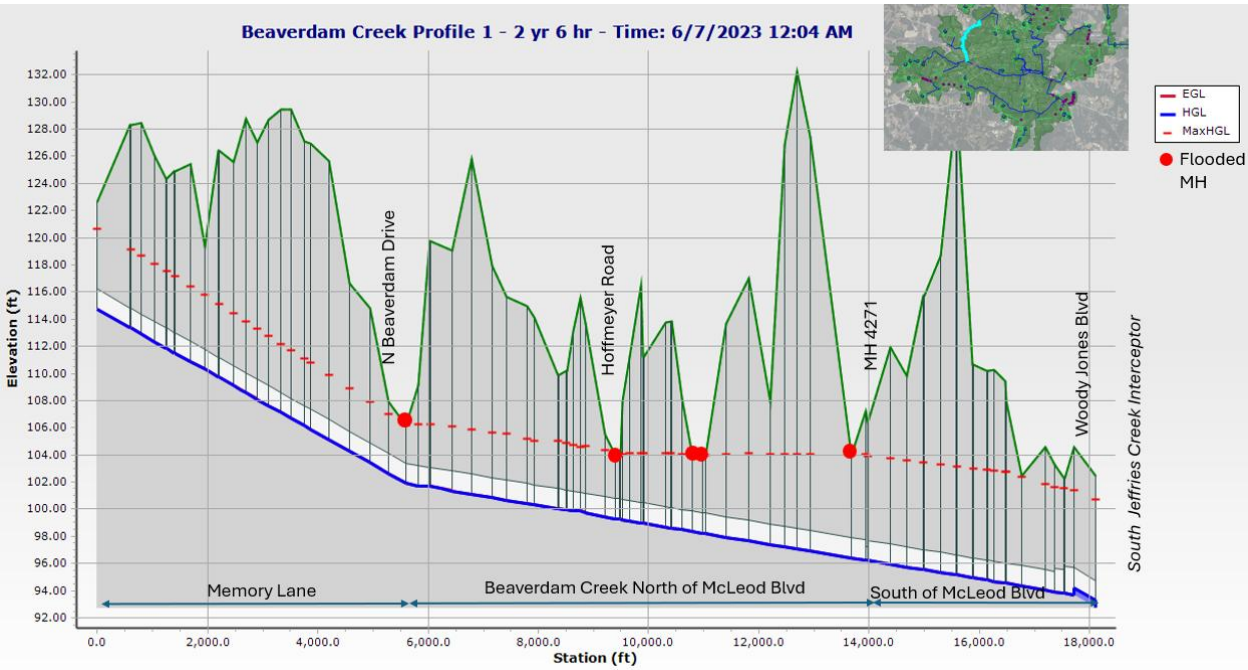


Figure 4-3: Upper and Lower BCI (Woody Jones Blvd to West Sumter Street) – 2-year Peak HGL Profile

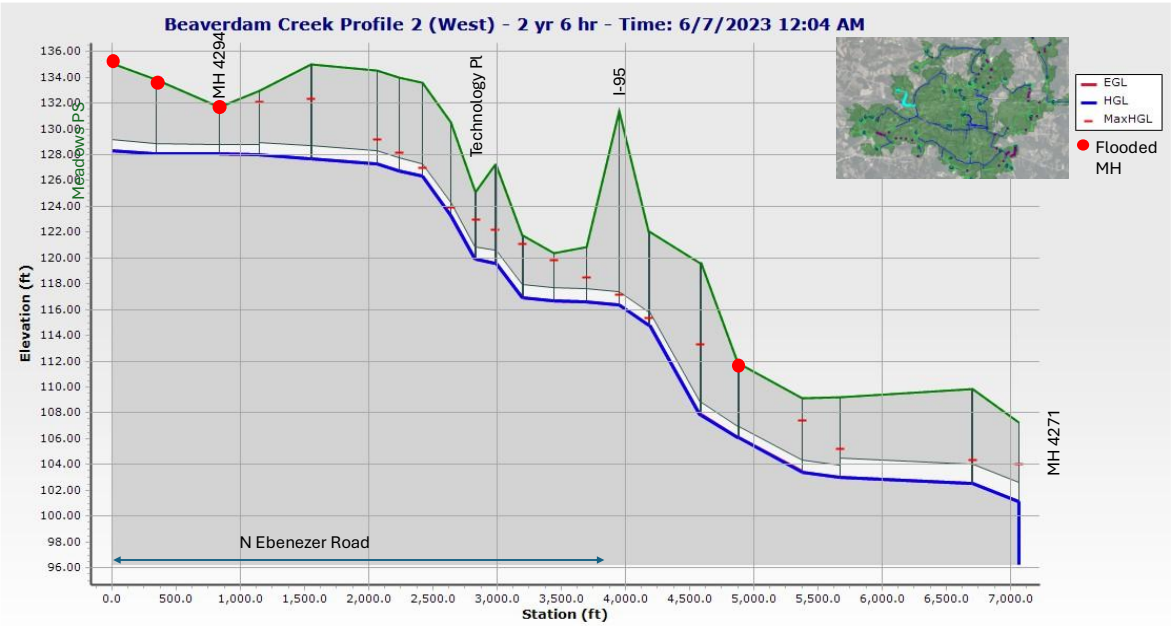


Figure 4-4: Western BCI (Meadows PS to MH 4271) – 2-year Peak HGL Profile

The following items were noted along the BCI study extents:

- **Hydraulic bottlenecks**. According to the City's GIS, at MH 6881, the BCI (24-inch at 0.22%) and Upper South JCI (18-inch at 0.29%) converge into a single 18-inch pipe at 0.014% slope which results in surcharged conditions downstream of the BCI. **Figure 4-5** shows the location of this hydraulic bottleneck.

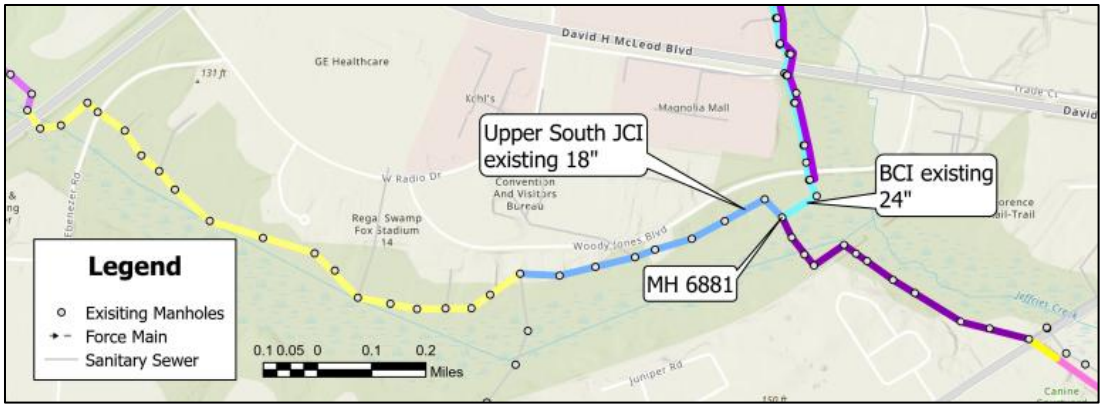


Figure 4-5: BCI Hydraulic Bottleneck Location

- **Surcharged conditions downstream of BCI**. The 2023 flow monitoring data (FM-6) showed surcharged conditions at the downstream portion of the BCI, near Woody Jones Boulevard due to apparent capacity restrictions where the BCI merges with the Upper South JCI. Surcharging was observed during dry weather and wet weather conditions.
- **Shallow manholes.** Several areas along the existing interceptor are suspected to be atypically shallow, specifically at MH 4271 (where the estimated sewer depth is 6-ft), the crossing at Hoffmeyer Road (where sewer depths are approximately 3.4 ft) and at North Beaverdam Drive (where the sewer depth is 4.3 ft).
- **Undersized gravity sewer.** The BCI extents referred to as “Beaverdam Creek North of McLeod Boulevard” in **Figure 4-3** consists of 18-inch pipe at an average slope of 0.02%. This equates to an estimated capacity of 0.96 MGD (assuming Manning’s n value of 0.013) which does not provide sufficient capacity to convey peak flows from the 2-year event. Similarly, flooded manholes along the western BCI (MH 4293 shown in **Figure 4-4**) are likely attributed to undersized pipes along North Ebenezer Road between MH 4293 and Technology Place.

4.4.2 Pye Branch

Observed and predicted SSOs along the Pye Branch interceptor (particularly on Stockade Drive and Walnut Street) are suspected to be impacted by undersized gravity sewers in various portions across the extents evaluated.

Figure 4-6 depicts the Pye Branch interceptor study extents from Stockade Drive to Lynch Street and the peak HGL during the 2-year event. Manhole flooding was noted along Stockade Drive, Walnut Street, South Ravenel Street, and Norfolk Street during the 2-year event.

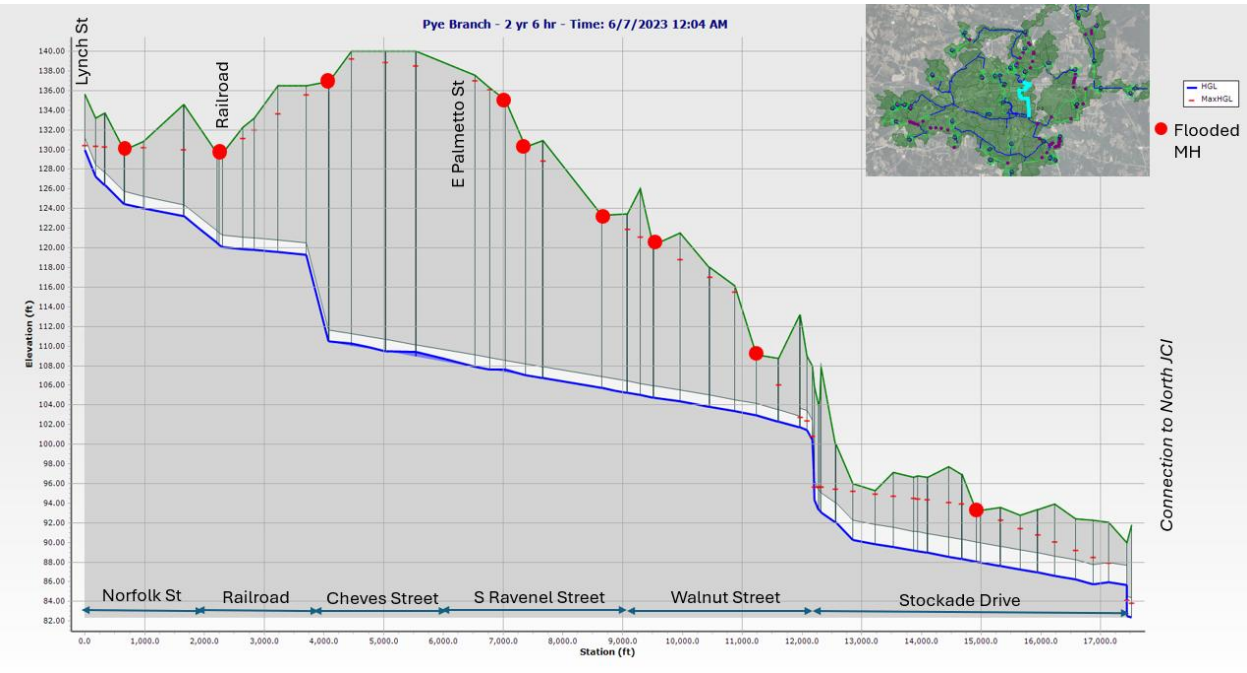


Figure 4-6: Pye Branch Interceptor (Stockade Dr to Lynch St) – 2-year Peak HGL Profile

4.4.3 South Irby

Figure 4-7 shows the 2-year HGL profile of the South Irby interceptor from the Chase Pump Station (PS) force main outlet to the downstream connection point into the North JCI. Potential capacity limitations are suspected within the extents parallel to Timrod Park Drive as evidenced by flooded manholes near Chestnut Street during the 2-year event.

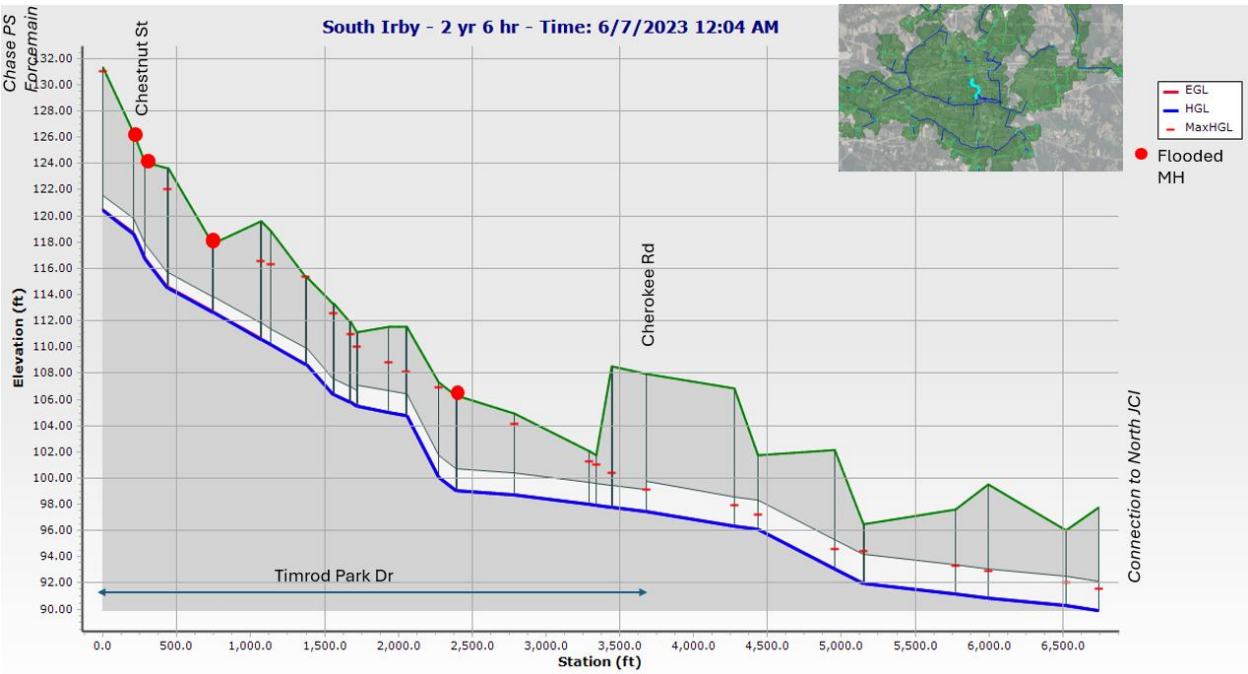


Figure 4-7: South Irby Interceptor (Chase PS Force main to North JCI) – 2-year Peak HGL Profile

4.4.4 East Palmetto Street / Highway 301 PS

Manhole flooding was predicted and observed along East Palmetto Street, just east of Highway 301 PS along the existing 12-inch sewer discharging into Highway 301 PS. Based on flow monitoring data, surcharged depths in the Highway 301 PS wet well results in surcharging along the 12-inch gravity sewer and results in manhole flooding during storm events. This suggests that Highway 301 is currently experiencing pump capacity limitations. **Figure 4-8** shows the 2-year Peak HGL profile from the Francis Marion University (FMU) Gate PS through the 12-inch gravity sewer discharging into Highway 301 PS.

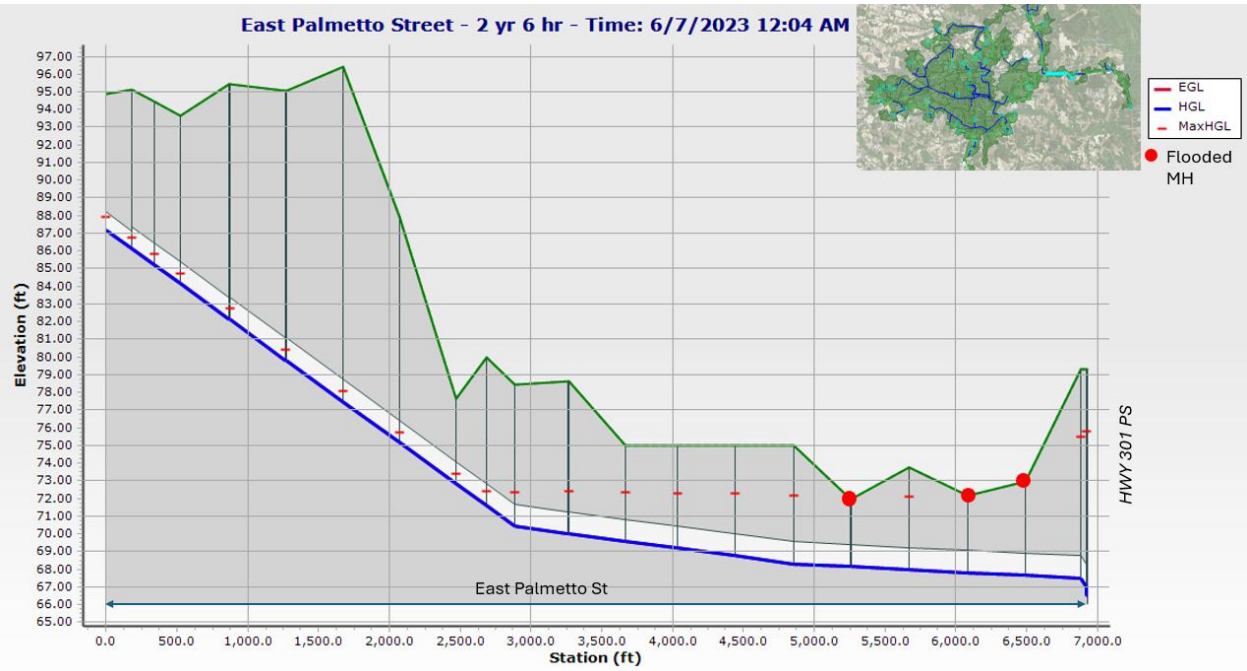


Figure 4-8: East Palmetto Street (FMU Gate PS to HWY 301 PS) – 2-year Peak HGL Profile

4.4.5 Upper South JCI

The 2023 flow monitoring data indicated surcharged conditions along the South JCI, as evidenced by elevated flow depths along the BCI (FM-6) just upstream of where the BCI converges with the Upper South JCI. Surcharging is likely due to apparent capacity restrictions along the South JCI. **Figure 4-9** shows the 2-year Peak HGL profile along the upper extents of the South JCI, referred to as “Upper South JCI” and indicates a capacity restriction downstream of where the JCI and BCI converge near Woody Jones Boulevard.

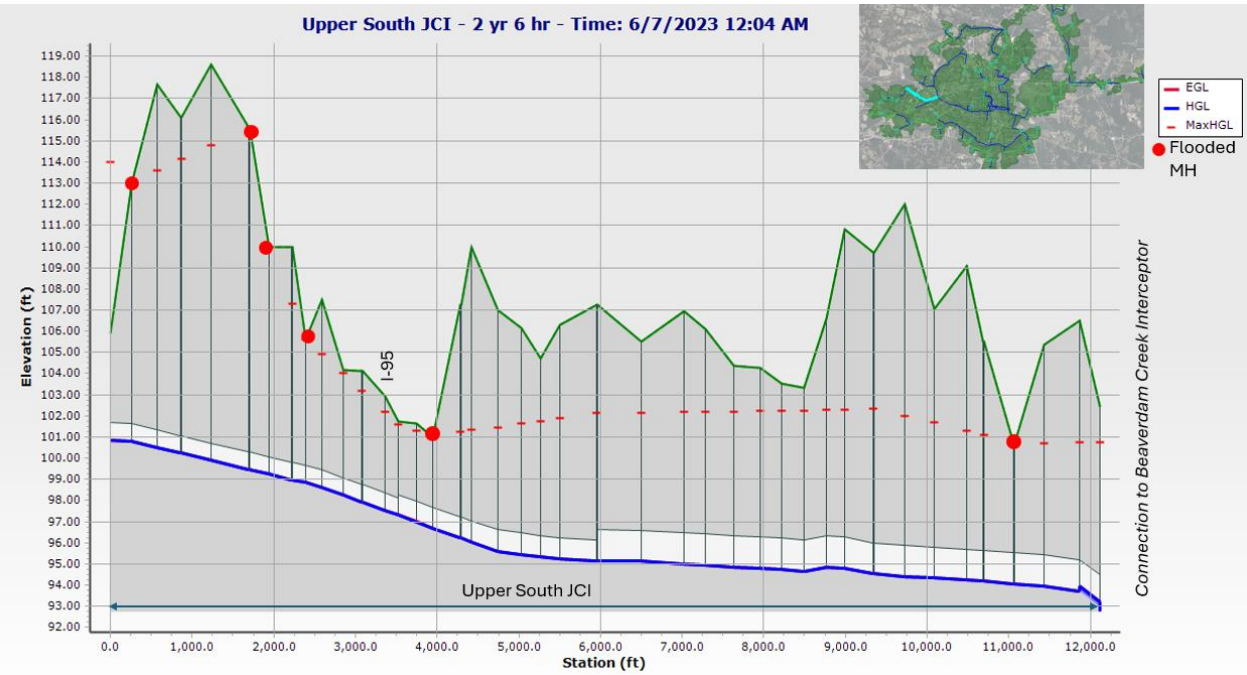


Figure 4-9: Upper South JCI– 2-year Peak HGL Profile

4.4.6 Lower South JCI

The skeletal model showed several instances of manhole flooding along the Lower South JCI extents from 2nd Loop Road to the WWMF during the 2-year event which indicated capacity restrictions. **Figure 4-10** shows the predicted peak HGL profile and manhole flooding along the South JCI during the 2-year event.

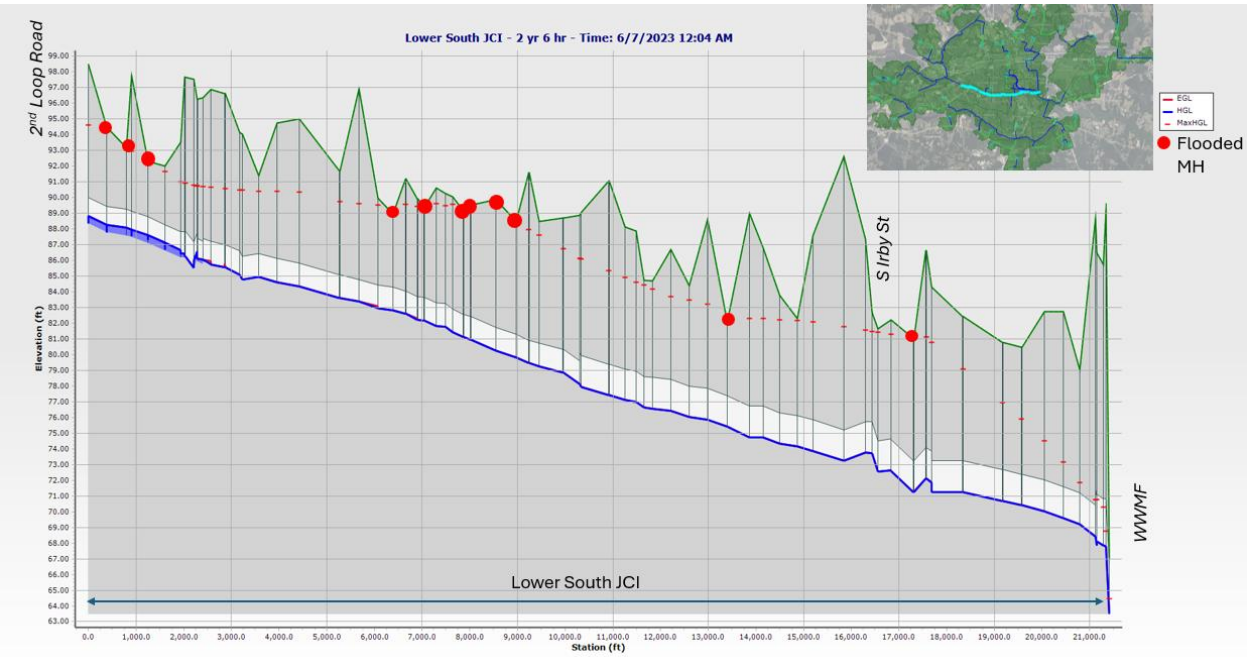


Figure 4-10: Lower South JCI (2nd Loop Road to WWMF) – 2-year Peak HGL Profile

4.4.7 East JCI

The East JCI intercepts flow from the inverted siphon and is intersected just downstream by an 18-inch gravity main conveying flow from the Middle Swamp Interceptor. The pipes in this area are relatively shallow, with sewer depths as low as approximately four feet. The combination of this hydraulic bottleneck and limited depth contributes to surcharging along the 18-inch East JCI which is evidenced by model-predicted flooding at MH 3820. The City has confirmed that this interceptor is the site of a significant overflow problem. **Figure 4-11** shows the predicted peak HGL profile and manhole flooding along the East JCI during the 2-year event.

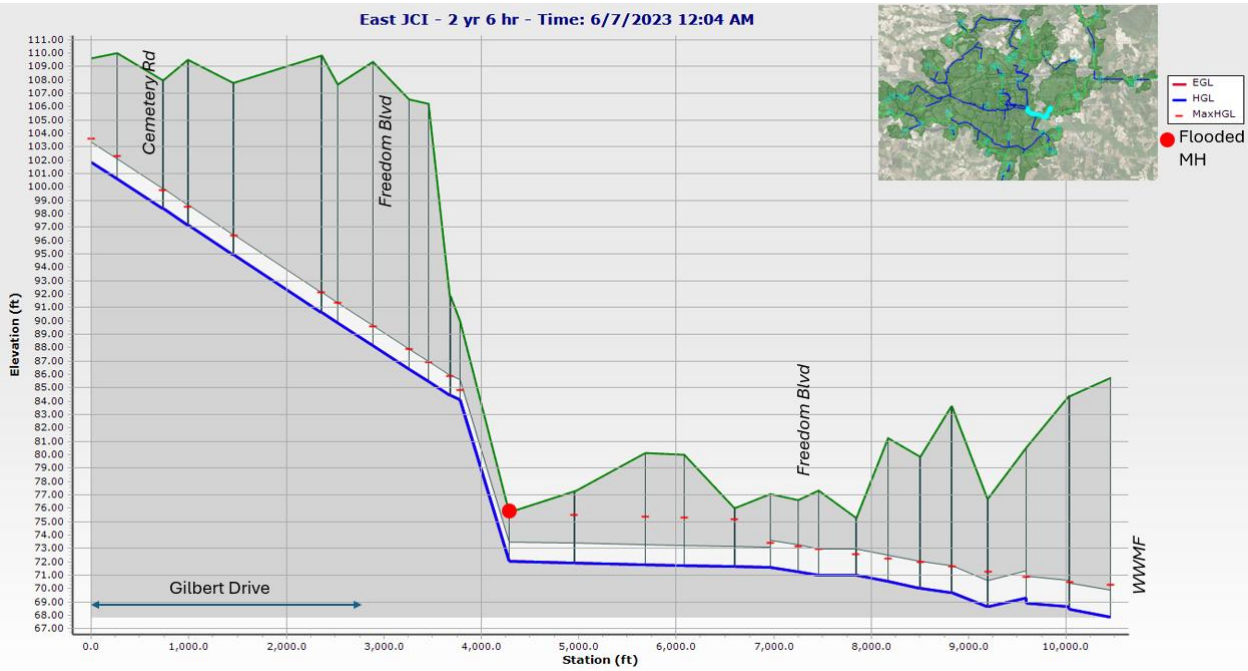


Figure 4-11: East JCI– 2-year Peak HGL Profile

4.4.8 Unconfirmed Capacity Limitations

The calibrated model showed manhole flooding and surcharged conditions in several areas which were not confirmed with City records. These areas are shown in **Appendix G** and require additional flow monitoring and field verification to confirm the validity of model-predicted capacity limitations. These areas were not considered for recommended conveyance upgrades in this plan due to lack of available data to confirm these capacity limitations. Reported “priority” SSO locations described in **Section 2.2** were used to identify which model-predicted SSOs were unable to be confirmed. **Figure 4-12** shows reported “priority” SSOs separated into the following three categories after being compared to modelled SSOs:

- Reported SSOs also shown in the model, therefore confirmed as a model-predicted SSO.
- Reported SSO locations upstream of the modelled main interceptors which would require model expansion to be confirmed as a model-predicted SSO location.
- Reported SSOs at locations in the model where additional flow monitoring would be recommended to confirm.

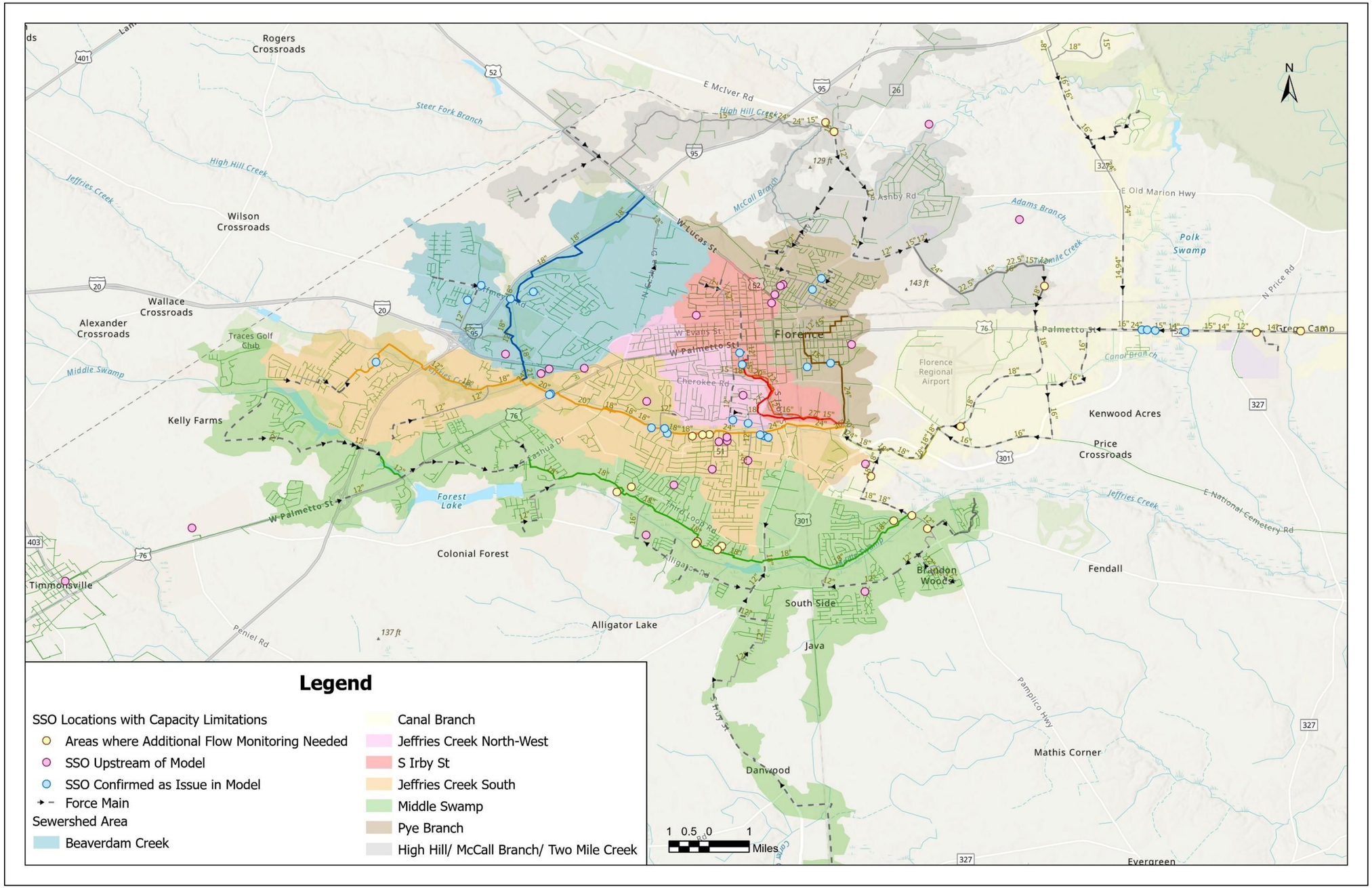


Figure 4-12: Reported and Modelled SSO Comparison

4.5 Impacts of Future Flows on Existing System

The flow projections described in **Section 3** were incorporated into the calibrated model of the City's existing sewer system to evaluate the severity and location of flooded manholes compared to that of existing flow conditions. **Figure 4-13** shows the model-predicted SSOs under the short term (2030), intermediate (2035) and long term (2045) planning horizons.

The model results indicate that the severity of flooded manholes is expected to increase across the system under future flow conditions. Additionally, this analysis suggests additional capacity restrictions as evidenced by manhole flooding in areas without manhole flooding under existing flow conditions. These areas include:

- Upper portions of the BCI sewershed, highlighting the need for conveyance improvements along North Cashua Drive and the sewer extents along I-95 north of Hoffmeyer Road.
- Flooded manholes located along the gravity sewer discharging to Fairgrounds PS during long term (2045) flow conditions.

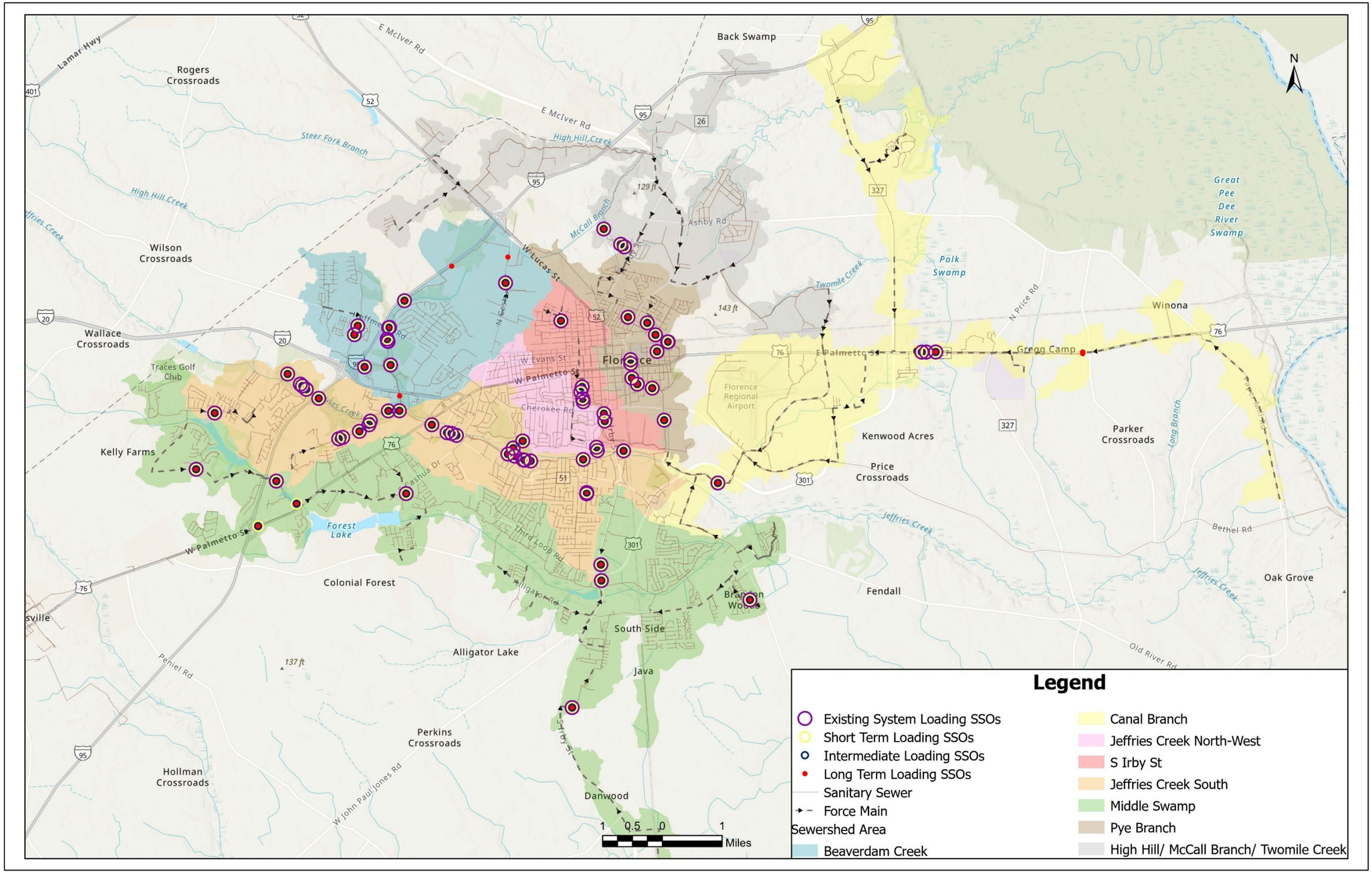


Figure 4-13: Sanitary Loading with Existing System Infrastructure

5 Capital Improvement Program Projects

5.1 Methodology

Potential CIP projects were developed and evaluated to address the capacity limitations discussed in **Section 4.4.** The following criteria were used to determine recommended CIP projects:

- **Adherence to Level of Service (LOS).** Recommended improvements were developed to allow conveyance of future sanitary loads during the 2-year 6-hour design storm. To meet the LOS criteria, the recommended CIP project shall result in zero predicted SSOs at manholes or pump stations and velocities less than 8 ft/s in recommended infrastructure. LOS criteria shall be met under both existing and future flow conditions.
- **Future Development Impacts.** Projected flows were considered when identifying potential system improvements, specifically in areas where recommended sanitary connections from high-flow industrial areas are anticipated to exceed existing system capacity.
- **Cost Effectiveness.** Opinions of probable construction costs (OPCC) were developed for each potential CIP project and used as an evaluation metric.

5.2 Flow Verification and Programmatic Review

The skeletal model constructed as part of this Master Plan was used in identifying and sizing potential CIP projects. Due to the limitations discussed in **Section 4.2.2**, additional flow monitoring and data collection is recommended prior to design and construction of respective CIP projects to refine the hydraulic model and to confirm the extents and sizing of CIP projects. This recommendation is consistent with the City's current plan to integrate all 130 pump stations into the existing SCADA system. As a result, the first project recommended for inclusion into the City's Sewer Master Plan is the Flow Verification and Programmatic Review project which includes the following components:

- **Additional Flow Monitoring.** A high-level evaluation was performed to estimate the location and number of flow meters recommended for refinement of the hydraulic model. A total of 30 flow monitoring locations were estimated based on 2-mile increments in areas with suspected capacity limitations, as well as areas not included in the 2023 flow monitoring efforts (refer to **Appendix D**). The quantity and location of recommended flow monitors should be re-evaluated using a detailed system evaluation during initiation of the flow verification program. **Figure 5-1** shows the recommended flow monitoring areas included in the flow verification program and the assigned "priority" based on known or suspected capacity limitations. Flow monitoring is recommended along sewers upstream of the trunk lines depicted in **Figure 5-1**. Additionally, specific flow meter installation locations have not been selected as part of this Master Plan, therefore site selection would be required during initiation of proposed flow monitoring efforts.
- **Pump Station Data Collection and Capacity Evaluations.** The City is in the process of installing flow meters and pressure sensors at the pump stations serving the east side of the

collection system, including 301 PS, Becky's PS, Adam's Branch PS, and Black Creek PS, and Fairgrounds PS. This task would involve a comprehensive evaluation of SCADA data collected to date, and collection of additional data for pump stations with apparent capacity limitations including but not limited to Highway 301 PS, Roche Carolina PS, Fairgrounds PS, Summit at Oakdale PS, Paper Mill PS, Adams Creek PS and Black Creek PS. The following tasks are recommended:

  - Collection of SCADA data to determine wet well depths during various flow conditions
  - Pump drawdown testing at pump stations where drawdown data is lacking or missing pressure measurement data
  - Analysis of SCADA data and pump drawdown testing data to evaluate potential pump station upgrades

- **Programmatic Review.** This task involves refinement of the hydraulic model including recently acquired field data, the additional flow monitoring data, and pump station data collected during initial phases. Based on the findings from this task, the prioritization and sizing of recommended CIP projects included in this Master Plan will be refined.

Table 5-1 provides a summary of the recommended Flow Verification and Programmatic Review project including the opinion of probable cost.

Table 5-1: Recommended Flow Verification and Programmatic Review Summary

Task	Name	Description	Opinion of Probable Cost
1	Additional Flow Monitoring	Installation of 30 additional flow meters over a 3-month monitoring period	$135,000[1]
2	Pump Station Data Collection and Capacity Evaluations	Collection and analysis of SCADA and pump drawdown data	$200,000[2]
3	Programmatic Review	Refinement of hydraulic model and review of recommended CIP projects	$200,000
		Total Opinion of Probable Cost:	**$535,000**

[1] Assumes 3-months off flow monitoring at an average flow monitoring cost of $1,500 per flow monitoring month per flow monitoring location.
[2] Assumes capacity evaluations at Highway 301 PS, Roche Carolina PS, Fairgrounds PS, Paper Mill PS, Police Cabin PS, Summit at Oakdale PS, Adams Creek PS and Black Creek PS, at an OPC value of $25,000 per pump station.

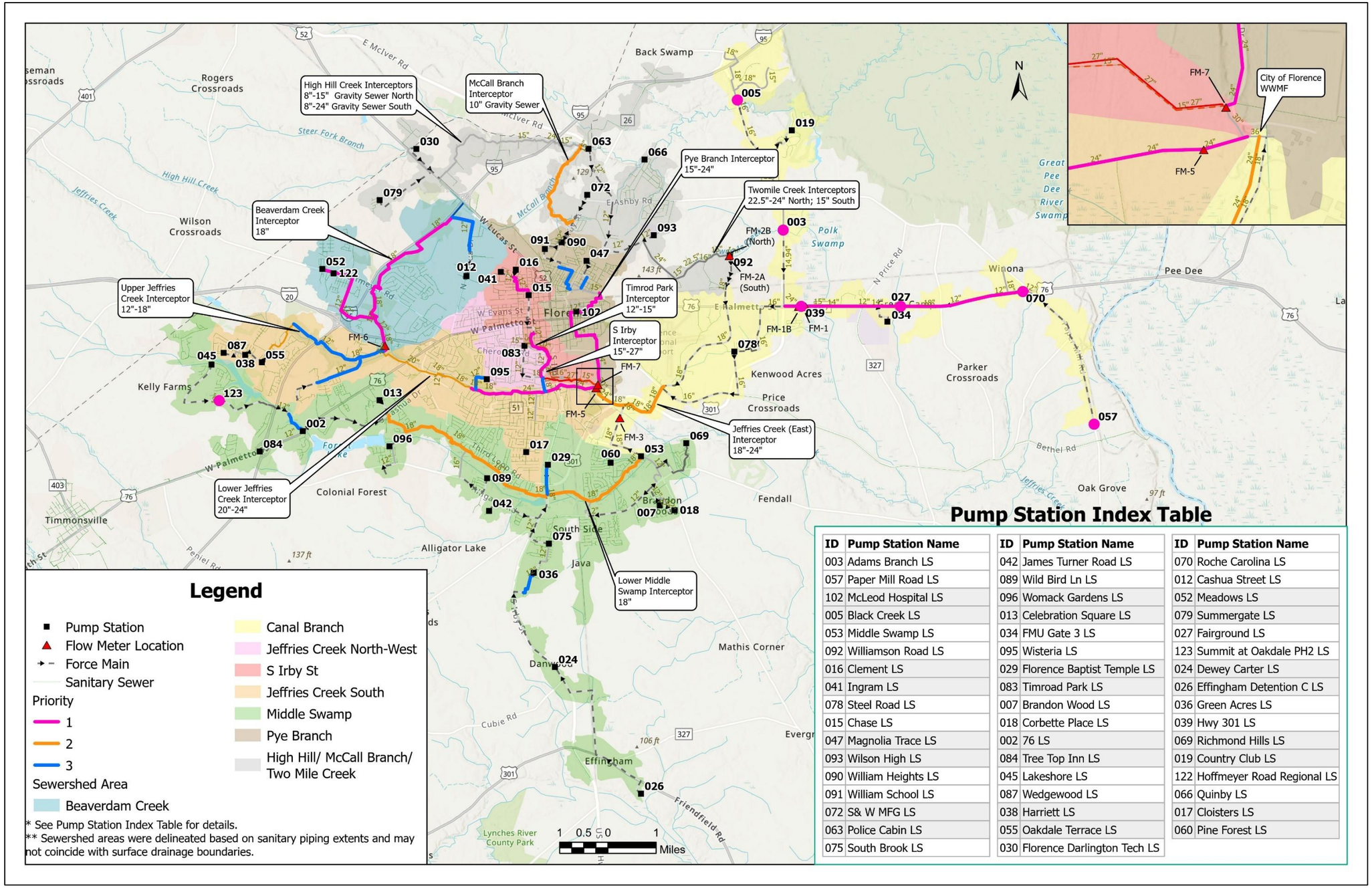


Figure 5-1: Preliminary Flow Verification Areas

5.3 Conveyance Upgrades

This section presents the recommended CIP projects identified to address existing capacity deficiencies and to provide adequate conveyance under future flow conditions through 2045. The recommended upgrades for the Pye Branch, North JCI and South JCI were developed, assuming that I/I reduction efforts are performed in tributary sewersheds to reduce the size and extent of additional conveyance required to meet the desired 2-year LOS criteria. A general assumption of 50% I/I reduction was assumed for the I/I reduction areas presented in **Section 5.4.**

The sizing and extents of the recommended conveyance upgrades are considered planning-level estimates and are subject to refinement based on the findings from the Flow Verification and Programmatic Review phase. Additionally, recommended upsizing extents are based on estimated existing sewer diameters and slopes discussed in **Section 4.4** and should be confirmed during detailed design.

Figure 5-2 presents an overview of the recommended conveyance upgrades over the 20-year planning period. Refer to **Appendix F** for peak HGL profiles of the recommended conveyance upgrades under future 20-year projected flow conditions.

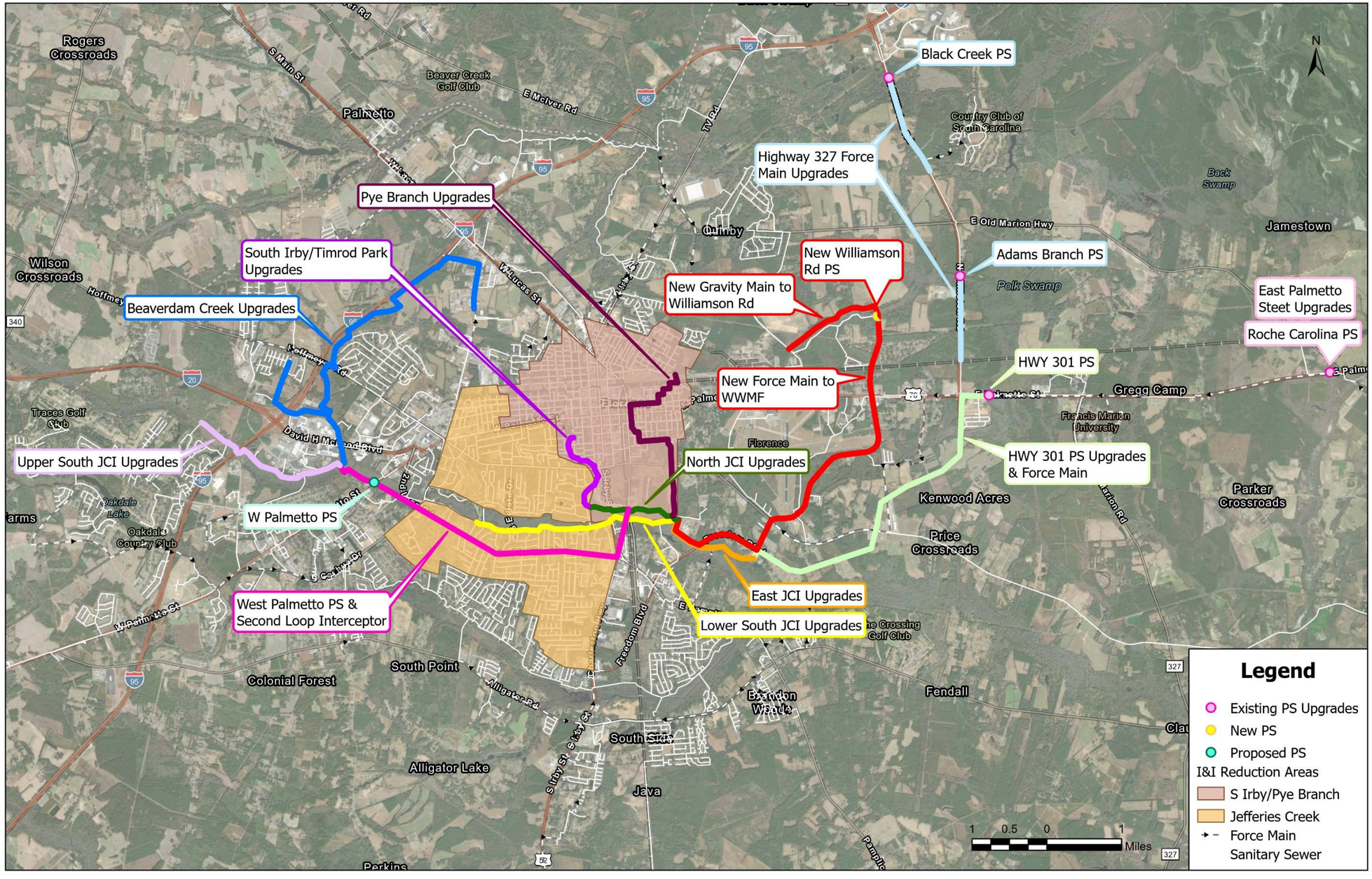


Figure 5-2: Capital Improvement Program Projects

5.3.1 West Palmetto PS and Second Loop Interceptor

The West Palmetto PS and Second Loop Interceptor are key components of the recommended alternative included in the 2022 JCI Improvements study (refer to **Section 1.1.1.1** for details). The recommended alternative was re-evaluated using the skeletal model and future flow projections to confirm infrastructure sizing with the additional flow monitoring and modeling conducted in this master planning effort. With the future flow projections from the western portion of the South JCI, the 8.2 MGD West Palmetto PS sizing is recommended to be increased to 10 MGD to provide conveyance of additional flows entering the Upper JCI and the BCI sewersheds during future conditions.

The West Palmetto PS and Second Loop Interceptor CIP project involves the following improvements shown in **Figure 5-3**:

- Install the 10 MGD West Palmetto Street Pump Station near US 76 / West Palmetto Street to convey flows from the west portion of the southern JCI to the upsized northern JCI.
- Install 12,000 LF of 20-inch force main and 10,000 LF of 30-inch gravity main to convey flows from the recommended West Palmetto PS to the upsized northern JCI and accept flow from existing sewers south of Second Loop Road.
- Replace 3,500 LF of 20-inch gravity sewer with 30-inch sewer from Woody Jones to US 76/ Palmetto Street and install 170 LF of new 30- or 36-inch sewer from US 76/Palmetto Street to West Palmetto PS.

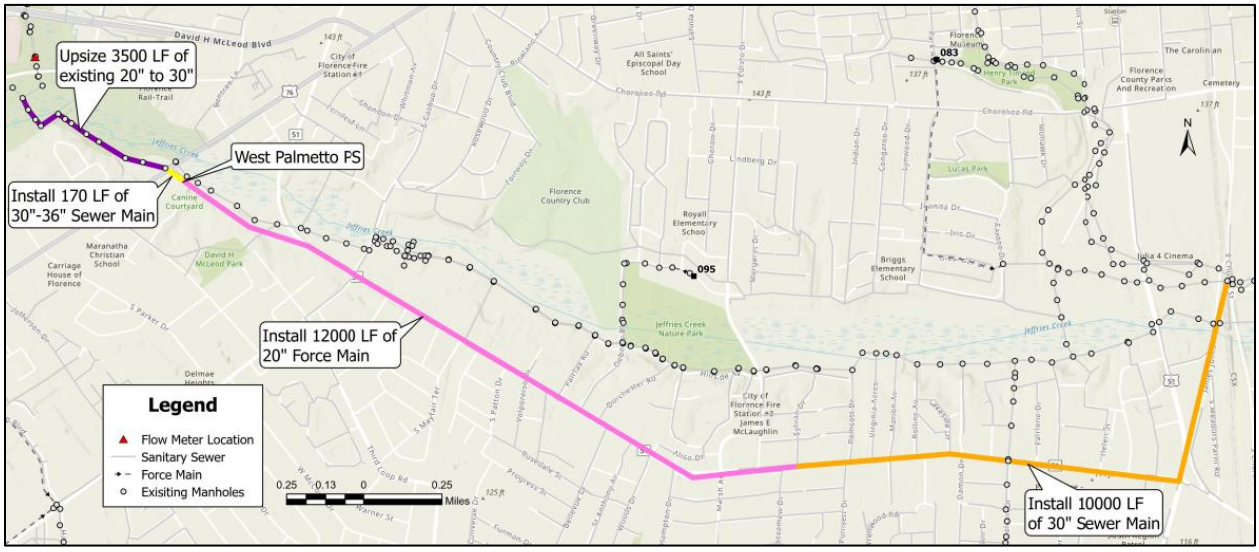


Figure 5-3: West Palmetto PS and Second Loop Interceptor

5.3.2 Beaverdam Creek

While the West Palmetto PS and Second Loop Interceptor project is expected to reduce downstream surcharging along the BCIs, additional conveyance upgrades are recommended to alleviate model-predicted hydraulic bottlenecks under future flow conditions. Conveyance improvements in the BCI

sewershed are broken down into two phases: Phase I is intended to address existing capacity limitations discussed in **Section 4.4** and Phase II is intended to address suspected future capacity improvements required to service large-flow users within the sewershed namely Dr. Floyd's industrial park.

5.3.2.1 Phase I

The following improvements are recommended under Phase I of the BCI Upgrades.

Western BCI (North Ebenezer Road to MH 4271)

- Upsize 3,000 LF of 10-inch and 12-inch sanitary main along North Ebenezer Road with a 15-inch sanitary sewer from Meadows PS force main to Technology Place.
- Upsize or rehabilitate 4,100 linear feet of 12-inch sanitary sewer main with 18-inch sanitary sewer from Technology Place to MH 4271.

Lower BCI (Hoffmeyer Road to JCI Connection)

- Upsize 5,100 LF of 18-inch sanitary sewer main to 24-inch from Hoffmeyer Road to MH 4271.
- Upsize 400 LF of 10-inch sanitary sewer main, 3,100 LF of 18-inch sanitary sewer main, 150 LF of 21-inch sanitary sewer main, and 550 LF of 24-inch sanitary sewer main with 27-inch sanitary sewer along BCI from MH 4271 to the South JCI just south of Woody Jones Boulevard.
- Rehabilitate 3,450 LF of existing 12-inch sewer parallel to the Lower BCI.
- Install new bolt down manhole lids in low-lying areas along upsized Lower BCI and 12-inch sewer extending from North Beaverdam Drive to existing connection to JCI south of Woody Jones Blvd.

Of additional note, it was assumed that planned residential growth along Hoffmeyer Road will connect into Meadows PS. Based on available pump data and projected flows to Meadows PS, the existing Meadows PS pumps and 14-inch force main have sufficient capacity to deliver the projected max day flow of 400 gpm anticipated by 2045. During the Flow Verification and Programmatic Review efforts, model updates will be made including modifying residential growth to connect to Hoffmeyer PS.

Figure 5-4 shows an overview of the recommended improvements included in Phase I of the BCI conveyance upgrades.

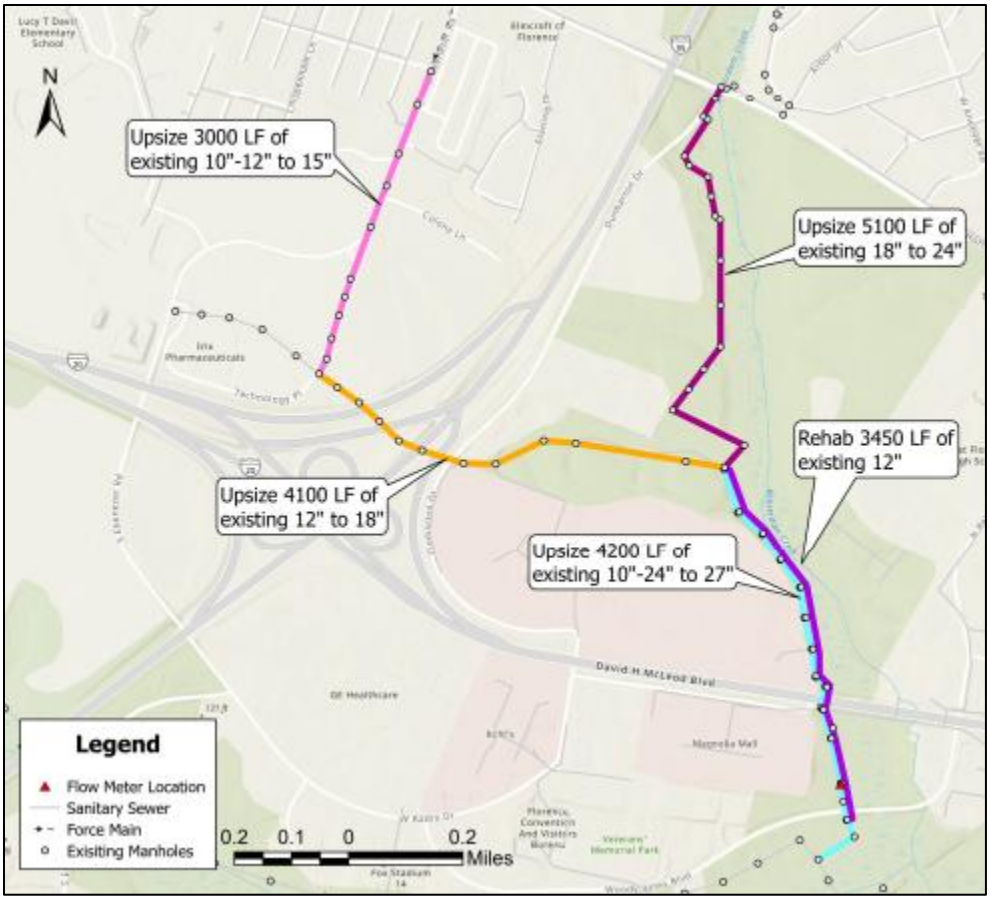


Figure 5-4: Beaverdam Creek Interceptor Upgrades – Phase I

5.3.2.2 Phase II

The Dr. Floyd planned development area (to be constructed by 2045) is assumed to connect into the existing Cashua Street PS. The existing Cashua Street PS is currently sized for a firm capacity of 900 gpm. As a result, Cashua Street PS upgrades and 8-inch force main upgrades will be required to convey projected flows.

Additionally, the existing 12-inch to 18-inch sewer extents located downstream of the Cashua Street PS force main are suspected to be undersized to convey the 2,200-gpm max day flow scenario under future conditions.

The following improvements are recommended under Phase II of the BCI Upgrades to provide adequate capacity to convey projected flows from the Dr. Floyd development area:

Cashua Street PS and Force Main Upgrades

- Upgrade Cashua Street PS to an estimated firm capacity of 2,500 gpm.
- Replace approximately 2,950 LF of 8-inch force main with 12-inch force main.

North Cashua Drive, Fairfield Circle, and Willis Circle Sewer Upgrades

- Upsize 5,540 LF of 12-inch sanitary sewer main with 15-inch sanitary sewer from the Cashua Street PS force main outlet to the intersection of Fairfield Circle and Willis Circle.
- Upsize 13,870 LF of 18-inch sanitary sewer main along Willis Circle to 21-inch sanitary sewer and connect into existing sewer on Hoffmeyer Road.

Figure 5-5 presents the recommended improvements included in Phase II of the BCI conveyance upgrades.

Another alternative to implement a new force main along Sumter Street could also be evaluated after flow monitoring during programmatic review. This alternative is also shown in **Figure 5-5.**

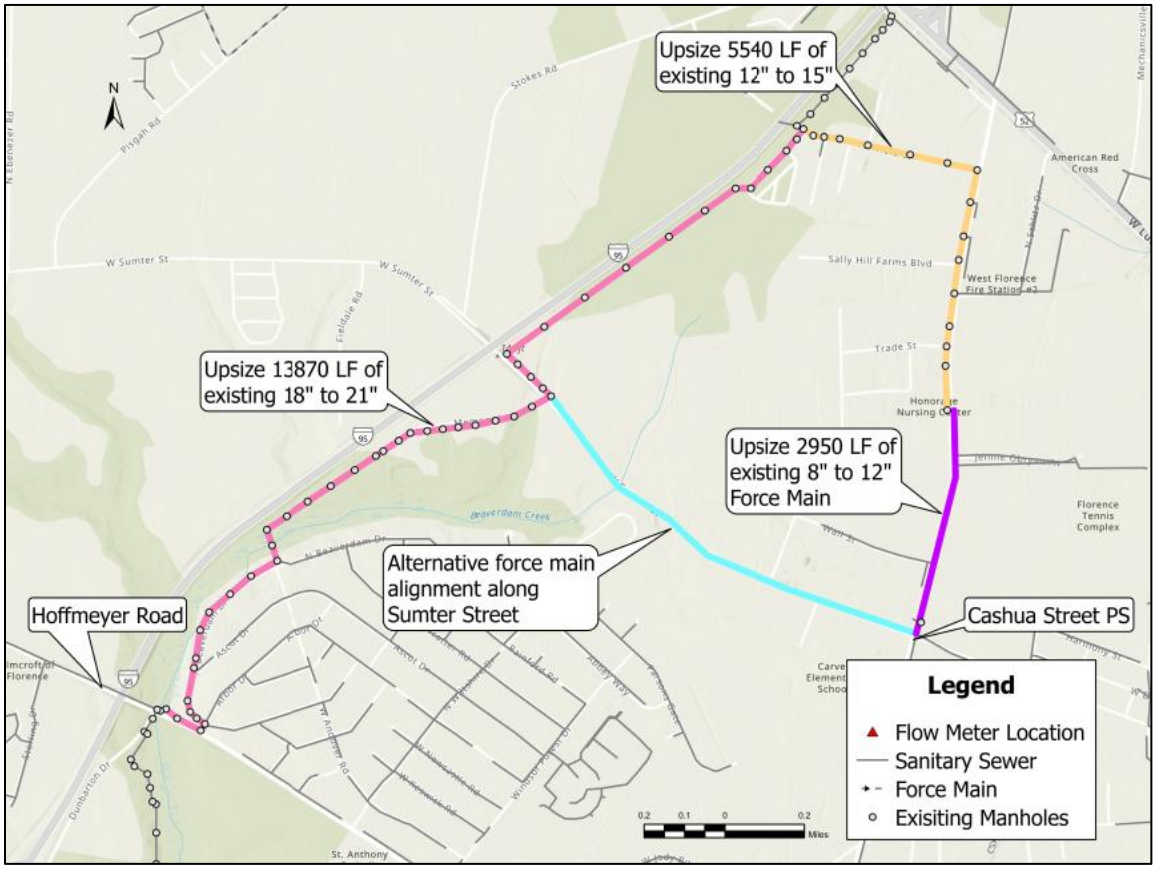


Figure 5-5: Beaverdam Creek Interceptor Improvements – Phase II

5.3.3 Pye Branch

As discussed in **Section 4.4.2**, there are several areas along the Pye Branch Interceptor which were flagged as undersized based on the calibrated skeletal model and observed SSO reports. Conveyance upgrades are required to eliminate SSOs from occurring in upstream portions of the service area.

The recommended Pye Branch Interceptor conveyance improvements are shown in **Figure 5-6** and include replacement or rehabilitation of approximately 15,930 LF of 15-inch to 24-inch sanitary sewer

with 24-inch to 30-inch sanitary sewer. These improvements are recommended due to the age (1951) of the existing sanitary sewer in this area as well as model-predicted capacity limitations discussed in **Section 4.4.2**.

It is recommended that closed-circuit television (CCTV) and manhole survey be performed for the extents shown in **Figure 5-6** during detailed design to confirm limits of recommended sewer rehabilitation.

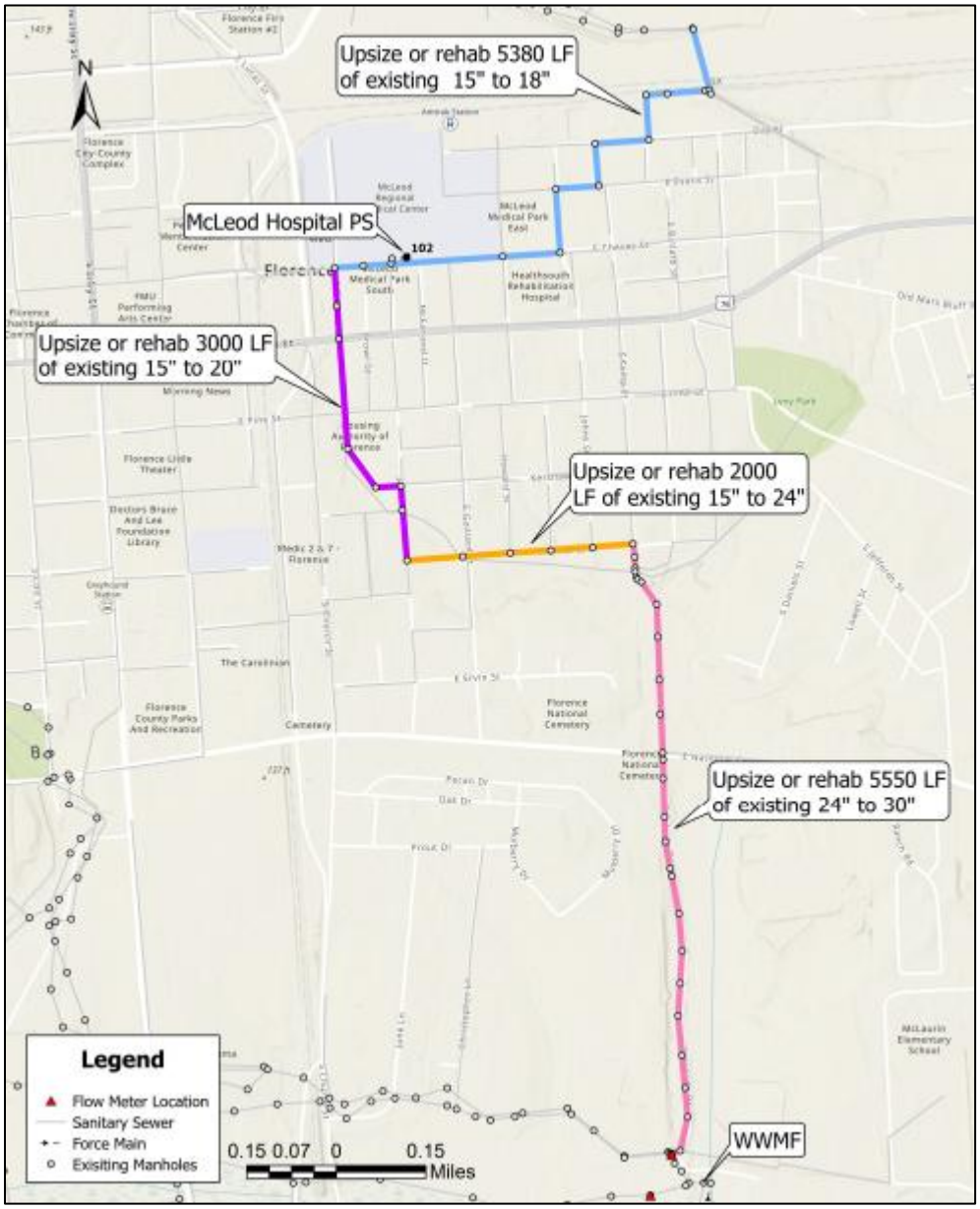


Figure 5-6: Pye Branch Interceptor Conveyance Improvements

Please note that the existing 15” gravity main which runs from the railroad to Walnut Street will be modelled after Flow Verification and Programmatic Review to refine recommended improvements for the Pye Branch interceptor.

5.3.4 East Palmetto Street and Highway 327

Capacity limitations and SSO occurrences along East Palmetto Street are anticipated to intensify under future flow conditions where large-flow users including Dupont, Pee Dee Commerce and various residential developments are expected to be constructed along East Palmetto Street (where Roche Carolina PS, Fairgrounds PS, and Highway 301 PS are located) and Highway 327 (where Adam's Branch PS and Black Creek PS are located).

To provide conveyance of additional flow from these developments this Master Plan includes evaluation of the five aforementioned pump stations (refer to **Section 5.2**).

5.3.4.1 Phase I: HWY 301 PS and Force Main

To accommodate flow from future industrial developments, it is recommended to upgrade Highway 301 PS to an estimated firm capacity of 8,300 gpm and install approximately 33,300 LF of 30-inch force main from Highway 301 PS to WWMF.

The City is currently considering three alternative alignments for the new 30-inch force main from Highway 301 to WWMF. **Figure 5-7** shows the recommended upgrades.

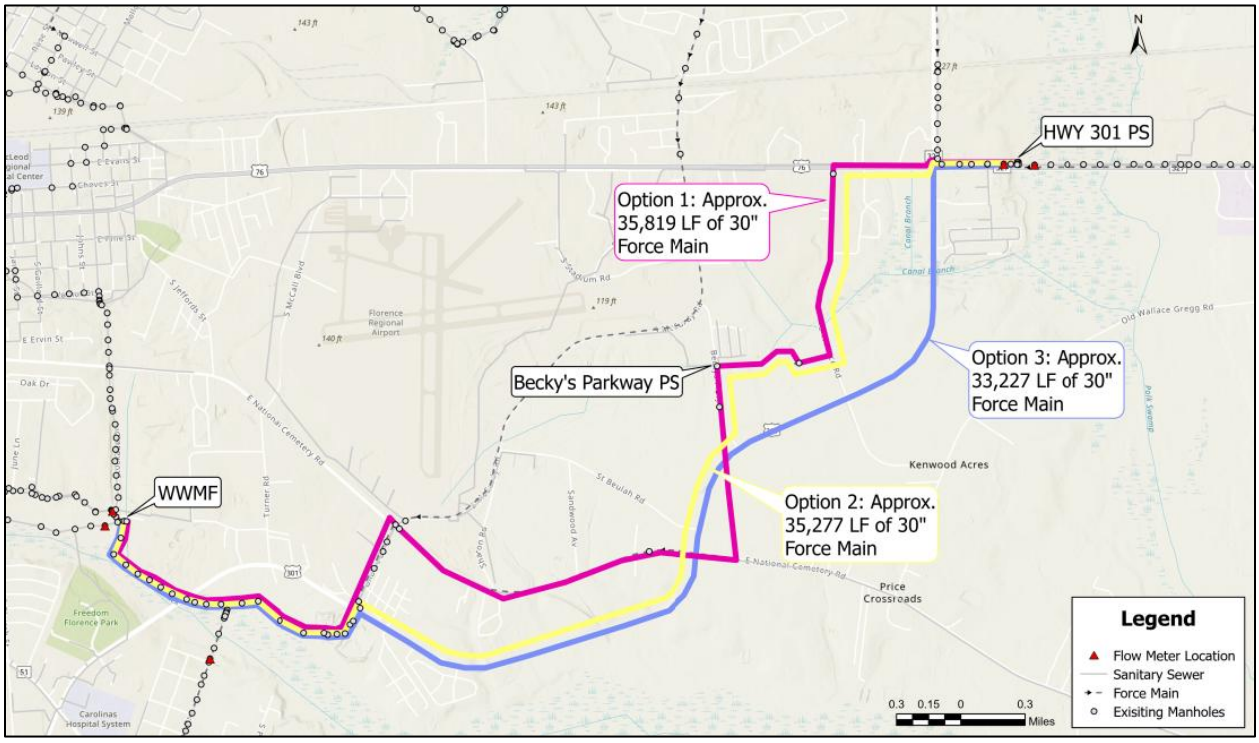


Figure 5-7: Highway 301 Pump Station Upgrades and Force Main

5.3.4.2 Phase II: East Palmetto Street Upgrades

Similarly to Phase I, it is recommended to make the following upgrades to accommodate future flow:

- Evaluate whether the Fairgrounds PS has sufficient capacity to handle future design flows.
- Upgrade the Roche Carolina PS to an estimated firm capacity of 1,750 gpm.

Figure 5-8 shows the recommended upgrades for East Palmetto Street.

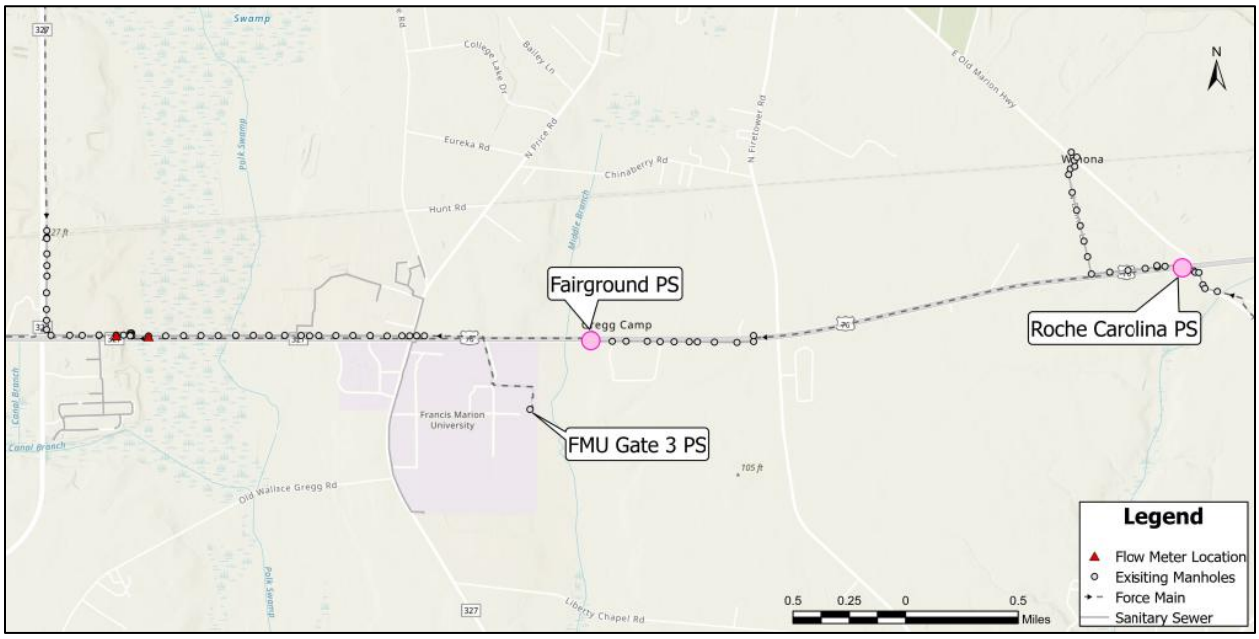


Figure 5-8: East Palmetto Street Upgrades

5.3.4.3 Phase III: Highway 327 Upgrades

Similarly to Phase I and II, it is recommended to make the following upgrades to accommodate future flow:

- Upgrade Adam's Branch PS to an estimated firm capacity of 2,400 gpm.
- Upsize 6,030 linear feet of existing 16-inch force main to 20-inch force main.
- Upgrade Black Creek PS to an estimated firm capacity of 2,000 gpm.
- Upsize 6,940 linear feet of existing 16-inch force main to 20-inch force main.

Figure 5-9 presents the recommended improvements for Highway 327.

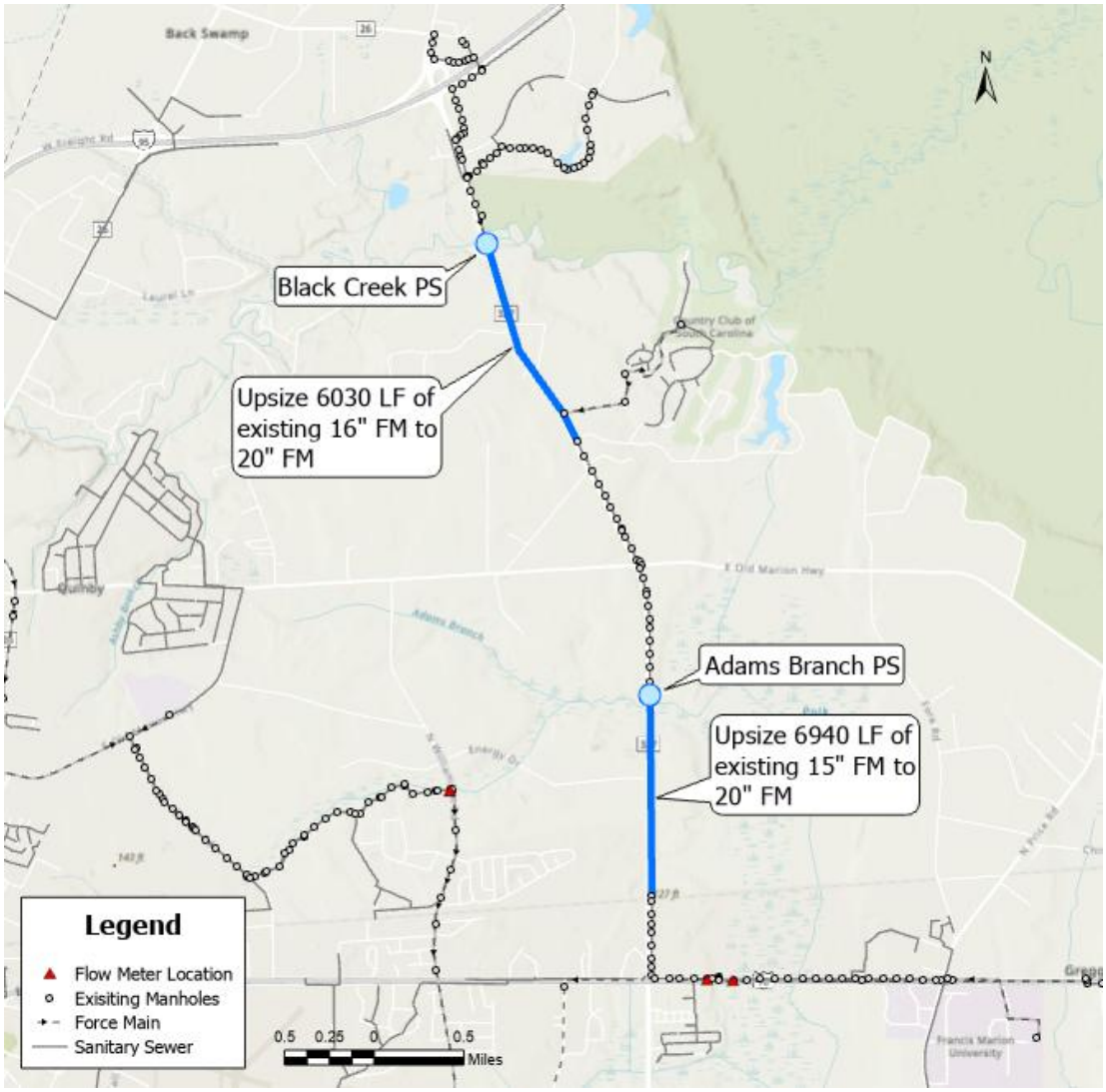


Figure 5-9: Highway 327 Upgrades

5.3.5 North JCI

Replacement of the 27-inch North JCI with 42-inch to 52-inch gravity sewer was included in the preferred alternative from the 2022 JCI Improvements Study (refer to **Section 1.1.1**). Other miscellaneous improvements were recommended in the North JCI sewer shed as part of the JCI study which are shown in **Figure 5-10**. The recommended improvements under the North JCI upgrades project are as follows:

- Upsize 7,800 LF of the existing 18-27-inch sewer to 42-48-inch sewer from Santee Drive to the Plant and construct 120 LF of 15-inch sewer to divert flow from the 15-inch sewer to the recommended 42-48-inch sewer. *Note: This upgrade is currently in design.*
- Install 1,500 LF of 24-inch sewer to replace existing 18-inch sewer between Wisteria Drive and Oleander Drive.

- Lower the existing diversion wall at South Brunwood Drive that connects the 18-inch portion of the northern JCI to the southern JCI.
- Upsize 1,500 LF of existing 12-inch gravity sewer to 15-inch sewer near Fairway Drive.
- Install proposed Country Club PS to provide 1.5 MGD capacity to convey flow from the North JCI west of the Florence Country Club and 14,000 LF of 4-inch force main to convey flow to the North JCI west of South Irby Street.

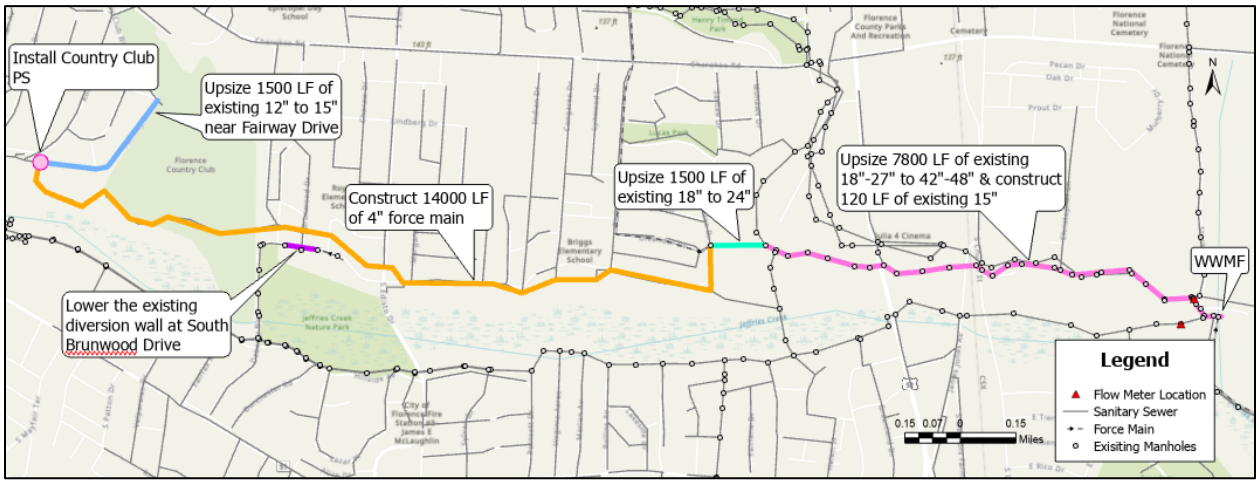


Figure 5-10: North JCI Upgrades

5.3.6 South Irby/Timrod Park

The hydraulic model predicts SSO occurrences farther upstream along South Irby and Timrod Park due to the capacity limitations discussed in **Section 4.4.3**. The recommended conveyance improvements in this area include:

- Upsizing 1,800 linear feet of 15-inch sanitary sewer main with 20-inch sanitary sewer.
- Rehabilitation of 2,000 linear feet of 20-inch sanitary sewer main and 3,200 linear feet of 27-inch sanitary sewer main.

Figure 5-11 presents the extents of the recommended North JCI and South Irby/Timrod Park Convenance Upgrades projects.

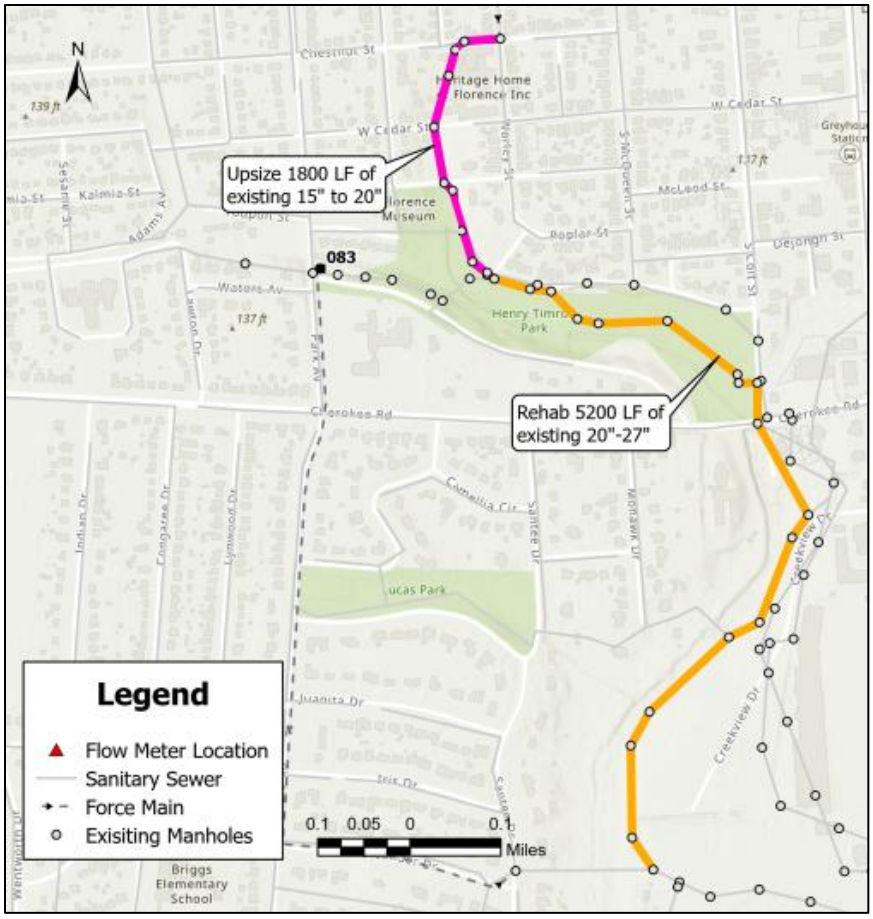


Figure 5-11: South Irby/Timrod Park Interceptor Upgrades

5.3.7 Upper South JCI

The following conveyance upgrades are required to eliminate model-predicted SSOs west of I-95 and provide increased conveyance from anticipated flows from industries to be developed near I-95 at the parcel currently belonging to the Epworth Children's Home.

- Upsizing 3,260 linear feet of 10-inch sanitary sewer main with 18-inch sanitary sewer.
- Upsizing 2,090 linear feet of 12-inch sanitary sewer main and 3,670 linear feet of 18-inch sanitary sewer main with 24-inch sanitary sewer.
- Upsizing 2,990 linear feet of 18-inch sanitary sewer main with 27-inch sanitary sewer.

Figure 5-12 presents the recommended upsizing for the Upper Jefferies Creek Interceptor.

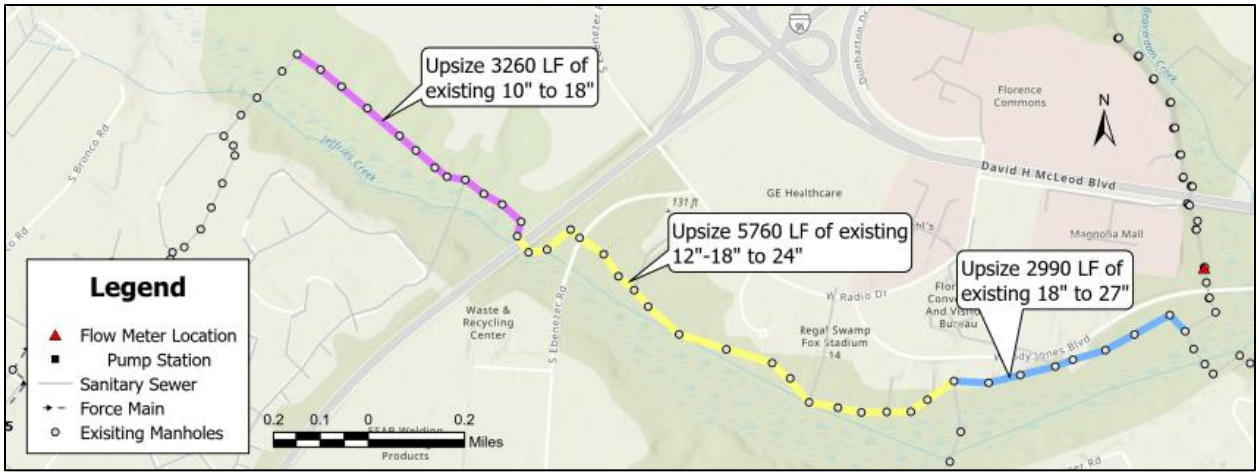


Figure 5-12: Upper South JCI Upgrades

5.3.8 Lower South JCI

Although the West Palmetto PS and Second Loop Interceptor (discussed in **Section 1.1.1)** are predicted to reduce flows to the Lower South JCI, there are SSO reports in this area. Furthermore, the model predicts SSOs in the Lower South JCI as well.

Referred to as the “Lower South JCI Upgrades Phase I” CIP project, it is recommended to replace approximately 7,000 LF of the Lower South JCI from Jeffries Lane to the WWMF. This includes constructing 3,000 LF of 36-inch diameter sewer replacement and 4,000 LF of 42-48-inch diameter sewer replacement.

In addition to these improvements, the following upgrades are recommended to alleviate manhole flooding along the South JCI during future conditions and are referred to as “Lower South JCI Phase II”:

- Upsizing 4,220 linear feet of 18-inch sanitary sewer main with 24-inch sanitary sewer.
- Upsizing 4,540 linear feet of 24-inch sanitary sewer main with 30-inch sanitary sewer.
- Rehabilitate 3,950 LF of existing 20-inch sewer and 8,070 LF of existing 18-inch along JC and parallel to the Lower south JCI.

Figure 5-13 presents the recommended upsizing for the Lower South Jeffries Creek Interceptor.

Figure 5-13: Lower South JCI Upgrades

5.3.9 East JCI

To mitigate overflow and eliminate a hydraulic bottleneck where the two existing 18-inch mains intersect the following measures are recommended:

- Upsizing 3,470 LF of 24-inch sanitary sewer main with 30-inch sanitary sewer.
- Upsizing 3,700 LF of 18-inch sanitary sewer main with 27-inch sanitary sewer.

The manhole depths in this area are shallow and it is recommended to install a bolt down cover at MH 3820 where apparent manhole flooding is taking place.

The City is currently in design phases to upgrade the Williamson Pump Station and install a new 24" force main extending directly to the WWMP, which will result in reduced flows to the East JCI. As such, this project should be revisited during the Flow Verification and Programmatic Review project.

Figure 5-14 presents the recommended upsizing for the East Jeffries Creek Interceptor.

Figure 5-14: East JCI Upgrades

5.4 I/I Reduction

Rainfall-Derived Infiltration and Inflow (RDII) refers to the extraneous stormwater and groundwater that enters sanitary sewer systems during and after rainfall events. RDII can significantly impact the capacity and operation of these systems, leading to sanitary sewer overflows (SSOs). Understanding the sources of RDII is crucial for developing effective mitigation strategies.

Reducing RDII and other sources of inflow (storm water or river water intrusion from open channels and creeks) is a cost-effective way of managing peak flows into the City's sanitary system. Areas with aging infrastructure including vitrified clay pipe (VCP) and brick manholes, and low-lying areas are especially prone to I/I. In conjunction with recommended conveyance upgrades, it is

recommended that the City implement an I/I reduction program to reduce peak lows in areas of the system with high amounts of I/I.

A high-level evaluation was performed to identify preliminary I/I reduction areas within the City's sewer system which involved selecting areas which were constructed pre-1980. **Figure 5-15** shows the preliminary I/I reduction areas for further evaluation. Due to lack of available record plans, some areas of the City's sewer system which predate 1980 may be missing from the preliminary I/I reduction areas. It is recommended that a detailed evaluation be performed to confirm I/I reduction areas prior to program implementation.

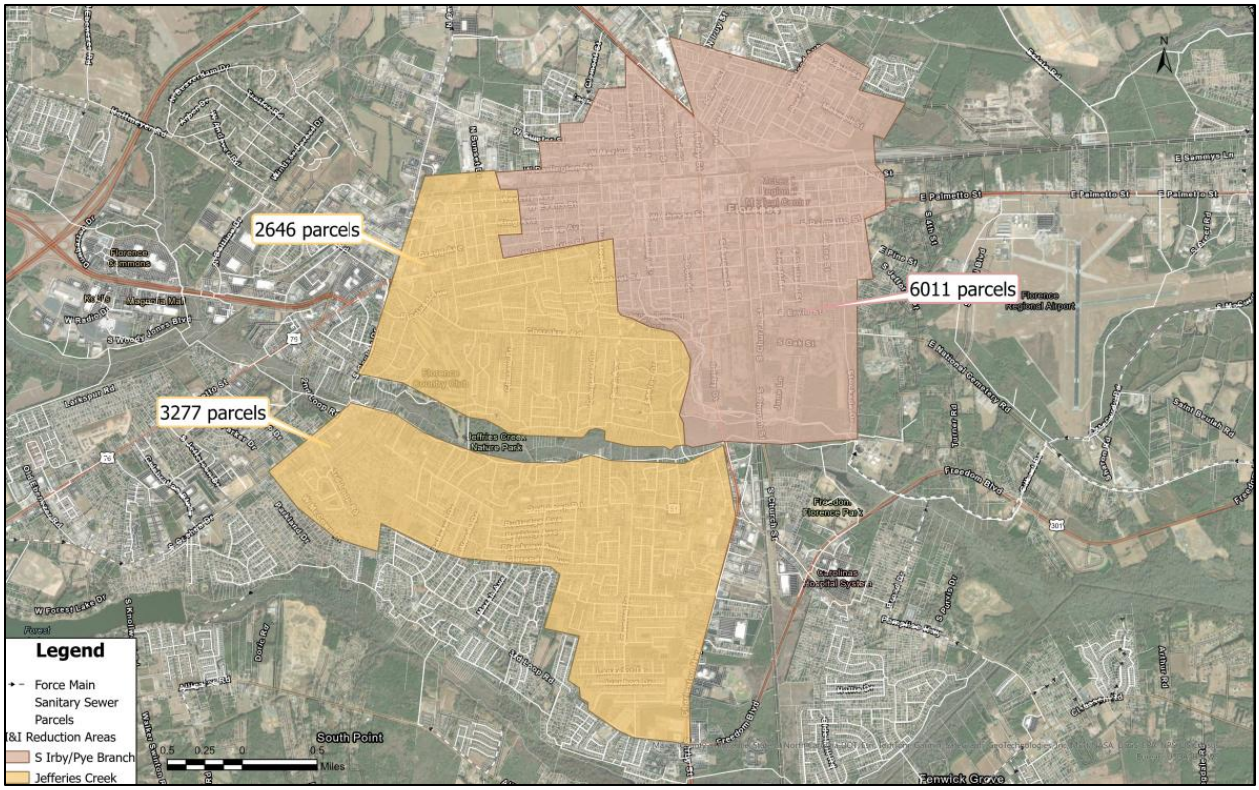


Figure 5-15: Preliminary I/I Reduction Areas

5.4.1 RDII Sources

RDII can enter sanitary sewer systems through various pathways, which can be broadly categorized into public and private sources.

Public sources of RDII can significantly increase the volume of water entering the system, especially during heavy rainfall events. These sources include:

- **Defective Sewer Pipes and Joints:** Cracks, fractures, and misaligned joints in sewer pipes can allow stormwater and groundwater to infiltrate the sewer system.
- **Manhole Infiltration:** Manholes can be a major source of RDII if they are not properly sealed. Water can enter through cracks in the manhole walls, defective covers, or improperly sealed connections.

- **Storm Sewer Cross-Connections:** Unintentional or illegal connections between storm sewers and sanitary sewers can lead to significant RDII. These cross-connections allow stormwater to flow directly into the sanitary sewer system.
- **Catch Basin Inflow:** Catch basins designed to collect stormwater from streets and other surfaces can sometimes be connected to the sanitary sewer system, either intentionally or due to improper construction.

Private sources of RDII can significantly increase the volume of water entering the system as well from the following sources:

- **Uncapped or Defective Cleanouts:** Cleanouts are access points for maintenance of the sewer system. If the caps on these cleanouts are missing or damaged, stormwater can enter the sewer system.
- **Building Roof Drains:** Roof drains from residence and commercial buildings that are connected to the sanitary sewer system can introduce significant volumes of stormwater.
- **Damaged Laterals with Root Intrusion:** Cracks, fractures, and misaligned joints in sanitary sewer lateral pipes due to age and root intrusion can allow stormwater and groundwater to infiltrate the sewer system.

To address RDII from public and private sources, the City can implement several strategies:

- **Roof Drain Disconnection:** Redirecting roof drains from buildings to storm sewers or other appropriate drainage systems.
- **Sewer Lateral or Public Main Lining and Repair:** Lining damaged sewer pipes and repairing joints to prevent RDII.
- **Manhole Lining Rehabilitation:** Sealing cracks, replacing defective covers, and ensuring proper sealing of connections.
- **Eliminating Cross-Connections**: Identifying and removing connections between storm and sanitary sewers.
- **Catch Basin Disconnection:** Ensuring that catch basins are connected to storm sewers rather than sanitary sewers.
- **Cleanout Maintenance:** Regular inspection and maintenance of cleanouts to ensure caps are intact and properly sealed.

Addressing RDII is essential for gaining capacity and functionality of the City’s sanitary sewer system. By implementing targeted mitigation strategies, the City can reduce the impact of RDII and improve the overall performance of their sewer infrastructure. **Table 5-2** presents the expected peak flow reductions that can be attained with various mitigation measures.

Table 5-2: Researched Peak Flow Reduction Values

Improvement	Peak Flow Reduction Estimate (GPM)	Unit
Direct Roof Drain Connection Removal	12	EA
Lateral Lining/Repaired	0.012	Per Ft
Mainline Lining/Repaired	0.012	Per Ft
Manhole Chimney Seal and Lid Replacement (when needed)	3	EA
Manhole Replacement	6.5	EA

5.4.2 RDII Reduction Program

5.4.2.1 Planning Phase

The planning phase of an RDII reduction program involves several key components to ensure effective management and coordination. A program management team will need to be in place to oversee the entire project, conducting monthly meetings and handling project administration tasks, including quality assurance and periodic status meetings.

The crucial part of the planning phase is the system flow monitoring and improvement analysis. This will include flow monitoring of all selected areas and could include the following surveys and various field exploration and testing:

- **Roof Drain Direct Connection Survey:** Perform a survey to evaluate roof drains. Provide maps of roof drains that are not splashed.
- **Roof Drain Direct Connection Point of Sale Administrative Code Development Plan:** Create a point-of-sale code to be voted on by City Commission that requires disconnection of roof drains during a real estate transaction.
- **Sewer Lining (Mains and Laterals) and inspections:** Conduct CCTV inspections. Perform smoke testing and dye testing. Develop figures presenting locations of lining work to be performed.
- **Creation of a Public Awareness Campaign:** This campaign will include the creation of a public education program and framework for the lateral lining and roof drain disconnection initiatives.

Overall, the planning phase of the RDII reduction program is comprehensive, involving detailed management, system analysis, and public engagement to achieve the desired outcomes.

5.4.2.2 Construction Phase

The construction phase of an RDII reduction program involves developing construction documents for public sanitary sewer main lining, maintaining a database of lateral repairs, lining or grouting selected manholes and sewers, and inspecting the work performed.

5.4.2.3 Post Construction Phase

The post-construction phase of an RDII reduction program focuses on monitoring and analyzing the effectiveness of the improvements made during the construction phase. This phase ensures that the desired reductions in inflow and infiltration are achieved and maintained. The key components and actions involved are as follows:

- Install temporary flow metering equipment and rain gauges to monitor the conditions after the improvements have been made. This equipment will help track the flow rates and rainfall data to assess the system's performance.
- Provide monthly feedback on storm events and recommendations based on the data collected. This feedback will include analysis of storm events and suggestions for any necessary adjustments or additional measures.
- Quantify reductions from grouting and lining improvements to measure the effectiveness of these specific interventions. This involves analyzing the data to determine the extent of inflow and infiltration reductions achieved through these improvements.
- Roof Drain Direct Connection Point of Sale Enforcement: Inspect homes during transaction to determine compliance with City codes.

By implementing these actions, the post-construction phase ensures continuous monitoring and evaluation of the RDII reduction program, allowing for data-driven decisions and ongoing improvements to the sanitary sewer system.

6 Opinion of Probable Construction Costs

6.1 Basis of Estimates

The opinion of probable construction costs (OPCCs) included in this Master Plan are high level planning costs and considered to be Class 5 “Concept Screening” cost estimates as defined by the AACE with an accuracy range of -50 to +100 percent. The OPCCs are representative of total project costs including construction, engineering design and construction oversight, permitting and legal costs, and contingencies.

Source data utilized during OPCC development process includes bid tabulation data and preliminary costing tools from similar project work. For projects involving new sewer installation, a high-level cost estimating approach was used which involves applying a unit price to each linear feet of sewer installed. It was assumed that new sewer installations will be constructed in the SCDOT right-of-way and would not involve easement acquisition. Costs for mobilization, maintenance of traffic, dewatering, bypass pumping and site and surface restoration were built into the OPCCs. For surface and site restoration, and average trench width of 5-feet was assumed for the length of recommended sewer construction.

A general contingency of 25% of the subtotal construction costs was included in the OPCCs to account for inherent uncertainties in the estimating process and is anticipated by the estimator as the relative stability of the design documents, project scopes and assumptions upon which the estimate is based.

Detailed breakdowns of OPCCs for each recommended CIP project are included in **Appendix H**, and all costs are presented in 2025 dollars.

6.1.1 Exclusions

The OPCCs developed as part of this Master Plan excluded the following items as well as any scope items outside of what is stated in the cost breakdowns (refer to **Appendix H**):

- Engineering fees.
- Construction administration/observation.
- Unforeseen subsurface conditions including rock excavation.
- Permitting, legal and miscellaneous regulatory fees such as coordination with regulatory agencies, assessments, taxes, easement acquisition or legal and development charges.
- Restoration costs unless specified as individual line items.
- Escalation.
- Active utility relocation costs.

6.2 I/I Reduction Program OPCC

Several levels of I/I reduction were evaluated from a OPCC perspective based on the percentage of existing sanitary sewer main, manholes and lateral lining achieved in the preliminary I/I reduction areas, as illustrated in **Figure 5-15**. These areas were identified through initial flow monitoring and system analysis as key contributors to excessive I/I within the collection system.

The total quantities of existing sanitary sewer mains and manholes within each I/I reduction area were determined using the City's GIS data. To estimate the number of laterals requiring rehabilitation, the analysis considered the number of parcels intersecting the I/I reduction areas, under the assumption that each parcel represents a potential lateral connection. For cost estimation purposes, it was assumed that 15 linear feet of each lateral would require lining from the mainline connection.

Table 6-1 presents a breakdown of OPCC values for a scenario in which 100% of the identified existing sanitary sewer mains, manholes, and lateral connections are lined or rehabilitated within the three targeted I/I reduction areas. This approach represents a maximum-level rehabilitation effort and provides a benchmark for understanding the potential investment required to significantly reduce I/I in these areas.

Table 6-1: 100% I/I Reduction OPCC Breakdown

I/I Reduction Improvement	Unit	South Irby & Pye Branch	Jeffries Creek North	Jeffries Creek South	OPCC (Millions)
Mainline CIPP Lining	LF	38,1275	179,703	190,611	**$29.4**
Manhole Rehabilitation	#	922	392	484	**$27.0**
Lateral Lining	#	6,011	2646	3,277	**$57.2**
OPCC (Millions):		**$52.2**	**$23.2**	**$38.2**	**$113.6**

Given the costs and practical challenges associated with performing I/I reduction on 100% of the existing infrastructure within the preliminary I/I reduction areas, additional scenarios involving partial rehabilitation were evaluated. It is recognized that inflow and infiltration issues are often concentrated in specific locations rather than uniformly distributed throughout the system. Therefore, targeting a subset of the infrastructure within the preliminary I/I reduction areas is recommended to achieve greater cost efficiency while still delivering meaningful reductions in system-wide I/I.

Several levels of targeted I/I reduction were analyzed, corresponding to rehabilitation of approximately 80%, 50%, and 20% of the infrastructure within the identified areas. These scenarios reflect a range of investment options, allowing the City to balance I/I reduction goals with available funding and other capital priorities.

Table 6-2 presents the total OPCC for performing 80% I/I reduction, 50% I/I reduction and 20% I/I reduction in the preliminary I/I areas.

Table 6-2: I/I Reduction Program OPCC Summary

80% I/I Reduction OPCC	50% I/I Reduction OPCC	20% I/I Reduction OPCC
$90.9 M	$56.8 M	$22.7 M

The 50% I/I reduction program is the recommended option as it is the most realistic and effective target compared to 80% or 20% I/I reduction programs. Aiming for 80% reduction can be overly ambitious and cost-prohibitive, requiring extensive and expensive rehabilitation efforts that may not yield proportional benefits. Conversely, a 20% reduction might be insufficient to significantly alleviate the issues caused by I/I, such as system overloads and increased treatment costs.

A 50% reduction strikes a balance between feasibility and impact, allowing substantial improvements in system performance and capacity without incurring excessive costs. This level of reduction typically involves targeted repairs and upgrades to critical areas, such as sewer mains, laterals, and manholes, which can effectively reduce I/I while being manageable within budget constraints.

The 50% I/I reduction program was separated into the intermediate and long-term planning horizons to balance the cost per year of CIP projects within the 20-year planning time-frame. This approach also allows time during the short-term planning horizon to complete flow verification and programmatic reviews, which will help better define and refine the targeted I/I reduction areas.

Refer to **Appendix H** for a detailed OPCC breakdown. The OPCC values included in this section do not include inherent project costs including mobilization, contractor overhead and profit, or engineering design.

6.3 Conveyance Upgrades OPCC

Table 6-3 shows a summary of the OPCC for the recommended conveyance upgrades projects recommended under the City's Master Plan.

These recommended improvements were developed through planning-level evaluations and are intended to address capacity and infrastructure needs across the system. It is important to note that the scope, cost estimates, and prioritization of these projects are preliminary and may be refined as additional information becomes available through the ongoing Flow Verification and Programmatic Review project. This future work will help confirm system performance, validate assumptions, and optimize the final design and implementation of the conveyance improvements.

Table 6-3: Conveyance Upgrades OPCC Summary

CIP Project	Description	OPCC (Million)
Lower South JCI Upgrades Phase I	• Upsize 7,000 LF of existing sewer from Jeffries Lane to WWMF.	$11.09[2]
HWY 301 PS Upgrades and Force Main	• Upgrades at HWY 301 PS and 33,300 LF of new force main to WWMF.	$27.09
West Palmetto Street PS & Second Loop Interceptor Upgrades	• Construct 10 MGD PS and 22,170 LF new force main or sewer along Second Loop to North JCI. • Upsize 3,500 LF of existing sewer from Woody Jones to US 76 / Palmetto Street.	$20.86[2]
North JCI Upgrades[1]	• Upsize 7,800 LF of existing sewer along North JCI. • Brunwood Drive structure modifications. • Oleander/Wisteria/Santee/Park sewer improvements • Construct Country Club PS. • Upsize 1,500 LF of existing sewer near Fairway Dr.	$13.18[2]
East Palmetto St Upgrades	• Upgrades at Fairgrounds & Roche Carolina PS's.	$5.23
Lower South JCI Upgrades Phase II	• Upsize 20,780 LF of existing sewer from West Palmetto PS to Jeffries Lane.	$12.21
Beaverdam Creek Upgrades Phase I	• Upsize 7,100 LF of existing sewer along western BCI. • Upsize 9,300 LF of existing sewer along Lower BCI. • Rehab 3,450 LF of existing sewer parallel to Lower BCI.	$12.89
East JCI Upgrades	• Upsizing 7,170 LF of existing sewer along East JCI.	$9.27
Highway 327 Upgrades	• Upgrades at Black Creek & Adams Branch PS's. • Upsize 12,970 LF of force main along HWY 327.	$13.01
Beaverdam Creek Upgrades Phase II	• Upgrades to Cashua Drive PS and force main. • Upsize 13,100 LF of existing gravity sewer.	$15.40
Pye Branch Upgrades	• Upsize or rehabilitate 15,930 LF of existing sewer.	$14.20
South Irby/Timrod Park Upgrades	• Upsize or rehabilitate 7,000 LF of existing sewer.	$3.55
Upper South JCI Upgrades	• Upsize 12,010 LF of existing sewer.	$9.56
	Total Opinion of Probable Construction Costs (Million):	**$167.53**

[1] The City is currently in design phases to replace the downstream portion of the North JCI.
[2] OPCCs for Lower JCI Upgrades Phase I, North JCI Upgrades and West Palmetto PS & Second Loop Interceptor projects were derived by escalating OPCCs from JCI Improvements Study (CDM Smith, 2022) 2025 dollars based on an estimated inflation rate of 7% per year. The OPCCs also include 25% construction contingency and exclude engineering fees.

7 CIP Summary and Implementation Schedule

Table 7-1 presents the recommended CIP project implementation schedule including implementation year (i.e. construction completion date) and OPCC values for each CIP project.

Early action projects play a crucial role in ensuring the success of future projects. For instance, the North JCI upgrades, currently under design, should be completed before the upstream conveyance improvements to prevent hydraulic bottlenecks from occurring at the intersection of project boundaries. Additionally, the Flow Verification and Programmatic Review project will help refined the scope of the proposed projects.

Short-term CIP projects (to be completed by 2030) were prioritized based on apparent recurring SSOs, to address bottlenecks in the downstream portion of the existing collection system, and to ensure downstream projects are completed before upstream projects. East Palmetto Phase I upgrades were included in the short-term planning horizon due to capacity issues at HWY 301 PS causing recurring SSOs along East Palmetto Street. Upgrading HWY 301 PS and adding an additional force main to the WWMF will allow for the next phases of East Palmetto Street upgrades to be implemented next as they are upstream. This project is particularly important to support the proposed industrial developments planned for the area. The West Palmetto PS and Second Loop interceptor project and Lower South JCI Phase I are also downstream projects and are expected to be completed soon.

CIP projects assigned to the intermediate planning horizon (to be completed by 2035) include areas of the collection system located downstream of one or more proposed CIP projects, or if the conveyance improvement is needed to serve future growth within the collection system (as is the case with East Palmetto Phase II). Beaverdam Creek Upgrades Phase I was identified as an intermediate CIP project due to SSOs along the southern portion of the BCI reported by the City. Beaverdam Creek Upgrades Phase I and II are recommended to be completed before the construction of predicted future industrial developments to accommodate the increased flow. East JCI upgrades were included as an intermediate project to eliminate the hydraulic bottleneck.

CIP projects designated for the long-term planning horizon include areas of the collection system located upstream of short-term or intermediate projects, where improvements are needed to convey increased flows resulting from future industrial developments.

To balance project costs across the CIP implementation schedule, the I/I reduction program was divided into two phases—Phase I and Phase II. The costs for each phase were estimated based on an equivalent annual CIP cost for the intermediate and long-term planning horizons. Although I/I reduction efforts were not included in the short-term planning phase due to higher estimated annual costs, they remain a crucial component in the overall program. These efforts can be implemented incrementally as funding becomes available and have the potential to reduce the scope of future projects, particularly in low-lying areas.

Table 7-1: Recommended CIP Projects and Schedule

	CIP Project	Year	OPCC (Million)	
Early Action Projects				
	Flow Verification and Programmatic Review	2027	$0.54[1]	$13.72
	North JCI Upgrades	Under Design[2]	$13.18[3]	
Conveyance Upgrades[4]				
Short Term	HWY 301 PS Upgrades and Force Main	2030	$27.09	$59.04
	West Palmetto Street PS and Second Loop Interceptor Upgrades	2030	$20.86[3]	
	Lower South JCI Upgrades Phase I	2030	$11.09[3]	
Intermediate	I/I Reduction Program Phase I	2035	$27.26	$66.86
	East Palmetto St Upgrades	2035	$5.23	
	Lower South JCI Upgrades Phase II	2035	$12.21	
	Beaverdam Creek Upgrades Phase I	2035	$12.89	
	East JCI Upgrades	2035	$9.27	
Long Term	I/I Reduction Program Phase II	2045	$29.54	$85.26
	Highway 327 Upgrades	2045	$13.01	
	Beaverdam Creek Upgrades Phase II	2045	$15.40	
	Pye Branch Upgrades	2045	$14.20	
	South Irby/Timrod Park Upgrades	2045	$3.55	
	Upper South JCI Upgrades	2045	$9.56	
	Total Opinion of Probable Construction Costs (Million):		**$224.9**	

[1] Refer to **Section 5.2** for detailed breakdown of opinion of probable costs for Flow Verification and Programmatic Review project.
[2] The City is currently in design phases to replace the downstream portion of the North JCI.
[3] OPCCs for Lower JCI Upgrades Phase I, North JCI Upgrades and West Palmetto PS & Second Loop Interceptor projects were derived by escalating OPCCs from JCI Improvements Study (CDM Smith, 2022) to 2025 dollars based on an estimated inflation rate of 7% per year. The OPCCs also include 25% construction contingency and exclude engineering fees.
[4] Recommended conveyance improvements projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.

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Sewer Collection System Master Plan

Appendix A

Pump Station Summary

September 2025

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Appendix A
Pump Station Summary

City_ID	LS_Name	Total # Pumps	# Pumps Duty	# Pumps Standby	Pump Make	Pump Model	Pump 1 ON evelation (ft)	Pump 2 ON elevation (ft)	Pump 3 ON elevation (ft)	Pump Off Elevation (ft)	Wet Well Rim Elevation (ft)	Wet Well Bottom Elevation (ft)	Motor HP	Voltage	Impeller	Notes	Included in Model?
102	McLeod Hospital	2	1	1	Flygt	3102.185 3102.06	124.33	129.75	-	122.33	138.5	121.33	5	240	463		Y
123	Summit at Oakdale	2	1	1			115.61	120.61	-	113.61	140	112.61					Y
002	76	2	1	1	Flygt	3153	101.96	106.96	-	99.96	117.41	98.96	20	240	462	assumed on/off elevations	Y
003	Adams Branch	3	2	1	Flygt	3231	85.28	88.1	93.1	78.65	95.66	78.56	90	480			Y
005	Black Creek	3	1	2	Flygt	3231	57.9	58	62.9	51.41	68.17	50.02	160	480			Y
007	Brandon Woods	2	1	1	Flygt	3127.181	94.47	99.47	-	92.06	107.71	91.06	10	240	438		Y
012	Cashua Street	2	1	1	Flygt	3127	121	126	-	117.7	135.8	116.7	10	240	432		Y
013	Celebration Square	2	1	1	Flygt	3127.18	108.26	113.26	-	106.26	130	105.26	7.5	230	433		Y
015	Chase	3	2	1	Sulzer	XFP150E-CB1.4-PE105	125.76	126.76	131.76	123.76	142.59	122.59	14	480			Y
016	Clement	2	1	1	Siemens	Gorman Rupp T4 (1984 yr)	126.87	131.87	-	124.87	139.87	123.87	5	240			Y
018	Corbette Place	2	1	1	Sulzer ABS	ABSXFP-PE1-100C-CB1.1 AFP1040.2M254-2	99.17	104.17	-	97.17	106.92	96.07	3.8 3	240			Y
019	County Club	2	1	1	KSB	F80	59.41	64.41	-	58.41	61.41	55.41			252		Y
024	Dewey Carter	2	1	1	Flygt	3153.185	97	101	-	95	107.62	93.6	20	240	461		Y
026	Effingham Detention C	2	1	1	Pumpex	K103M2414-4	74.72	79.72	-	72.72	84.17	71.72	20	240			Y
027	Fairground	3	2	1	Flygt	3201.18	56.58	57.5	62.5	54.58	70	53.58	35	480			Y
029	Florence Baptist Temple	2	1	1	Flygt	3127.185	96.69	101.69	-	94.69	114.94	93.69	10	240	438		Y
030	Florence Darlington Tech	2	1	1	KSB	KRTE80-251	83.7	88.7	-	81.7	101.5	80	15	480			Y
034	FMU Gate 3	2	1	1	KSB	KRT K 100-253/114XEG	67.61	72.61	-	65.61	77.66	64.61	15	240	205		Y
036	Green Acres	2	1	1			95.19	100.19	-	93.19	116.64	92.19					Y
038	Harriett	2	1	1	Flygt	3127.16	126.03	131.03	-	124.03	137.73	123.03	10	240	438		Y
039	HWY 301	3	2	1	Flygt	3301.185	69	69.7	74.7	67	79.28	66	70	480			Y
041	Ingram	2	1	1	Siemens	Gorman Rupp T4 (1984 yr)	126.47	131.47	-	124.47	138.05	123.47	5	240			Y
042	James Turner Road	2	1	1	Pumpex	K100	97.16	102.16	-	94.58	102.83	93.58	10	240			Y
045	Lakeshore	2	1	1	Flygt	3152.181	119	124	-	115.67	131	114.67	20	240	454 432		Y
047	Magnolia Trace	2	1	1	Flygt	3102.185	128.76	133.76	-	126.76	142.01	125.76	5	240	465		Y
052	Meadows	2	1	1	Flygt	3102.06	125.67	130.67	-	123.67	139.27	122.67	5	480	423		Y
053	Middle Swamp	3	2	1	Flygt	3202.095	61.02	62.16	67.16	59.02	79.12	58.02	70	480	467		Y
055	Oakdale Terrace	2	1	1	Flygt	3102.18	129.04	134.04	-	127.04	140.39	125.76	5	240	433		Y
057	Paper Mill Road	2	1	1	KSB	KRT K 100-253/184XEG	67.48	72.48	-	65.48	91.13	64.48	25	480	262		Y
063	Police Cabin	2	1	1	KSB	KRT-K150-401/784XG	58.82	63.82	-	56.57	77	55.07	110	480			Y
069	Richmond Hills	2	1	1	Flygt	3152.181	59.97	64.97	-	57.97	74.42	56.97	20	240	454		Y
070	Roche Carolina	3	2	1	Flygt	3300.181	69	70	75	67	83.48	66	60	480	467		Y
072	S&W MFG LS	2	1	1	Siemens	Gorman Rupp T4	123.62	128.62	-	121.62	136.82	120.62	10	240			Y
075	South Brook	2	1	1			91	96	-	89	113.02	88					Y

Appendix A
Pump Station Summary

078	Steel Road/ Becky's Park	3	2	1	Flygt	3300.181	81.6	82.6	87.6	79.6	95.08	77.63	60	480	481		Y
079	Summergate	2	1	1	KSB	KRTE100-251	120.5	125.5	-	118	133	117	20	240	236		Y
083	Timroad	2	1	1	AFP ABS		104	109	-	102	116.1	101					Y
084	Tree Top Inn	2	1	1	Flygt		127.89	132.89	-	125.4	138.24	124	5	240			Y
087	Wedgewood	2	1	1	Flygt	3102.18	77.5	82.5	-	75.5	90.5	74.5	5	240	433		Y
089	Wild Bird Lane	2	1	1	KSB	KRTE80-251/74	99	104	-	95	110	94	10	240	210		Y
090	Wiliam Heights	2	1	1	Flygt	3102.185	83.1	88.1	-	81.1	100	81.1	5	240	247		Y
091	William School	2	2	0	Flygt	3140.18	124	129	-	121.37	139.22	120.37	15	240	481		Y
092	Wiliamson Road	2	1	1	KSB	KRTK-150-401/904XG	99.44	100	-	94.94	109.03	93.36	13	480			Y
093	Wilson High	2	1	1	Siemens	Gorman Rupp T4	128.5	133.5	-	126.5	139.42	125.5	5	240			Y
095	Wisteria	2	1	1	Flygt	3085.182	88.11	93.94	-	86.11	96.59	85.11	2.2	240	436		Y
096	Womack Gardens	2	1	1	Pumpex	K103	99.15	104.15	-	96.33	119.48	95.33	20	240			Y
017	Cloisters	2	1	1	Flygt	3127.185			-				10	240	421		N
	Camp Ground	2	1	1	Sulzer	GX7J3K4C111132	132.6	132.6	-	126.2	115.59	0	14	480			N
	Calvin	2	1	1	Flygt	3127.185			-				10	240	488		N
	Carolina Bank	2	1	1	Flygt	3085.182			-				3	240	434		N
	Carver	2	1	1	Flygt	3102			-				5	240	463		N
	Darlington St																N
	Ebenzer IGA																N
	Honda																N
	Industrial Park																N
	Kemper																N
	Kingpin																N
	Main St																N
	Mars Hill	2			Fairbanks Morse	T4B							5				N
	Mashack																N
	Mays	2			Flygt	3085.606							3	240	462		N
	Mccall	2			Flygt KSP	3127.06 KRTF80-217							15 20	240	438 170		N
	Mccracken	2			Flygt	3127.181							10	240	483		N
	Oak Point	2			Flygt	3102.185							5	240	163		N
	Panton	2			Flygt	3102.185							5	240	462		N
	Pelican	2			ABS	AFP1000M2504-4-42.6							35	240			N
	Peninsula	2			Liberty	LSG203M							3	240			N
	Pine Forrest	2			Tsurumi	100C47.5							10	240			N
	Pine Lake	2			ABS Flygt	M7514-22.6 3127.181							10	240			N
	Pine Needles	2			Flygt	3102.181							5	240	462		N
	Public Works	2			Pentair	Hyrdomatic 40mph							10	240			N
	Quinby	2			Flygt	3201.18							47	480	458		N

Appendix A
Pump Station Summary

	QVC	2			KSB	KRTF80-250/46XG							7.5	240			N
	Rest Area	2			Flygt	3182.181							20	240	454		N
	Roasedale	2			Flygt	3102.185							5	240	464		N
	Sandspurr																N
	Sandstone	2			Flygt	3127.181							10	240	484		N
	Sopkin	2			Flygt	3127.18							5	240	485		N
	Southern Pines	1			Zoeller								1	240	270		N
	Sparrow Swamp																N
	Stanley Drive	2			KSB	KRTF80-250							15	240	249		N
	Tara Village	2			GE Balldor	Hydromatic 40MPC							5	240			N
	Tennis Courts	2			Flygt	3127.1845							10	240	439		N
	Theodore Lester	2			Flygt	3127.181							10	240	484		N
	Timrod Park	2			ABS	AFP1541M105-4-22							14	240			N
	Vanda																N
	Villa Arno	2			Flygt	3102.185							5	240	465		N
	Vintage Place	2			Flygt	3127.060 3127.181							10	240	438		N
	White St																N
	Whitehall	2			Flygt	3102.185							5	240	463		N
	Windsor Forrest	2			Flygt	3102.185							5	240	463		N
	Woodmont	2			Flygt	3102.181							5	240			N
	Wrenwood	2			Flygt	3102.185							5	240	462		N
	YMCA	2			ABS	XFP100E-CB1.5-PE75/4-E-60FM							12	240			N
	Yopps																N
	Young Road																N
	HWY 403																N
	Timmons																N
	Budget Inn																N
	Academy Sports																N
	Westlakes Division																N
	The Grove																N
	Chandler Point																N
	Hoffmeyer Place																N
	Summit																N

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Sewer Collection System Master Plan

Appendix B

Reported Sanitary Sewer Overflow Data

September 2025

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Appendix B
Part 1
Reported SSOs Suspected Capacity Limitations

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
56	6/14/2006	900	1109 Hillside Avenue	Dry land	2500	Excessive rain	Monitored manhole until released stopped.	Cleaned debris and applied pellet lime.	1109 Hillside Avenue, City of Florence, South Carolina	YES
57	6/14/2006	900	1109 Hillside Avenue	Dry land	2,500	Collection system submerged and inflow released from downstream manhole. Area received 8.8" of rainfall.	Monitored manhole until released stopped.	Cleaned debris and applied pellet lime.	1109 Hillside Avenue, City of Florence, South Carolina	YES
58	6/14/2006	830	2342 Cascade Avenue	Dry land	5,000	Collection system submerged and inflow released form downstream manhole. Area received 8.8" of rainfall.	Monitored manhole until released stopped.	Cleaned debris and applied pellet lime.	2342 Cascade Avenue, City of Florence, South Carolina	YES
88	11/14/2006		1500 Hillside Avenue	Jeffries Creek	less than 500	Excessive rain			1500 Hillside Avenue, City of Florence, South Carolina	YES
106	3/3/2007	1600	3500 Broad Drive	Jeffries Creek	1,500	Manhole surcharge due to excessive flow being more than line capacity.	Called DNR about the City's annual beaver removal program.	Beaver dams are being removed and DNR has scheduled beaver control inspections to occur this week to reduce inflow into manholes that are presently under water due to beaver dam construction.	3500 Broad Drive, City of Florence, South Carolina	YES
196	9/6/2008	1000	2212 Pamplico Hwy.	Middle Swamp	10,000	Area received 4.5" rain and excessive inflow into collection system from tropical depression Hannah.	Monitored manhole until released stopped.	Cleaned debris and applied pellet lime.	2212 Pamplico Hwy., City of Florence, South Carolina	YES
197	9/6/2008	1000	2342 Cascade Avenue	Dry land	4,000	Area received 4.5" rain and excessive inflow into collection system from tropical depression Hannah.	Monitored manhole until released stopped.	Cleaned debris and applied pellet lime.	2342 Cascade Avenue, City of Florence, South Carolina	YES
202	9/10/2008	2045	2342 Cascade Avenue	Dry land	1,000	Inflow into system due to manholes being submerged from the rainfall of the 4.5" event on 9/6/08 from tropical depression Hannah and 2.5" event on 9/9/08.	Adjusted the operating capacity of the downstream pump station at a higher capacity.	Pump station operator monitored operation of the station.	2342 Cascade Avenue, City of Florence, South Carolina	YES
209	9/26/2008	1145	3500 Broad Drive	Dry land	2,700	Inflow into collection system due to system manhole being submerged upstream.	Reduced the pump station discharge flow by throttled back upstream pump station discharge valve.	Pump station operator monitored operation of the station and downstream manhole. The placed this section of the system on the Capital Improvement Schedule. Force main being installed summer of 2010.	3500 Broad Drive, City of Florence, South Carolina	YES
210	9/27/2008		600 Fraser Street	Dry land	less than 500	excessive rain			600 Fraser Street, City of Florence, South Carolina	YES
238	3/1/2009	1400	4009 East Palmetto Street	Polk Swamp	9,000	One of the pumps at our Hwy. 301 pump station tripped out causing the gravity line to back up with flow that was not being removed from the line. This occurred after the area received 2.7" rain which allowed portions of our collection to take on access water while being submerged.	Pump station operator got the pumps operating.	Pump station operator called electrician to check the control panel to ensure normal operation was occurring.	4009 East Palmetto Street, City of Florence, South Carolina	YES
239	3/2/2009	1200	2519 West Palmetto Street	Jeffries Creek	50,000	Area received 2.7" rain which elevated the waters of the creeks and streams which allowed portions of the collection system to be completely submerged by rain water.	Utility operations crew responded to the call.	The collection system operators repaired identified cracks within the riser portion of the manholes.	2519 West Palmetto Street, City of Florence, South Carolina	YES
248	4/4/2009	2300	Campbell & Prince Street	Dry land	4,000	Line collapsed.	Utility operations crew responded to the call.	City crews installed a new section of the 8" main with a 10' section of C900 pvc pipe.	Campbell & Prince Street, City of Florence, South Carolina	YES
258	6/17/2009	1300	2519 West Palmetto Street	Jeffries Creek	290,000	Area received 3.2" rain which elevated the waters of the creeks and streams which allowed portions of the collection system to be completely submerged by rain water.	Utility operations crew responded to the call.	The collection system operators washed the line upstream and downstream to identify any potential line blockages. No blockages were identified on June 17. On June 23, 2009 city crews located and removed a significant grease blockage from the interceptor near South Irby St., which is located approximately 7 miles downstream.	2519 West Palmetto Street, City of Florence, South Carolina	YES
260	6/17/2009	830	405 Harborough Court	Dry land	4,000	Area received 3.2 inches of rain and all manholes in the subdivision were submerged and the pump station wet well was submerged by approximately 18" of water.	Utility operations crew responded to the call.	Utility operations crew checked storm drains in the subdivision to ensure they were cleared to allow proper drainage and prevent inflow into sanitary sewer system.	405 Harborough Court, City of Florence, South Carolina	YES
320	1/25/2010	1415	Furches Avenue	Unnamed tributary that flows into Jeffries Creek	3,000	Gravity main flowing full and customer cleanout is at a lower elevation and line surcharging at customer connection.	Reduced the pump station discharge flow by throttled back upstream pump station discharge valve.		Furches Avenue, City of Florence, South Carolina	YES
325	2/5/2010	1200	2519 West Palmetto Street	Jeffries Creek	36,000	Area received 2.4" of rain which elevated the waters of the creeks and streams which allowed portions of the collection system to be completely submerged by rain water.	Utility operations crew responded to the call.	The collection system operators repaired identified cracks within the riser portion of the manholes.	2519 West Palmetto Street, City of Florence, South Carolina	YES
326	2/5/2010	1200	2519 West Palmetto Street	Jeffries Creek	50,000	Area received 2.4" of rain which elevated the waters of the creeks and streams which allowed portions of the collection system to be completely submerged by rain water.	Utility operations crew responded to the call.	The collection system operators repaired identified cracks within the riser portion of the manholes.	2519 West Palmetto Street, City of Florence, South Carolina	YES
327	2/5/2010	1400	3500 Broad Drive	Dry land	1,200	Manhole surcharge due to sewer system being surcharged.	Adjusted pump station flow upstream of the manhole.	Force main project placed on the City's CIP to begin construction summer of 2010.	3500 Broad Drive, City of Florence, South Carolina	YES
378	7/12/2010	2000	2342 Cascade Avenue	Dry land	200	Seal failure around manhole lid. The area received 2.6" of rain within thirty minutes which allowed portions of our collection system to be completely submerged with water.	Utility operations crew responded to the call.	Collection system crew repaired the manhole seal with hot patch.	2342 Cascade Avenue, City of Florence, South Carolina	YES
379	7/12/2010	1900	2519 West Palmetto Street	Dry land	300	The area received 2.6" of rain within thirty minutes which elevated the waters of the creeks and streams which allowed portions of our collection system to be completely submerged by rain water.	Utility operations crew responded to the call.	The collection system operators repaired identified cracks within the riser portion of the manholes.	2519 West Palmetto Street, City of Florence, South Carolina	YES
391	9/29/2010	2000	2342 Cascade Avenue	Middle Swamp	12,600	Area received 8.7" of rainfall influencing the creeks and the collection system with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		2342 Cascade Avenue, City of Florence, South Carolina	YES
392	9/30/2010	805	266 West McIver Road	Black Creek	75,000	8.7" of rainfall created major inflow into the collection system in areas of low lying manholes and placing additional demand on the collection system	Pump station operator monitored the station regularly to ensure proper operation of the downstream pump station at full capacity.		266 West McIver Road, City of Florence, South Carolina	YES
393	9/30/2010	1200	Red Tip Circle	Dry land	4,200	8.7" of rainfall created major inflow into the collection system in areas of low lying manholes and placing additional demand on the collection system	Utility collection system crew rodded the line to check and remove any blockages that were reducing line flow and capacity.		Red Tip Circle, City of Florence, South Carolina	YES
394	9/30/2010	900	3128 South Oliver Drive	Dry land	720	8.7" of rainfall created major inflow into the collection system in areas of low lying manholes and placing additional demand on the collection system	Utility collection system crew rodded the line to check and remove any blockages that were reducing line flow and capacity.		3128 South Oliver Drive, City of Florence, South Carolina	YES

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395	9/30/2010	830	1600 South Mauldin Drive	Dry land	less than 500	8.7" of rainfall created major inflow into the collection system in areas of low lying manholes and placing additional demand on the collection system	Utility collection system crew rodded the line to check and remove any blockages that were reducing line flow and capacity.		1600 South Mauldin Drive, City of Florence, South Carolina	YES
398	9/30/2010	700	3000 Broad Drive	Jeffries Creek	288,000	Area received 8.7" of rainfall influencing the creeks and the collection system with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		3000 Broad Drive, City of Florence, South Carolina	YES
399	9/30/2010	1500	400 Jeffords Street	Dry land	3,000	Gravity sewer collapse	City hired a private contractor Seaside Utilities to complete a point repair at the location of the break. Contractor by-passed pump to complete the repair.		400 Jeffords Street, City of Florence, South Carolina	YES
400	9/30/2010	1200	1109 Hillside Avenue	Jeffries Creek	4,300	Area received 8.7" of rainfall influencing the creeks and the collection system with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		1109 Hillside Avenue, City of Florence, South Carolina	YES
401	9/30/2010	738	1000 Oakland Avenue	Dry land	2,500	Area received 8.7" of rainfall influencing the creeks and the collection system with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		1000 Oakland Avenue, City of Florence, South Carolina	YES
409	2/5/2011	1200	2519 West Palmetto Street	Jeffries Creek	22,000	The area received 3" of rain which elevated the groundwater level and the levels of the creeks and streams and allowed portions of the collection system to be completely submerged.	The City's collection system operators responded to the call and monitored the creek level and flows in the interceptor.		2519 West Palmetto Street, City of Florence, South Carolina	YES
422	12/30/2011	1356	802 Walnut Street	Pye Branch	168,000	The 12 inch interceptor sewer main collapsed.	City staff removed visible solids and debris from the area then spread a mixture of pellet lime and granular chlorine for odor control and disinfection.		802 Walnut Street, City of Florence, South Carolina	YES
425	5/17/2012	1825	1600 East Williamson Road	Two Mile Creek	3,500	Both soft start inverters tripped due to lightning storm. Extremely severe storm with 3 - 6 " rain	The affected area was raked to remove debris and solids and pellet lime was spread for disinfection and odor control in the area adjacent to the water body.		1600 East Williamson Road, City of Florence, South Carolina	YES
436	4/29/2013	2130	266 West McIver Road	Black Creek	19200 gallons	Heavy rain storms with 3.9" of rain created a major inflow into collection system in areas of low lying manholes causing additional demand on the collection system. Several manholes on the line are under water.	Pump station operator continued to monitor and maintain the station regularly and pulled & cleaned pumps to ensure operation of the downstream pump station was at full capacity. Plans are to raise the manholes in the low lying problem areas.		266 West McIver Road, City of Florence, South Carolina	YES
437	5/1/2013	710	2000 Pamplico Hwy	Middle Swamp	750 gallons	Heavy rain storms with 3.9" of rain created a major inflow into collection system causing a heavy demand on the pumping system with excessive quantities of debris partially clogging the pumps.	WW operator checked the LS for problems and found that the station was pumping but not keeping up. The operator immediately called for help and pulled the pumps and cleaned the rags & debris from the pumps allowing the pumps to maintain a working level.		2000 Pamplico Hwy, City of Florence, South Carolina	YES
440	5/21/2013	730	520 Williamson Road	Two Mile Creek	14150 gallons	The 12" force main split	Repaired 12" force main		520 Williamson Road, City of Florence, South Carolina	YES
441	6/24/2013	840	5227 East Palmetto Street	Dry land	4000 gallons	Extremely heavy rainfall in a short period of time on 6/24/13 caused a backup in the sewer system.	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		5227 East Palmetto Street, City of Florence, South Carolina	YES
442	7/1/2013	1930	5227 East Palmetto Street	Dry land	4500 gallons	Extremely heavy rainfall in a short period of time on 7/1/13 caused a backup in the sewer system.	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		5227 East Palmetto Street, City of Florence, South Carolina	YES
443	7/16/2013	934	Rollins Avenue	Jeffries Creek	2000 gallons	Main flowing full	Flow went down, we are checking downstream manholes and will be washing and vacuuming them as needed		Rollins Avenue, City of Florence, South Carolina	YES
445	8/19/2013	1900	266 West McIver Road	Black Creek	4500 gallons	Wet well level was high due to heavy rainfall and one of two pumps had failed. One pump was not enough to keep the wetwell level down and mainhole overflowed.	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		266 West McIver Road, City of Florence, South Carolina	YES
448	12/29/2013	2000	266 West McIver Road	High Hill Creek	1800 gallons	Operator checked the Police Cabin lift station and found both pumps had tripped off. One pump shorted out and caused the other pump to trip. The wet well level was high and a nearby manhole overflowing.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		266 West McIver Road, City of Florence, South Carolina	YES
460	3/7/2014	955	519 Cedar Street	Gully Branch	2970 gallons	Sewer mains along Jeffries Creek were up due to heavy rains and had the system backed up to this point.	Washed/vacuumed 950' of sewer main. Pellet lime was spread for odor control and disinfection.		519 Cedar Street, City of Florence, South Carolina	YES
461	3/7/2014	1100	Hwy 76 & Sally Hill Road	Dry land	3800 gallons	Heavy rains created a major inflow into the collection system causing addt'l demand on the system and the Industrial Park lift station. The pump was unable to keep up with the inflow. One pump was out to be replaced.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		Hwy 76 & Sally Hill Road, City of Florence, South Carolina	YES
462	3/10/2014	1227	1301 Rollins Avenue	Jeffries Creek	1660 gallons	Due to heavy rains, the sewer mains that run along Jeffries Creek were up and had the system backed up to this point.	Cleaned up debris and spread pellet lime for odor control and disinfection.		1301 Rollins Avenue, City of Florence, South Carolina	YES
466	4/20/2014	2030	405 Harborough Court	Dry land	3700 gallons	Operator responded to alarm at Foxcraft Lift Station and found that the main breaker for the station had tripped off. One of the two pumps had failed electrically causing a short which tripped the electrical breaker. The wetwell level was high and the operator found a nearby manhole overflowing.	The operator reset the breakers and was able to restart one of the two pumps. This pump operated normally pumping the lift station down to normal operating levels. The manhole stopped overflowing. The failed pump was removed and replaced with a spare pump on 4/21/14.		405 Harborough Court, City of Florence, South Carolina	YES

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468	4/23/2014	1000	2000 Pamplico Hwy	Middle Swamp	1200 gallons	One of the two wastewater pumps failed to pump because of a broken pump shaft. Heavy rain storms with 3.0" of rain created a major inflow in the collection system causing a heavy demand on the remaining pump and partially clogging this pump with quantities of debris (rags, trash, bricks)	The area was raked to remove debris and solids and pellet lime was spread for odor control and disinfection.		2000 Pamplico Hwy, City of Florence, South Carolina	YES
483	12/24/2014	800	1600 East Williamson Road	Two Mile Creek	1500 gallons	Both Soft start inverters tripped off due to a power fluctuation from Duke Energy. During this time, there were periods of heavy rain.	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		1600 East Williamson Road, City of Florence, South Carolina	YES
485	1/24/2015	1149	1600 East Williamson Road	Two Mile Creek	3500 gallons	Both Soft start inverters tripped off due to a power fluctuation from Duke Energy. During this time, there were periods of heavy rain.	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		1600 East Williamson Road, City of Florence, South Carolina	YES
489	4/27/2015	1920	Pump station #22-Curry Lane - Near 1120 Harmony Street	Dry land	100 gallons	Operator responded to alarm at Curry Lane lift station and found that the breaker for both pumps had tripped off. The wetwell level was high and another City employee found a nearby cleanout was overflowing wastewater.	All wastewater that was released was vacuumed up, the area was raked to remove visible debris and solids, and pellet lime was spread for odor control and disinfection.		1120 Harmony Street, Florence, SC, City of Florence, South Carolina	YES
495	11/6/2015	900	Main & Brockington Street	Dry land	15,000 gallons	Rain water has system up causing force main to leak at discharge manhole.	Will repair the 8" force main when flow in sewer main goes down.		Main Street & Brockington Street, Timmonsville, South Carolina	YES
501	1/2/2016	1130	405 Harborough Court	Dry land	4,400 gallons	Florence area received more than 1" of rainfall and all the manholes in the subdivision and the pump station wet well were submerged.	Pump station operator responded to the high wet well alarm and checked for proper operation of the pump station. The area was raked of any visible solids and debris and pellet lime was spread for disinfection and odor control.		405 Harborough Court, City of Florence, South Carolina	YES
503	2/24/2016	1640	651 Red Tip Circle	Middle Swamp	200 gallons	The 18" sewer main along Middle Swamp was flowing full due to heavy rains and 8" main was up in Garden Hills Subdivision on Redtip Circle was up.	City crews walking the 18" main along Middle Swamp to locate manholes and to locate any with missing covers.		651 Red Tip Circle, City of Florence, South Carolina	YES
505	3/4/2016	1903	1600 East Williamson Road	Dry land	1000 gallons	Overcurrent fault in main electrical panel which also caused the VFD to trip out. This failure also disrupted signal to start on-site emergency generator.	Electrician talked operator thru electrical issues via telephone and operator reset main electrical breaker and VFD. Once on site electician checked main feed supply from electrical service provider to determine potential interruption supply.		1600 East Williamson Road, City of Florence, South Carolina	YES
526	12/9/2017	200	4101 East Palmetto Street	Polk Swamp	4500 gallons	Florence received approx. 2.75" of rainfall. Low-lying manholes on gravity sewer line in Polk Swamp were covered.	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		4101 East Palmetto Street, City of Florence, South Carolina	YES
530	11/18/2018	1800	651 Red Tip Circle		1,000 gallons	Area rainfall with high water table in negatively influencing the sanitary sewer intercepter main along Middle Swamp with inflow into low lying manholes reducing capacity of the system.			651 Red Tip Circle, City of Florence, South Carolina	YES
531	11/15/2018		800 Fraiser Street		No release	11/15/18 Rain Event			800 Fraiser Street, City of Florence, South Carolina	YES
532	11/15/2018		1822 Marsh Avenue		No release	11/15/18 Rain Event			1822 Marsh Avenue, City of Florence, South Carolina	YES
533	11/15/2018		2003 Enchanted Lane		No release	11/15/18 Rain Event			2003 Enchanted Lane, City of Florence, South Carolina	YES
534	11/15/2018		2113 Gable Terrace		No release	11/15/18 Rain Event			2113 Gable Terrace, City of Florence, South Carolina	YES
535	11/15/2018		David McLeod Blvd.		No release	11/15/18 Rain Event			David McLeod Blvd., City of Florence, South Carolina	YES
536	11/15/2018		1200 Hillside Avenue		No release	11/15/18 Rain Event			1200 Hillside Avenue, City of Florence, South Carolina	YES
537	11/15/2018		1300 Deberry Blvd.		No release	11/15/18 Rain Event			1300 Deberry Blvd., City of Florence, South Carolina	YES
538	11/15/2018		2342 Cascade Avenue		No release	11/15/18 Rain Event			2342 Cascade Avenue, City of Florence, South Carolina	YES
539	11/15/2018		1700 Poinsett Drive		No release	11/15/18 Rain Event			1700 Poinsett Drive, City of Florence, South Carolina	YES
540	11/15/2018		540 Wisteria Drive		No release	11/15/18 Rain Event			540 Wisteria Drive, City of Florence, South Carolina	YES
542	12/9/2018	1640	2342 Cascade Avenue		1,500 gallons	Area rainfall with high water table is negatively influencing the sanitary sewer intercepter main along Middle Swamp with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		2342 Cascade Avenue, City of Florence, South Carolina	YES
543	12/9/2018	1830	651 Red Tip Circle		4,000 gallons	Area rainfall with high water table is negatively influencing the sanitary sewer intercepter main along Middle Swamp with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		651 Red Tip Circle, City of Florence, South Carolina	YES
548	12/29/2018		651 Red Tip Circle		4,000 gallons	Area rainfall with high water table is nagatively influencing the sanitary sewer interceptor main along Middle Swamp with inflow into low lying manholes reducing capacity of the system.	Utility crew rodded the line and used the vactor truck to remove any solids that were reducing capacity.		651 Red Tip Circle, City of Florence, South Carolina	YES
558	3/24/2020	1400	1046 Santee Drive	dry land	350 gallons	The Florence area had over 3" of rainfall over the last four days. In addition to this being the wettest winter on record with the floodways under water since December 2019. System was operating at full capacity with multiple manholes under water with the system takin in excessive inflow.	Collections crew washed and vacuumed sewer interceptor to remove potential blockages of debris.		1046 Santee Drive, City of Florence, South Carolina	YES

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559	3/24/2020	1400	520 West Pine Street	dry land	350 gallons	The Florence area had over 3" of rainfall over the last four days. In addition to this being the wettest winter on record with the floodways under water since December 2019. System was operating at full capacity with multiple manholes under water with the system takin in excessive inflow.	Collections crew washed and vacuumed sewer interceptor to remove potential blockages of debris.		520 West Pine Street, City of Florence, South Carolina	YES
560	3/24/2020	1400	3031 Hoffmeyer Road	dry land	300 gallons	The Florence area had over 3" of rainfall over the last four days. In addition to this being the wettest winter on record with the floodways under water since December 2019. System was operating at full capacity with multiple manholes under water with the system takin in excessive inflow.	Collections crew washed and vacuumed sewer interceptor to remove potential blockages of debris.		3031 Hoffmeyer Road, City of Florence, South Carolina	YES
561	3/24/2020	1400	2701 David McLeod Blvd.	Beaver Dam Creek	400 gallons	The Florence area had over 3" of rainfall over the last four days. In addition to this being the wettest winter on record with the floodways under water since December 2019. System was operating at full capacity with multiple manholes under water with the system taking in excessive inflow.	Collections crew washed and vacuumed sewer interceptor to remove potential blockages of debris.		2701 David McLeod Blvd., City of Florence, South Carolina	YES
563	3/2/2020	800	120 Woody Jones Blvd. (rail trail behind Academy)	Jeffries Creek	75,000 gallons	The Florence area had over 3" of rainfall over the last four days. In addition to this being the wettest winter on record with the floodways under water since December 2019. System was operating at full capacity with multiple manholes under water with the system taking in excessive inflow.	Collections crew washed and vacuumed sewer interceptor to remove potential blockages of debris. Additionally, contractor completed interceptor repairs upstream of this location .		120 Woody Jones Blvd., City of Florence, South Carolina	YES
565	5/19-5/31/20		Sumter & North Irby Street		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Sumter & North Irby Street, City of Florence, South Carolina	YES
566	5/19-5/31/20		651 Red Tip Circle		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			651 Red Tip Circle, City of Florence, South Carolina	YES
567	5/19-5/31/20		Fraser & Athens Street		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Fraser & Athens Street, City of Florence, South Carolina	YES
568	5/19-5/31/20		Jarrott & East Campbell Street		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Jarrott & East Campbell Street, City of Florence, South Carolina	YES
569	5/19-5/31/20		2003 Enchanted Lane		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			2003 Enchanted Lane, City of Florence, South Carolina	YES
570	5/19-5/31/20		1500 McCurdy Road		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			1500 McCurdy Road, City of Florence, South Carolina	YES
571	5/19-5/31/20		Oakland Avenue		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Oakland Avenue, City of Florence, South Carolina	YES
572	5/19-5/31/20		1600 Block Malden Drive		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			1600 Block Malden Drive, City of Florence, South Carolina	YES
573	5/19-5/31/20		540 Wisteria Drive		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			540 Wisteria Drive, City of Florence, South Carolina	YES
574	5/19-5/31/20		1401 Fairfax Road		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			1401 Fairfax Road, City of Florence, South Carolina	YES
575	5/19-5/31/20		2364 Hallmark Drive		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			2364 Hallmark Drive, City of Florence, South Carolina	YES
576	5/19-5/31/20		1525 Hillside Avenue		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			1525 Hillside Avenue, City of Florence, South Carolina	YES
577	5/19-5/31/20		1301 Hillside Avenue		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			1301 Hillside Avenue, City of Florence, South Carolina	YES
578	5/19-5/31/20		Jeffries Lane		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Jeffries Lane, City of Florence, South Carolina	YES
579	5/19-5/31/20		120 Woody Jones Blvd. (Rail Trail)		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			120 Woody Jones Blvd., City of Florence, South Carolina	YES
580	5/19-5/31/20		2519 West Palmetto Street (Rail Trail)		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			2519 West Palmetto Street, City of Florence, South Carolina	YES
581	5/19-5/31/20		Dunbarton Drive & Hoffmeyer Road		No release	Tropical Storm Bertha with rainfall exceeding 7 inches			Dunbarton Drive & Hoffmeyer Road, City of Florence, South Carolina	YES
600	2/13-19/21		Fraser & Athens Street		No release	February Rain Event			Fraser & Athens Street, City of Florence, South Carolina	YES
601	2/13-19/21		651 Red Tip Cirlce		No release	February Rain Event			651 Red Tip Cirlce, City of Florence, South Carolina	YES
602	2/13-19/22		Jarrott & East Campbell Street		No release	February Rain Event			Jarrott & East Campbell Street, City of Florence, South Carolina	YES
603	2/13-19/23		1500 McCurdy Road		No release	February Rain Event			1500 McCurdy Road, City of Florence, South Carolina	YES
604	2/13-19/24		2003 Enchanted Lane		No release	February Rain Event			2003 Enchanted Lane, City of Florence, South Carolina	YES
605	2/13-19/25		1500 McCurdy Road		No release	February Rain Event			1500 McCurdy Road, City of Florence, South Carolina	YES
606	2/13-19/26		Oakland Avenue		No release	February Rain Event			Oakland Avenue, City of Florence, South Carolina	YES
607	2/13-19/27		1401 Fairfax Road		No release	February Rain Event			1401 Fairfax Road, City of Florence, South Carolina	YES
608	2/13-19/28		2401 Hallmark Drive		No release	February Rain Event			2401 Hallmark Drive, City of Florence, South Carolina	YES
609	2/13-19/29		1525 Hillside Avenue		No release	February Rain Event			1525 Hillside Avenue, City of Florence, South Carolina	YES
610	2/13-19/30		1301 Hillside Avenue		No release	February Rain Event			1301 Hillside Avenue, City of Florence, South Carolina	YES
611	2/13-19/31		513 Jeffries Lane		No release	February Rain Event			513 Jeffries Lane, City of Florence, South Carolina	YES
612	2/13-19/32		120 Woody Jones Blvd. (Rail Trail)		No release	February Rain Event			120 Woody Jones Blvd., City of Florence, South Carolina	YES

Appendix B
Part 1
Reported SSOs Suspected Capacity Limitations

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
613	2/13-19/33		2519 West Palmetto Street (Rail Trail)		No release	February Rain Event			2519 West Palmetto Street, City of Florence, South Carolina	YES
614	2/13-19/34		Dunbarton Drive & Hoffmeyer Road		No release	February Rain Event			Dunbarton Drive & Hoffmeyer Road, City of Florence, South Carolina	YES
615	2/13-19/35		Lucas Park		No release	February Rain Event			Lucas Park, City of Florence, South Carolina	YES
616	2/13-19/36		2342 Cascade Avenue		No release	February Rain Event			2342 Cascade Avenue, City of Florence, South Carolina	YES
617	2/13-19/37		Guilford Circle		No release	February Rain Event			Guilford Circle, City of Florence, South Carolina	YES
618	2/13-19/38		1046 Santee Drive		No release	February Rain Event			1046 Santee Drive, City of Florence, South Carolina	YES
619	2/13-19/39		1200 Hondros Circle		No release	February Rain Event			1200 Hondros Circle, City of Florence, South Carolina	YES
620	2/13-19/40		Virginia Acres		No release	February Rain Event			Virginia Acres, City of Florence, South Carolina	YES
656	9/22/2022	1000	4400 East Palmetto Street (Lift Station)	Polk Swamp	400 Gallons	High Flow & 1 pump turned off caused erratic pump behavior and higher than normal wet well levels	Intermediate station was valved in to relieve excess flow. Emergency float installed to start all 3 pumps in case of high level.		4400 East Palmetto Street, City of Florence, South Carolina	YES
676	3/27/2023	630	4400 East Palmetto Street (Lift Station)	Polk Swamp	500 Gallons	Rain Event w/ unknown cause overwhelmed station capacity.	Station regained capacity & pumped down. Air release valves on downstream line were replaced & downstream lift station was valved in for flow relief.		4400 East Palmetto Street, City of Florence, South Carolina	YES
678	3/27/2023	800	2519 East McIver Road	High Hill Creek	500 Gallons	Pump breaker failed. Due to heave rain event, pump was running constatly more than designed.	Reset breaker to stop sso & replaced breaker. Pump soft start was also adjusted to not put as heavy a load on components.		2519 East McIver Road, City of Florence, South Carolina	YES
679	4/12/2023	1732	120 Woody Jones Blvd.	Jeffries Creek	3600 Gallons	Infiltration/inflow into system along Jeffries Creek corridor	Installed 4' riser onto manhole.		120 Woody Jones Blvd., City of Florence, South Carolina	YES

Appendix B
Part 2
Reported SSOs Unknown Cause

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
4	7/17/2005		3175 Beechwood Road	Dry land	less than 500		washed clean out		3175 Beechwood Road, City of Florence, South Carolina	unknown
5	7/21/2005		1106 Stephenson Drive	Dry land	less than 500		rodded service		1106 Stephenson Drive, City of Florence, South Carolina	unknown
9	8/6/2005		1808 Bellaire Drive	Dry land	less than 500		washed clean out		1808 Bellaire Drive, City of Florence, South Carolina	unknown
15	9/10/2005		2105 Kincaid Court	Dry land	less than 500		washed clean out		2105 Kincaid Court, City of Florence, South Carolina	unknown
17	9/29/2005		Pine & Dargan Street	Dry Branch	less than 500		washed blocked main		Pine & Dargan Street, City of Florence, South Carolina	unknown
18	10/3/2005		Walnut Street	Dry Branch	less than 500				Walnut Street, City of Florence, South Carolina	unknown
19	10/11/2005		151 N. Dargan Street	Dry land	less than 500				151 N. Dargan Street, City of Florence, South Carolina	unknown
20	10/13/2005		1811 Jason Drive	Dry land	less than 500		washed clean out		1811 Jason Drive, City of Florence, South Carolina	unknown
21	10/19/2005		2100 Fernleaf Lane	Dry land	less than 500		washed main		2100 Fernleaf Lane, City of Florence, South Carolina	unknown
31	1/9/2006		2233 Oakwood Lane	Dry land	less than 500		Washed Main		2233 Oakwood Lane, City of Florence, South Carolina	unknown
33	2/23/2006		403 Noble Street	Dry land	less than 500		Washed Main		403 Noble Street, City of Florence, South Carolina	unknown
34	2/26/2006		100 North Caroline Drive	Dry land	less than 500		Washed Main		100 North Carolina Drive, City of Florence, South Carolina	unknown
35	3/4/2006		1327 Third Loop Road	Dry land	less than 500				1327 Third Loop Road, City of Florence, South Carolina	unknown
38	3/14/2006		1929 Longwood Drive	Dry land	less than 500		Washed service		1929 Longwood Drive, City of Florence, South Carolina	unknown
40	3/20/2006		1107 Howe Springs Road	Dry land	less than 500		Repaired force main		1107 Howe Springs Road, City of Florence, South Carolina	unknown
41	3/27/2006		273 Thorncliff Road	Dry land	less than 500		Washed main		273 Thorncliff Road, City of Florence, South Carolina	unknown
44	4/3/2006		1600 S. Irby Street	Dry land	less than 500		Washed main returned 4/2/06 spread more lime		1600 S. Irby Street, City of Florence, South Carolina	unknown
45	4/17/2006		1116 Candy Lane	Dry land	less than 500		Washed service		1116 Candy Lane, City of Florence, South Carolina	unknown
46	4/17/2006		3414 Chantz Court	Dry land	less than 500		Washed service		3414 Chantz Court, City of Florence, South Carolina	unknown
47	4/20/2006		1010 Kershaw Street	Dry land	less than 500		Rodded service		1010 Kershaw, City of Florence, South Carolina	unknown
49	5/5/2006		908 Wrenwood Road	Dry land	less than 500		Rodded service		908 Wrenwood Road, City of Florence, South Carolina	unknown
50	5/12/2006		1727 W Lucas Street	Dry land	less than 500				1727 W Lucas Street, City of Florence, South Carolina	unknown
54	5/31/2006		1132 Diggs Avenue	Dry land	less than 500		Rodded service		1132 Diggs Avenue, City of Florence, South Carolina	unknown
59	6/14/2006		471 Chippenham Lane	Dry land	less than 500		Washed main		471 Chippenham Lane, City of Florence, South Carolina	unknown
61	6/20/2006		3517 Atlanta Terrace	Dry land	less than 500		Washed service		3517 Atlanta Terrace, City of Florence, South Carolina	unknown
62	6/28/2006		311 S. McQueen Street	Dry land	less than 500		Washed service		311 S. McQueen Street, City of Florence, South Carolina	unknown
63	6/30/2006		1114 Elmgrove Avenue	Dry land	less than 500		Washed service		1114 Elmgrove Avenue, City of Florence, South Carolina	unknown
65	6/30/2006		909 Madison Avenue	Dry land	less than 500		Washed service		909 Madison Avenue, City of Florence, South Carolina	unknown
66	7/3/2006		1015 Buchanan Drive	Dry land	less than 500		rodded service		1015 Buchanan Drive, City of Florence, South Carolina	unknown
68	7/21/2006		515 North Dargan Street	Dry land	less than 500		Washed service		515 North Dargan Street, City of Florence, South Carolina	unknown
74	8/29/2006		820 Waverly Avenue	Dry land	less than 500		rodded service		820 Waverly Avenue, City of Florence, South Carolina	unknown
79	9/28/2006		2700 David McLeod Blvd.	Dry land	less than 500		Washed main		2700 David McLeod Blvd., City of Florence, South Carolina	unknown
84	10/23/2006		106 Liberty Street	Dry land	less than 500		Washed service		106 Liberty, City of Florence, South Carolina	unknown
87	11/9/2006		804 Cedar Street	Dry land	less than 500		Washed main		804 Cedar, City of Florence, South Carolina	unknown
89	11/19/2006		1111 Mimosa Drive	Dry land	less than 500		Washed service		1111 Mimosa Drive, City of Florence, South Carolina	unknown
90	11/20/2006		1330 Palmetto Street	Dry land	less than 500		Washed service		1330 Palmetto, City of Florence, South Carolina	unknown
91	11/20/2006		709 Hampton Court	Dry land	less than 500		Washed service		709 Hampton Court, City of Florence, South Carolina	unknown
93	11/29/2006		3001 Stockbridge Lane	Dry land	less than 500		Washed service		3001 Stockbridge Lane, City of Florence, South Carolina	unknown
94	12/14/2006		507 Darlington Street	Dry land	less than 500		Washed service		507 Darlington Street, City of Florence, South Carolina	unknown
97	1/9/2007		765 Boone Circle	Dry land	less than 500		Washed main		765 Boone Circle, City of Florence, South Carolina	unknown
99	1/16/2007		1300 Cabrillo Drive	Dry land	less than 500		Washed main		1300 Cabrillo Drive, City of Florence, South Carolina	unknown
101	1/30/2007		603 Cannon Street	McCall Branch	less than 500				603 Cannon Street, City of Florence, South Carolina	unknown
102	2/19/2007		1401 Success Way	Dry land	less than 500		Washed service		1401 Success Way, City of Florence, South Carolina	unknown
103	2/19/2007		2111 Providence Court	Dry land	less than 500		Washed service		2111 Providence Court, City of Florence, South Carolina	unknown
104	2/24/2007		1411 Reed Court	Dry land	less than 500		Washed service		1411 Reed Court, City of Florence, South Carolina	unknown
107	3/4/2007		1317 Furches Avenue	Jeffries Creek	less than 500				1317 Furches Avenue, City of Florence, South Carolina	unknown
108	3/7/2007		2300 Broad Drive	Jeffries Creek	less than 500				2300 Broad Drive, City of Florence, South Carolina	unknown
109	3/9/2007		2400 Broad Drive	Jeffries Creek	less than 500				2400 Broad Drive, City of Florence, South Carolina	unknown
110	3/20/2007		2500 Kingston Drive	Dry land	less than 500				2500 Kingston Drive, City of Florence, South Carolina	unknown
111	4/2/2007		300 West Sumter Street	McCall Branch	less than 500				300 West Sumter, City of Florence, South Carolina	unknown
113	4/21/2007		337 Bristol Street	Dry land	less than 500				337 Bristol Street, City of Florence, South Carolina	unknown
114	4/22/2007		917 Adams Avenue	Dry land	less than 500				917 Adams Avenue, City of Florence, South Carolina	unknown
120	8/12/2007		1031 Julip Lane	Dry land	less than 500		Washed service		1031 Julip Lane, City of Florence, South Carolina	unknown
124	8/30/2007		1004 East Palmetto Street	Dry land	less than 500		Rodded service		1004 East Palmetto Street, City of Florence, South Carolina	unknown
125	8/30/2007		813 Commander Street	Dry land	less than 500		Rodded service		813 Commander Street, City of Florence, South Carolina	unknown
126	9/1/2007		811 Roberta Circle	Dry land	less than 500		Rodded service		811 Roberta Circle, City of Florence, South Carolina	unknown
132	10/12/2007		400 Noble Street	Dry Branch	less than 500				400 Noble Street, City of Florence, South Carolina	unknown
133	10/18/2007		South Damon Drive	Middle Swamp	less than 500				South Damon Drive, City of Florence, South Carolina	unknown
134	10/27/2007		3549 Georgia Lane	Dry land	less than 500				3549 Geogia Lane, City of Florence, South Carolina	unknown
135	10/29/2007		810 West Lakeside Place	Dry land	less than 500		Rodded service		810 West Lakeside Place, City of Florence, South Carolina	unknown
136	11/16/2007		600 West Washington Blvd.	Dry land	less than 500		Rodded service		600 West Washington Blvd, City of Florence, South Carolina	unknown
138	11/23/2007		2028 Dorn Lane	Dry land	less than 500		Washed service		2028 Dorn Lane, City of Florence, South Carolina	unknown
139	11/27/2007		100 West Pine Street	Dry Branch	less than 500		Washed main		100 West Pine Street, City of Florence, South Carolina	unknown
140	11/28/2007		2400 David McLeod Blvd.	Dry land	less than 500		Washed main		2400 David McLeod Blvd., City of Florence, South Carolina	unknown
142	12/3/2007		1316 West Dixie Street	Dry land	less than 500		Washed service		1316 West Dixie Street, City of Florence, South Carolina	unknown
143	12/4/2007		1115 Middleton Street	Dry land	less than 500		Washed service		1115 Middleton Street, City of Florence, South Carolina	unknown
144	12/4/2007		865 Indian Drive	Dry land	less than 500		Washed service		865 Indian Drive, City of Florence, South Carolina	unknown
147	12/22/2007		321 Chippenham Lane	Dry land	less than 500		Washed service		321 Chippenham Lane, City of Florence, South Carolina	unknown
149	12/23/2007		1221 Claremont Avenue	Dry land	less than 500		Washed main		1221 Claremont Avenue, City of Florence, South Carolina	unknown
150	12/24/2007		1812 Damon Drive	Dry land	less than 500		Washed service		1812 Damon Drive, City of Florence, South Carolina	unknown
151	12/24/2007		2804 Myrtle Drive	Middle Swamp	less than 500		Washed main		2804 Myrtle Drive, City of Florence, South Carolina	unknown
152	12/28/2007		833 Congaree Drive	Dry land	less than 500		Washed service		833 Congaree Drive, City of Florence, South Carolina	unknown
153	12/29/2007		908 Wrenwood Road	Dry land	less than 500		Unstopped service		908 Wrenwood Road, City of Florence, South Carolina	unknown
155	12/31/2007		833 Congaree Drive	Dry land	less than 500				833 Congraree Drive, City of Florence, South Carolina	unknown
157	1/7/2008		833 Congaree Drive	Dry land	less than 500		Washed service		833 Congaree Drive, City of Florence, South Carolina	unknown
158	1/18/2008		342 West Palmetto Street	Dry land	less than 500		Washed service		342 West Palmetto Street, City of Florence, South Carolina	unknown

Appendix B
Part 2
Reported SSOs Unknown Cause

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
160	1/30/2008		2100 Hoffmeyer Road	Dry land	less than 500		Washed main		2100 Hoffmeyer Road, City of Florence, South Carolina	unknown
161	2/5/2008		2346 Cascade Avenue	Dry land	less than 500		Washed service and main		2346 Cascade Avenue, City of Florence, South Carolina	unknown
162	2/6/2008		120 Sebrell Street	Dry land	less than 500		Washed main		120 Sebrell Street, City of Florence, South Carolina	unknown
163	2/8/2008		1003 East Royal Street	Dry land	less than 500		Washed service		1003 East Royal Street, City of Florence, South Carolina	unknown
164	2/11/2008		917 Adams Street	Dry land	less than 500		Washed service		917 Adams Street, City of Florence, South Carolina	unknown
166	3/15/2008		3512 Leigh Lane	Dry land	less than 500		Washed service		3512 Leigh Lane, City of Florence, South Carolina	unknown
169	3/28/2008		2229 Bellaire Drive	Dry land	less than 500		Rodded service		2229 Bellaire Drive, City of Florence, South Carolina	unknown
170	4/7/2008		720 Howe Springs Road	Dry land	less than 500				720 Howe Springs Road, City of Florence, South Carolina	unknown
171	4/11/2008		1206 Mayfair Terrace	Dry land	less than 500		Rodded service		1206 Mayfair Terrace, City of Florence, South Carolina	unknown
172	4/11/2008		361 North Church Street	Dry land	less than 500		Rodded service		361 North Church Street, City of Florence, South Carolina	unknown
173	4/11/2008		1400 McMillian Lane	Dry land	less than 500				1400 McMillian Lane, City of Florence, South Carolina	unknown
175	4/15/2008		Dargan & Booker Street	Dry land	less than 500		Washed main		Dargan & Booker Street, City of Florence, South Carolina	unknown
176	4/20/2008		1300 Valparaiso Drive	Dry land	less than 500				1300 Valparaiso Drive, City of Florence, South Carolina	unknown
177	4/21/2008		600 Plum Drive	Dry land	less than 500		Washed main		600 Plum Drive, City of Florence, South Carolina	unknown
178	4/21/2008		2701 David Mcleod Blvd.	Dry land	less than 500		Washed main		2701 David Mcleod Blvd., City of Florence, South Carolina	unknown
179	4/29/2008		3234 South Oliver Drive	Dry land	less than 500		Washed service and main		3234 South Oliver Drive, City of Florence, South Carolina	unknown
182	5/11/2008		1926 Damon Drive	Dry land	less than 500		Washed service		1926 Damon Dive, City of Florence, South Carolina	unknown
183	5/23/2008		2205 Brandon Woods Road	Dry land	less than 500		Rodded service		2205 Brandon Woods Road, City of Florence, South Carolina	unknown
184	5/28/2008		1247 South Irby Street	Dry land	less than 500				1247 South Irby Street, City of Florence, South Carolina	unknown
185	5/28/2008		1931 East Sandhurst Drive	Dry land	less than 500		Rodded service		1931 East Sandhurst Drive, City of Florence, South Carolina	unknown
187	7/5/2008		454 Chatham Place	Dry land	less than 500		Washed service		454 Chatham Place, City of Florence, South Carolina	unknown
189	7/10/2008		898 South Irby Street	Dry land	less than 500				898 South Irby Street, City of Florence, South Carolina	unknown
192	8/2/2008		3420 Saxon Drive	Dry land	less than 500		Washed service		3420 Saxon Drive, City of Florence, South Carolina	unknown
195	8/18/2008		1000 Took Place	Dry land	less than 500		Washed main		1000 Took Place, City of Florence, South Carolina	unknown
198	9/6/2008		663 Fraser Street	Dry land	less than 500				663 Fraser Street, City of Florence, South Carolina	unknown
200	9/10/2008		1700 South Malden Drive	Dry land	less than 500				1700 South Malden Drive, City of Florence, South Carolina	unknown
201	9/10/2008		1700 South Malden Drive	Dry land	less than 500				1700 South Malden Drive, City of Florence, South Carolina	unknown
205	9/16/2008		1113 Chase Street	Building	less than 500				1113 Chase Street, City of Florence, South Carolina	unknown
207	9/24/2008		1011 Wisteria Drive	Dry land	less than 500		Rodded service		1011 Wisteria Drive, City of Florence, South Carolina	unknown
208	9/26/2008		1317 Furches Avenue	Dry land	less than 500				1317 Furches Avenue, City of Florence, South Carolina	unknown
213	9/29/2008		1404 Deberry Blvd.	Dry land	less than 500		Rodded service		1404 Deberry Blvd., City of Florence, South Carolina	unknown
215	10/10/2008		405 East Mullins Street	Dry land	less than 500		Washes service		405 East Mullins Street, City of Florence, South Carolina	unknown
220	11/19/2008		2421 West Palmetto Street	Dry land	less than 500				2421 West Palmetto Street, City of Florence, South Carolina	unknown
228	1/6/2009		511 Jarrott Street	Dry land	less than 500				511 Jarrott Street, City of Florence, South Carolina	unknown
231	1/28/2009		Pine Forest Drive & Cheer Lane	Dry land	less than 500				Pine Forest Drive & Cheer Lane, City of Florence, South Carolina	unknown
234	2/7/2009		463 Bellingham Court	Dry land	less than 500		Washed service		463 Bellingham Court, City of Florence, South Carolina	unknown
235	2/8/2009		619 Boone Circle	Dry land	less than 500		Washed service		619 Boone Circle, City of Florence, South Carolina	unknown
236	2/16/2009		929 Wrenwood Road	Dry land	less than 500		Washed service		929 Wrenwood Road, City of Florence, South Carolina	unknown
244	3/13/2009		200 South Church Street	Dry land	less than 500				200 South Church Street, City of Florence, South Carolina	unknown
245	3/13/2009		306 Sanborn Street	Dry land	less than 500		Rodded service		306 Sanborn Street, City of Florence, South Carolina	unknown
247	4/1/2009		1317 Furches Avenue	Dry land	less than 500				1317 Furches Avenue, City of Florence, South Carolina	unknown
249	4/9/2009		1211 Claremont Avenue	Dry land	less than 500		Washed main		1211 Claremont Avenue, City of Florence, South Carolina	unknown
250	5/2/2009		2647 Trotter Road	Dry land	less than 500		Washed service		2647 Trotter Road, City of Florence, South Carolina	unknown
252	5/26/2009		613 Gaillard Street	Dry land	less than 500		Washed main		613 Gaillard Street, City of Florence, South Carolina	unknown
253	5/28/2009		613 Gaillard Street	Dry land	less than 500		Washed main		613 Gaillard Street, City of Florence, South Carolina	unknown
257	6/16/2009		511 Beaverdam Drive	Dry land	less than 500				511 Beaverdam Drive, City of Florence, South Carolina	unknown
265	7/25/2009		2025 Andrew Court	Dry land	less than 500		Washed service		2025 Andrew Court, City of Florence, South Carolina	unknown
266	7/26/2009		932 Ashton Drive	Building	less than 500		Washed service		932 Ashton Drive, City of Florence, South Carolina	unknown
267	7/27/2009		149 Wwestford Road	Dry land	less than 500		Washed service		149 Westford Road, City of Florence, South Carolina	unknown
269	8/4/2009		1213 West Palmetto Street	Dry land	less than 500		Washed service		1213 West Palmetto, City of Florence, South Carolina	unknown
272	8/26/2009		2900 Paving Stone Court	Dry land	less than 500		Washed service		2900 Paving Stone Court, Effingham, South Carolina	unknown
273	8/30/2009		1911 East Sandhurst Drive	Dry land	less than 500		Washed service		1911 East Sandhurst, City of Florence, South Carolina	unknown
275	9/6/2009		404 Noble Street	Dry land	less than 500		Washed main		404 Noble Street, City of Florence, South Carolina	unknown
280	9/24/2009		1730 South Irby Street	Dry land	less than 500		Utility operations crew responded to the call.	Utility operations repaired the 6" force main.	1730 South Irby Street, City of Florence, South Carolina	unknown
282	11/6/2009		2113 Elderberry Drive	Dry land	less than 500				2113 Elderberry Drive, City of Florence, South Carolina	unknown
283	11/6/2009		800-900 Palmetto Street	Gully Branch	less than 500				800-900 Palmetto Street, City of Florence, South Carolina	unknown
287	11/30/2009		1925 Damon Drive	Dry land	less than 500		Washed service		1925 Damon Drive, City of Florence, South Carolina	unknown
288	12/9/2009		1210 Waverly Avenue	Dry land	less than 500		Washed service		1210 Waverly Avenue, City of Florence, South Carolina	unknown
289	12/12/2009		1108 Waverly Avenue	Dry land	less than 500		Washed service		1108 Waverly Avenue, City of Florence, South Carolina	unknown
290	12/16/2009		1107 Diggs Avenue	Dry land	less than 500		Rodded service		1107 Diggs Avenue, City of Florence, South Carolina	unknown
291	12/18/2009		2226 Clareview Drive	Dry land	less than 500		Rodded service		2226 Clareview Drive, City of Florence, South Carolina	unknown
292	12/24/2009		3084 Brandon Woods Road	Dry land	less than 500		Washed service		3084 Brandon Woods Road, City of Florence, South Carolina	unknown
293	12/24/2009		3500 Southbrook Circle	Dry land	less than 500		Washed service		3500 Southbrook Circle, City of Florence, South Carolina	unknown
294	12/25/2009		1005 East Royal Street	Dry land	less than 500		Washed service		1005 East Royal Street, City of Florence, South Carolina	unknown
295	12/25/2009		1106 Middleton Street	Dry land	less than 500		Washed main		1106 Middleton Street, City of Florence, South Carolina	unknown
298	12/30/2009		1210 Waverly Avenue	Dry land	less than 500		Rodded service		1210 Waverly Avenue, City of Florence, South Carolina	unknown
300	12/30/2009		628 Mclver Road	Dry land	less than 500		Rodded service		628 McIver Road, City of Florence, South Carolina	unknown
301	1/5/2010		1005 East Royal Street	Dry land	less than 500		Washed service		1005 East Royal Street, City of Florence, South Carolina	unknown
302	1/5/2010	1313	1704 Victory Court	Dry land	less than 500				1704 Victory Court, City of Florence, South Carolina	unknown
303	1/5/2010		1817 Jason Drive	Dry land	less than 500		Washed service		1817 Jason Drive, City of Florence, South Carolina	unknown
304	1/6/2010		714 National Cemetery Road	Dry land	less than 500				714 National Cemetery Road, City of Florence, South Carolina	unknown
305	1/7/2010		105 Miller Street	Dry land	less than 500		Washed service		105 Miller Street, City of Florence, South Carolina	unknown

Appendix B
Part 2
Reported SSOs Unknown Cause

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
308	1/11/2010	1234	Coit & Sumter Street	Dry land	less than 500		Washed service		Coit & Sumter Street, City of Florence, South Carolina	unknown
309	1/12/2010	735	1066 Patrick Drive	Dry land	less than 500		Rodded service		1066 Patrick Drive, City of Florence, South Carolina	unknown
310	1/13/2010		3360 Thornblade Drive	Dry land	less than 500				3360 Thornblade Drive, City of Florence, South Carolina	unknown
311	1/17/2010		1111 Hillside Avenue	Dry land	less than 500				1111 Hillside Avenue, City of Florence, South Carolina	unknown
312	1/19/2010		420 Howard Street	Dry land	less than 500		Washed main		420 Howard Street, City of Florence, South Carolina	unknown
313	1/20/2010	1028	708 Harriett Drive	Dry land	less than 500				708 Harriett Drive, City of Florence, South Carolina	unknown
314	1/20/2010		Saluda Drive & Sewanee Avenue	Gully Branch	less than 500				Saluda Drive & Sewanee Avenue, City of Florence, South Carolina	unknown
315	1/22/2010		1516 North Irby Street	Dry land	less than 500		Washed service		1516 North Irby Street, City of Florence, South Carolina	unknown
316	1/23/2010		860 South Park Avenue	Dry land	less than 500		Washed main		860 South Park Avenue, City of Florence, South Carolina	unknown
317	1/25/2010	1133	1207 Windsor Road	Dry land	less than 500		Washed service		1207 Windsor Road, City of Florence, South Carolina	unknown
319	1/25/2010		900 South Santiago Drive	Dry land	less than 500				900 South Santiago Drive, City of Florence, South Carolina	unknown
321	1/26/2010	907	3175 Tall Oaks Drive	Dry land	less than 500		Washed service		3175 Tall Oaks Drive, City of Florence, South Carolina	unknown
322	1/29/2010		168 Sycamore Drive	Dry land	less than 500				168 Sycamore Drive, City of Florence, South Carolina	unknown
323	1/29/2010	1037	3084 Brandon Woods Road	Dry land	less than 500		Washed service		3084 Brandon Woods Road, City of Florence, South Carolina	unknown
324	2/1/2010	1045	929 Wrenwood Road	Dry land	less than 500		Rodded service		929 Wrenwood Road, City of Florence, South Carolina	unknown
328	2/8/2010	1527	605 Frasier Street	Dry land	less than 500		Washed service		605 Frasier Street, City of Florence, South Carolina	unknown
329	2/8/2010		Woody Jones Blvd. (Sewer in Swamp)	Beaver Dam Creek	less than 500				Woody Jones Blvd., City of Florence, South Carolina	unknown
330	2/14/2010		1824 West Lucas Street	Dry land	less than 500		Washed service		1724 West Lucas Street, City of Florence, South Carolina	unknown
331	2/18/2010	1035	1002 Macree Terrace	Dry land	less than 500		Washed service		1002 Macree Terrace, City of Florence, South Carolina	unknown
332	2/18/2010		1503 Tanglewood Circle	Dry land	less than 500		Rodded service		1503 Tanglewood Circle, City of Florence, South Carolina	unknown
333	2/24/2010		1025 Mimosa Drive	Dry land	less than 500		Washed service		1025 Mimosa Drive, City of Florence, South Carolina	unknown
334	2/24/2010		1509 Woods Avenue	Dry land	less than 500		Washed service		1509 Woods Avenue, City of Florence, South Carolina	unknown
336	2/24/2010	859	409 Park Avenue	Dry land	less than 500		Washed service		409 Park Avenue, City of Florence, South Carolina	unknown
338	3/2/2010	801	408 Millstone Road	Dry land	less than 500		Washed service		408 Millstone Road, City of Florence, South Carolina	unknown
339	3/12/2010	1523	522 & 541 Wisteria Drive	Dry land	less than 500		Washed main		522 & 541 Wisteria Road, City of Florence, South Carolina	unknown
341	3/31/2010		1927 East Sandhurst Drive	Dry land	less than 500		Washed main		1927 East Sandhurst Drive, City of Florence, South Carolina	unknown
342	4/8/2010		503 South Church Street	Dry land	less than 500		Washed service		503 South Church Street, City of Florence, South Carolina	unknown
344	4/12/2010		2006 Glenmore Drive	Dry land	less than 500		Rodded service		2006 Glenmore Drive, City of Florence, South Carolina	unknown
346	4/18/2010		3002 Buckeye Drive	Dry land	less than 500		Washed service		3002 Buckeye Drive, City of Florence, South Carolina	unknown
347	4/20/2010	1012	1850 Partridge Drive	Dry land	less than 500		Washed service		1850 Partridge Drive, City of Florence, South Carolina	unknown
352	4/26/2010	1326	507 Prince Street	Dry land	less than 500		Washed service		507 Prince Street, City of Florence, South Carolina	unknown
356	5/12/2010		3518 Leigh Lane	Dry land	less than 500		Washed main		3518 Leigh Lane, City of Florence, South Carolina	unknown
358	5/19/2010	1046	2011 Second Loop Road	Dry land	less than 500		Washed main		2011 Second Loop Road, City of Florence, South Carolina	unknown
359	5/24/2010		847 E. Pine Street	Pye Branch	less than 500		Repaired sewer main		847 E. Pine Street, City of Florence, South Carolina	unknown
361	5/27/2010	853	2800 Apple Valley Drive	Dry land	less than 500		Washed main		2800 Apple Valley Drive, City of Florence, South Carolina	unknown
363	6/4/2010		2519 West Palmetto Street	Dry land	less than 500				2519 West Palmetto Street, City of Florence, South Carolina	unknown
364	6/7/2010		1910 Winterwood Road	Dry land	less than 500		Washed service		1910 Winterwood Road, City of Florence, South Carolina	unknown
366	6/9/2010	930	1915 Longwood Drive	Dry land	less than 500		Washed service		1915 Longwood Drive, City of Florence, South Carolina	unknown
367	6/10/2010	1308	312 McLeod Street	Dry land	less than 500		Washed service		312 McLeod Street, City of Florence, South Carolina	unknown
368	6/14/2010		2400 David McLeod Blvd.	Dry land	less than 500		Washed main		2400 David McLeod Blvd., City of Florence, South Carolina	unknown
370	6/21/2010	1009	408 Guildford Circle	Dry land	less than 500		Washed main		408 Guilford Circle, City of Florence, South Carolina	unknown
372	6/28/2010	957	121 East Cedar Street	Dry land	less than 500		Washed main		121 East Cedar Street, City of Florence, South Carolina	unknown
380	7/13/2010	855	937 Farm Quarter Road	Dry land	less than 500		Washed service		937 Farm Quarter Road, City of Florence, South Carolina	unknown
381	7/20/2010		503 South Church Street	Dry land	less than 500		Washed service		503 South Church Street, City of Florence, South Carolina	unknown
382	7/24/2010		2812 Alberti Drive	Dry land	less than 500		Washed and rodded service		2812 Alberti Drive, City of Florence, South Carolina	unknown
383	7/24/2010		3980 Lake Oakdale Drive	Dry land	less than 500		Washed and rodded service		3980 Lake Oakdale Drive, City of Florence, South Carolina	unknown
385	8/3/2010	952	1132 Hollings Avenue	Dry land	less than 500		Washed service		1132 Hollings Avenue, City of Florence, South Carolina	unknown
652	8/19/2022	Unknown	4400 East Palmetto Street (Lift Station)	Polk Swamp	0 No Spillage	Unknown-No active SSO	Solids removed, lime spread		4400 East Palmetto Street, City of Florence, South Carolina	unknown
674	3/8/2023	1100	4400 East Palmetto Street (Lift Station)	Polk Swamp	750 Gallons	Under Investigation	Soil layer surrounding overflow area was removed & lime spread.		4400 East Palmetto Street, City of Florence, South Carolina	unknown

Appendix B
Part 3
Reported SSOs Known Emergency Event

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
1	7/4/2005	2030	4424 South Arundel Drive	Lake Oakdale	5,000	Pumps tripped off.	Reset pumps	Monitored 1st and 2nd shifts on 7/05/05	4424 South Arundel Drive, City of Florence, South Carolina	NO
2	7/9/2005	1500	800 West McIver Road	Black Creek	774,000	8' split in the force main.	Replace split section of the force main. Spread lime 7/13/05	No Action Necessary	800 West McIver Road, City of Florence, South Carolina	NO
3	7/13/2005	1715	817 Williamson Road	Dry land	750	Electrical storm disrupted power supply to pump station.	Called Progress Energy and they restored power supply to the station and reset electrical control panel.	Replaced phase monitor	817 Williamson Road, City of Florence, South Carolina	NO
6	7/27/2005	1230	2301 Dozier Blvd.	Dry land	100	A crack in T-valve caused a loss of pressure, disenabling the pressure switches which regulate pump operation.	Primed pumps and returned station to normal operation.	Installed a new T-valve in the pressure system.	2301 Dozier Blvd., City of Florence, South Carolina	NO
7	7/30/2005	730	817 Williamson Road	Dry land	5,000	Electrical storm blew out phase monitor.	Pump station operator called electrican.	Electricans replaced phase monitor.	817 Williamson Road, City of Florence, South Carolina	NO
8	8/1/2005	730	6719 1/2 Friendfield Road	Dry land	100	Power supply turned off by power company for new service connection. Company did not inform the City prior to disconnecting the power.	Called Santee Electric power provider.	Talked with electrical service provider about notifying the city in the future of scheduling work at the pump station if power is going to be interrupted.	6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
10	8/7/2005	1000	817 Williamson Road	Dry land	1,000	Electrical storm disrupted power supply to pump station.	Power was restored, reset electrical control panel, replaced phase monitor.	Met with Progress Energy engineer to discuss continual electrical issues with the pump station power supply. Engineer will review information on the station. Also, did power supply study and will make future suggestion of potential changes to internal electrical components for station operation.	817 Williamson Road, City of Florence, South Carolina	NO
11	8/16/2005	1500	1041 Steel Road	Canal Branch	10,000	1 phase of the 3 phase power dropped out on the supply line from the electrical provider.	Set emergency generator until power was restored by Progress Energy.	No Action Necessary	1041 Steel Road, City of Florence, South Carolina	NO
12	9/2/2005	1218	4101 Pelican Lane	Dry land	60	8' split in four inch force main.	Replace split section of the force main.	No Action Necessary	4101 Pelican Lane, City of Florence, South Carolina	NO
13	9/2/2005	700	750 W. McIver Road	Dry land	67,600	6' split in force main.	Replace split section of the force main.	No Action Necessary	750 W. McIver Road, City of Florence, South Carolina	NO
14	9/7/2005	2300	800 West McIver Road	Dry land	19,300	8' split in the force main.	Replace split section of the force main.	No Action Necessary	800 West McIver Road, City of Florence, South Carolina	NO
16	9/19/2005	900	750 West McIver Road	Dry land	13,500	20' split in the force main.	Replace split section of the force main.	See attached October 18, 2005 letter to DHEC.	750 West McIver Road, City of Florence, South Carolina	NO
22	10/26/2005		1166 Pickney Avenue	Dry land	less than 500	stopped up with paper	washed clean out		1166 Pickney Avenue, City of Florence, South Carolina	NO
23	11/14/2005		120 Conyers Avenue	Dry land	less than 500	main stopped up and damaged	replaced damaged section		120 Conyers Avenue, City of Florence, South Carolina	NO
24	12/3/2005		519 McIver Road	Dry land	less than 500	leaking bell	repair clamp		519 McIver Road, City of Florence, South Carolina	NO
25	12/6/2005		1418 Hunter Street	Dry land	less than 500	stopped with paper	rodded service		1418 Hunter Street, City of Florence, South Carolina	NO
26	12/10/2005	1000	6719 1/2 Friendfield Road	Dry land	100	Gear broke on bar screen, screen was clogged with debris.	Operated station in manual operation mode.	Replaced and installed a new gear in the bar screen.	6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
27	12/20/2005	1000	4101 Pelican Lane	Dry land	50	Jack jumped out of position on transformer feeding electricity to station.	Called Pee Dee Electric	Pee Dee Electric repaired wiring at the transformer.	4101 Pelican Lane, City of Florence, South Carolina	NO
28	12/28/2005	2030	221 Cherokee Road	Gully Branch	50	Car hit manhole ring and knocked the manhole lid out. Rain washed released sewage from asphalt into storm drain, which discharges into Gully Branch.	Crew responded immediately to police dispatch call.	Repaired manhole ring and cover.	221 Cherokee Road, City of Florence, South Carolina	NO
29	12/29/2005	1530	2600 Williamson Road	Dry land	300	Electrical storm hit phase monitor & disabled pumps.	Responded to call and called electrican for assistance.	Replaced phase monitor	2600 Williamson Road, City of Florence, South Carolina	NO
30	1/6/2006		2700 Cypress Bend	Dry land	less than 500	lift station not running	Called pump station operator and started pumps.	Placed a new lock on the electrical control panel.	2700 Cypress Bend, City of Florence, South Carolina	NO
32	1/23/2006	600	750 West McIver Road	Dry land	11,000	Ten foot - nine inch (10'9") split in force main.	Replace section in force main.	Checked gate valves positions in the valve box.	750 West McIver Road, City of Florence, South Carolina	NO
36	3/7/2006	830	750 West McIver Road	Dry land	15,000	Nineteen foot (19') split in force main.	Replace section in force main.	Made operational adjustment of reducing discharge capacity of the pump station by adjusting discharge valves at the pump station and changing impellers on the pumps which would reduce velocity and pressure of flow discharged from the pump station.	750 West McIver Road, City of Florence, South Carolina	NO
37	3/9/2006	800	2402 David McLeod Blvd.	Dry land	7,500	Sewer main blocked with grease.	Responded to the call.	Washed and rodded main to remove blockage.	2402 David McLeod Blvd., City of Florence, South Carolina	NO
39	3/14/2006		Alligator/James Turner Road	Dry land	less than 500	Contractors bored hole in force main	Repaired force main		Alligator/James Turner Road, City of Florence, South Carolina	NO
42	3/30/2006	1300	NW of 221 N. Beltline Drive	Dry land	4,000	Large rock was lodged in line, which caused other products to be collected and trapped at this location creating the blockage.	Utility operations crew responded to the call.	Cleaned sewer main with wash truck and rod machine.	NW of 221 N. Beltline Drive, City of Florence, South Carolina	NO
43	4/3/2006	No time available	1511 S. Irby Street	Dry land	100	Sewer main blocked.	Rodded and washed sewer main with truck.		1511 S. Irby Street, City of Florence, South Carolina	NO
48	4/24/2006	1000	2301 Dozier Blvd.	Dry land	500	Pumps lost prime.	Primed pumps and returned station to normal operation.	Checked pump station every 2 hours to ensure proper operation was back to normal.	2301 Dozier Blvd., City of Florence, South Carolina	NO
51	5/21/2006	730	2600 Williamson Road	Dry land	100	Relay block in panel inoperative.	Pump station operator called electrican.	Changed relay block in electrical control panel.	2600 Williamson Road, City of Florence, South Carolina	NO
52	5/22/2006	No time available	1413 North Cashua Drive	Dry land	less than 500	broken force main			1413 North Cashua Drive, City of Florence, South Carolina	NO
53	5/30/2006	2130	3550 E. Palmetto St.	Dry land	500	Six foot (6)' split on a twelve (12") inch force main.	Turned off pump station.	Replaced serven foot section of the force main.	3550 E. Palmetto St., City of Florence, South Carolina	NO
55	6/12/2006	1000	2600 Williamson Road	Dry land	500	Electrical storm hit phase monitor.	Installation of new phase monitor in station control panel.	Made staffing change to check all major pump stations daily on first and second shifts for early detection of any mechanical or electrical operating issues to further prevent or minimize SSO occurrences.	2600 Williamson Road, City of Florence, South Carolina	NO
60	6/15/2006		1900 Andrew Court	Dry land	less than 500	lift station not running			1900 Andrew Court, City of Florence, South Carolina	NO
64	6/30/2006	1430	2600 Williamson Road	Dry land	100	Separation of electrical wires from the starter.	Called electrican.	Starter was rewired and inspected by electricans on a regular basis.	2600 Williamson Road, City of Florence, South Carolina	NO
67	7/17/2006		McIver Road	Dry land	less than 500	12" force main broken	repaired 12" force main		McIver Road, City of Florence, South Carolina	NO
69	7/27/2006	931	2519 E. McIver Rd.	Black Creek	500	Relay module burnt out.	Called electrician.	Replaced burnt out relay module.	2519 E. McIver Rd., City of Florence, South Carolina	NO
70	7/28/2006	1900	2600 Williamson Road	Dry land	2,000	Electrical storm knocked out power and wind broke utility poles.	Transported mobile emergency generator to site and operated station by emergency power until power was restored.	No Action Necessary	2600 Williamson Road, City of Florence, South Carolina	NO
71	7/31/2006	1730	100 TV Road	Dry land	200	Pressure build up in the force main caused the main to split.	Force main had a 1 & 1/2' split and replace this section with a 4' length of replacement pipe.	No Action Necessary	100 TV Road, City of Florence, South Carolina	NO
72	8/7/2006	2000	2600 Williamson Road	Dry land	200	Fuses blown in electrical control panel during electrical storm.	Called electrician.	Replaced damaged fuses with new ones.	2600 Williamson Road, City of Florence, South Carolina	NO
73	8/28/2006	1245	100 E. McIver Rd.	Dry land	100	1' split in the force main.	Called pump station operator.	Repaired broken C160 pipe with C900 pipe two feet long.	100 E. McIver Rd., City of Florence, South Carolina	NO
75	9/5/2006		800 Waverly Avenue	Dry land	less than 500	chunks of grease	Washed service		800 Waverly Avenue, City of Florence, South Carolina	NO
76	9/9/2006		706 South Dunes Drive	Dry land	less than 500	grease	Washed service		706 South Dunes Drive, City of Florence, South Carolina	NO
77	9/10/2006	1300	200 Williamson Rd.	Dry land	100	6' split in the force main.	Called pump station operator and turned pump station off while repair was being completed.	Repaired force main with a 12" x 15" repair clamp.	200 Williamson Rd., City of Florence, South Carolina	NO
78	9/18/2006	800	165 W. McIver Rd.	Dry land	8,000	16' split in the force main.	Called pump station and turned off pump station while repair was being completed.	Replaced the broken C160 pvc pipe with 20' section of C900.	165 W. McIver Rd., City of Florence, South Carolina	NO

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Part 3
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80	9/29/2006		805 East Day Street	Dry land	less than 500	broken pipe	repaired main		805 East Day Street, City of Florence, South Carolina	NO
81	10/13/2006	1830	1307 North Douglas Street	Dry land	12,000	Pipe damaged by undetermined source digging in the right of way.	Turned off pump station.	Replaced 260' of 6" C160 pvc with 260' of 6" C900 pvc pipe.	1307 North Douglas Street, City of Florence, South Carolina	NO
82	10/15/2006		515 North Dargan Street	Dry land	less than 500	grease	Washed service		515 North Dargan Street, City of Florence, South Carolina	NO
83	10/16/2006	1430	1000 Celebration Square	Dry land	200	Force main hit by contractor.	Called pump station operator and turned pump station off while repair was being completed.	Replaced a 4' section of 6" pvc pipe in the force main. Also marked right of way.	1000 Celebration Square, City of Florence, South Carolina	NO
85	10/30/2006		2230 Mechanicsville Road	Dry land	less than 500	broken 4" force main	repaired 4" force main		2230 Mechanicsville Road, City of Florence, South Carolina	NO
86	11/1/2006		1307 Douglas Street	McCall Branch	less than 500	broken force main	Relayed 260' 6" force main	Completing the project from 1307 Douglas Street listed above on 10/13/06.	1307 Douglas Street, City of Florence, South Carolina	NO
92	11/21/2006	1100	Near 150 S. Ebenezer Road	Jeffries Creek	2,484,000	Wind storm blew down a tree and it fell across a ten inch (10") gravity sewer main that caused the support pillars to collapse.	Hired a contractor to complete the repair work.	Contractors used wet track equipment to replace the damaged support pillars and jacked the line back into place.	Near 150 S. Ebenezer Road, City of Florence, South Carolina	NO
95	12/18/2006	1400	Near 150 S. Ebenezer Road	Jeffries Creek	66,000	Ten inch (10") gravity sewer main had a blockage of organic and inorganic debris.	Utility operation crew responded to the call.	City staff used our rod and wash truck along with hot packs to dislodge the materials compacted together, which corrected the overflow of sewage.	Near 150 S. Ebenezer Road, City of Florence, South Carolina	NO
96	12/29/2006	2100	708 Harriet Drive	Dry land	1,500	Three (3') foot split in a six inch (6") force main	Turned off pump station.	Replaced the split section of the force main.	708 Harriet Drive, City of Florence, South Carolina	NO
98	1/11/2007	1400	1040 Becky's Parkway	Canal Branch	3,000	To set-up by-pass to repair manhole that the force main discharges into.	Put pump station back in normal operation.	No Action Necessary	1040 Becky's Parkway, City of Florence, South Carolina	NO
100	1/29/2007		500 Coker Street	Dry land	less than 500	grease	Broke grease		500 Coker Street, City of Florence, South Carolina	NO
105	2/26/2007	1000	4937 S. Irby Street	Middle Swamp	500	Relay blown in control panel.	Pump station operator called electrican.	Replaced damaged relay and returned pump station to normal operation.	4937 S. Irby Street, City of Florence, South Carolina	NO
112	4/4/2007	1230	1850 Williamson Road	Dry land	4,000	Break in the force main line.	Turned off pump station.	Replace a four (4') foot section of the eight (8") inch force main.	1850 Williamson Road, City of Florence, South Carolina	NO
115	4/24/2007		908 West Palmetto Street	Gully Branch	less than 500	broken 8" pipe	fixed broken 8" pipe		908 West Palmetto Street, City of Florence, South Carolina	NO
116	5/4/2007	1200	3622 West Palmetto Street	Dry land	30,000	Manhole was hit by a farmer clearing area at the end of a field with farm equipment.	Utility operation crew responded to the call.	Removed all the concrete and other debris from within the manhole and rebuilt the top section of the manhole and placed marking poles around the manhole.	3622 West Palmetto Street, City of Florence, South Carolina	NO
117	6/6/2007		2100 South Damon Drive	Dry land	less than 500	6" valve	repaired 6" valve		2100 South Damon Drive, City of Florence, South Carolina	NO
118	7/14/2007	1500	4000 West Pelican Lane	Lake Oakdale	19,000	Force main had a 4" (four inch) split within a section of pipe that ran thru a storm drain.	Turned off pump station.	Replaced the split section of the force main with a 6" section of C160 pvc.	4000 West Pelican Lane, City of Florence, South Carolina	NO
119	8/10/2007		Ingram Street	Dry land	less than 500	lift station off	reset station	Operator monitored pump station.	Ingram Street, City of Florence, South Carolina	NO
121	8/22/2007	1930	1040 Becky's Parkway	Canal Branch	2,000	Electrical storm tripped main breaker in pump station control panel.	Called pump station operator called electrican.	on-call electrician responded quickly and trouble-shot the electrical control panel and reset all necessary breakers and relays within the panel.	1040 Becky's Parkway, City of Florence, South Carolina	NO
122	8/23/2007	730	1040 Becky's Parkway	Canal Branch	5,000	Progress Energy transformer feeding electrical power to pump station blew up.	Used portable generator to operate station until power restored.	Progress Energy sent in a crew to replace the damaged transformer and other related damaged parts and put the station back into normal operation.	1040 Becky's Parkway, City of Florence, South Carolina	NO
123	8/23/2007	1430	266 West McIver Road	Black Creek	5,000	Electrical relays in control panel burnt up. There was a strong electrical storm in the area.	Pump station operator called electrican.	Electrician checked control panel and replaced damaged electrical relays.	266 West McIver Road, City of Florence, South Carolina	NO
127	9/23/2007	1030	1600 East Williamson Road	Dry land	500	Clamp failure.	Installed a pipe clamp.		1600 East Williamson Road, City of Florence, South Carolina	NO
128	9/27/2007		718 Wimbledon Avenue	Dry land	less than 500	roots	Rodded service		718 Wimbledon Avenue, City of Florence, South Carolina	NO
129	10/1/2007	1520	1033 Wrenwood Road	Dry land	50	Split in four inch (4") force main.	Turned off pump station.	Installed a 4"x6" repair clamp over the four inch (4") split in the force main.	1033 Wrenwood Road, City of Florence, South Carolina	NO
130	10/6/2007		1320 Highlander Court	Dry land	less than 500	roots	Rodded service		1320 Highlander Court, City of Florence, South Carolina	NO
131	10/10/2007	730	1040 Becky's Parkway	Dry land	1,000	Main power tripped out.	Electricans rerouted power thru the control panel until new breaker installed.	Purchased and installed new breaker on 10-11-2007.	1040 Becky's Parkway, City of Florence, South Carolina	NO
137	11/23/2007		1127 Diggs Avenue	Dry land	less than 500	grease	Washed service		1127 Diggs Avenue, City of Florence, South Carolina	NO
141	11/30/2007		4822 East Palmetto Street	Dry land	less than 500	Lift station off	Reset lift station	Operator monitored pump station.	4822 East Palmetto Street, City of Florence, South Carolina	NO
145	12/14/2007	645	1600 East Williamson Road	Dry land	1,000	Two jacks were out at a transformer on the line that feeds electrical power supply to the pump station. Power is supplied by Progress Energy.	Operated on-site emergency generator until power was restored by Progress Energy.	Called Progress Energy and they checked their line and identified the location of the problem and reinserted the jacks at the transformer location.	1600 East Williamson Road, City of Florence, South Carolina	NO
146	12/17/2007	730	1175 Hannah Drive	Dry land	200	Blockage in the gravity sewer.	Utility operations crew responded to the call.	Collection system crew jetted and rodded the line to break and remove blockage from the gravity line.	1175 Hannah Drive, City of Florence, South Carolina	NO
148	12/23/2007	1000	1154 Beauvoir Lane	Unnamed tributary that flows into Middle Swamp	4,000	Grease blockage in the northern gravity sewer main.	Utility operations crew responded to the call.	Sewer line maintenance crew rodded and vacuumed the line to remove the grease blockage from the gravity sewer.	1154 Beauvoir Lane, City of Florence, South Carolina	NO
154	12/31/2007	1200	3500 East Palmetto Street	Dry land	500	Large volume of grease in the line caused the pumps to lose prime.	Primed both pumps and placed the station in normal operating mode.	Operator monitored pump station.	3500 East Palmetto Street, City of Florence, South Carolina	NO
156	1/3/2008	900	2000 Pamplico Highway	Dry land	3,000	Impeller came off pump and tripped breaker on electrical control panel.	Pump station operator called electrican.	Pump station operator and maintenance crew removed pump for repair.	2000 Pamplico Highway, City of Florence, South Carolina	NO
159	1/22/2008	1500	2000 Pamplico Highway	Dry land	3,500	Debris was lodged around impeller of pumps and prevented pumping.	Remove debris from volute of both pumps and placed back into service.	Pump station operator checked up stream manholes ensure manhole lids were in place.	2000 Pamplico Highway, City of Florence, South Carolina	NO
165	2/19/2008		1221 Claremont Avenue	Dry land	less than 500	roots	washed service		1221 Claremont Avenue, City of Florence, South Carolina	NO
167	3/18/2008	No time available	4000 Pelican Lane	Lake Oakdale	1,500	Four inch (4") split in four inch (4") force main.	Turned off pump station.	Coupling sleeve was placed over split in the force main.	4000 Pelican Lane, City of Florence, South Carolina	NO
168	3/26/2008		Walnut Street	Dry land	less than 500	broken 12" main	repaired 12" main		Walnut Street, City of Florence, South Carolina	NO
174	4/13/2008		Brandon Woods Road	Dry land	less than 500	lift station off pump and not running	Called pump station operators.	Pump station operators pulled pumps and remove debris clogged in pumps volute.	Brandon Woods Road, City of Florence, South Carolina	NO
180	5/3/2008	1400	Beaverdam Creek gravity line behind West Florence High School	Beaver Dam Creek	1,000,000	Line was blocked by various debris materials.	Utility operations crew responded to the call.	The main was rodded and cleaned to remove the debris.	221 North Beltline Drive, City of Florence, South Carolina	NO
181	5/10/2008		415 Oakland Avenue	Dry land	less than 500	grease	Washed service		415 Oakland Avenue, City of Florence, South Carolina	NO
186	6/4/2008		YOUNGSÆPLANTATION INN	Dry land	less than 500	grease	Washed main		YOUNGSÆPLANTATION INN, City of Florence, South Carolina	NO
188	7/9/2008	100	2000 Block Pamplico Highway	Dry land	18,000	Transducer failure which monitors elevation level in wet well that provides a start and stop pumping signal to the pumps.	Operated the pumps in the manual position.	Electricians installed a new transducer.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO
190	7/11/2008	100	1600 E. Williamson Road	Two Mile Creek	10,000	Electrical storm disrupted power supply.	Power was restored upon arrival to site and reset pumps to return pumps to normal operation.	Operator monitored pump station.	1600 E. Williamson Road, City of Florence, South Carolina	NO
191	7/27/2008	400	2000 Block Pamplico Highway	Dry land	15,000	Power outage to pump station.	Reset breaker to electrical control panel and started pumps.	Operator monitored pump station.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO

Appendix B
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Reported SSOs Known Emergency Event

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
193	8/3/2008	1700	Intersection of Ivey & Honeysuckle	Dry land	200	Air relief valve deterioration.	Wastewater operator turned off the Quinby pump station while Utility Operation crew closed the air relief valve.	Utility operations crew installed a new air relief valve.	Intersection of Ivey & Honeysuckle, City of Florence, South Carolina	NO
194	8/5/2008	2100	Entrance of South Oak S/D on South Irby St. 4000 block	Dry land	300	Air relief valve deterioration.	Wastewater operator turned off the Dewey Carter pump station while Utility Operation crew closed the air relief valve.	Utility operations crew installed a new air relief valve.	Entrance of South Oak S/D on South Irby St. 4000 block, City of Florence, South Carolina	NO
199	9/10/2008	1000	1621 S. Mauldin Dr.	Jeffries Creek	4,200	Blockage in the gravity line.	Utility operations crew responded to the call.	Utility operations crew rodded and washed the line to break up the debris.	1621 S. Mauldin Dr., City of Florence, South Carolina	NO
203	9/11/2008	1135	221 N. Beltline Dr.	Dry land	1,500	Blockage in 8" gravity line.	Utility operations crew responded to the call.	Utility operations crew rodded and washed the line to break up the debris.	221 N. Beltline Dr., City of Florence, South Carolina	NO
204	9/13/2008	1400	3500 Broad Drive	Dry land	4,000	Manhole surcharge due to blockage in the line.	Utility operation crew responded to the call.	Utility operations crew rodded and washed the line to break up the debris.	3500 Broad Drive, City of Florence, South Carolina	NO
206	9/23/2008		FRIENDFIELD RD COUNTY JAIL	Dry land	less than 500	broken force main	Pump station operator turned off pump station until repair completed.	Utility operations crew repaired 8" force main.	FRIENDFIELD RD COUNTY JAIL, City of Florence, South Carolina	NO
211	9/28/2008	1400	1035 Ingram St.	Dry land	4,000	Pumps lost prime.	Pump station operator responded to the call.	Operator primed both pumps and returned station to normal operating procedures.	1035 Ingram St., City of Florence, South Carolina	NO
212	9/28/2008		1811 MALDEN	Dry land	less than 500	roots	Rodded service		1811 MALDEN, City of Florence, South Carolina	NO
214	10/2/2008	800	1300 Block Rollins Ave.	Jeffries Creek	150,000	Blockage within 24" sewer gravity line.	Utility operations crew responded to the call.	The City crews cleared the blockage by rodding, vacuuming, and pressurizing the line.	1300 Block Rollins Ave., City of Florence, South Carolina	NO
216	11/1/2008	800	Manhole located in edge of creek. Hampton Pointe Subdivision Area	Jeffries Creek	175,000	Tree fell on an elevated 8" interceptor, cracking a manhole.	Utility operations crew responded to the call.	Utility Operations' crew removed the tree, repaired the damage manhole and removed other trees in the close vicinity of the elevated interceptor.	Manhole located in edge of creek. Hampton Pointe Subdivision Area, City of Florence, South Carolina	NO
217	11/5/2008		THORNBERRY	Dry land	less than 500	Contractor cut force main	Pump station operator turned off pump station until repair completed.	Utility operations crew repaired force main.	THORNBERRY, City of Florence, South Carolina	NO
218	11/10/2008	No time available	BRANDONWOODS	Dry land	less than 500	broken 6" force main	Pump station operator turned off pump station until repair completed.	Utility operations crew repaired force main.	BRANDONWOODS, City of Florence, South Carolina	NO
219	11/14/2008	930	220 W. Cherokee Road	Gully Branch	17,000	Blockages in the sewer interceptor.	Utility operations crew responded to the call.	The Utility Operations' crew investigated and traced the sewer interceptor to locate the blockages within the interceptor and once located that section of the sewer interceptor was rodded to remove blockages.	220 W. Cherokee Road, City of Florence, South Carolina	NO
221	11/24/2008	900	1211 Claremont Ave.	Jeffries Creek	10,500	Ruptured water main damaged an adjacent sewer main joint.	Utility operations crew responded to the call.	Repaired damaged sewer joint and ruptured water main.	1211 Claremont Ave., City of Florence, South Carolina	NO
222	11/29/2008	930	220 W. Cherokee Road	Gully Branch	3,000	Blockages in the sewer interceptor.	Utility operations crew responded to the call.	The Utility Operations' crew investigated and traced the sewer interceptor to locate the blockages within the interceptor and once located that section of the sewer interceptor was rodded to remove blockages.	220 W. Cherokee Road, City of Florence, South Carolina	NO
223	12/11/2008	1000	220 Cherokee Road	Gully Branch	800	Grease blockage in the line.	Utility operations crew responded to the call.	The Utility crew continued to clean the line to remove excessive grease blocks from the line.	220 Cherokee Road, City of Florence, South Carolina	NO
224	12/13/2008	2030	1850 Williamson Rd.	Two Mile Creek	125,000	Break in the force main line.	Pump station operator turned off pump station until repair completed.	Replaced the coupling and pipe on the force main.	1850 Williamson Rd., City of Florence, South Carolina	NO
225	12/20/2008		1122 LEWIS	Dry land	less than 500	roots	Rodded service		1122 LEWIS, City of Florence, South Carolina	NO
226	12/30/2008	1300	2400 David McLeod Blvd.	Dry land	30	Grease blockage in the sewer main.	Utility operations crew responded to the call.	The main was washed and rodded to break and remove the grease blockage.	2400 David McLeod Blvd., City of Florence, South Carolina	NO
227	1/5/2009	2000	6719 1/2 Friendfield Road	McCall Branch	30,000	The Effingham Detention Center lost water pressure and all urinals and other water devices got stuck creating a continuous full flow from all devices and the water was clean and clear.	2nd Shift operator responded to the call.	Called detention center on-call maintenance staff who came and corrected the internal water pressure problem.	6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
229	1/7/2009	1300	1104 Hillside Avenue	Dry land	30	Manhole was hit by loggers.	Utility operations crew responded to the call.	Utility sewer placed the manhole cover back in its proper position and sealed it with concrete and concrete sealer.	1104 Hillside Avenue, City of Florence, South Carolina	NO
230	1/15/2009	1000	Gaillard Street	Dry Branch	1,000,000	10" clay sanitary sewer line was cracked and sewer was entering a joint in the adjoining storm drainage line.	Utility operations crew responded to the call.	The Utility crews repaired both the 10" clay sanitary sewer line and adjoining storm drainage line.	Gaillard Street, City of Florence, South Carolina	NO
232	1/29/2009	1245	2400 David McLeod Blvd.	Beaver Dam Creek	25,000	Grease blockage in the sanitary sewer.	Utility operation crew responded to the call.	Utility crew immediately began washing the line from a downstream manhole.	2400 David McLeod Blvd., City of Florence, South Carolina	NO
233	2/4/2009	830	221 N. Beltline Dr.	Dry land	100	Root intrusion into manhole catching debris and blocking flow.	Utility operations crew responded to the call.	Removed the root growth from the manhole.	221 N. Beltline Dr., City of Florence, South Carolina	NO
237	2/17/2009		708 Harriet Dr	Dry land	less than 500	leaking clamp	tightened clamp		708 Harriet Dr, City of Florence, South Carolina	NO
240	3/4/2009	1100	1175 Hannah Drive	Unnamed tributary that flows into Middle Swamp	200	Both pumps at the Pine Forrest pump station tripped out.	Pump station operator responded to the call.	Operator called electrician to check the control panel operating system.	1175 Hannah Drive, City of Florence, South Carolina	NO
241	3/5/2009	1000	1175 Hannah Drive	Unnamed tributary that flows into Middle Swamp	500	Both pumps at the Pine Forrest pump station tripped out.	Pump station operator responded to the call.	Operator called electrician to check the control panel operating system and contacted contractor to meet with their electrician due to this being a new pump station accepted approximately three weeks prior.	1175 Hannah Drive, City of Florence, South Carolina	NO
242	3/5/2009	1110	2421 W. Palmetto St.	Dry land	1,500	Blockage in the line down stream.	Utility operations crew responded to the call.	Staff rodded the line from downstream manhole and our FOG inspector is working with facilities upstream to ensure proper operation and maintenance of their grease traps.	2421 W. Palmetto St., City of Florence, South Carolina	NO
243	3/7/2009	1335	1621 S. Mauldin Dr.	Dry land	20	Pumps were clogged with grease.	Pump station operator responded to the call.	Operators pulled both pumps and broke up the large deposits of grease within the pump station wet well.	1621 S. Mauldin Dr., City of Florence, South Carolina	NO
246	3/25/2009	1430	1175 Hannah Drive	Dry land	800	Grease blockage in the gravity sewer.	Utility operation crew responded to the call.	The line was rodded upstream and downstream of the manhole to break up and remove excess grease from the collection system in the area.	1175 Hannah Drive, City of Florence, South Carolina	NO
251	5/14/2009	600	519 Williamson Road	Dry land	4,000	Break in a 12" force main line 2' in length occurring at the bell.	Pump station operator turned off pump station until repair completed.	Replaced a 3.6' section of pipe and installed two couplings on the force main.	519 Williamson Road, City of Florence, South Carolina	NO
254	6/5/2009	830	2000 Block Pamplico Highway	Middle Swamp	18,000	Blown fuse on the main breaker.	Pump station operator responded to the call and called an electrician.	Replaced blown fuse on the main breaker with a new one.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO
255	6/6/2009	1610	1600 E. Williamson Road	Two Mile Creek	12,000	#18 wire for the mercury sensor system broken at terminal within electrical control panel.	Pump station operator responded to the call and called an electrician.	Called electrician to trouble the control panel within the station to diagnose the situation. A broken terminal wire was found within the electrical control panel, which prevented the pumps from operating correctly in automatic mode.	1600 E. Williamson Road, City of Florence, South Carolina	NO
256	6/16/2009	730	2000 Block Pamplico Highway	Middle Swamp	90,000	Blown fuse on the main breaker.	Pump station operator called electrican.	Replaced blown fuse on the main breaker with a new one and electrical staff investigated the situation to try and identify what is causing the blown fuse to occur.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO

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259	6/17/2009	1100	266 W. McIver Road	Black Creek	39,000	Pumps were clogged with rags and other large debris.	Pump station operator responded to the call.	Operators pulled pumps from wet well and removed rags and other debris from volute section of the pumps.	266 W. McIver Road, City of Florence, South Carolina	NO
261	6/19/2009	1300	1400 Block Fairfax Ave.	Dry land	800	Manhole was hit by contractor.	Utility operations crew responded to the call.	Utility sewer placed the manhole cover back in its proper position and sealed it with concrete and concrete sealer.	1400 Block Fairfax Ave., City of Florence, South Carolina	NO
262	6/20/2009	1500	2000 Block Pamplico Highway	Dry land	3,500	Breaker in control panel tripped out and would not allow pumps to engage.	Pump station operator called electrican.	Operator called on-call electrician to trace the electrical problem. Electrician staff found burnt wires within the control panel impacts proper operation of the transducer and high level alarm system	2000 Block Pamplico Highway, City of Florence, South Carolina	NO
263	7/4/2009	1520	350 Fairhaven Road	Dry land	300	Mercury switch went bad at the down stream pump station.	Pump station operator called electrican.	Operator placed pump in hand operation mode and pump the station wet well down. Then called electrician to check the multiple mercury switches and changed bad mercury switch.	350 Fairhaven Road, City of Florence, South Carolina	NO
264	7/20/2009	No time available	301 LFT STA	Dry land	less than 500	lift station problem	Called pump station operator.	Pump station monitored the pump station for normal operation.	301 LFT STA, City of Florence, South Carolina	NO
268	7/30/2009	1800	2000 Block Pamplico Highway	Dry land	3,500	Electrical storm caused main breaker to fail.	Operator reset main breaker.	Operator called electrician to check electrical components within the control panel.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO
270	8/6/2009	800	3500 E. Palmetto St.	Dry land	300	Fuse blown for main breaker.	Pump station operator called electrican.	Electrician replaced blown fuse and reset breaker control parameters.	3500 E. Palmetto St., City of Florence, South Carolina	NO
271	8/16/2009	2000	410 Thomas Road	Dry land	1,500	Blockage in gravity sewer main.	Utility operations crew responded to the call.	The main sewer line was rodded out which removed the blockage from the sewer line and allowed the sewer to drain normally.	410 Thomas Road, City of Florence, South Carolina	NO
274	8/31/2009	1515	1600 E. Williamson Road	Dry land	1,200	Phase monitor burnt out in electrical control panel.	Upon arrival operator assessed the problem and installed back up phase monitor kept onsite within the electrical control panel.	Called electrician to trouble shoot the electrical control panel.	1600 E. Williamson Road, City of Florence, South Carolina	NO
276	9/9/2009	1030	2000 Block Pine Needles Road	Dry land	2,000	Electrical control breaker at our Pine Needles pump station tripped out.	Pump station operator called electrican.	Electrician checked electrical control breaker and reset to operating conditions.	2000 Block Pine Needles Road, City of Florence, South Carolina	NO
277	9/10/2009		Presbyterian Home	Dry land	less than 500	Contractor peirced force main	Pump station operator turned off pump station until repair completed.	Utility operations crew repaired the 4" force main.	Presbyterian Home, City of Florence, South Carolina	NO
278	9/16/2009	1030	Intersection of Marshall & Lester Streets	Dry land	200	Line blockage due to grease.	Utility operations crew responded to the call.	Utility Operations' crew rodded and vacuumed the line to remove the debris blockage.	Intersection of Marshall & Lester Streets, City of Florence, South Carolina	NO
279	9/17/2009	600	1000 Stockade Drive	Dry land	1,000	Air line broke in sludge holding tank.	Wastewater operations turned off the air line.	Repaired air line inside holding tank.	1000 Stockade Drive, City of Florence, South Carolina	NO
281	11/3/2009		GREER ROAD NATÆL GUARD ARMORY	Dry land	less than 500	contractor cut 8" main	Utility operations crew responded to the call.	Utility operations crew repaired the 8" force main.	GREER ROAD NATÆL GUARD ARMORY, City of Florence, South Carolina	NO
284	11/8/2009	800	6719 1/2 Friendfield Road	McCall Branch	1,000	The line was clogged with debris and grease.	Utility operations crew responded to the call.	Operator called our line crew which washed and rodded the line to breakup and remove the blockage of debris.	6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
285	11/21/2009	1230	4104 W. Pelican Lane	Dry land	240	Electrical power supply failure on Pee Dee Electrical side.	Electrician checked electrical supply & called Pee Dee Electric. Maintenance & Electrical operators brought portable generators and ran station until Pee Dee Electric restored power.	Pee Dee Electric restored power to the pump station.	4104 W. Pelican Lane, City of Florence, South Carolina	NO
286	11/27/2009	1900	2012 Pisgah Road	Unnamed tributary that flows into High Hill Creek	500	Grease blockage from Palmer Work Release Center. Palmer is the only service at this location connected to the City's sewer collection system. Internal grease trap and operation and maintenance system needs to be monitored closely to ensure proper operation. The City's CMOM inspector is set to meet with Center to identify the operational problem.	Utility operations crew responded to the call.	City staff rodded and cleaned the line to remove the blockage. CMOM inspector is set to meet with the supervisor on Thursday, December 3, 2009, to discuss operation and maintenance of their grease trap and proper maintenance of their internal system.	2012 Pisgah Road, City of Florence, South Carolina	NO
296	12/25/2009	1830	2342 Cascade Ave.	Dry land	100	Residential service connection to the main broken.	Utility operations crew responded to the call.	Installed a new service residential service connection to the main.	2342 Cascade Ave., City of Florence, South Carolina	NO
297	12/26/2009	1730	4937 S. Irby St.	Dry land	50	Mercury switch was not operating properly.	Pump station operator called electrican.	Replaced mercury switch and placed pump in normal operation.	4937 S. Irby St., City of Florence, South Carolina	NO
299	12/30/2009		2347 CASCADE	Dry land	less than 500	broken service			2347 CASCADE, City of Florence, South Carolina	NO
306	1/8/2010	1245	305 Magna Carta Road	Dry land	less than 500	lift station off	Pump station operator responded to the call.	Pump station operator monitored the station for normal operation.	305 Magna Carta Road, City of Florence, South Carolina	NO
307	1/10/2010	1620	2400 David McLeod Blvd.	Dry land	100	Grease blockage in the sewer main.	Utility operations crew responded to the call.	The main was washed and rodded to break and remove the grease blockage. FOG inspector is investigating commercial businesses in the area and meeting with them in accordance with City of Florence Ordinances.	2400 David McLeod Blvd., City of Florence, South Carolina	NO
318	1/25/2010	1930	266 W. McIver Road	Black Creek	3,500	Two mercury switches were inoperative.	Pump station operator called electrican.	Operator switched pumps to hand operation and pumped down the wet well. Electricians then came and installed new mercury switches.	266 W. McIver Road, City of Florence, South Carolina	NO
335	2/24/2010	1003	1915 Converse Dr	Dry land	less than 500	roots	Washed service		1915 Converse Dr, City of Florence, South Carolina	NO
337	3/2/2010	1256	1046 Santee Drive	Dry land	1,000	Sewer interceptor was blocked.	Utility operations crew responded to the call.	Collection operation crew inspected, washed, and rodded sewer interceptor.	1046 Santee Drive, City of Florence, South Carolina	NO
340	3/30/2010	1410	6331 E. Palmetto Street	Two Mile Creek	3,700	One of the jack legs was out on the transformer on the supply line to the pump station from Progress Energy.	Pump station operator responded to the call and called Progress Energy.	Progress Energy technician placed jack leg back into proper position and power supply resumed to the pump station.	6331 E. Palmetto Street, City of Florence, South Carolina	NO
343	4/9/2010	1200	701 N. Williamson Road	Two Mile Creek	6,000	Break in a 12" force main line being 18" in length.	Pump station operator turned off pump station until repair completed.	Replaced a 2' section of pipe and installed two couplings on the force main. Electricians installed two soft starts which allow for continual operation thereby reducing initial startup pressure within the SSS.	701 N. Williamson Road, City of Florence, South Carolina	NO
345	4/16/2010		WWTP	Dry land	less than 500	broken pipe			WWTP, City of Florence, South Carolina	NO
348	4/21/2010	100	1600 E. Williamson Road	Two Mile Creek	45,000	Discharge piping split leaving the pump station.	Pump station operator turned off pump station until repair completed.	City crews replaced a 3' section of discharge piping and installed two new repair clamps.	1600 E. Williamson Road, City of Florence, South Carolina	NO
349	4/22/2010	1511	Lester School	Dry land	less than 500	lift station not working	Pump station operator responded to the call.	Pump station operator and utility operation crew vacuumed excess grease from pump station wet well.	Lester School, City of Florence, South Carolina	NO
350	4/23/2010	1315	221 N. Beltline Dr.	Dry land	250	Grease blockage in 8" gravity line.	Utility operation crew responded to the call.	City crews washed line in both directions to breakup grease and wash line to ensure line was properly flowing. Also notify FOG inspector.	221 N. Beltline Dr., City of Florence, South Carolina	NO
351	4/23/2010	1519	Hoffmeyer & Evans	Dry land	less than 500	Dirt from construction	Washed service		Hoffmeyer & Evans, City of Florence, South Carolina	NO
353	4/28/2010	1010	1759 St. Anthony Drive	Dry land	less than 500	Contractor cut service	Repaired service line		1759 St. Anthony Drive, City of Florence, South Carolina	NO
354	5/4/2010		2658 TROTTER	Dry land	less than 500	roots	Repaired service line		2658 TROTTER, City of Florence, South Carolina	NO
355	5/7/2010	923	1300 VALPARAISO	Dry land	less than 500	grease	Washed service		1300 VALPARAISO, City of Florence, South Carolina	NO
357	5/13/2010	1700	2000 Block Nance Road	Dry land	2,000	8" split in the 6" force main.	Utility operations crew responded to the call.	Utility field crew installed an 18" repair clamp to repair the 6" force main.	2000 Block Nance Road, City of Florence, South Carolina	NO
360	5/26/2010	1400	1600 E. Williamson Road	Dry land	700	Mercury switch stuck with grease from collection system.	Pump station operator responded to the call.	Operator pump wet well down and removed all residual grease from the wet well.	1600 E. Williamson Road, City of Florence, South Carolina	NO
362	6/3/2010	815	266 W. McIver Road	Black Creek	1,500	Phase monitor was inoperable.	Pump station operator responded to the call.	Operator called electricians who came and installed a new phase monitor.	266 W. McIver Road, City of Florence, South Carolina	NO

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365	6/7/2010	1143	4301 W. Pelican Ln.	Dry land	less than 500	broken force main	Pump station operator turned off pump station until repair completed.	Replaced the broken force main.	4301 W. Pelican Ln., City of Florence, South Carolina	NO
369	6/17/2010		W. PALMETTO RAIL TRAIL SWR (BEHIND BICYCLE WORLD)	Dry land	less than 500	leaking manhole	Utility operations crew responded to the call.	Repaired manhole with cement adhesive packs	W. PALMETTO RAIL TRAIL SWR (BEHIND BICYCLE WORLD), City of Florence, South Carolina	NO
371	6/27/2010	1800	266 W. McIver Road	Black Creek	4,500	Electrical storm hit station and caused a power surge within the phase monitor.	2nd Shift operator responded to the call.	Operator called electricians who came and installed a new phase monitor and reset control panel.	266 W. McIver Road, City of Florence, South Carolina	NO
373	6/29/2010	1300	1000 Stockade Drive	Dry land	1,300	Object stuck in drain line.	Wastewater operator called for utility operations crew vactor truck.	Used vactor truck to wash line under pressure to move stuck object within the line.	1000 Stockade Drive, City of Florence, South Carolina	NO
374	6/29/2010	1139	3205 Industry Blvd.	Dry land	less than 500	Contractor cut abandon force main	Pump station operator turned off pump station until repair completed.	Utility operations crew replaced broken section of the force main.	3205 Industry Blvd., City of Florence, South Carolina	NO
375	6/29/2010		EBENEZER ROAD/INDUSTRIAL BLVD	Dry land	less than 500	broken line	Repaired 6" line		EBENEZER ROAD/INDUSTRIAL BLVD, City of Florence, South Carolina	NO
376	7/1/2010	1830	2000 Block Pamplico Highway	Dry land	3,900	Transducer starting to fail electronically.	Pump station operator called electrican.	Called electrician to calibrate unit and check operating parameters. Also, ordered a new unit to be installed.	2000 Block Pamplico Highway, City of Florence, South Carolina	NO
377	7/10/2010	1800	1600 E. Williamson Road	Two Mile Creek	3,000	Electrical storm disrupted power supply.	Operated on-site emergency generator until power was restored by Progress Energy.	No Action Necessary	1600 E. Williamson Road, City of Florence, South Carolina	NO
384	7/26/2010	2045	1600 E. Williamson Road	Two Mile Creek	600	Electrical storm hit the Progress Energy line providing service to our pump station and caused a disrupted of power supply to the station.	Upon arrival inspection station would not operate. Called on-call electrician who instructed him how to turn on the on-site emergency generator and ran the emergency generator for two and one-half hours while Progress Energy completed their repair work.	No Action Necessary	1600 E. Williamson Road, City of Florence, South Carolina	NO
386	8/10/2010	914	3514 Southborough Rd.	Dry land	less than 500	Contractor cut abandon force main	Utilty operations crew responded to the call.		3514 Southborough Rd., City of Florence, South Carolina	NO
387	8/13/2010	1300	905 Whitehall Shores	Dry land	less than 500	Floatballs hung up in station and prevented pumps from operating normally.	Pump station operator identified the problem, pulled up float balls and untangled floatballs.		905 Whitehall Shores, City of Florence, South Carolina	NO
388	8/27/2010	830	1129 Hannah Dr.	Dry land	144,000	Blockage in sewer main composed mostly of grease	Utility crew rodded the line restoring normal flow.		1129 Hannah Dr., City of Florence, South Carolina	NO
389	9/1/2010	1900	466 Guildford Circle	Dry land	144,000	Blockage in sewer main composed mostly of grease	Utility crew rodded the line restoring normal flow.		466 Guildford Circle, City of Florence, South Carolina	NO
390	9/2/2010	700	509 S. Dargan St.	Dry land	4,000	Crack on the bell section of the sewer pipe	Repaired the bell section of the pipe with Quick Patch		509 S. Dargan St., City of Florence, South Carolina	NO
396	9/30/2010	1015	1000 Block Becky's Pkwy	Canal Creek	50,000	Main breaker for the electrical control panel burnt out.	Electrician jumpered out the main breaker until a new one could be obtained from the electrical supply house.		1000 Block Becky's Pkwy, City of Florence, South Carolina	NO
397	9/30/2010	820	1600 E. Williamson Road	Two Mile Creek	50,000	Electrical relay was inoperative inside the electrical control panel.	Electrician installed a new electrical relay upon arrival to the station.		1600 E. Williamson Road, City of Florence, South Carolina	NO
402	10/10/2010	1430	701 N. Williamson Road	Two Mile Creek	10,000	Break in 12" force main line	Replaced a section of pipe 15' long and installed couplings on the force main.		701 N. Williamson Road, City of Florence, South Carolina	NO
403	10/22/2010	1700	Intersection Pineland Ave & S. Cashua St.	Dry land	500	Grease build-up collecting at a manhole creating a blockage	Utility crew rodded the line and ten used the vactor truck to remove residual grease and other sold material from the line and manhole.		Intersection Pineland Ave & S. Cashua St., City of Florence, South Carolina	NO
404	10/30/2010	1645	700 S. Dargan St.	Dry land	less than 500	Cleared lot service connect clean-out was damaged during clearing process and with main up release occurred at the sewer connection.	Collection system crew washed and rodded the line to remove the blockage.		700 S. Dargan St., City of Florence, South Carolina	NO
405	10/30/2010	2046	400 S. Sanborn St.	Dry land	less than 500	Failure was due to a grease blockage in the sewer collection system	Collection system crew washed and rodded the line to remove the blockage. Also our FOG inspector is providing a FOG pamphlet to the residents in the area whose sewer flows thru this portion of the collection system.		400 S. Sanborn St., City of Florence, South Carolina	NO
406	1/4/2011	1100	Intersection Howard & Kershaw Streets	Dry land	700	Blockage in gravity sanitary sewer interceptor due to congealed grease improperly discharged into sewer system	The blockage was cleared by washng & vacuuming the line from a downstream manhole by city crews.		Intersection Howard & Kershaw Streets, City of Florence, South Carolina	NO
407	1/12/2011	1550	Intersection S. Coit St. & Cherokee Rd.	Jeffries Creek	4,000	Blockage in gravity sanitary sewer interceptor due to congealed grease improperly discharged into sewer system	The blockage was cleared by washng & vacuuming the line from a downstream manhole by city crews.		Intersection S. Coit St. & Cherokee Rd., City of Florence, South Carolina	NO
408	3/3/2011	1300	3117 W. Palmetto St.	Jeffries Creek	less than 500	Rags & debris cased the downstream sewage pump station to have an electrical overload preventing both pumps from operating.	Collection system crew responded to the call and notified pump station operators to check the first downstream sewage pump station.		3117 W. Palmetto St., City of Florence, South Carolina	NO
410	4/13/2011	1430	3315 Hoffmeyer Rd.	Dry land	3,700	Collection system operators completing a tie-in for the new FSD 1 elementary school.	Pump station operator turned off an additional pump station discharging to the force main not located near the area involved with the tie-in.		3315 Hoffmeyer Rd., City of Florence, South Carolina	NO
411	5/12/2011	2000	Intersection of Magnolia St. & Oakland Ave.	Dry land	1,500	Discharge of fats and grease into the sanitary sewer system.	Night crew used vactor truck to wash and rod line to break up the blockage. The used vacuum suction to remove the large composition of grease from the sanitary sewer.		Intersection of Magnolia St. & Oakland Ave., City of Florence, South Carolina	NO
412	5/30/2011	1800	1237 Spring Branch Rd.	Dry land	1,500	Discharge of fats and grease into the sanitary sewer system caused the pressure in the main to increase and created a break in the line allowing for discharge of sanitary sewer to be released.	Night crew used vactor truck to wash and rod line to break up the blockage. The used vacuum suction to remove the large composition of grease from the sanitary sewer.		1237 Spring Branch Rd., City of Florence, South Carolina	NO
413	6/11/2011	1535	3117 W. Palmetto St.	Jeffries Creek	1,800	Elevated ampere usage by the pumps caused the thermal overloads to malfunction and not allow the pumps to operate continuously.	Electrical staff replaced both thermal overloads in the electrical control panel of the pump stations.		3117 W. Palmetto St., City of Florence, South Carolina	NO
414	7/22/2011	1220	903 Rice Planters	Dry land	5,900	Both pumps at the Pine Needles pump station were clogged with rags and debris preventing the pumps from pumping sewage.	Operators removed rags and debris from both pump stations and returned stations to normal operation condition.		903 Rice Planters, City of Florence, South Carolina	NO
415	8/29/2011	1300	1600 E. Williamson Road	Two Mile Creek	15,000	Electrical breakers were tripped in the electrical control panel at the pump station.	The maintenance operator found the problem when passing the station and immediately stopped and reset the electrical control for both pumps in the station.		1600 E. Williamson Road, City of Florence, South Carolina	NO

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416	8/31/2011	945	550 Fairway Dr.	Dry land	4,000	Contractor hit and removed a 6' section of 18" terra cotta pipe while excavating at the golf course. He did not call for locates.	Collection crew constructed a berm to contain the release of sewage and installed a 7' section of 18" PVC pipe with femco couplings.	Met with contractor onsite and informed them of the rules of digging or excavating to meet state requirements.	550 Fairway Dr., City of Florence, South Carolina	NO
417	10/12/2011	1515	2423 David H. McLeod Blvd.	Beaver Dam Creek	20,000	Grease blocking sewer lines.	Crew cleared blockage by washing and vacuuming the line from a downstream manhole and then used vacuum suction to remove the large composition of grease from the sanitary sewer.		2423 David H. McLeod Blvd., City of Florence, South Carolina	NO
418	12/4/2011	1000	6719 1/2 Friendfield Road	Lynches River	1,600	The gear box drive sheared which operates the bar screen.	Spread lime pellets on the affected area		6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
419	12/12/2011	915	1604 Partridge Drive	Jeffries Creek	4,500	Grease blocking sewer lines.	Spread lime pellets on the affected area		1604 Partridge Drive, City of Florence, South Carolina	NO
420	12/20/2011	1100	1153 Day Street	Pye Branch	20,000	Grease blockage in 10" sewer line	Spread lime pellets on the affected area		1153 Day Street, City of Florence, South Carolina	NO
421	12/30/2011	1630	1600 E. Williamson Road	Two Mile Creek	3,400	High level alarm mercury switch became inoperable	The affected area was raked to remove debris and solids and pellet lime was spread for disinfection and odor control in the area adjacent to the water body.		1600 E. Williamson Road, City of Florence, South Carolina	NO
423	1/19/2012	1548	1177 Hannah Drive	Middle Swamp	4,000	Grease and rags blocking sewer lines.	Spread lime pellets on the affected area		1177 Hannah Drive, City of Florence, South Carolina	NO
424	4/30/2012	835	2101 Kristens Channel	Forest Lake	less than 500	Grease blocking floats in wet well in Womack Gardens Lift Station	Washed out storm drain		2101 Kristens Channel, City of Florence, South Carolina	NO
426	6/8/2012	1230	2000 Block Pine Needles Road	dry land	1,800	Both pumps at Pine Needles pump station tripped due to rags/trash	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		2000 Block Pine Needles Road, City of Florence, South Carolina	NO
427	7/2/2012	1325	3728 N. Williston Rd.	Dry land	less than 500	Severe wind storm on 7/1/2012 resulted in power outage of Eastern Florence including this lift station and down stream station Hwy 301.	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		3728 N. Williston Rd., City of Florence, South Carolina	NO
428	7/2/2012	1553	103 Easterling Circle, Quinby	Dry land	800 gallons	Severe wind storm on 7/1/2012 resulted in power outage of Eastern Florence including this lift station. Power restored on 7/3/12 - 8:00 am	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		103 Easterling Circle, Quinby, City of Florence, South Carolina	NO
429	7/10/2012	1920	Williamson Road	Two Mile Creek	3000 gallons	Lightning in area tripped control breaker to station	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		Williamson Road, City of Florence, South Carolina	NO
430	7/22/2012	946	301 Pump Station	Polk Swamp	800 gallons	Control fuses and phase monitor blown out, probably due to power surge.	City electrician replaced the fuses and monitor and restarted the pumps. Cleaned up and spread lime pellets on the affected area.		301 Pump Station, City of Florence, South Carolina	NO
431	9/7/2012	851	Middle Swamp lift station	Middle Swamp	7200 gallons	The pump control panel was tripped due to lightning storm. Severe lightning and heavy rain (2.25")	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		Middle Swamp lift station, City of Florence, South Carolina	NO
432	12/21/2012	1250	Williamson Road	Two Mile Creek	4050 gallons	Progress Energy lost power to the station due to phase loss on their supply line (tripped breakers on power lines)	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		Williamson Road, City of Florence, South Carolina	NO
433	1/6/2013	1140	Williamson Road	Two Mile Creek	1350 gallons	Progress Energy lost power to the station due to phase loss on their supply line (tripped breakers on power lines)	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		Williamson Road, City of Florence, South Carolina	NO
434	1/19/2013	1325	802 Walnut Street	Dry Branch	4000 gallons	Blockage in main	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		802 Walnut Street, City of Florence, South Carolina	NO
435	2/26/2013	1825	2000 Pamplico Hwy	Middle Swamp	10500 gallons	Progress Energy lost power to the liftstation due to severe weather that damaged a main power feeder to a large area of Florence - possible tornado	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		2000 Pamplico Hwy, City of Florence, South Carolina	NO
438	5/2/2013	1030	Bridge on Whitehall Shores Rd over Oakdale Lake	Oakdale Lake	8200 gallons	Corrosion caused hole in 4" force main under the water at the bridge.	Passed out notifications to residents along the lake(14). Pulled samples, got a plan together and materials to cut, plug and relay the force main on the bridge.		Bridge on Whitehall Shores Rd over Oakdale Lake, City of Florence, South Carolina	NO
439	5/7/2013	1410	100 Kenzie Avenue	Dry land	100 gallons	Hole in force pipe, probably from a small rock in the pipe bed.	WW operator checked the LS and found leak in the force main when the pump was running, he shut the pumps off and the force main pipe was repaired.		100 Kenzie Avenue, City of Florence, South Carolina	NO
444	8/11/2013	1746	1600 East Williamson Rd	Two Mile Creek	2700 gallons	Float ball switch failed; would not turn pumps on to run	The area was raked to remove visible solids and pellet lime was spread for odor control and disinfection.		1600 East Williamson Rd, City of Florence, South Carolina	NO
446	9/27/2013	2300	5227 E. Palmetto St.	Dry land	3600 gallons	On a routine inspection, WW operator found that electrical power feeding the station wetwell was out and station was overflowing.	Operator contacted Duke Power and electrician on call. Duke restored power and the operator pumped the station down. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		5227 E. Palmetto St., City of Florence, South Carolina	NO
447	10/4/2013	1100	Timrod Park	Gully Branch	2100 gallons	It appeared as though the dirt washed away from the 15" RCP storm drain pipe, causing the pipe to collaps onto the clay sewer pipe below. This brok the sewer pipe.	Cleanup will be complete when the storm drain pipe is installed.		Timrod Park, City of Florence, South Carolina	NO
449	2/13/2014	1105	3700 Breckridge Circle	Dry land	1100 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		3700 Breckridge Circle, City of Florence, South Carolina	NO
450	2/13/2014	855	Patriot Drive	Dry land	1500 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		Patriot Drive, City of Florence, South Carolina	NO
451	2/13/2014	845	2000 Pamplico Hwy	Middle Swamp	900 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		2000 Pamplico Hwy, City of Florence, South Carolina	NO
452	2/13/2014	1105	6331 E. Palmetto Street	Dry land	2875 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		6331 E. Palmetto Street, City of Florence, South Carolina	NO

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453	2/13/2014	1105	End of Market Street	Sparrow Swamp	4500 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		End of Market Street, City of Florence, South Carolina	NO
454	2/13/2014	850	4424 S. Arundel Drive	Dry land	1800 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		4424 S. Arundel Drive, City of Florence, South Carolina	NO
455	2/13/2014	840	1600 E. Williamson Road	Two Mile Creek	1200 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		1600 E. Williamson Road, City of Florence, South Carolina	NO
456	2/14/2014	1400	Paper Mill Rd @ Johnson Controls	Dry land	950 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		Paper Mill Rd @ Johnson Controls, City of Florence, South Carolina	NO
457	2/14/2014	1000	End of Market Street	Sparrow Swamp	1000 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		End of Market Street, City of Florence, South Carolina	NO
458	2/14/2014	1201	2132 Woodmore Circle	Dry land	900 gallons	Extreme winter weather with freezing rain, sleet, ice and snow shut down electricity for this station and for a major part of the state.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		2132 Woodmore Circle, City of Florence, South Carolina	NO
459	2/20/2014	1830	308 N. Hill Street Timmonsville	Dry land	300 gallons	Vandalism - someone knocked holes in the above ground discharge piping	Pellet lime was spread for odor control and disinfection		308 N. Hill Street Timmonsville, City of Florence, South Carolina	NO
463	3/15/2014	1024	Hoffmeyer Rd @ I-95 Overpass	Beaver Dam Creek	2028 gallons	Sewer main was up due to a blockage in the main.	Cleaned up debris and spread pellet lime for odor control and disinfection.		Hoffmeyer Rd @ I-95 Overpass, City of Florence, South Carolina	NO
464	3/30/2014	1543	3559 E. Palmetto Street	Polk Swamp	1020 gallons	The main breaker at the Hwy 301 lift station tripped off due to a power surge.	The operator reset the main breaker. The on call electrician checked the station. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		3559 E. Palmetto Street, City of Florence, South Carolina	NO
465	3/31/2014	1000	6719 1/2 Friendfield Road	Pond behind jail	600 gallons	Bar screen tripped off and failed to run.	The operator cleaned out the bar screen and restarted it. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
467	4/21/2014	900	301 N. Orange St., T'ville	Dry land	3300 gallons	Bypass pumps on S. Hill Street stopped running. They were off - out of fuel.	Fueled up pumps and got pumps back up and running. Pellet lime was spread for odor control and disinfection		301 N. Orange St., T'ville, City of Florence, South Carolina	NO
469	4/29/2014	1330	308 N. Hill Street Timmonsville	Dry land	<100 gallons	Vandalism - someone knocked holes in the above ground discharge piping	Pellet lime was spread for odor control and disinfection		308 N. Hill Street Timmonsville, City of Florence, South Carolina	NO
470	5/6/2014	1905	1600 East Williamson Rd	Two Mile Creek	3,500 gallons	High level alarm mercury switch became inoperable due to debris covering the switch	There was no visible release of debris and solids and pellet lime was spread for disinfection and odor control in the area adjacent to the water body.		1600 East Williamson Rd, City of Florence, South Carolina	NO
471	5/12/2014	930	4010 W. Palmetto St., Timmonsville	Dry land	125 gallons	A piece of broken manhole lid fell into the manhole and was blocking the sewer flow.	Removed the broken manhole lid and restored full flow. Pellet lime was spread for odor control and disinfection.		4010 W. Palmetto St., Timmonsville, City of Florence, South Carolina	NO
472	5/30/2014	940	308 S. Hill St., Timmonsville	Dry land	200 gallons	Vandalism - someone intentionally drove into the pump discharge pipe and knocked holes in it.	Vacuumed the pooled waste water. Pellet lime was spread for odor control and disinfection.		308 S. Hill St., Timmonsville, City of Florence, South Carolina	NO
473	6/12/2014	1345	End of Market Street, Timmonsville	Sparrow Swamp	4000 gallons	PLC electrical controls for the lift station pumps trippe doff and did not operate the pumps.	WW operator found the PLC electrical control for the ww pumps was tripped off and pumps would not operate in automatic. He reset the control and the pumps started up. A backup power supply was installed to the PLC in the event of a power disruption.		End of Market Street, Timmonsville, City of Florence, South Carolina	NO
474	6/22/2014	1130	Market Street, Timmonsville	Sparrow Swamp	1500 gallons	PLC electrical controls breaker for the lift station pumps tripped off and pumps did not operate in automatic	The operator started the pumps in the manual run position. Maintenance reset the PLC electrical control breaker. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		Market Street, Timmonsville, City of Florence, South Carolina	NO
475	6/23/2014	715	Hwy 76 & Sally Hill Road, Timmonsville	Dry land	600 gallons	Fuses for the lift station pumps were blown resulting in no power to the pumps	The operator received an alarm call for the Industrial Park LS. The pumps were not operating. Maintenance replaced both fuses to the pumps that were blown and the lift station returned to normal operation		Hwy 76 & Sally Hill Road, Timmonsville, City of Florence, South Carolina	NO
476	8/6/2014	2018	308 S. Hill St., Timmonsville	Dry land	100 gallons	Vandalism, someone intentionally knocked a hole in the pipe.	Pellet lime was spread for odor control and disinfection		308 S. Hill St., Timmonsville, City of Florence, South Carolina	NO
477	9/17/2014	1700	4210 W. Palmetto St., Timmonsville	Dry land	100 gallons	Road contractor hit the 8" force main and broke it	Pellet lime was spread for odor control and disinfection		4210 W. Palmetto St., Timmonsville, City of Florence, South Carolina	NO
478	9/19/2014	1030	Freedom Blvd near Gilbert Drive	Jeffries Creek	13,500 gallons	The sewer main was blocked with tree roots.	Pellet lime was spread for odor control and disinfection		Freedom Blvd near Gilbert Drive, City of Florence, South Carolina	NO
479	10/2/2014	1023	Vanda St. at E. Smith St, Timmonsville	Dry land	500 gallons	Road contractor hit the 6" force main and broke it	Pellet lime was spread for odor control and disinfection		Vanda St. at E. Smith St, Timmonsville, City of Florence, South Carolina	NO
480	10/20/2014	1135	Vanda St. at E. Smith St, Timmonsville	Dry land	100 gallons	Road contractor hit the 6" force main and broke it	Pellet lime was spread for odor control and disinfection		Vanda St. at E. Smith St, Timmonsville, City of Florence, South Carolina	NO
481	10/20/2014	1420	Vanda St. at E. Smith St, Timmonsville	Dry land	100 gallons	Road contractor hit the 6" force main and broke it	Pellet lime was spread for odor control and disinfection		Vanda St. at E. Smith St, Timmonsville, City of Florence, South Carolina	NO
482	12/11/2014	1400	Center Rd at Young Rd east of Timmonsville	Dry land	100 gallons	Air release valve in manhole broken	Pellet lime was spread for odor control and disinfection		Center Rd at Young Rd east of Timmonsville, City of Florence, South Carolina	NO
484	1/19/2015	1215	6719 Friendfield Road, Effingham		1500 gallons	Bar screen failed to operate clogging the channel resulting in an overflow	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		6719 Friendfield Road, Effingham, City of Florence, South Carolina	NO

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486	1/29/2015	1600	W. Palmetto St @ Sally Hill Rd, Timmonsville, SC	Lake Swamp	10,550 gallons	Road contractor boring to install traffic pole (1600 on 1/29/15), bored into 8" force main. Contractor did not contact city until 0830 on 1/30/15.	Pellet lime was spread for odor control and disinfection		W. Palmetto St @ Sally Hill Rd, Timmonsville, SC, City of Florence, South Carolina	NO
487	2/27/2015	1627	Spring Branch Trailer Park	Dry land	1,500 gallons	There was a hole in the ductile iron sewer pipe on piers.	Pellet lime was spread for odor control and disinfection		Spring Branch Trailer Park, City of Florence, South Carolina	NO
488	2/27/2015	1034	Santiago Drive - McLeod Park	Jeffries Creek	4,200 gallons	The sewer main was blocked with grease.	Pellet lime was spread for odor control and disinfection		Santiago Drive - McLeod Park, City of Florence, South Carolina	NO
490	7/9/2015	845	End of Market Street, Timmonsville	Dry land	2,500 gallons	Air level control system was not operating properly.	The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		End of Market Street, Timmonsville, City of Florence, South Carolina	NO
491	7/13/2015	600	Behind 821 S. Irby St. in Indigo Point Apts.-new construction	Gully Branch	29,000 gallons	The 15" sewer main was cut through by a site contractor working at the Indigo Point Apts.	Cleaned up debris and spread pellet lime for odor control and disinfection.		Behind 821 S. Irby St. in Indigo Point Apts.-new construction, City of Florence, South Carolina	NO
492	7/15/2015	1030	End of Market Street, Timmonsville	Dry land	1,000 gallons	Air level control system compressor was not operating.	The area was raked to remove debris and solids and pellet lime was spread for odor control and disinfection.		End of Market Street, Timmonsville, City of Florence, South Carolina	NO
493	8/5/2015	1910	1600 East Williamson Rd	Two Mile Creek	3,800 gallons	Thunderstorm with high winds shut down electricity for this station and for this area.	The standby emergency generator was started until Duke power was restored. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		1600 East Williamson Rd, City of Florence, South Carolina	NO
494	9/12/2015	1125	2109 Kristens Channel	Forest Lake	400 gallons	Fuse had blown at Womack Gardens Lift Station and the station was off.	Called in the city electrician and go Womack Gardens Lift Station back on and pumped down the main.		2109 Kristens Channel, City of Florence, South Carolina	NO
496	11/6/2015	1938	519 Williamson Road	Dry land	1,000 gallons	Debris inactivated on/off mercury switch inside wet well.	Removed debris from mercury switch. The area was raked and all debris was removed and pellet lime was spread for disinfection and odor control		519 Williamson Road, City of Florence, South Carolina	NO
497	11/18/2015	1715	520 Williamson Road	Dry land	500 gallons	Debris inactivated on/off mercury switch inside wet well.	Removed debris from the mercury switch.		520 Williamson Road, City of Florence, South Carolina	NO
498	11/19/2015	2000	520 Williamson Road	Dry land	1,000 gallons	Debris inactivated on/off mercury switch inside wet well.	Electrician installed a new low level mercury switch to control pump operation.		520 Williamson Road, City of Florence, South Carolina	NO
499	12/23/2015	1240	4001 East Palmetto Street		1500 gallons	The main power breaker tripped at the 301 Hwy sanitary sewer pump station due to electrical lighting and created a power surge within the electrical control panel.	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		4001 East Palmetto Street, City of Florence, South Carolina	NO
500	12/24/2015	1330	1621 Malden Drive		4500 gallons	Three electrical relays within the electrical control panel burnt out.	Area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		1621 Malden Drive, City of Florence, South Carolina	NO
502	2/19/2016	815	133 Amber lane	Dry land	200 gallons	Both pumps were clogged full of rags	Operators pulled both pumps and removed rags from the volute and impeller area from both pumps.		133 Amber lane, City of Florence, South Carolina	NO
504	2/25/2016	1130	905 Whitehall Shores	Dry land	1000 gallons	Pump station lost one phase of the three phase power supply to the station.	Operator contacted electrician, who checked electrical system and identified one phase of power was lost. Called electric company to get field service person to respond to power issue. The lost phase of power was restored.		905 Whitehall Shores, City of Florence, South Carolina	NO
506	3/25/2016	1203	6719 1/2 Friendfield Road		1600 gallons	The output bearing on the augur gearbox reducer went bad causint the augur motor to overheat.	Bearings were ordered and the augur motor was taken to be rebuilt. The bar screen will be mannually cleaned to remove solids and debris from the collection system and allow flow to be contained within the channel. When the new drive is received it will be installed.		6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
507	5/22/2016	1100	6720 1/2 Friendfield Road		600 gallons	Debris was discharged from the detention center that clogged the pump and force main.	Operator called our maintenance and collection staff for assistance to remove pump and work to remove debris from force main.		6720 1/2 Friendfield Road, City of Florence, South Carolina	NO
508	6/4/2016	1030	End of Market Street, Timmonsville		1,000 gallons	UPS electronic control unit burnt out	Electrician installed a new UPS unit. The area was raked to remove visible debris and solids and pellet lime was spread for odor control and disinfection.		End of Market Street, Timmonsville, City of Florence, South Carolina	NO
509	6/20/2016	830	6719 1/2 Friendfield Road		800 gallons	By-pass was operated at a rate that created excessive flow and pressure that broke the connection between the by-pass and the forcemain.	Maintenance and collection staff reduced the rate at which the by-pass pump operated.		6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
510	7/1/2016	1330	266 W. McIver Road		1000 gallons	Valve on force main was closed by someone other than collection staff.	Operator, maintenance and collections staff checked pumps at pump station, inspected force main valves and opened closed valve.		266 W. McIver Road, City of Florence, South Carolina	NO
511	7/24/2016	1750	519 Williamson Road		1000 gallons	Electrical relays within control panel overheated causing control panel to trip.	Operator reset electrical control and pumped station down in manual mode.		519 Williamson Road, City of Florence, South Carolina	NO
512	7/27/2016	1115	3728 Williston Road		800 gallons	Burnt coil and blown electrical fuse.	Electrical staff installed new coil and electrical fuse in control panel.		3728 Williston Road, City of Florence, South Carolina	NO
513	8/8/2016	630	3729 Williston Road		4000 gallons	Phase monitor failure in electrical control panel	Electrical staff installed a new phase monitor in control panel.		3729 Williston Road, City of Florence, South Carolina	NO
514	8/30/2016	1424	James Jones Avenue at Jeffries Creek	Jeffries Creek	3300 gallons	Grease had 8" sewer line partially blocked	Washed the line with degreaser and notified Compliance Division with City to check upstream restaurants.		James Jones Avenue at Jeffries Creek, City of Florence, South Carolina	NO
515	9/7/2016	930	6719 1/2 Friendfield Road		4,000 gallons	Debris had clogged the sewer channel leading into the bar screen and prevented sewage from flowing through.	Pellet lime was spread over the area for odor control and disinfection. Area was cleaned to remove solids and debris.		6719 1/2 Friendfield Road, City of Florence, South Carolina	NO
516	9/27/2016	715	4721 W. Palmetto St, Timmonsville		4,000 gallons	Both pumps were tripped out.	The area was raked of any visible solids and debris and pellet lime was spread for disinfection and odor control.		4721 W. Palmetto St, Timmonsville, City of Florence, South Carolina	NO

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517	10/18/2016	1330	Eagerton Road 100 ' West of RR track	Carter Creek	3,555 gallons	Florence County was digging up a large metal storm drain tile, dropped it, and hit the main, causing the break	Repaired the break in the line and cleaned up the area with lime.		Eagerton Road 100 ' West of RR track, City of Florence, South Carolina	NO
518	10/26/2016	1530	905 Whitehall Shores	Dry land	800 gallons	Gravity sewer main had a break in the line	Collection Operations repaired gravity sewer main and lift station was placed back in normal operation.		905 Whitehall Shores, City of Florence, South Carolina	NO
519	2/8/2017	1500	Cashua Drive	Forest Lake	100 gallons	Contractors working on Cashua road widening project hit a 4" force main.	Staff repaired the break in the line then cleaned up the area and spread lime.		Cashua Drive, City of Florence, South Carolina	NO
520	2/21/2017	1350	Mechanicsville Road	High Hill Creek	3600 gallons	Wooden piers suspending the 15" ductile iron sewer main failed causing the line to slump and separate over an unnamed branch that flows to High Hill Creek.	Temporary action was taken to divert wastewater to a 24" gravity line. Engineering is taking emergency procedures to contract out the permanent corrective action needed.		Mechanicsville Road, City of Florence, South Carolina	NO
521	8/8/2017	1100	E. Palmetto St, #39 L.S.	Polk Swamp	300 gallons	The #39 LS was down to perform maintenance on a force main. During the shutdown, there was an overflow on the manhole on the gravity line feeding the LS	Flow from the LS was restored, and solids were removed. Lime was applied on 8/8 and 8/9/2017.		E. Palmetto St, #39 L.S., City of Florence, South Carolina	NO
522	8/13/2017	1030	4721 W. Palmetto St, Timmonsville	Polk Swamp	1000 gallons	On-off mercury switch failed to operate upon contact within the wet-well	Electrician replaced on-off mercury switch with a new installation and station immediately returned to normal operation.		4721 W. Palmetto St, Timmonsville, City of Florence, South Carolina	NO
523	8/24/2017	715	4001 E. Palmetto St.	Polk Swamp	3600 gallons	The main power breaker burnt at the 301 Hwy sanitary sewer pump station due to lightning and created a power surge within the electrical control panel.	Wastewater operator identified issue with control panel breaker. Electrician checked control panel and installed a new main power breaker and restored operation to normal.		4001 E. Palmetto St., City of Florence, South Carolina	NO
524	8/25/2017	1040	1830 Paper Mill Road	Dry land	2000 gallons	Electrical power surge and threw jacks at Duke's transformer porviding power to the lift station.	Duke Power electrical staff reset power jacks at the transformer and restored supplied electrical power to the lift station.		1830 Paper Mill Road, City of Florence, South Carolina	NO
525	8/29/2017	1200	4104 W. Pelican Lane	Lake Oakdale	2000 gallons	Three mercury switches failed within the electrical system.	Electrician changed all three inoperative mercury switches wihin the electrical control system with new units.		4104 W. Pelican Lane, City of Florence, South Carolina	NO
527	1/9/2018	730	2211 Williston Road		350 gallons	Pump in the lead operating position failed and caused the station to have an electrical overload iwthin the control panel, which prevented the redundant pumps for operating.	Operator reset the electrical main, operated the redundant pump in the hand mode, then called maintenance staff who removed the damaged pump and sent to electrical shop for electrical rebuild.		2211 Williston Road, City of Florence, South Carolina	NO
528	10/4/2018	730	2212 Williston Road		2,000 gallons	Third pump went to ground and tripped electrical control panel.	Operator reset the electrical main, operated the redundant pump in the hand mode, then called maintenance staff who removed the damaged pump and sent to electrical shop for electrical rebuild.		2212 Williston Road, City of Florence, South Carolina	NO
529	10/9/2018	730	2213 Williston Road		4,300 gallons	Mercury switch that signals pumps to shut off was inoperative.	Operator reset the electrical main, operated the redundant pump in the hand mode, then called maintenance staff for assistance. They installed a new mercury switch. Electrical staff observed pump complete multiple operating cycles.		2213 Williston Road, City of Florence, South Carolina	NO
541	12/6/2018	1330	2519 East McIver Road		2,500 gallons	Grease and debris blockage within the gravity sewer.	Operator and Collections staff rodded, washed, and vacuumed manhole to remove debris.		2519 East McIver Road, City of Florence, South Carolina	NO
544	12/9/2018	1600	1500 Block Sierra Range		2,000 gallons	Blockage within 8" sewer gravity line.	City crews cleared the blockage by rodding and vacuuming the line.		1500 Block Sierra Range, City of Florence, South Carolina	NO
545	12/9/2018	1700	Intersection of Sumter Street & North Irby Street		1,000 gallons	Blockage within 8" sewer gravity line.	City crews cleared the blockage by rodding and vacuuming the line.		Intersection of Sumter Street & North Irby Street, City of Florence, South Carolina	NO
546	12/11/2018	2030	944 Swan Circle		1,000 gallons	Pee Dee Electric service interrupted supplying power to the lift station.	Staff called Pee Dee Electric on-call after-hours numbers and electric company on-call staff responded. Pee Dee Electric staff replaced damaged component parts and restored power to the lift station.		944 Swan Circle, City of Florence, South Carolina	NO
547	12/14/2018	1445	4721 W. Palmetto St, Timmonsville		4,500 gallons	Blown fuse in main electrical panel which caused loss of power to the station	Electrician installed new fuse within the elecrical control panel.		4721 W. Palmetto St, Timmonsville, City of Florence, South Carolina	NO
549	1/25/2019	715	5227 East Palmetto St.		300 gallons	The mercury switch failure at Fairground sanitary sewer pump station.	Wastewater operator checked station and identified issue with mercury switch, operated station in manual mode, and called the electrician. Electrician installed a new mercury switch and restored operation to normal.		5227 East Palmetto St., City of Florence, South Carolina	NO
550	3/14/2019	1400	300 Block Woody Jones Blvd.	Jeffries Creek	2,000 gallons	Gravity sewer was clogged with a combination of large rags and other debris, which caused sewer to be released from the manhole within the right of way of the Florence Rail Trail along Jeffries Creek.	Collection staff removed debris from gravity sewer.		300 Block Woody Jones Blvd., City of Florence, South Carolina	NO
551	3/26/2019	1637	800 Block Walnut Street		3,000 gallons	Debris clogged 12 inch sanitary sewer interceptor.	City staff used vac truck to wash and rod the interceptor to remove the debris that was causing the overflow.		800 Block Walnut Street, City of Florence, South Carolina	NO
552	8/20/2019	845	1517 Schlitz Drive	Dry land	4,500 gallons	Crack in manhole	The area was raked of any visible solids and debris and pellet lime was spread for disinfection and odor control.		1517 Schlitz Drive, City of Florence, South Carolina	NO
553	9/30/2019	1200	Beaverdam Creek gravity line south of Memory Lane	Beaver Dam Creek	300,000 gallons	Multiple large trees fell atop the 18" Beaverdam Creek elevated sewer main that caused the main to collapse in sections.	Contractor cleared vegetation to otain access for equipment to get to the work site. Contractor completed a temporary repair stopping the release of sewer from the sanitary sewer interceptor. Materials were ordered for the permanent repair.		Beaverdam Creek gravity line south of Memory Lane, City of Florence, South Carolina	NO
554	9/16/2019	730	3031 Hoffmeyer Rd.	Beaver Dam Creek	1,000 gallons	Grease blockage	City staff vac and washed manhole		3031 Hoffmeyer Rd., City of Florence, South Carolina	NO

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555	9/25/2019	0	1830 Paper Mill Road	dry land	4,700 gallons	Lead pump electrical failure caused power supply jack on Duke Energy pole to disconnect and lost power supply to the pump station.	Once power supply was restored, Collections personnel assisted Wastewater to set up by-pass pump to operate pump station. Submersible pumps were removed and sent to electrical maintenance for repair. One of the pumps is repaired and the pump station is now back in operation.		1830 Paper Mill Road, City of Florence, South Carolina	NO
556	10/5/2019	1240	1600 East Williamson Rd		4,500 gallons	Transducer failure in main electrical control panel. Emergency generator automatically started with loss of power but without transducer power was unable to power up pumps.	Electrician installed a new transducer and pump station was returned to normal operation with power supply from electric supplier.		1600 East Williamson Rd, City of Florence, South Carolina	NO
557	10/23/2019	1700	103 Easterling Circle, Quinby	dry land	1,500 gallons	Shaft broke on pump number one and motor burnt on pump number two	Both pumps are currently at a repair shop and will be re-installed when repairs are completed.		103 Easterling Circle, Quinby, City of Florence, South Carolina	NO
562	4/1/2020	1142	2713 Cypress Bend	Unnamed retention pond	300 gallons	Contractor was installing new base 90's in pump station wetwell and the bypass pump lost prime. Manhole overflow due to pump losing prime.	Collection crew vacuumed manhole while representative worked on bypass pump.		2713 Cypress Bend, City of Florence, South Carolina	NO
564	6/3/2020	800	519 Williamson Road	Two Mile Creek	3,500 gallons	Surge protector was burnt.	Purchased a new surge protector unit to be intalled within control panel upon delivery.		519 Williamson Road, City of Florence, South Carolina	NO
582	7/2/2020	1311	110 Woody Jones Blvd	Jeffries Creek	300 gallons	Grease blockage in manhole	Compliance met and inspected restaurant grease interceptor and modified cleaning. Swept area to remove debris and visible solids then spread pellet.		110 Woody Jones Blvd, City of Florence, South Carolina	NO
583	7/7/2020	1200	805 Pamplico Hwy.	Middle Swamp	1,000 gallons	Elevated sewer pipe pier was broken by floating debris and separated pipe connection at the downstream manhole.	Installed new pier and resealed manhole interior and exterior at point of connection with the sewer pipe. Swept area to remove debris and visible solids then spread pellet.		805 Pamplico Hwy., City of Florence, South Carolina	NO
584	9/17/2020	1900	1409 Pamplico Hwy	Jeffries Creek	20,000 gallons	6' Split along force main pipe	Staff replaced 18' section of pipe.		1409 Pamplico Hwy, City of Florence, South Carolina	NO
585	9/18/2020	1140	4937 South Irby St	Pump Station/Dewey Carter	800 Gallons	Lift station wet well clogged with grease, which caused the pumps to over-load temperature.	Used Vac tor truck to remove grease from wet-well. Operator & utility tech reset control panel & electrical parameters that operate the pumps & motor.		4937 South Irby St, City of Florence, South Carolina	NO
586	9/18/2020	1100	1300 Riverdale & 2500 Blk Lakeview	Jeffries Creek	2,000 Gallons	Grease	Staf rodded & washed line to remove the blockage.		1300 Riverdale & 2500 Blk Lakeview , City of Florence, South Carolina	NO
587	10/8/2020	1400	901 North Douglas St	Force Main	250 Gallons	Force main hit by Spectrum	Crew replaced 5 foot section of pipe.		901 North Douglas St, City of Florence, South Carolina	NO
588	11/21/2020	1513	2132 Woodmore Circle	Lift station Influent Manhole	4,000 Gallons	Electrical phase monitor failed inside electrical control panel.	Operator called on call utility tech once he was not able to start pumps in automatic or hand. Utility tech completed diagnosis of the control panel & found phase monitor inoperative. Tech installed new phase monitor & pump returned to normal operation.		2132 Woodmore Circle, City of Florence, South Carolina	NO
589	11/23/2020	1200	155 NE Baroody St	Manhole	1500 Gallons	Grease	Staff inspected manholes & washed from upstream manhole to remove blockage.		155 NE Baroody St, City of Florence, South Carolina	NO
590	12/11/2020	1100	2700 Blk Old National Cem Rd	Jeffries Creek	4,200 Gallons	Air release valve failure.	Turned off wheel valve on line & will install new air relief valve.		2700 Blk Old National Cem Rd, City of Florence, South Carolina	NO
591	12/26/2020	1700	Whitehall Shore Rd/Pump Station #45	Middle Swamp	350 Gallons	Pump failure	Set up a bypass pump to maintian the flow of sewer in the lift station. Crew will replace pumps.		Whitehall Shore Rd/Pump Station #45, City of Florence, South Carolina	NO
592	1/2/2021	1300	White Hall & Pelican Lane/Pump Station #45	Middle Swamp	1,800 Gallons	Mechanical/Electrical Issues	Set up a bypass pump at the lift station. Operator incresed speed volume on bypass pump. Repaire pump & installed 1/4/21. Placed station back on normal operation.		White Hall & Pelican Lane/Pump Station #45, City of Florence, South Carolina	NO
593	1/11/2021	1600	1521 McKinney Ct/Manhole		600 Gallons	Damaged Manhole	Contractor hired to completely rehabilitate manhole.		1521 McKinney Ct/Manhole, City of Florence, South Carolina	NO
594	1/12/2021	1600	1300 Blk Virginia Acres	Jeffries Creek	700 Gallons	Damaged Manhole	Contractor hired to completely rehabilitate manhole.		1300 Blk Virginia Acres, City of Florence, South Carolina	NO
595	1/23/2021	827	1300 Blk James Jones Rd/Manhole	Jeffries Creek	1,000 Gallons	Grease	Used vactor truck to wash sewer interceptor. Removed blockage 82' downstream of the manhole.		1300 Blk James Jones Rd/Manhole, City of Florence, South Carolina	NO
596	2/7/2021	854	2000 Block Pamplico Highway	Middlle Swamp # 53	300 gallons	Pump in station failed to start	Maintenance checked station & could not duplicate the problem. Suspect power spike shutdown variable speed pump drives.		2000 Block Pamplico Highway, City of Florence, South Carolina	NO
597	2/8/2021	830	520 Williamson Rd/Pump St # 92	Jeffries Creek	3,000 Gallons	Pump Failure	Removed both pumps & sent out for repair. Diesel bypass pump will remain in place until pumps are repaired & reinstalled.		520 Williamson Rd/Pump St # 92, City of Florence, South Carolina	NO
598	2/13/2021	1100	1600 E Williamson Rd/Pump Station	Two Mile Creek	325,000 Gallons	Bearings seized on lead pump & impeller broke on lag pump.	Installed 8" by pass pump. Removed both pumps & took to third party repair shop. Contacted vendors regarding new submersible pump for station.		1600 E Williamson Rd/Pump Station, City of Florence, South Carolina	NO
599	2/28/2021	1941	Williamson Rd at Sammy's Ln	Air relief valve	32,000 Gallons	Air relief valve blew on the force main.	Turned off broken air relief valve & ordered new relief valve to replace existing unit.		Williamson Rd at Sammy's Ln, City of Florence, South Carolina	NO
621	3/24/2021	1330	4100 Blk E Palmetto/Manhole	Polk Swamp	1,500 Gallons	Damaged Manhole	Staff monitored the area & contacted contractor for repairs.		4100 Blk E Palmetto/Manhole, City of Florence, South Carolina	NO
622	7/19/2021	1930	2701 David McLeod Blvd./Manhole	Dry Land	3,500 Gallons	Greas & rags along Woody Jones section of system	Found the downstream manhole & was able to remove the blockage.		2701 David McLeod Blvd./Manhole, City of Florence, South Carolina	NO
623	7/13/2021	900	300 Blk Wild Bird Ln/Station #89	Dry Land	900 Gallons	Pump failed b/c of rags & debris clogging pump. Second pump in station has been removed for repair.	Operator found station surcharging & reset pump & was able to pump the station down. Pump was pulled & rags & debris removed.		300 Blk Wild Bird Ln/Station #89, City of Florence, South Carolina	NO
624	8/4/2021	1600	I 95/I20 Interchange/Gravity Sewer Main	Dry Land	500 Gallons	Gravity sewer main was hit & damaged by SCDOT contractor doing tree grubbing in ROW.	Monitor the situaiton & installed a temporary fix until the next day.		I 95/I20 Interchange/Gravity Sewer Main, City of Florence, South Carolina	NO
625	8/8/2021	900	Adams Branch LS #3	Adams Branch	3500 gallons	Pumps 1,2,3 Failed	Bypass pump was installed, Pumps 2 & 3 were taken to be rebuilt.		Adams Branch LS #3, City of Florence, South Carolina	NO
626	8/8/2021	1925	2519 E McIver Rd/P Station 83 Police Cabin	High Hill Creek	15,000 Gallons	Debris in wet well caused pump failure.	Placed a larger rental bypass pump in place. Cleared wet well as much as possible & reinstalled electrical pump #1.		2519 E McIver Rd/P Station 83 Police Cabin, City of Florence, South Carolina	NO
627	10/4/2021	830	3728 N Williston Rd	Adams Branch Lift Station/Manhole	4,000 Gallons	Split in discharge pipe	Staff removed & installed a new discharge pipe.		3728 N Williston Rd, City of Florence, South Carolina	NO
628	10/11/2021	830	3728 N Williston Rd	Adams Branch Lift Station/Manhole	1,000 Gallons	Alternator burned.	Staff removed & installed a new alternator.		3728 N Williston Rd, City of Florence, South Carolina	NO

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629	11/17/2021	730	2211 N Williston Rd	Black Crk Lift St.	1,200 Gallons	Mercury switch that signals pumps to shut off was in operative.	Reset the electrical main, operated the redundant pump in the hand mode & called maintenance for assistance. Removed damaged mercury switch & installed a new one. Observed pump complete multiple operating cycles.		2211 N Williston Rd, City of Florence, South Carolina	NO
630	12/4/2021	1002	1000 Blk Becky's Pkwy/Manhole	Canal Creek	1,200 Gallons	Main breaker for the electrical control panel burnt out.	Installed a new breaker.		1000 Blk Becky's Pkwy/Manhole, City of Florence, South Carolina	NO
631	12/15/2021	1530	3200 Winding way Dr/Manhole	Canal/creek	2,500 Gallons	Steel Road lift station failure	Found Pump #1 to be tripped at breaker & breaker was reset normal operations resumed. Pump #2 power supply cable was damaged requiring installation of a new power supply cable. Pump 3 had internal electrical & the pump was sent to electrical shop for repair.		3200 Winding way Dr/Manhole, City of Florence, South Carolina	NO
632	12/27/2021	1430	Sebrell & James Jones Blvd	Manhole	750 Gallons	Grease	Found the downstream manhole and was able to remove the blockage by use of the vactor truck.		Sebrell & James Jones Blvd, City of Florence, South Carolina	NO
633	12/30/2021	835	End of Market Street	Sparrow Swamp Pump Station	4,000 Gallons	Pressure control sensor burnt up.	Installed a new pressure control sensor unit.		End of Market Street, City of Florence, South Carolina	NO
634	1/8/2022	1625	Jasmine Ln @ Veranda Way/Manhole	Retention Pond	800 Gallons	Thermal overload in electrical control panel at Pine Needles Lift Station	Reset thermal overload switch and station returned to normal operation.		Jasmine Ln @ Veranda Way/Manhole, City of Florence, South Carolina	NO
635	1/18/2022	1020	1113 Oak Chase Lane	Lift Station	800 Gallons	Phase monitor failure	New pphase monitor installed & station back in service.		1113 Oak Chase Lane, City of Florence, South Carolina	NO
636	2/1/2022	1500	1177 Hannah drive	Manhole/Lift Station	2,000 Gallons	Blown Duke Energy utility fuse on power supply that supplies power to the lift station.	Duke Progress calld on site & replaced pole fuse, station put pack in service.		1177 Hannah drive, City of Florence, South Carolina	NO
637	2/11/2022	1501	300 Blk Wild Bird Ln	Pump Station	3,000 Gallons	Damaged electrical components & wiring	Installed new electrical wiring & other components.		300 Blk Wild Bird Ln, City of Florence, South Carolina	NO
638	3/13/2022	854	3700 Blk E Palmetto St-Force Main	Polk Swamp	120,000 Gallons	Gasket seal failure at pipe joint connection	Shut off lift station & associated line valves.		3700 Blk E Palmetto St-Force Main, City of Florence, South Carolina	NO
639	3/29/2022	1430	4101 E Palmetto St-Manhole	Polk Swamp	50,000 Gallons	Operational issue w/ temporary by-pass pumps the downstream manhole outside of Polk Swamp was surcharged.	WW Operator adjusted operational controls of the by pass pumps. 3 new submersible pumps have been purchased & ordered Fall 2021 & estimaed delivery end of May 2022.		4101 E Palmetto St-Manhole, City of Florence, South Carolina	NO
640	4/7/2022	830	4400 Blk E Palmetto St-Manhole	Polk Swamp	4,000 Gallons	Top section of manhole damaged.	Utilized a contractor already performing utility work for the City to replace existing damaged section of the manhole and installed a new manhole section.		4400 Blk E Palmetto St-Manhole, City of Florence, South Carolina	NO
641	4/29/2022	715	4101 E Palmetto St-Manhole	Polk Swamp	4,000 Gallons	lift station lost utility supplied power & once power was restored there was an electrical fault within the control panel which caused the station to not operate.	Turned off main breaker to control panel & allowed electrical fault to clear within the control panel. Turned main breaker back on, which allowed the control panel to reset and the pump began to operate.		4101 E Palmetto St-Manhole, City of Florence, South Carolina	NO
642	5/15/2022	800	2109 Kristens Channel-Manhole	Forest Lake	1,000 Gallons	Failed on/off mercury switch & 2 mercury switches bound by rags.	Placed station in manual operation & pumps immediately began to pump down wet well. Operator removed the rags from mercury switches and technician installed 2 new mercury switches to replaced existing ones that failed.		2109 Kristens Channel-Manhole, City of Florence, South Carolina	NO
643	6/20/2022	1855	4400 Blk E Palmetto St-Manholes	Polk Swamp	75,000 Gallons	Electrical emergency by-pass pump failure	By Pass pump contractor Wylem sent tech to the site. Tech was unable to ge the pump to operatre to pump sewage. Tech ordered new by pass pump to be installed on site. Xylem tech & city staff removed existing damaged pump & installed new one.		4400 Blk E Palmetto St-Manholes, City of Florence, South Carolina	NO
644	6/28/2022	730	2211 N Williston Rd-LS #5	Black Creek	2,000 Gallons	Submersible pumps electrical failure. Potentially caused by the blown tranformer of the electrical supplier adjacent to the lift station site.	Installed bypass pump to rpovide service to lift station		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
645	6/28/2022	1200	2301 Dozier Blvd.-LS #1		700 Gallons	Pumps loss of prime at the station.	Operator reprimed pumps & station resumed operation.		2301 Dozier Blvd.-LS #1, City of Florence, South Carolina	NO
646	6/29/2022	1603	908 E Howe Springs Rd-12" Gravity Line	Roadway Ditch	3,500 Gallons (vac'd up 1000 gallons)	Blockage due to wipes, rags & othe debris.	Washed line with vactor truck & was able to break up the blockage and was able to remove portion of the debris before it traveled down the line.		908 E Howe Springs Rd-12" Gravity Line, City of Florence, South Carolina	NO
647	6/30/2022	1330	2211 N Williston Rd-LS #5	Black Creek	1,000 Gallons	Hole in bypass pump discharge hose & inoperable air relief valve on downstream force main.	Discharge pipe and air release valve replaced.		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
648	7/4/2022	1645	2211 N Williston Rd-LS #5	Black Creek	600 Gallons	Hole in bypass pump discharge hose & high flow to station well	Discharge pipe replaced and pump speed increased.		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
649	7/5/2022	700	2211 N Williston Rd-LS #5	Black Creek	600 Gallons	Hole in bypass pump discharge hose.	Discharge pipe & fittings replaced & bypass put back into service.		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
650	7/7/2022	2300	2211 N Williston Rd-LS #5	Black Creek	2000 Gallons	Suction hose failure on bypass pump.	Suction hose replaced, bypass resumed pumping.		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
651	8/2/2022	1130	Station at 1800 Paper Mill Rd Pump Station	Roadway Ditch	200 Gallons	Control float ball failed & pump tripped	Pump was reset & maintenance was dispatched to replace the faulty control float		Station at 1800 Paper Mill Rd-Pump Station, City of Florence, South Carolina	NO
653	8/19/2022	1645	4400 Blk E Palmetto St-Lift Station	Polk Swamp/Gulley Branch	750 Gallons	Utility Power Failure at Pole	Utility power was restured and resumed normal operation.		4400 Blk E Palmetto St-Lift Station, City of Florence, South Carolina	NO
654	9/7/2022	700	4400 Blk E Palmetto St-Lift Station	Polk Swamp/Gulley Branch	500 Gallons	LS discharge was restricted during peak inflow & intermediate station was not valved to relieve flow	Intermediate station was valved to relieve excess flow and pellet lime was spread.		4400 Blk E Palmetto St-Lift Station, City of Florence, South Carolina	NO
655	9/13/2022	1030	Station at 1800 Paper Mill Rd Pump Station	Roadway Ditch	200 Gallons	A Pump Tripped	Pump was reset, well began to pump down.		Station at 1800 Paper Mill Rd-Pump Station, City of Florence, South Carolina	NO
657	10/2/2022	1510	905 Whitehall Shores Rd-LS #45	Middle Swamp	700 Gallons	Control panel had a blown level control fuse & corroded wires	Operator pumped well down manually to stop SSO	Maintenance replaced wires and fuse.	905 Whitehall Shores Rd-LS #45, City of Florence, South Carolina	NO
658	10/3/2022	930	3206 James Turner Rd-LS 42	Retention Pond	600 Gallons	Failure of both pumps	Operator responded & notified maintenance & collections	Collections vacuumed out well to stop sso, bypass was installed.	3206 James Turner Rd-LS 42, City of Florence, South Carolina	NO
659	10/10/2022	930	1800 Paper Mill Rd-Pump Station	Roadway Ditch	1500 Gallons	Submersible pump failure	Bypass pump was intalled & process to purchase new pump initiated.		1800 Paper Mill Rd-Pump Station, City of Florence, South Carolina	NO
660	10/16/2022	1030	2519 E McIver Rd-Manhole	High Hill Creek	1500 Gallons	Operator reset pump, pumped down well 7 contacted maint. To diagnose problem.			2519 E McIver Rd-Manhole, City of Florence, South Carolina	NO
661	10/27/2022	1450	Pye Branch Demo Park-Gravity Sewer Pipe	Pye Branch	425 Gallons	12" gravity sewer clay pipe	Isolated area, dug a trench around contaminated area and used rocks to create a berm.	Contractor replace or repair necessary damaged pipe and restore system	Pye Branch Demo Park-Gravity Sewer Pipe, City of Florence, South Carolina	NO
662	11/4/2022	1000	4937 S Irby St-PS #24	Roadway Ditch	1000 Gallons	Station control panel power failed.	Power was restored for station to resume normal operation. Vac truck removed excess overlow from station, ditches up and downstream.		4937 S Irby St-PS #24, City of Florence, South Carolina	NO
663	11/9/2022	1900	2915 E Mciver Rd-Manhole	High Hill Creek	750 Gallons	Submersible pumps in lift station became bound w/ nylon rope, caused a trip failure	Submersible pump pulled, rope removed. Pumps was put back in service.		2915 E Mciver Rd-Manhole, City of Florence, South Carolina	NO

Appendix B
Part 3
Reported SSOs Known Emergency Event

eventno	Date of SSO	Estimated Time Notification of SSO (Military Format)	Location of SSO (pump station, manhole or line)	Ultimate location of SSO (dry land, building or water body)	Estimated Volume of the SSO (gallons)	Cause of SSO (grease, blockage, I&I, loss of pump station power, pump station failure or other)	Corrective Action to Stop SSO	Corrective Action to Prevent Future SSOs	Address	Capacity Restriction?
664	11/11/2022	1030	200 Block Pamplico Hwy-LS 53	Middle Swamp	400 Gallons	Generator transfer switch malfunctioned	Tranfer switches were manually reset, generator services provider was contacted.		200 Block Pamplico Hwy-LS 53, City of Florence, South Carolina	NO
665	12/7/2022	1345	Otis Way & Pisgah Ditch-8" sewer main	Ditch leading to Black Creek	200 Gallons	SCDOT SW culvert pipe washed out in ditch causing 8" sewer main to collapse	Capped the 8" sewer line temporarility, scheduled to pump out manhole daily. Working w/ DOT for perm solution.		Otis Way & Pisgah Ditch-8" sewer main, City of Florence, South Carolina	NO
666	12/8/2022	733	Williamson Rd Lift Station-PS 92	Two Mile Creek	700 Gallons	Power failure caused pumps to trip and phase monitor not to reset	Reset Phase Monitor		Williamson Rd Lift Station-PS 92, City of Florence, South Carolina	NO
667	2/10/2023	1100	2211 N Williston Rd-LS #5	Black Creek	700 Gallons	Stop float ball failure	Maintenance replaced faulty float control		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
668	2/11/2023	1413	2519 E MCIVER RD-MANHOLE	High Hill Creek	2000 Gallons	Submersible pump motor failure	Contractor installed bypass pumps.		2519 E MCIVER RD-MANHOLE, City of Florence, South Carolina	NO
669	2/12/2023	830	694 Park Ave-LS 83	Gully Branch	1000 Gallons	Starters for both pumps failed & pump 1 had a ground fault failure.	New starter was installed on the working pump & backups placed on order. Faulty pump is being pulled for repair.		694 Park Ave-LS 83, City of Florence, South Carolina	NO
670	2/23/2023	1515	2221 2nd Loop Rd,-Sewer line	Jeffries Creek	130,000 Gallons +	Failed installation, hanger straps no longer supporting pipe, let do disconnection of sewer service lateral.	Implement a temporary sewer collection service until a more permanent solution has been established & implemented. Property osners are required to spread lime around polluted area, rake up and dispose of as much polluted soil as possible.		2221 2nd Loop Rd,-Sewer line, City of Florence, South Carolina	NO
671	3/6/2023	700	2211 N Williston Rd-LS #5	Black Creek	750 Gallons	Faulty alternating control relay & burned up pump component.	Replaced the faulty control element & pulled the pump for repairs.		2211 N Williston Rd-LS #5, City of Florence, South Carolina	NO
672	3/6/2023	845	2519 E McIver Rd-Manhole	High Hill Creek	600 Gallons	Level indicator & pump control malfunction.	Operator manually pumped down well to stop overflow & reset level control. Mercury float switch was installed to prevent further surcharges.		2519 E McIver Rd-Manhole, City of Florence, South Carolina	NO
673	3/8/2023	1100	2519 E McIver Rd-Manhole	High Hill creek	300 Gallons	Level indicator & pump control malfunction.	Operator manually pumped down well to stop overflow & reset level control. Mercury float switch was installed to prevent further surcharges.		2519 E McIver Rd-Manhole, City of Florence, South Carolina	NO
675	3/16/2023	1130	2519 E McIver Rd-Manhole	High Hill Creek	200 gallons	Automatic starter tripped	Operator resent pump control panel, manually pumped down well to stop overflow & tested mercury float switch control. Station resumed automatic operation.		2519 E McIver Rd-Manhole, City of Florence, South Carolina	NO
677	3/27/2023	800	4424 S Arundel Dr/Manhole	Ditch	500 Gallons	Pump became bound with rags and was unable to keep up with increased flow due to heavy rain event.	Solids & overflow were removed w/ vactor truck, rags were removed from both pumps & station was put back in service.		4424 S Arundel Dr/Manhole, City of Florence, South Carolina	NO

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Sewer Collection System Master Plan

Appendix C

Residential Flow Projections

September 2025

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Flow Projections for Non-Industrial Areas to 2045

Assumptions: 75 gpcd

2.5 people per 0.333333333 acre

Shapefile	FID	Area (acres)	Projected Flow (mgd)	Model Input Location	Planning Horizon
Future	0	33.23	0.01869	Summergate LS	Longterm (20 year)
	1	29.94	0.01684	swr-mh-1816	Longterm (20 year)
	2	3.32	0.00187	swr-mh-1816	Longterm (20 year)
	3	82.57	0.04645	Summergate LS	Longterm (20 year)
	4	168.33	0.09469	Meadows LS	Longterm (20 year)
	14	423.07	0.23798	HWY 301 LS	Longterm (20 year)
	15	45.79	0.02576	HWY 301 LS	Longterm (20 year)
	16	80.03	0.04502	Corbette Place LS	Longterm (20 year)
	17	22.20	0.01249	swr-mh-5331	Longterm (20 year)
	18	17.28	0.00972	swr-mh-5331	Longterm (20 year)
	19	49.92	0.02808	Tree Top Inn LS	Longterm (20 year)
new/proposed	1	73.39	0.04128	Wilson High LS	Intermediate (10 year)
	2	299.70	0.16858	Roche Carolina LS	Intermediate (10 year)
	3	344.36	0.19370	FMU Gate 3 LS	Intermediate (10 year)
	4	72.22	0.04062	Steel Road LS	Intermediate (10 year)
	5	101.72	0.05722	Womack Gardens LS	Intermediate (10 year)
	6	305.54	0.17187	Brandon Wood LS	Intermediate (10 year)
	7	43.75	0.02461	swr-mh-5331	Intermediate (10 year)
	8	39.08	0.02198	Summit at Oakdale PH2 LS	Intermediate (10 year)
Under Construction	0	17.70	0.00995	swr-mh-4049	Short term (5 year)
	1	60.45	0.03400	Meadows LS	Short term (5 year)
	2	9.01	0.00507	Meadows LS	Short term (5 year)
	3	50.61	0.02847	swr-mh-4268	Short term (5 year)
	4	3.34	0.00188	McLeod Hospital LS	Short term (5 year)
	8	16.19	0.00911	swr-mh-6573	Short term (5 year)
	9	24.41	0.01373	swr-mh-6573	Short term (5 year)
	10	15.40	0.00866	Steel Road LS	Short term (5 year)
	11	36.93	0.02077	swr-mh-2466	Short term (5 year)
	12	13.94	0.00784	swr-mh-5331	Short term (5 year)
	13	106.10	0.05968	swr-mh-6729	Short term (5 year)
	14	20.06	0.01129	Green Acres LS	Short term (5 year)
	15	2.99	0.00168	South Brook LS	Short term (5 year)
	16	5.79	0.00326	South Brook LS	Short term (5 year)
	17	5.99	0.00337	swr-mh-2250	Short term (5 year)
	18	32.71	0.01840	swr-mh-4654	Short term (5 year)
	19	7.44	0.00418	Celebration Square LS	Short term (5 year)
	20	61.82	0.03477	76 LS	Short term (5 year)
	21	50.58	0.02845	Tree Top Inn LS	Short term (5 year)
	22	61.39	0.03453	Summit at Oakdale PH2 LS	Short term (5 year)
	23	49.78	0.02800	Harriett LS	Short term (5 year)
Under Review	0	103.15	0.05802	Meadows LS	Short term (5 year)
	1	8.56	0.00481	Cashua Street LS	Short term (5 year)
	2	6.82	0.00384	McLeod Hospital LS	Short term (5 year)
	3	256.84	0.14447	swr-mh-6573	Short term (5 year)
	4	84.19	0.04736	Steel Road LS	Short term (5 year)
	5	34.38	0.01934	Steel Road LS	Short term (5 year)
	6	61.62	0.03466	swr-mh-7980	Short term (5 year)
	7	137.52	0.07735	South Brook LS	Short term (5 year)
	8	76.27	0.04290	Wedgewood LS	Short term (5 year)
MISC			0.15000	Meadows LS	Short term (5 year)
		SUM	**2.21**		

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Sewer Collection System Master Plan

Appendix D

Flow Monitoring Analysis

September 2025

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CITY OF FLORENCE FLOW MONITORING REPORT

CITY OF FLORENCE, SOUTH CAROLINA

February 15, 2025

AECOM

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Rainfall and Flow Monitoring

Rain Gauges Locations

AECOM installed two rain gauges as part of this project – RG#1 was installed at the Pine Street Water Treatment Plant at the roof of the building located at 16 Levy Park and RG#2 from installed at the Pee Dee Regional Wastewater Management Facility (PDRWWMF) at the South sidewalk of the Administration Building. Precipitation data was downloaded in five-minute intervals to coincide with the flow monitoring data log time interval. Data was collected and stored remotely on the Telog data hosting website and then subsequently downloaded by AECOM for the required analysis period.

Flow Monitoring Site Locations

Eight locations were selected for flow monitoring. **Figure 1** shows an illustration of the typical flow monitor installation used during this study. Hach FL901 portable flow monitoring equipment was used to collect water levels and flow velocities. **Figure 2** illustrates the location of the flow monitors and associated tributary area.

Table 1 shows a summary of the flow monitoring locations including flow monitoring ID number and location.

Attachment A contains the site installation forms for each flow monitoring location.

Figure 1: Typical Flow Monitor Installation in a Sewer Manhole

Table 1: Flow Monitoring Location Summary

Flow Monitor ID	Location	Pipe Size	MH ID	Installation Date	Removal Date
FM-1	East Palmetto	15-in	MH 6555	5/23/23	8/22/23
FM-1B	West Palmetto	24-in	MH 5444	5/23/23	8/22/23
FM-2	High Hills PS	24-in	MH 3993	5/23/23	8/22/23
FM-2B	High Hills PS	18-in	MH 3992	5/24/23	8/22/23
FM-3	Broad Drive	18-in	MH 7826	5/23/23	8/22/223
FM-5	Jeffries Interceptor North	24-in	MH 3165	5/24/2023	8/22/2023
FM-6	Beaverdam Creek	24-in	MH 1377	5/23/2023	8/22/2023
FM-7	Jeffries Interceptor South	30-in	MH 7539	5/24/2023	8/18/2023

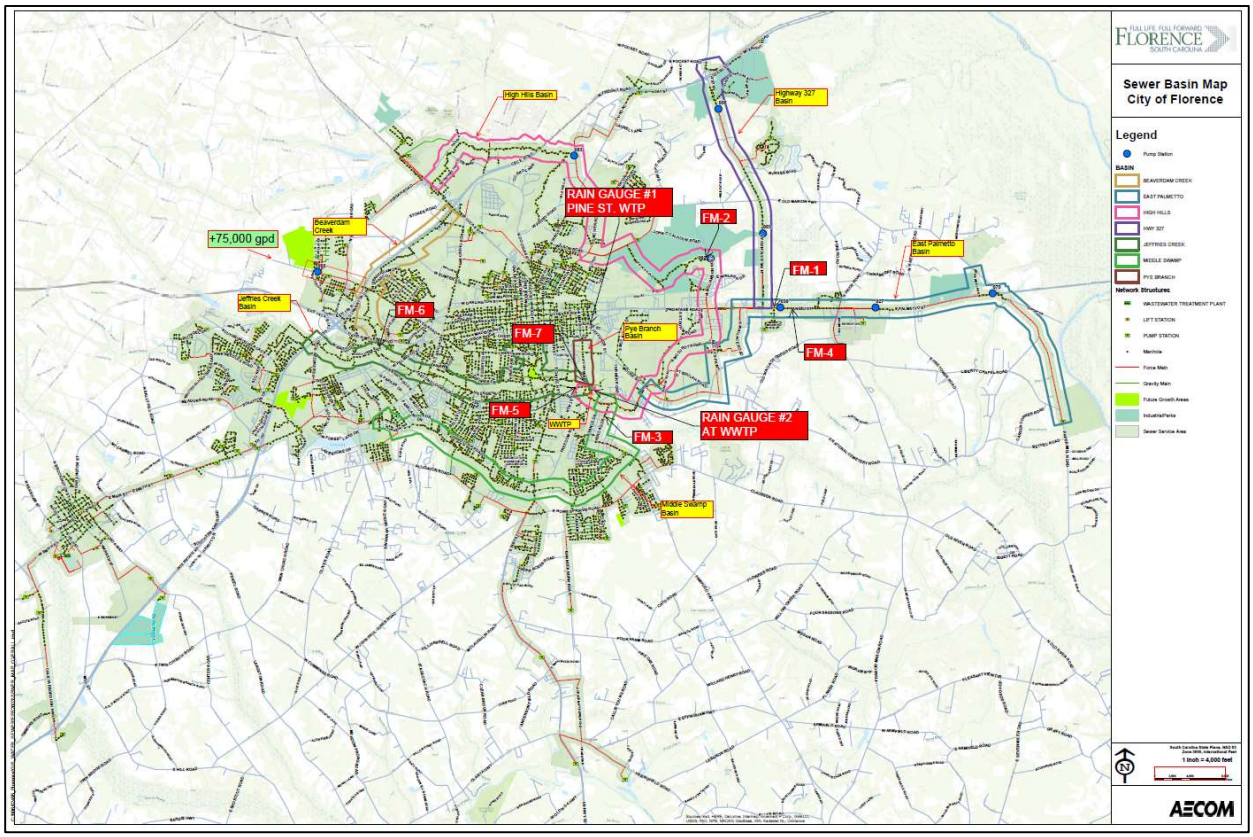

Figure 2: Flow Monitor Locations with Tributary Area

Flow Monitor Description and Configuration

AECOM installed area/velocity flow monitors equipped with a submerged pressure transducer sensor to measure the depth of liquid in the sewer. The depth of liquid is converted into a cross-sectional area (A) based on the size and shape of the pipe. The submerged area/velocity sensor use Doppler technology to measure the velocity (V) of the liquid in the sewer. From these two measurements a flow (Q) can be calculated using the continuity equation (Q = A x V).

The flow monitor was programmed to collect level and velocity readings every five minutes. Flow data was collected weekly by AECOM personnel using proprietary computer software from the flow monitor manufacturer installed on a laptop computer. Data was analyzed and edited using proprietary computer software from the flow monitor manufacturer.

Manual level and velocity measurements of the flow were obtained and compared to the flow monitor status readings. Collected data was reviewed in the field at the time of the site visit and screened for poor or irregular data. Occasionally, it was necessary to edit data to correct anomalous data points, but overall, the data quality was acceptable and in line with industry standards.

Rainfall and Flow Data Summary

Rainfall Data Summary

Dry Weather Events

The dry weather period from June 13 to 16, 2023, was selected for DWF analysis. The flows during the period were stable with a consistent diurnal pattern.

Table 3 presents the dry weather flow characteristics - ADWF, PDWF, and pipe utilization – during nighttime and peak conditions. ADWF and PDWF were calculated from data recorded from June 13 to 16, 2023.

DWF measurements may give an indication of the amount of groundwater infiltration (GWI) entering the sanitary sewer system through system defects (structural issues) as well as provide an indication of potential hydraulic restrictions in the system (O&M issues). Dry weather flow nighttime pipe utilization greater than 10% was observed at all locations except FM-3. This may indicate GWI to the sanitary system at those locations.

In addition, all flow monitoring locations except FM-3 showed PDWF values exceeding 20%, which may suggest GWI into the system, surcharging in the downstream system, or that the pipe is undersized for its sanitary tributary area.

Table 2: Dry Weather Flow

DWF Event	Monitor	ADWF (MGD)	DWF Night Time Flow (MGD)	DWF Nighttime Pipe Utilization	PDWF (MGD)	Pipe Utilization @ PDWF
June 13 to June 16, 2023	FM-1	0.097	0.093	**15.60%**	0.505	**37.80%**
	FM-1B	1.130	1.130[2]	**22.40%**	2.466	**>100.00%[1]**
	FM-2	0.473	0.384	**12.50%**	0.962	**20.80%**
	FM-2B	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
	FM-3	0.043	0.011	1.60%	0.112	6.50%
	FM-5	2.909	2.603	**53.00%**	4.078	74.70%
	FM-6	0.916	0.639	**21.20%**	1.380	**>100.00%[1]**
	FM-7	3.000	2.483	**37.40%**	3.882	**51%**

Note 1. Pipes were surcharged. Nighttime pipe utilization ≥10% (Bolded) indicates high GWI. Pipe utilization @ PDWF ≥20% (Bolded) suggests potential capacity issues or possible restrictions downstream.

Note 2. DWF nighttime (June 13, 2023- 3am to 4am) flow value was higher than ADWF, therefore ADWF was used.

Note 3. For FM-2B, observed ADWF and nighttime DWF values were negative during the dry weather period, therefore DWF parameters were not reported.

Wet Weather Events

Table 2 summarizes the rainfall events during the Flow Monitoring Period (FMP). Fourteen events were recorded. The reported parameters are based on the more intense rainfall occurrence between the two rain gauge locations.

Figure 3 shows the total rainfall depth, storm duration, and the recurrence intervals for the 11 largest storms from **Table 2**. The wet weather events which occurred on June 11, July 14, July 23, and July 31, 2023 were used for hydraulic model calibration purposes are indicated in **bold** text.

Table 3: Rainfall Summary

Storm No.	Start Date, Time	Duration (hr)	Rainfall Depth (in)	Peak Hourly Intensity (in/hr)
1	5/27/2023 1:55	48.5	1.63	0.35
2	**6/11/2023 16:20**	**4.58**	**0.89**	**0.38**
3	6/19/2023 14:00	38.92	1.16	0.44
4	6/21/2023 22:00	14.58	0.52	0.33
5	7/7/2023 14:25	7.58	0.5	0.44
6	**7/14/2023 18:00**	**23.08**	**2.35**	**1.16**
7	7/15/2023 12:35	4.67	0.66	0.44
8	7/20/2023 17:30	1.92	0.29	0.28
9	**7/23/2023 18:10**	**1.67**	**4.15**	**3.96**
10	**7/31/2023 17:10**	**2.00**	**1.15**	**1.1**
11	8/7/2023 19:55	1.33	0.44	0.42
12	8/15/2023 17:15	1.25	0.4	0.39
13	8/26/2023 16:45	3.33	1.59	1.53
14	8/27/2023 15:15	9	1.33	1.04

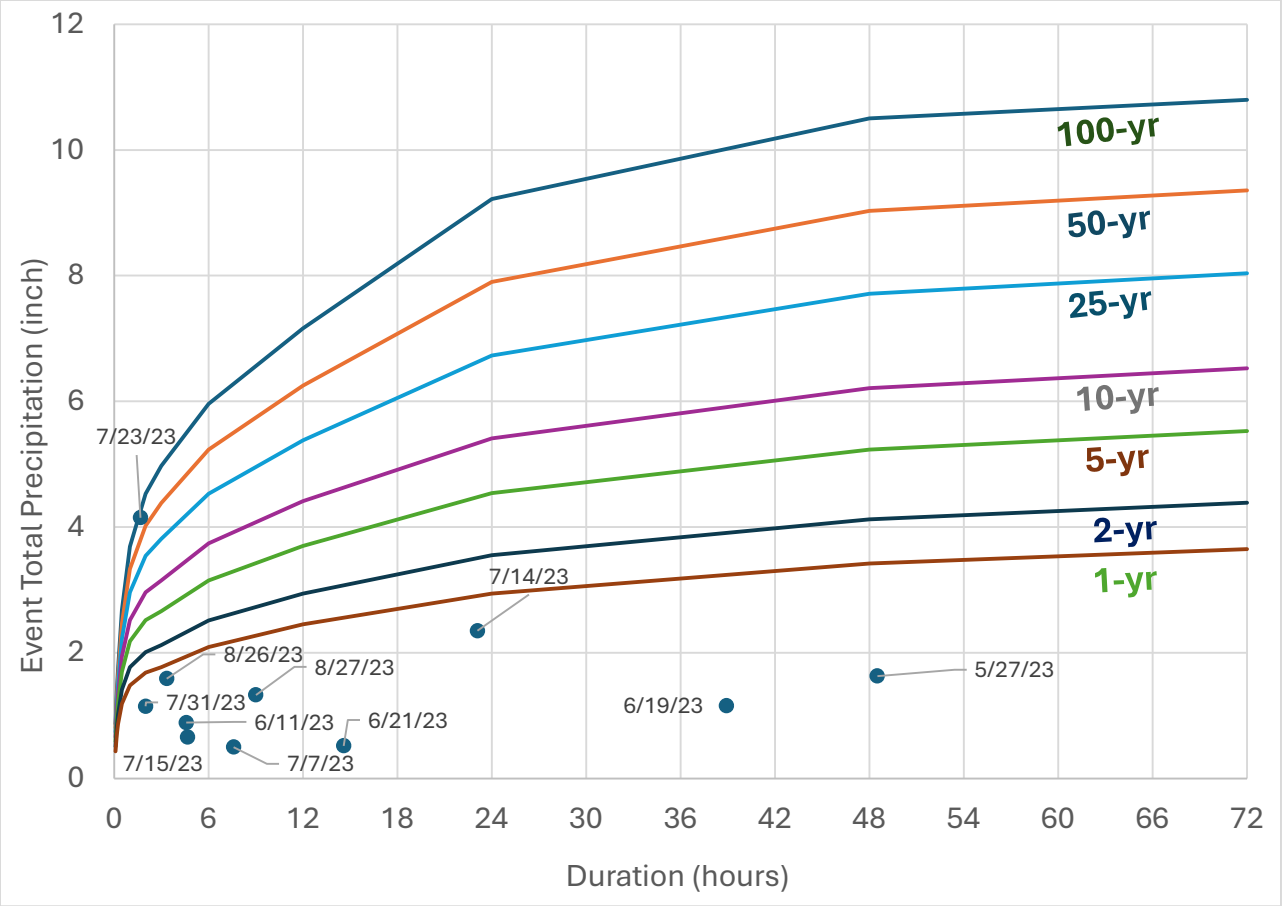

Figure 3: Rainfall Summary

Table 4 shows a summary of the ADWF and wet weather flow characteristics, including peak wet weather flow (PWWF), freeboard range and peak flow factor (PWWF/ ADWF) for each flow monitoring location.

Table 4: Peak Wet Weather Flow

Peak Storm Event	Monitor	ADWF	PWWF[1] (MGD)	Freeboard Range (ft)	Peak Flow Factor
June 11, July 14, July 23 and, July 31, 2023	FM-1	0.097	0.199	5.4 ft to 11.1 ft	2.05
	FM-1B	1.130	4.614	8.4 ft to 8.9 ft	4.08
	FM-2	0.473	3.248	6.4 ft to 12.1 ft	6.87
	FM-2B	N/A[2]	N/A[2]	1.6 ft to 7.2 ft	N/A[2]
	FM-3	0.043	0.082	3.86 ft to 3.94 ft	1.91
	FM-5	2.909	6.096	2.3 ft to 3.6 ft	2.10
	FM-6	0.916	2.656	2.1 ft to 4.4 ft	2.90
	FM-7	3.000	7.446	3.3 ft to 3.6 ft	2.48

Note 1. PWWF values were obtained during wet weather event which occurred on July 23, 2023, which was the largest wet weather event during the FMP.
Note 2. For FM-2B, observed ADWF and nighttime DWF values were negative during the dry weather period, which suggest impacts from downstream surcharging at the flow meter. Therefore, flow parameters were not reported.

Attachment A – Site Installation Forms

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Monitoring Site Installation Form

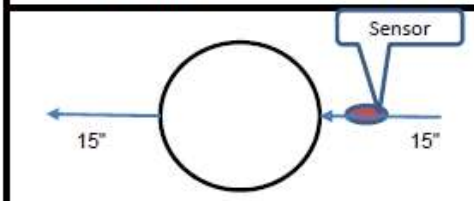
Project Name:	COF Flow Monitoring	**Install Date:** 5/23/2023	**Time:** 11:00
Project Job #:	60704377	**Crew:**	BK S Clark, S. Coker
Site Number/ID:	FM 01 E. Palmetto PS 39	**Location:**	Grass north of westbound lane
Location Description:	E. Palmetto 301		Grass/rocks swale

Type of Sewer:	Storm	Sanitary	Combined	Other:			
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:		
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:		
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop	Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:		

Manhole Depth:	11.6	(FT)	**Pipe Monitored (circle one)**	Inlet	Outlet	Overflow
Evidence Surcharge:	Yes					

Flow Meter Information

Meter Type:	FL901
Vendor:	Hach
Meter Serial Number:	2696
Sensor Types:	Sub AV
Sensor S/N:	549239
Sensor Location:	Upstream
Velocity Direction:	NA
Data collection interval:	2 Minutes



Pipe Sizes:

Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
15"	15"			

Flow Characteristics:

Stagnant	Turbulent	Laminar	Dry	Other

Real Time/Current Status Readings at Installation

METER	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
	Depth (in)	3.22		
	Velocity (fps)	1.07		
	Flow (MGD)	0.182		
MANUAL		1	2	3
	Depth (in)	3.25		
	Velocity (fps)	1.05		

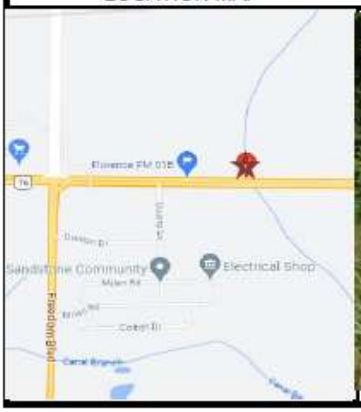
Physical Offset:	1	Electronic Level Adj: Pdepth:	0
Silt:	0	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**	
Velocity Gain	1		
Calc. Manual Velocity:			

Telemetry

Telemetry Used:	Yes / No	Coordinates:	34° 11.808	79° 40.547	Ant. Type	Wing
Ant. Location:	top of MH cover					

Setup Equipment Needed:

LOCATION MAP



LANDSCAPE

SENSOR

AECOM

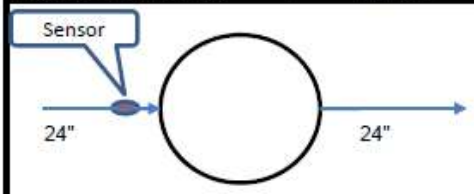
Monitoring Site Installation Form

Project Name:	COF Flow Monitoring			**Install Date:**	5/23/2023	**Time:** 12:00
Project Job #:	60704377			**Crew:**	BK SC	
Site Number/ID:	FM 001B			**Location:**	Woods	
Location Description:	W. Palmetto PS 39				Brush west of PS 39	

Type of Sewer:	Storm	Sanitary	Combined	Other:			
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:		
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:		
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop	Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:		

Manhole Depth:	9.6 (FT)	**Pipe Monitored (circle one)**	Inlet	Outlet	Overflow
Evidence Surcharge:	NO	**Pipe Sizes:**			

Flow Meter Information		Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
Meter Type:	FL901	24"	24"			
Vendor:	Hach	**Flow Characteristics:**				
Meter Serial Number:	2693	Stagnant	Turbulent	Laminar	Dry	Other
Sensor Types:	Sub AV	**Real Time/Current Status Readings at Installation**				
Sensor S/N:	585993	METER	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
Sensor Location:	Upstream		Depth (in)	8.03		
Velocity Direction:	NA		Velocity (fps)	3.47		
Data collection interval:	2 Minutes		Flow (MGD)	2.02		
		MANUAL		1	2	3
			Depth (in)	8		
			Velocity (fps)	3.45		



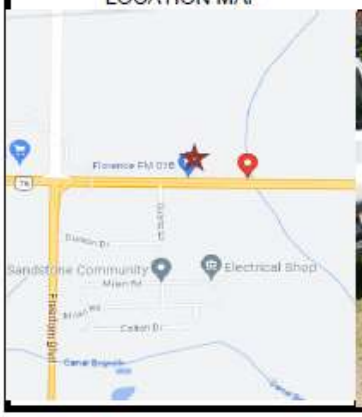
Physical Offset:	0	**Electronic**	Pdepth:	0
Silt:	0	**Level Adj:**	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**		
Velocity Gain	1			
Calc. Manual Velocity:				

Telemetry

Telemetry Used:	Yes / No	Coordinates:	34° 11.809	79° 40.698	Ant. Type	Wing
Ant. Location:						

Setup Equipment Needed:

LOCATION MAP



LANDSCAPE

SENSOR

AECOM

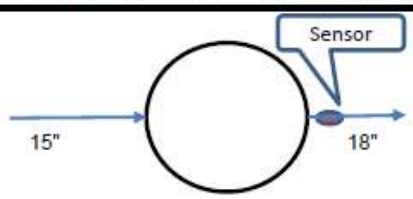
Monitoring Site Installation Form

Project Name:	COF Flow Monitoring		**Install Date:**	5/23/2023	**Time:**	15:00
Project Job #:	60704377		**Crew:**	BK SC		
Site Number/ID:	FM 002B		**Location:**	Woods behind PS		
Location Description:	High Hills PS 18 in			Brush behind PS on N. Williamson Rd.		

Type of Sewer:	Storm	Sanitary	Combined	Other:			
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:		
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:		
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop	Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:		

Manhole Depth:	8.2	(FT)	**Pipe Monitored (circle one)**	Inlet	Outlet	Overflow
Evidence Surcharge:	Yes / No		**Pipe Sizes:**			

Flow Meter Information		Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
Meter Type:	FL901	15"	18"			
Vendor:	Hach					
Meter Serial Number:	2687					
Sensor Types:	Sub AV					
Sensor S/N:	587663					
Sensor Location:	Downstream					
Velocity Direction:	NA					
Data collection interval:	2 Minutes					



Flow Characteristics:				
Stagnant	Turbulent	Laminar	Dry	Other

Real Time/Current Status Readings at Installation

METER	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
	Depth (in)	6.74		
	Velocity (fps)	1.08		
	Flow (MGD)	0.504		
MANUAL		1	2	3
	Depth (in)	6.75		
	Velocity (fps)	1.1		

Physical Offset:	0.75		**Electronic**	Pdepth:	-0.27
Silt:	0		**Level Adj:**	Udepth:	0
Vel Max fps:			**Manual Velocity Profiling**		
Velocity Gain	1				
Calc. Manual Velocity:					

Telemetry

Telemetry Used:	Yes / No	Coordinates:	34° 12.743	79° 42.187	Ant. Type	Puck
Ant. Location:	On MH cover					

Setup Equipment Needed:

LOCATION MAP

LANDSCAPE

SENSOR

AECOM

Monitoring Site Installation Form

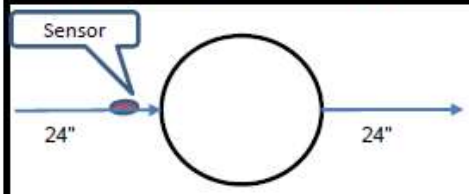
Project Name:	COF Flow Monitoring		**Install Date:**	5/23/2023	**Time:**	14:00
Project Job #:	60704377		**Crew:**	BK SC		
Site Number/ID:	FM 002		**Location:**	Woods behind PS		
Location Description:	High Hills PS 24 in			Brush behind PS on N. Williamson Rd.		

Type of Sewer:	Storm	Sanitary	Combined	Other:			
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:		
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:		
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop	Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:		

Manhole Depth:	12.6	(FT)
Evidence Surcharge:	NO	

Flow Meter Information

Meter Type:	FL901
Vendor:	Hach
Meter Serial Number:	2866
Sensor Types:	Sub AV
Sensor S/N:	584494
Sensor Location:	Upstream
Velocity Direction:	Upstream
Data collection interval:	2 Minutes



Pipe Monitored (circle one): Inlet | Outlet | Overflow

Pipe Sizes:

Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
24"	24"			

Flow Characteristics:

Stagnant	Turbulent	Laminar	Dry	Other

Real Time/Current Status Readings at Installation

		UDepth	PDepth/UDepth	PDepth/UDepth
METER	Time:			
	Depth (in)	6.74		
	Velocity (fps)	1.08		
	Flow (MGD)	0.504		
MANUAL		1	2	3
	Depth (in)	6.75		
	Velocity (fps)	1.1		

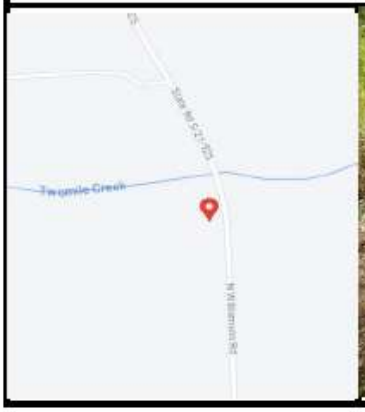
Physical Offset:	0.75	**Electronic Level Adj:** Pdepth:	-0.27
Silt:	0	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**	
Velocity Gain	1		
Calc. Manual Velocity:			

Telemetry

Telemetry Used:	Yes / No	Coordinates:	34° 12.743	79° 42.187	Ant. Type	Wing
Ant. Location:	On MH cover					

Setup Equipment Needed:

LOCATION MAP



LANDSCAPE

SENSOR

AECOM

Monitoring Site Installation Form

Project Name:	COF Flow Monitoring			**Install Date:**	5/23/2023	**Time:** 16:00
Project Job #:	60704377			**Crew:**	BK SC	
Site Number/ID:	FM 03			**Location:**	Driveway to Carolina Townhomes	
Location Description:	Broad Drive					

Type of Sewer:	Storm	Sanitary	Combined	Other:		
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:	
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:	
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop / Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:	

Manhole Depth: 4.1 (FT)
Evidence Surcharge: Yes

Pipe Monitored (circle one): Inlet / Outlet / Overflow

Pipe Sizes:

Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
18"	18"	8		

Flow Meter Information

Meter Type:	FL901
Vendor:	Hach
Meter Serial Number:	210600005197
Sensor Types:	Sub AV
Sensor S/N:	593005
Sensor Location:	Upstream
Velocity Direction:	NA
Data collection interval:	5 Minutes

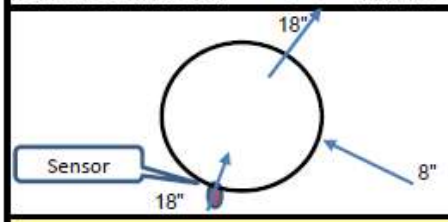
Flow Characteristics:

Stagnant	Turbulent	Laminar	Dry	Other

Real Time/Current Status Readings at Installation

	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
METER	Depth (in)	2.97		
	Velocity (fps)	0.71		
	Flow (MGD)	0.0876		

		1	2	3
MANUAL	Depth (in)	2.9		
	Velocity (fps)	0.75		



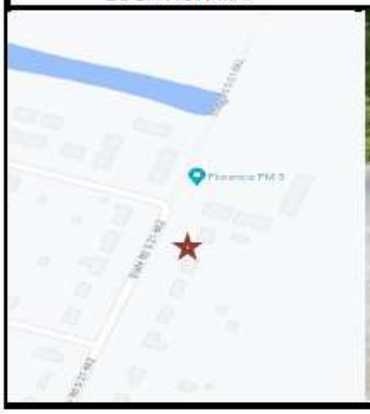
Physical Offset:	0	Electronic Level Adj: Pdepth:	0
Silt:	0	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**	
Velocity Gain	1		
Calc. Manual Velocity:			

Telemetry

Telemetry Used: Yes / No Coordinates: 34° 9.8412 79° 44.610 Ant. Type Wing
Ant. Location:

Setup Equipment Needed:

LOCATION MAP



LANDSCAPE

SENSOR

AECOM

Monitoring Site Installation Form

Project Name:	COF Flow Monitoring			**Install Date:**	5/24/2023	**Time:**	9:00
Project Job #:	60704377			**Crew:**	BK SC		
Site Number/ID:	FM 05			**Location:**	Woods west of WWTP		
Location Description:	Jeffries Creek South						

Type of Sewer:	Storm	Sanitary	Combined	Other:		
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:	
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:	
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop / Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:	

Manhole Depth: 5.1' (FT)
Evidence Surcharge: Yes / No

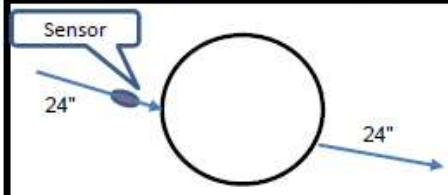
Pipe Monitored (circle one): Inlet / Outlet / Overflow

Pipe Sizes:

Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
24"	24"			

Flow Meter Information

Meter Type:	FL901
Vendor:	Hach
Meter Serial Number:	2695
Sensor Types:	Sub AV
Sensor S/N:	174625
Sensor Location:	Upstream
Velocity Direction:	NA
Data collection interval:	5 Minutes



Flow Characteristics:

Stagnant	Turbulent	Laminar	Dry	Other
		✓		

Real Time/Current Status Readings at Installation

		UDepth	PDepth/UDepth	PDepth/UDepth
METER	Time:			
	Depth (in)	11.54		
	Velocity (fps)	2.39		
	Flow (MGD)	2.31		
MANUAL		1	2	3
	Depth (in)	11.5		
	Velocity (fps)	2.5		

Physical Offset:	0	Electronic Level Adj: Pdepth:	0.51
Silt:	0	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**	
Velocity Gain	1		
Calc. Manual Velocity:			

Telemetry

Telemetry Used: Yes / No Coordinates: 34° 10.386 79° 45.120 Ant. Type Puck
Ant. Location:

Setup Equipment Needed: Long walk to site through woods

LOCATION MAP

LANDSCAPE

SENSOR

AECOM

Monitoring Site Installation Form

Project Name:	COF Flow Monitoring			**Install Date:**	5/24/2023	**Time:** 11:00
Project Job #:	60704377			**Crew:**	BK SC	
Site Number/ID:	FM 06			**Location:**	trail south of Woody Jones	
Location Description:	Beaver Creek Dam					

Type of Sewer:	Storm	Sanitary	Combined	Other:		
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:	
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:	
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop / Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:	

Manhole Depth: 8.9 (FT)
Evidence Surcharge: Yes

Pipe Monitored (circle one): Inlet / Outlet / Overflow

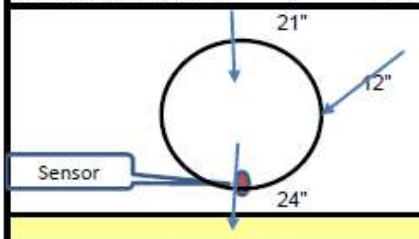
Pipe Sizes:

Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
21	24	12		

Flow Characteristics: Stagnant / Turbulent / Laminar / Dry / Other

Flow Meter Information

Meter Type:	FL901
Vendor:	Hach
Meter Serial Number:	2685
Sensor Types:	Sub AV
Sensor S/N:	555243
Sensor Location:	Downstream
Velocity Direction:	NA
Data collection interval:	5 Minutes



Real Time/Current Status Readings at Installation

	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
METER	Depth (in)	9.02		
	Velocity (fps)	1.39		
	Flow (MGD)	1.119		

		1	2	3
MANUAL	Depth (in)	9		
	Velocity (fps)	1.42		

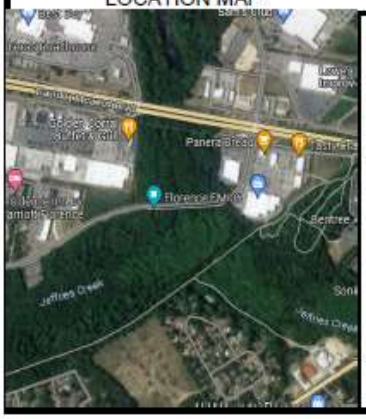
Physical Offset:	0	**Electronic Level Adj:** Pdepth:	-2.22
Silt:	0	Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**	
Velocity Gain	1		
Calc. Manual Velocity:			

Telemetry

Telemetry Used: Yes / No Coordinates: 34° 11.142 79° 49.704 Ant. Type Wing
Ant. Location:

Setup Equipment Needed:

LOCATION MAP



LANDSCAPE

SENSOR

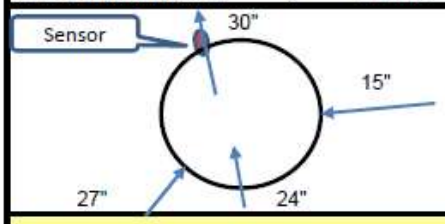
AECOM

Monitoring Site Installation Form

Project Name:	COF Flow Monitoring			**Install Date:**	5/24/2023	**Time:**	11:00
Project Job #:	60704377			**Crew:**	BK SC		
Site Number/ID:	FM 07			**Location:**	Field West of WWTP		
Location Description:	Jeffries Creek North						
Type of Sewer:	Storm	Sanitary	Combined	Other:			
Tributary Area:	Residential	Commercial	Undeveloped	Industrial	Other:		
Manhole Conditions:	Good	Silting	Oil/Grease	Surchraged	Other:		
Manhole Type:	Over/Under	Dividing Wall	Standard	Junction	Bend	Drop	Overflow
Pipe Construction:	VCP	Concrete	PVC	Brick	Other:		

Manhole Depth:	5.1' (FT)	**Pipe Monitored (circle one)**	Inlet	Outlet	Overflow
Evidence Surcharge:	yes	**Pipe Sizes:**			

Flow Meter Information		Inlet:	Outlet:	Pipe 1:	Pipe 2:	Pipe 3:
Meter Type:	FL901	24"	30"	27"	15"	
Vendor:	Hach	**Flow Characteristics:**				
Meter Serial Number:	2694	Stagnant	Turbulent	Laminar	Dry	Other
Sensor Types:	Sub AV	**Real Time/Current Status Readings at Installation**				
Sensor S/N:	174627	METER	Time:	UDepth	PDepth/UDepth	PDepth/UDepth
Sensor Location:	Downstream		Depth (in)	13.56		
Velocity Direction:	NA		Velocity (fps)	2.17		
Data collection interval:	5 Minutes		Flow (MGD)	3.02		
		MANUAL		1	2	3
			Depth (in)	13.5		
			Velocity (fps)	2.22		



Physical Offset:	0	**Electronic Level Adj:**	Pdepth:	0.51
Silt:	0		Udepth:	0
Vel Max fps:		**Manual Velocity Profiling**		
Velocity Gain	1			
Calc. Manual Velocity:				

Telemetry

Telemetry Used:	Yes / No	Coordinates:	34° 10.448	79° 45.089	Ant. Type	Puck
Ant. Location:	Next to MH					

Setup Equipment Needed:

LOCATION MAP | LANDSCAPE | SENSOR

Figure A: Installation Sheet for Flow Monitors for 2023

AECOM

RAIN GAUGE INSTALLATION FORM

Project Name: COL Flow Monitoring
Rain Gauge Name: Florence RG1 **(1 OF 2)**
Site I D: RG2

Install Date: 5/24/2023
Time: 2:00 PM
Installers Initials: BK, SC
Removal Date:

Location Description: Roof of Water Treatment Plant 16 Levy Park

Building Contact Person:
Title: **Telephone Number:**

Instructions for access:

Rain Gauge Hardware Information		Communication/Access Information	
Logger Type:	Telog RG-32A	**Telemetry Used:**	Yes or No
Logger Serial #:	23209945	**IP Address:**	
Logger Location:	Roof	**Antenna Location:**	Internal
Bucket Type/SN:	T.E. 83296-0420	**Tip Test at Install (Y/N)**	Y 5
Bucket Location:	Roof	**Ladder necessary for bucket access (Y/N)**	N
Data Collection Interval:	5 Minutes	**Ladder necessary for logger access (Y/N)**	N

LOCATION MAP

PHOTO

Coordinates: 34.19300, -79.74767

AECOM

RAIN GAUGE INSTALLATION FORM

Project Name: COL Flow Monitoring
Rain Gauge Name: Florence RG2 **(2 OF 2)**
Site I D: RG2

Install Date: 5/24/2023
Time: 1:00 PM
Installers Initials: BK, SC
Removal Date:

Location Description: South sidewalk of WWTP Admn. Bldg.

Building Contact Person:
Title: **Telephone Number:**

Instructions for access:

Rain Gauge Hardware Information		Communication/Access Information	
Logger Type:	Telog RG-32A	**Telemetry Used:**	Yes or No
Logger Serial #:	34200917	**IP Address:**	
Logger Location:	Sidewalk	**Antenna Location:**	Internal
Bucket Type/SN:	T.E. 86745-0521	**Tip Test at Install (Y/N)**	Y 5
Bucket Location:	Sidewalk	**Ladder necessary for bucket access (Y/N)**	N
Data Collection Interval:	5 Minutes	**Ladder necessary for logger access (Y/N)**	N

LOCATION MAP

PHOTO

Coordinates: 34.17246, -79.74398

Figure B: Installation Sheet for Rain Gauges for 2023

FULL LIFE. FULL FORWARD.
FLORENCE
SOUTH CAROLINA

City of Florence, South Carolina

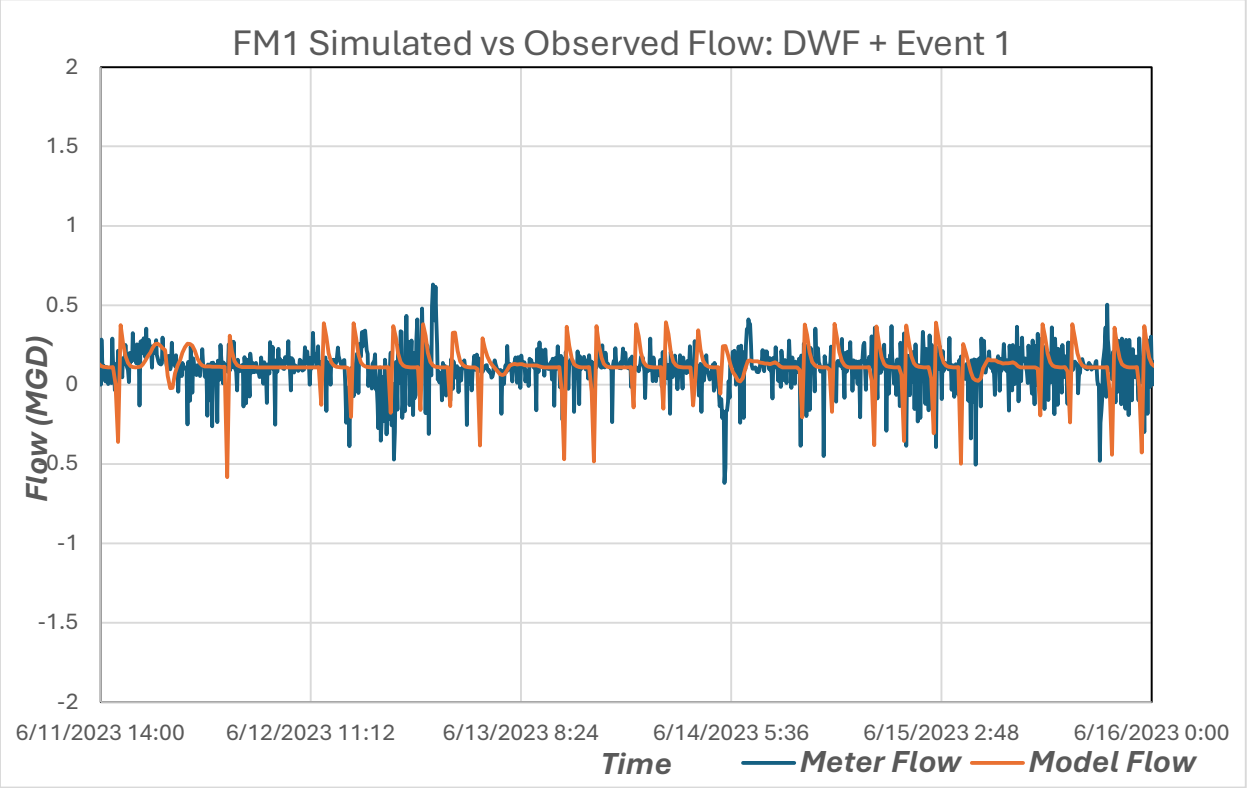
Sewer Collection System Master Plan

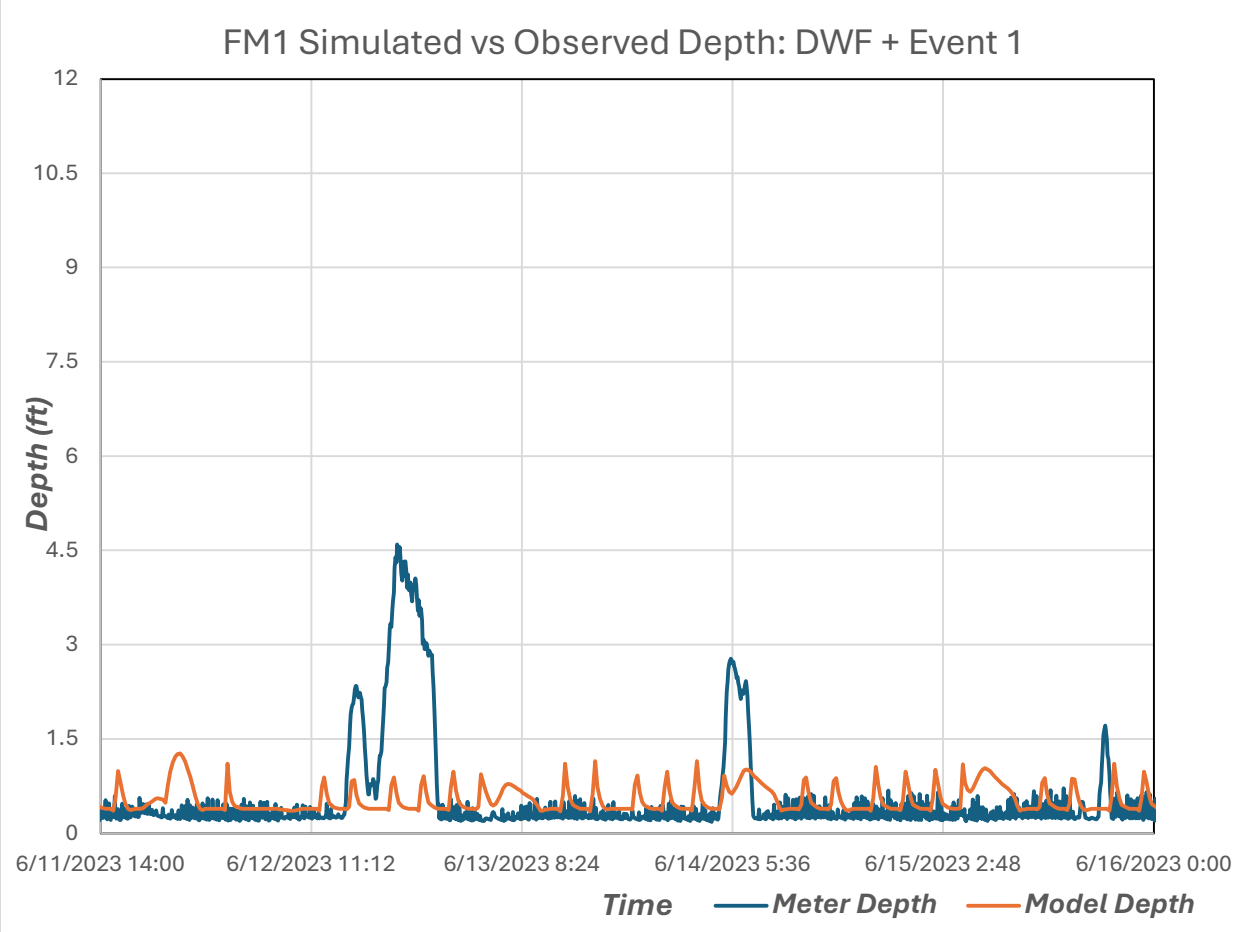
Appendix E

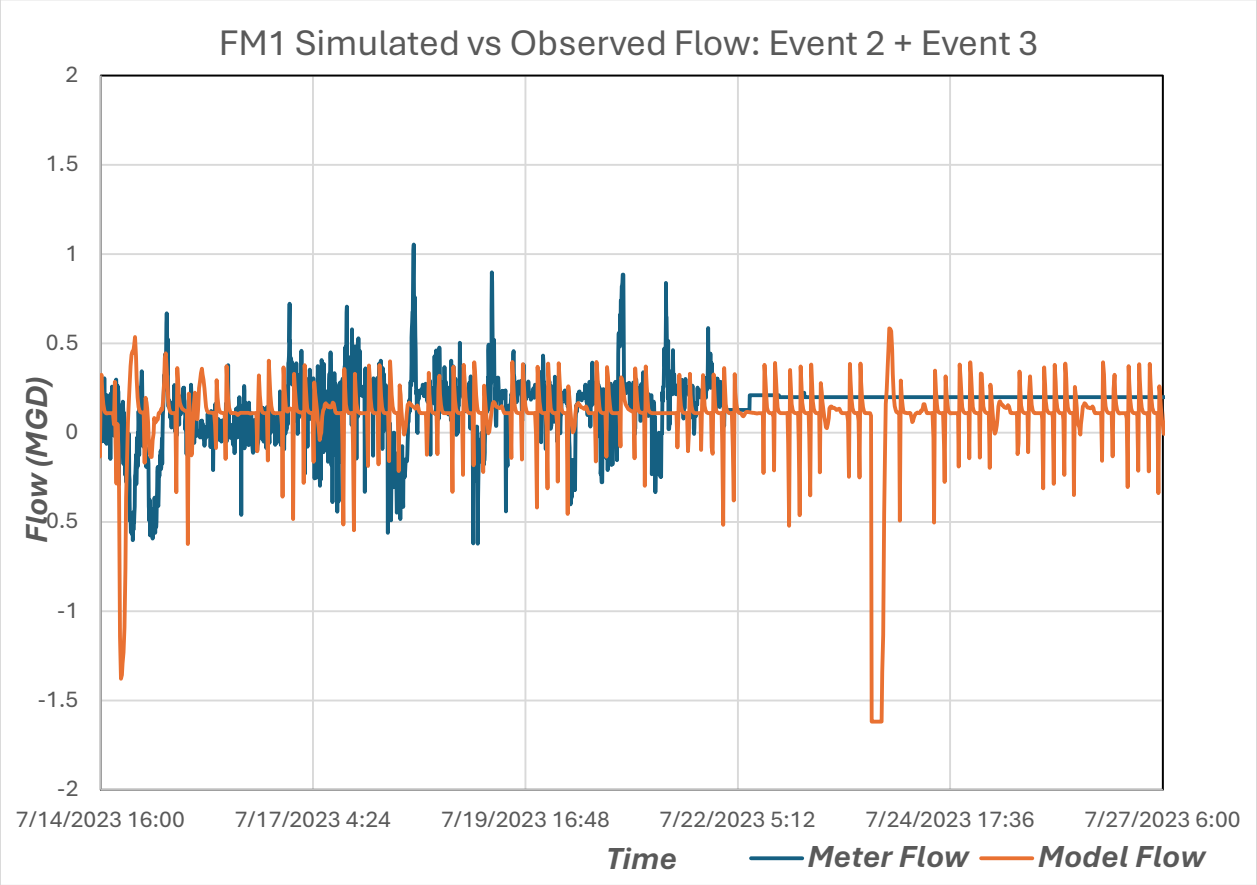
Model Calibration Plots

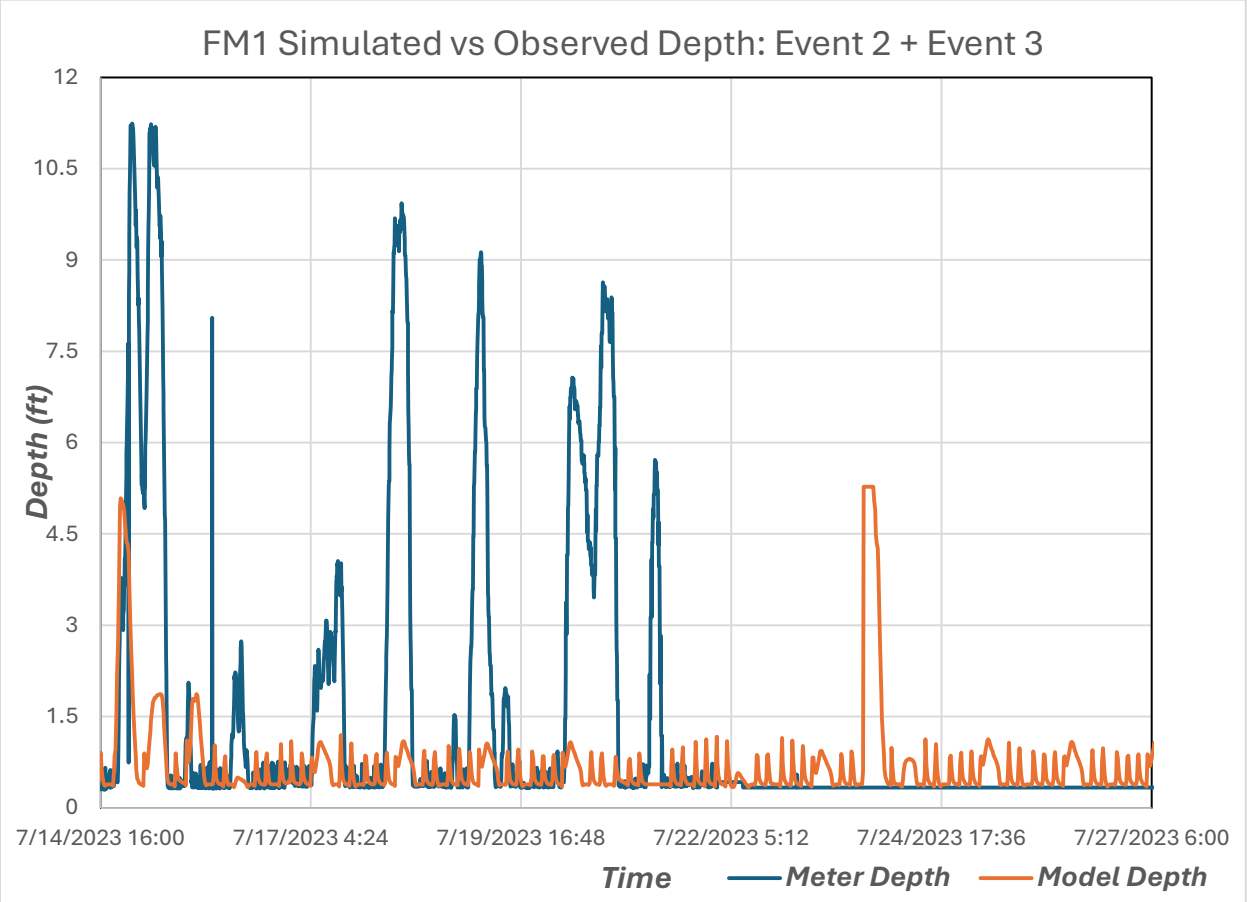
September 2025

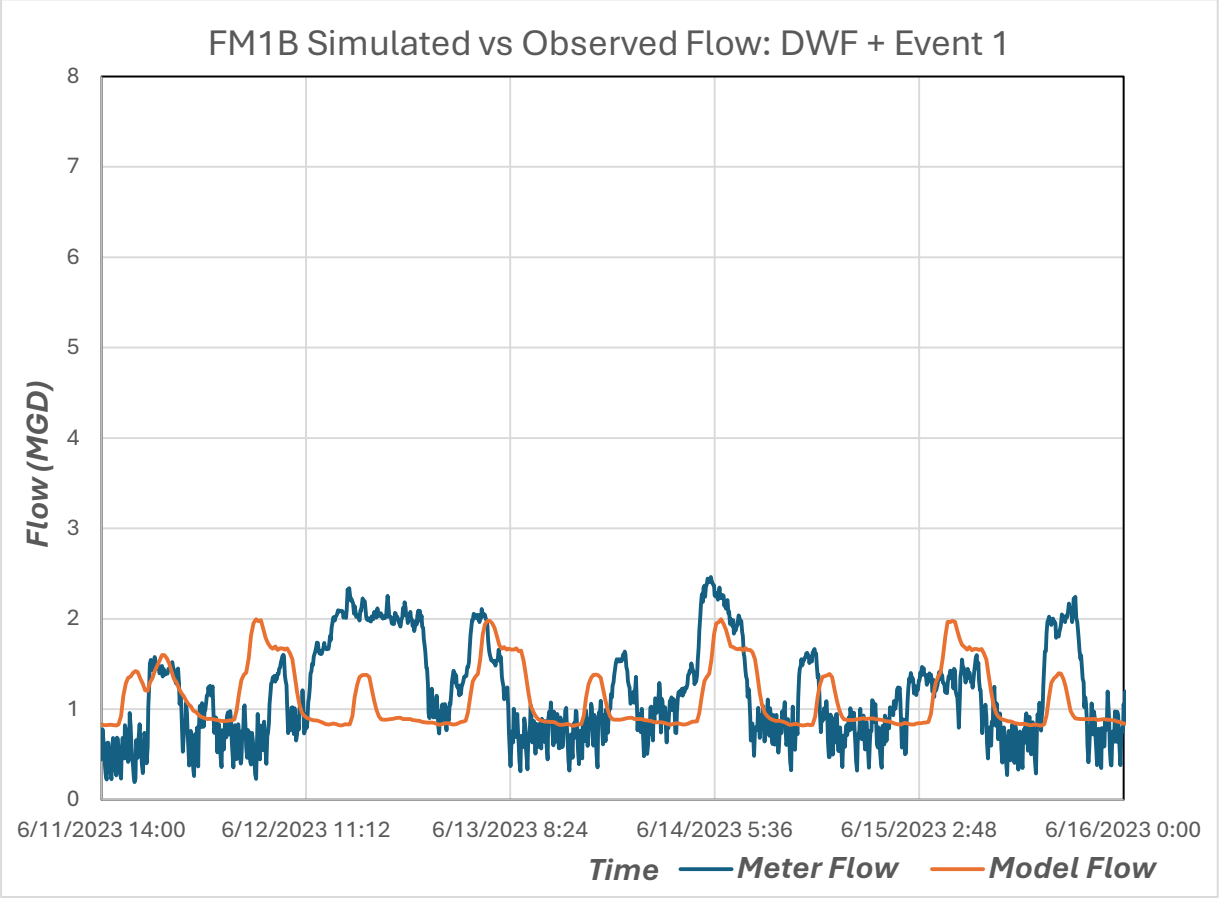
FULL LIFE. FULL FORWARD.
FLORENCE
SOUTH CAROLINA

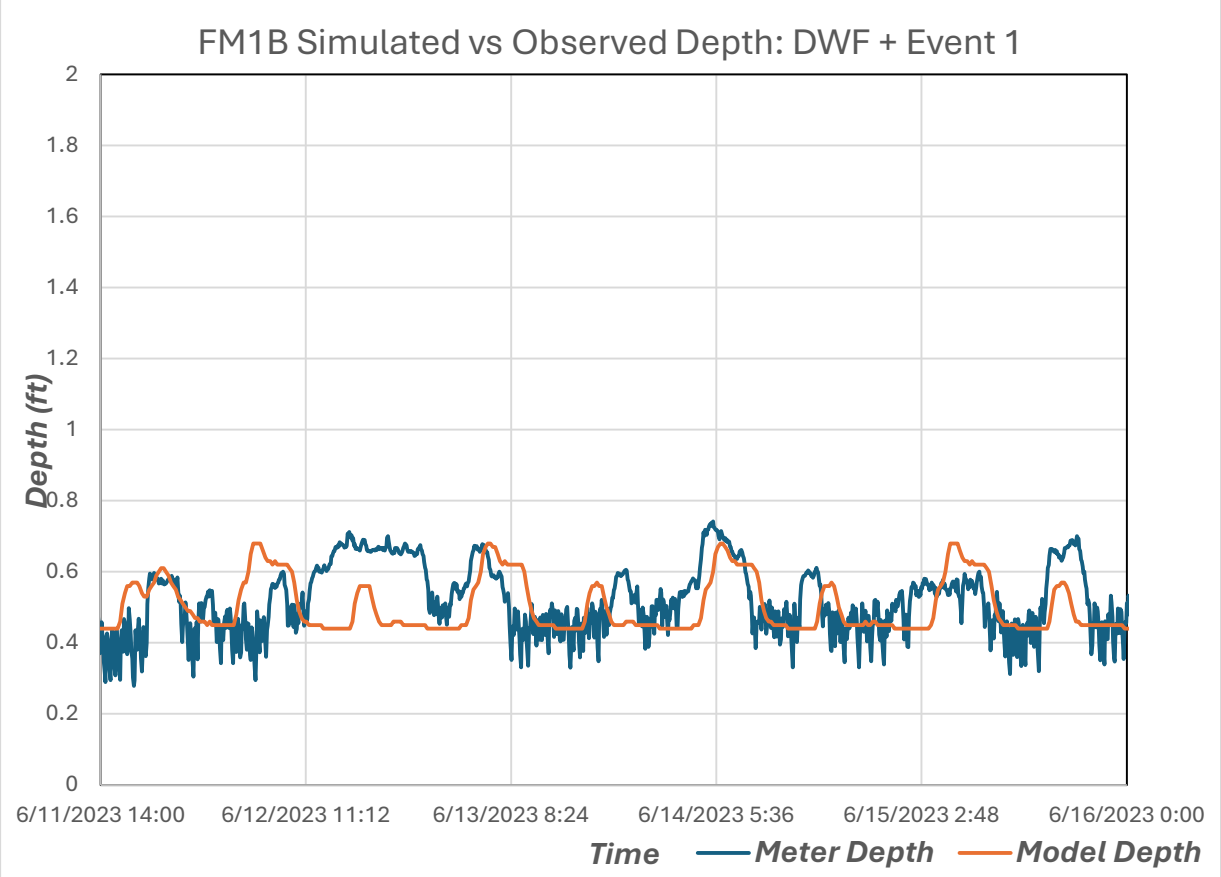

FM1 Simulated vs Observed Flow: DWF + Event 1
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Flow (MGD)
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

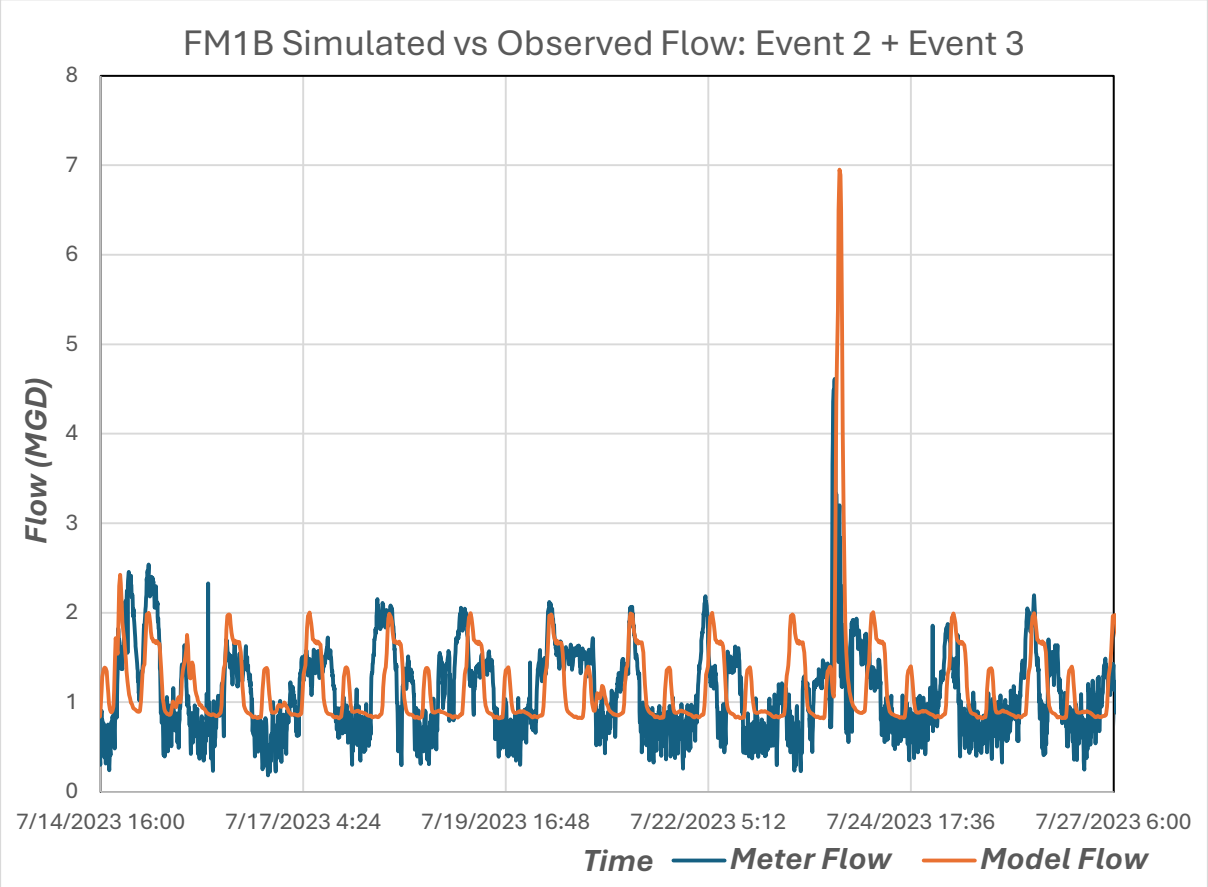

FM1 Simulated vs Observed Depth: DWF + Event 1
12
10.5
9
7.5
6
4.5
3
1.5
0
Depth (ft)
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

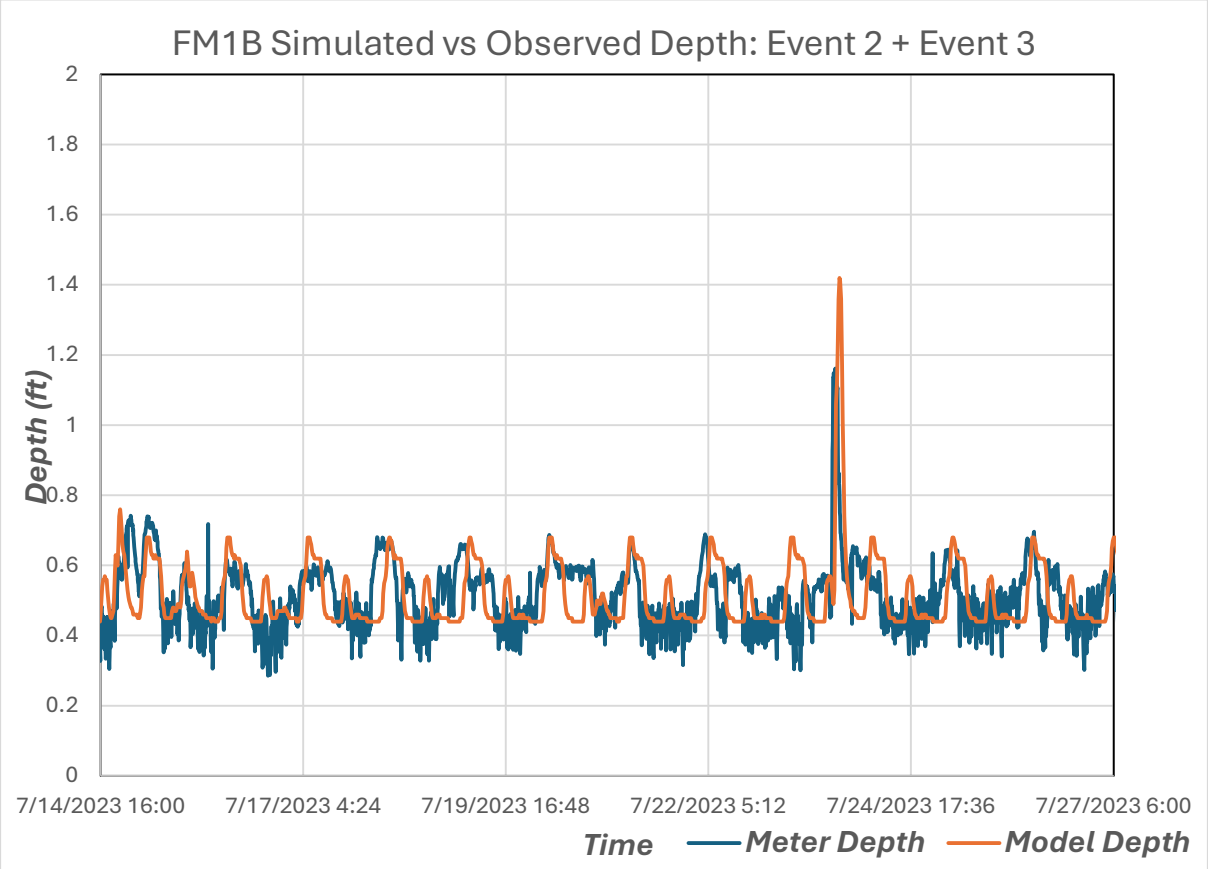

FM1 Simulated vs Observed Flow: Event 2 + Event 3
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Flow (MGD)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

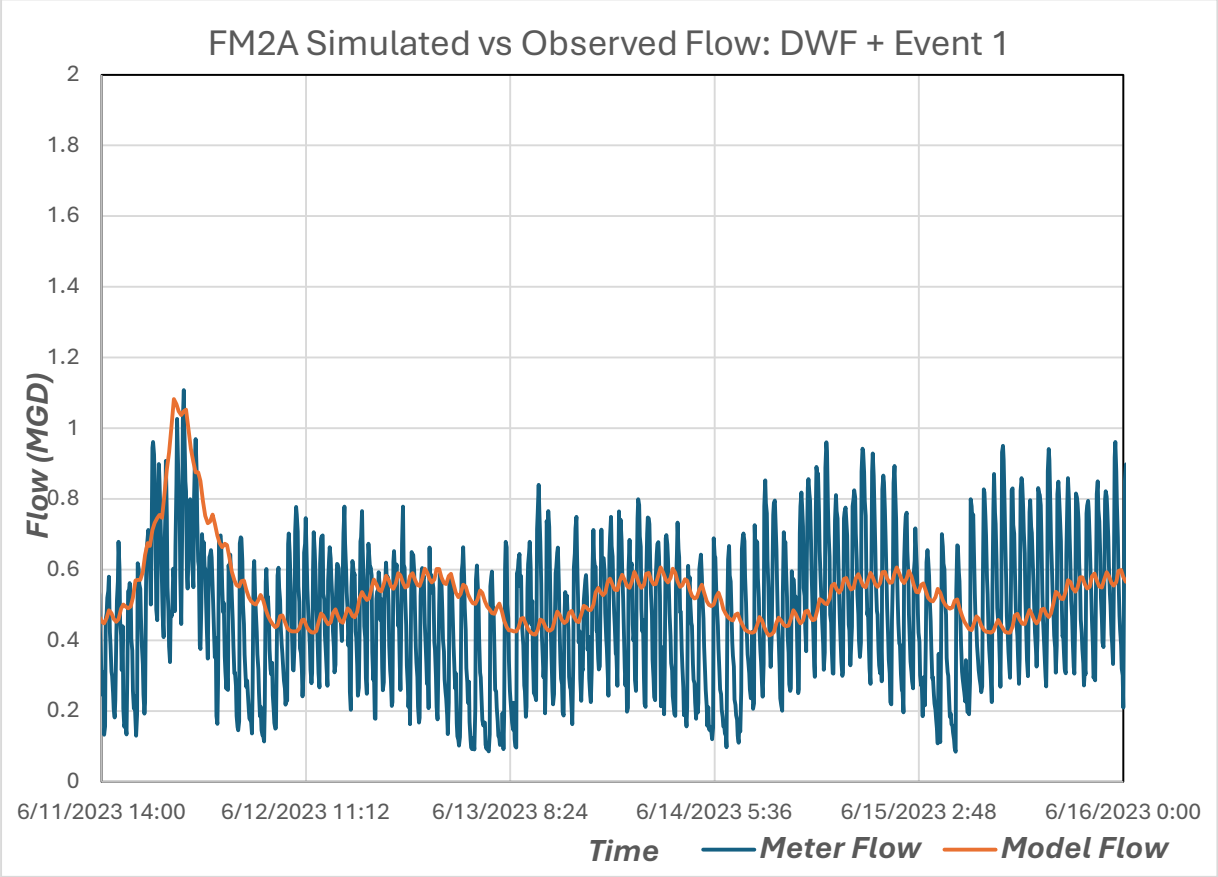

FM1 Simulated vs Observed Depth: Event 2 + Event 3
12
10.5
9
7.5
6
4.5
3
1.5
0
Depth (ft)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

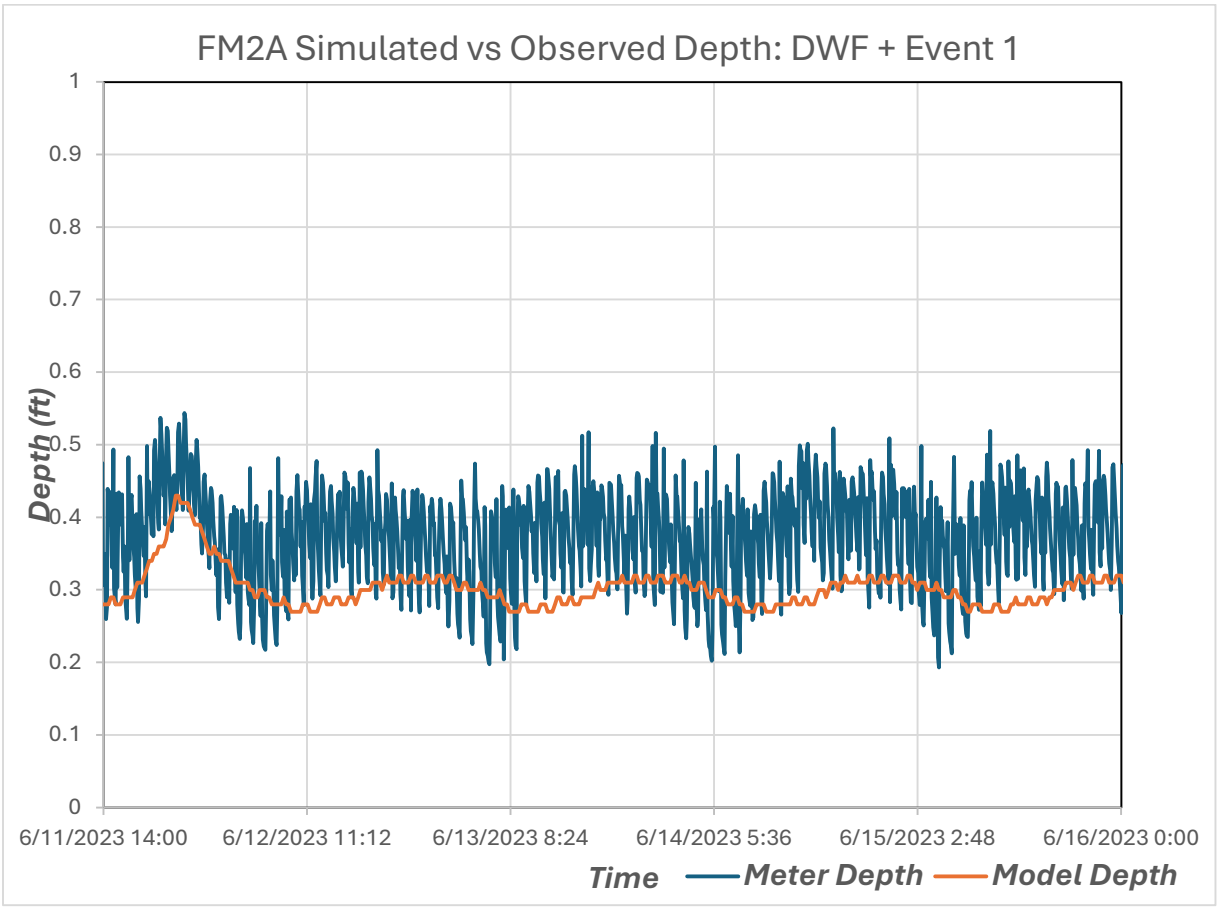

FM1B Simulated vs Observed Flow: DWF + Event 1
Flow (MGD)
8
7
6
5
4
3
2
1
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

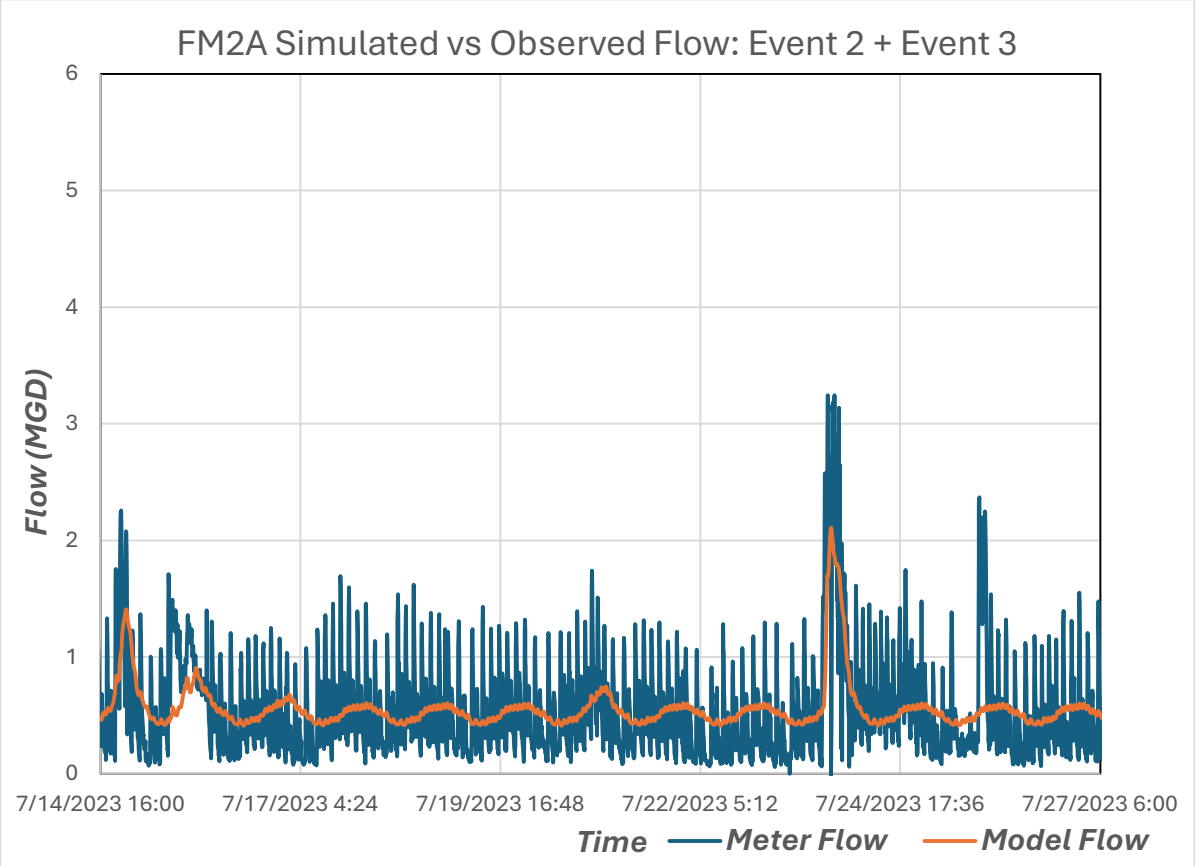

FM1B Simulated vs Observed Depth: DWF + Event 1
Depth (ft)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

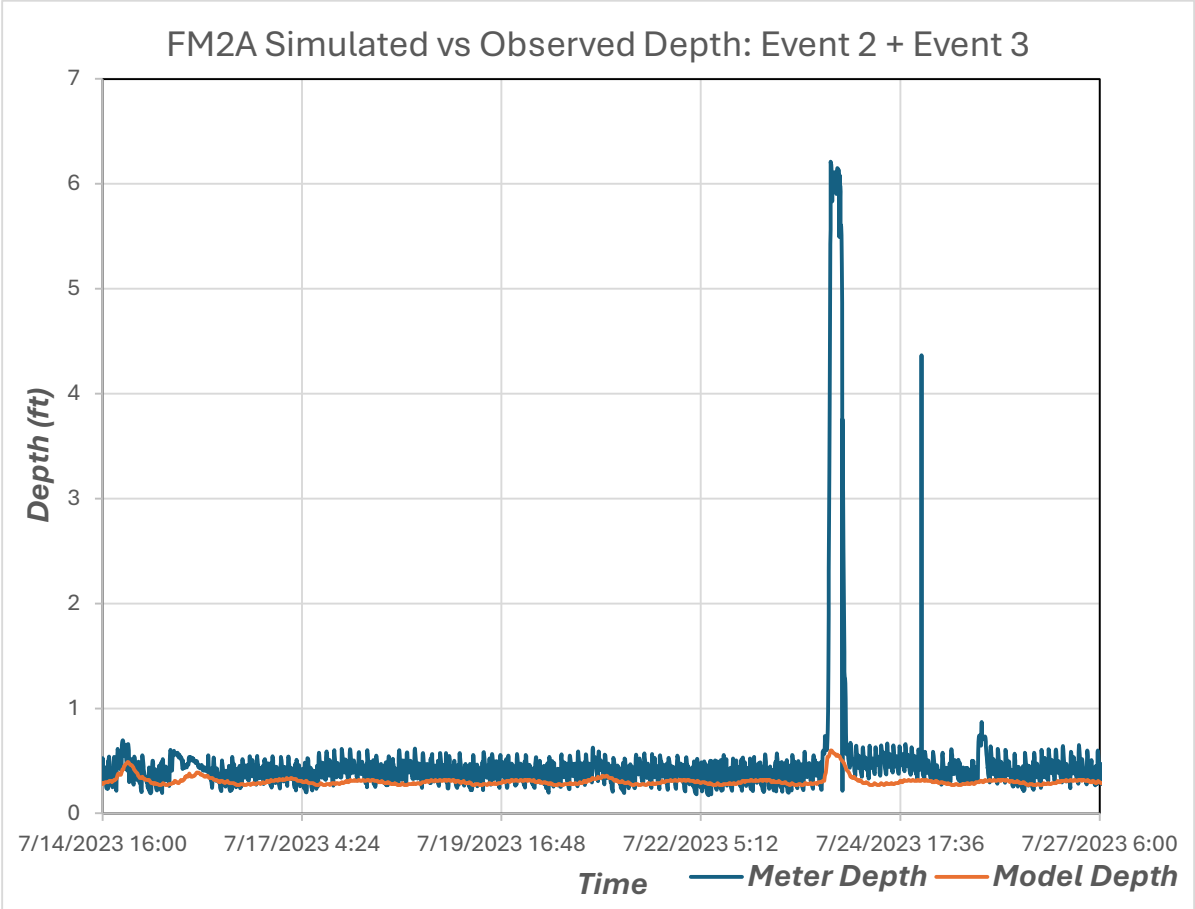

FM1B Simulated vs Observed Flow: Event 2 + Event 3
Flow (MGD)
8
7
6
5
4
3
2
1
0
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

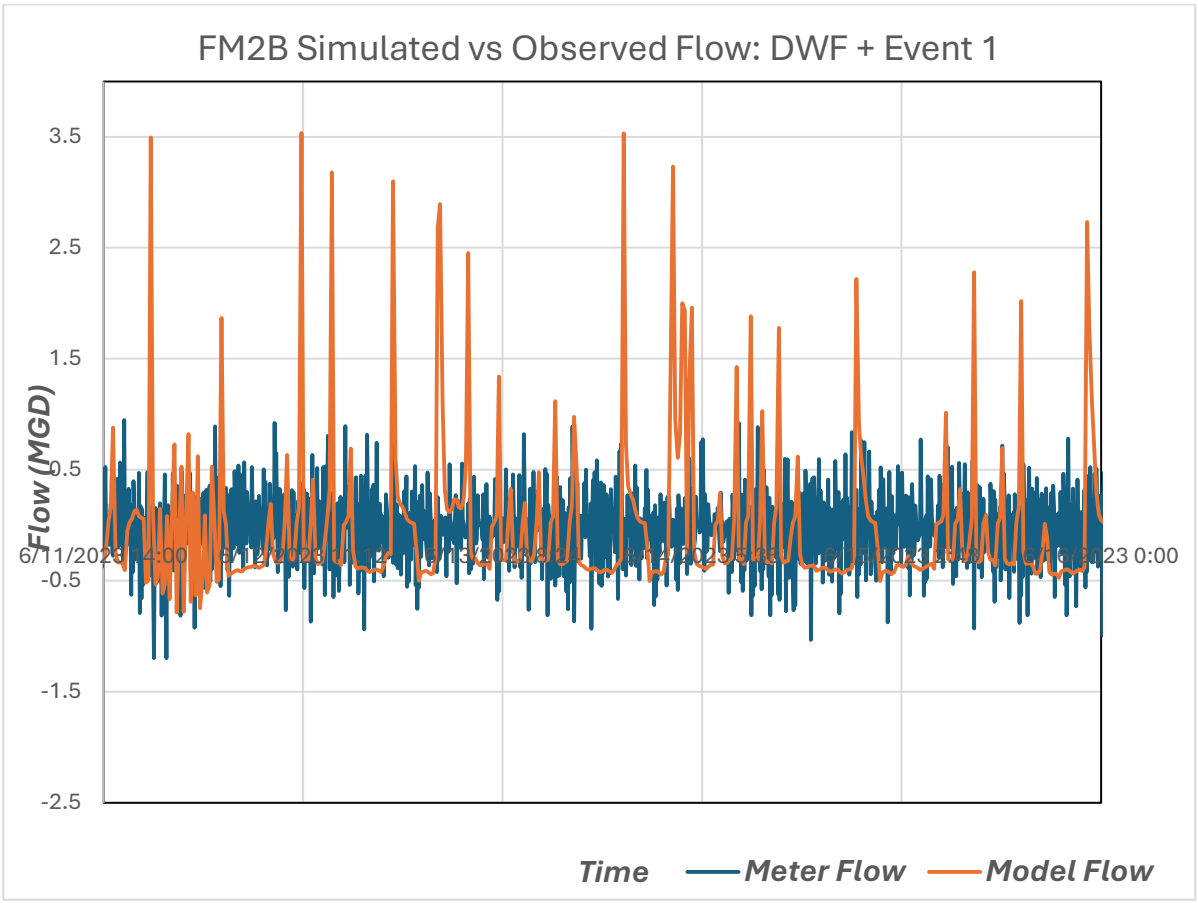

FM1B Simulated vs Observed Depth: Event 2 + Event 3
Depth (ft)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

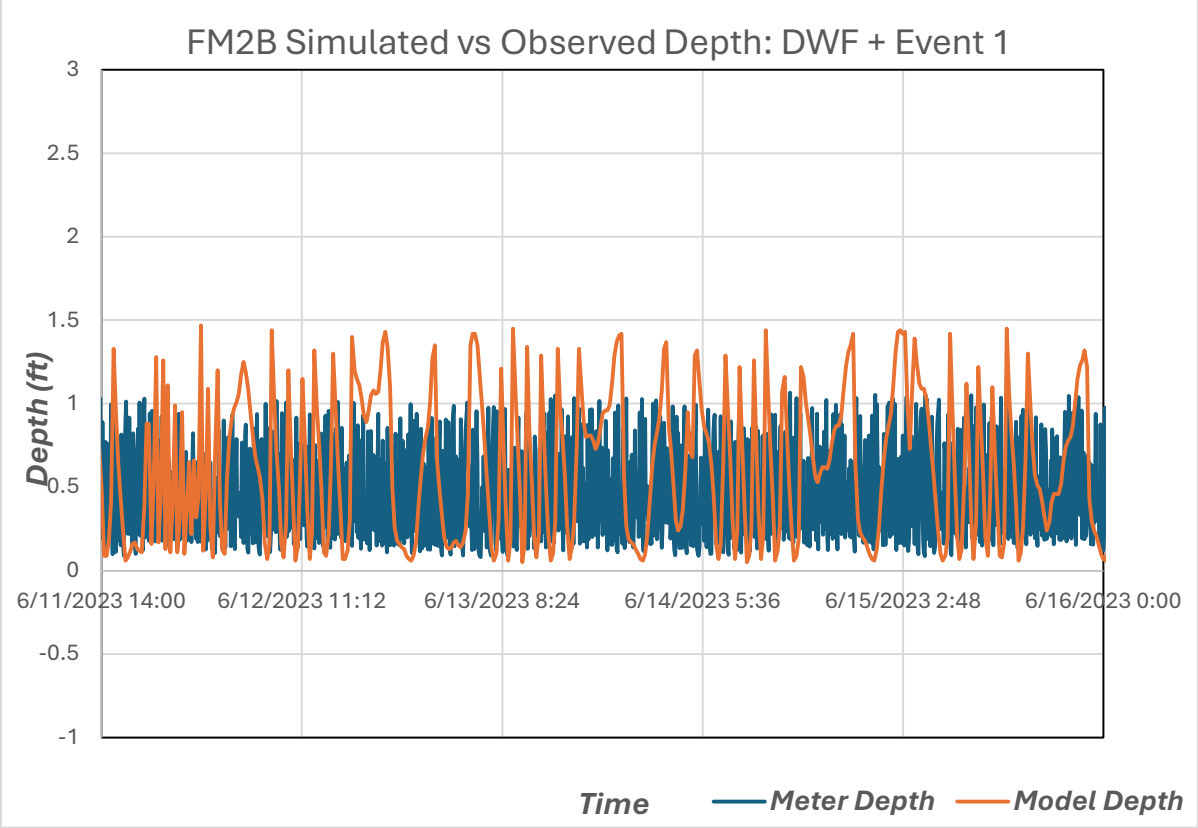

FM2A Simulated vs Observed Flow: DWF + Event 1
Flow (MGD)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

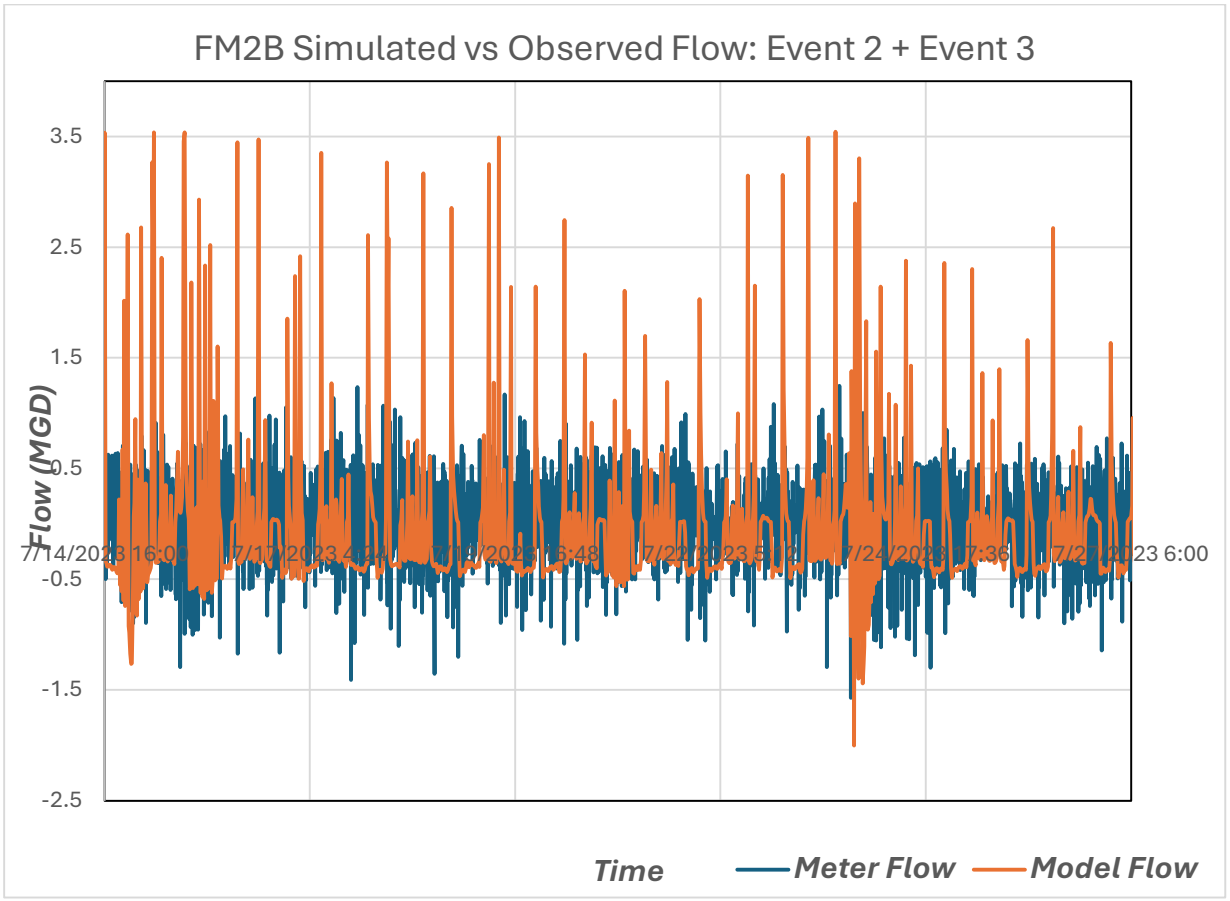

FM2A Simulated vs Observed Depth: DWF + Event 1
Depth (ft)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

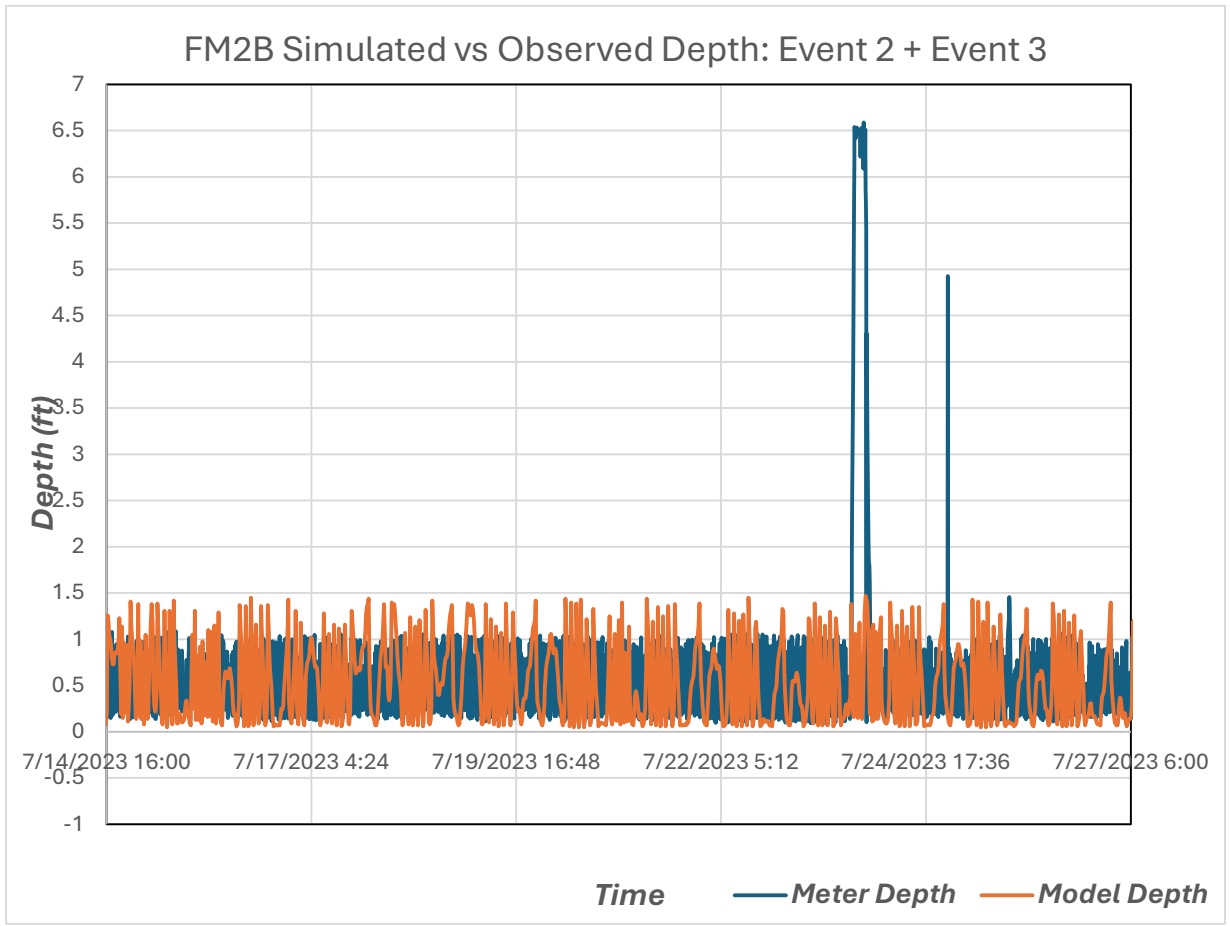

FM2A Simulated vs Observed Flow: Event 2 + Event 3
Flow (MGD)
0
1
2
3
4
5
6
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

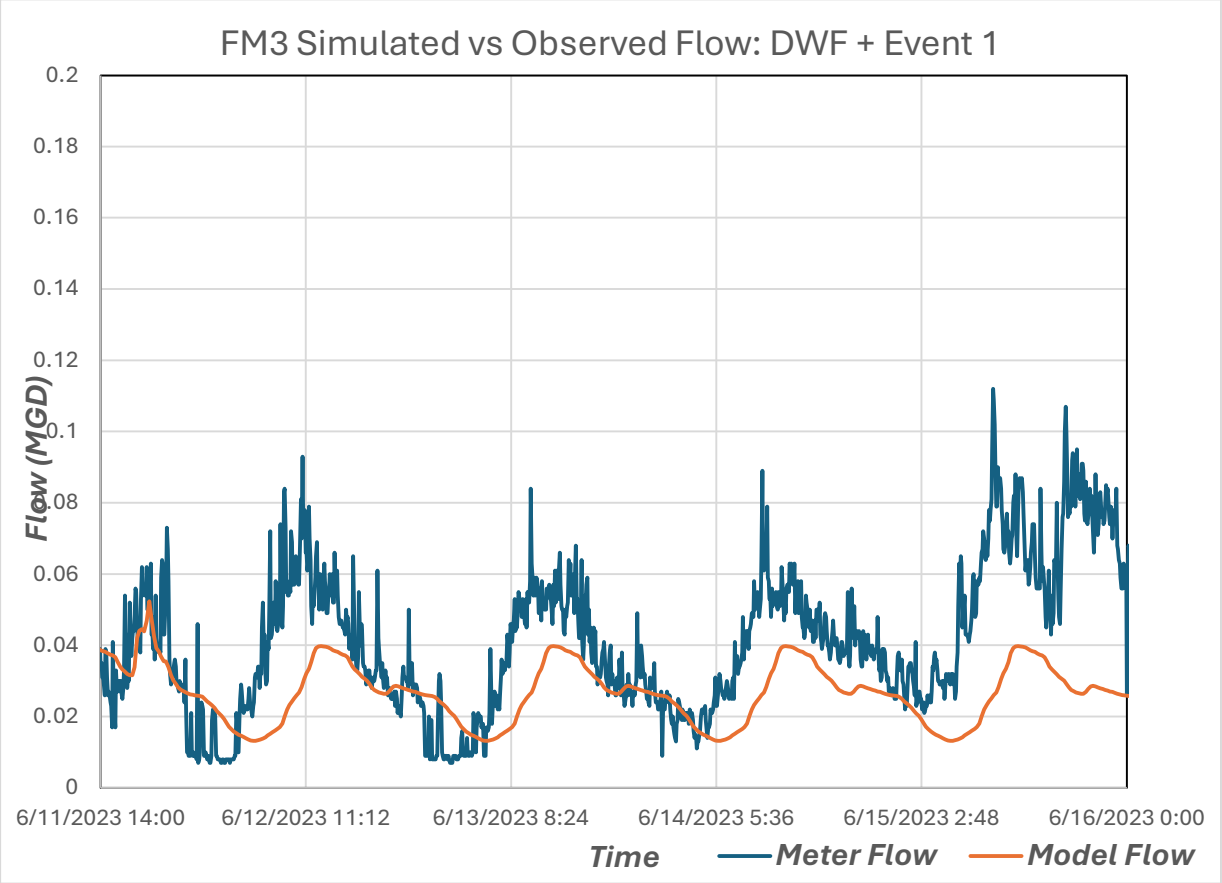

FM2A Simulated vs Observed Depth: Event 2 + Event 3
Depth (ft)
0
1
2
3
4
5
6
7
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

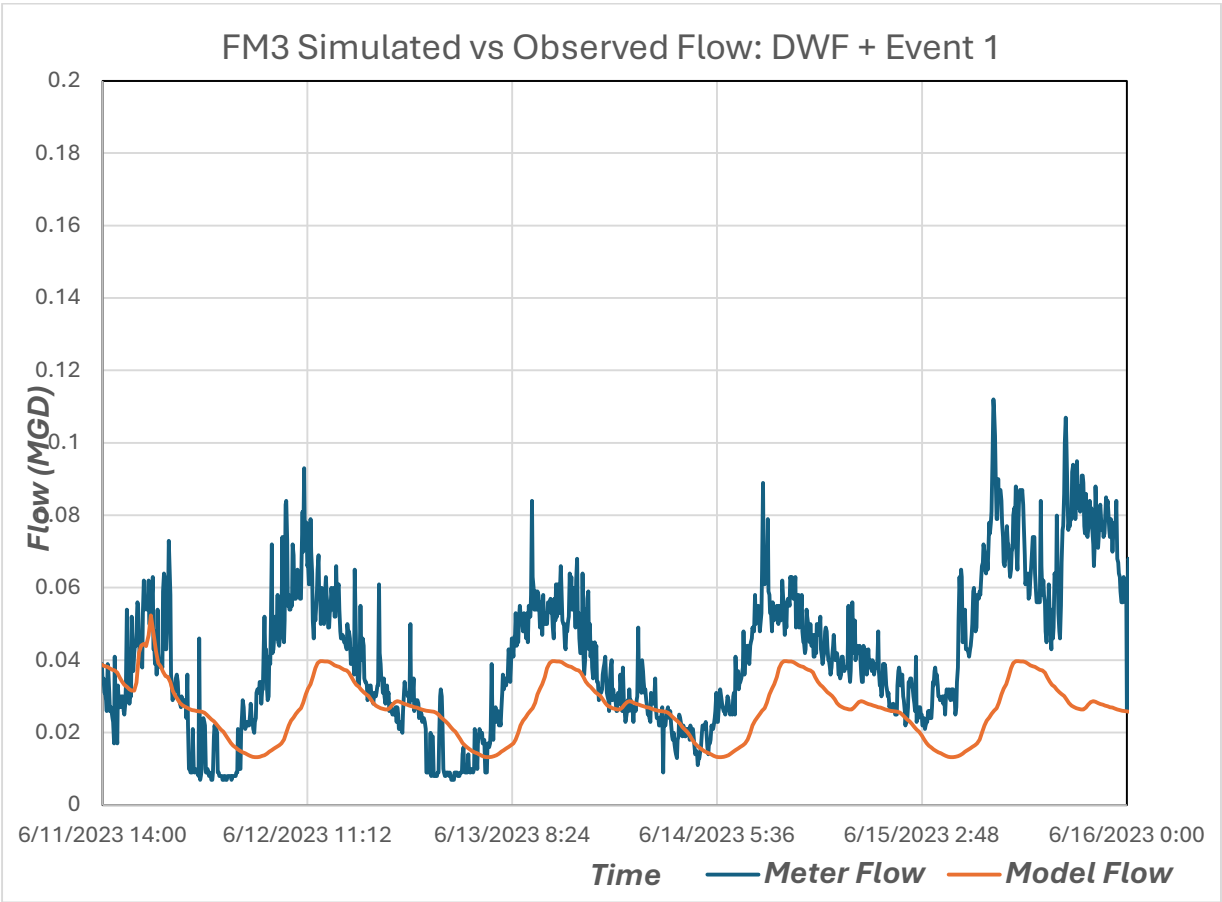

FM2B Simulated vs Observed Flow: DWF + Event 1
3.5
2.5
1.5
0.5
-0.5
-1.5
-2.5
Flow (MGD)
6/11/2023 14:00
6/16/2023 0:00
Time
Meter Flow
Model Flow

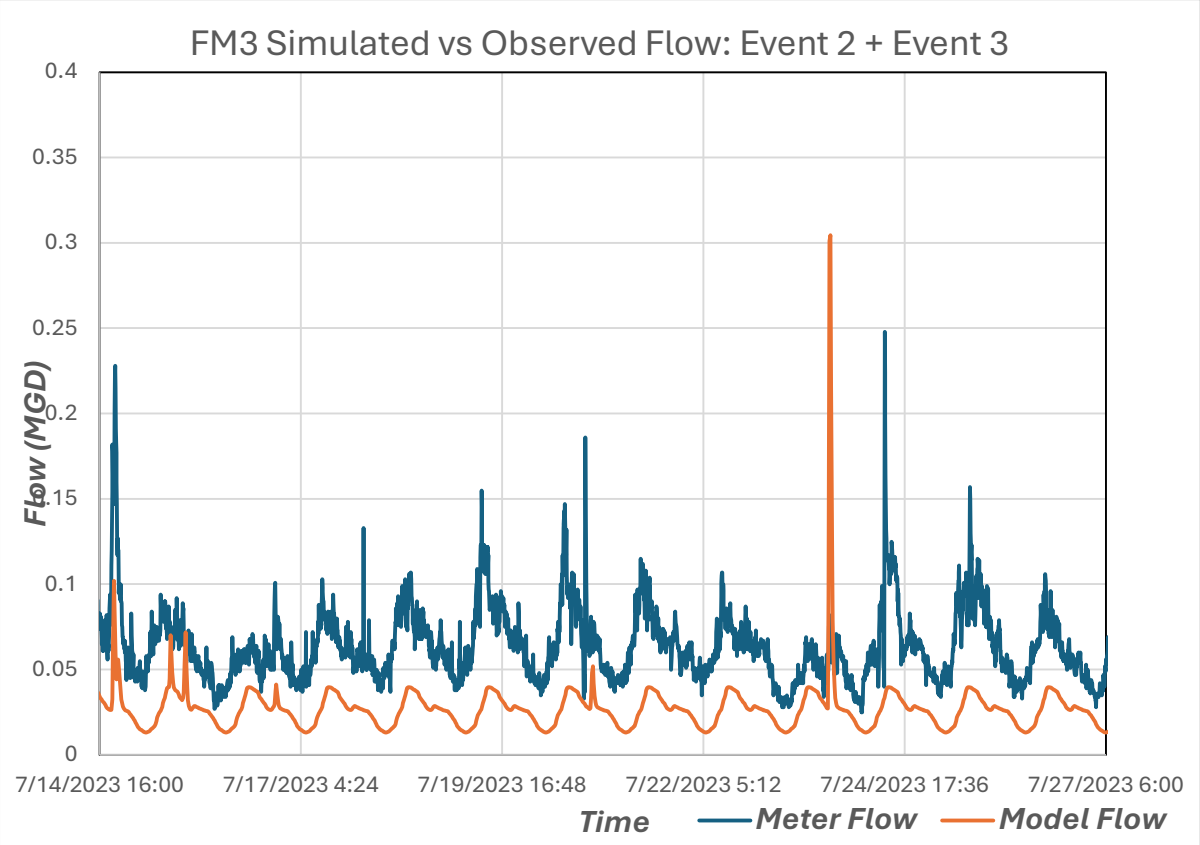

FM2B Simulated vs Observed Depth: DWF + Event 1
3
2.5
2
1.5
1
0.5
0
-0.5
-1
Depth (ft)
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

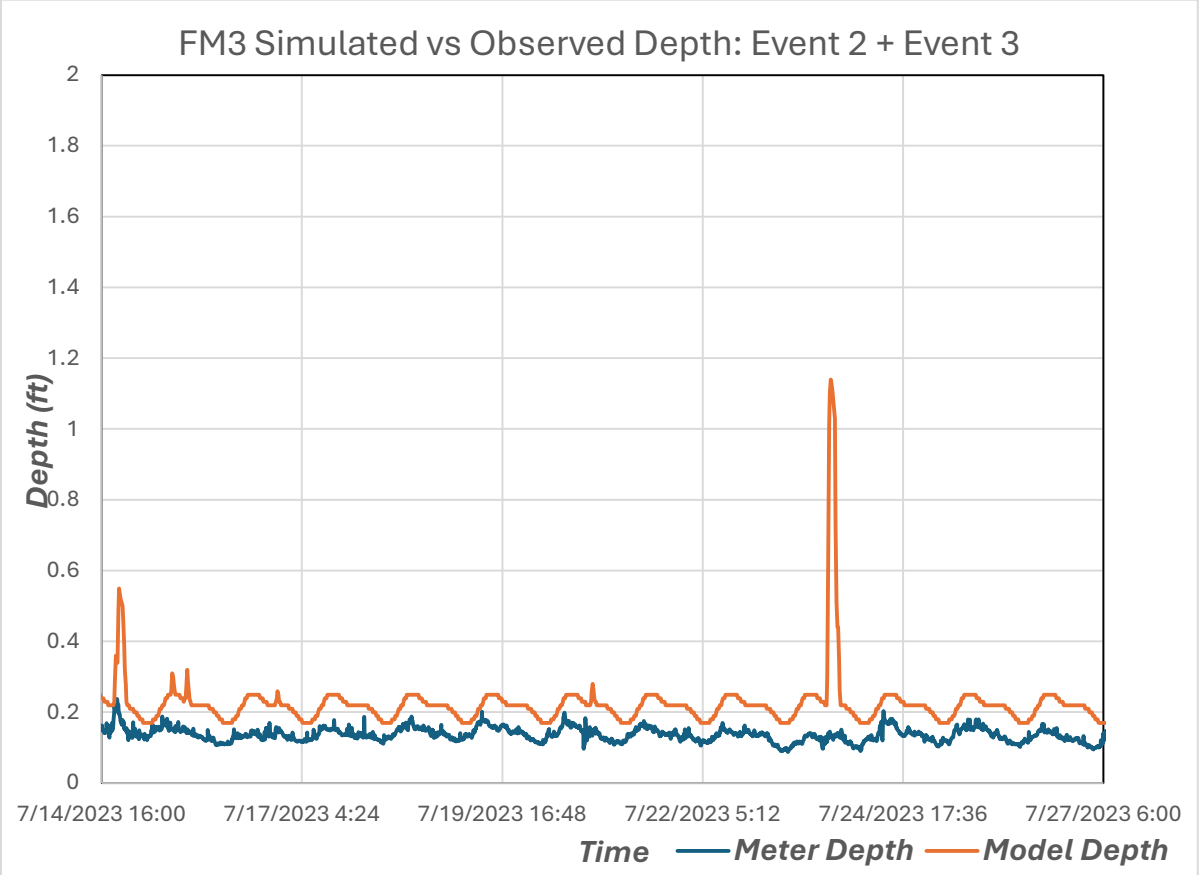

FM2B Simulated vs Observed Flow: Event 2 + Event 3
Flow (MGD)
3.5
2.5
1.5
0.5
-0.5
-1.5
-2.5
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

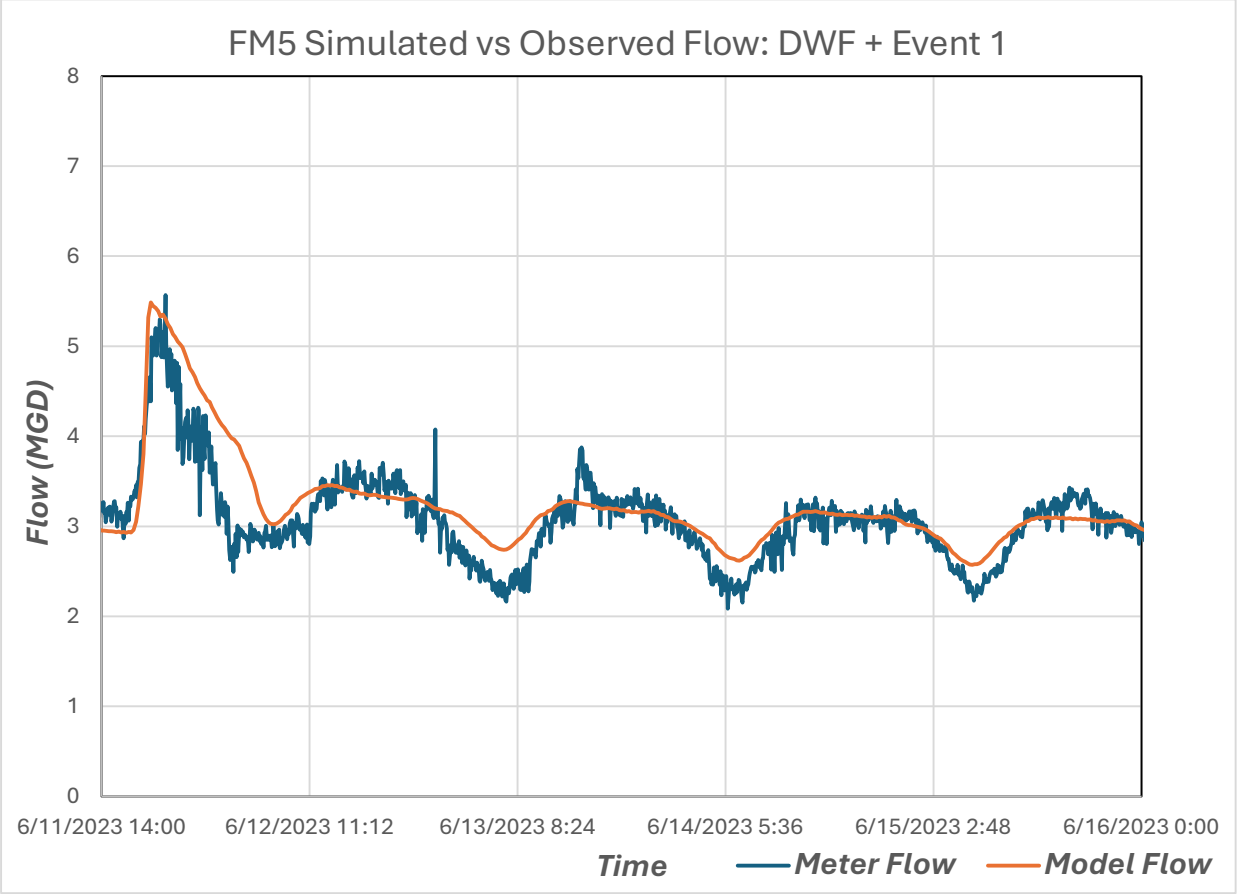

FM2B Simulated vs Observed Depth: Event 2 + Event 3
Depth (ft)
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

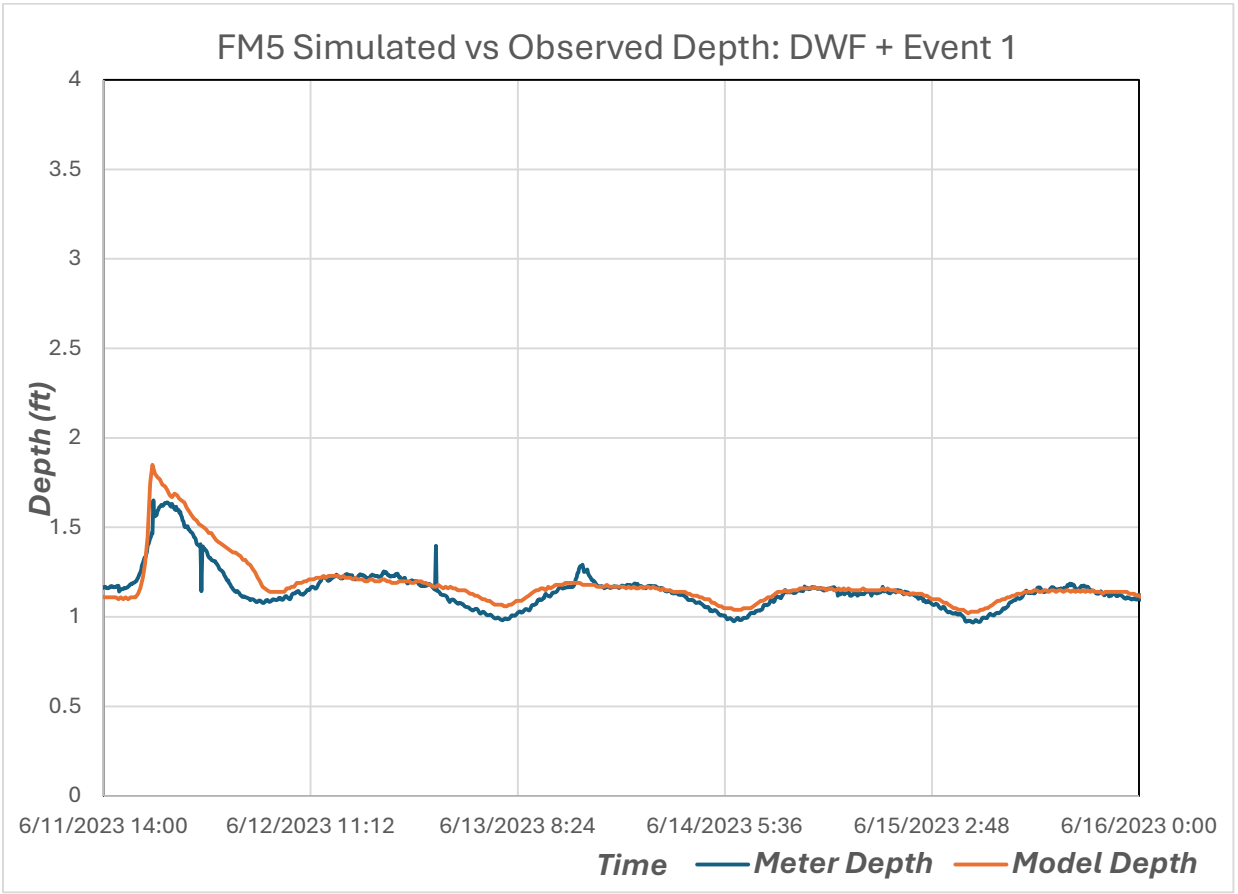

FM3 Simulated vs Observed Flow: DWF + Event 1
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Flow (MGD)
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

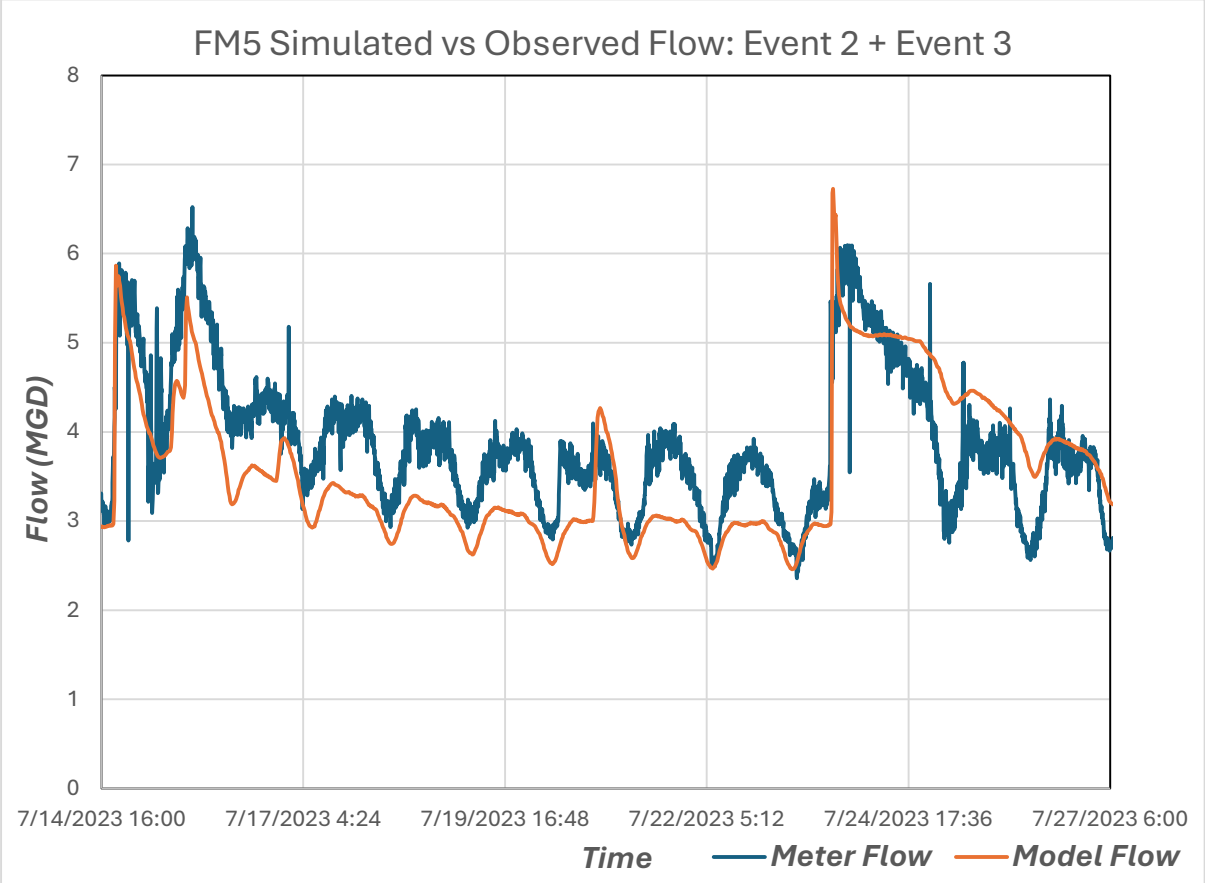

FM3 Simulated vs Observed Flow: DWF + Event 1
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Flow (MGD)
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

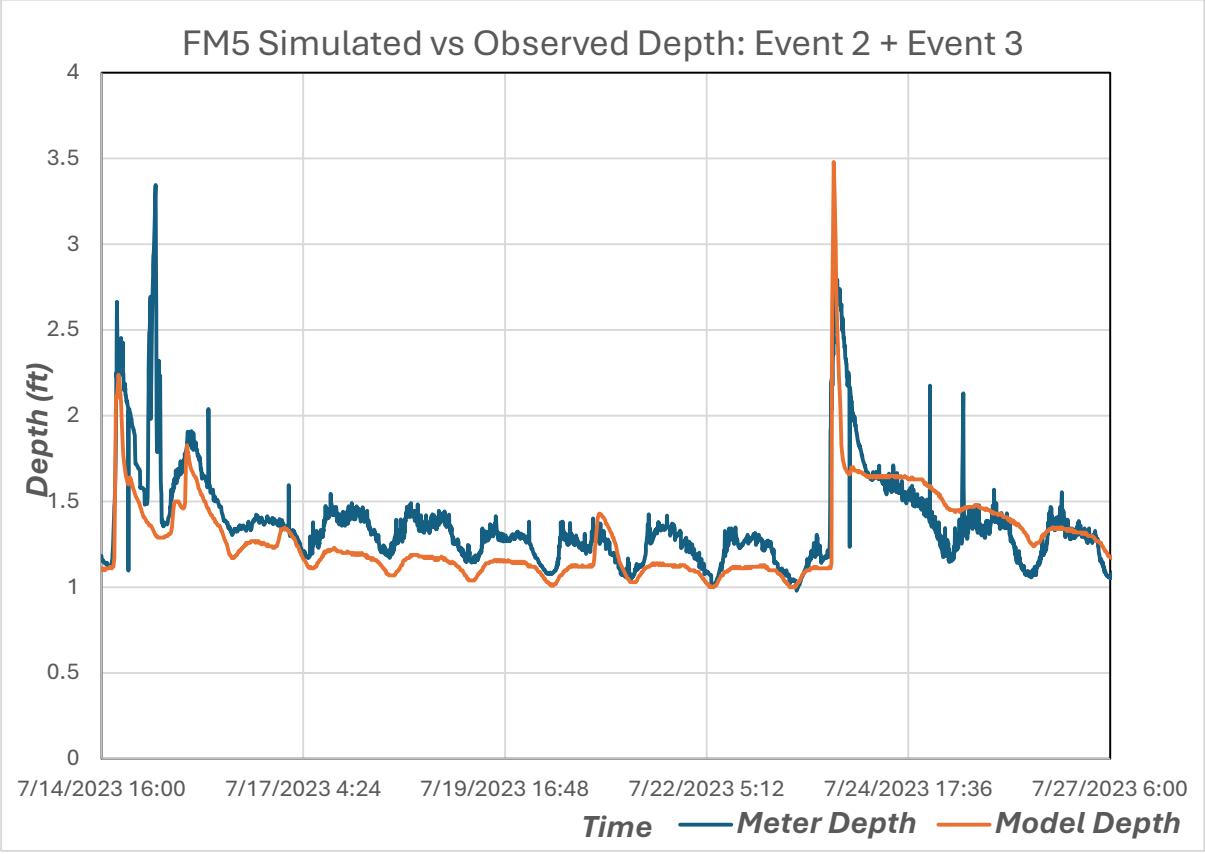

FM3 Simulated vs Observed Flow: Event 2 + Event 3
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Flow (MGD)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

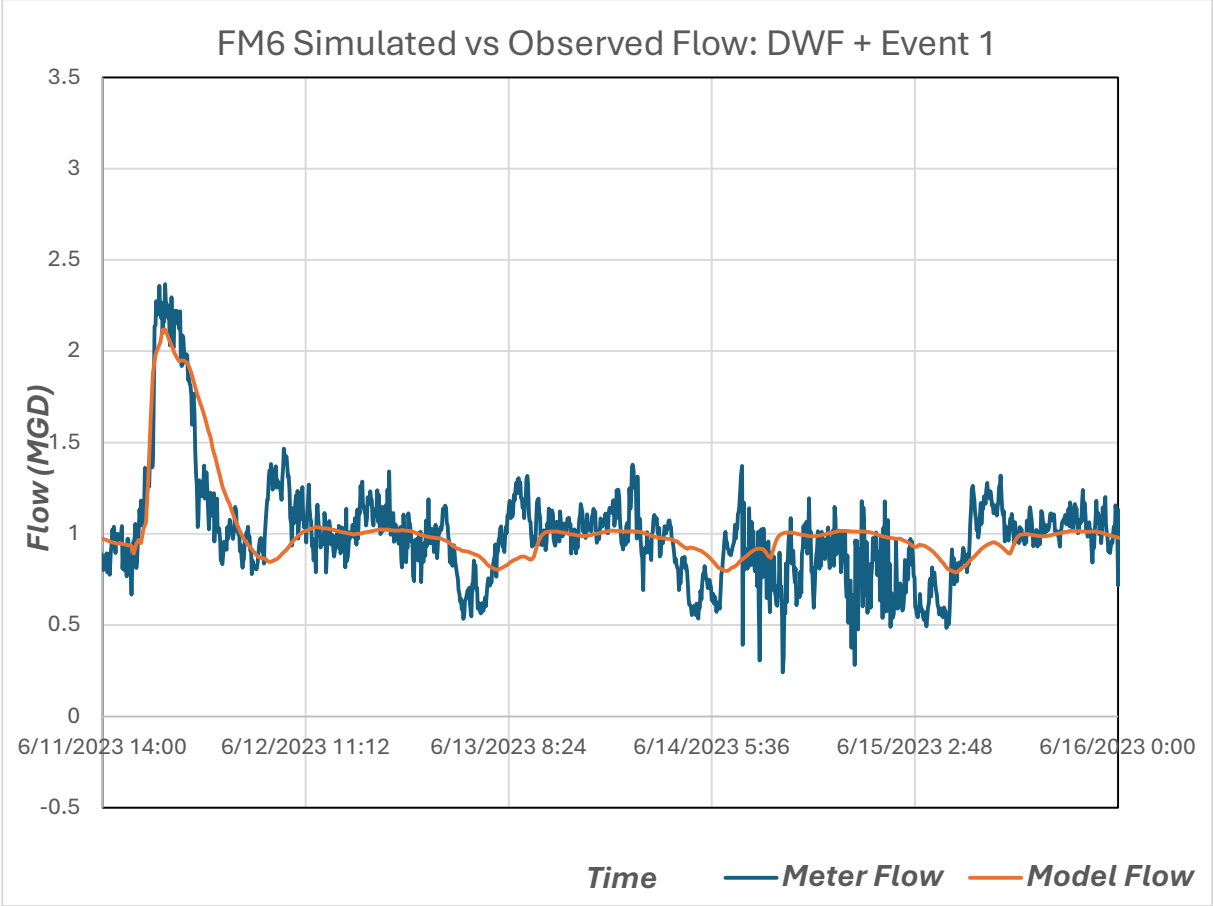

FM3 Simulated vs Observed Depth: Event 2 + Event 3
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Depth (ft)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

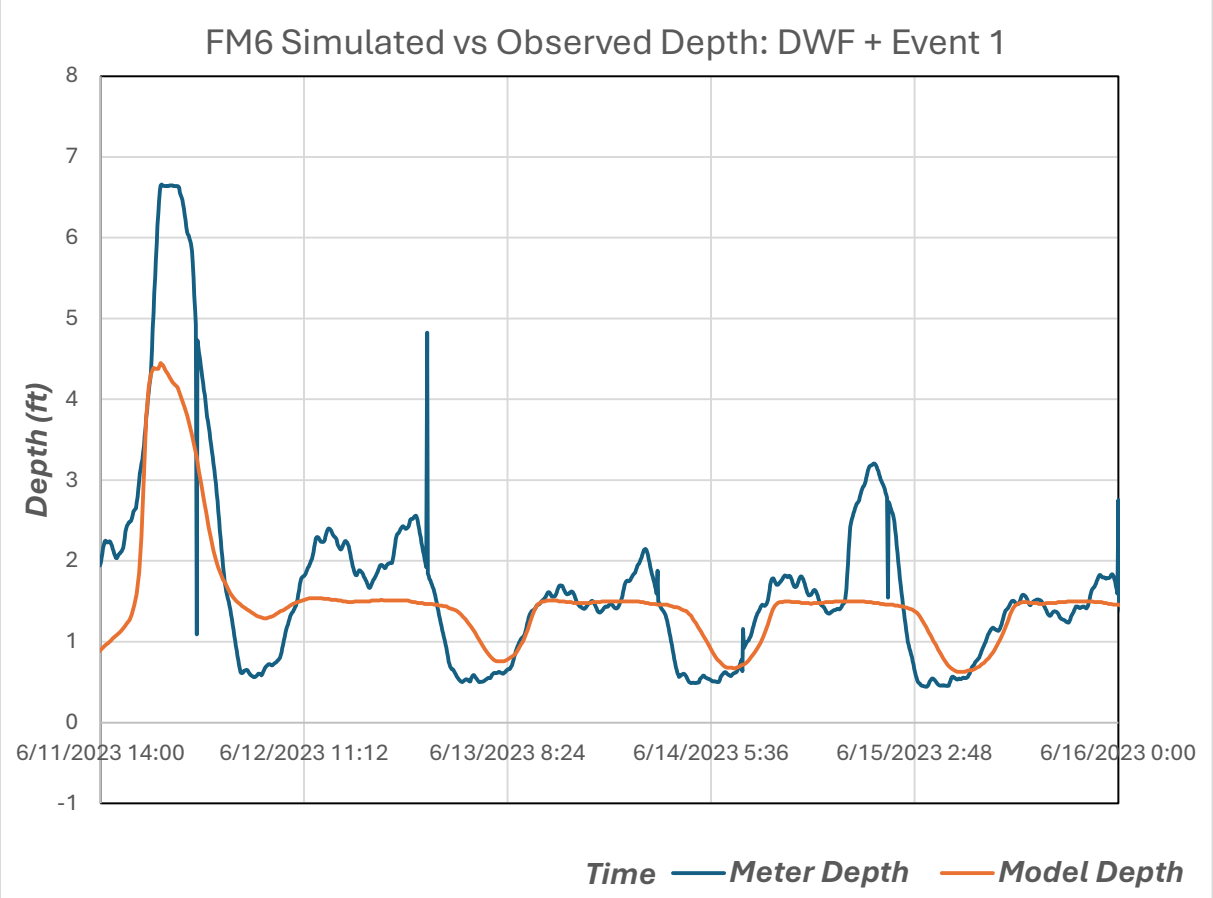

FM5 Simulated vs Observed Flow: DWF + Event 1
Flow (MGD)
8
7
6
5
4
3
2
1
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

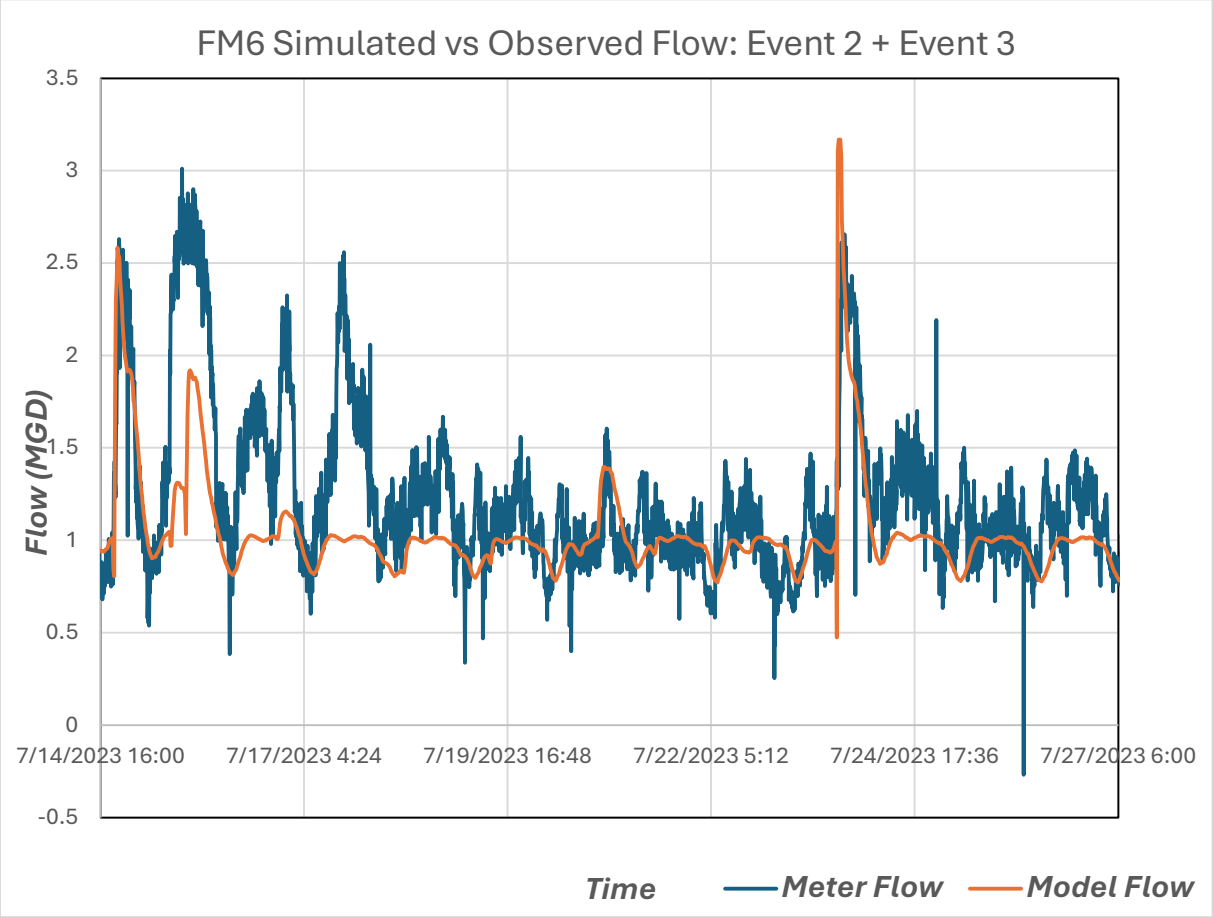

FM5 Simulated vs Observed Depth: DWF + Event 1
Depth (ft)
4
3.5
3
2.5
2
1.5
1
0.5
0
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

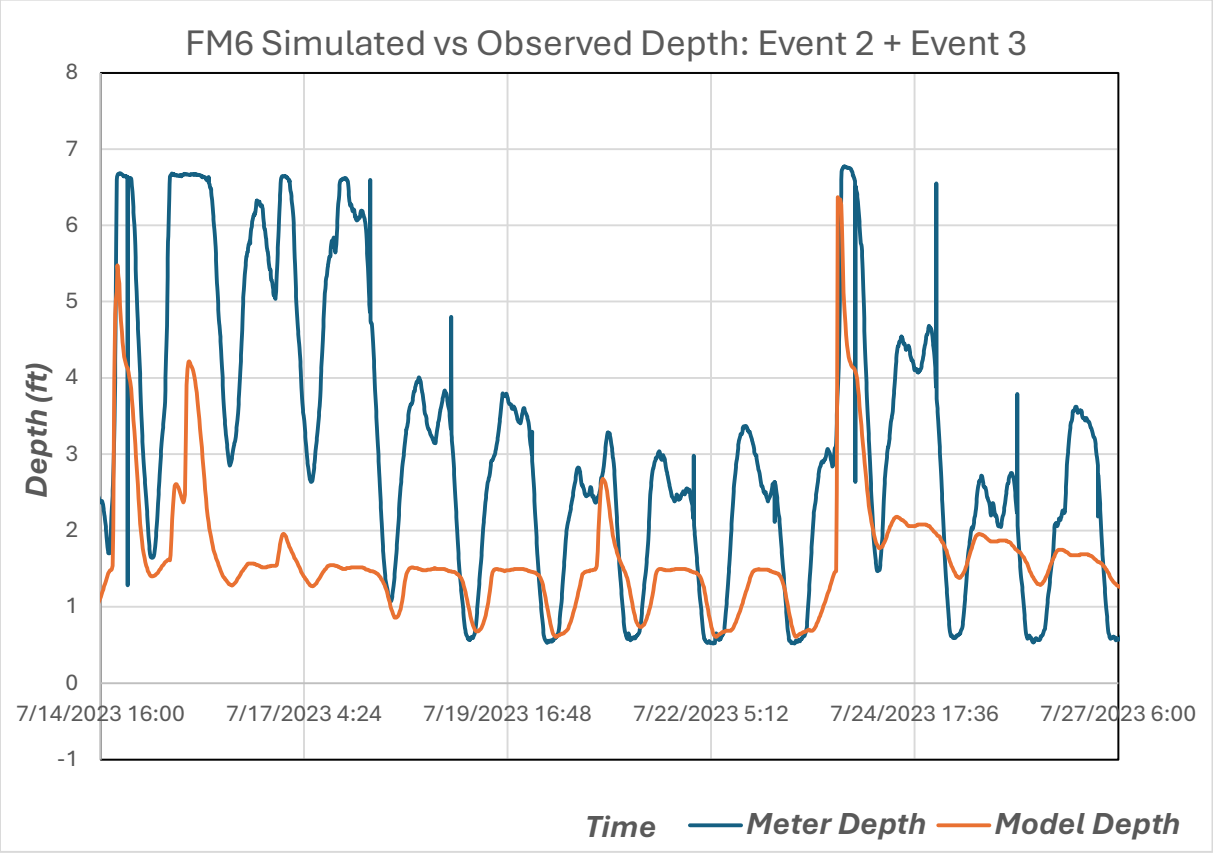

FM5 Simulated vs Observed Flow: Event 2 + Event 3
Flow (MGD)
0
1
2
3
4
5
6
7
8
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow

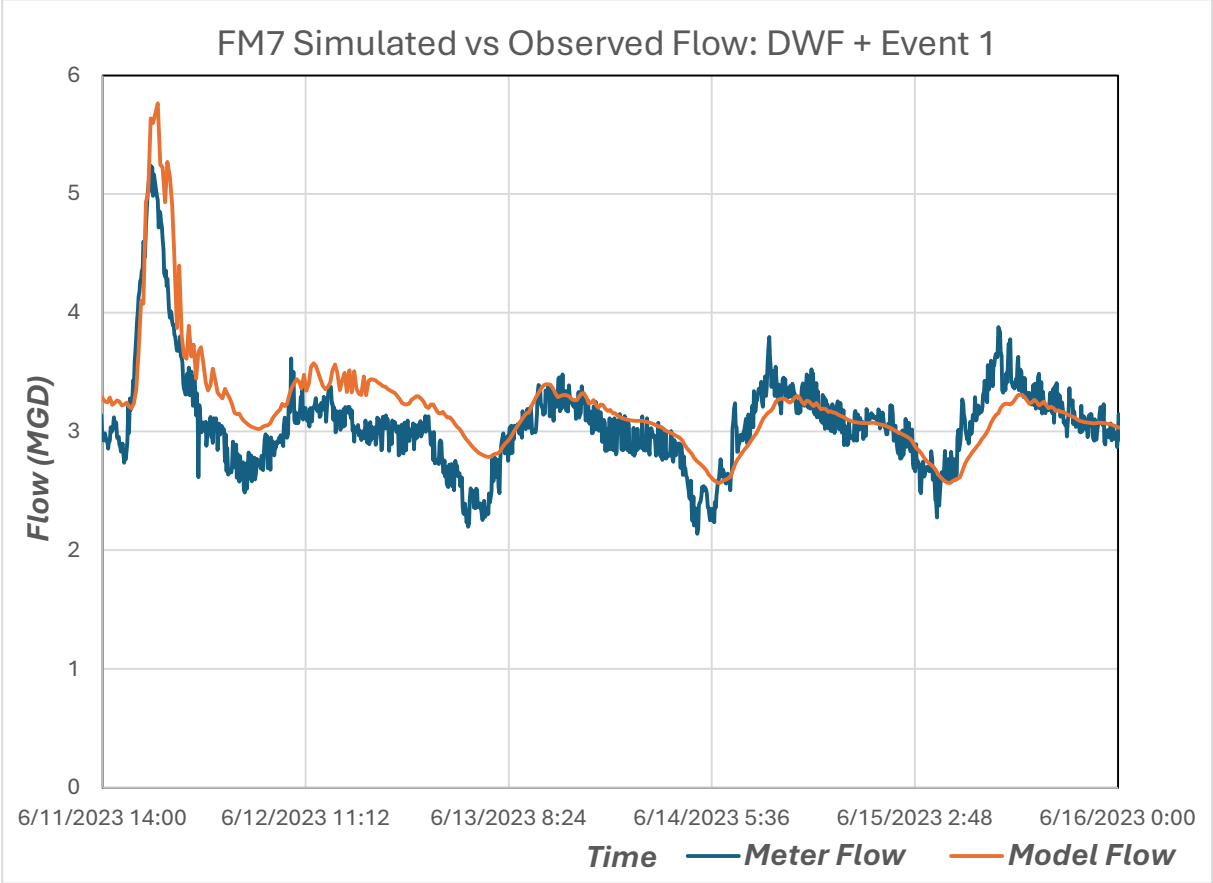

FM5 Simulated vs Observed Depth: Event 2 + Event 3
Depth (ft)
0
0.5
1
1.5
2
2.5
3
3.5
4
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

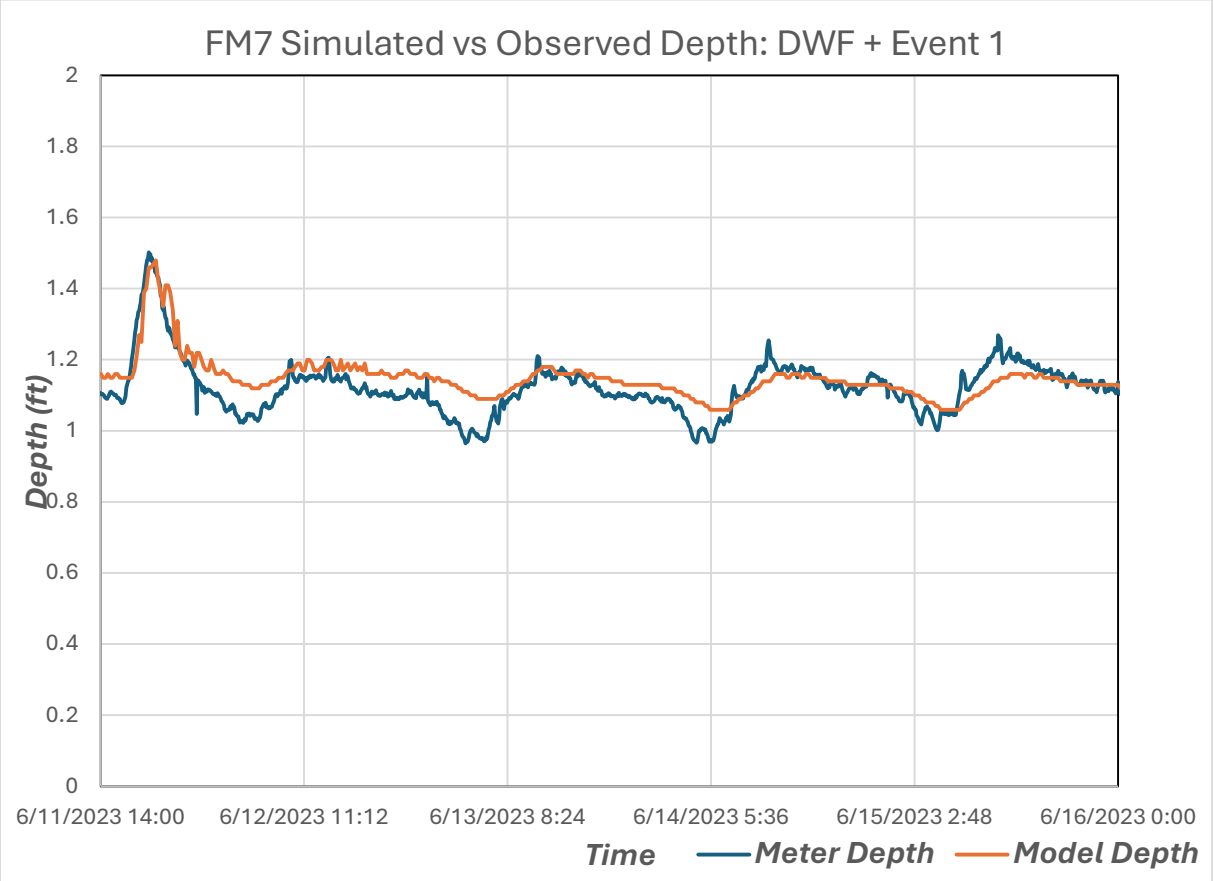

FM6 Simulated vs Observed Flow: DWF + Event 1
Flow (MGD)
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow

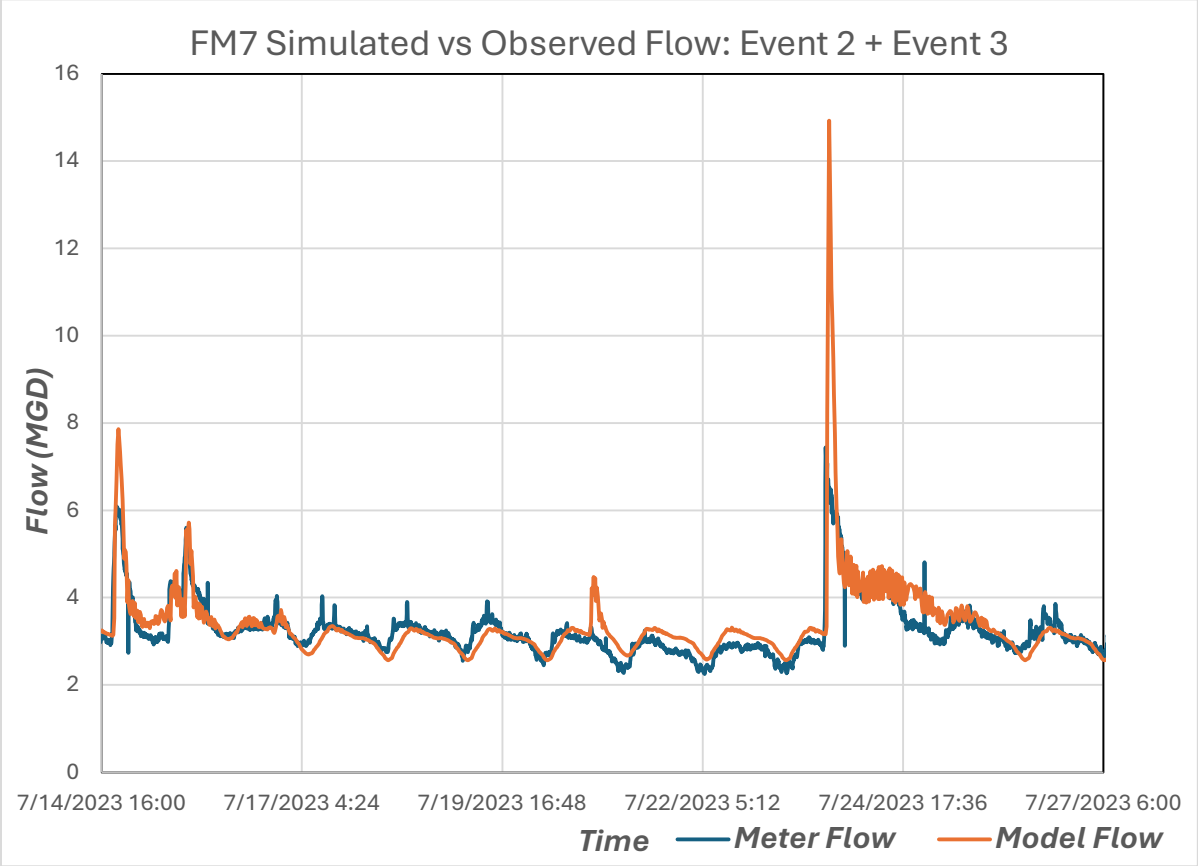

FM6 Simulated vs Observed Depth: DWF + Event 1
Depth (ft)
8
7
6
5
4
3
2
1
0
-1
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth

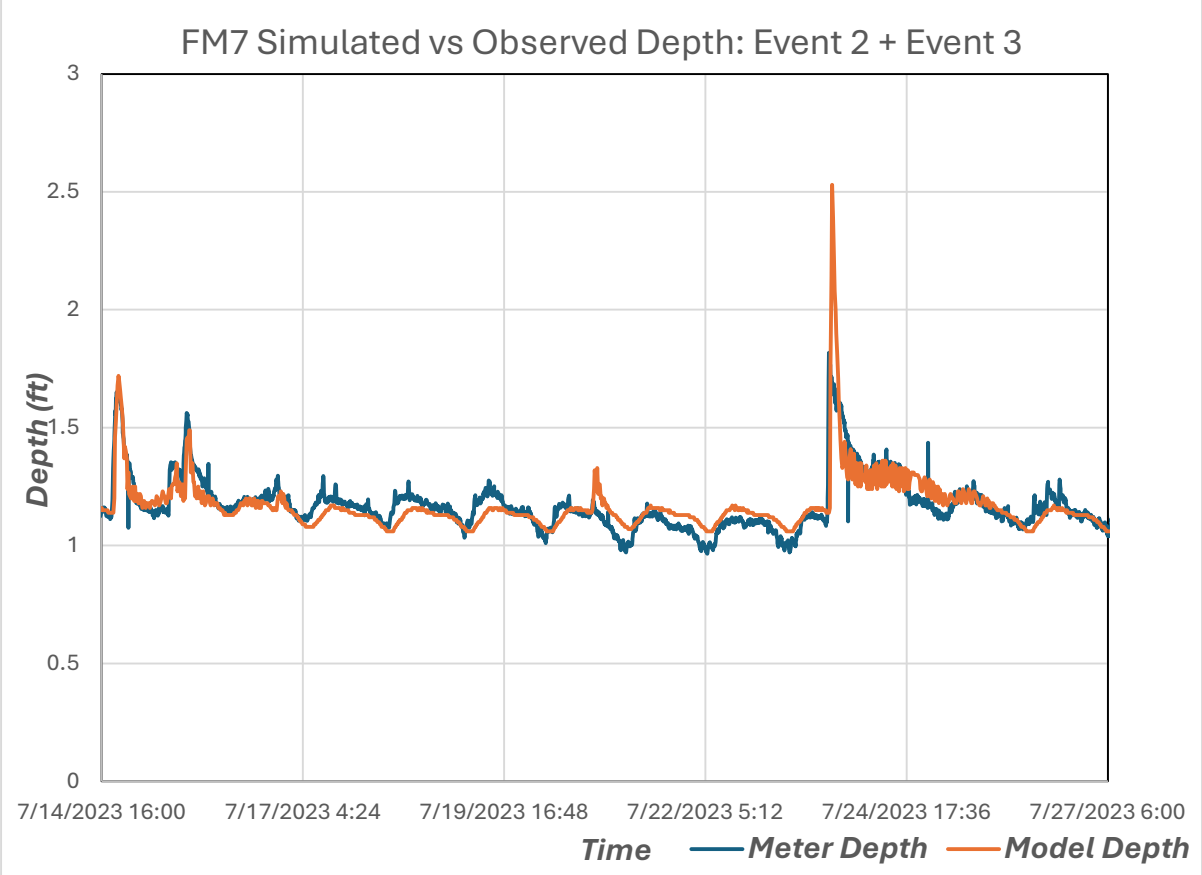

FM6 Simulated vs Observed Flow: Event 2 + Event 3
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
Flow (MGD)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow


FM6 Simulated vs Observed Depth: Event 2 + Event 3
8
7
6
5
4
3
2
1
0
-1
Depth (ft)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth


FM7 Simulated vs Observed Flow: DWF + Event 1
Flow (MGD)
0
1
2
3
4
5
6
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Flow
Model Flow


FM7 Simulated vs Observed Depth: DWF + Event 1
Depth (ft)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
6/11/2023 14:00
6/12/2023 11:12
6/13/2023 8:24
6/14/2023 5:36
6/15/2023 2:48
6/16/2023 0:00
Time
Meter Depth
Model Depth


FM7 Simulated vs Observed Flow: Event 2 + Event 3
16
14
12
10
8
6
4
2
0
Flow (MGD)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Flow
Model Flow


FM7 Simulated vs Observed Depth: Event 2 + Event 3
3
2.5
2
1.5
1
0.5
0
Depth (ft)
7/14/2023 16:00
7/17/2023 4:24
7/19/2023 16:48
7/22/2023 5:12
7/24/2023 17:36
7/27/2023 6:00
Time
Meter Depth
Model Depth

FULL LIFE. FULL FORWARD.
FLORENCE
SOUTH CAROLINA

City of Florence, South Carolina

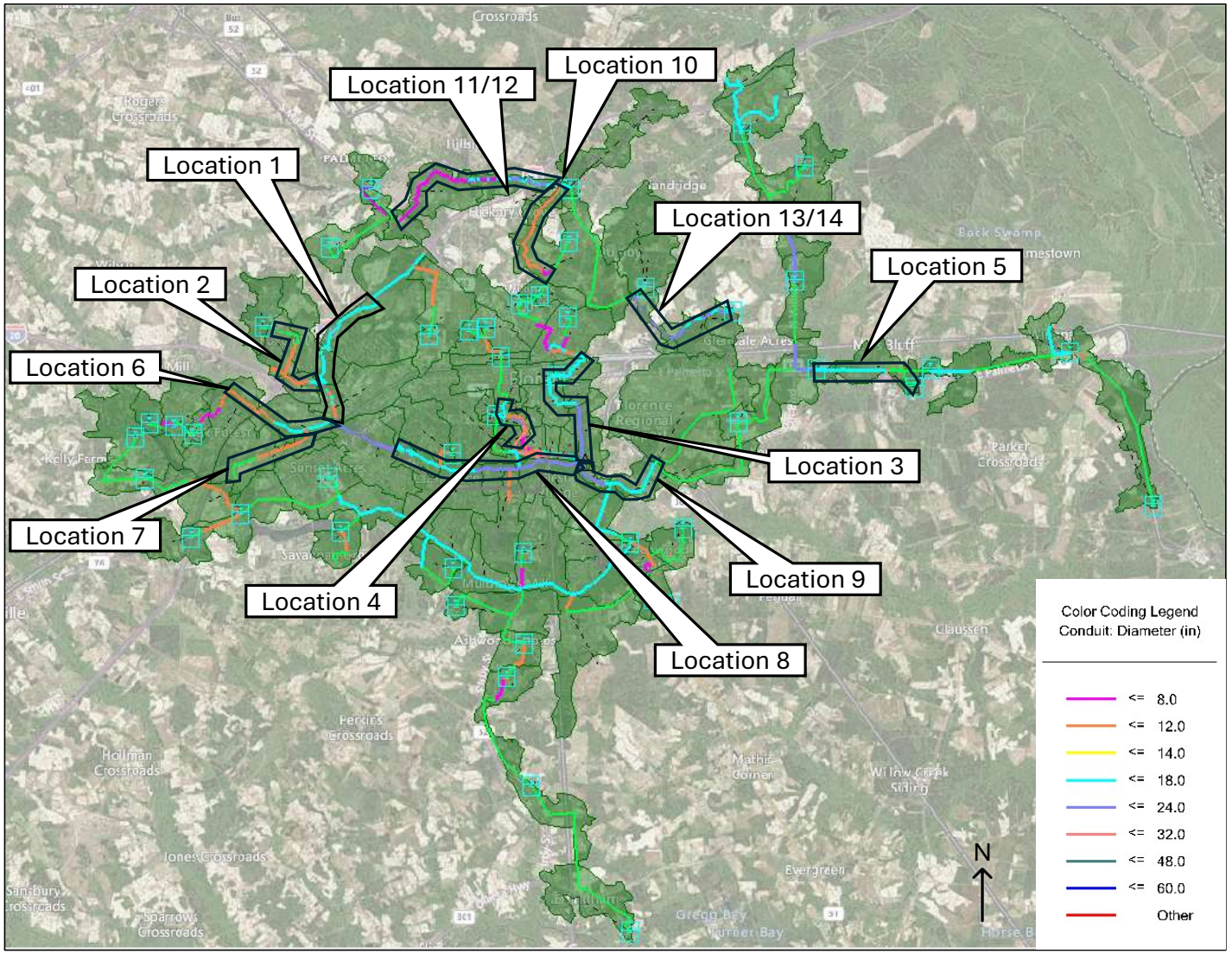
Sewer Collection System Master Plan

Appendix F

Model Peak HGLs

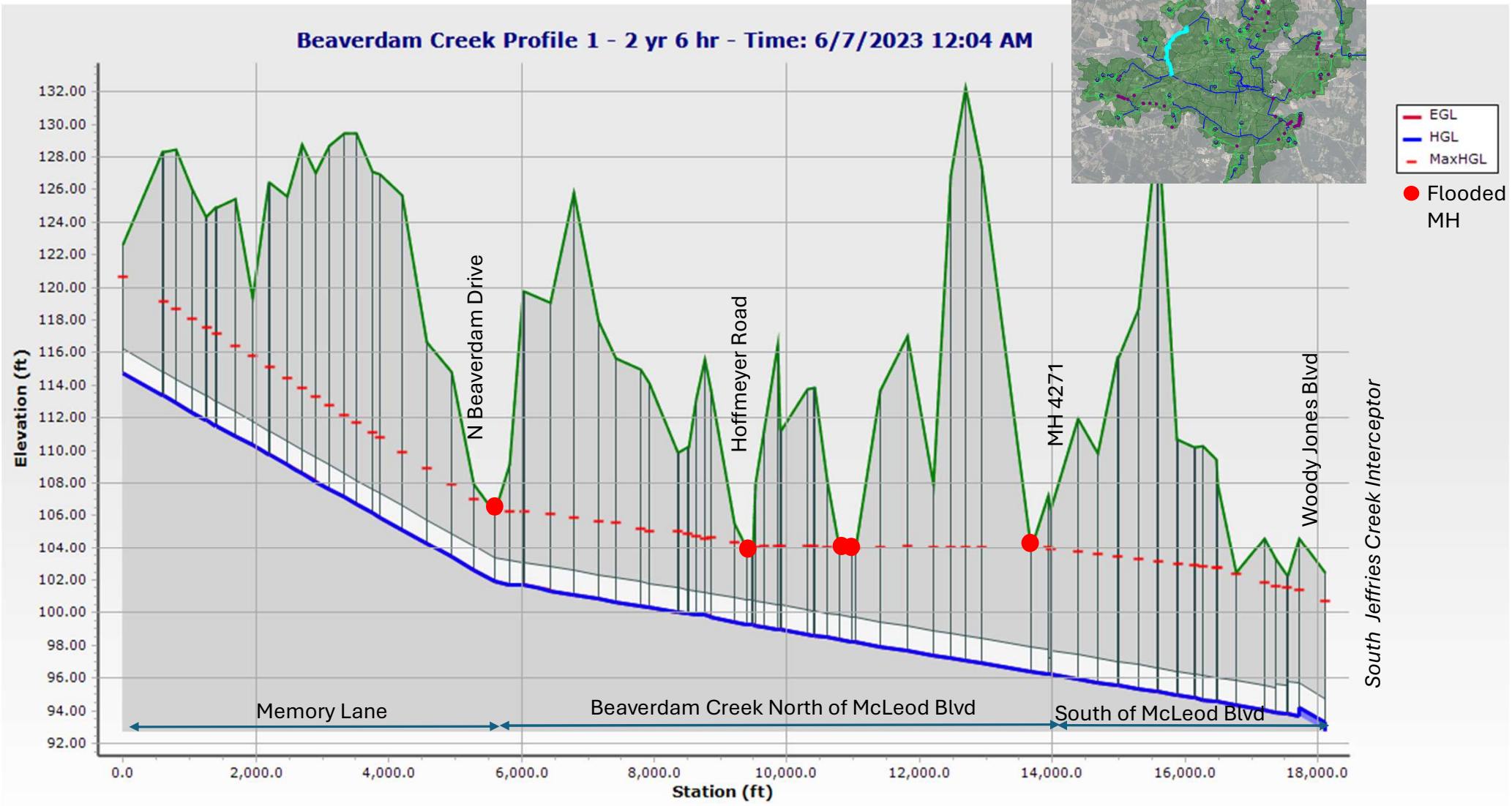
September 2025

FULL LIFE. FULL FORWARD.
FLORENCE
SOUTH CAROLINA


Location 1
Location 2
Location 3
Location 4
Location 5
Location 6
Location 7
Location 8
Location 9
Location 10
Location 11/12
Location 13/14
Color Coding Legend
Conduit: Diameter (in)
<= 8.0
<= 12.0
<= 14.0
<= 18.0
<= 24.0
<= 32.0
<= 48.0
<= 60.0
Other
N

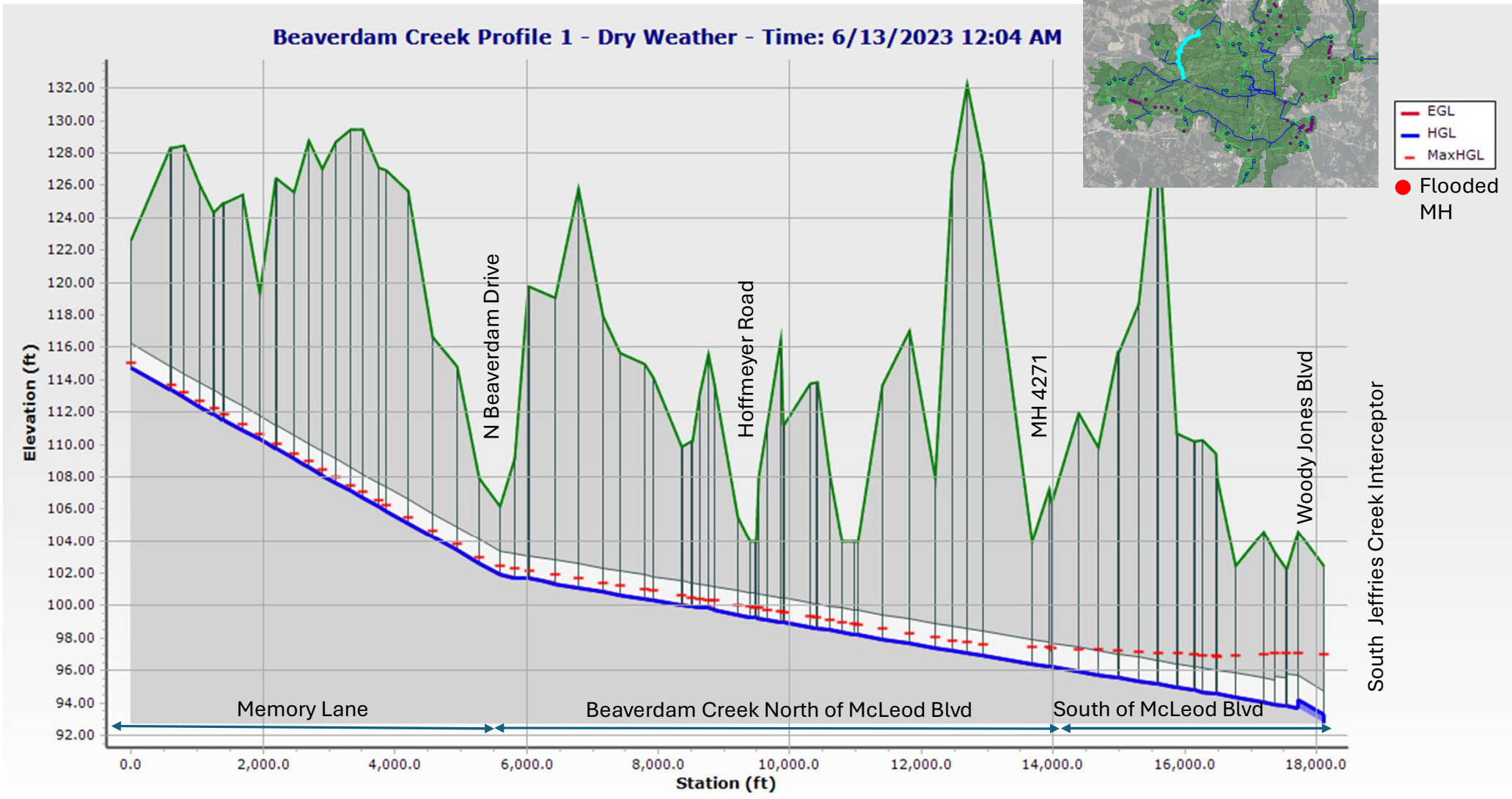
Location 1

Existing System Under Existing Flow Conditions – 2-yr 6-hr



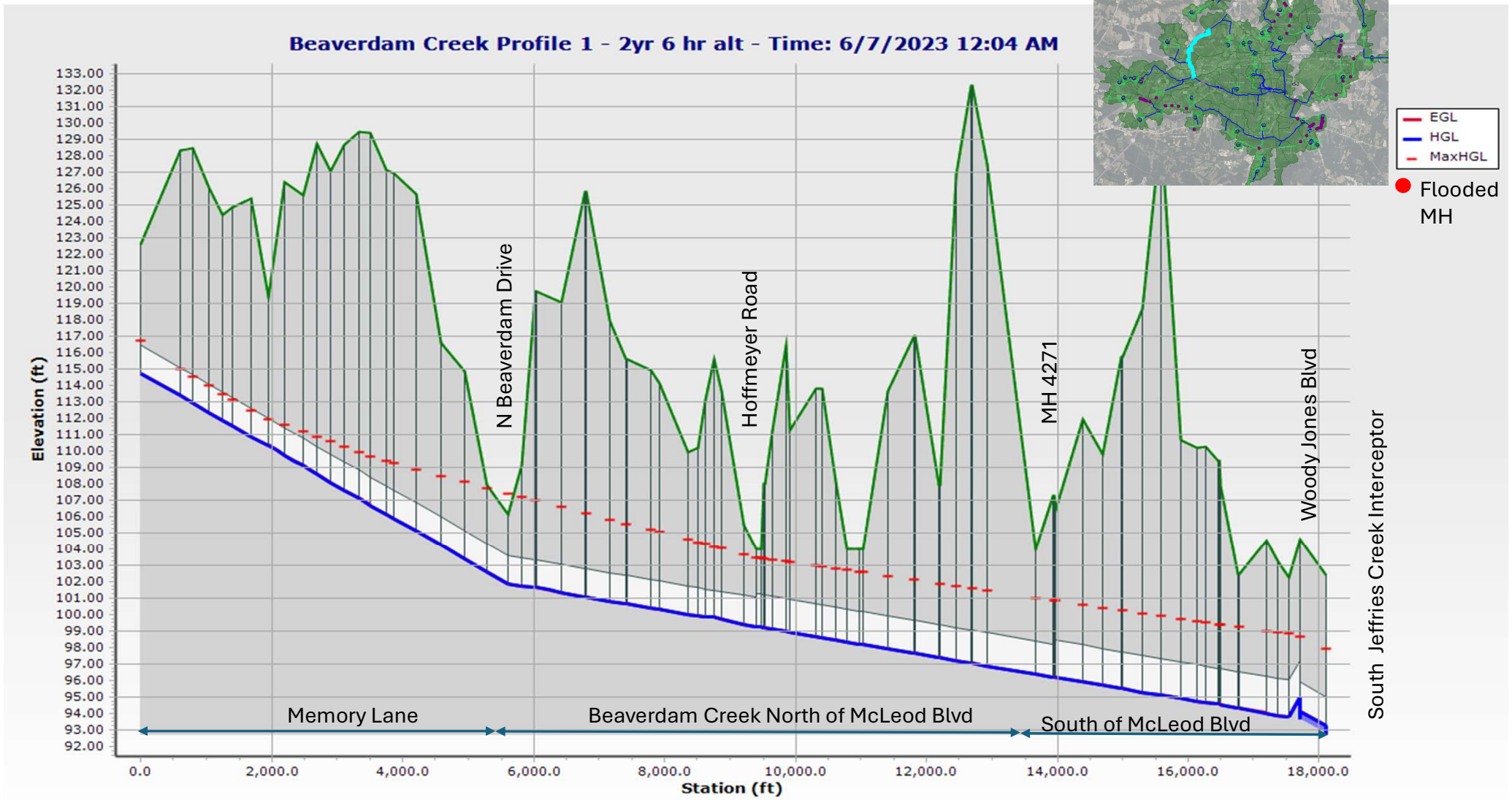
Location 1

Existing System Under Existing Flow Conditions – Dry Weather



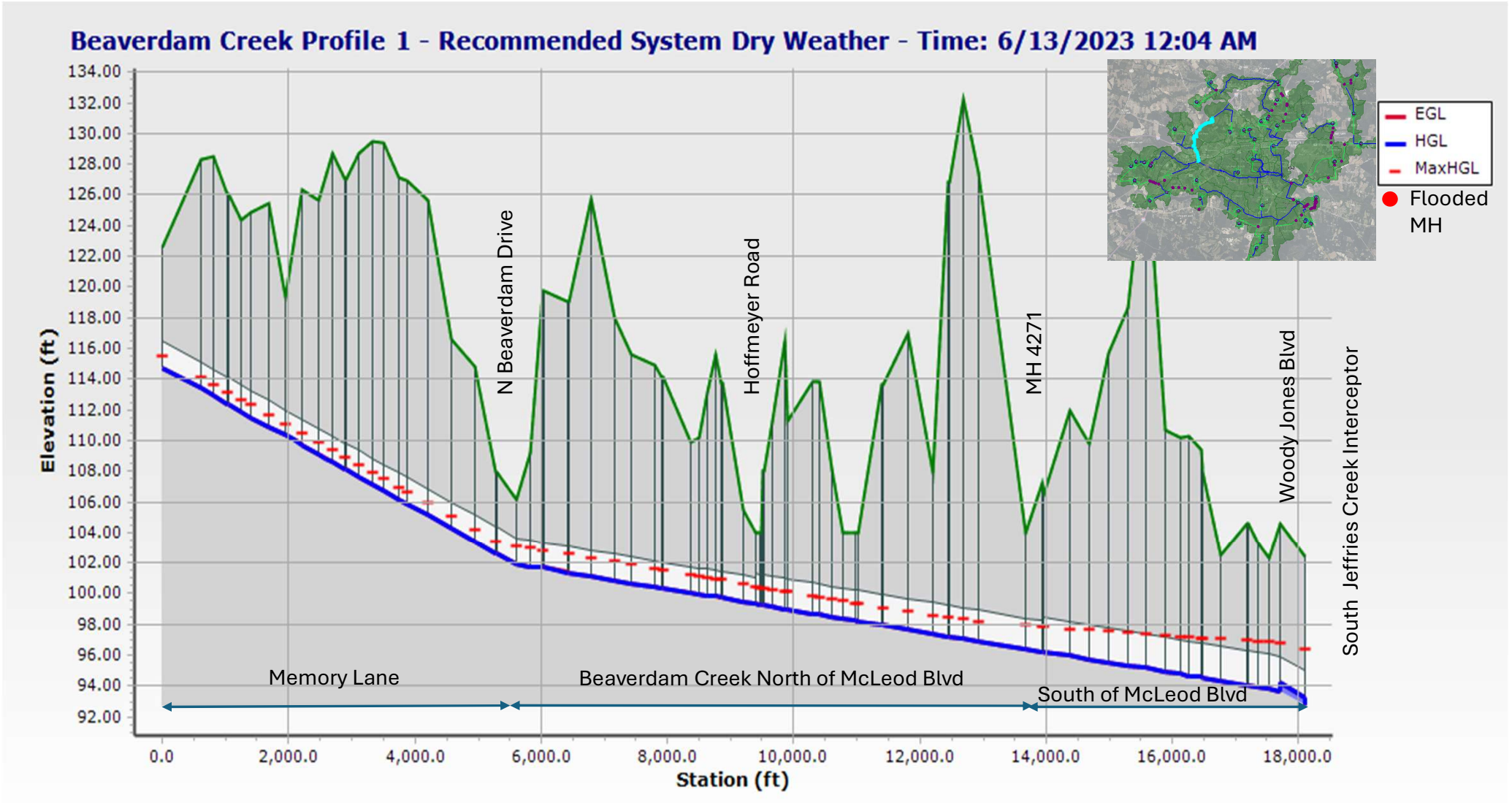
Location 1

Proposed System Under Future Flow Conditions – 2-yr 6-hr



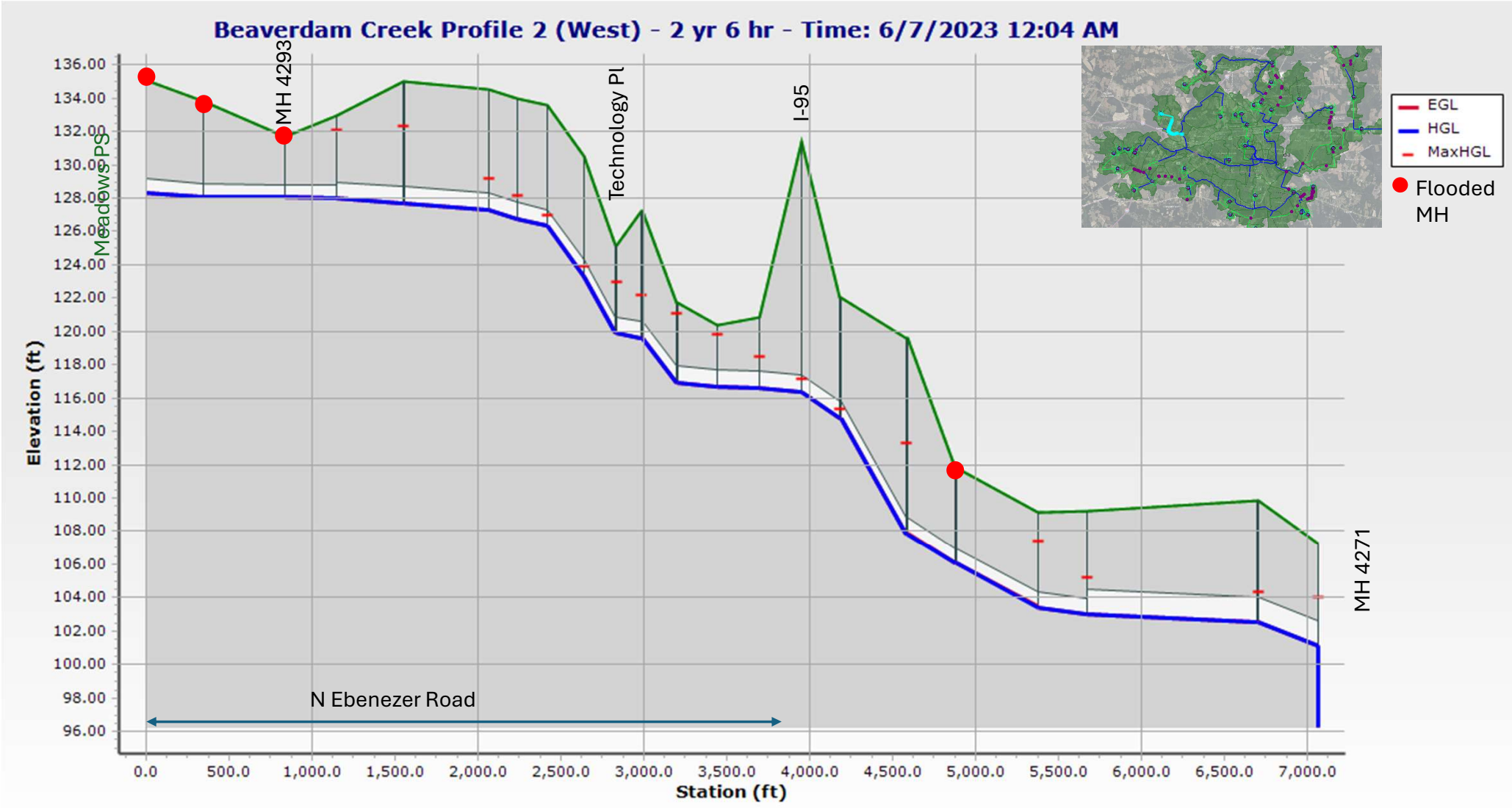
Location 1

Proposed System Under Future Flow Conditions – Dry Weather



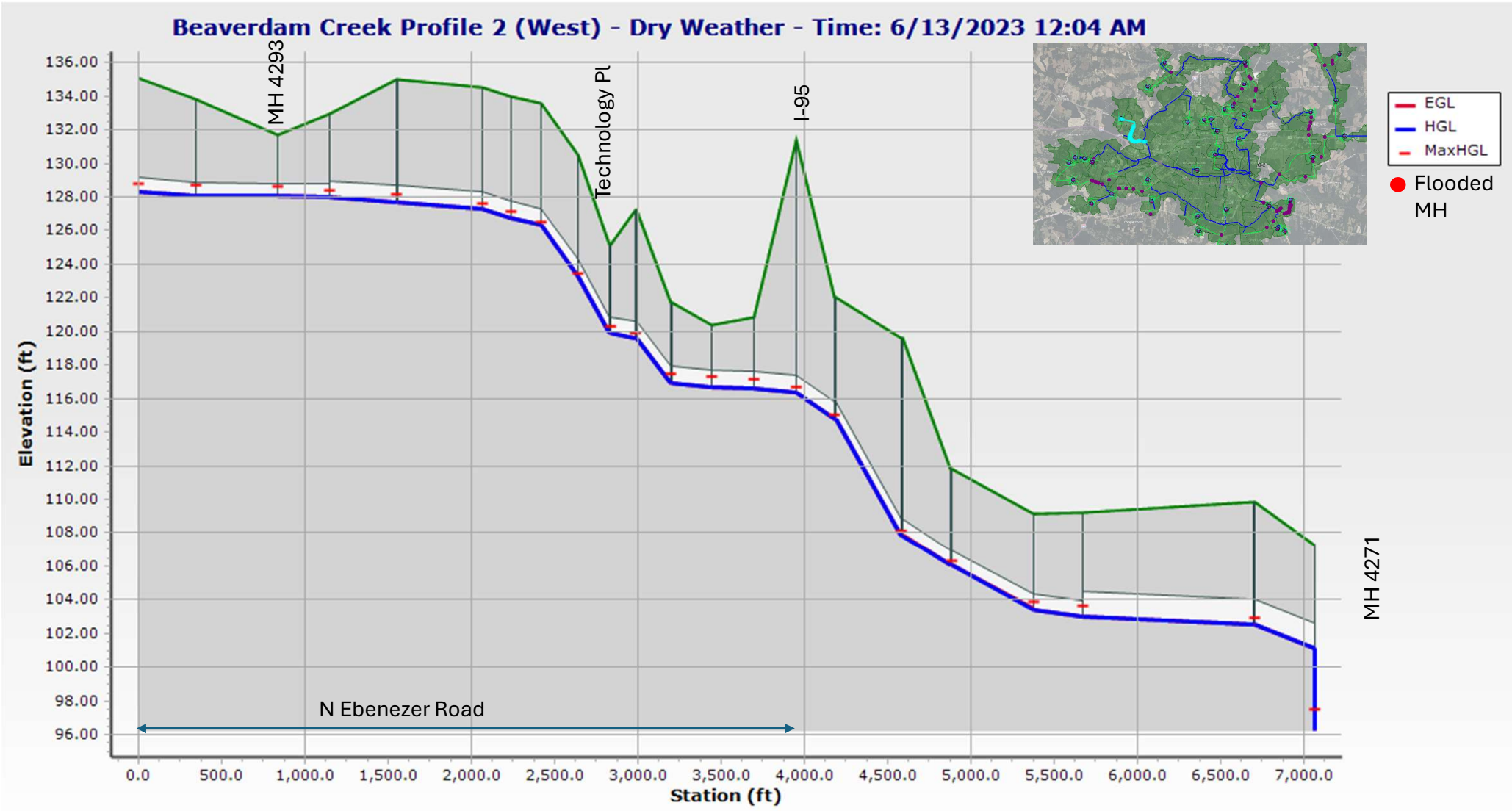
Location 2

Existing System Under Existing Flow Conditions – 2-yr 6-hr



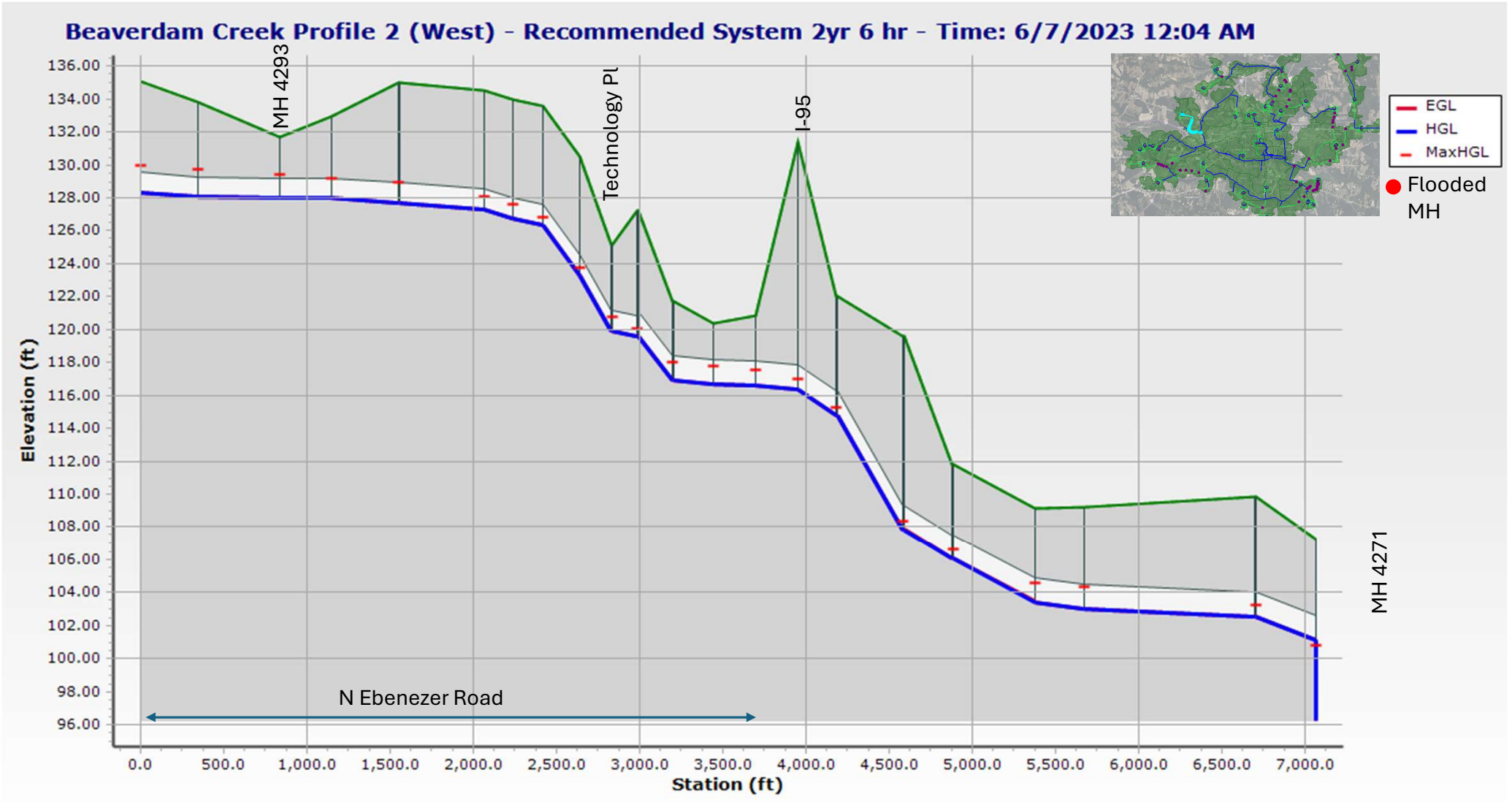
Location 2

Existing System Under Existing Flow Conditions – Dry Weather



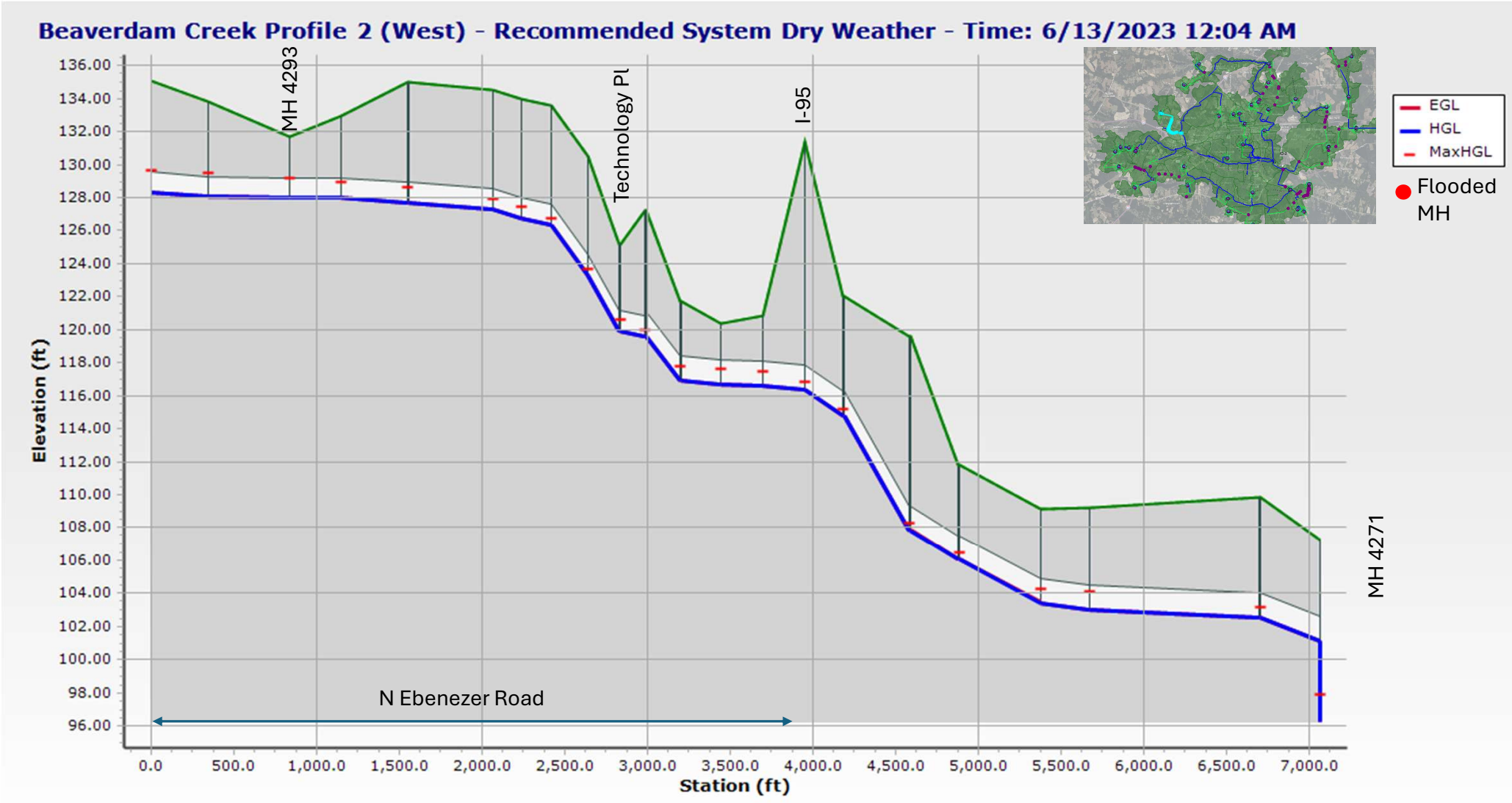
Location 2

Proposed System Under Future Flow Conditions – 2-yr 6-hr



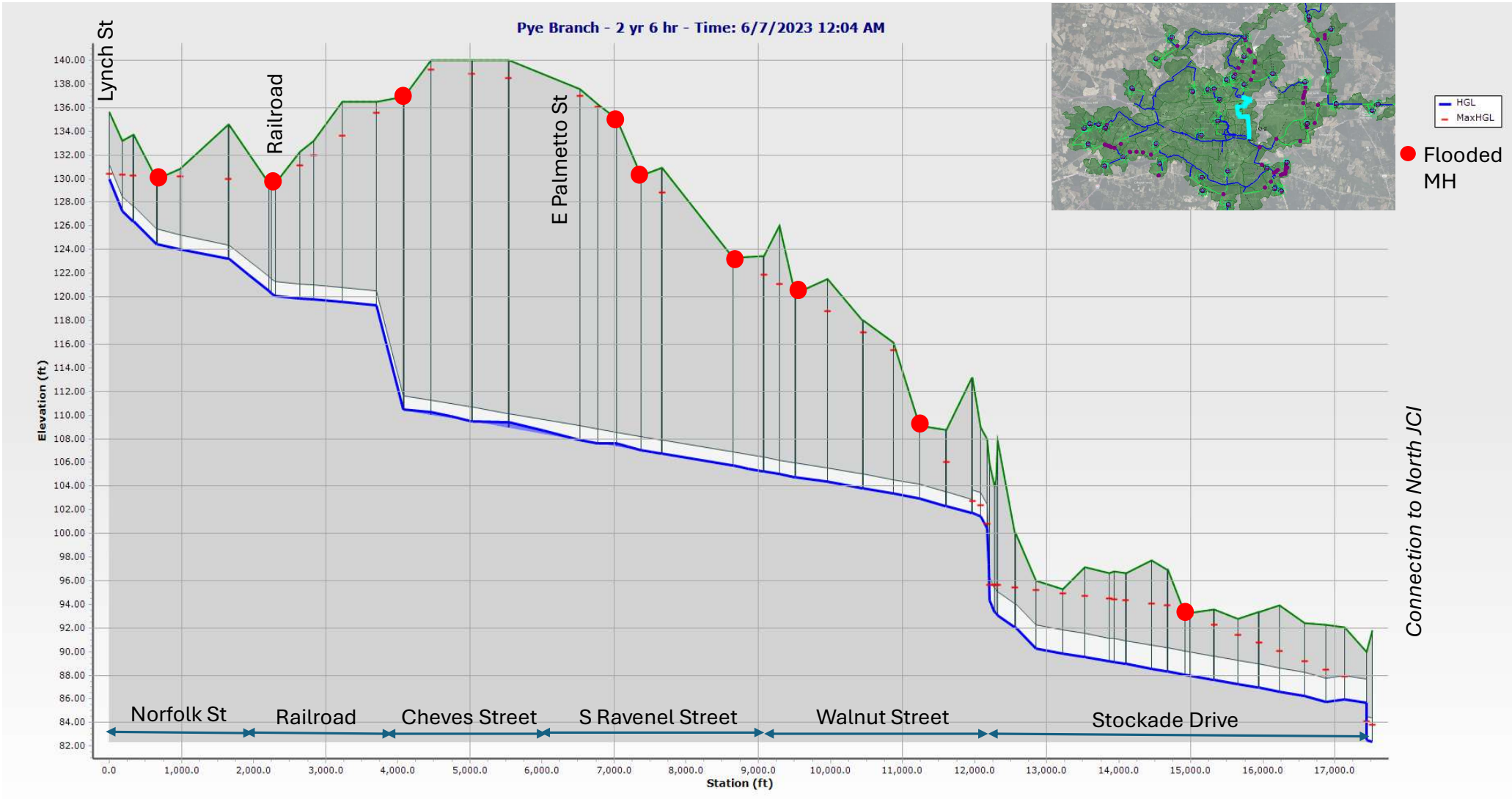
Location 2

Proposed System Under Future Flow Conditions – Dry Weather



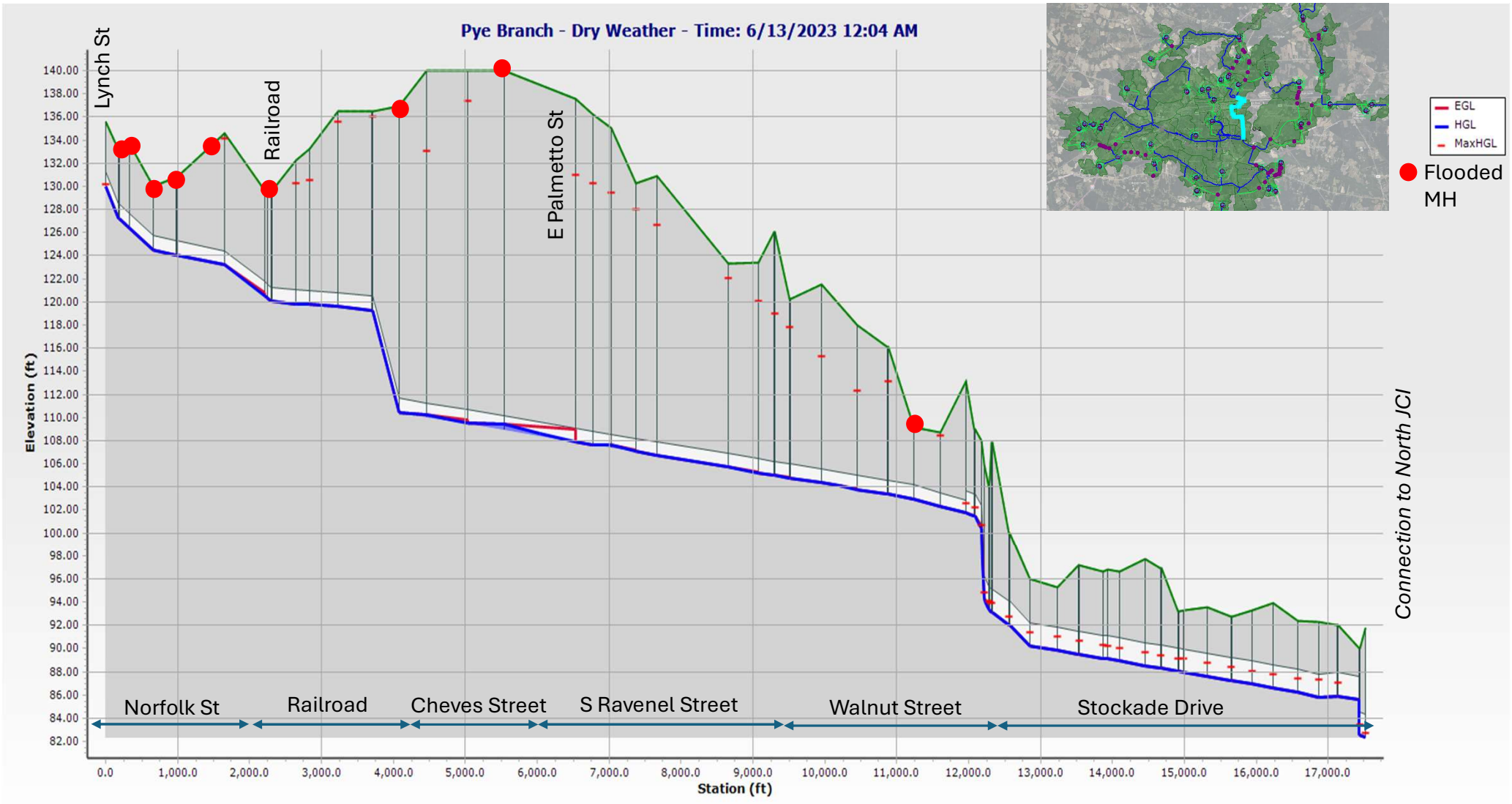
Location 3

Existing System Under Existing Flow Conditions – 2-yr 6-hr



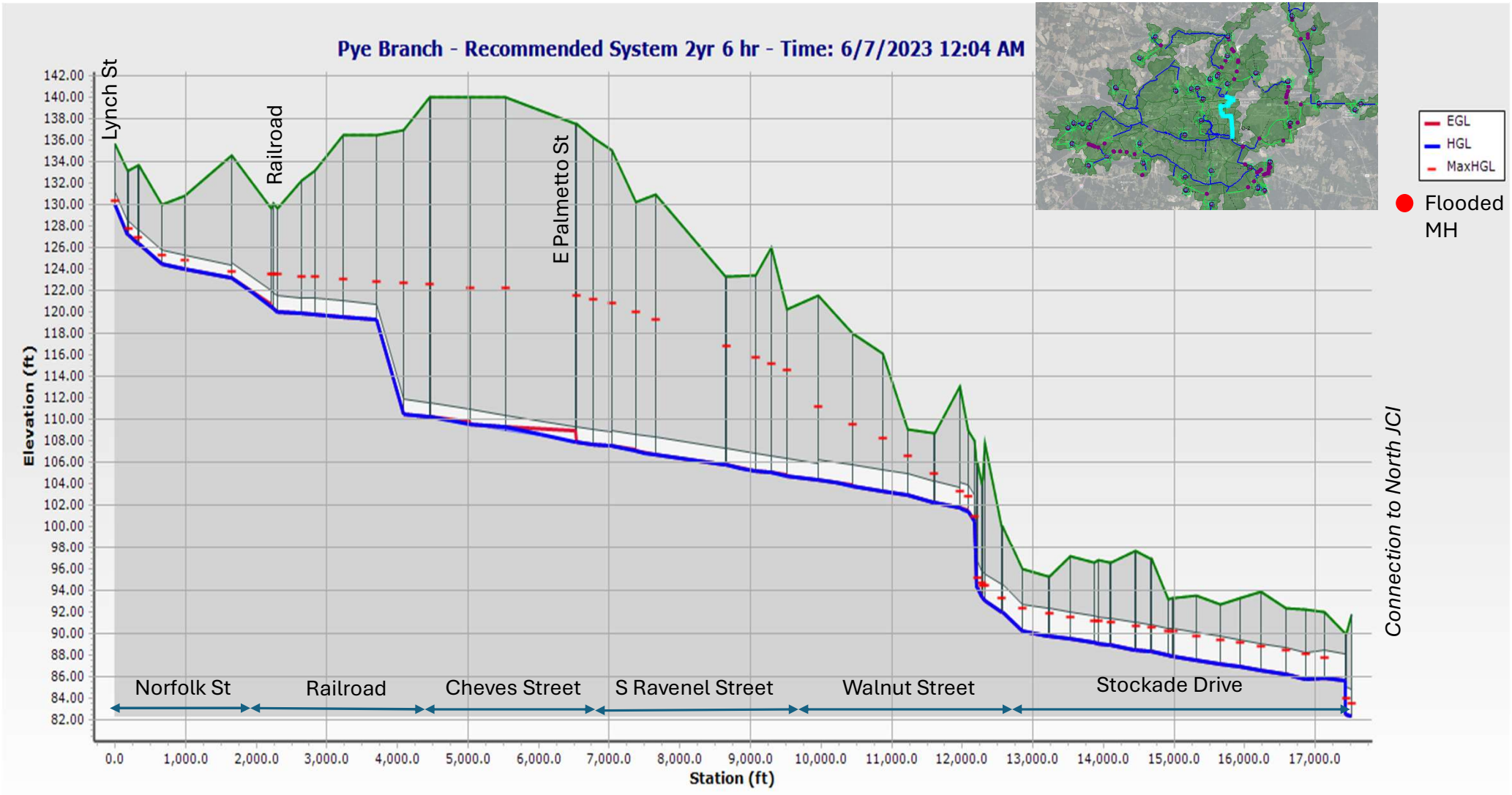
Location 3

Existing System Under Existing Flow Conditions – Dry Weather



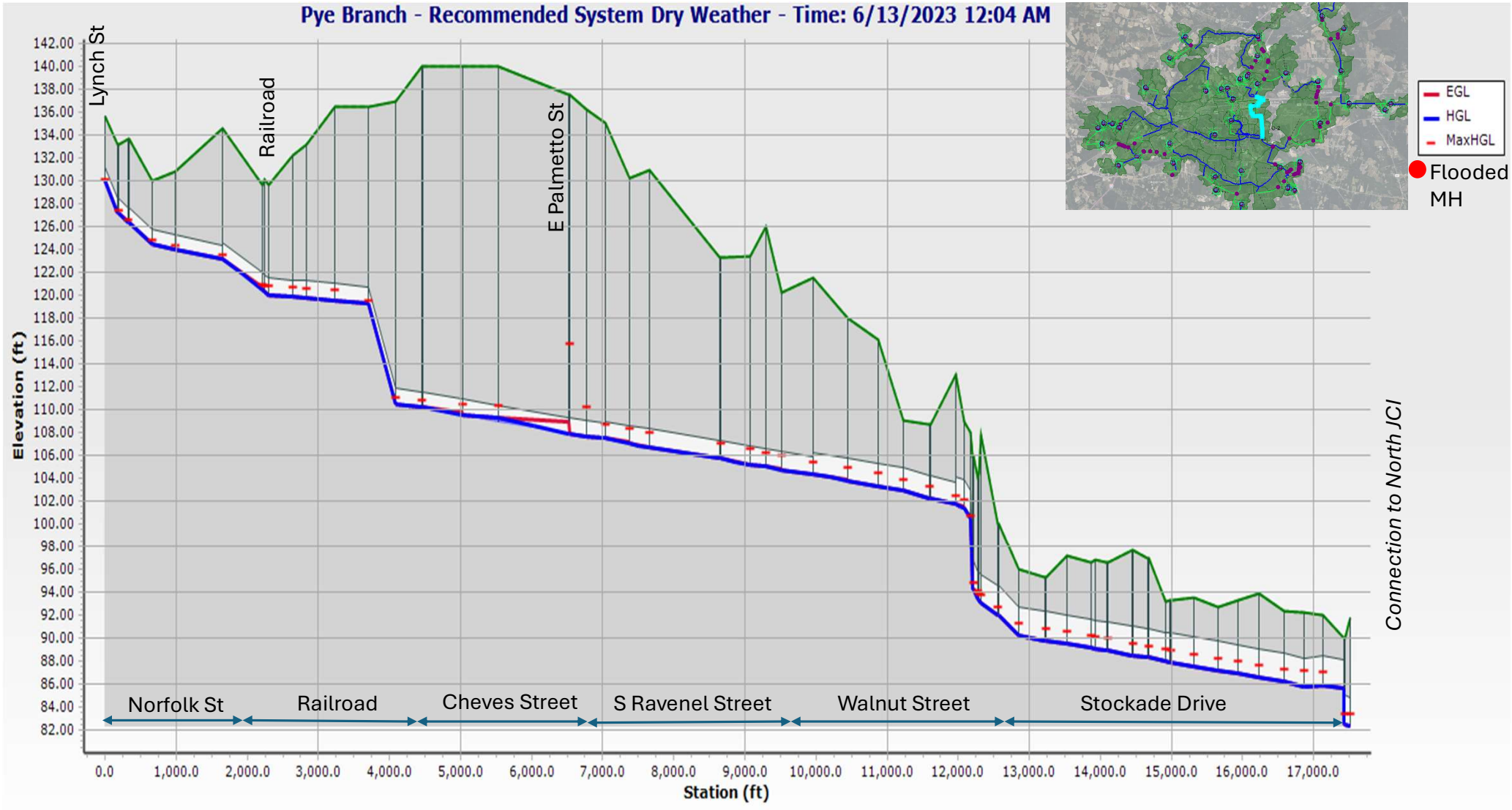
Location 3

Proposed System Under Future Flow Conditions – 2-yr 6-hr



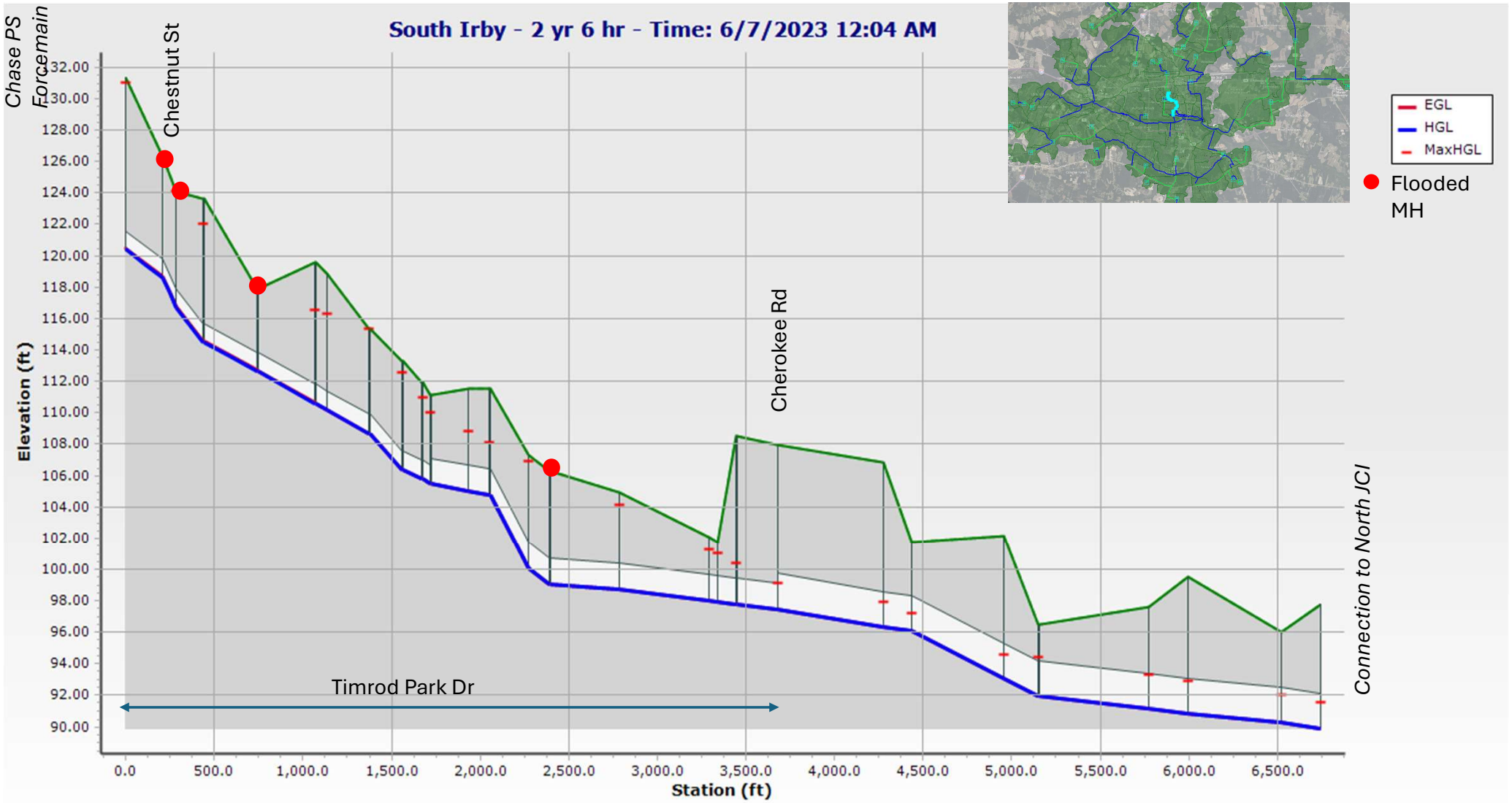
Location 3

Proposed System Under Future Flow Conditions – Dry Weather



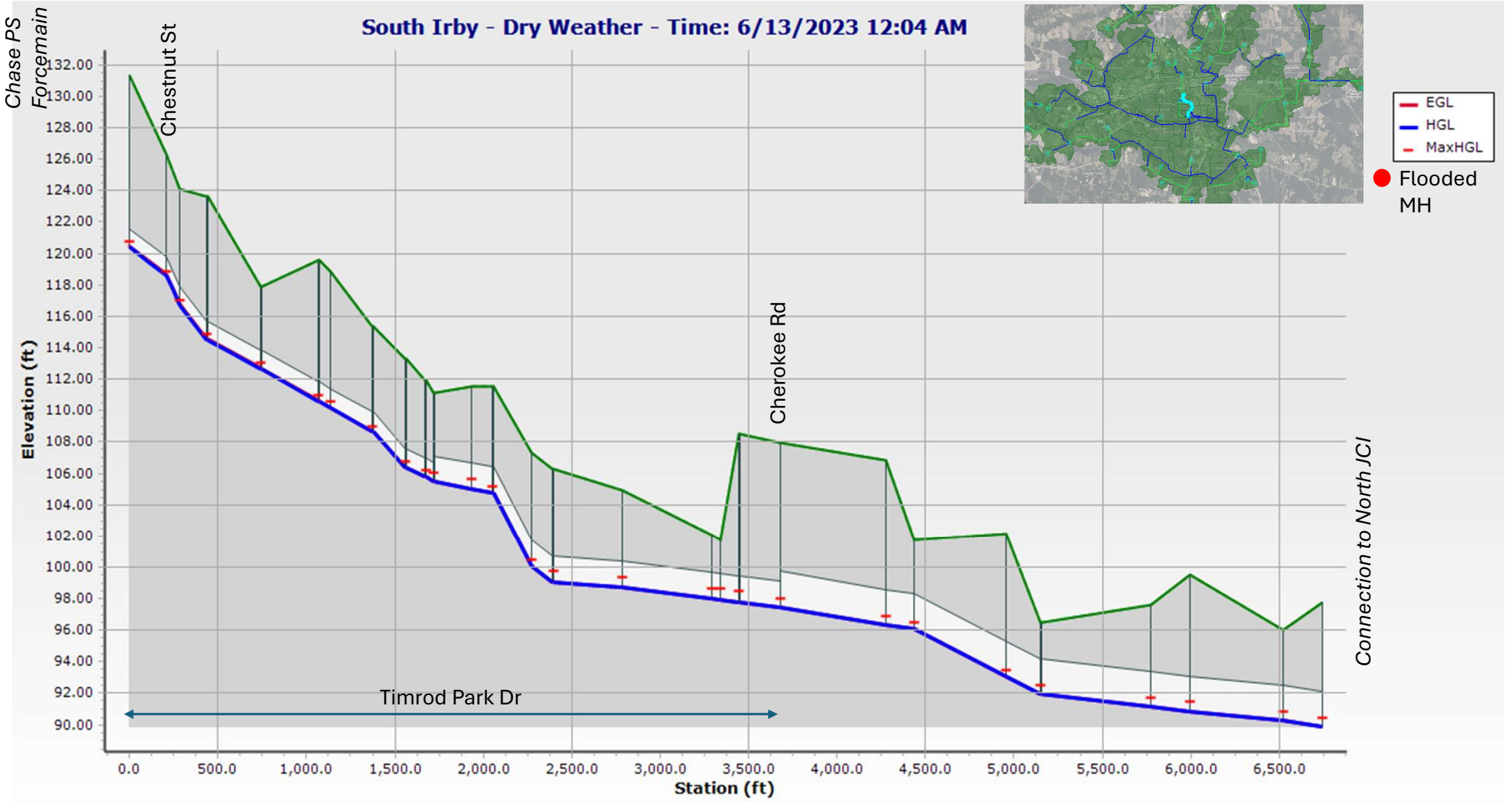
Location 4

Existing System Under Existing Flow Conditions – 2-yr 6-hr



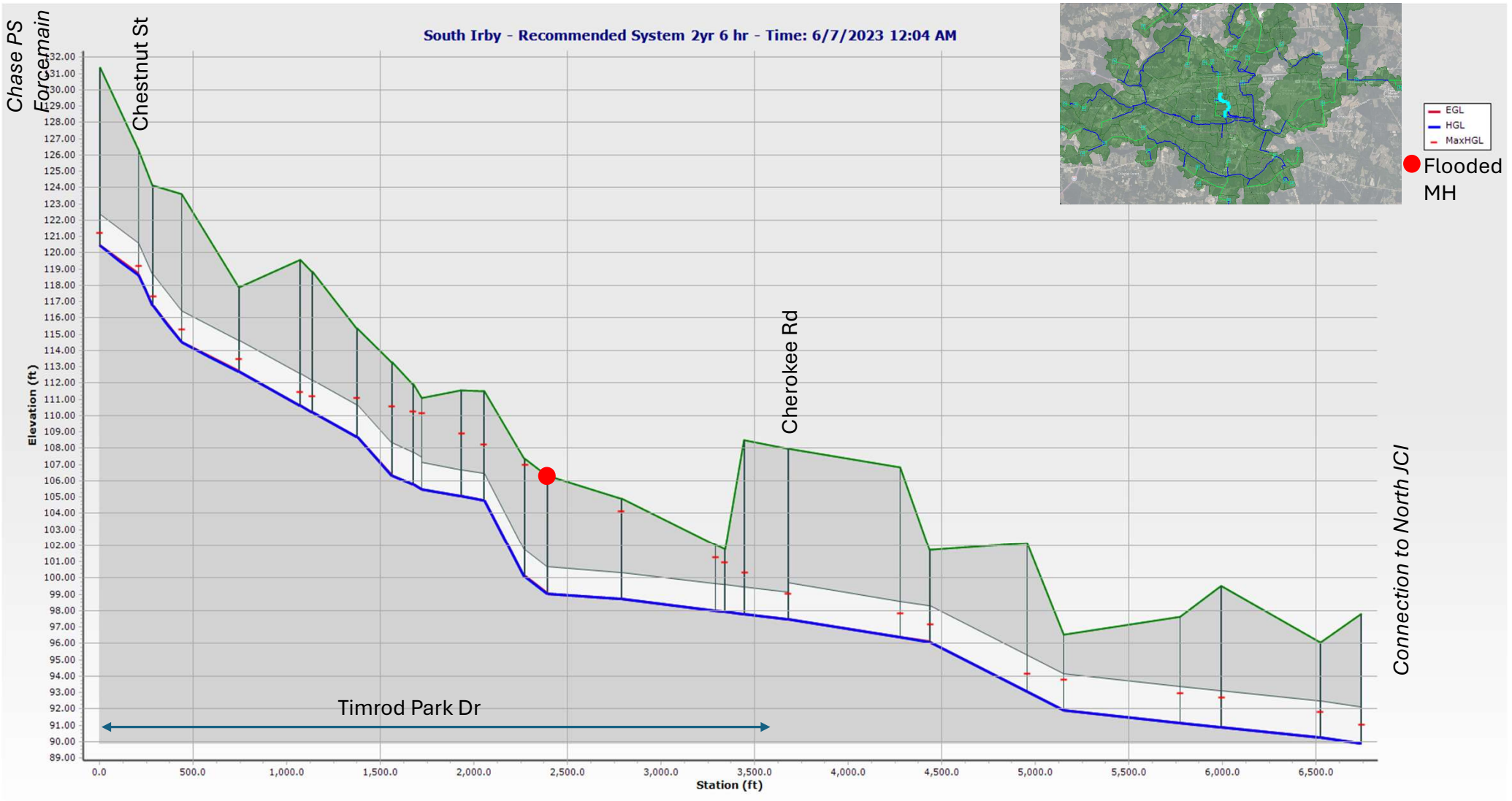
Location 4

Existing System Under Existing Flow Conditions – Dry Weather



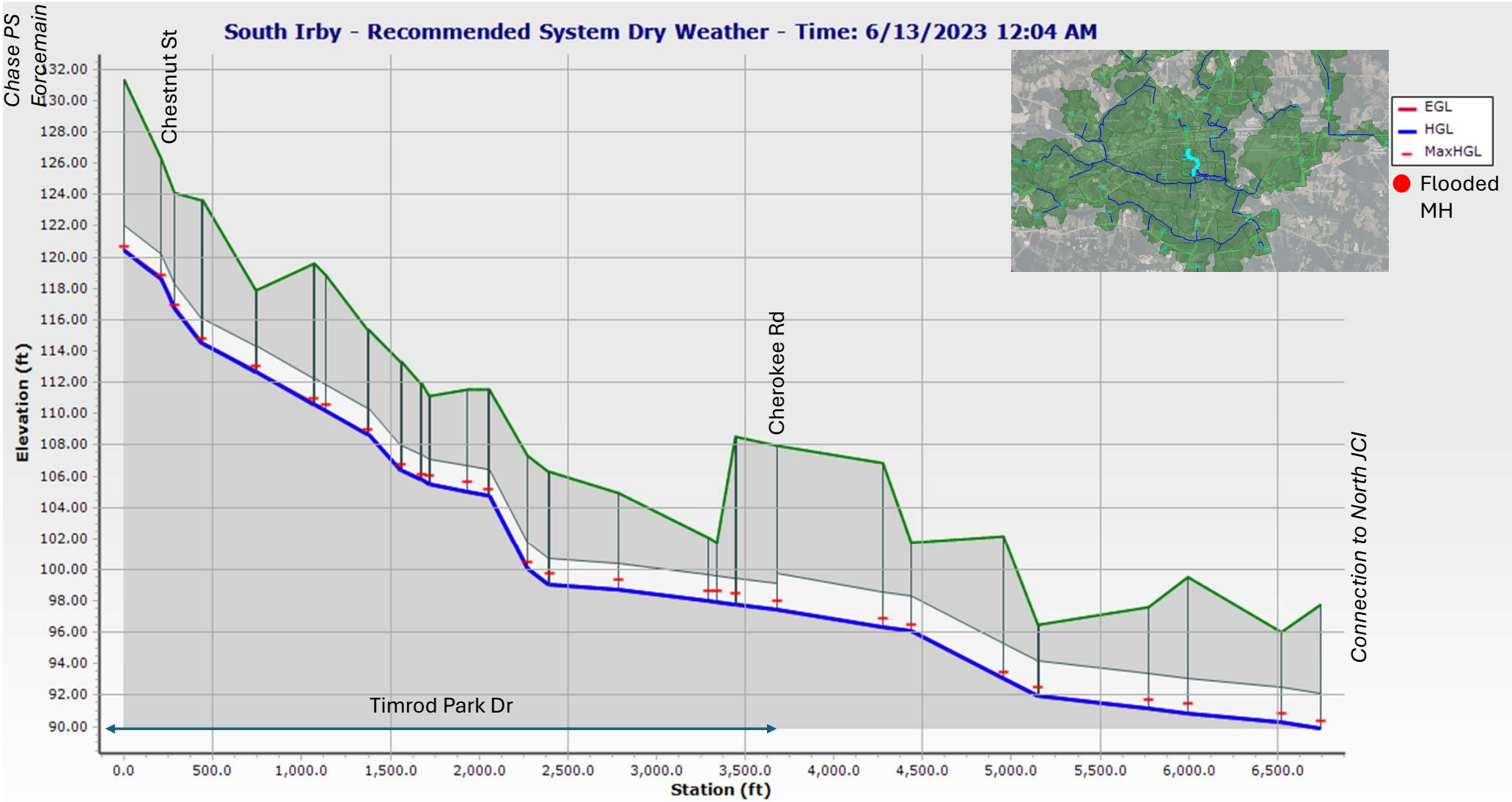
Location 4

Proposed System Under Future Flow Conditions – 2-yr 6-hr



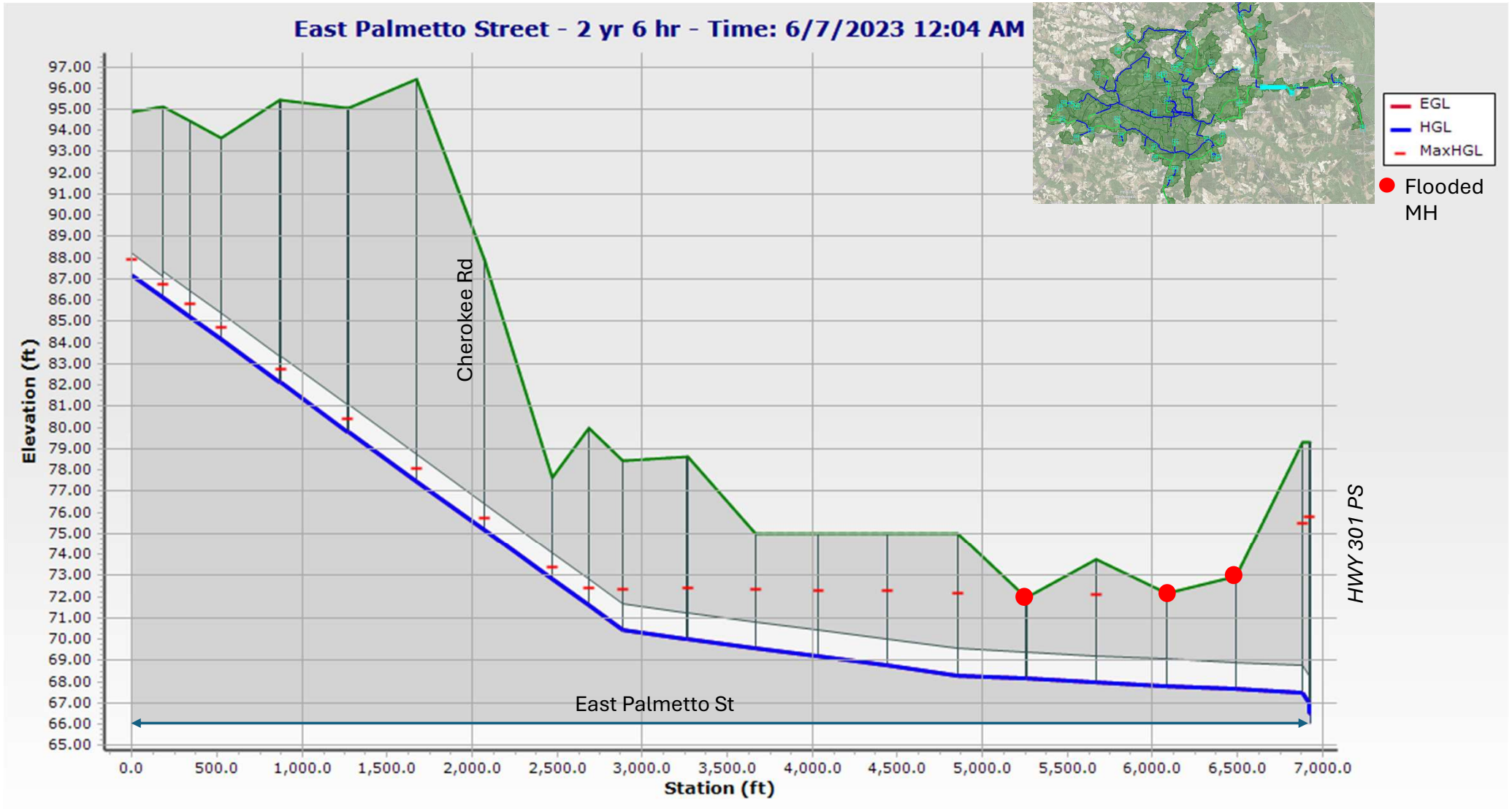
Location 4

Proposed System Under Future Flow Conditions – Dry Weather



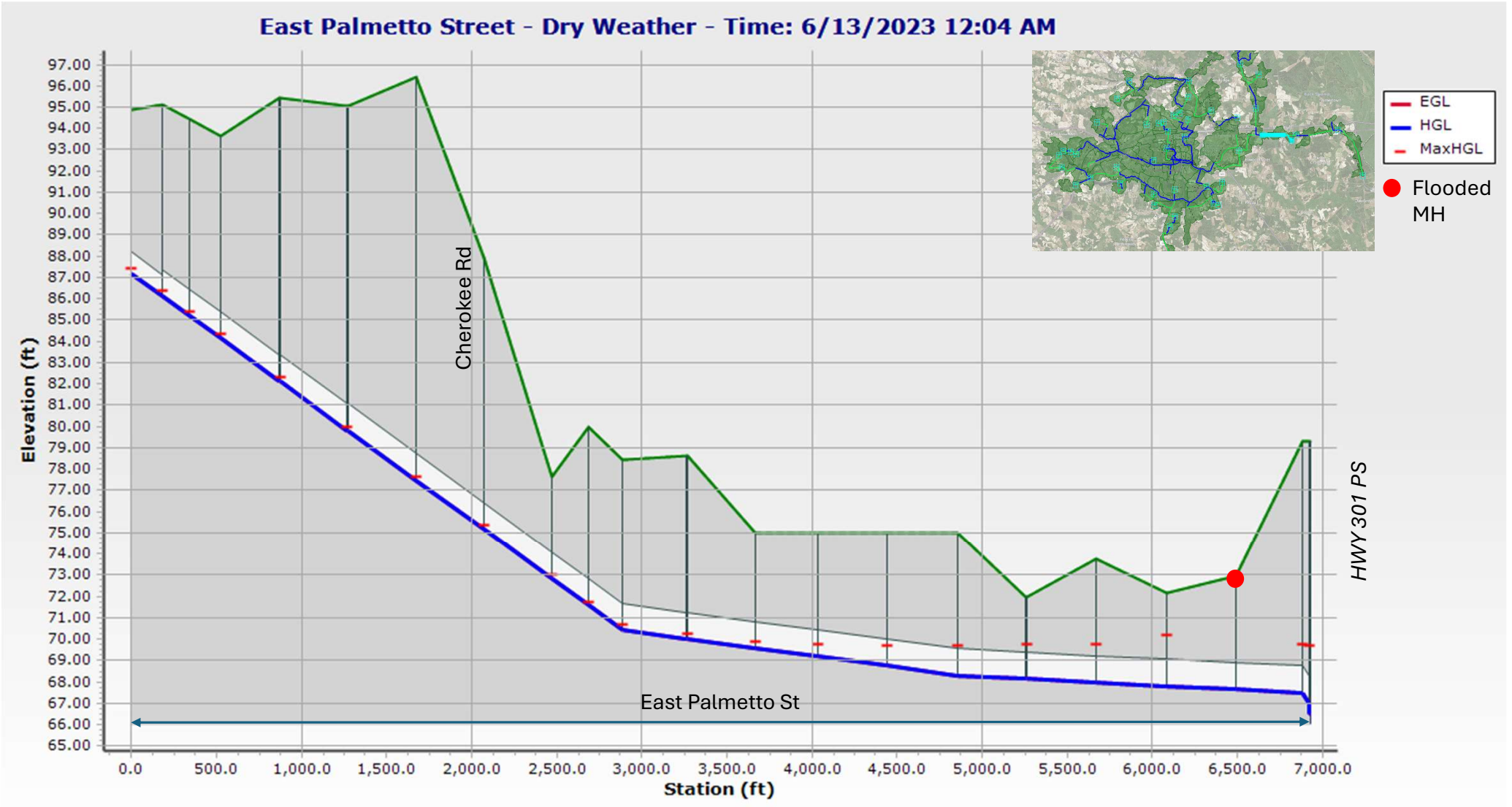
Location 5

Existing System Under Existing Flow Conditions – 2-yr 6-hr



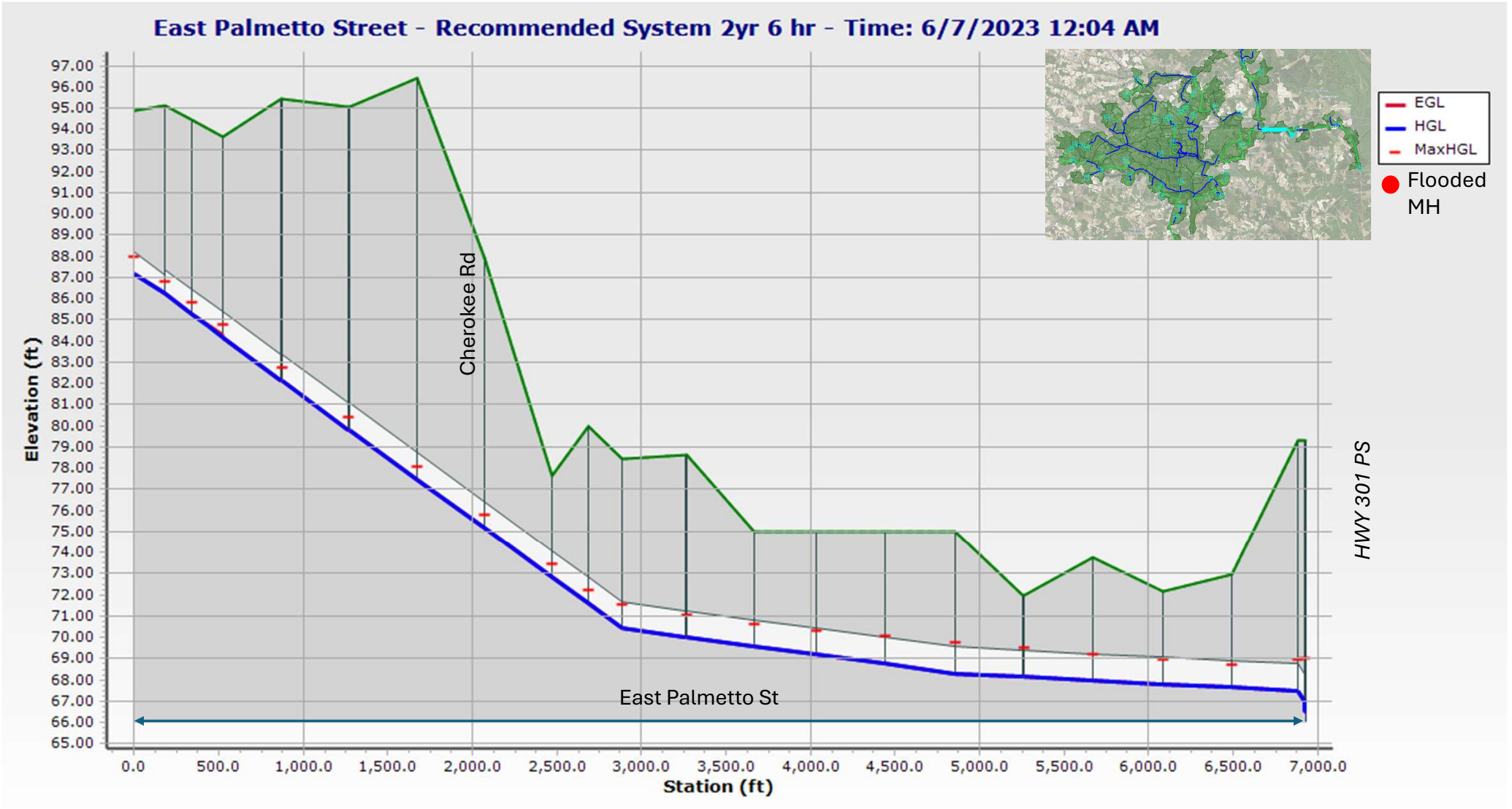
Location 5

Existing System Under Existing Flow Conditions – Dry weather



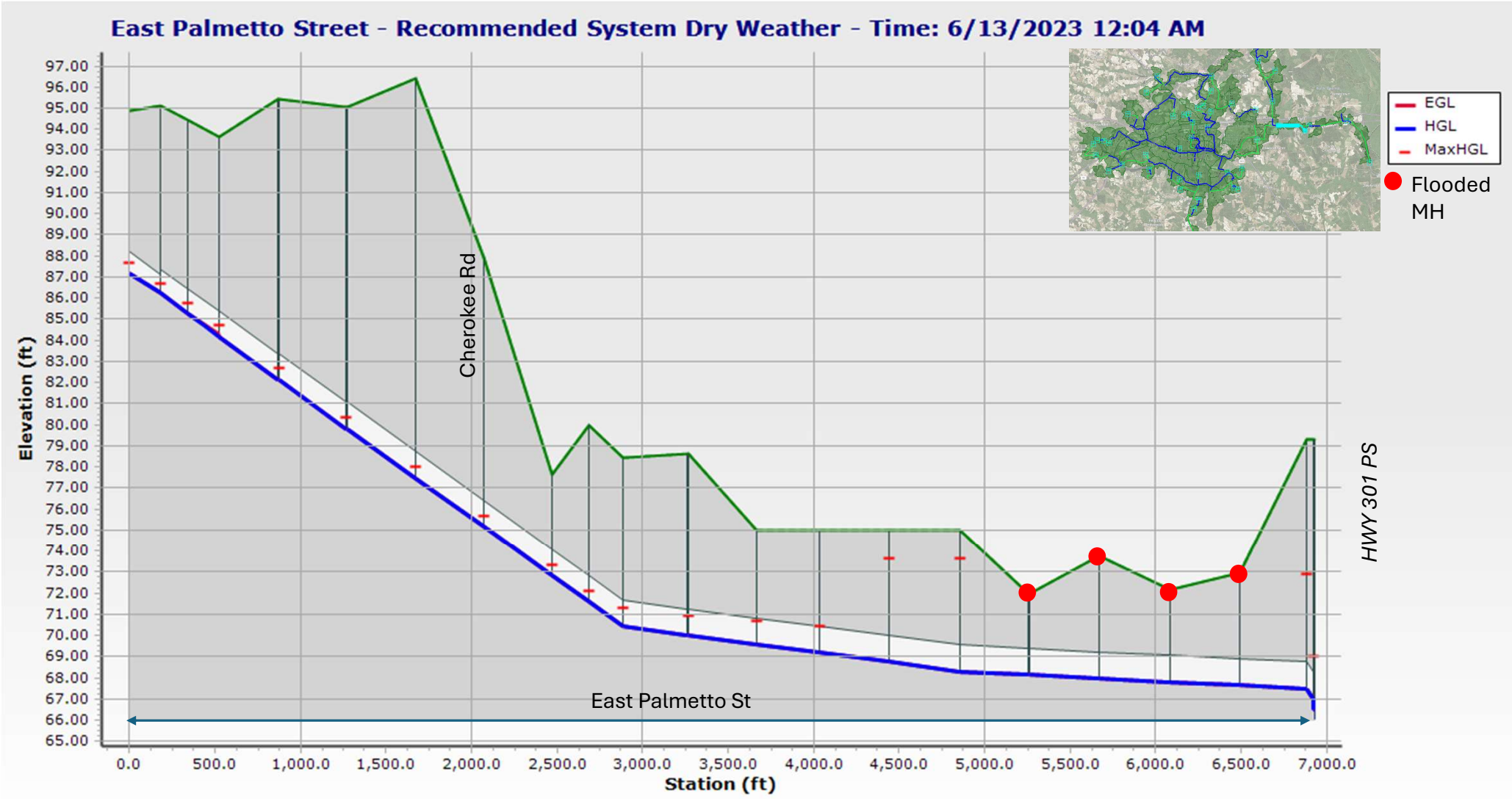
Location 5

Proposed System Under Future Flow Conditions – 2-yr 6-hr



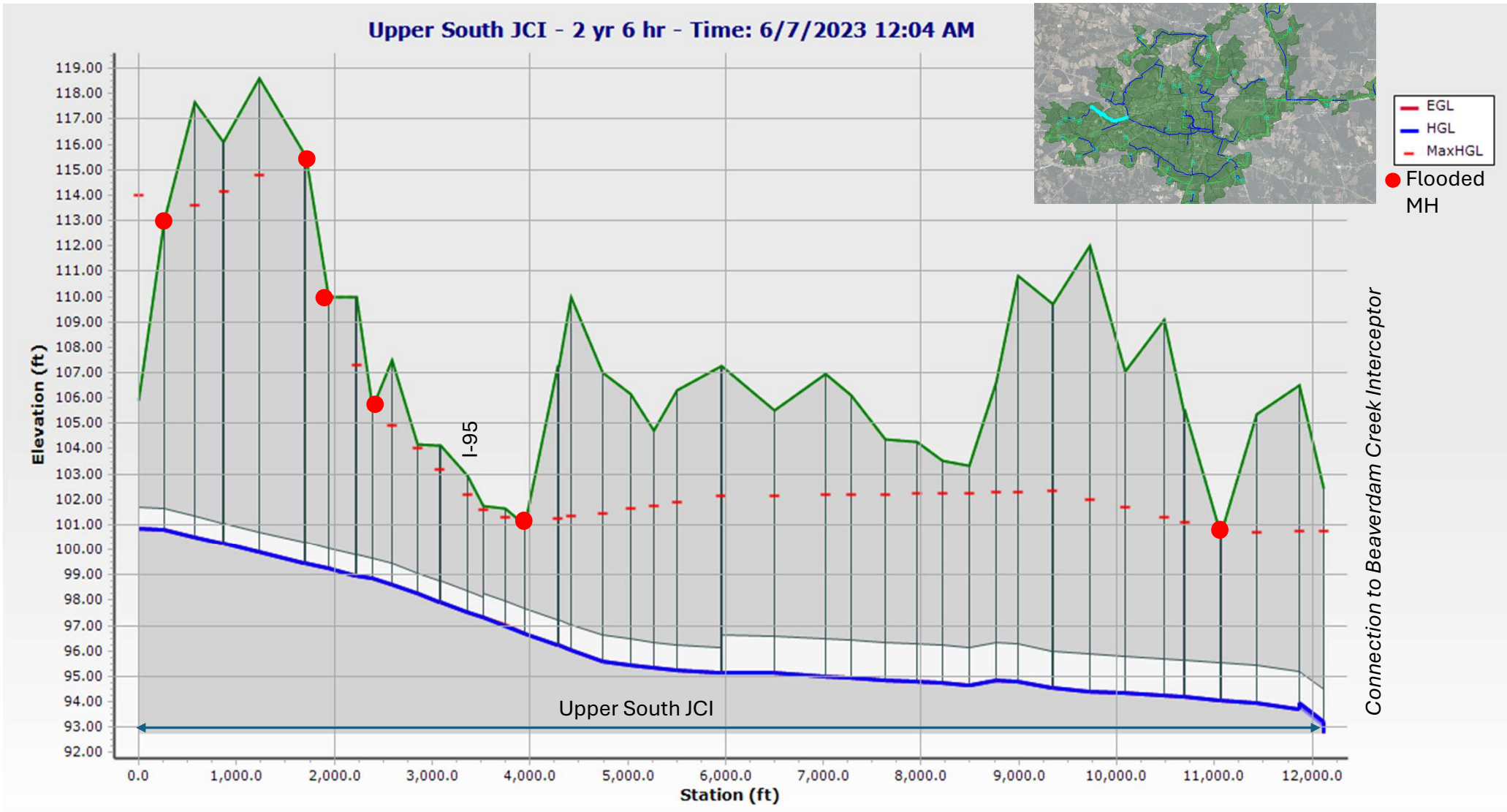
Location 5

Proposed System Under Future Flow Conditions – Dry Weather



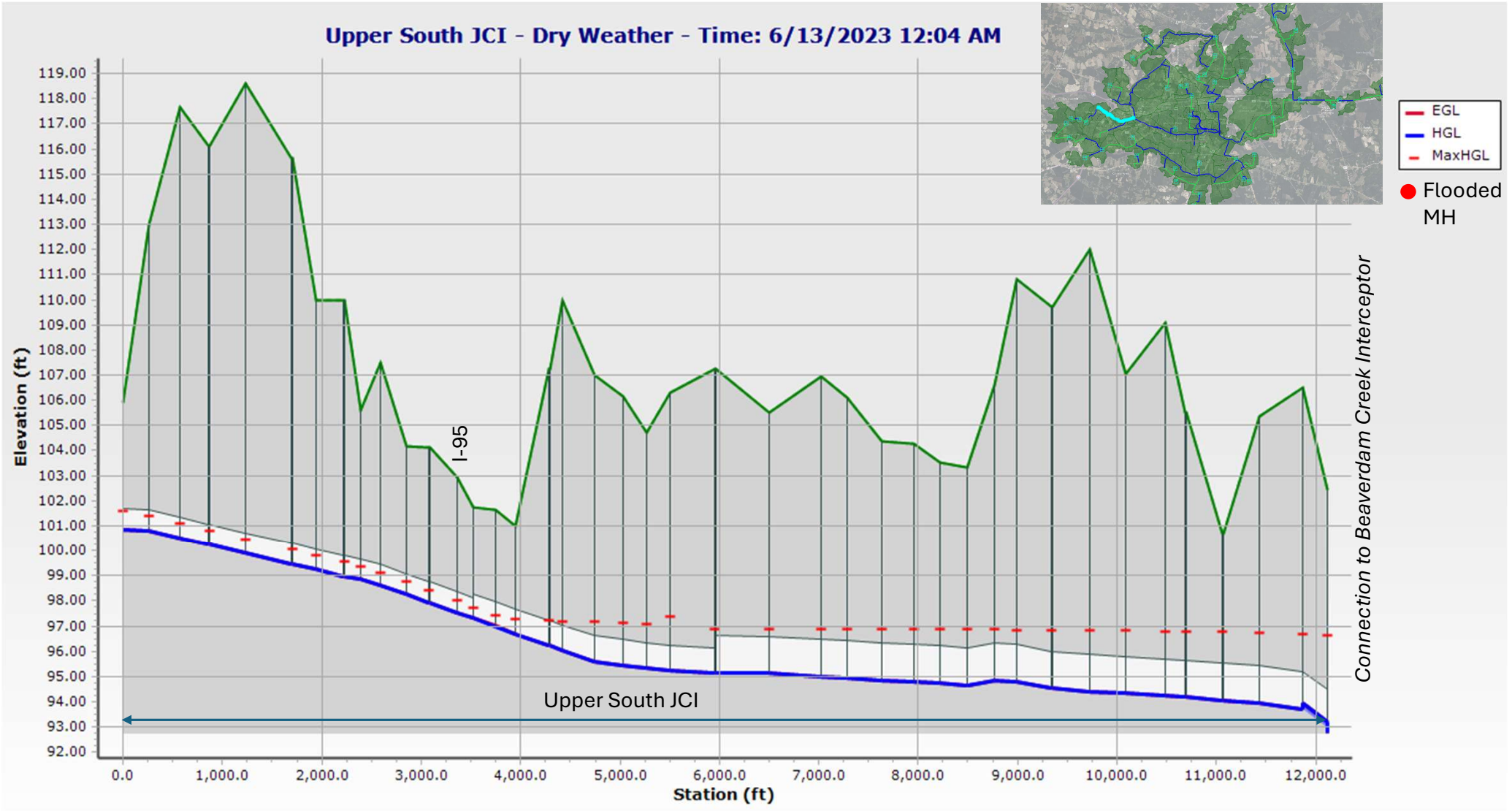
Location 6

Existing System Under Existing Flow Conditions – 2-yr 6-hr



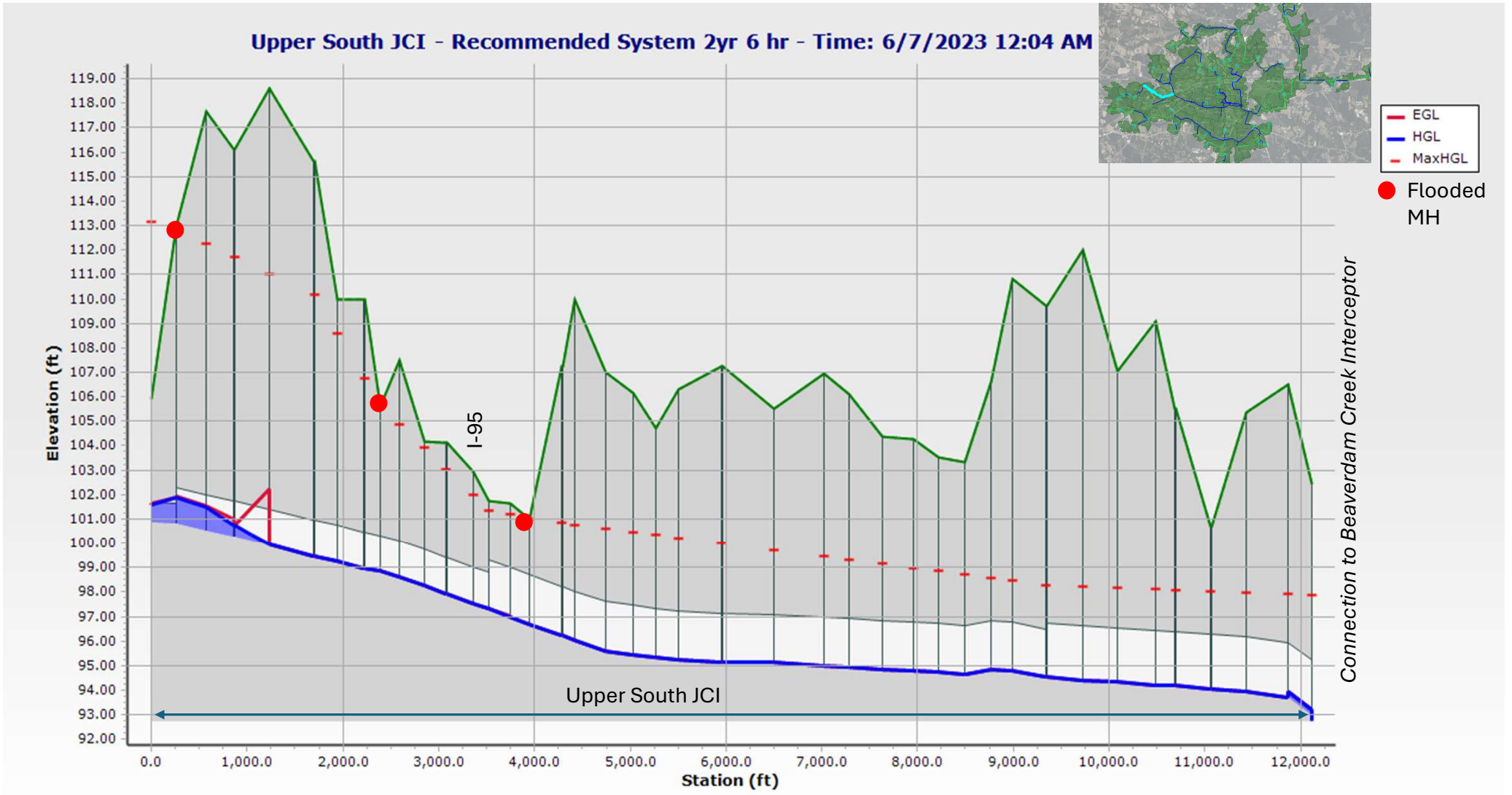
Location 6

Existing System Under Existing Flow Conditions – Dry Weather



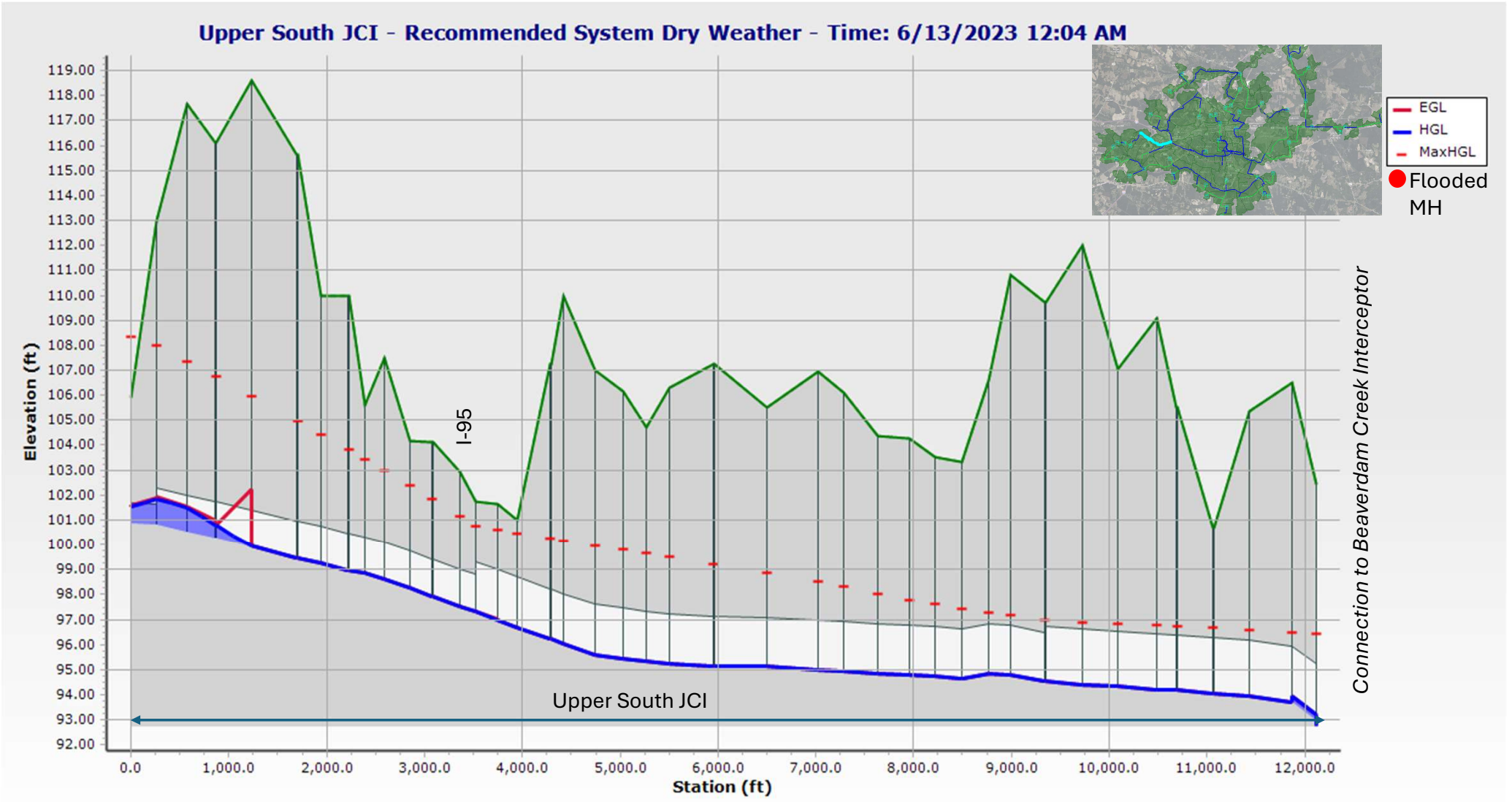
Location 6

Proposed System Under Future Flow Conditions – 2-yr 6-hr



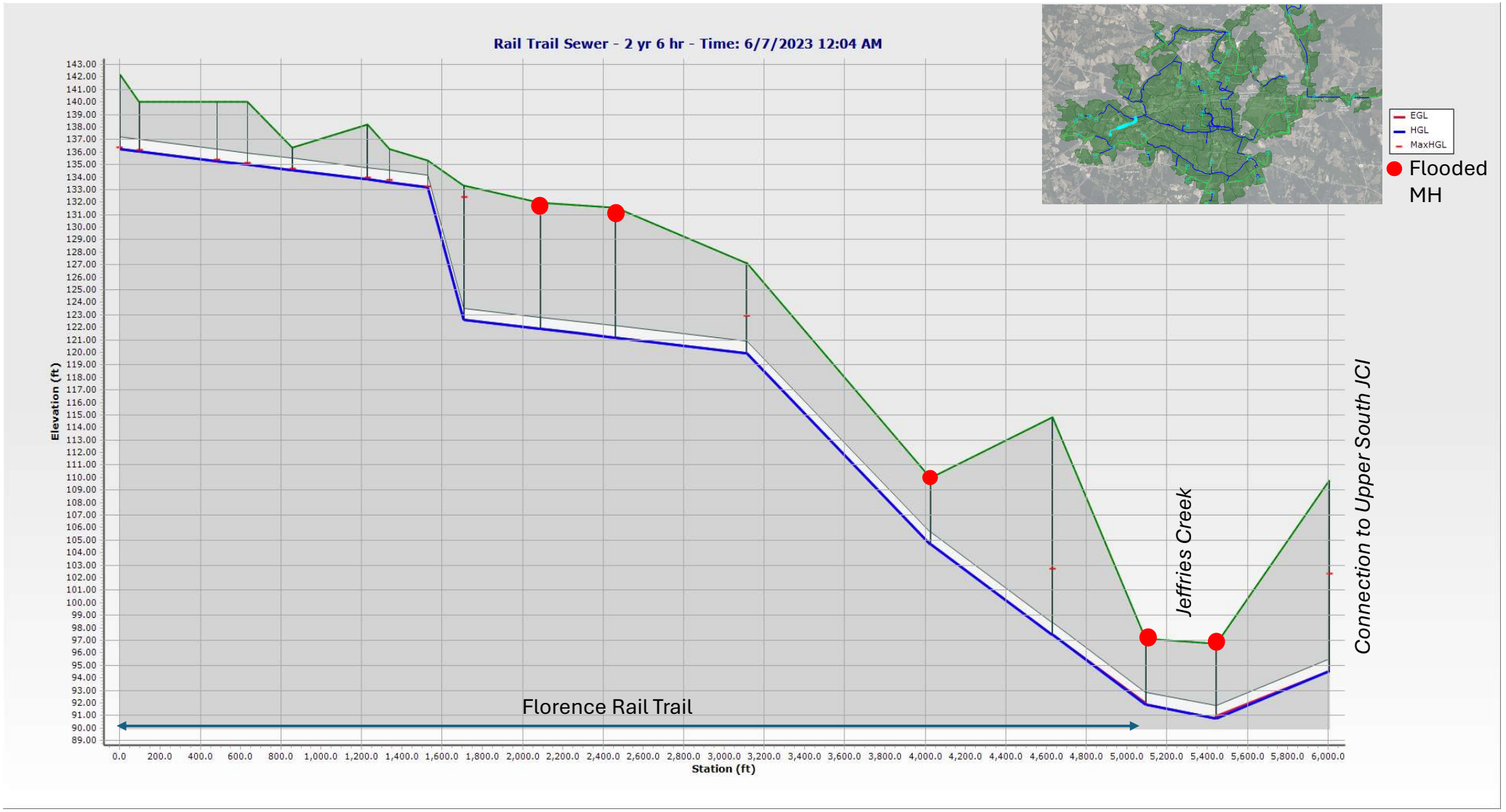
Location 6

Proposed System Under Future Flow Conditions – Dry Weather



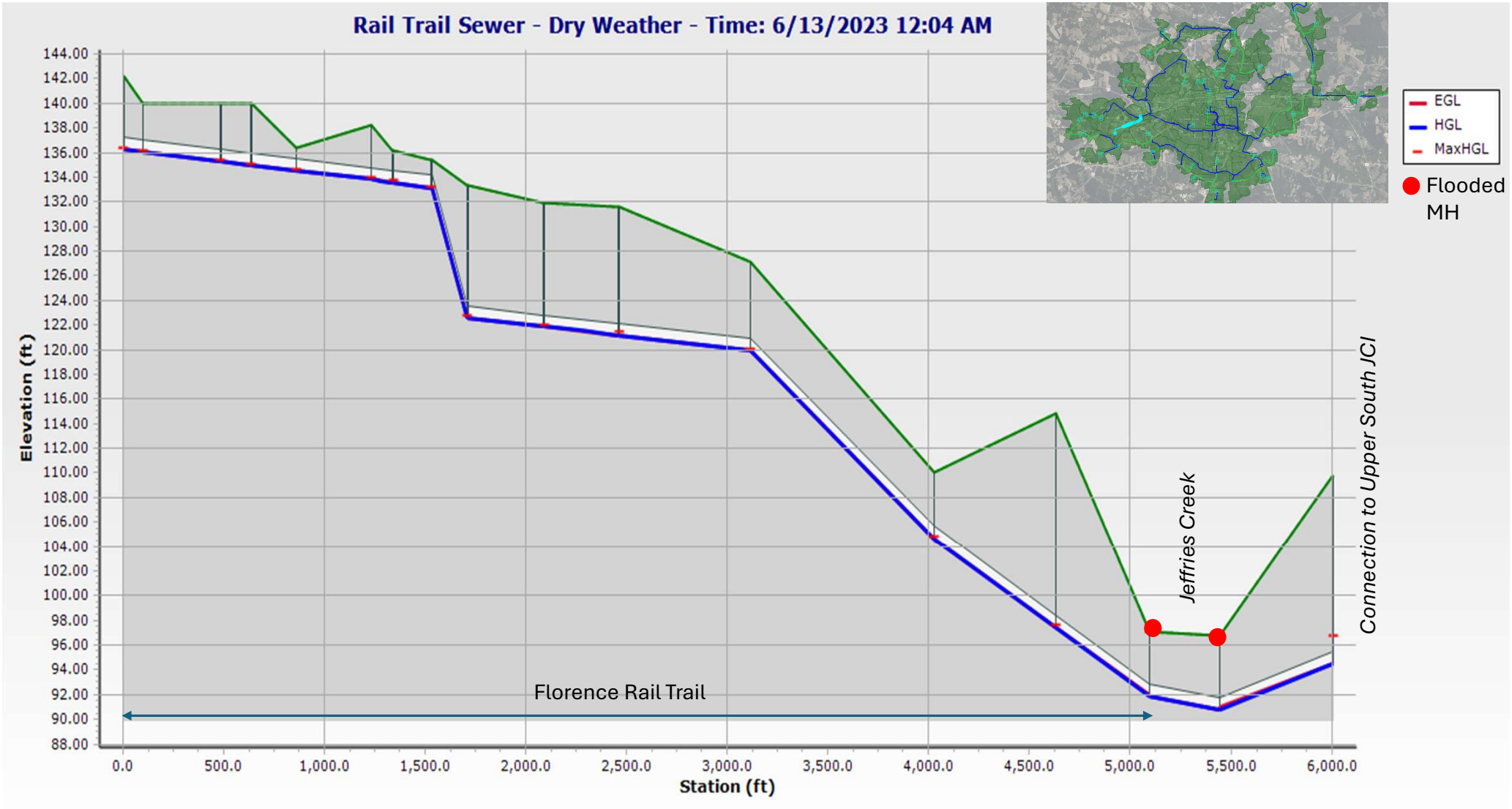
Location 7

Existing System Under Existing Flow Conditions – 2-yr 6-hr



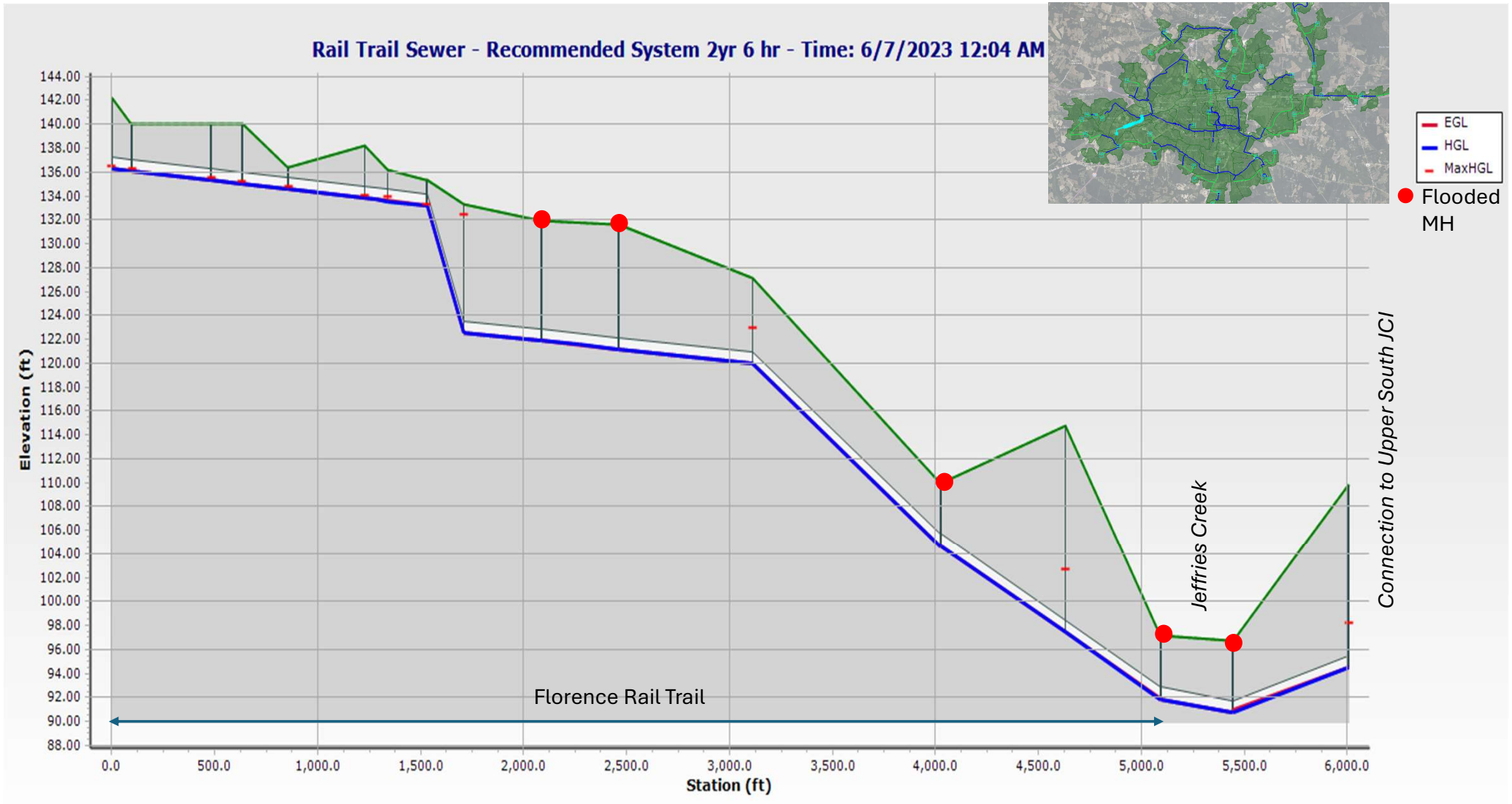
Location 7

Existing System Under Existing Flow Conditions – Dry Weather



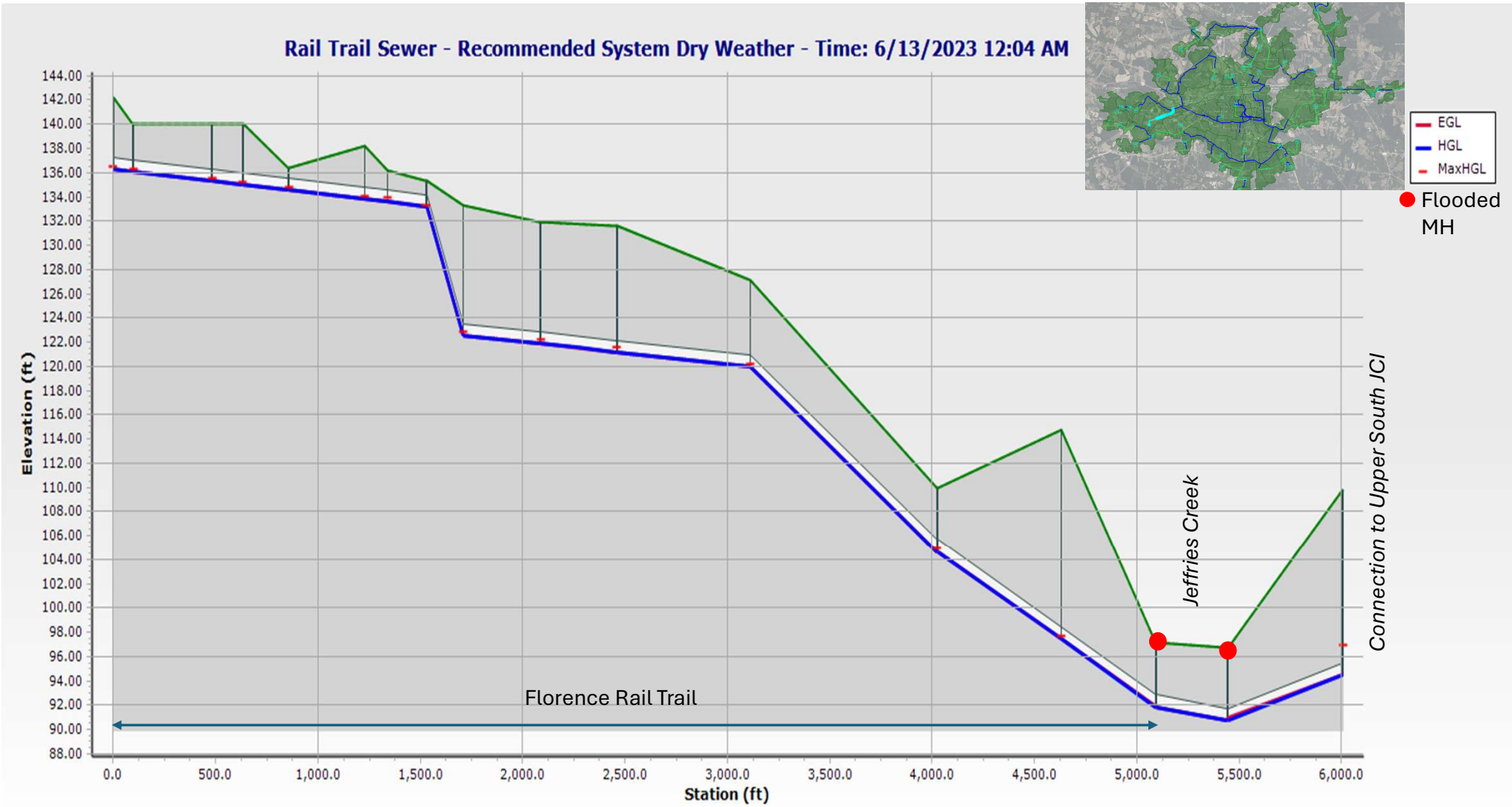
Location 7

Proposed System Under Future Flow Conditions – 2-yr 6-hr



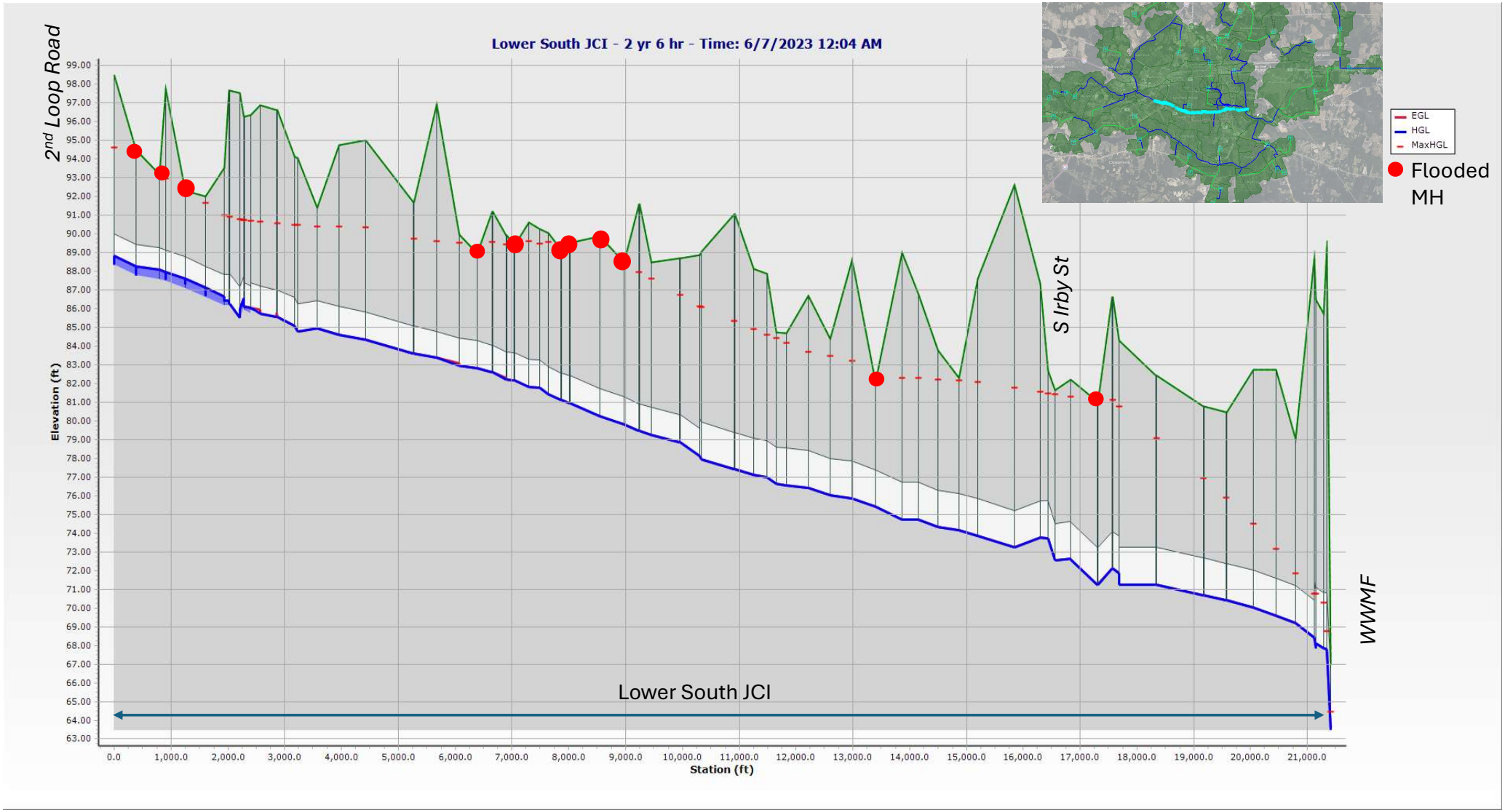
Location 7

Proposed System Under Future Flow Conditions – Dry Weather



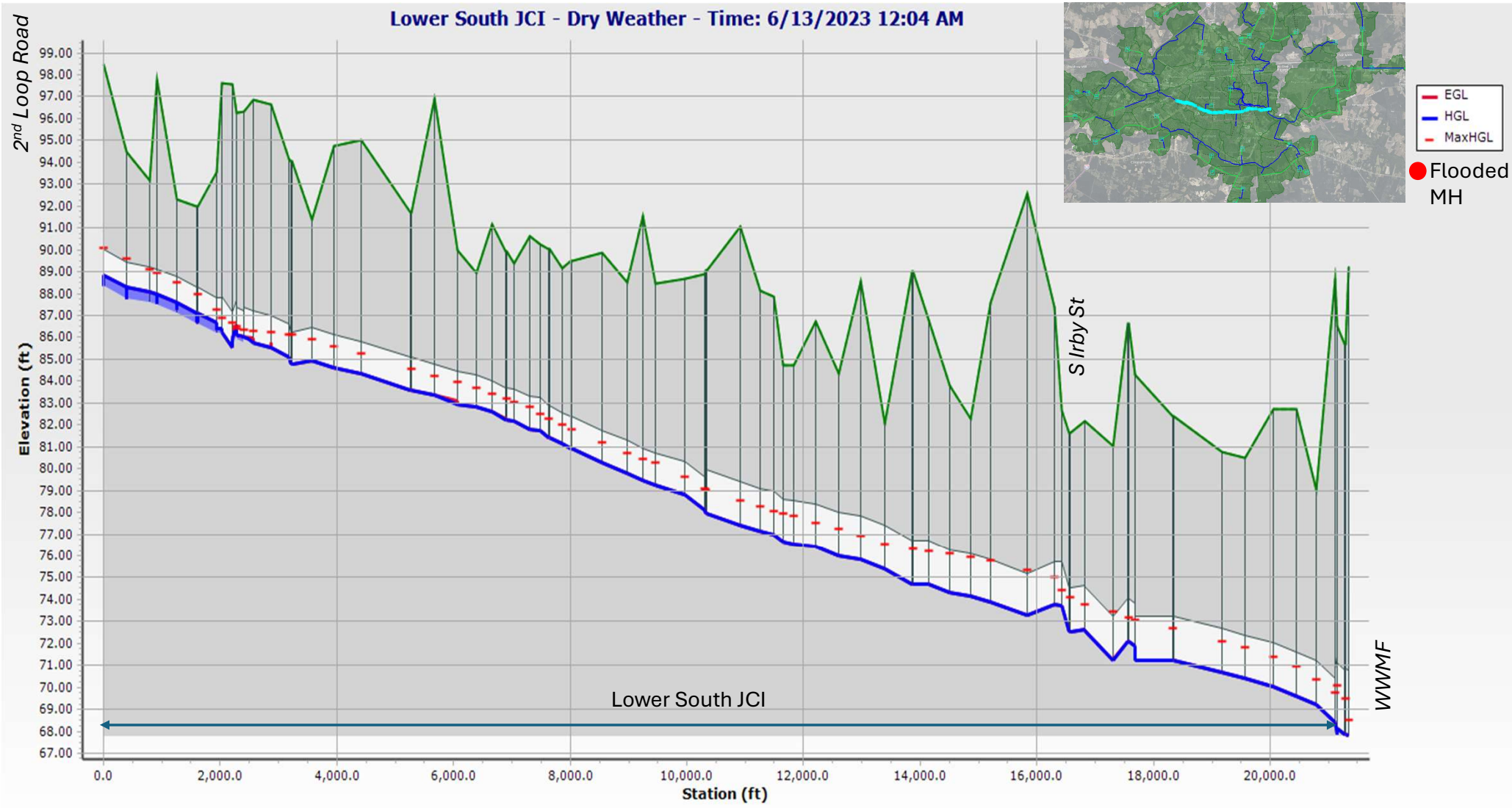
Location 8

Existing System Under Existing Flow Conditions – 2-yr 6-hr



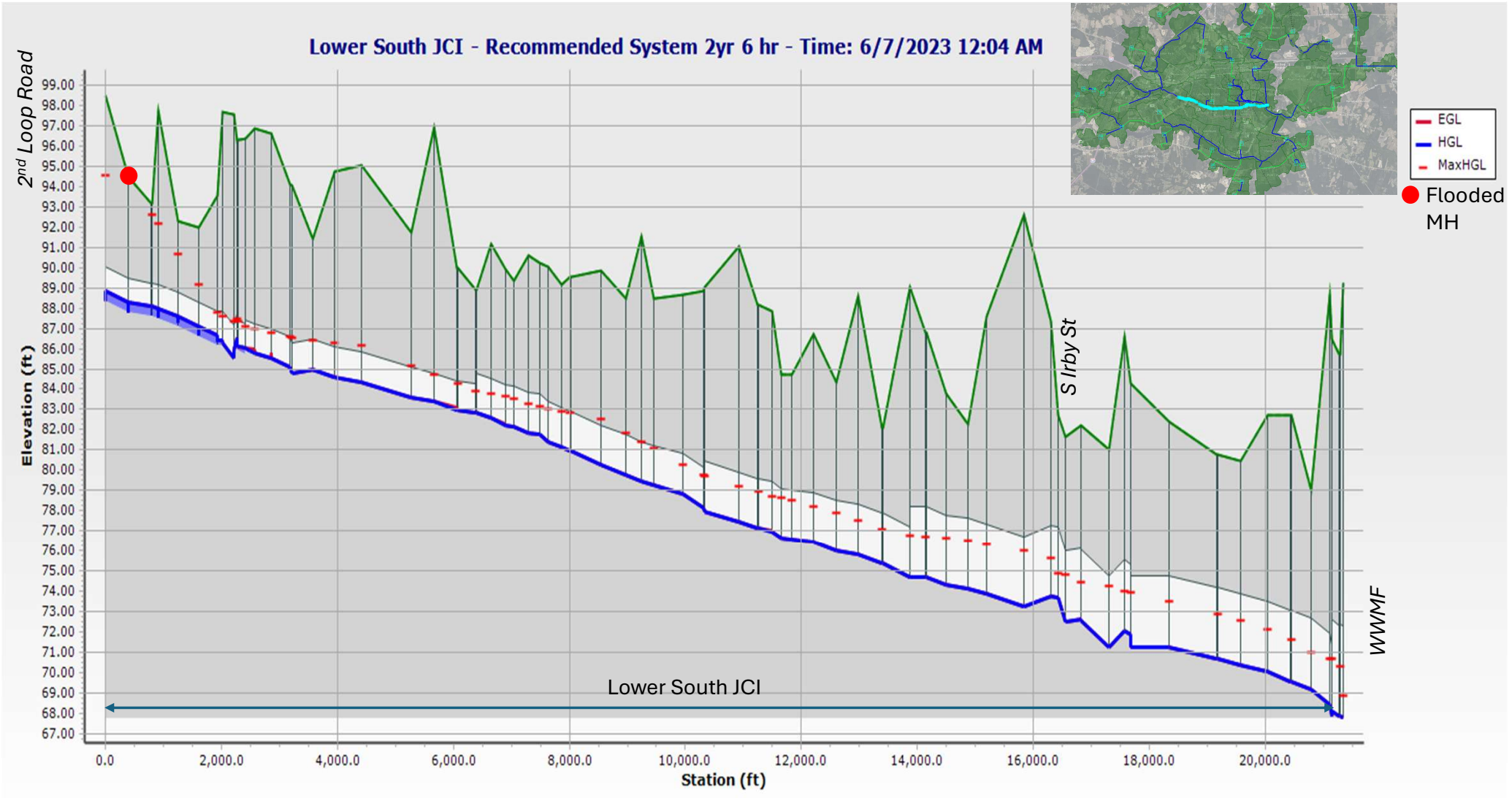
Location 8

Existing System Under Existing Flow Conditions – Dry Weather



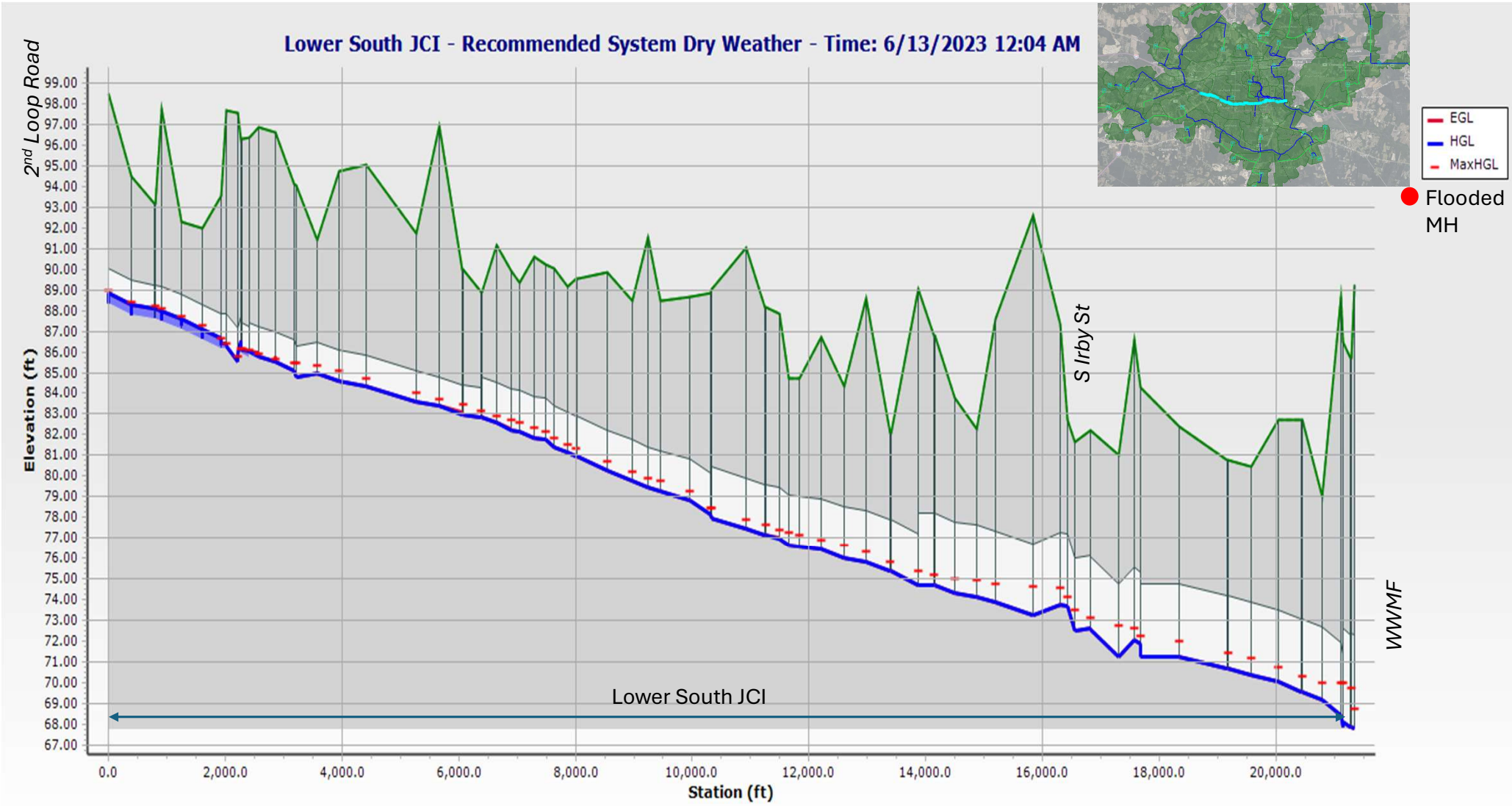
Location 8

Proposed System Under Future Flow Conditions – 2-yr 6-hr



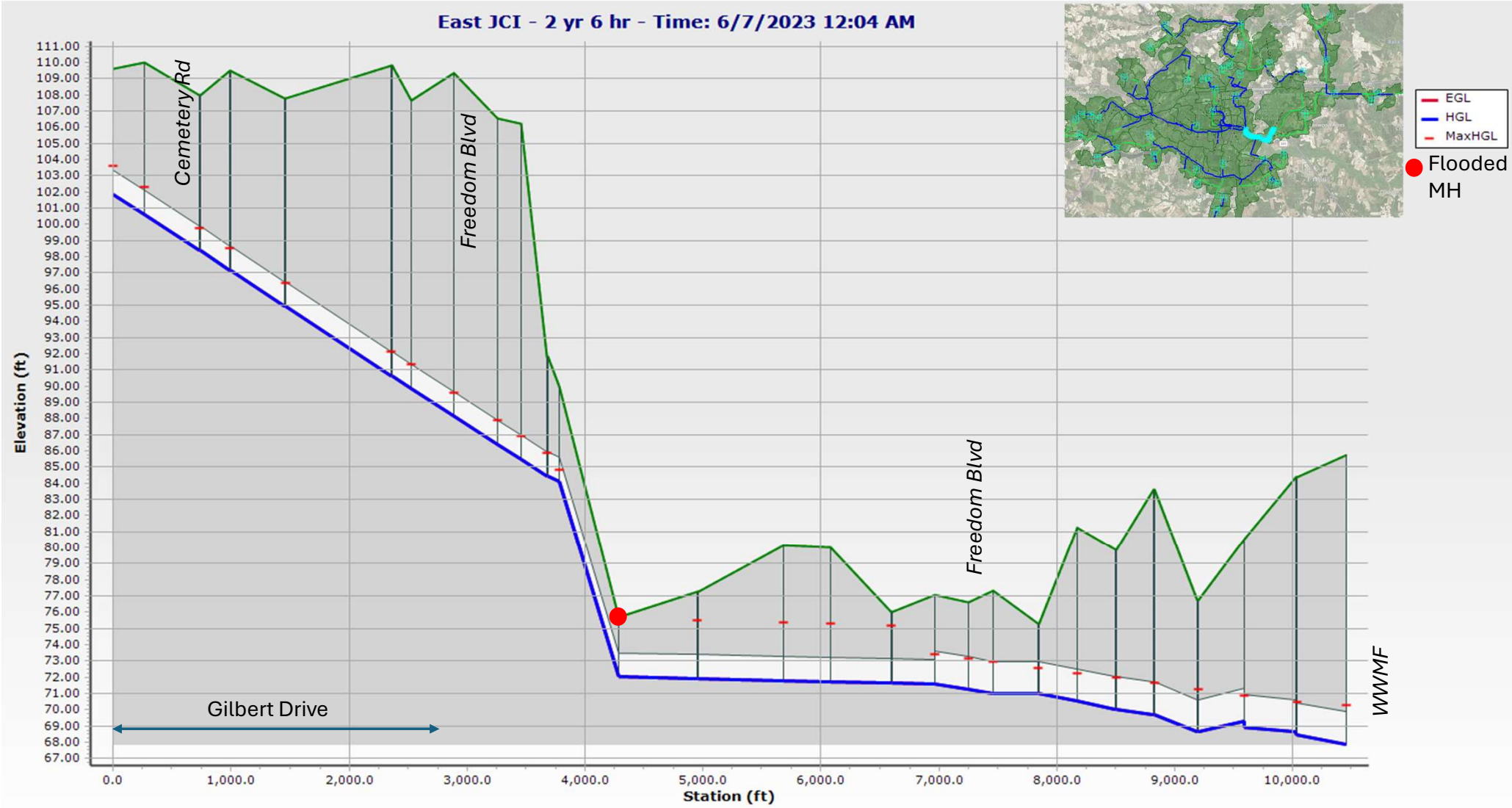
Location 8

Proposed System Under Future Flow Conditions – Dry Weather



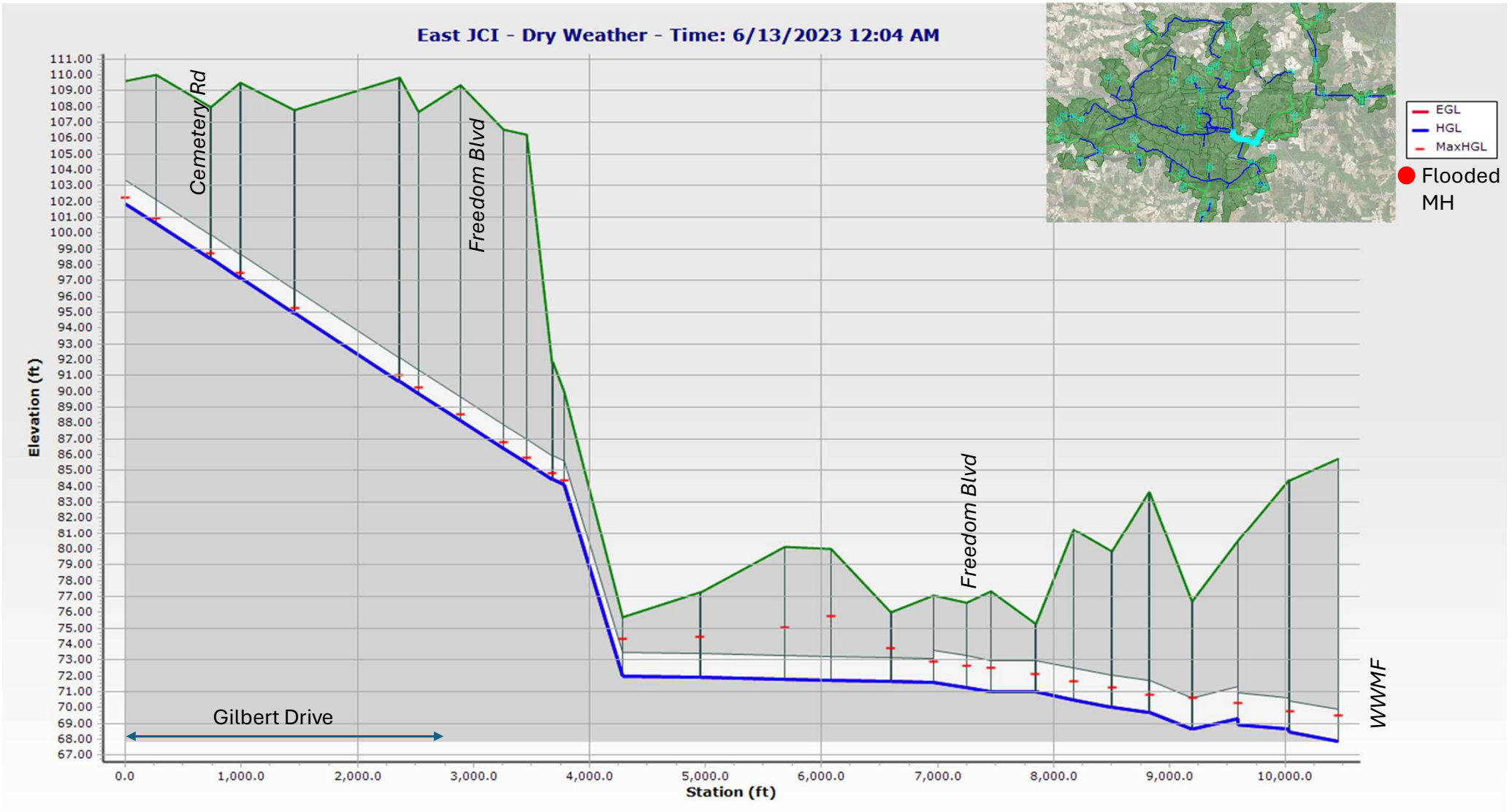
Location 9

Existing System Under Existing Flow Conditions – 2-yr 6-hr



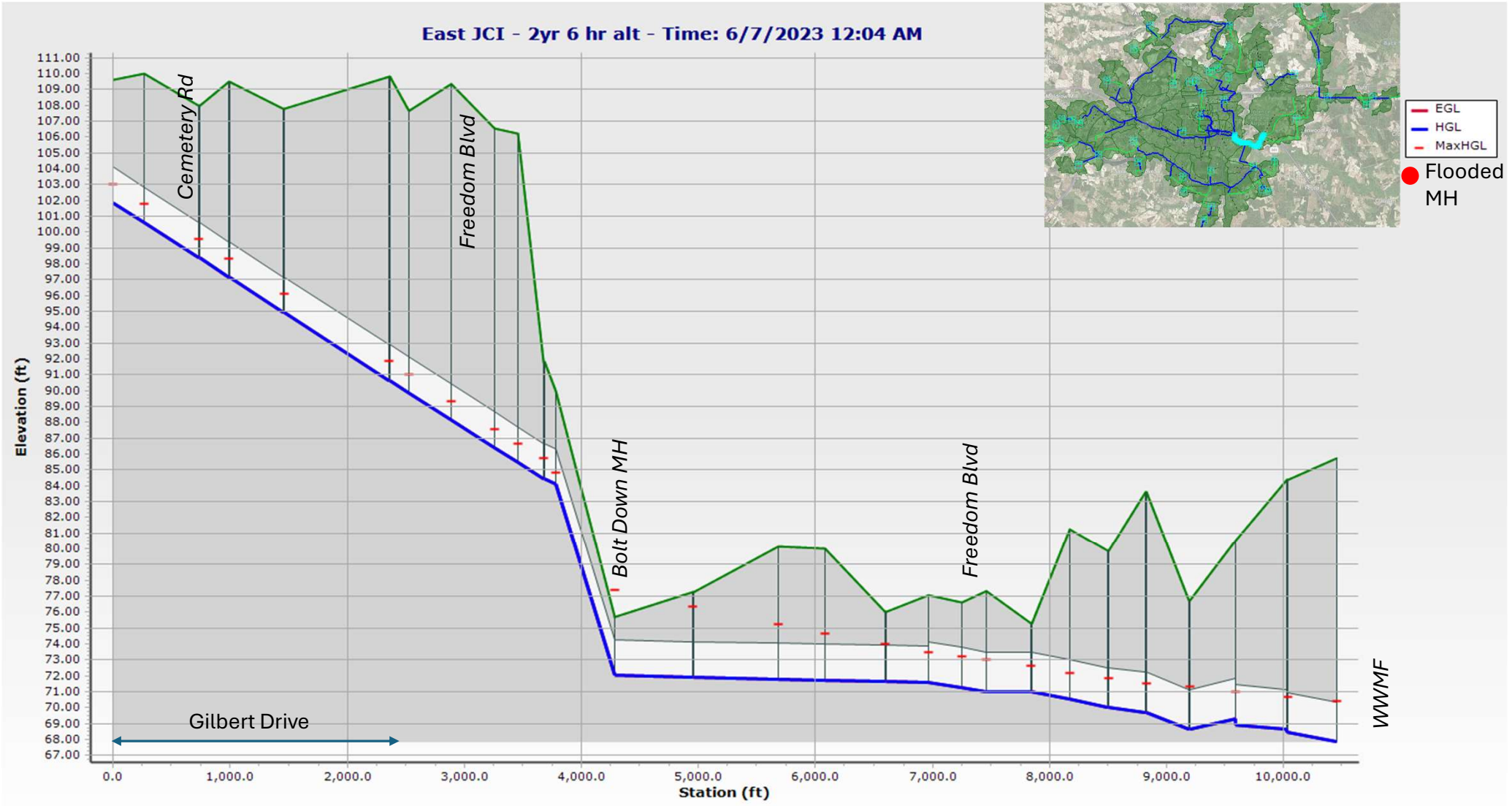
Location 9

Existing System Under Existing Flow Conditions – Dry Weather



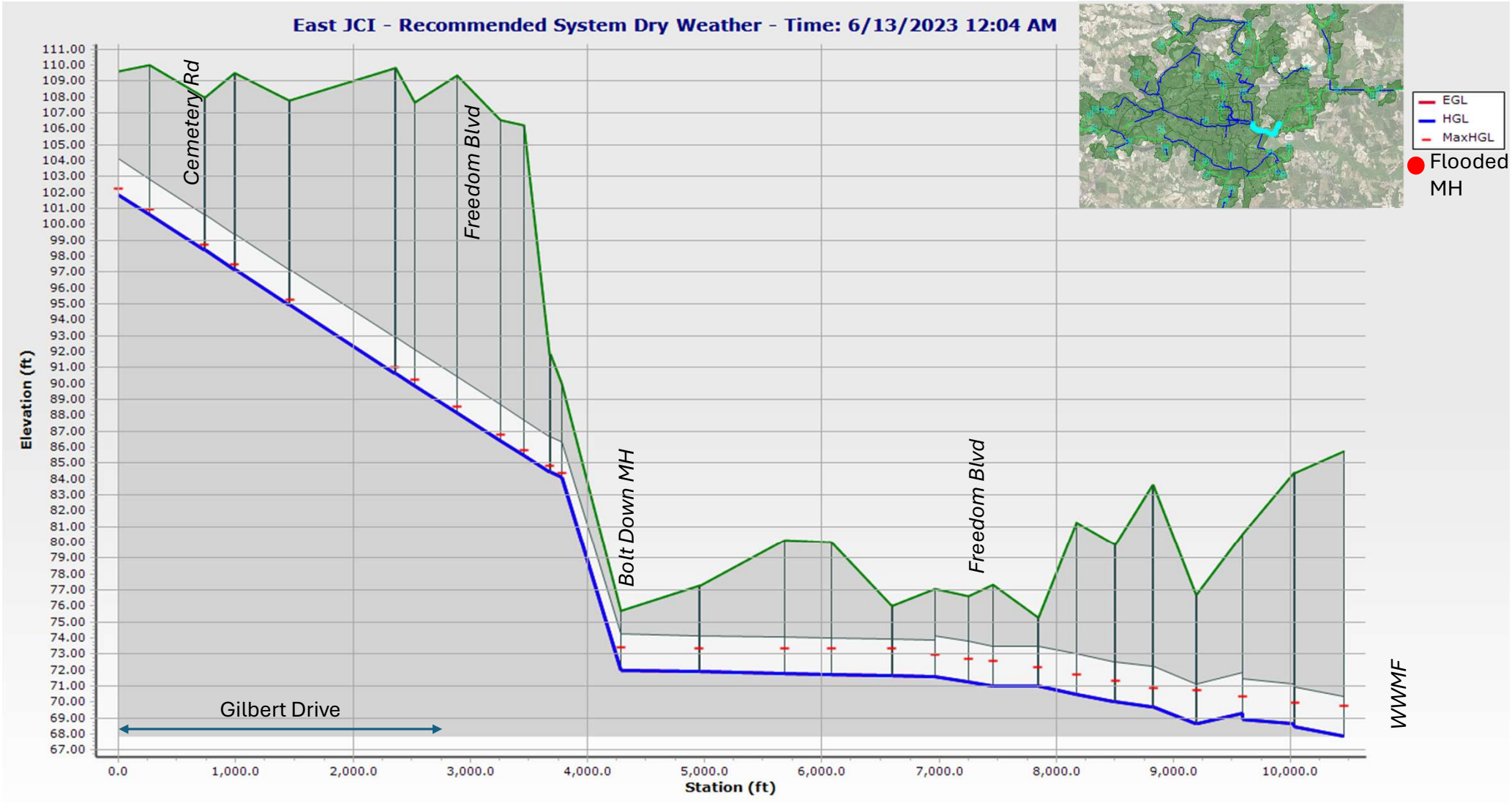
Location 9

Proposed System Under Future Flow Conditions – 2-yr 6-hr



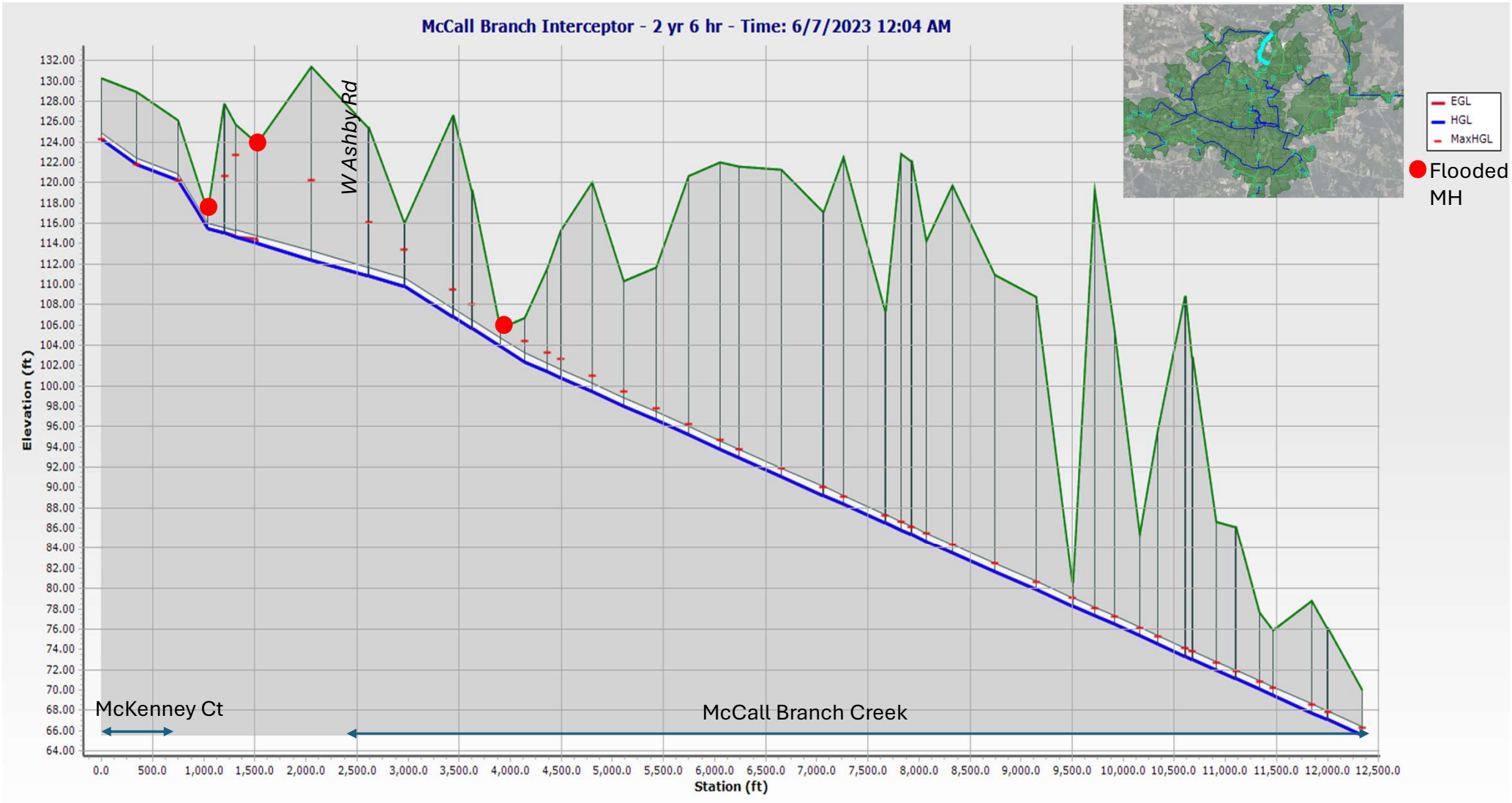
Location 9

Proposed System Under Future Flow Conditions – Dry Weather



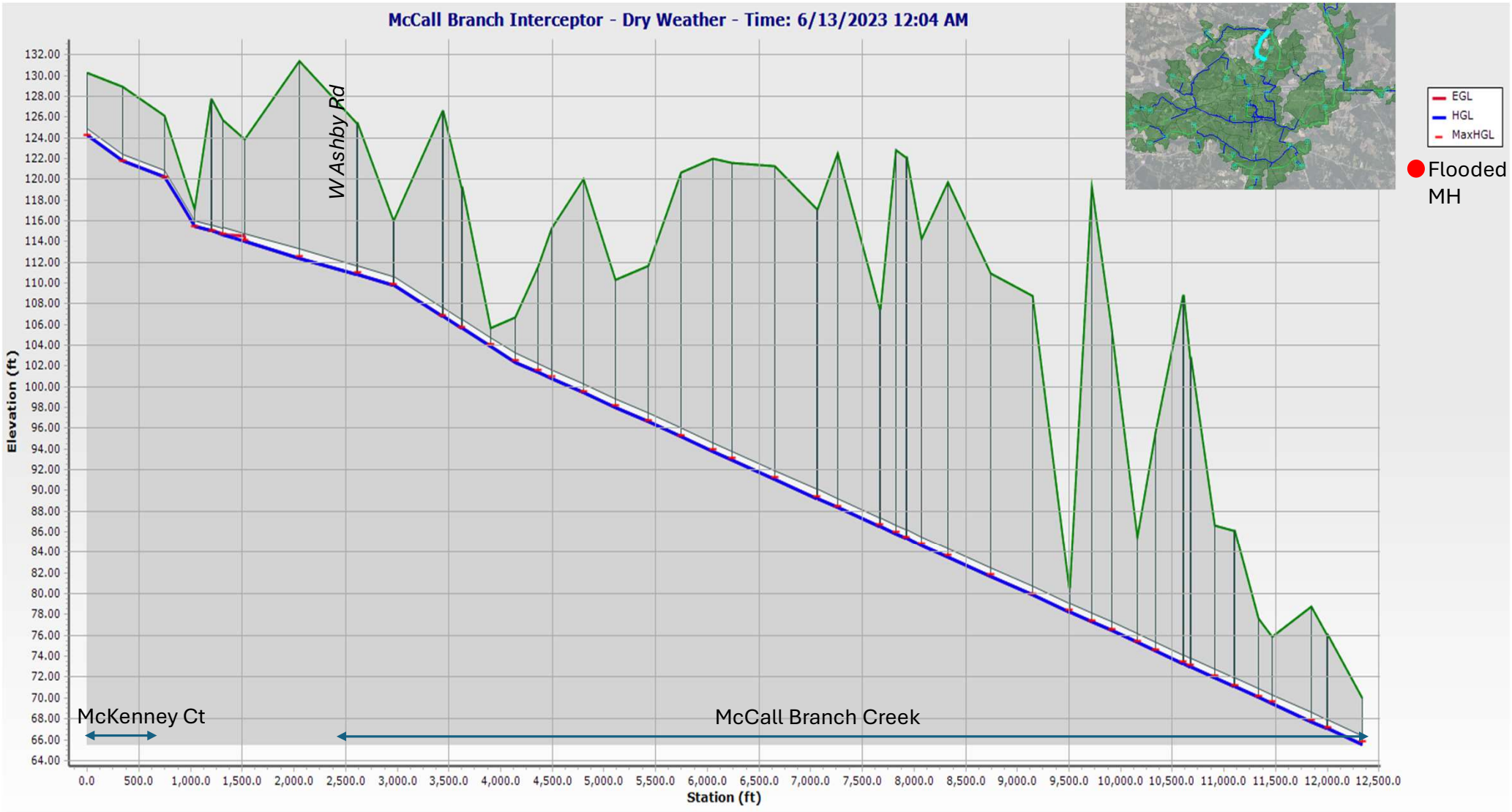
Location 10

Existing System Under Existing Flow Conditions – 2-yr 6-hr



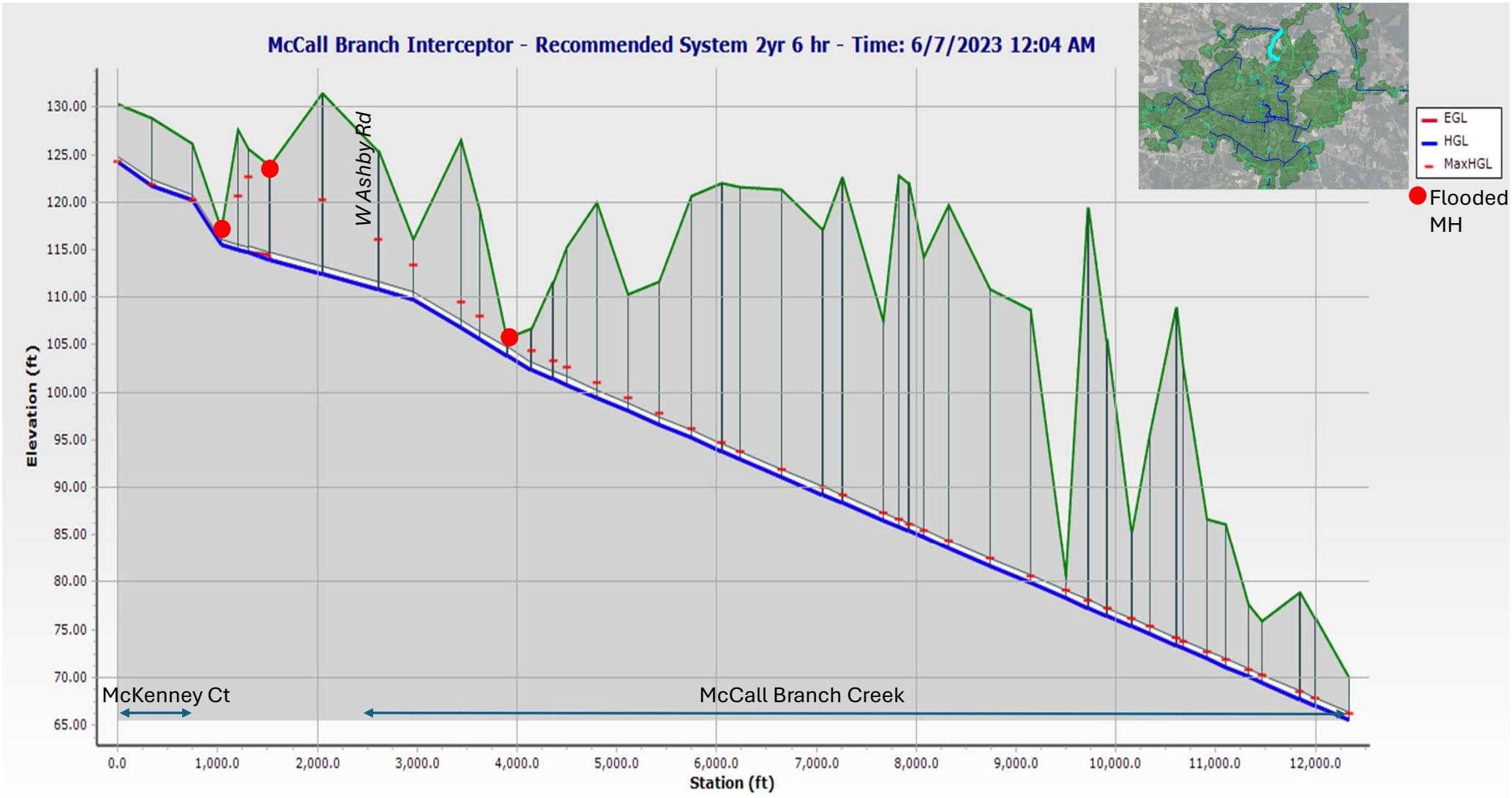
Location 10

Existing System Under Existing Flow Conditions – Dry Weather



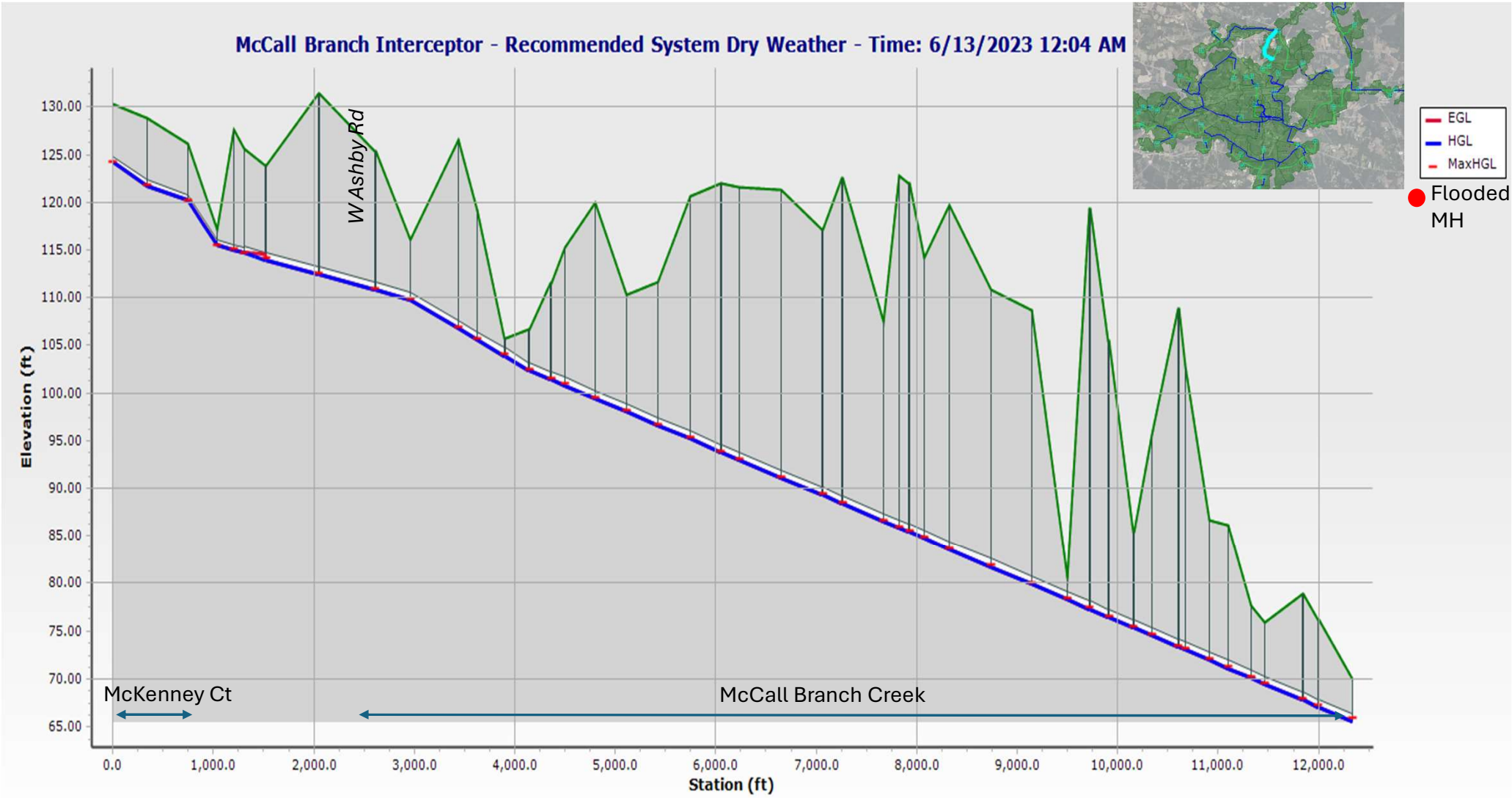
Location 10

Proposed System Under Future Flow Conditions – 2-yr 6-hr



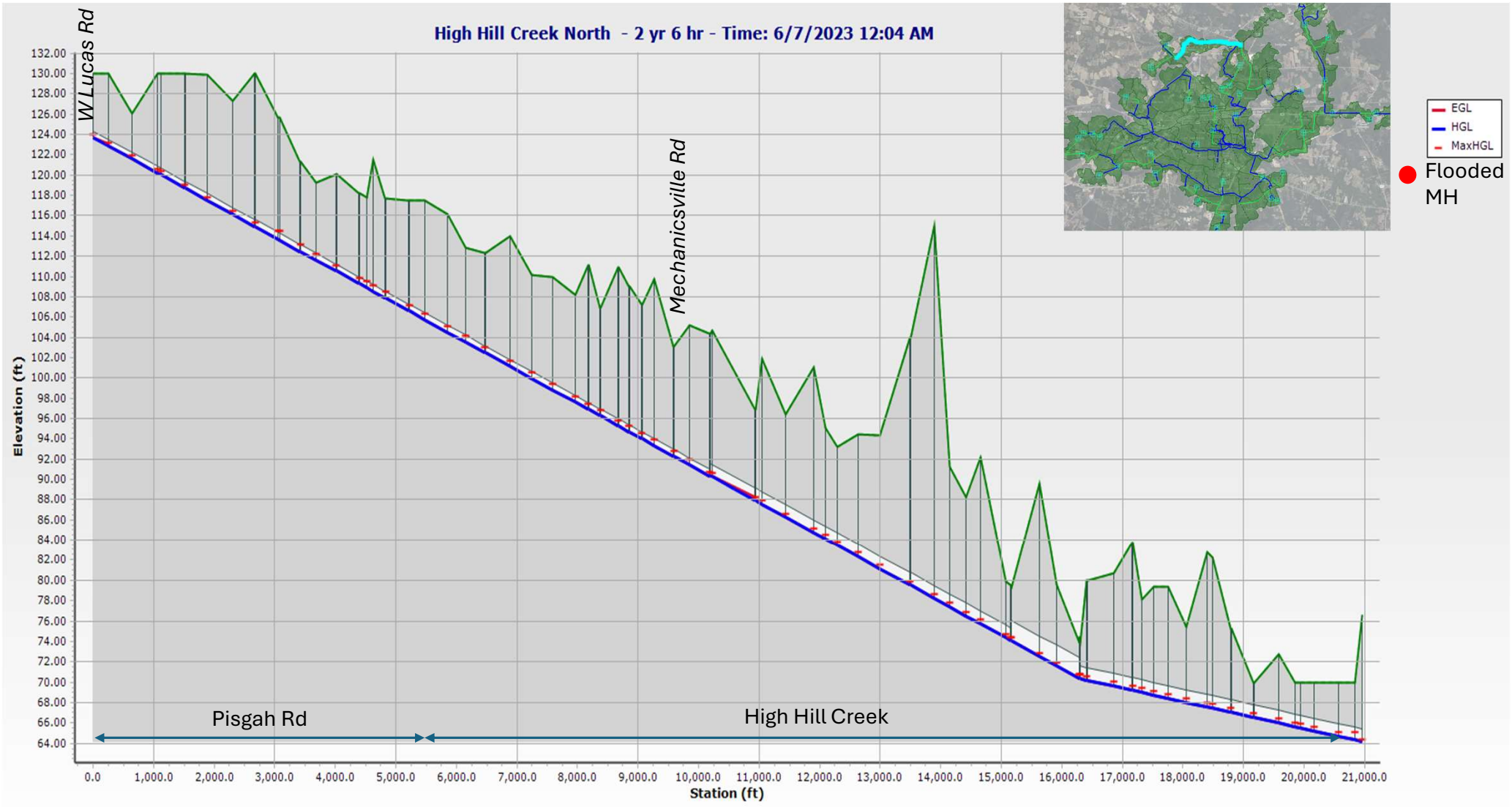
Location 10

Proposed System Under Future Flow Conditions – Dry Weather



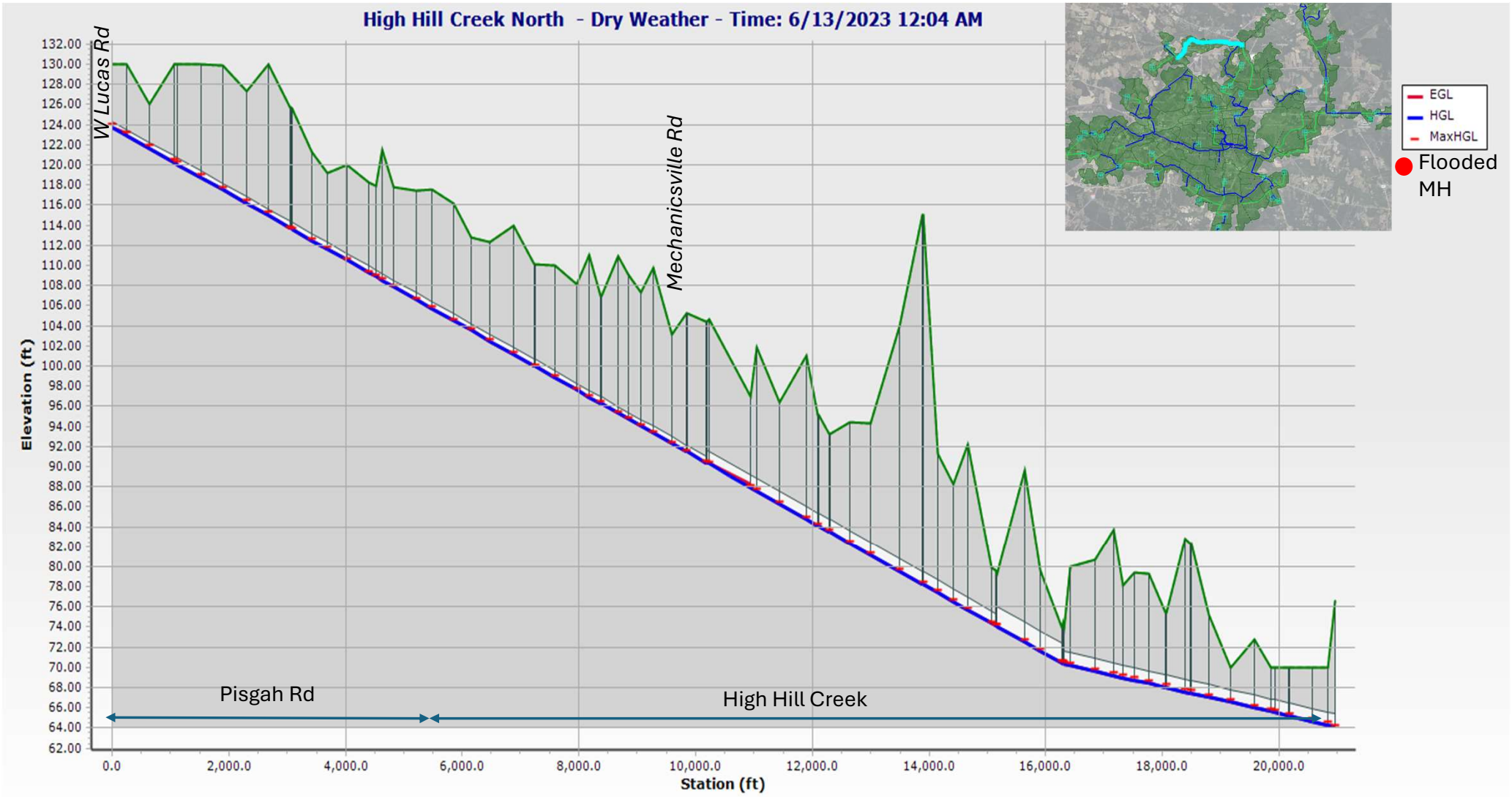
Location 11

Existing System Under Existing Flow Conditions – 2-yr 6-hr



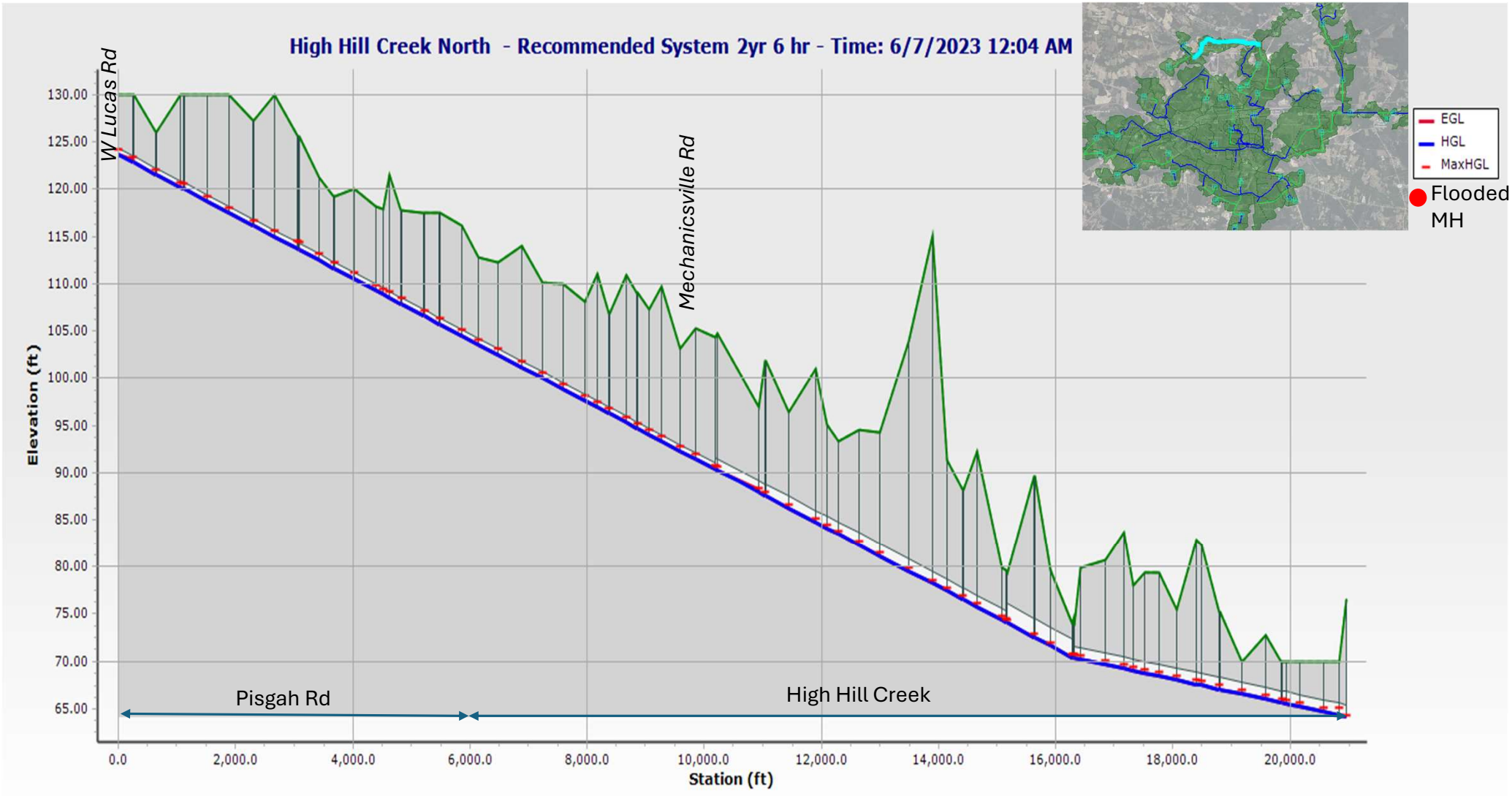
Location 11

Existing System Under Existing Flow Conditions – Dry Weather



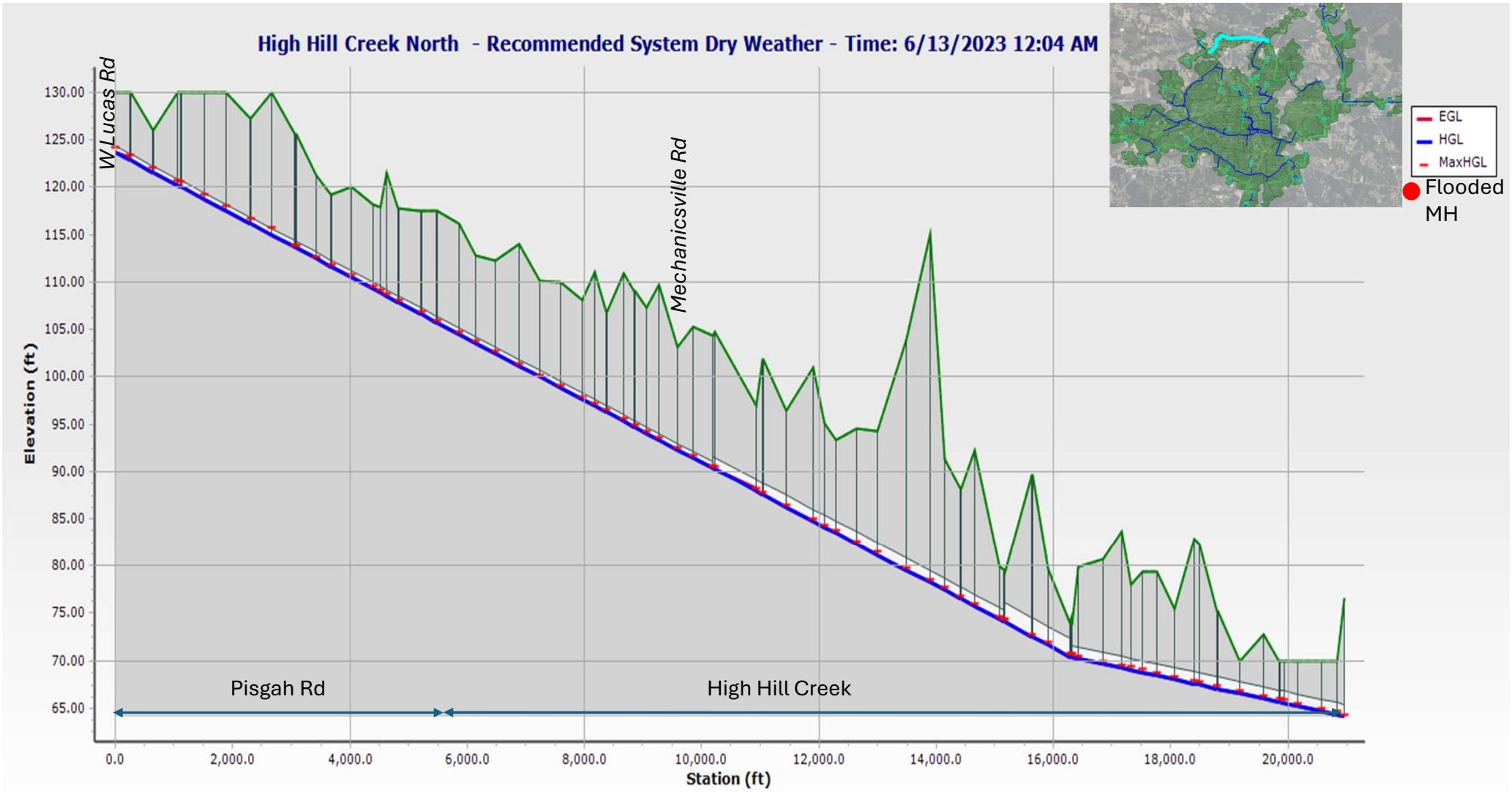
Location 11

Proposed System Under Future Flow Conditions – 2-yr 6-hr



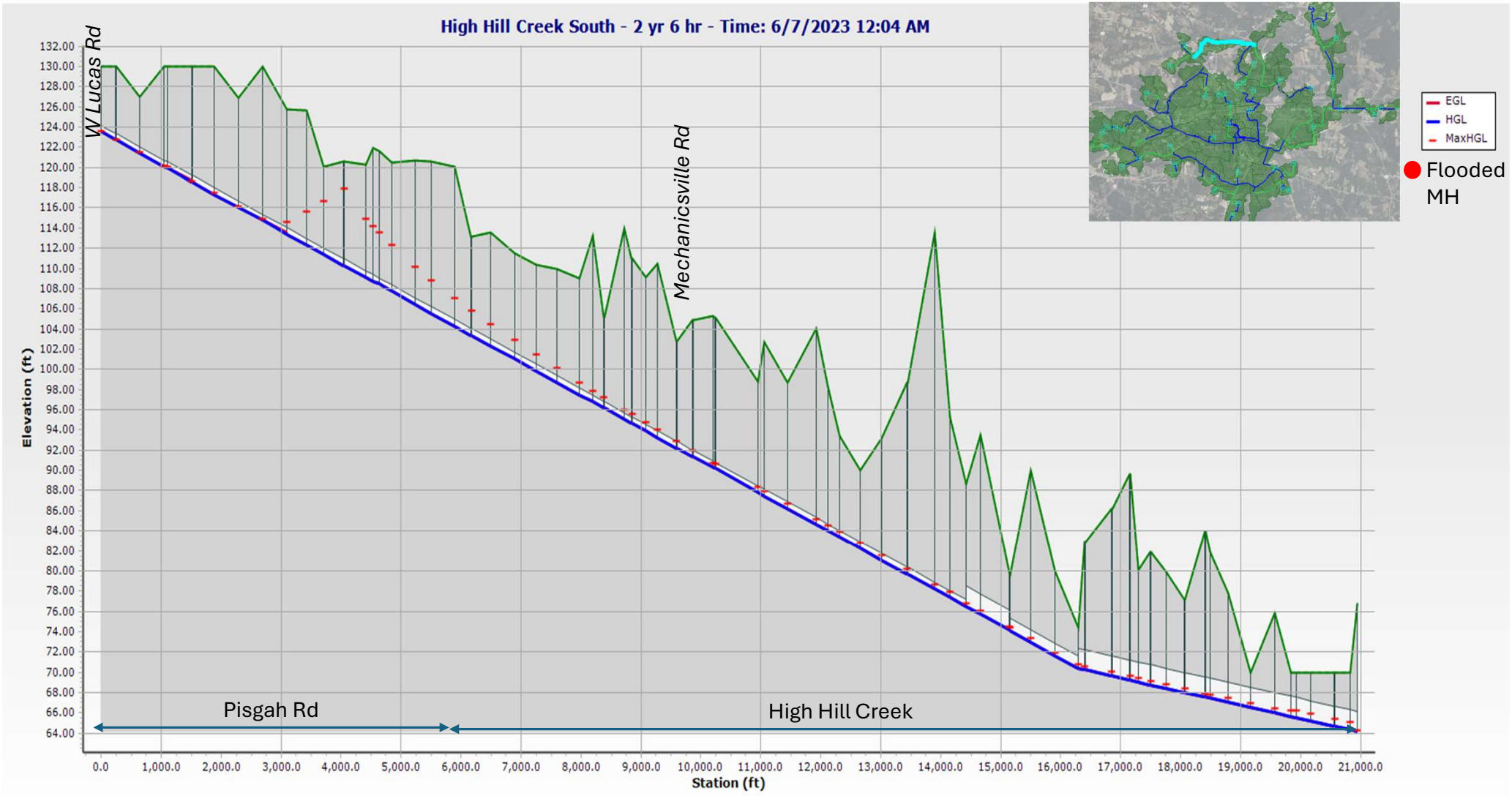
Location 11

Proposed System Under Future Flow Conditions – Dry Weather



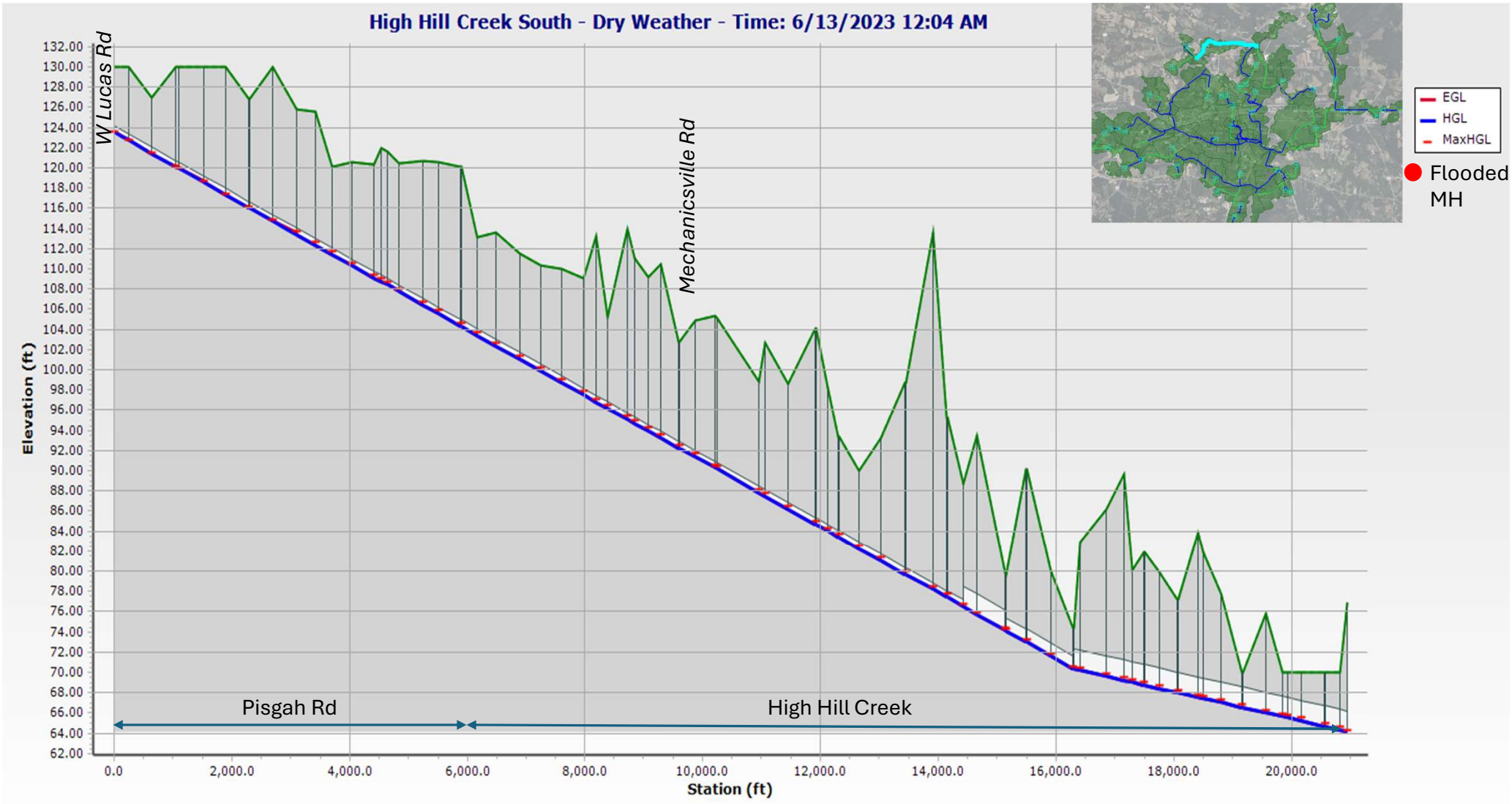
Location 12

Existing System Under Existing Flow Conditions – 2-yr 6-hr



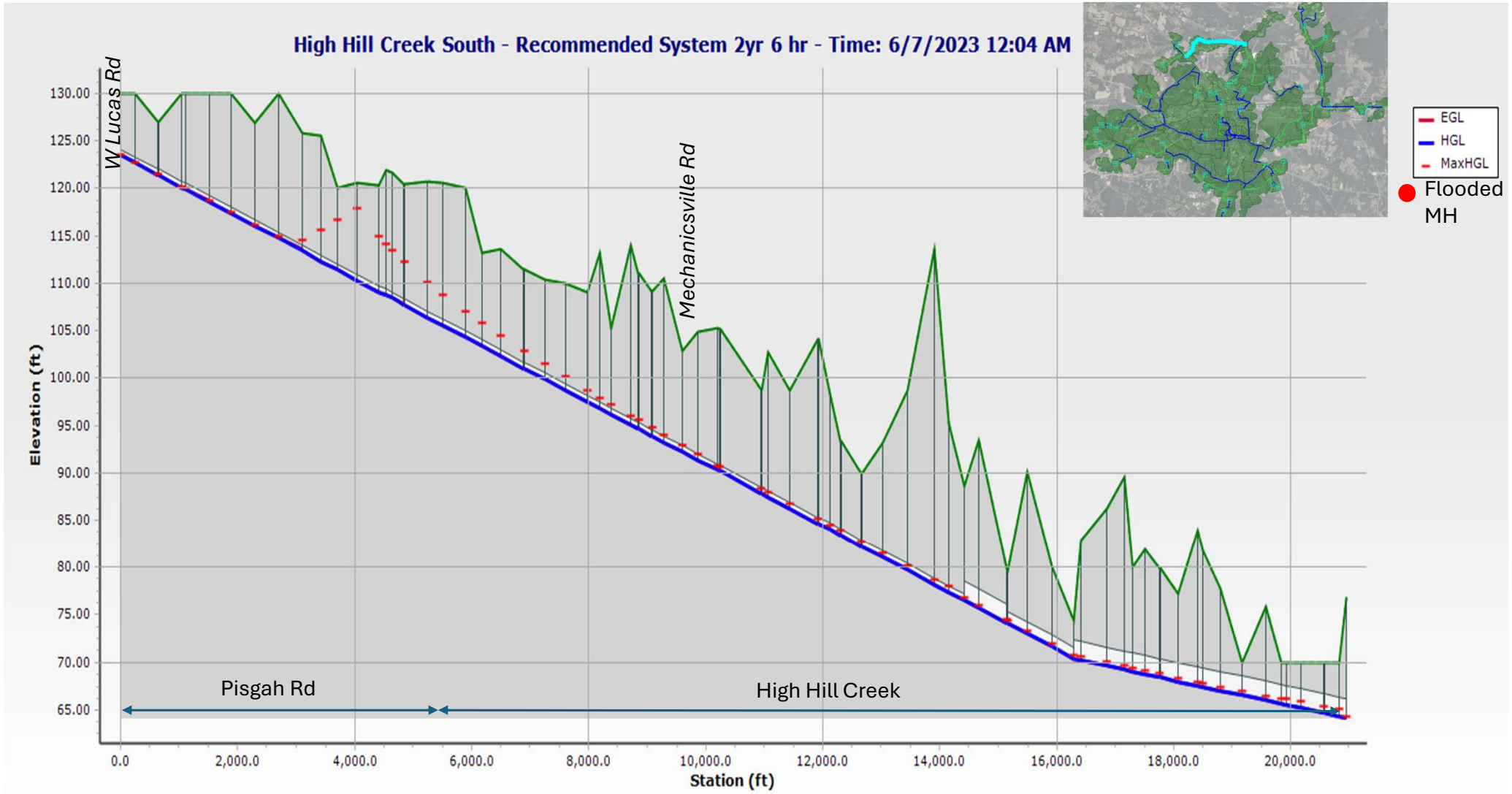
Location 12

Existing System Under Existing Flow Conditions – Dry Weather



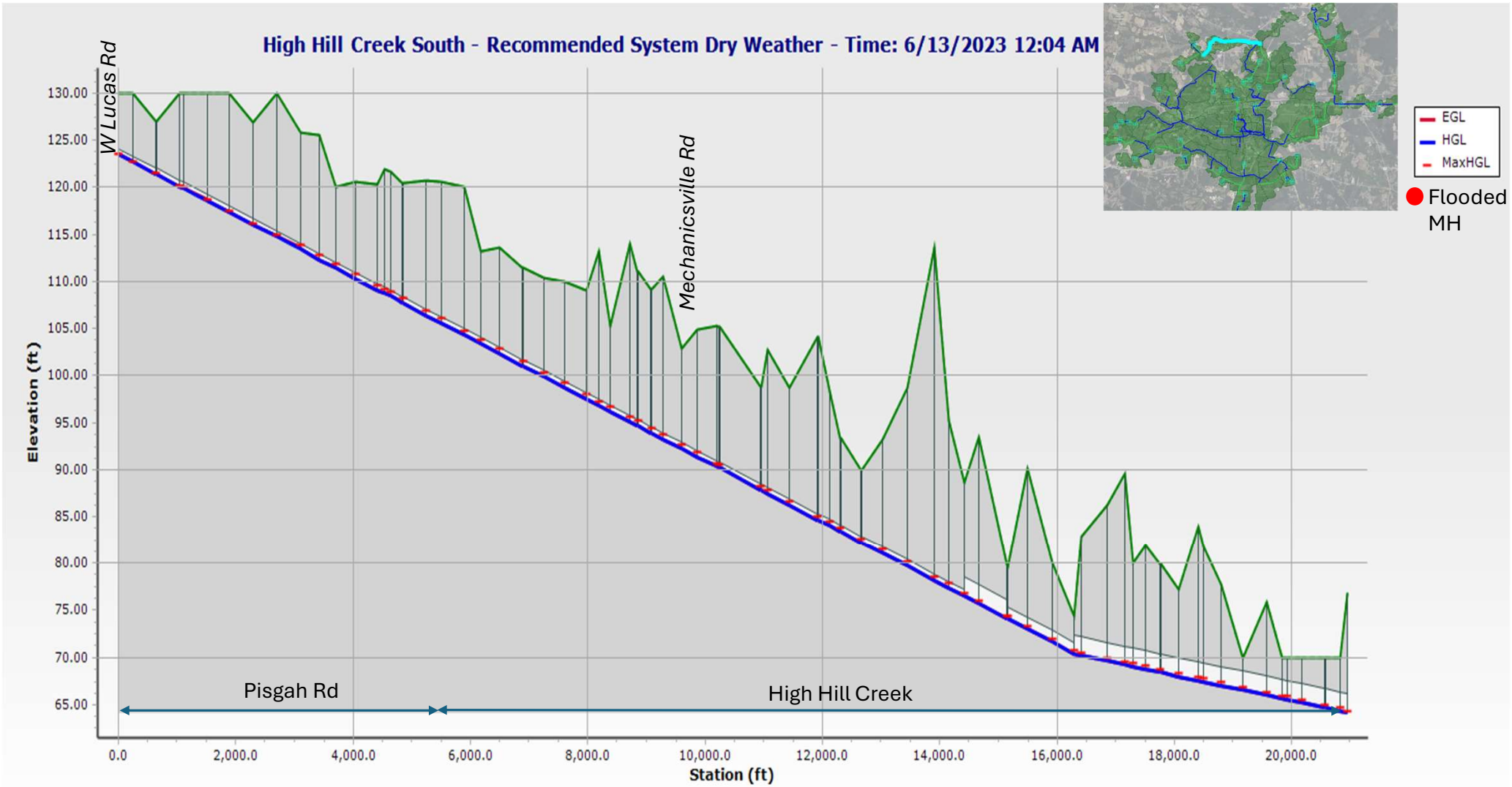
Location 12

Proposed System Under Future Flow Conditions – 2-yr 6-hr



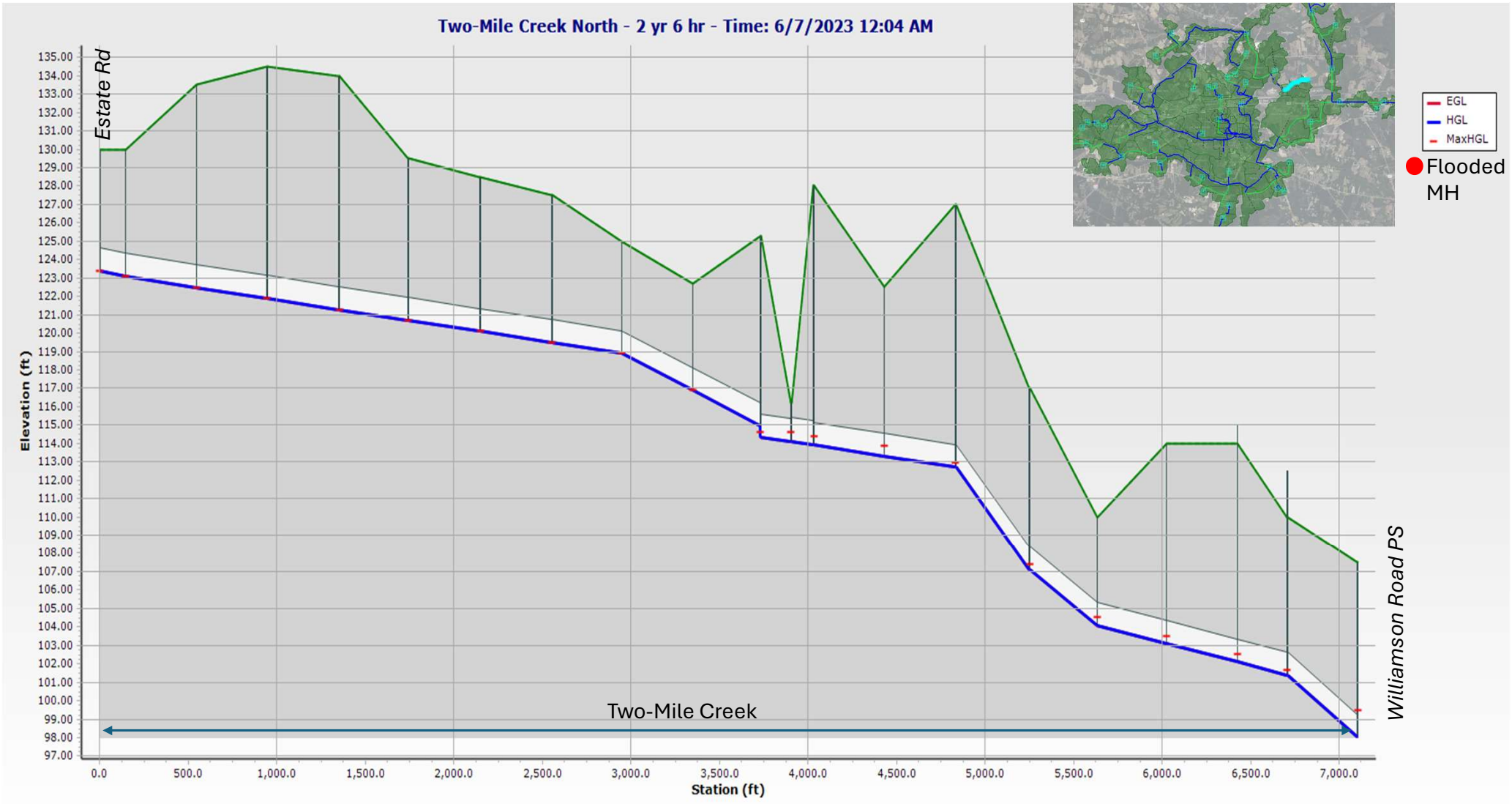
Location 12

Proposed System Under Future Flow Conditions – Dry Weather



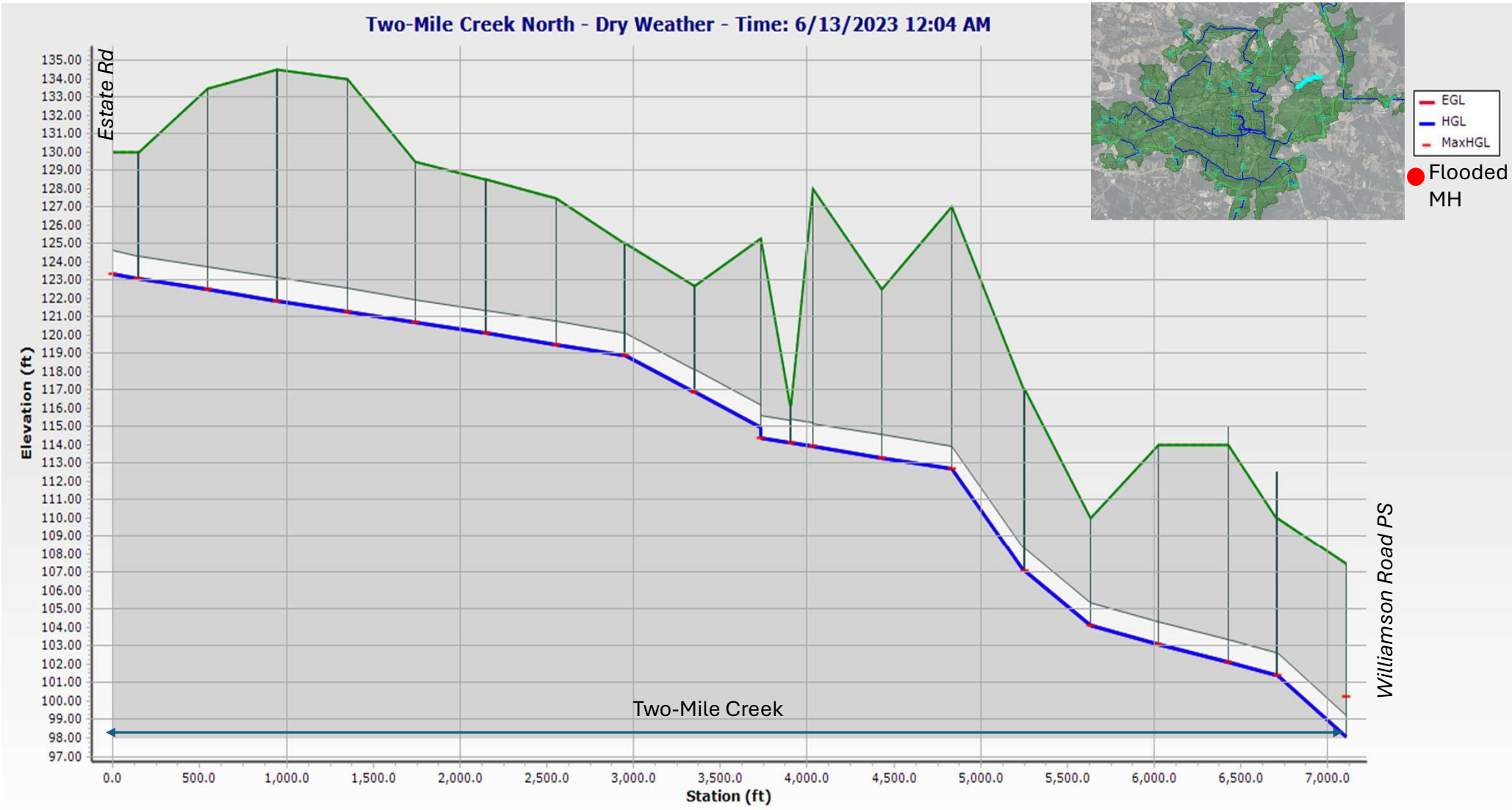
Location 13

Existing System Under Existing Flow Conditions – 2-yr 6-hr



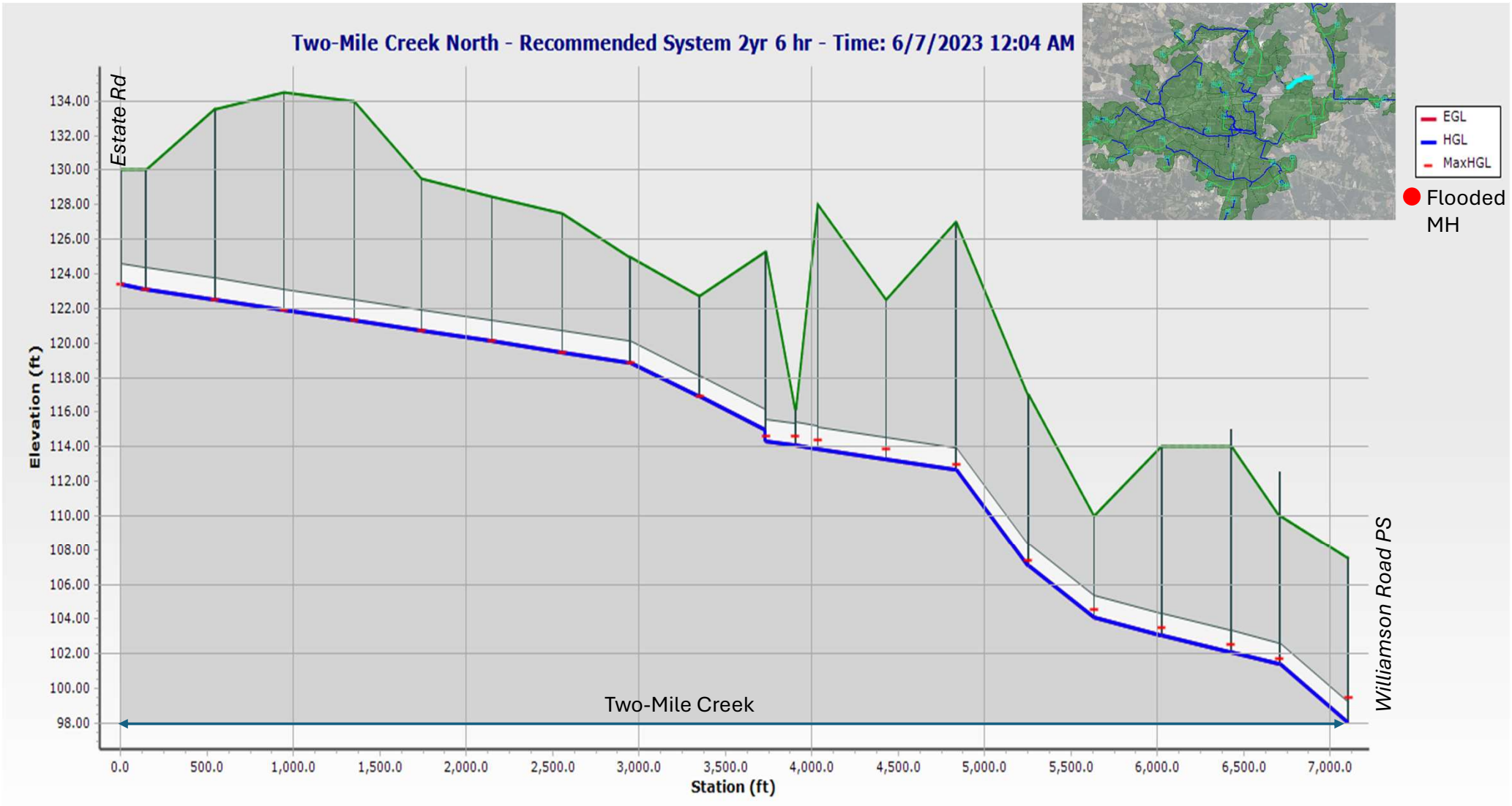
Location 13

Existing System Under Existing Flow Conditions – Dry Weather



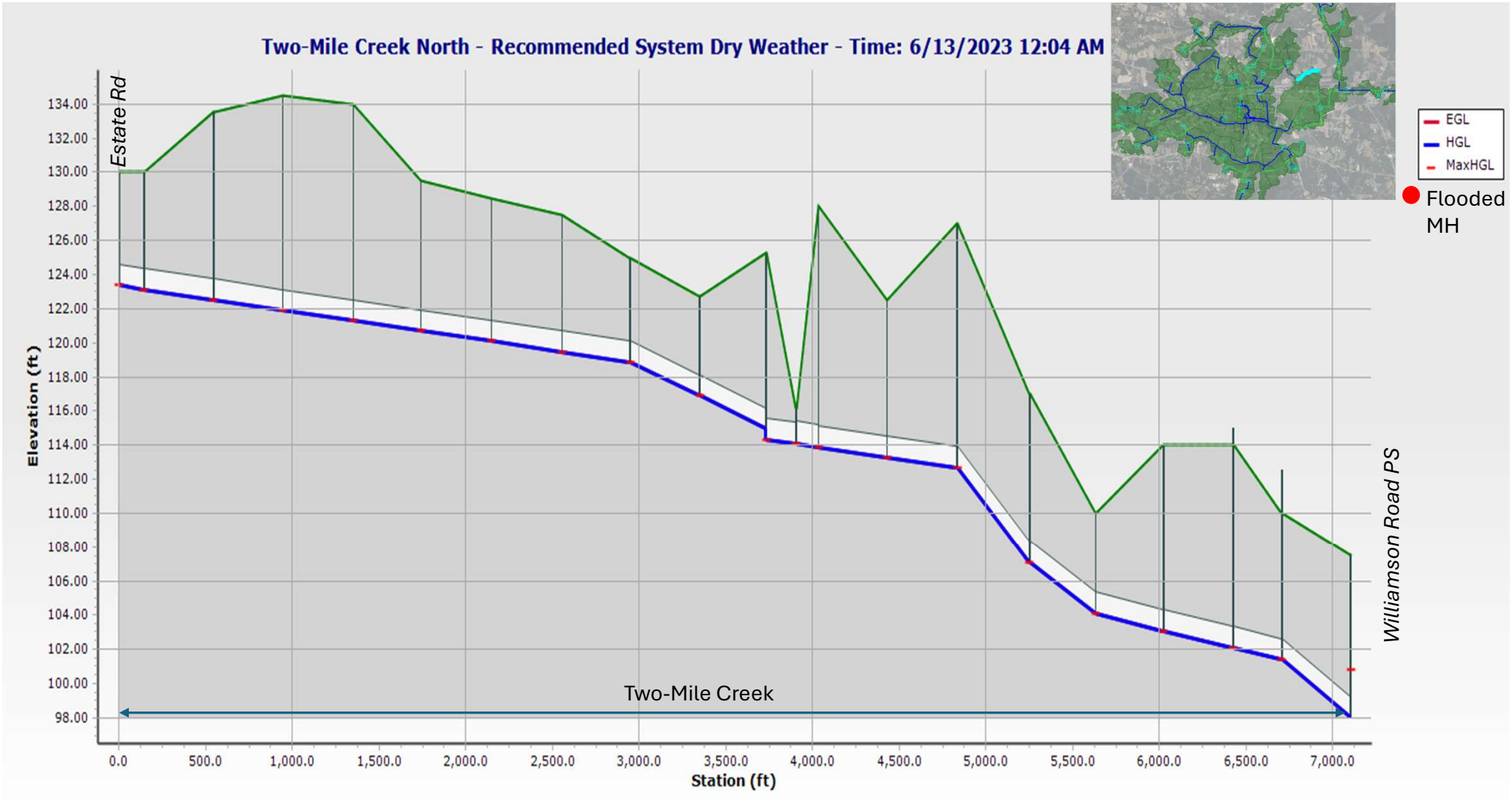
Location 13

Proposed System Under Future Flow Conditions – 2-yr 6-hr



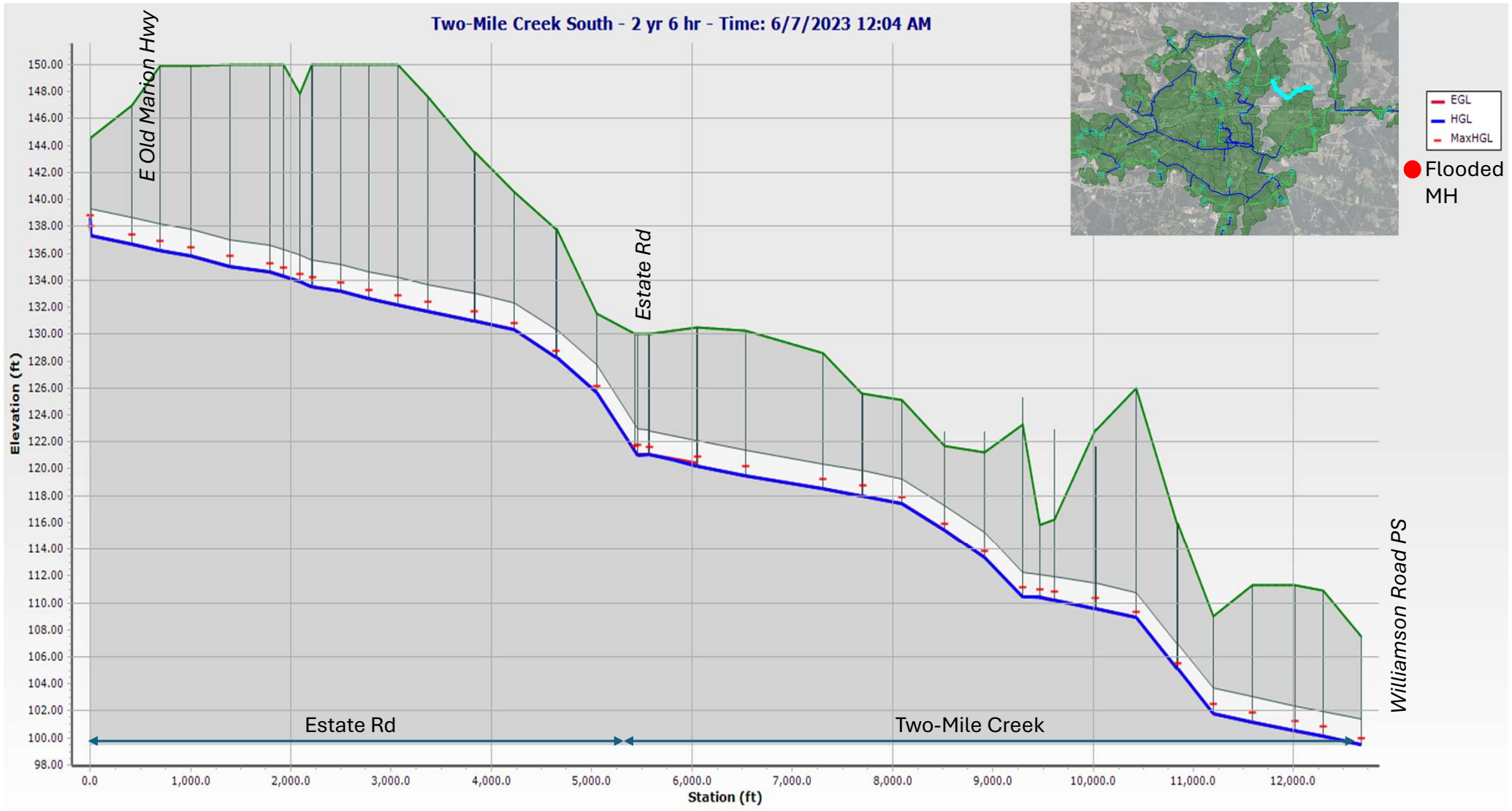
Location 13

Proposed System Under Future Flow Conditions – Dry Weather



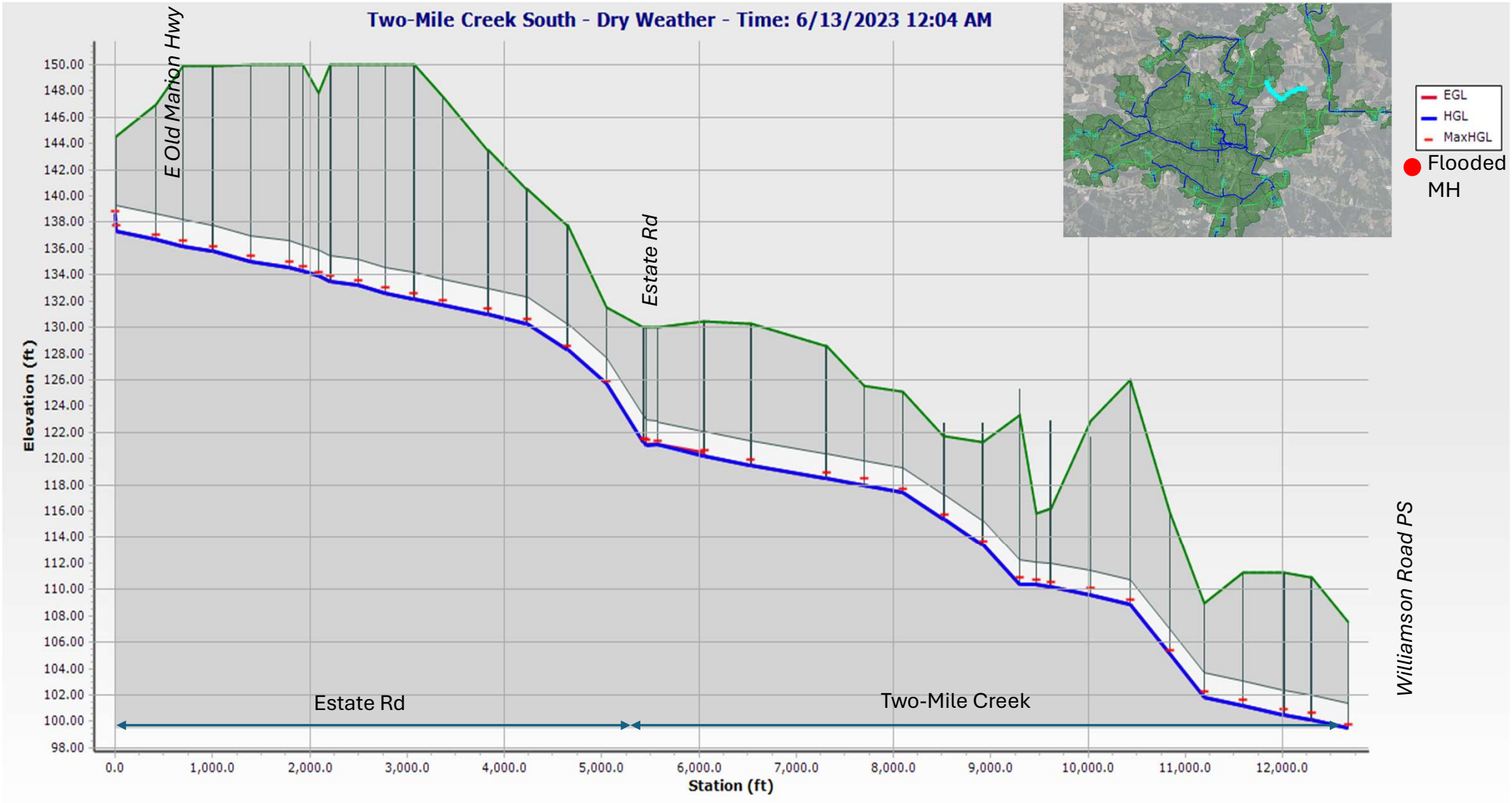
Location 14

Existing System Under Existing Flow Conditions – 2-yr 6-hr



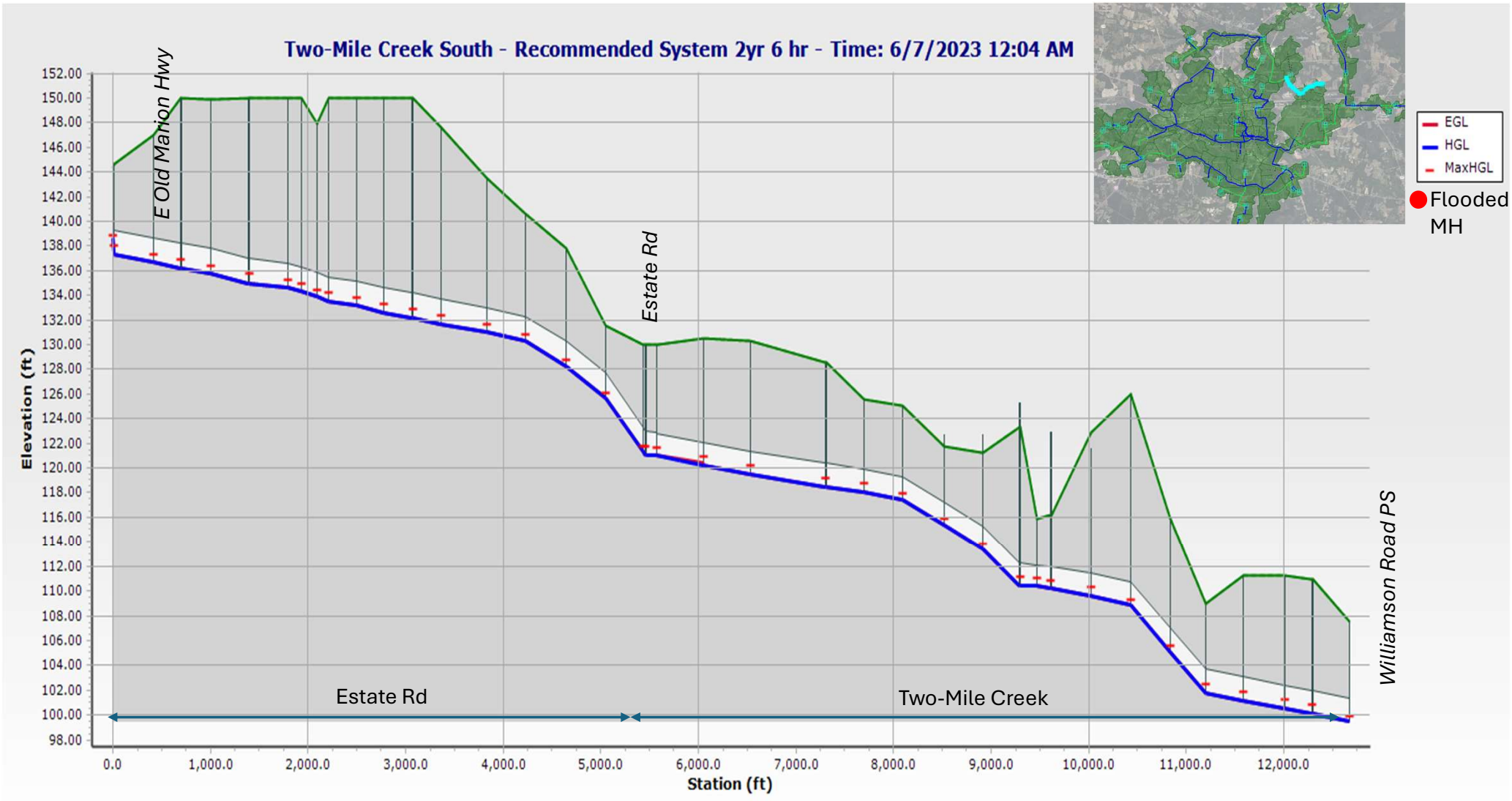
Location 14

Existing System Under Existing Flow Conditions – Dry Weather



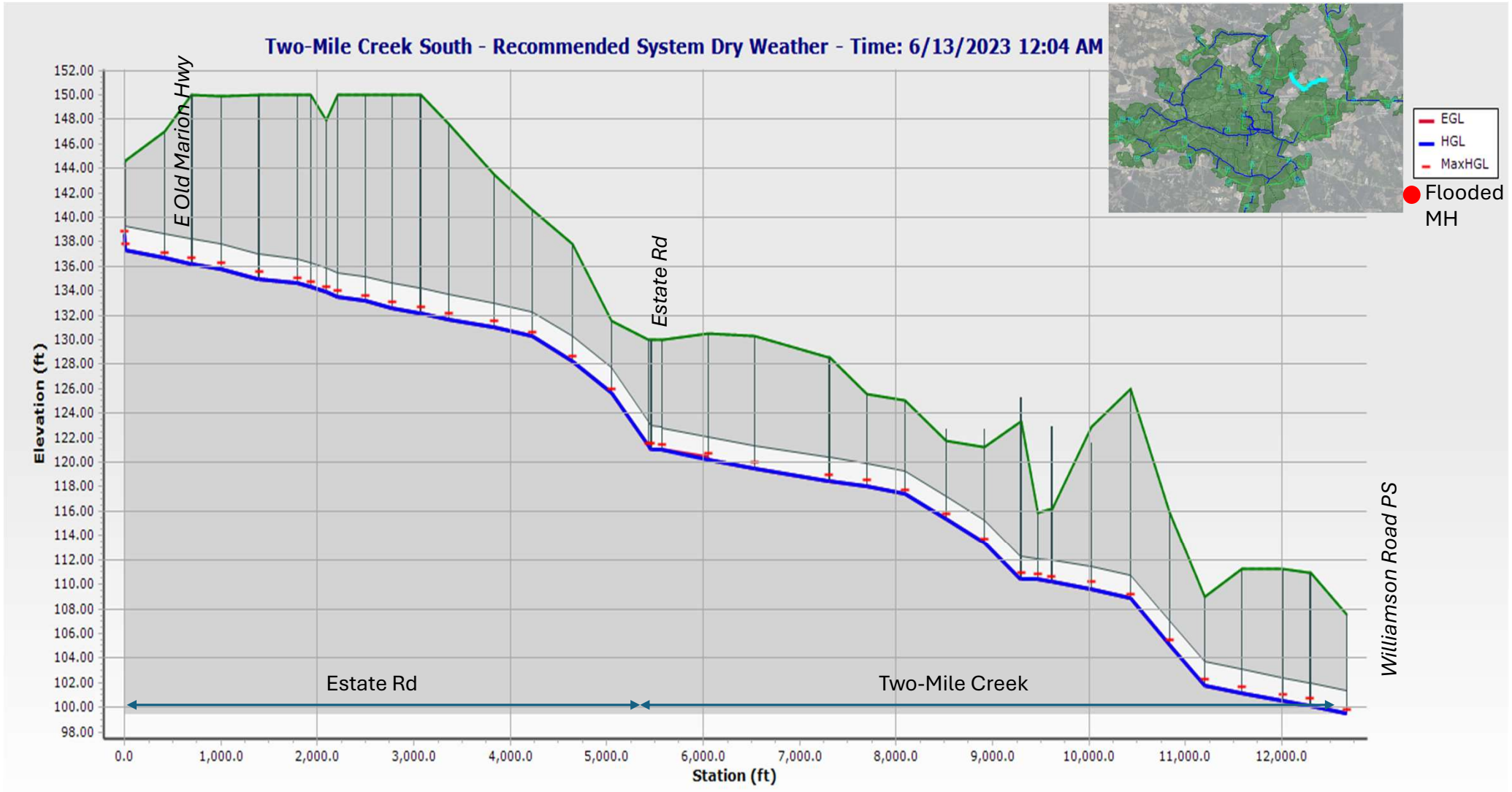
Location 14

Proposed System Under Future Flow Conditions – 2-yr 6-hr



Location 14

Proposed System Under Future Flow Conditions – Dry Weather



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City of Florence, South Carolina

Sewer Collection System Master Plan

Appendix G

Unconfirmed Model-Predicted Capacity Limitations

September 2025

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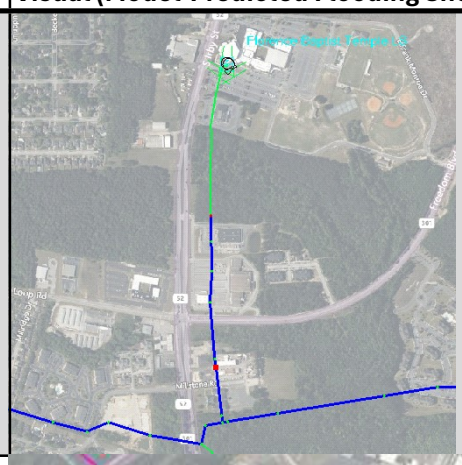
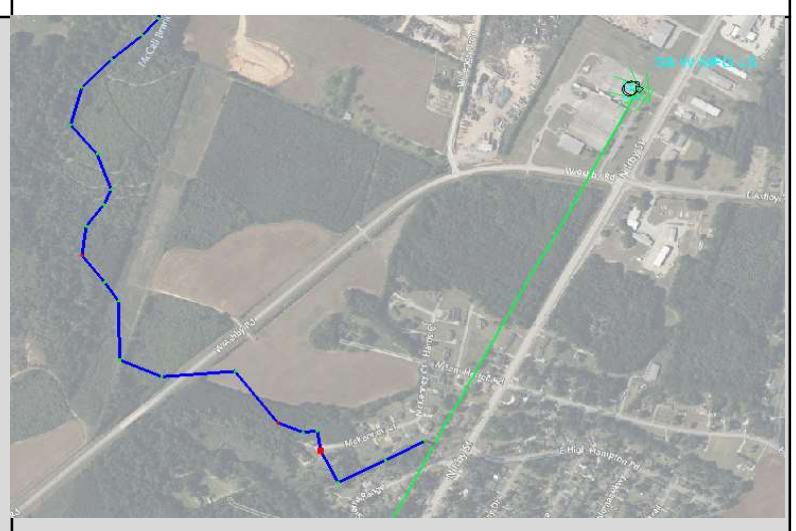
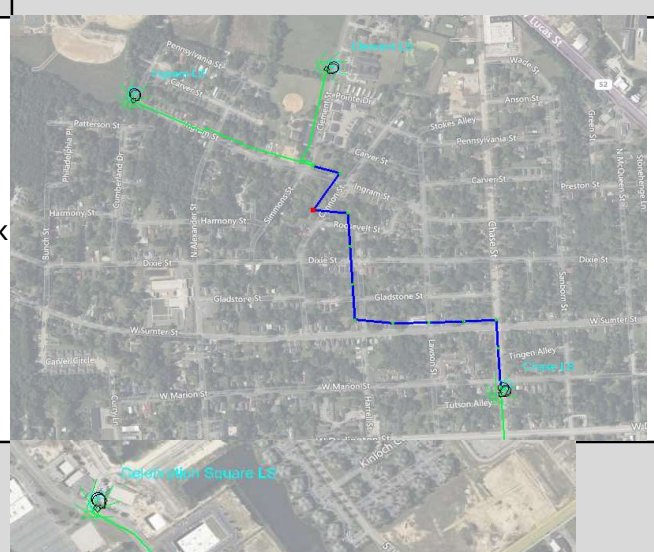
Appendix G
Unconfirmed Model-Predicted Capacity Limitations

ID	Label	Location	Visual (Model-Predicted Flooding Shown in Red)
9204, 10077	swr-mh-534, swr-mh-3202	D/S of Florence Baptist Temple	
9203, 9324, 9880, 9883, 9884	swr-mh-5338, swr-mh-585, swr-mh-2464, swr-mh-2467, swr-mh-2468	Florence Rail Trail	
9621, 9169, 9319	swr-mh-7571, swr-mh-4838, swr-mh-5641	McCall Branch Interceptor	
9740	swr-mh-1693	North of Timrod Park	
9874	swr-mh-2444	DS of Celebration Square LS	
9225	swr-mh-5488	Corbette Place LS forcemain outlet	

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City of Florence, South Carolina

Sewer Collection System Master Plan

Appendix H

Opinion of Probable Construction Costs

September 2025

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Capital Improvement Program Summary

	CIP Project	Year	Description	OPCC (Million)
Early Action Projects				
	Flow Verification and Programmatic Review	2027	Additional flow monitoring and field investigations (CCTV, survey) to confirm capacity limitations.	$0.54
			Data collection and analysis at HWY 301, Roche Carolina, Fairgrounds, Police Cabin, Paper Mill, Summit at Oakdale, Adams Creek and Black Creek, at an OPC value of $25,000 per pump station (PS).	
			Programmatic review of CIP projects.	
			I/I Reduction Analysis.	
	North JCI Upgrades[1]	Under Design[2]	Upsize 7,800 LF of existing sewer along North JCI.	$13.18
			Brunwood Drive structure modifications.	
			Oleander/Wisteria/Santee/Park sewer improvements.	
			Upgrades at Country Club PS.	
			Upsize 1,500 LF of existing sewer near Fairway Drive.	
Conveyance Upgrades[3]				
Short Term	Highway 301 Pump Station and Force Main (East Palmetto St Upgrades Phase I)	2030	Upgrades at HWY 301 PS and 33,300 LF of new force main to WWMF.	$27.09
	West Palmetto Street Pump Station and Second Loop Interceptor Upgrades[1]	2030	Construct 10 MGD PS and 22,170 LF of new force main or sewer along Second Loop to North JCI.	$20.86
			Upsize 3,500 LF of existing sewer from Woody Jones to US 76/Palmetto Street.	
	Lower South Jeffries Creek Interceptor (JCI) Upgrades Phase I[1]	2030	Upsize 7,000 LF of existing sewer from Jeffries Ln to WWMF.	$11.09
Intermediate	I&I Reduction Program Phase I	2035	Perfrom I/I reduction for 48% of targeted I/I area.	$27.26
	East Palmetto St Upgrades Phase II	2035	Upgrades at Fairgrounds and Roche PS's.	$5.23
	Lower South JCI Upgrades Phase II	2035	Upsize 20,780 LF of existing sewer from West Palmetto PS to Jeffries Lane.	$12.21
	Beaverdam Creek Upgrades Phase I	2035	Upsize 7,100 LF of existing sewer along western Beaverdam Creek Interceptor (BCI).	$12.89
			Upsize 9,300 LF of existing sewer along Lower BCI.	
			Rehab 3,450 LF of existing sewer parallel to Lower BCI.	
	East JCI Upgrades	2035	Upsize 7,170 LF of existing sewer along East JCI.	$9.27
Long Term	I&I Reduction Program Phase II	2045	Perfrom I/I reduction for 52% of targeted I/I area.	$29.54
	East Palmetto St Upgrades Phase III	2045	Upgrades at Black Creek and Adams Branch PS's.	$13.01
			Upsize 12,970 LF of force main along HWY 327.	
	Beaverdam Creek Upgrades Phase II	2045	Upgrades to Cashua Dr PS and force main.	$15.40
			Upsize 13,100 LF of existing gravity sewer.	
	Pye Branch Upgrades	2045	Upsize or rehabilitate 15,930 LF of existing sewer.	$14.20
	South Irby/Timrod Park Upgrades	2045	Upsize or rehabilitate 7,000 LF of existing sewer.	$3.55
	Upper South JCI Upgrades	2045	Upsize 12,010 LF of existing sewer.	$9.56
			Total Opinion of Probable Construction Costs (Million)[4]:	**$224.9**

1. OPCCs for Lower JCI Upgrades Phase I, North JCI Upgrades and West Palmetto PS & Second Loop Interceptor projects were derived by escalating OPCCs from JCI Improvements Study (CDM Smith, 2022) to 2025 dollars based on an estimated inflation rate of 7% per year.
2. The City is currently in design phases to replace the downstream portion of the Lower South JCI.
3. Recommended conveyance improvements projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
4. The OPCC does not include expenses such as engineering fees, construction administration/observation, permitting, and property acquisition. A planning-level contingency of 25% has been incorporated to account for uncertainties in market conditions and construction costs.

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
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I/I Reduction Program OPCC

Item	Unit	Unit Cost	%	Qty S Irby/Pye Branch	Qty Jefferies Creek 1	Qty Jefferies Creek 2	Cost
Lateral Lining - Connected to 8-inch Mainline	EA	$ 3,850	70%	4,208	1,852	4,208	**$ 39,530,260**
Lateral Lining - Connected to 12-inch Mainline	EA	$ 3,850	20%	1,202	529	1,202	**$ 11,294,360**
Lateral Lining - Connected to 15-inch Mainline	EA	$ 4,345	5%	301	132	301	**$ 3,186,623**
Lateral Lining - Connected to 18-inch Mainline	EA	$ 4,345	5%	301	132	301	**$ 3,186,623**
Subtotal Lateral Lining OPCC (Rounded):				$ 23,440,000	$ 10,319,000	$ 23,440,000	**$ 57,198,000**

Item	Unit	Unit Cost		Qty S Irby/Pye Branch	Qty Jefferies Creek 1	Qty Jefferies Creek 2	Cost
Rehabilitate Manhole (Lining: 8'-10' Deep)	EA	$ 15,000	-	922	392	484	**$ 26,970,000**
Subtotal Manhole Rehab OPCC (Rounded):				$ 13,830,000	$ 5,880,000	$ 7,260,000	**$ 26,970,000**

Item	Unit	Unit Cost	%	Qty S Irby/Pye Branch	Qty Jefferies Creek 1	Qty Jefferies Creek 2	Cost
8-inch CIPP Lining	LF	$ 33.5	70%	266,893	125,792	133,428	**$ 17,625,000**
12-inch CIPP Lining	LF	$ 41.5	20%	76,255	35,941	38,122	**$ 6,239,000**
15-inch CIPP Lining	LF	$ 66.0	5%	19,064	8,985	9,531	**$ 2,481,000**
18-inch CIPP Lining	LF	$ 81.5	5%	19,064	8,985	9,531	**$ 3,063,000**
Subtotal Mainline CIPP Lining OPCC (Rounded):				$ 14,918,000	$ 7,031,000	$ 7,458,000	**$ 29,407,000**

Total I/I Reduction Program Cost (Rounded):	**$ 52,188,000**	**$ 23,230,000**	**$ 38,158,000**	**$ 113,575,000**

I/I Reduction Area	Unit	# of Parcels	# of Manholes	LF of Mainline
S Irby/Pye Branch	#	6,011	922	381,275
Jefferies Creek 1	#	2,646	392	179,703
Jefferies Creek 2	#	3,277	484	190,611

I/I Reduction:	100%	80%	50%	20%
Total I/I Reduction Program Cost (Rounded):	**$ 113,575,000**	**$ 90,860,000**	**$ 56,787,500**	**$ 22,715,000**

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East Palmetto Street Upgrades Phase I					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Highway 301 Pump Station Rehabilitation					
1	Mobilization Bonds, & Insurance	1	LS	$ 733,000.00	$ 733,000.00
2	Erosion & Sediment Control	1	LS	$ 15,000.00	$ 15,000.00
3	Traffic Control	1	LS	$ 45,000.00	$ 45,000.00
4	Demolition	1	LS	$ 45,000.00	$ 45,000.00
5	Temporary Bypass Pumping	1	LS	$ 250,000.00	$ 250,000.00
6	Site Work	1	LS	$ 45,000.00	$ 45,000.00
7	New Water Service	1	LS	$ 15,000.00	$ 15,000.00
8	Rehabilitate Existing Wet Well (10'x20'x12')	1	LS	$ 250,000.00	$ 250,000.00
9	Rehabilitate Existing Check Valve Vault	1	LS	$ 40,000.00	$ 40,000.00
10	New Access Hatches w/ Safety Grate	6	EA	$ 40,000.00	$ 240,000.00
11	Concrete Slab	1	LS	$ 50,000.00	$ 50,000.00
12	Fencing	1	LS	$ 20,000.00	$ 20,000.00
13	Triplex Submersible Pumps (100hp Proposed)	1	LS	$ 975,000.00	$ 975,000.00
14	Pump Station Control Panel	1	LS	$ 675,000.00	$ 675,000.00
15	Piping / Valves / Appurtenances	1	LS	$ 225,000.00	$ 225,000.00
16	SCADA System	1	LS	$ 75,000.00	$ 75,000.00
17	Electrical	1	LS	$ 350,000.00	$ 350,000.00
18	Tie-in to New Force Main	1	EA	$ 35,000.00	$ 35,000.00
19	Rehabilitate Manhole (Lining: 8'-10' Deep)	8	EA	$ 25,000.00	$ 200,000.00
				Subtotal Estimated Construction Costs:	**$ 4,283,000.00**

OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
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East Palmetto Street Upgrades Phase I					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Highway 301 Pump Station - 30" Force Main					
1	30" PVC Force Main	22,217	LF	$ 320.00	$ 7,109,440.00
2	30" RJ PVC Force Main	4,990	LF	$ 360.00	$ 1,796,400.00
3	30" RJ PVC Force Main In Casing	1,020	LF	$ 440.00	$ 448,800.00
4	36" HDPE DR 11 Force Main By Directional Drill	5,000	LF	$ 900.00	$ 4,500,000.00
5	Jack & Bore 54" Casing	1,020	LF	$ 2,100.00	$ 2,142,000.00
6	Ductile Iron Fittings	10	TONS	$ 30,000.00	$ 300,000.00
7	30" Plug Valve w/ valve Box & Marker	4	EA	$ 75,000.00	$ 300,000.00
8	Tie-in to WWTP	1	EA	$ 125,000.00	$ 125,000.00
9	Air Release Valve w/ Manhole & Valve Marker	8	EA	$ 18,000.00	$ 144,000.00
10	Traffic Control	1	LS	$ 75,000.00	$ 75,000.00
11	Remove & Replace Asphalt Driveway	720	LF	$ 100.00	$ 72,000.00
12	Mill & Resurface Asphalt Driveway	2,000	SY	$ 60.00	$ 120,000.00
13	Remove & Replace Gravel Driveway	600	LF	$ 40.00	$ 24,000.00
14	Resurface Gravel Driveway	1,700	SY	$ 20.00	$ 34,000.00
15	Clearing	1	LS	$ 150,000.00	$ 150,000.00
16	Erosion & Sediment Control	1	LS	$ 45,000.00	$ 45,000.00
				Subtotal Estimated Construction Costs:	**$ 17,385,640.00**
East Palmetto Street Upgrades Phase I - Opinion of Probable Construction Costs (OPCC)					
				Highway 301 Pump Station Rehabilitation OPCC Subtotal:	**$ 4,283,000**
				Highway 301 Pump Station - 30" Force Main OPCC Subtotal:	**$ 17,385,640**
				Combined Subtotals of Estimated Construction Costs:	**$ 21,668,640**
				Contingency (25%):	**$ 5,417,160**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 27,086,000**

Notes:

1. This conceptual cost estimate is based on current available cost data.
2. This conceptual cost estimate does not include engineering fees, construction administration/observation fees, permitting fees, or property acquisition fees.
3. All prices shown are in 2025 dollars.
4. Recommended projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
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East Palmetto Street Upgrades Phase II					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Fairgrounds Pump Station Rehabilitation					
1	Mobilization/Insurance	1	LS	$ 70,000.00	$ 70,000.00
2	Erosion & Sediment Control	1	LS	$ 15,000.00	$ 15,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	Demolition	1	LS	$ 35,000.00	$ 35,000.00
5	Temporary Bypass Pumping	1	LS	$ 150,000.00	$ 150,000.00
6	Site Work	1	LS	$ 35,000.00	$ 35,000.00
7	New Water Service	1	LS	$ 10,000.00	$ 10,000.00
8	Rehabilitate Existing Wet Well (10'x20'x16')	1	LS	$ 180,000.00	$ 180,000.00
9	Rehabilitate Existing Check Valve Vault	1	LS	$ 40,000.00	$ 40,000.00
10	New Access Hatches w/ Safety Grate	6	EA	$ 20,000.00	$ 120,000.00
11	Concrete Slab	1	LS	$ 50,000.00	$ 50,000.00
12	Fencing	1	LS	$ 20,000.00	$ 20,000.00
13	Triplex Submersible Pumps (70hp Proposed)	1	LS	$ 550,000.00	$ 550,000.00
14	Pump Station Control Panel	1	LS	$ 370,000.00	$ 370,000.00
15	Piping / Valves / Appurtenances	1	LS	$ 140,000.00	$ 140,000.00
16	SCADA System	1	LS	$ 50,000.00	$ 50,000.00
17	Electrical	1	LS	$ 275,000.00	$ 275,000.00
18	Tie-in to Existing Force Main	1	EA	$ 15,000.00	$ 15,000.00
19	Rehabilitate Manhole (Lining: 8'-10' Deep)	1	EA	$ 25,000.00	$ 25,000.00
				Subtotal Estimated Construction Costs:	**$ 2,175,000.00**
Roche Carolina Pump Station Rehabilitation					
1	Mobilization/Insurance	1	LS	$ 70,000.00	$ 70,000.00
2	Erosion & Sediment Control	1	LS	$ 15,000.00	$ 15,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	Demolition	1	LS	$ 35,000.00	$ 35,000.00
5	Temporary Bypass Pumping	1	LS	$ 130,000.00	$ 130,000.00
6	Site Work	1	LS	$ 35,000.00	$ 35,000.00
7	New Water Service	1	LS	$ 10,000.00	$ 10,000.00
8	Rehabilitate Existing Wet Well (10'x20')	1	LS	$ 150,000.00	$ 150,000.00
9	Rehabilitate Existing Check Valve Vault	1	LS	$ 40,000.00	$ 40,000.00
10	New Access Hatches w/ Safety Grate	6	EA	$ 20,000.00	$ 120,000.00
11	Concrete Slab	1	LS	$ 50,000.00	$ 50,000.00
12	Fencing	1	LS	$ 20,000.00	$ 20,000.00
13	Triplex Submersible Pumps (60hp Existing)	1	LS	$ 450,000.00	$ 450,000.00
14	Pump Station Control Panel	1	LS	$ 340,000.00	$ 340,000.00

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East Palmetto Street Upgrades Phase II					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
15	Piping / Valves / Appurtenances	1	LS	$ 125,000.00	$ 125,000.00
16	SCADA System	1	LS	$ 50,000.00	$ 50,000.00
17	Electrical	1	LS	$ 300,000.00	$ 300,000.00
18	Tie-in to Existing Force Main	1	EA	$ 15,000.00	$ 15,000.00
19	Rehabilitate Manhole (Lining: 8'-10' Deep)	1	EA	$ 25,000.00	$ 25,000.00
				Subtotal Estimated Construction Costs:	**$ 2,005,000.00**
East Palmetto Street Upgrades Phase II - Opinion of Probable Construction Costs (OPCC)					
				Fairgrounds Pump Station Rehabilitation OPCC Subtotal:	**$ 2,175,000**
				Roche Carolina Pump Station Rehabilitation OPCC Subtotal:	**$ 2,005,000**
				Combined Subtotals of Estimated Construction Costs:	**$ 4,180,000**
				Contingency (25%):	**$ 1,045,000**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 5,225,000**

Notes:

1. This conceptual cost estimate is based on current available cost data.
2. This conceptual cost estimate does not include engineering fees, construction administration/observation fees, permitting fees, or property acquisition fees.
3. All prices shown are in 2025 dollars.
4. Recommended projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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OPINION OF PROBABLE CONSTRUCTION COSTS

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East Palmetto Street Upgrades Phase III					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Adams Branch Pump Station Upgrades					
1	Mobilization/Insurance	1	LS	$ 70,000.00	$ 70,000.00
2	Erosion & Sediment Control	1	LS	$ 15,000.00	$ 15,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	Demolition	1	LS	$ 35,000.00	$ 35,000.00
5	Temporary Bypass Pumping	1	LS	$ 150,000.00	$ 150,000.00
6	Site Work	1	LS	$ 35,000.00	$ 35,000.00
7	New Water Service	1	LS	$ 10,000.00	$ 10,000.00
8	Rehabilitate Existing 10' Diameter Wet Well	1	LS	$ 150,000.00	$ 150,000.00
9	Rehabilitate Existing Check Valve Vault	1	LS	$ 40,000.00	$ 40,000.00
10	New Access Hatches w/ Safety Grate	6	EA	$ 20,000.00	$ 120,000.00
11	Concrete Slab	1	LS	$ 50,000.00	$ 50,000.00
12	Fencing	1	LS	$ 20,000.00	$ 20,000.00
13	Triplex Submersible Pumps (80hp Proposed)	1	LS	$ 700,000.00	$ 700,000.00
14	Pump Station Control Panel	1	LS	$ 440,000.00	$ 440,000.00
15	Piping / Valves / Appurtenances	1	LS	$ 140,000.00	$ 140,000.00
16	SCADA System	1	LS	$ 50,000.00	$ 50,000.00
17	Electrical	1	LS	$ 330,000.00	$ 330,000.00
18	Tie-in to Existing Force Main	1	EA	$ 15,000.00	$ 15,000.00
19	Rehabilitate Manhole (Lining: 8'-10' Deep)	1	EA	$ 25,000.00	$ 25,000.00
				Subtotal Estimated Construction Costs:	**$ 2,420,000.00**
Adams Branch Pump Station - Force Main Upsizing					
1	20" PVC Force Main	4,220	LF	$ 235.00	$ 991,700.00
2	20" RJ PVC Force Main	1,810	LF	$ 275.00	$ 497,750.00
3	Ductile Iron Fittings	5	EA	$ 30,000.00	$ 150,000.00
4	20" Plug Valve w/ valve Box & Marker	2	EA	$ 36,000.00	$ 72,000.00
5	Tie-in to Gravity Sewer	1	EA	$ 10,000.00	$ 10,000.00
6	Air Release Valve w/ Manhole & Valve Marker	4	EA	$ 15,000.00	$ 60,000.00
7	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
8	Remove & Replace Asphalt Driveway	80	LF	$ 60.00	$ 4,800.00
9	Mill & Resurface Asphalt Driveway	300	SY	$ 40.00	$ 12,000.00
10	Flowable Fill	80	LF	$ 5.00	$ 400.00
11	Erosion & Sediment Control	1	LS	$ 45,000.00	$ 45,000.00
				Subtotal Estimated Construction Costs:	**$ 1,868,650.00**

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
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East Palmetto Street Upgrades Phase III					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Black Creek Pump Station Upgrades					
1	Mobilization/Insurance	1	LS	$ 70,000.00	$ 70,000.00
2	Erosion & Sediment Control	1	LS	$ 15,000.00	$ 15,000.00
3	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
4	Demolition	1	LS	$ 35,000.00	$ 35,000.00
5	Temporary Bypass Pumping	1	LS	$ 150,000.00	$ 150,000.00
6	Site Work	1	LS	$ 50,000.00	$ 50,000.00
7	New Water Service	1	LS	$ 10,000.00	$ 10,000.00
8	Rehabilitate Existing 10' Diameter Wet Well	1	LS	$ 150,000.00	$ 150,000.00
9	Rehabilitate Existing Check Valve Vault	1	LS	$ 40,000.00	$ 40,000.00
10	New Access Hatches w/ Safety Grate	6	EA	$ 20,000.00	$ 120,000.00
11	Concrete Slab	1	LS	$ 50,000.00	$ 50,000.00
12	Fencing	1	LS	$ 20,000.00	$ 20,000.00
13	Triplex Submersible Pumps (150hp Proposed)	1	LS	$ 1,200,000.00	$ 1,200,000.00
14	Pump Station Control Panel	1	LS	$ 700,000.00	$ 700,000.00
15	Piping / Valves / Appurtenances	1	LS	$ 140,000.00	$ 140,000.00
16	SCADA System	1	LS	$ 50,000.00	$ 50,000.00
17	Electrical	1	LS	$ 400,000.00	$ 400,000.00
18	Tie-in to Existing Force Main	1	EA	$ 15,000.00	$ 15,000.00
19	Rehabilitate Manhole (Lining: 8'-10' Deep)	1	EA	$ 25,000.00	$ 25,000.00
				Subtotal Estimated Construction Costs:	**$ 3,265,000.00**

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Sewer Collection System Master Plan
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East Palmetto Street Upgrades Phase III					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
Black Creek Pump Station - Force Main Upsizing					
1	20" PVC Force Main	4,720	LF	$ 235.00	$ 1,109,200.00
2	20" RJ PVC Force Main	2,020	LF	$ 275.00	$ 555,500.00
3	20" RJ PVC Force Main In Casing	200	LF	$ 300.00	$ 60,000.00
4	Jack & Bore 42" Casing	200	LF	$ 750.00	$ 150,000.00
5	24" HDPE DR 11 Force Main By Directional Drill	800	LF	$ 550.00	$ 440,000.00
6	Ductile Iron Fittings	10	TONS	$ 30,000.00	$ 300,000.00
7	20" Plug Valve w/ valve Box & Marker	2	EA	$ 36,000.00	$ 72,000.00
8	Tie-in to Gravity Sewer	1	EA	$ 10,000.00	$ 10,000.00
9	Air Release Valve w/ Manhole & Valve Marker	4	EA	$ 15,000.00	$ 60,000.00
10	Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
11	Remove & Replace Asphalt Driveway	120	LF	$ 60.00	$ 7,200.00
12	Mill & Resurface Asphalt Driveway	400	SY	$ 40.00	$ 16,000.00
13	Flowable Fill	1,120	LF	$ 5.00	$ 5,600.00
14	Erosion & Sediment Control	1	LS	$ 45,000.00	$ 45,000.00
				Subtotal Estimated Construction Costs:	**$ 2,855,500.00**
East Palmetto Street Upgrades Phase III - Opinion of Probable Construction Costs (OPCC)					
				Adams Branch Pump Station Upgrades OPCC Subtotal:	**$ 2,420,000**
				Adams Branch Pump Station - Force Main Upsizing OPCC Subtotal:	**$ 1,868,650**
				Black Creek Pump Station Upgrades OPCC Subtotal:	**$ 3,265,000**
				Black Creek Pump Station - Force Main Upsizing OPCC Subtotal:	**$ 2,855,500**
				Combined Subtotals of Estimated Construction Costs:	**$ 10,409,150**
				Contingency (25%):	**$ 2,602,288**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 13,012,000**

Notes:

1. This conceptual cost estimate is based on current available cost data.
2. This conceptual cost estimate does not include engineering fees, construction administration/observation fees, permitting fees, or property acquisition fees.
3. All prices shown are in 2025 dollars.
4. Recommended projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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Lower South Jeffries Creek Interceptor Upgrades Phase II					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
	General				
1	Dewatering	1	LS	$ 515,178.85	$ 515,178.85
2	Clearing	8,750	SF	$ 35.00	$ 306,250.00
3	Mobilization	1	LS	$ 464,982.62	$ 464,982.62
4	Traffic Control	20,757	LF	$ 10.00	$ 207,570.00
5	Demolition	8,750	LF	$ 20.00	$ 175,000.00
	Gravity Pipe				
6	Upsize 18" to 24" Sanitary (5"to 10" deep)	3,965	LF	$ 350.00	$ 1,387,750.00
7	Upsize 18" to 24" Sanitary (10"to 15" deep)	250	LF	$ 365.00	$ 91,250.00
8	Upsize 24" to 30" Sanitary (5"to 10" deep)	1,745	LF	$ 550.00	$ 959,750.00
9	Upsize 24" to 30" Sanitary (10"to 15" deep)	2,790	LF	$ 575.00	$ 1,604,250.00
	Sewer Lining Costs				
10	18-inch	8,061	LF	$ 81.50	$ 656,971.50
11	20-inch	3,946	LF	$ 114.50	$ 451,817.00
	Manholes				
12	48-inch Manholes (5-10' deep)	19	EA	$ 18,500.00	$ 351,500.00
13	48-inch Manholes (10-15' deep)	11	EA	$ 20,000.00	$ 220,000.00
14	Rehabilitate Manhole (Lining: 8'-10' Deep)	59	EA	$ 25,000.00	$ 1,475,000.00
	Misc				
15	Road, Restoration	533	SF	$ 25.00	$ 13,333.33
16	Seed, Restoration	46,889	SF	$ 10.00	$ 468,891.67
17	Bypass Pumping	20,757	LF	$ 20.00	$ 415,140.00
				Subtotal Estimated Construction Costs:	**$ 9,764,635**
				Contingency (25%):	**$ 2,441,159**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 12,206,000**

Notes:

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2. This conceptual cost estimate does not include engineering fees, construction administration/observation fees, permitting fees, or property acquisition fees.
3. All prices shown are in 2025 dollars.
4. Recommended projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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Beaverdam Creek Upgrades Phase I					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
General					
1	Dewatering	1	LS	$ 411,000.00	$ 411,000.00
2	Clearing	11,300	LF	$ 35.00	$ 395,500.00
3	Mobilization (5%)	1	LS	$ 490,924.25	$ 490,924.25
4	Traffic Control	14,750	LF	$ 10.00	$ 147,500.00
5	Remove or Abandon Existing Pipe	11,300	LF	$ 20.00	$ 226,000.00
Gravity Pipe					
6	15" PVC Sanitary	1,100	LF	$ 275.00	$ 302,500.00
7	15" PVC Sanitary	1,900	LF	$ 275.00	$ 522,500.00
8	18" PVC Sanitary	4,100	LF	$ 300.00	$ 1,230,000.00
9	24-inch (5-10' deep)	400	LF	$ 350.00	$ 140,000.00
10	24-inch (10-15'' deep)	1,075	LF	$ 365.00	$ 392,375.00
11	24-inch (15-20' deep)	825	LF	$ 380.00	$ 313,500.00
12	24-inch (20-25' deep)	150	LF	$ 395.00	$ 59,250.00
13	24-inch (25-30' deep)	550	LF	$ 410.00	$ 225,500.00
14	27-inch (5-10' deep)	2,200	LF	$ 400.00	$ 880,000.00
15	27-inch (10-15' deep)	800	LF	$ 415.00	$ 332,000.00
16	27-inch (15-20' deep)	425	LF	$ 430.00	$ 182,750.00
17	27-inch (20-25' deep)	325	LF	$ 445.00	$ 144,625.00
18	27-inch (25-30' deep)	250	LF	$ 460.00	$ 115,000.00
19	27-inch (30-35' deep)	200	LF	$ 475.00	$ 95,000.00
Sewer Lining Costs					
20	12-inch	3,450	LF	$ 41.50	$ 143,175.00
Pipe Accessories					
21	Tie-in to Gravity Sewer	1	EA	$ 10,000.00	$ 10,000.00
Manholes					
22	Gravity Sewer Manholes (14-16')	61	EA	$ 18,500.00	$ 1,128,500.00
23	Gravity Sewer Manholes (18-20')	6	EA	$ 20,000.00	$ 120,000.00
24	48-inch Manholes (20-25' deep)	2	EA	$ 59,000.00	$ 118,000.00
25	Rehabilitate Manhole (Lining: 8'-10' Deep)	14	EA	$ 25,000.00	$ 350,000.00
Directional Drilling					
26	Directional drill 27-inch FRPMP	116	LF	$ 4,000.00	$ 463,560.00

OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
May 2025

Beaverdam Creek Upgrades Phase I							
		Schedule of Values					
Item No	Description	Quantity	Unit	Unit Price		Total Cost	
Misc							
27	Road, Restoration	13,250	SF	$	25.00	$	331,250.00
28	Seed, Restoration	68,400	SF	$	10.00	$	684,000.00
29	Bypass Pumping	17,750	LF	$	20.00	$	355,000.00
					Subtotal Estimated Construction Costs:	**$**	**10,309,409**
					Contingency (25%):	**$**	**2,577,352**
					Total Opinion of Probable Construction Costs (Rounded):	**$**	**12,887,000**

Notes:

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3. All prices shown are in 2025 dollars.
4. Recommended projects were developed based on planning-level analyses and are subject to change based on findings from the Flow Verification and Programmatic Review project.
5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
May 2025

Beaverdam Creek Upgrades Phase II					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
	General				
1	Dewatering	1	LS	$ 291,062.50	$ 291,062.50
2	Clearing	21,600	LF	$ 35.00	$ 756,000.00
3	Mobilization (5%)	1	LS	$ 586,787.08	$ 586,787.08
4	Traffic Control	21,600	LF	$ 10.00	$ 216,000.00
5	Remove or Abandon Existing Pipe	21,600	LF	$ 20.00	$ 432,000.00
	Gravity Pipe				
6	15" Sanitary Sewer (10-15' deep)	5,550	LF	$ 275.00	$ 1,526,250.00
7	21-inch (5-10' deep)	5,100	LF	$ 300.00	$ 1,530,000.00
8	21-inch (10-15" deep)	3,875	LF	$ 315.00	$ 1,220,625.00
9	21-inch (15-20' deep)	1,875	LF	$ 330.00	$ 618,750.00
10	21-inch (20-25' deep)	2,250	LF	$ 345.00	$ 776,250.00
	Forcemain Installation				
11	12-inch forcemain	2,950	LF	$ 100.00	$ 295,000.00
	Pipe Accessories				
12	Tie-in to Gravity Sewer	1	EA	$ 10,000.00	$ 10,000.00
13	Tie-in to Pump Station	1	EA	$ 15,000.00	$ 15,000.00
	Manholes				
14	Gravity Sewer Manholes (14-16')	37	EA	$ 18,500.00	$ 684,500.00
15	48-inch Manholes (20-25' deep)	10	EA	$ 59,000.00	$ 590,000.00
	Lift Stations/Forcemain				
16	Upgarde Cashua Street LS	1	LS	$ 250,000.00	$ 250,000.00
	Misc				
17	Road, Restoration	70,084	SF	$ 25.00	$ 1,752,104.17
18	Seed, Restoration	34,020	SF	$ 10.00	$ 340,200.00
19	Bypass Pumping	21,600	LF	$ 20.00	$ 432,000.00
				Subtotal Estimated Construction Costs:	**$ 12,322,529**
				Contingency (25%):	**$ 3,080,632**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 15,404,000**

Notes:

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
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East Jeffries Creek Interceptor Upgrades							
		Schedule of Values					
Item No	Description	Quantity	Unit	Unit Price		Total Cost	
	General						
1	Dewatering	1	LS	$	481,880.00	$	481,880.00
2	Clearing	7,161	LF	$	35.00	$	250,635.00
3	Mobilization (5%)	1	LS	$	353,153.00	$	353,153.00
4	Traffic Control	7,161	LF	$	10.00	$	71,610.00
5	Demolition	7,161	LF	$	20.00	$	143,220.00
	Gravity Pipe						
6	27-inch PVC (5-10' deep)	4,107	LF	$	400.00	$	1,642,800.00
7	27-inch PVC (10-15' deep)	1,300	LF	$	415.00	$	539,500.00
8	27-inch PVC (15-20' deep)	1,500	LF	$	430.00	$	645,000.00
9	30-inch PVC (5-10' deep)	1,200	LF	$	550.00	$	660,000.00
10	30-inch PVC (10-15' deep)	1,700	LF	$	575.00	$	977,500.00
11	30-inch PVC (15-20' deep)	600	LF	$	590.00	$	354,000.00
	Manholes						
12	48-inch Manholes (5-10' deep)	20	EA	$	18,500.00	$	370,000.00
13	48-inch Manholes (10-15' deep)	7	EA	$	20,000.00	$	140,000.00
14	48-inch Manholes (15-20' deep)	4	EA	$	47,000.00	$	188,000.00
	Misc						
15	Seed, Restoration	39,078	SF	$	10.00	$	390,775.00
16	Bypass Pumping	10,407	LF	$	20.00	$	208,140.00
				Subtotal Estimated Construction Costs:		**$**	**7,416,213.00**
				Contingency (25%):		**$**	**1,854,053.25**
				Total Opinion of Probable Construction Costs (Rounded):		**$**	**9,271,000.00**

Notes:

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5. It was assumed that only a portion of the roadway would require restoration following pipe installation rather than full-width roadway reconstruction.

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
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Pye Branch Upgrades							
		Schedule of Values					
Item No	Description	Quantity	Unit	Unit Price		Total Cost	
	General						
1	Dewatering	1	LS	$	306,000.00	$	306,000.00
2	Clearing	15,930	LF	$	35.00	$	557,550.00
3	Mobilization (5%)	1	LS	$	540,951.50	$	540,951.50
4	Traffic Control	15,930	LF	$	10.00	$	159,300.00
5	Demolition	15,930	LF	$	20.00	$	318,600.00
	Gravity Pipe						
6	18" PVC Sanitary	5,380	LF	$	300.00	$	1,614,000.00
7	20-inch PVC (10-15'' deep)	800	LF	$	315.00	$	252,000.00
8	20-inch PVC (15-20' deep)	1,100	LF	$	330.00	$	363,000.00
9	20-inch PVC (20-25' deep)	600	LF	$	345.00	$	207,000.00
10	20-inch PVC (25-30' deep)	500	LF	$	360.00	$	180,000.00
11	24-inch PVC (5-10'' deep)	1,000	LF	$	350.00	$	350,000.00
12	24-inch PVC (10-15'' deep)	1,000	LF	$	365.00	$	365,000.00
13	30-inch FRPMP (5-10' deep)	5,250	LF	$	550.00	$	2,887,500.00
14	30-inch FRPMP (10-15' deep)	300	LF	$	575.00	$	172,500.00
	Manholes						
15	48-inch Manholes (5-10' deep)	25	EA	$	18,500.00	$	462,500.00
16	48-inch Manholes (10-15' deep)	12	EA	$	20,000.00	$	240,000.00
17	48-inch Manholes (15-20' deep)	9	EA	$	47,000.00	$	423,000.00
18	48-inch Manholes (20-25' deep)	3	EA	$	59,000.00	$	177,000.00
	Directional Drilling						
19	Directional drill	204	LF	$	4,000.00	$	817,480.00
	Misc						
20	Road, Restoration	21,360	SF	$	25.00	$	534,000.00
21	Seed, Restoration	11,400	SF	$	10.00	$	114,000.00
22	Bypass Pumping	15,930	LF	$	20.00	$	318,600.00
				Subtotal Estimated Construction Costs:		**$**	**11,359,982**
				Contingency (25%):		**$**	**2,839,995**
				Total Opinion of Probable Construction Costs (Rounded):		**$**	**14,200,000**

Notes:

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
May 2025

South Irby / Timrod Park Upgrades					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
	General				
1	Dewatering	1	LS	$ 54,150.00	$ 54,150.00
2	Clearing	7,000	SF	$ 35.00	$ 245,000.00
3	Mobilization	1	LS	$ 135,282.50	$ 135,282.50
4	Traffic Control	7,000	LF	$ 10.00	$ 70,000.00
5	Demolition	7,000	LF	$ 20.00	$ 140,000.00
	Gravity Pipe				
6	20-inch PVC (5-10' deep)	1,700	LF	$ 300.00	$ 510,000.00
7	20-inch PVC (10-15' deep)	100	LF	$ 315.00	$ 31,500.00
	Sewer Lining Costs				
8	20-inch Sanitary Sewer CIPP Lining	2,000	LF	$ 114.50	$ 229,000.00
9	27-inch Sanitary Sewer CIPP Lining	3,200	LF	$ 150.00	$ 480,000.00
	Manholes				
10	48-inch Manholes (5-10' deep)	10	EA	$ 18,500.00	$ 185,000.00
11	48-inch Manholes (10-15' deep)	1	EA	$ 20,000.00	$ 20,000.00
12	Rehabilitate Manhole (Lining: 8'-10' Deep)	17	EA	$ 25,000.00	$ 425,000.00
	Misc				
13	Road, Restoration	5,333	SF	$ 25.00	$ 133,333.33
14	Seed, Restoration	4,267	SF	$ 10.00	$ 42,666.67
15	Bypass Pumping	7,000	LF	$ 20.00	$ 140,000.00
				Subtotal Estimated Construction Costs:	**$ 2,840,933**
				Contingency (25%):	**$ 710,233**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 3,552,000**

Notes:

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OPINION OF PROBABLE CONSTRUCTION COSTS

Sewer Collection System Master Plan
City of Florence, SC
May 2025

Upper South Jeffries Creek Interceptor Upgrades					
		Schedule of Values			
Item No	Description	Quantity	Unit	Unit Price	Total Cost
	General				
1	Dewatering	1	LS	$ 429,950.00	$ 429,950.00
2	Clearing	12,010	SF	$ 35.00	$ 420,350.00
3	Mobilization	1	LS	$ 364,207.92	$ 364,207.92
4	Traffic Control	12,010	LF	$ 10.00	$ 120,100.00
5	Demolition	12,010	LF	$ 20.00	$ 240,200.00
	Gravity Pipe				
6	Upsize 10" to 18"	3,260	LF	$ 300.00	$ 978,000.00
7	Upsize 12" to 24" Sanitary (5"to 10" deep)	890	LF	$ 350.00	$ 311,500.00
8	Upsize 12" to 24" Sanitary (10"to 15" deep)	1,200	LF	$ 365.00	$ 438,000.00
9	Upsize 18" to 24" Sanitary (5"to 10" deep)	1,190	LF	$ 350.00	$ 416,500.00
10	Upsize 18" to 24" Sanitary (10"to 15" deep)	1,990	LF	$ 365.00	$ 726,350.00
11	Upsize 18" to 24" Sanitary (15"to 20" deep)	490	LF	$ 380.00	$ 186,200.00
12	Upsize 18" to 27" Sanitary (5"to 10" deep)	600	LF	$ 400.00	$ 240,000.00
13	Upsize 18" to 27" Sanitary (10"to 15" deep)	1,650	LF	$ 415.00	$ 684,750.00
14	Upsize 18" to 27" Sanitary (15"to 20" deep)	740	LF	$ 430.00	$ 318,200.00
	Manholes				
15	48-inch Manholes (5-10' deep)	12	EA	$ 18,500.00	$ 222,000.00
16	48-inch Manholes (10-15' deep)	16	EA	$ 20,000.00	$ 320,000.00
17	48-inch Manholes (15-20' deep)	8	EA	$ 47,000.00	$ 376,000.00
	Misc				
18	Seed, Restoration	61,586	SF	$ 10.00	$ 615,858.33
19	Bypass Pumping	12,010	LF	$ 20.00	$ 240,200.00
				Subtotal Estimated Construction Costs:	**$ 7,648,366**
				Contingency (25%):	**$ 1,912,092**
				Total Opinion of Probable Construction Costs (Rounded):	**$ 9,561,000**

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FULL LIFE. FULL FORWARD.
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