QUARTERLY REPORT

OCTOBER 1 – DECEMBER 31, 2023

Hampton Roads Sanitation District

1434 Air Rail Avenue

Virginia Beach, VA 23455

March 7, 2024

TABLE OF CONTENTS

1. Introduction and Purpose

On September 26, 2007, the Hampton Roads Sanitation District (HRSD) entered into a Special Order by Consent (SOC) with the Virginia Department of Environmental Quality (DEQ) and thirteen (13) area Localities for the purpose of resolving certain alleged violations of environmental laws and regulations related to Sanitary Sewer Overflows (SSOs). On February 23, 2010, HRSD entered into an Amended Consent Decree ("Consent Decree") with the United States of America and the Commonwealth of Virginia for the purpose of fulfilling the objectives of the Clean Water Act and the Virginia State Water Control Law. This Consent Decree has been modified five times by agreement of all parties in 2011, 2013, 2014, 2017, and 2022. In December 2014, the SOC was eliminated by DEQ and HRSD is no longer under state enforcement. On February 8, 2022, the Fifth Amendment to the Consent Decree was entered.

The Fifth Amendment to the Consent Decree requires:

"HRSD will submit quarterly SSO reports to VADEQ and EPA, in which HRSD will identify all SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges from the HRSD SS System or the HRSD STPs. HRSD will identify those SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges for which it asserts a claim of force majeure. If HRSD asserts a force majeure claim, it shall document the basis for such claim in the quarterly SSO reports. It will pay the associated undisputed stipulated penalties for all SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges for which it did not assert a claim of force majeure within 90 days of the close of each calendar quarter. In addition, HRSD will submit all of HRSD's post-storm synopses reports for rain events during the quarterly reporting period to VADEQ and EPA as part of the quarterly reports for rain events that satisfy HRSD's current criteria for publishing a post-storm analysis, i.e.: (a.) one or more rain gauge sites meet a two-year or greater rainfall recurrence interval and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater; (b.) a rain gauge meets a five-year or greater rainfall recurrence interval; or (c.) a weather-related SSO occurs."

This quarterly report is submitted pursuant to Section XVII.D of the Consent Decree. HRSD has prepared this quarterly report in accordance with the above requirements to apprise the EPA (representing the United States of America) and the DEQ (representing the Commonwealth of Virginia) of steps taken toward meeting the obligations of the Consent Decree. Specifically, this quarterly report summarizes all Sanitary Sewer Overflows (SSOs), Sanitary Sewer Discharges (SSDs), Prohibited Bypasses, or unauthorized discharges from the HRSD Sanitary Sewer System or the HRSD Sewage Treatment Plants from October 1, 2023, through December 31, 2023, the associated post-storm synopses reports, claims of force majeure, and undisputed stipulated penalties.

During the reporting period, there were a total of ten (10) SSOs, SSDs, Prohibited Bypasses, and unauthorized discharges from the HRSD SS System or the HRSD STPs. These are summarized in Tables 1 & 2.

2. Claim of Force Majeure

2.1. Sanitary Sewer Overflow

There were four (4) SSOs from the HRSD SS System during the 3-month reporting period. HRSD asserts a force majeure claim for zero (0) of the SSOs.

2.1.1. Basis of Claim

A description of the circumstances supporting a claim of force majeure is included in Table 1.

2.2. Unusual Discharges (Sanitary Sewer Discharge, Prohibited Bypasses, Unauthorized Discharge)

There were six (6) unusual discharges from the HRSD SS System or the HRSD STPs during the 3-month reporting period. HRSD asserts a force majeure claim for three (3) Unusual Discharges that were non potable water or final effluent.

2.2.1. Basis of Claim

A description of the circumstances supporting a claim of force majeure is included in Table 2.

3. Undisputed Stipulated Penalties

3.1. Sanitary Sewer Overflow

There were four (4) SSOs from the HRSD SS System during the 3-month reporting period. HRSD will pay undisputed stipulated penalties in the amount of $7,450 for four (4) SSOs.

3.1.1. Basis of Undisputed Stipulated Penalties
Calculation of undisputed stipulated penalties is outlined in Section XX "Stipulated Penalties" paragraph 110 of the Consent Decree. The calculated stipulated penalties are shown in Table 1.

Volume of the SSD or Prohibited Bypass	Penalty from the date of entry
Less than 100 gallons	$ 100
100 to 2,499 gallons	$ 750
2,500 to 9,999 gallons	$ 1,250
10,000 to 99,999 gallons	$ 4,700
100,000 to 999,999 gallons	$ 10,000
1,000,000 gallons or greater	$ 15,000

3.2. Unusual Discharges (Sanitary Sewer Discharge, Prohibited Bypasses, Unauthorized Discharge)
There were six (6) unusual discharges from the HRSD SS System or the HRSD STPs during the 3-month reporting period. HRSD will pay undisputed stipulated penalties in the amount of $2,750 for three (3) Unusual Discharges.

3.2.1. Basis of Undisputed Stipulated Penalties

Calculation of undisputed stipulated penalties is outlined in Section XX "Stipulated Penalties" paragraph 110 of the Consent Decree. The calculated stipulated penalties are shown in Table 2.

Volume of the SSD or Prohibited Bypass	Penalty from the date of entry
Less than 100 gallons	$ 100
100 to 2,499 gallons	$ 750
2,500 to 9,999 gallons	$ 1,250
10,000 to 99,999 gallons	$ 4,700
100,000 to 999,999 gallons	$ 10,000
1,000,000 gallons or greater	$ 15,000

4. Post-Storm Synopses Reports

Post-Storm Synopses Reports are generated when:

- One or more rain gauge sites meets a two year or greater rainfall recurrence interval and 50% of sites receive one inch or greater rainfall
- A rain gauge meets a five-year or greater rainfall recurrence interval or
- A capacity related wet weather SSO occurs

There was one (1) Post-Storm Synopses Report for the 3-month reporting period.

Table 1. Detailed Listing of HRSD SSOs

(October 1, 2023 to December 31, 2023)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO	Discharge Quantity (gallons)**	Amount Reaching State Waters (gallons)**	DEQ IR	Force Majeure Rationale or Stipulated Penalty
12/18/2023 12:07:00AM	720 Bayshore Lane	Bayshore Lane PS	Ground draining to Chesapeake Bay	Hampton	Capacity – Weather Related	Significant wet weather resulted in increased system flows. The Bayshore PS rain gauge saw a maximum rainfall of 0.26” in 15 minutes, with a total of 0.78” falling in 1 hour. Total rainfall for the rain event for this rain gauge was 3.31”.	3 hour(s) 43 minute(s)	Verified pump station operating properly, monitored the SSO, and cleaned up the site after the event.	750	750	SSORS#2024-T-106359	$750
12/18/2023 2:30:00AM	219 National Avenue	Willard Avenue PS	Storm drain to Chesapeake Bay	Hampton	Infrastructure	The permanent bypass pump was experiencing mechanical issues, resulting in the loose discharge flange connection and sewage being released. The Bayshore PS rain gauge saw a maximum rainfall of 0.26” in 15 minutes, with a total of 0.78” falling in 1 hour. Total rainfall for the rain event for this rain gauge was 3.31”.	0 hour(s) 2 minute(s)	Crews reconnected discharge flange connections.	300	300	SSORS#2024-T-106361	$750
12/18/2023 10:52:00AM	5734 Chesapeake Boulevard	Chesapeake Boulevard PS	Lafayette River via Wayne Creek	Norfolk	Capacity – Weather Related	Heavy rainfall in the area resulted in increased system flows. The flows exceeded the capacity of the Chesapeake Boulevard PS causing sewage to overflow from this overflow pipe. The Luxembourg Avenue PS saw a maximum rainfall of 0.30” in 15 minutes, with a total of 0.76” falling in 1 hour. Total rainfall for the rain event for this rain gauge was 3.62”.	3 hour(s) 10 minute(s)	HRSD staff verified the Chesapeake Boulevard PS was operating properly. Once the rain subsided the PS was able to pull the levels within the gravity system down enough to stop the overflow. All sewage from this overflow was conveyed directly to the creek behind the station via gravity overflow pipe. No sewage was spilled onto the ground.	32,500	32,500	SSORS#2024-T-106362	$4,700
12/24/2023 4:30:00PM	Intersection of Great Bridge Boulevard and Neal Street	Great Bridge Boulevard Gravity at Neal Street	Storm drain to Newton Creek / Elizabeth River	Chesapeake	Third Party Action	HRSD contractor's plug from adjacent CIP project plugged line causing overflows at HRSD's manholes and numerous City of Chesapeake sanitary sewer manholes and clean outs.	1 hour(s) 30 minute(s)	Responding to a call from Chesapeake Public Utilities, staff discovered manhole SG-162-3194 at the corner of Great Bridge Boulevard and Neal Street was surcharged to the rim of the structure. This manhole is a discharge point for an active bypass system supporting HRSD's CIP AT013000. The bypass system, which	2,500	2,500	SSORS#2024-T-106364	$1,250

Table 1. Detailed Listing of HRSD SSOs

(October 1, 2023 to December 31, 2023)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO	Discharge Quantity (gallons)**	Amount Reaching State Waters (gallons)**	DEQ IR	Force Majeure Rationale or Stipulated Penalty
								pumped sewage from a City of Chesapeake manhole several hundred feet to the east, was still in operation and when called to run caused the surcharged manhole to spill onto the ground. The contractor was on site and was instructed to turn the bypass system off. Once the bypass was turned off, the spill at the HRSD manholes stopped. However, City manholes and cleanouts in the north-east area of the neighborhood, the lowest part of the collection system, continued to spill for several more hours. Staff shut off Doziers Corner PS and coordinated a shutdown of Chesapeake PS-12 to minimize the sewage lost. Anticipating a blockage in the downstream pipe, staff jetted the line several times to attempt to free up the perceived blockage. After the jetting did not produce results, the contractor and HRSD pumper trucks pumped out of local manholes while a bypass system was put in place to pump around the apparent blockage. After the spilling from City manholes was stopped and the collection system upstream from SG-162-3194 was pumped down, a plug belonging to the CIPP contractor was visible in the manhole in the downstream pipe. Bypass system stayed online until contractor's plug was removed on 12/25/2023. Clean-up of the area was performed by HRSD and contractor staff. Vactor trucks were deployed to collect debris and contractor and HRSD staff spread bleach and lime in the spill areas.				

Table 2. Detailed Listing of HRSD Treatment Plant Unusual Discharges (October 1, 2023 to December 31, 2023)									
Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Force Majeure Rationale Or Stipulated Penalty
10/10/2023	Boat Harbor	Secondary clarifier #5 was filled with Non-Potable Water (NPW) to test the rake arm function last week. Over the weekend the tank lost volume and a maintenance operator noticed water on the back road. Upon inspection fluid was noticed to be flowing out of an expansion joint between secondary #4 and secondary #5. A total of 22" of NPW was lost from the tank.	30	Maintenance operator dug a pit near the leak, placed rubber material in the pit and a sump pump to capture the water as it continues to leak. The tank is being drained from that location to the plant drain system. Once the leak location has been determined, the Condition Assessment group will assist in hiring a contractor to repair the tank.	120735	120735	Non-Potable Water (NPW)	Ground, drainage creek from storm drain	NPW
11/2/2023	Nansemond	Contractors dropped a piece of concrete on the discharge line from Centrate tanks, spilling ~600 gallons of centrate onto the ground, none of which was recovered. Contractors were lifting a piece of concrete that buckled under the weight and landed on the discharge piping from the centrate tanks. The pipe was broken before the closest valve in line, so there was no way to secure the spill. The spill was going directly into the rock outside of the excavation for the new PreDewatering building and was unable to be recovered. This resulted in ~600 gallons of centrate being spilled with zero gallons being recovered.	15	Plant Staff and contractors removed a broken section of pipe at a flange and replaced it with a flange that had a valve on it to stop the spill.	600	600	Centrate	Ground	$750
11/4/2023	Williamsburg	Our Plant Operator noticed water coming out of the road and ground at an intersection on the southwest end the plant at 9:45am while investigating a sudden drop in NPW system pressure. Standby personnel responded but found the leak to be on the main 10" line so they had to shutdown NPW to the plant to stop the leak. The system was shutdown and the leak stopped at 12:30pm. It is estimated that 16,500 gallons of NPW soaked into the ground and ran down storm drains 9 and 10 into Grove Creek.	165	Bridgeman Civil was called out to excavate and repair the 10" cast iron NPW line. The cracked section of line was replaced and NPW flow to the plant was back on at 9:45pm.	16500	16500	Non-Potable Water (NPW)	Ground and Grove Creek	NPW
11/7/2023	Nansemond	Plant staff discovered flow discharging from the SRF Reactor #3 drain that has been cut in preparation for the demo of Reactor #3. The plant drain well was overwhelmed with drain flow from AAA Tank #5, causing the overflow at the SRF. The pipe the flow was discharging was 6" PVC pipe and the building sump pumps could not keep up causing some flow to leave the building.	15	Plant Staff contacted LO On-call and were instructed to close down on the drain from AAA Tank #5. The LO reported to NP and evaluated the spill and deemed it non recoverable and sprayed down the interior of the SRF	650	650	NPW w/Struvite	Ground	$750

Table 2. Detailed Listing of HRSD Treatment Plant Unusual Discharges (October 1, 2023 to December 31, 2023)									
Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Force Majeure Rationale Or Stipulated Penalty
11/9/2023	James River	A newly built tank was being filled with non-potable water (NPW) to soak the concrete and test for leaks. It was noticed that the level had dropped more than expected which indicated a potential leak. The contractor excavated down to the influent pipe and found that they had forgotten to put a plug in a 1/2 inch test port. This resulted in ~40,000 gallons of NPW being released into the ground. The contractor does have deep stilling wells with sump pumps to remove ground water from their excavations and those pumps likely conveyed this NPW to a storm water discharge.	37	Contractor excavated down to the pipe and installed a plug.	40000	40000	Non-Potable Water (NPW)	Ground to storm drain	NPW
11/14/2023	Nansemond	While Contractors were drilling piles for the new Primary Clarifier Equalization Tank, part of the Anaerobic, Anoxic, Aerobic (AAA) influent channel separated at an expansion joint and began leaking. This caused a mixed liquor leak on both the north and south side of the influent channel which peaked at ~10 gallons per minute on the north and ~5 gallons per minute on the south.	1365	Contractors dug a trench to collect the mixed liquor and pump it back into the AAA channel. Contractors will have to setup bypass pumping to isolate the channel for repair, until this is able to be done, to eliminate / slow the leak, Contractors patched the leaks from the outside with oakum soaked in hydrophobic polyurethane grout.	2930	2930	Mixed Liquor	Ground	$1250

Note: NPW (non-potable water) is fully treated and chlorinated final effluent.

Appendix A. Post-Storm Synopses Reports

There was one (1) qualifying event this quarter.

Hampton Roads Sanitation District

Post-Storm Report

12/17/2023 – 12/18/2023

HRSD
Cleaning wastewater every day for a better Bay.

Summary

From December 17th through December 18th, there was an approximate 12-hour rainfall event that resulted in 22 sites on the North Shore and 36 sites on the South Shore that met a 1 to 5-year rainfall recurrence interval throughout the HRSD rain gauge network. An area of low pressure brought strong winds of 45-50mph along the coast but also brought heavy downpours overnight that led to Flash Flood Warnings. There were still light showers the next morning but wind gusts were still 35mph until early afternoon. North Shore sites averaged around 2.86 inches of rain while South Shore sites averaged around 3.04 inches. There was minimal impact on groundwater levels compared to December 2022. See Appendix C for the Historical Shallow Well comparison.

2 HRSD interceptor weather-related overflow(s) were reported.

4 Locality weather-related overflow (s) were reported

HRSD flow and pressure meters met data reliability requirements per the MOM program. For all pressure meters in the aggregate and all pressure-side flow meters in the aggregate for each treatment plant service area listed below, at least 90% reliable data was achieved, based on the duration of system response to this rainfall event. The data reliability for the gravity flow meters is not included in this synopsis.

- Duration of system response: See Table Below
- Aggregate flow meter validity: 91.22%
- Aggregate pressure meter validity: 98.25%

Currently, rainfall recurrence intervals are only analyzed for a maximum of 96-hours. Rainfall analysis begins after 0.1 inches of rain has occurred. A 72-hour dry period of less than 0.1 inches of rain is typically used to signify two separate events. However, if a site returns to "dry weather" conditions prior to the next rainfall that occurs within 72 hours of the previous event, it is also considered for separate analysis. See Appendix A for the Rainfall Total System Maps.

The current criteria for publishing a post-storm analysis are the following:

- One or more rain gauge sites meet a two-year or greater RRI (rainfall recurrence interval) and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater,
- A rain gauge site meets a five-year or greater RRI, or
- A weather-related SSO occurs.

Sanitary Sewer Overflows:

HRSD - South Shore

Location	Locality	Start Date
5734 Chesapeake Blvd	Norfolk	12/18/2023

HRSD – North Shore

Location	Locality	Start Date
720 Bayshore Ln	Hampton	12/18/2023

Localities

Location	Locality	Start Date
99 Patrick Henry Dr	Williamsburg	12/17/2023
1752 Nickerson Blvd to 491 Seaboard Ave	Hampton	12/18/2023
174 Forest Heights Rd	James City	12/17/2023
115 Depot St	James City	12/17/2023

Treatment Plant Data: *(Data obtained from Telog Database)*
See Appendix B for HRSD Treatment Plant Flows

HRSD Treatment Plant Data
12/17/2023 – 12/18/2023

North Shore				
Treatment Plant	Date of Peak Hourly Flow	Peak Hourly Flow (MGD)	Peak Hour	TPSA Total Rainfall Avg (in)
Boat Harbor	12/17/2023	23.73	19:00	2.51
	12/18/2023	42.37	2:00	0.79
James River	12/17/2023	31.25	18:00	2.04
	12/18/2023	35.82	2:00	0..90
Williamsburg	12/17/2023	25.99	23:00	2.22
	12/18/2023	31.56	0:00	0..38
York River	12/17/2023	23.03	23:00	2.15
	12/18/2023	25.99	0:00	0.72

HRSD Treatment Plant Data
12/17/2023 – 12/18/2023

South Shore				
Treatment Plant	**Date of Peak Hourly Flow**	**Peak Hourly Flow (MGD)**	**Peak Hour**	**TPSA Total Rainfall Avg (in)**
Army Base	12/17/2023	19.19	18:00	2.30
	12/18/2023	34.10	1:00	0.94
Atlantic	12/17/2023	106.76	18:00	2.22
	12/18/2023	110.11	3:00	1.47
Nansemond	12/17/2023	41.99	23:00	2.34
	12/18/2023	42.96	0:00	1.06
VIP	12/17/2023	64.23	23:00	2.46
	12/18/2023	75.70	0:00	0.89

North Shore

Weather:

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Boat Harbor Treatment Plant Service Area[1]		
Bayshore PS	2-year (12hr)	HAMP
Bridge Street Tide Gate	1- to 2-year (12hr)	HAMP
Boat Harbor	2-year (12hr)	NEWP
Copeland Park PS	2- to 5-year (12hr)	NEWP
Hampton PS 159	1- to 2-year (12hr)	HAMP
James River Treatment Plant Service Area[1]		
Hilton School PS	1-year (12hr)	NEWP
James River Main Flow (Influent)	1- to 2-year (12hr)	NEWP
Lee Hall PRS	1-year (12hr)	NEWP
Lucas Creek PS	2-year (12hr)	NEWP
Morrison PS	1-year (12hr)	NEWP
Williamsburg Treatment Plant Service Area[1]		
Ford's Colony	1-year (12hr)	JCSA
Fort Eustis PS	DNQ	NEWP
Greensprings PS	1-year (12hr)	JCA
Solarex	1-year (12hr)	JCSA
Williamsburg Main Flow (Effluent)	DNQ	JCSA
Williamsburg PS	DNQ	WILL
York Skimino Hills PS	1-year (12hr)	YORK

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
York River Treatment Plant Service Area[1]		
Big Bethel PRS	2- to 5-year (12hr)	HAMP
Freeman PS	1- to 2-year (12hr)	HAMP
Gloucester Court House	1-year (12hr)	GLOU
Guinea Rd at Maryus Rd	1- to 2-year (12hr)	GLOU
Ordinary PCV	1-year (12hr)	GLOU
Poquoson PS 6	2- to 5-year (12hr)	POQ
Wolf Trappe PCV	DNQ	YORK
York Kiln Creek 1 PS	1-year (12hr)	YORK
York PS 15	1-year (12hr)	YORK
York River Main Flow (Influent)	DNQ	YORK
York River Crossing (York River Rectifier)	Invalid	GLOU

Note:

1. Typical treatment plant service area.

Newport News-Williamsburg International (PHF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
12/17/2023	41 mph	21 mph	9 mph	NE	1.83
12/18/2023	38 mph	20 mph	12 mph	NE	0.7

Tide:

- Yorktown USCG Training Center:
  - Storm Surge: An approximate 2.39 -foot storm surge was observed.

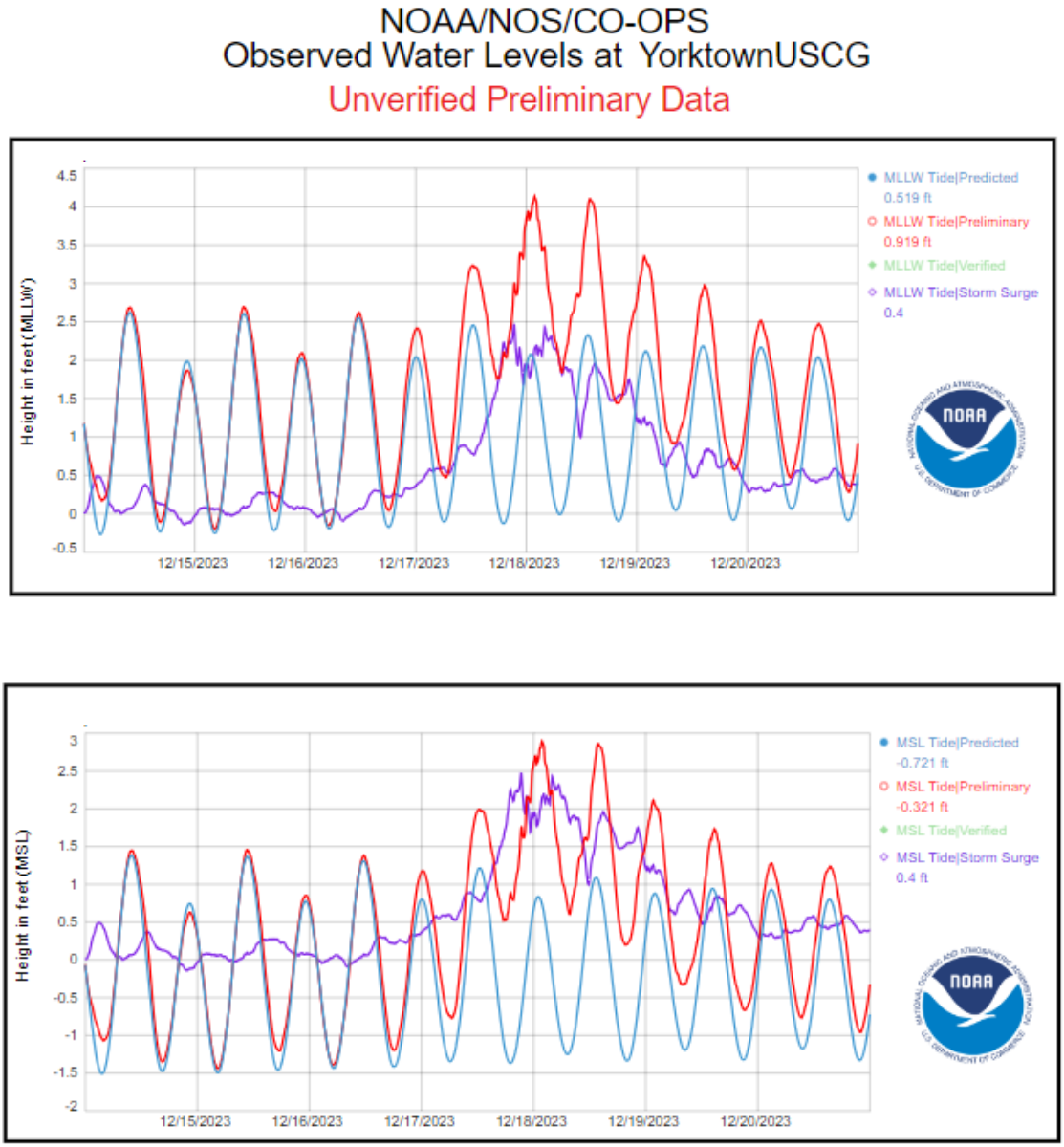
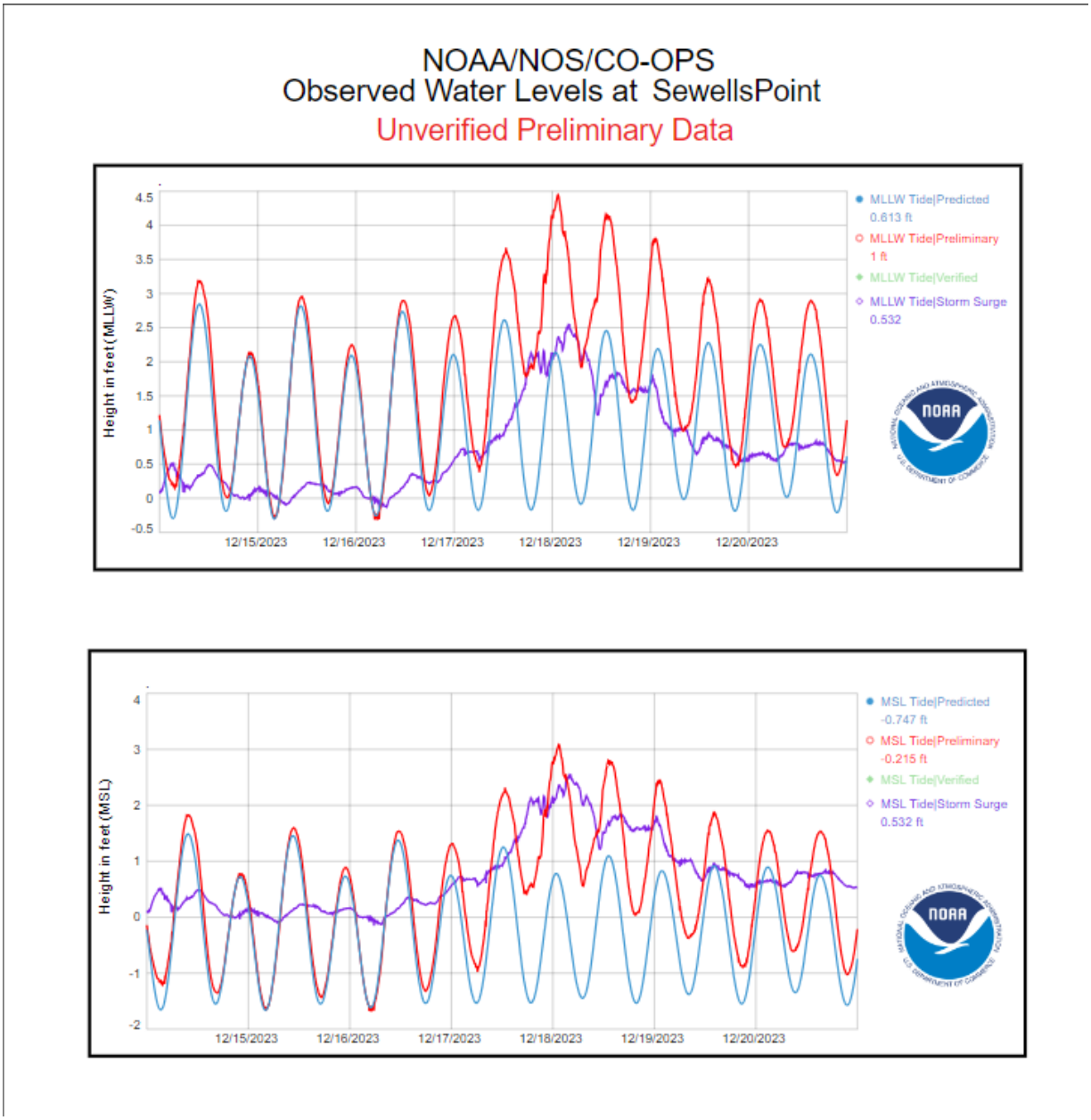


Figure 1. Preliminary data obtained from NOAA and a connection with Open Weather

- Sewells Point Tide Station:
  - Storm Surge: An approximate 2.5 foot storm surge was observed.



South Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

*Duration represents the minimum amount of time it took to reach the specified RRI.

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Army Base Treatment Plant Service Area[1]		
Bancker Rd (Dovercourt Discharge)	1-year (12hr)	NORF
Taussig Blvd PS	2-year (12hr)	NORF
Atlantic Treatment Plant Service Area[1]		
Callison at GB Locks	1-year (12hr)	CHES
Chesapeake PS 243	2-year (12hr)	CHES
Chesapeake PS 254	DNQ	CHES
Courthouse PRS	1-year (12hr)	VAB
Elbow Rd	2- to 5-year (12hr)	CHES
John B. Dey MLV-AT side	1- to 2-year (12hr)	VAB
Kempsville PRS	5-year (12hr)	VAB
Lagomar IFM at Atlantic TP	5-year (12hr)	VAB
Laskin Rd PRS	2- to 5-year (12hr)	VAB
Pine Tree PRS	1-year (12hr)	VAB
Shipps Corner PRS	1-year (12hr)	VAB
Ches-Liz Treatment Plant Service Area[1]		
Dozier's Corner PS	2-year (12hr)	CHES
Independence PRS	5-year (12hr)	VAB
Northampton Blvd at Wesleyan Dr	2- to 5-year (12hr)	NORF
Providence PRS	1-year (12hr)	VAB
Shore Dr @ Jack Frost	2-year (12hr)	CHES
Nansemond Treatment Plant Service Area[1]		
Bowers Hill PRS	2-year (12hr)	CHES
Cedar Lane PS	5-year (12hr)	PORT
Chesapeake PS 158	2-year (12hr)	CHES
Chesapeake PS 238	2-year (12hr)	CHES
Crittenden Rd_Chuckatuck Rectifier	1- to 2-year (12hr)	SUFF
Deep Creek PRS	2-year (12hr)	CHES
Hill Pt Rectifier	1- to 2-year (12hr)	SUFF
Lake Kilby WTP	1- to 2-year (12hr)	SUFF
Nansemond Main Flow (Effluent)	2- to 5-year (12hr)	SUFF
Pagan River Rectifier	Disconnected	IOW
Pughsville PS	5-year (12hr)	SUFF
Route 337 PRS	2- to 5-year (12hr)	CHES
Smithfield High School	1- to 2-year (12hr)	IOW
Suffolk PS	2-year (12hr)	SUFF
Suffolk PS 81	1- to 2-year (12hr)	SUFF
Suffolk PS 87	DNQ	SUFF
Windsor Duke St PS	DNQ	IOW

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
VIP Treatment Plant Service Area[1]		
Elizabeth River Crossing_Eastern Branch	2- to 5-year (12hr)	NORF
Ferebee Avenue PS	2- to 5-year (12hr)	CHES
Luxembourg Avenue PS	2-year (12hr)	NORF
Rodman Ave PS	1- to 2-year (12hr)	PORT
Va Beach Blvd PS	1- to 2-year (12hr)	NORF
VIP Main Flow (Effluent)	DNQ	NORF

Note:

1. Typical treatment plant service area.

Norfolk International Airport (ORF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
12/17/2023	53 mph	30 mph	11 mph	NE	2.47
12/18/2023	37 mph	21 mph	9 mph	NE	1.34

Tide:

- Sewells Point Tide Station:
  - Storm Surge: An approximate 2.5 foot storm surge was observed.

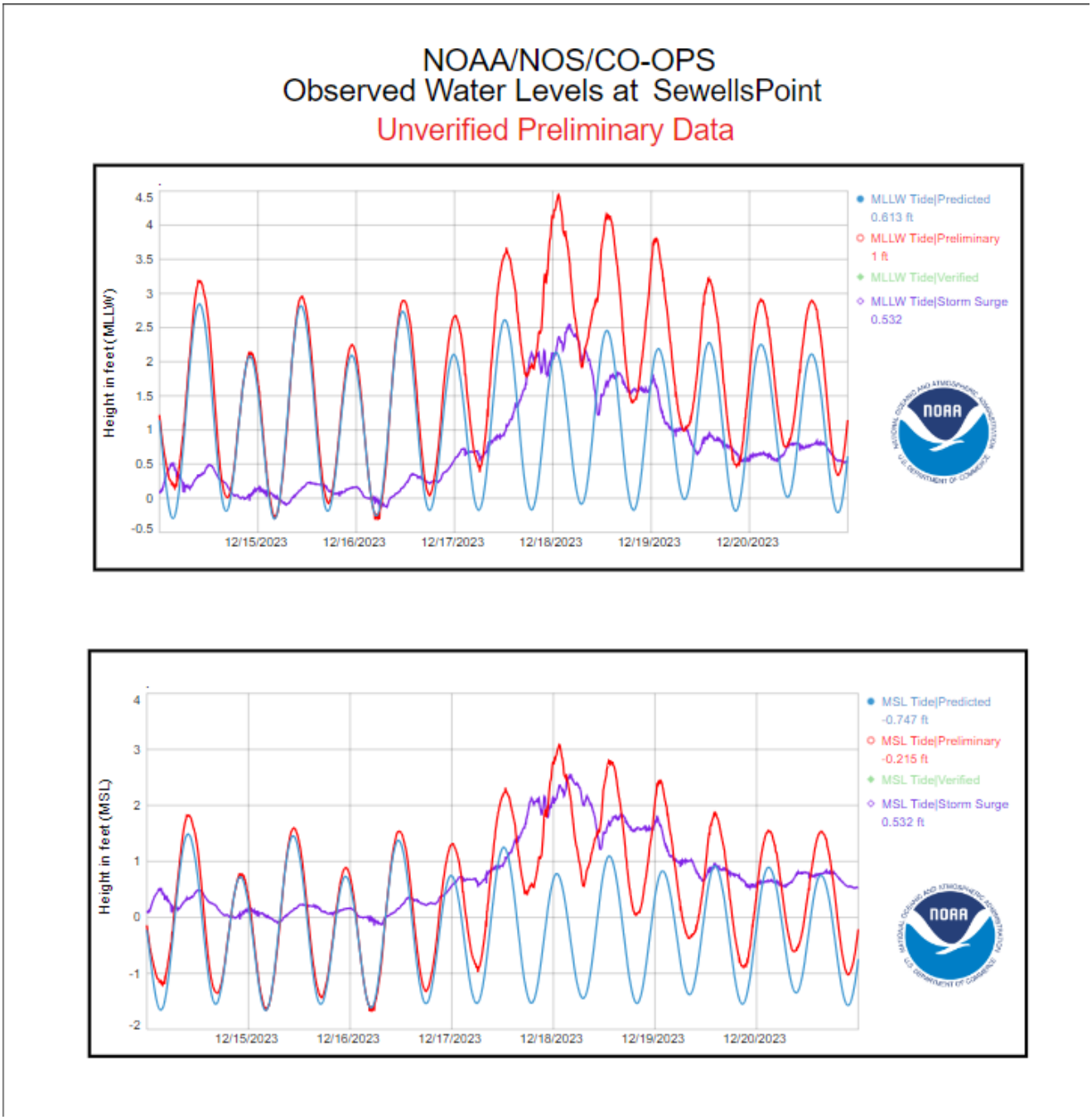


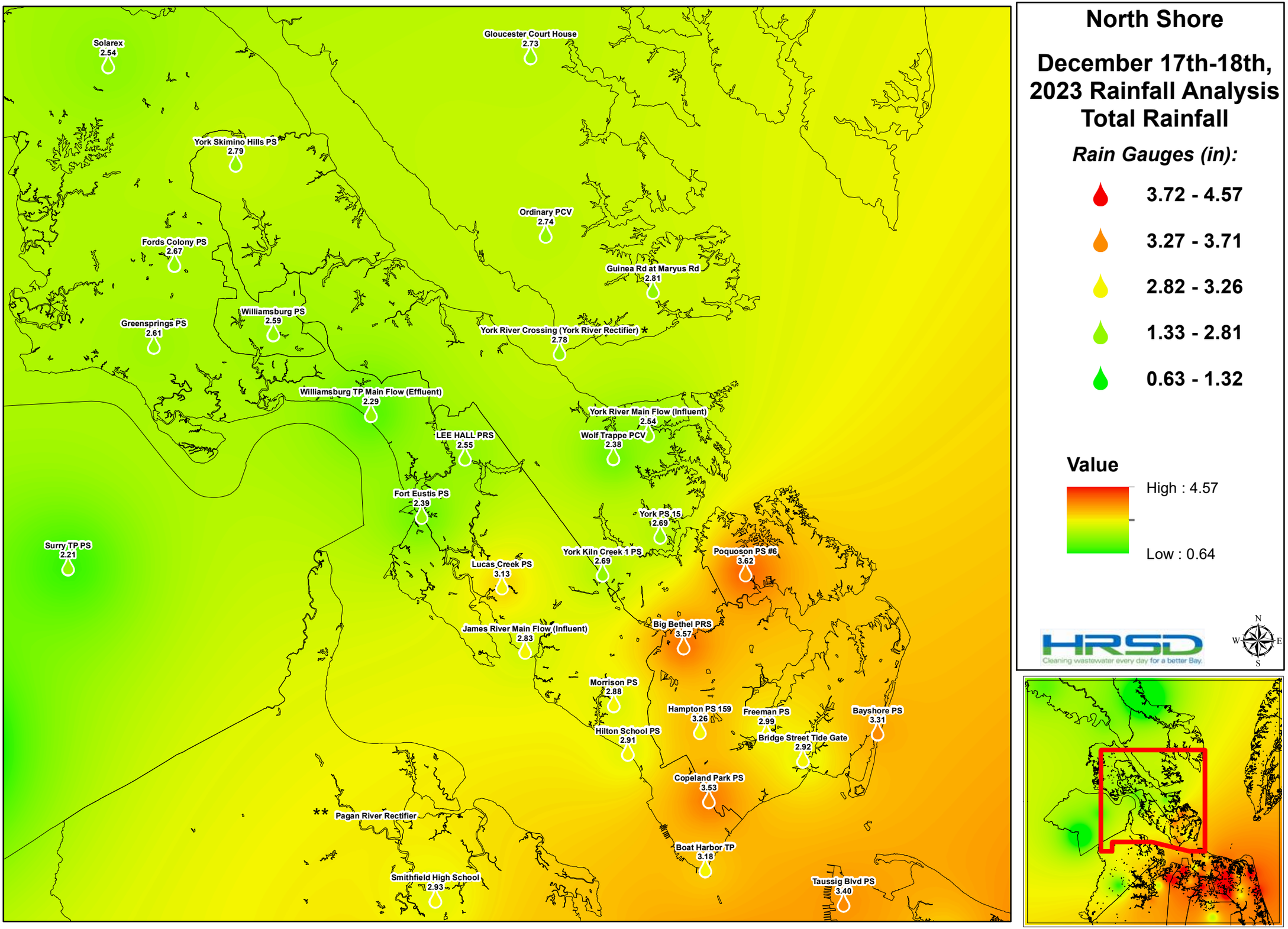
Figure 3. Preliminary data obtained from NOAA and a connection with Open Weather

Shallow Well Analysis:

Shallow wells are located at/or near HRSD Pump Stations to measure groundwater levels. The water column is measured using a pressure transducer located near the bottom of the well. The installed sensor measures gauge pressure in inches of water. The Shallow Well_NAVD88 measurement referenced in Appendix C refers to the elevation (referenced as NAVD 88) of the sensor plus the gauge measurement in feet.

Appendix A

HRSD Rain Gauge Network
Rainfall Totals



North Shore

December 17th-18th, 2023 Rainfall Analysis Total Rainfall

Rain Gauges (in):

- 3.72 - 4.57
- 3.27 - 3.71
- 2.82 - 3.26
- 1.33 - 2.81
- 0.63 - 1.32

Value

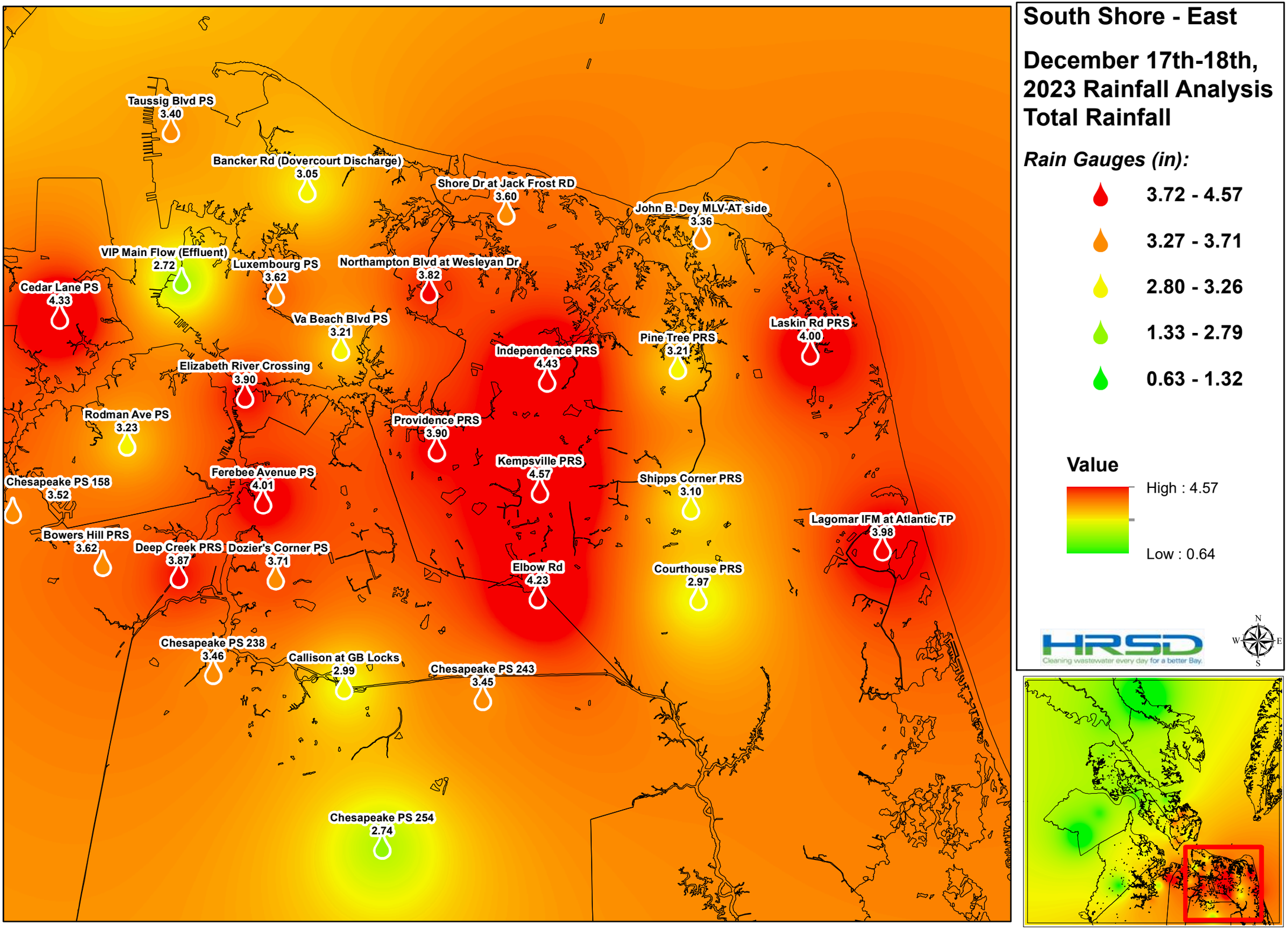
High : 4.57

Low : 0.64

HRSD
Cleaning wastewater every day for a better Bay.

N
W E
S

*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event



South Shore - East

December 17th-18th, 2023 Rainfall Analysis Total Rainfall

Rain Gauges (in):

- 3.72 - 4.57
- 3.27 - 3.71
- 2.80 - 3.26
- 1.33 - 2.79
- 0.63 - 1.32

Value

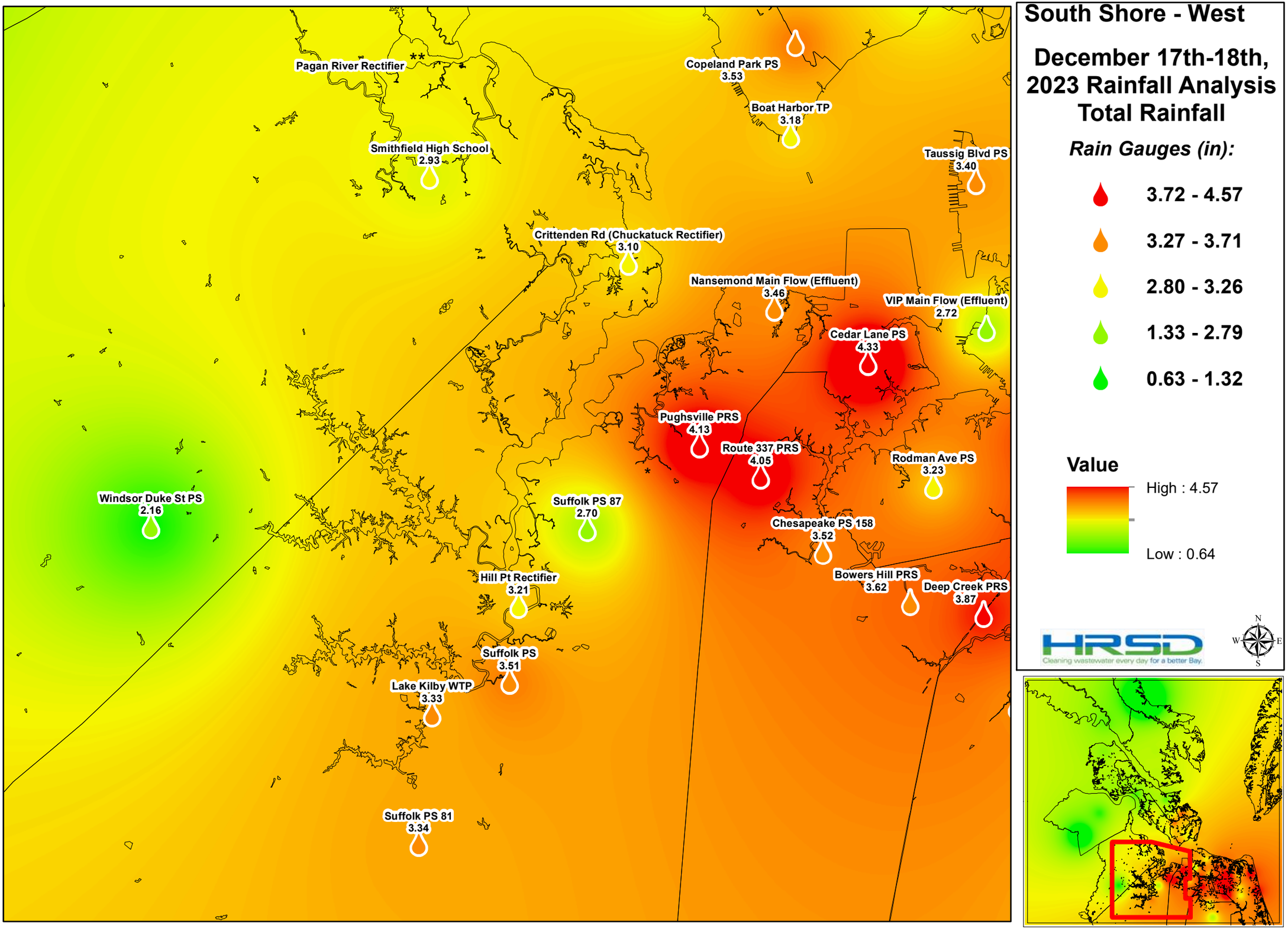
High : 4.57

Low : 0.64

HRSD
Cleaning wastewater every day for a better Bay.

N W E S

*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event



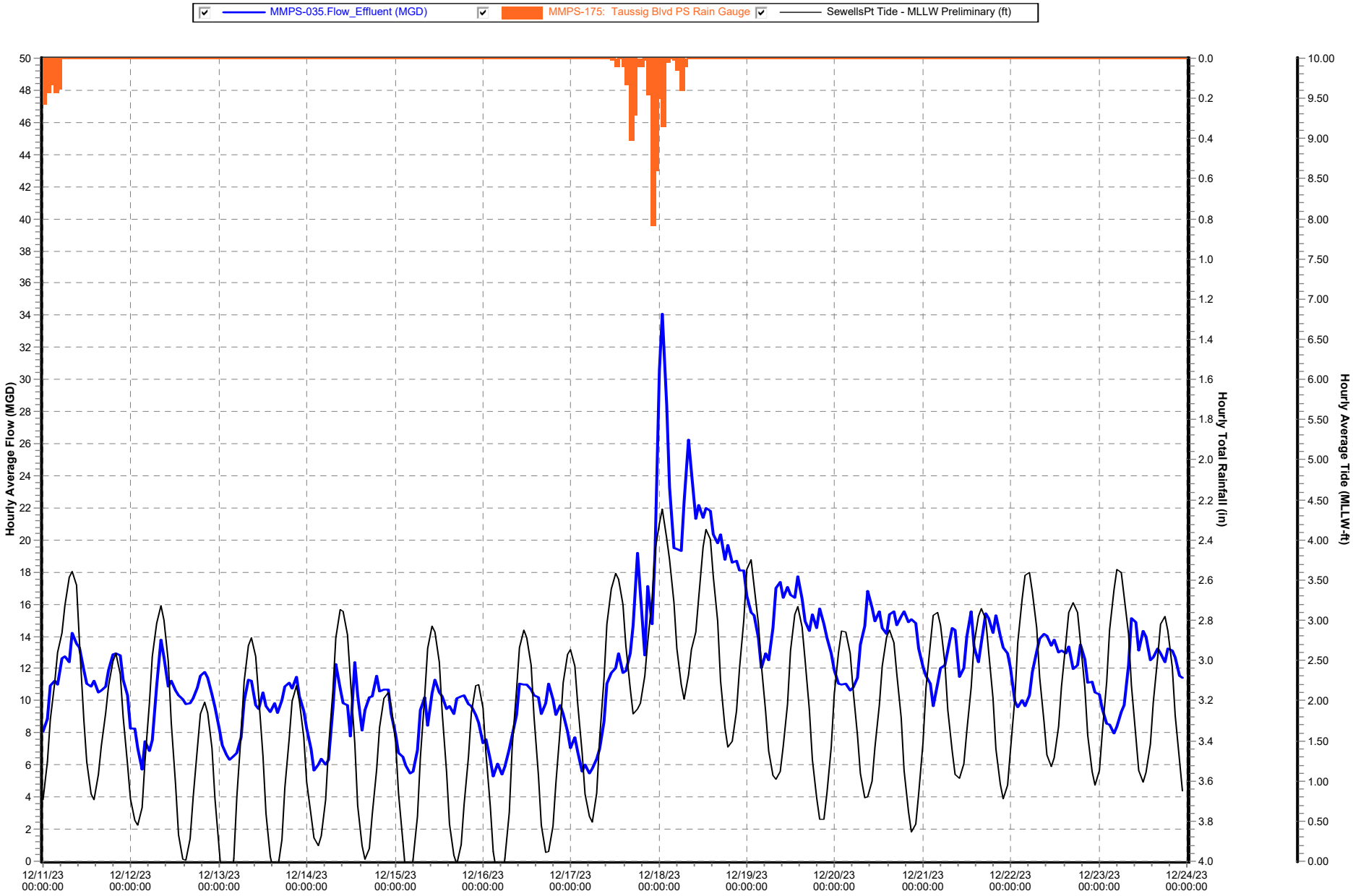
*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event

Appendix B

HRSD Treatment Plant Flows

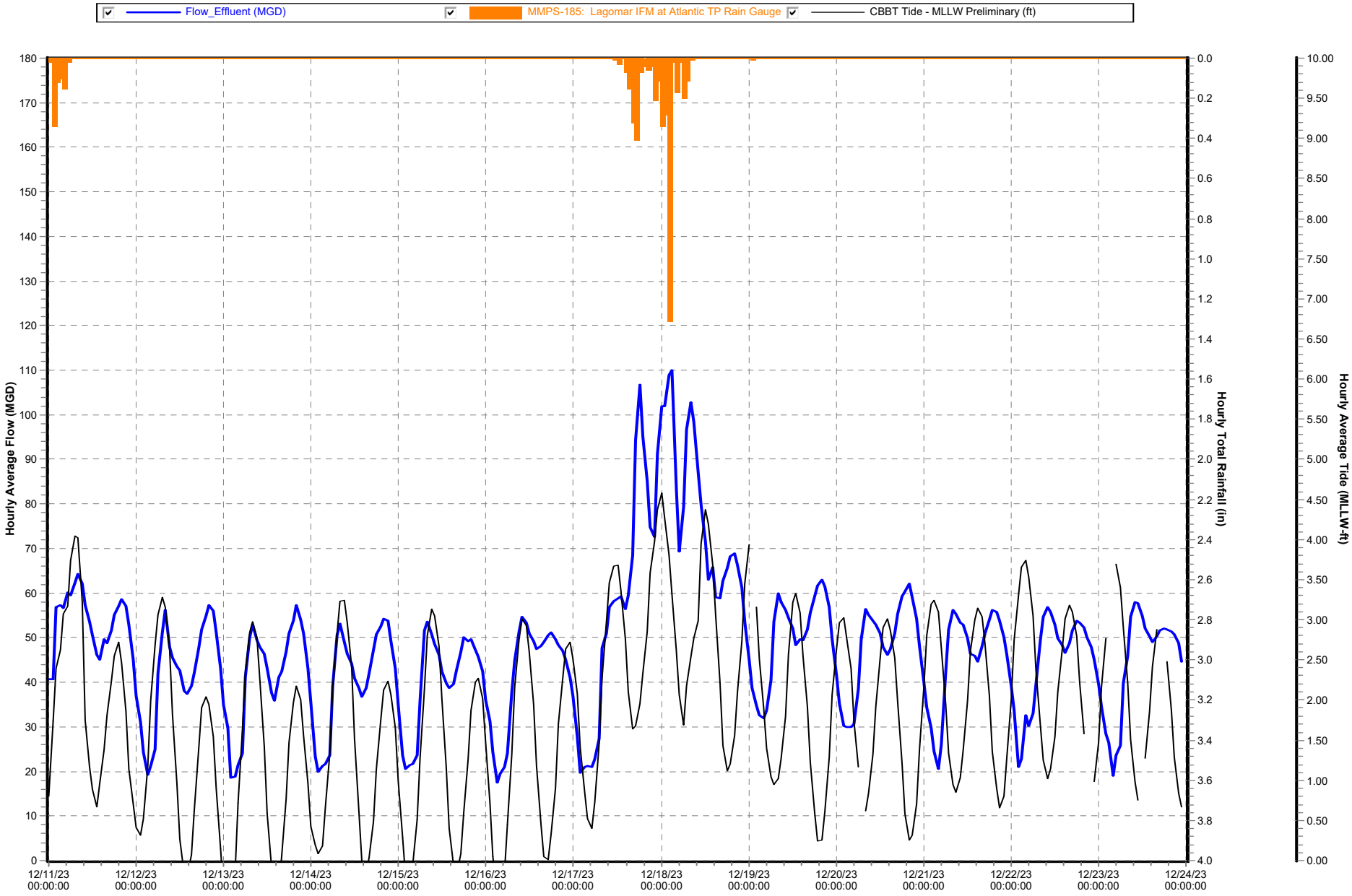
Army Base Treatment Plant

MMPS-035 (12/11/23 to 12/24/23)



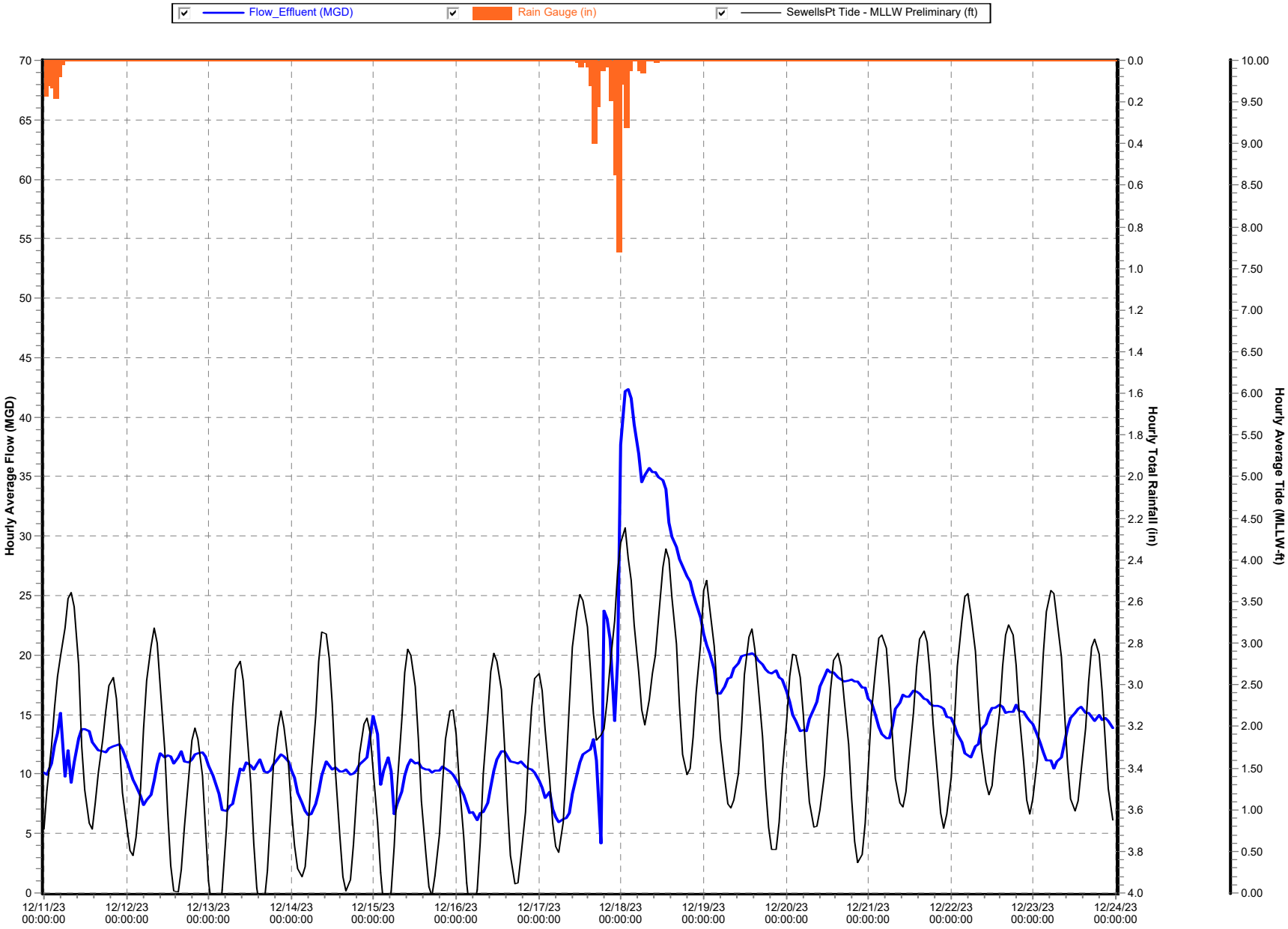
Atlantic Treatment Plant

MMPS-071 (12/11/23 to 12/24/23)



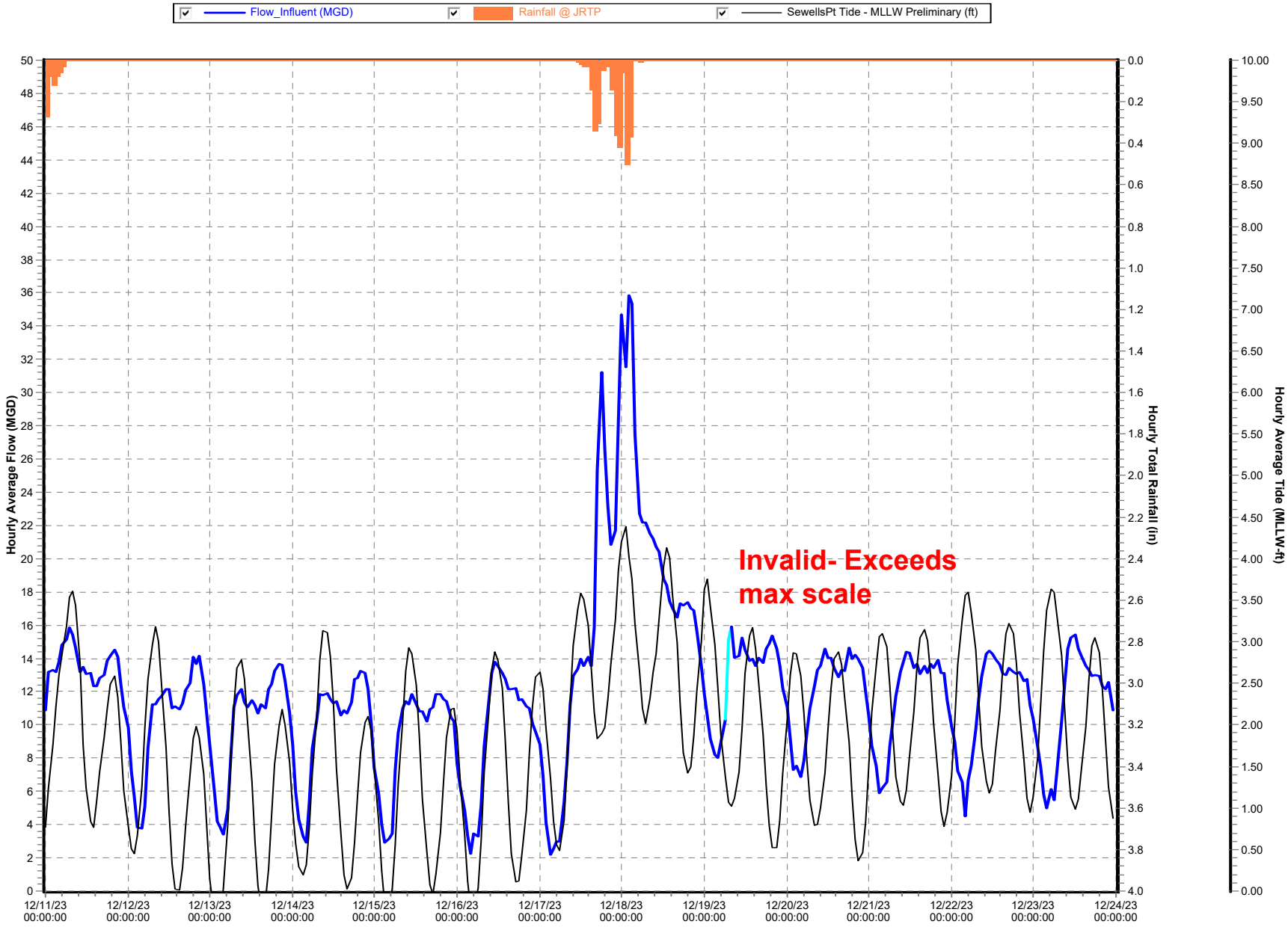
Boat Harbor Treatment Plant

MMPS-075 (12/11/23 to 12/24/23)



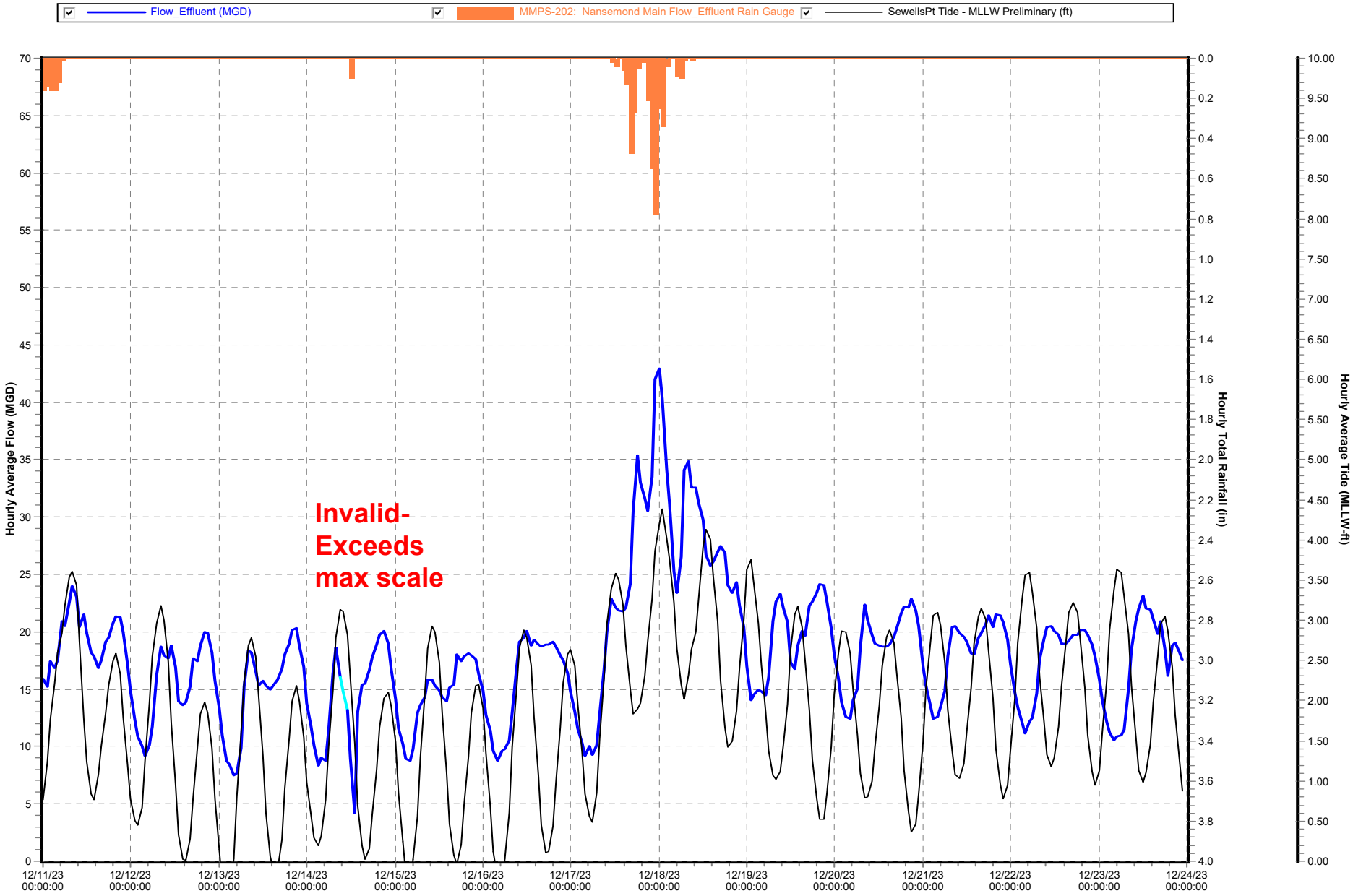
James River Treatment Plant

MMPS-184 (12/11/23 to 12/24/23)



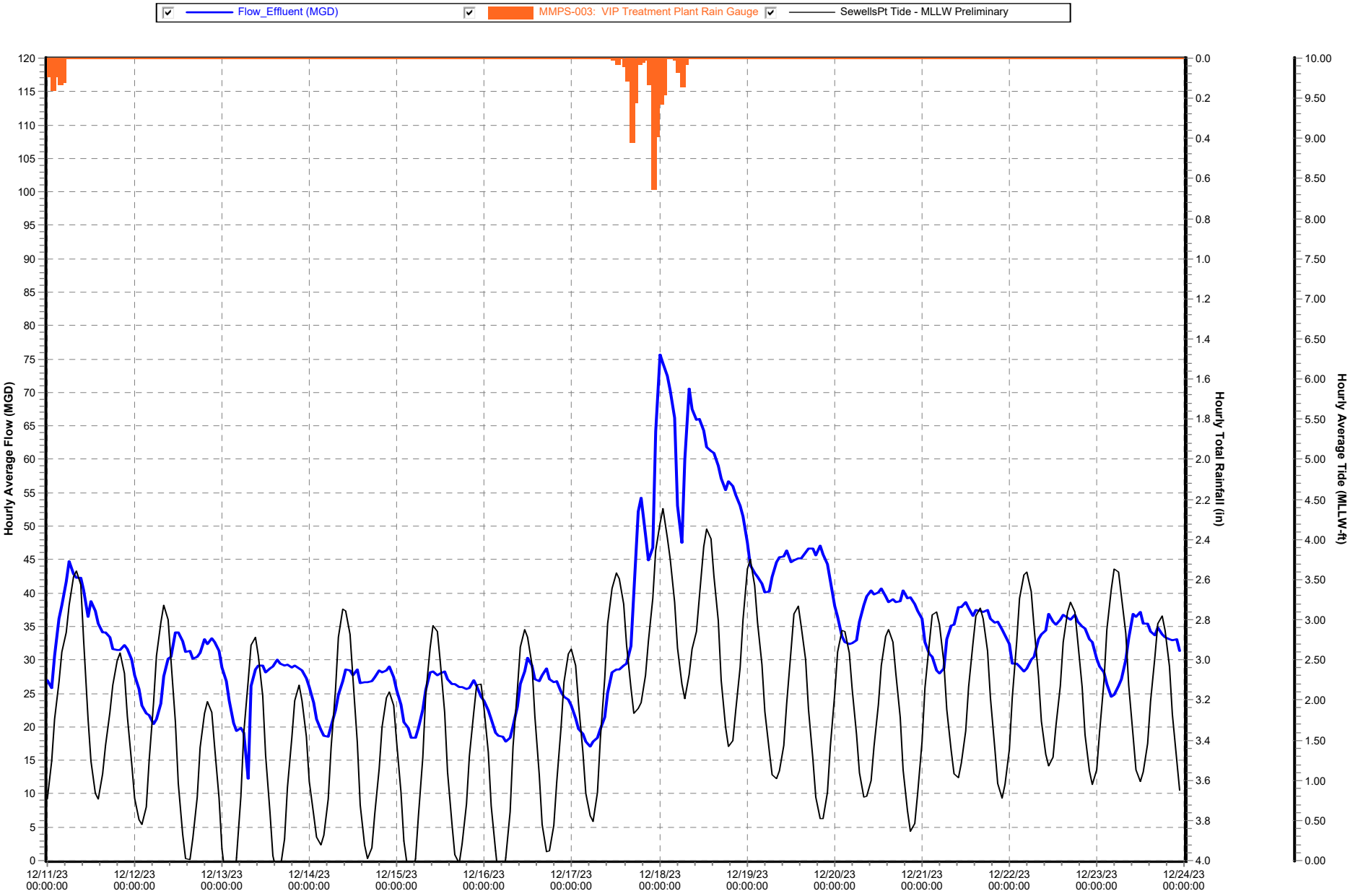
Nansemond Treatment Plant

MMPS-202 (12/11/23 to 12/24/23)



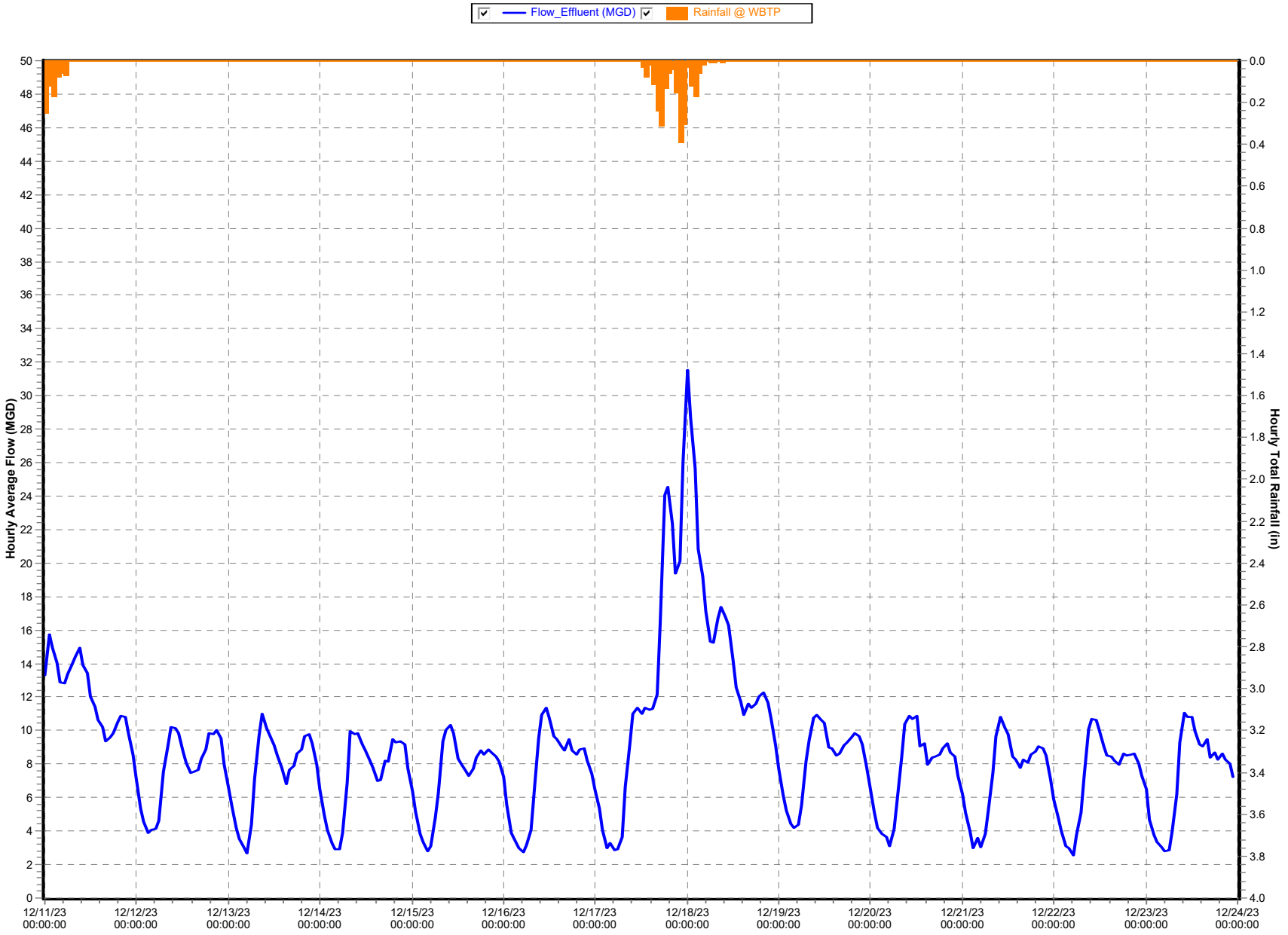
VIP Treatment Plant

MMPS-003 (12/11/23 to 12/24/23)



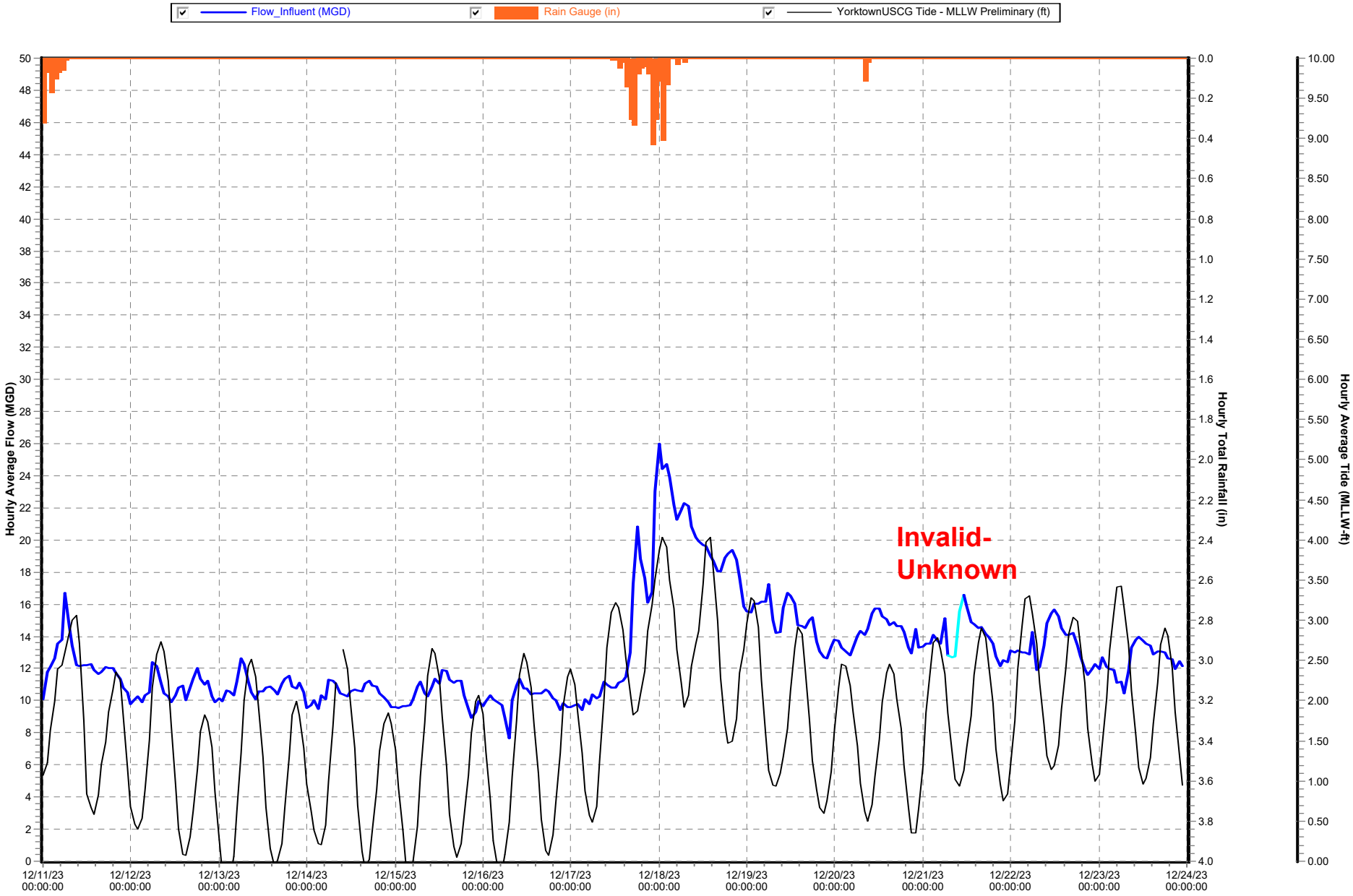
Williamsburg Treatment Plant

MMPS-222 (12/11/23 to 12/24/23)



York River Treatment Plant

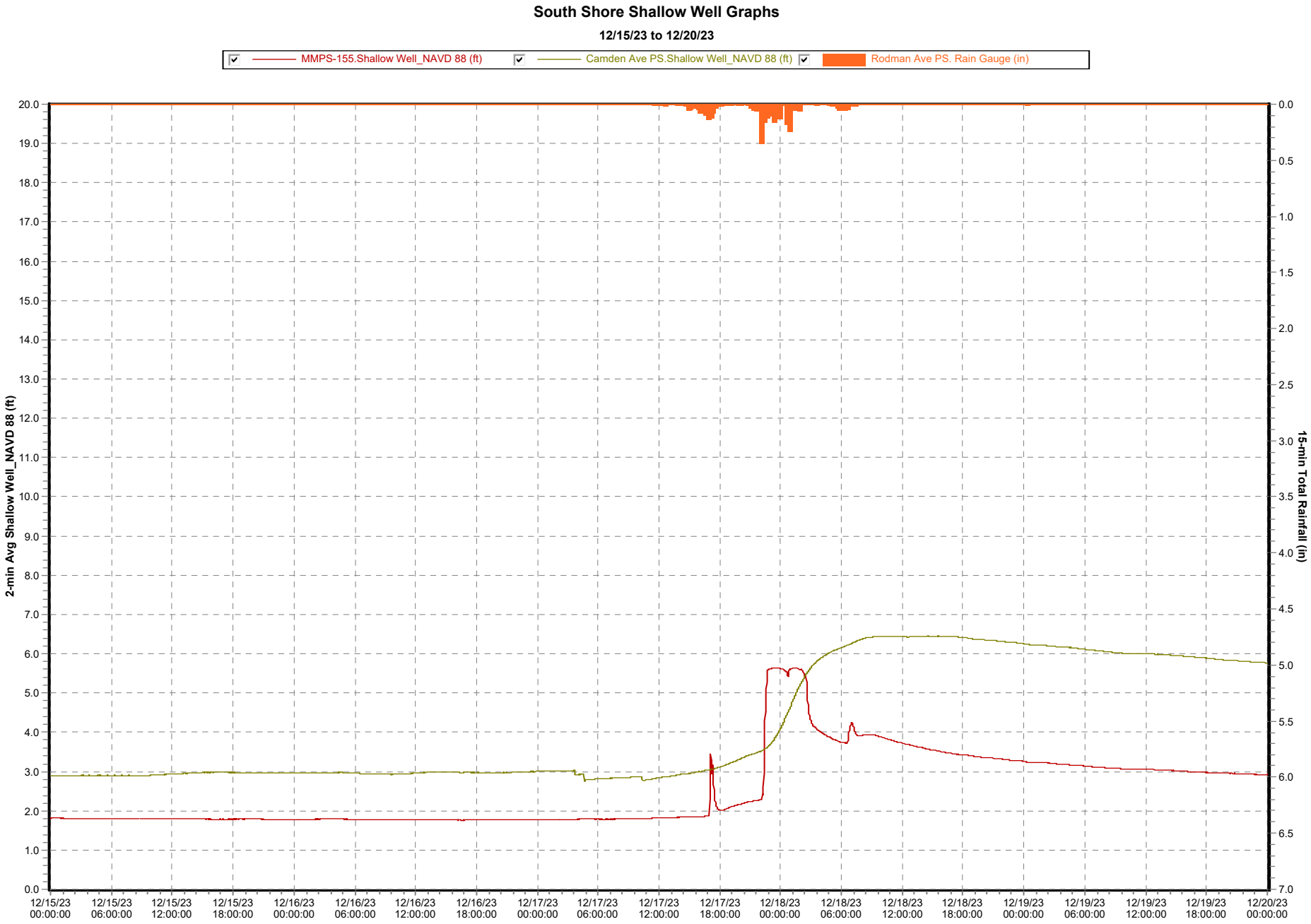
MMPS-235 (12/11/23 to 12/24/23)



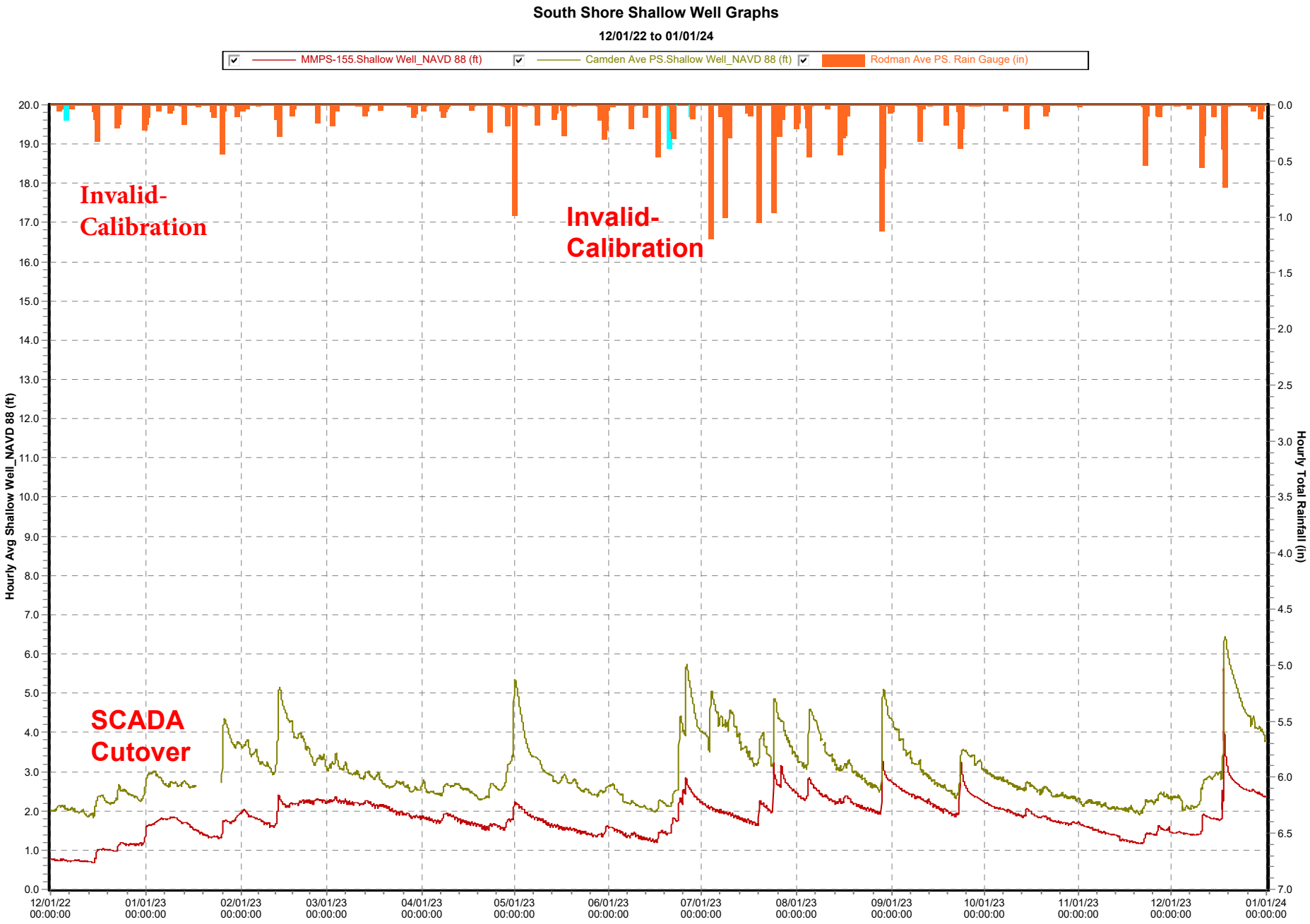
Appendix C

Shallow Well Analysis

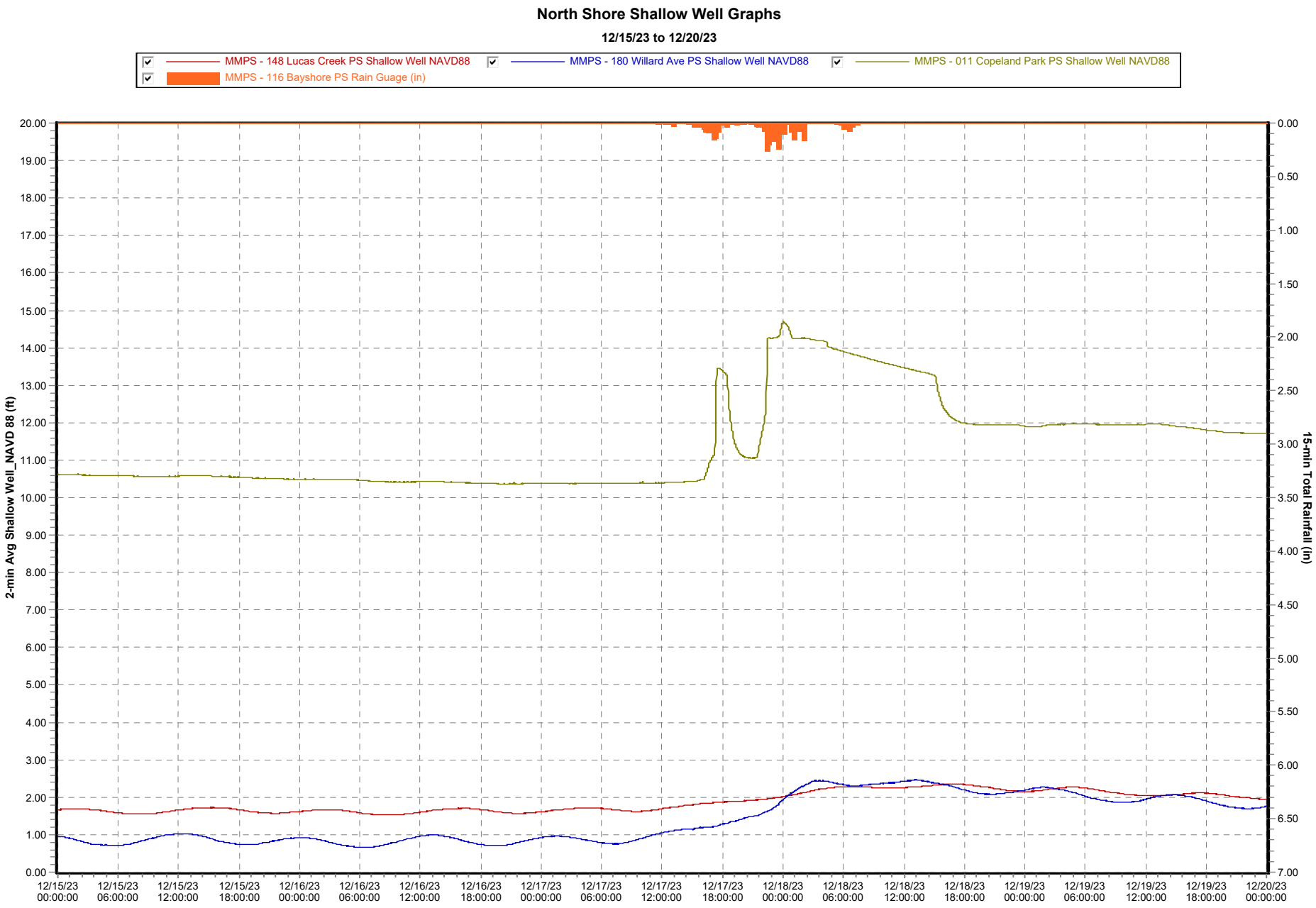
5 Day


South Shore Shallow Well Graphs
12/15/23 to 12/20/23
MMPS-155.Shallow Well_NAVD 88 (ft)
Camden Ave PS.Shallow Well_NAVD 88 (ft)
Rodman Ave PS. Rain Gauge (in)
2-min Avg Shallow Well_NAVD 88 (ft)
15-min Total Rainfall (in)
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
12/15/23 00:00:00
12/15/23 06:00:00
12/15/23 12:00:00
12/15/23 18:00:00
12/16/23 00:00:00
12/16/23 06:00:00
12/16/23 12:00:00
12/16/23 18:00:00
12/17/23 00:00:00
12/17/23 06:00:00
12/17/23 12:00:00
12/17/23 18:00:00
12/18/23 00:00:00
12/18/23 06:00:00
12/18/23 12:00:00
12/18/23 18:00:00
12/19/23 00:00:00
12/19/23 06:00:00
12/19/23 12:00:00
12/19/23 18:00:00
12/20/23 00:00:00

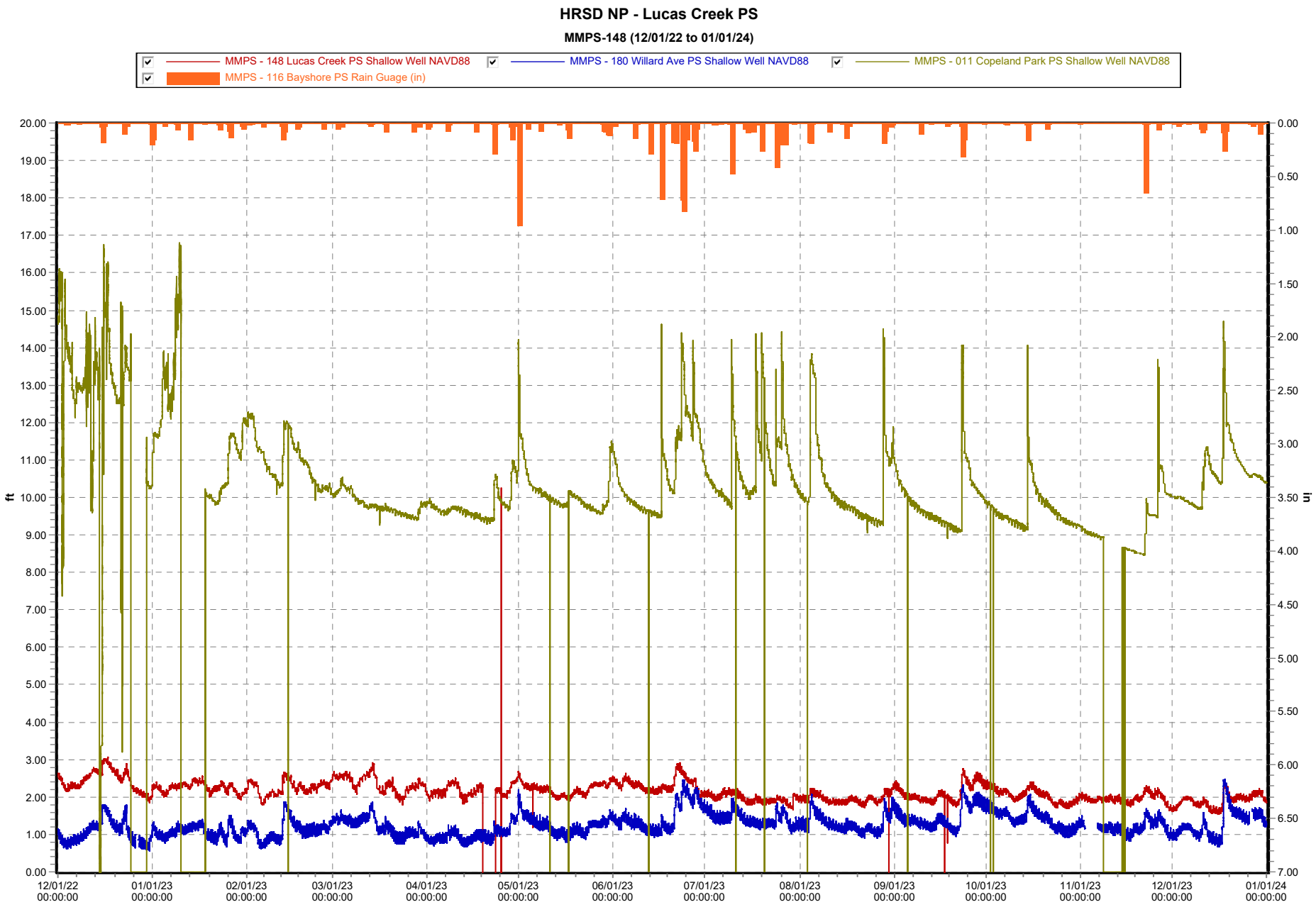
1 Year


South Shore Shallow Well Graphs
12/01/22 to 01/01/24
MMPS-155.Shallow Well_NAVD 88 (ft)
Camden Ave PS.Shallow Well_NAVD 88 (ft)
Rodman Ave PS. Rain Gauge (in)
Invalid-
Calibration
Invalid-
Calibration
SCADA
Cutover
Hourly Avg Shallow Well_NAVD 88 (ft)
Hourly Total Rainfall (in)
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
12/01/22 00:00:00
01/01/23 00:00:00
02/01/23 00:00:00
03/01/23 00:00:00
04/01/23 00:00:00
05/01/23 00:00:00
06/01/23 00:00:00
07/01/23 00:00:00
08/01/23 00:00:00
09/01/23 00:00:00
10/01/23 00:00:00
11/01/23 00:00:00
12/01/23 00:00:00
01/01/24 00:00:00

5 Day


North Shore Shallow Well Graphs
12/15/23 to 12/20/23
MMPS - 148 Lucas Creek PS Shallow Well NAVD88
MMPS - 180 Willard Ave PS Shallow Well NAVD88
MMPS - 011 Copeland Park PS Shallow Well NAVD88
MMPS - 116 Bayshore PS Rain Guage (in)
2-min Avg Shallow Well_NAVD 88 (ft)
15-min Total Rainfall (in)
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.00
6.50
7.00
12/15/23 00:00:00
12/15/23 06:00:00
12/15/23 12:00:00
12/15/23 18:00:00
12/16/23 00:00:00
12/16/23 06:00:00
12/16/23 12:00:00
12/16/23 18:00:00
12/17/23 00:00:00
12/17/23 06:00:00
12/17/23 12:00:00
12/17/23 18:00:00
12/18/23 00:00:00
12/18/23 06:00:00
12/18/23 12:00:00
12/18/23 18:00:00
12/19/23 00:00:00
12/19/23 06:00:00
12/19/23 12:00:00
12/19/23 18:00:00
12/20/23 00:00:00

1 Year


HRSD NP - Lucas Creek PS
MMPS-148 (12/01/22 to 01/01/24)
MMPS - 148 Lucas Creek PS Shallow Well NAVD88
MMPS - 180 Willard Ave PS Shallow Well NAVD88
MMPS - 011 Copeland Park PS Shallow Well NAVD88
MMPS - 116 Bayshore PS Rain Guage (in)
ft
in
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.00
6.50
7.00
12/01/22 00:00:00
01/01/23 00:00:00
02/01/23 00:00:00
03/01/23 00:00:00
04/01/23 00:00:00
05/01/23 00:00:00
06/01/23 00:00:00
07/01/23 00:00:00
08/01/23 00:00:00
09/01/23 00:00:00
10/01/23 00:00:00
11/01/23 00:00:00
12/01/23 00:00:00
01/01/24 00:00:00

Appendix B. Definitions

"Bypass" shall mean the intentional diversion of waste streams from any portion of a treatment facility, as defined by 40 C.F.R. § 122.41(m).

"HRSD SS System" or "HRSD Sanitary Sewer System" shall mean the wastewater collection and transmission systems, including all pipes, Force Mains, Gravity Sewer Lines, lift stations, Pumping Stations, Pressure Reducing Stations, manholes, and any other appurtenances thereto, which are owned or operated by HRSD as of the Effective Date of this Consent Decree, and which serve the Localities. It does not include the portions of the sewer system that serves the Middle Peninsula communities within King William County, King and Queen County, Middlesex County, and Mathews County.

"Non-potable water (NPW)" is fully treated and chlorinated final effluent.

"Prohibited Bypass" shall mean a Bypass within the meaning of 40 C.F.R § 122.41(m)(4).

"Sanitary Sewer Overflow" or "SSO" shall mean an overflow, spill, diversion, or release of wastewater from or caused by the Regional SS System. This term shall include: (i) discharges to waters of the State or United States from the Regional SS System and (ii) any release of wastewater from the Regional SS System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups.

"Sanitary Sewer Discharge" or "SSD" shall mean any discharge to waters of the State or the United States from the HRSD SS System through a point source not authorized in any Permit.