BALTIMORE CITY
MS4 ANNUAL REPORT

Reporting Period: July 1, 2021 to June 30, 2022

BALTIMORE CITY
DEPARTMENT OF
PUBLIC WORKS

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1 Introduction

This report includes the progress of compliance for the period of Fiscal Year (FY) 2022, in association with Baltimore City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permits (Permit Number: 11-DP-3315 and 20-DP3315, MD0068292). Permit 11-DP-3315 was issued on December 27, 2013 and will be referenced as the previous permit. Although that permit expired on December 27, 2018, it was administratively continued and the City remained responsible for compliance of those permit conditions. Permit 20-DP-3315 was issued on November 5, 2021 and will be referenced as the current permit in this report. Annual report periods follow the City's fiscal calendar: July 1 to June 30, so this reporting period will cover both permits. This Annual report has been formatted to match the reporting requirements as listed in Part V.A of the current MS4 permit.

1.1 Permit Administration

The following individual was designated to act as a liaison between the City and the Maryland Department of Environment (MDE) for the implementation of both the previous and current permit:

Kimberly L. Grove, P.E.
Chief, Office of Research and Environmental Protection
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Kimberly.grove@baltimorecity.gov

Two organization charts (as of June 30, 2022) are provided in Appendix A of this report:

- City agency organization chart with designations of MS4 permit condition responsibilities.
- DPW organization chart.

In November 2020, a new mayor, city council president and comptroller were elected for the City. Brandon M. Scott was elected mayor. He created a new position of Chief Administrator Office and hired Chris Shorter. Nick Mosby was elected as city council president; 5 of the 14 City council members were also newly elected. Finally, Bill Henry was elected as comptroller.

Within the Department of Public Works, Jason Mitchell was hired as the Director; Matt Garbark resumed his role as Deputy Director. The Office of General Counsel was moved from the City's Law Department to DPW; Darnell Ingram was selected as chief. Three divisions (Office of Compliance and Research, Office of Quality Assurance, and Office of Boards and Commissions) were moved within this work unit. Audree Jones-Taylor was hired as the Chief of Staff. Julie Day departed as the Chief Administrative Officer and the Chief of Staff assumed this role while vacant.

1.2 Legal Authority

The City maintained adequate legal authority in accordance with NPDES regulations 40 CFR 122.26(d) (2) (i) during FY 2022.

2 Implementation Status

Table 2-1 is a summary of the status for implementing the permit conditions under the current permit, as of the end of the fiscal year. The status is shown in bold text.

Table 2-1: Summary of Implementation Status

Permit Condition	Description	Due	Status as of June 30, 2022
Part IV.C. Source Identification	Georeferenced database shall be in accordance with Geodatabase (May 2017).	Annual report	MDE issued the new database in 2021; the transition is **in progress**. See Appendix B for a progress summary.
Part IV.D.1 Stormwater Management	Identification of problems and modifications of ESD to MEP	Annual report	**No Action Needed**
	Modification to ordinances to eliminate impediments to ESD to MEP	Annual report	**No Action Needed**
Part IV.D.2 Erosion and Sediment Control	Inventory of projects > 1 acre of disturbance	Quarterly	**Completed**. See Section 5.2 and Quarterly Grading Permit feature class table of the MS4 Geodatabase (Appendix C).
Part IV.D.3 Illicit Discharge Detection and Elimination	Alternative program for field screening (min. 150 prioritized outfalls)	11/5/22	**Completed**. The City is using the same alternative analysis (Ammonia Screening) since 1998. See Section 5.3.1 and Appendix D.
Part IV.D.4.a -b NPDES General Permits	A list of City properties currently covered under the NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity.	Annual Report	**No action needed**. No changes since FY 2020, under 12SW. 20SW final issuance was pending.
	Good housekeeping plan (GHP) for City-owned properties not required Maryland's SW Industrial GP	3rd year Annual Report (12/31/24)	**On track**. See Section 5.4.2.
Part IV.D.4.d Winter Weather Deicing and Anti-icing Materials	City Salt Management Plan (SMP)	3rd year Annual Report (12/31/24)	**On-track**. See Section 5.4.6.
	Track and record amount of materials used, and snowfalls in inches / event, if applicable	4th year Annual Report and thereafter	**On-track**. See Section 5.4.6.
Part IV.D.4.e Trash and Litter	Evaluate current litter control problems associated with discharges into, through, or from portions from its MS4 that are not already	Annual Report	**Completed** under previous permit. See Section 5.4.3.

Permit Condition	Description	Due	Status as of June 30, 2022
	addressed under the TMDL implementation plans for trash		
	Continue to remove or prevent from entering its storm drain system 300 tons litter and debris	Annual Report	**Completed**. See Section 5.4.4.
Part IV.D.6 Public Education	Conduct a minimum 15 outreach efforts per year	Annual Report	**Completed**. See Sections 5.5.
Part IV.E. Stormwater Restoration	Continue annual alternative control practices at the same level of prior permit or replace with BMPs, programmatic initiatives or alternative control practices to equate to 5,701 acres	Annual Report	**Completed with issues** that will be resolved in FY 2023. See Section 5.4.3 and 5.4.4.
	Commence and complete the restoration of 3,696 impervious acres that have not been treated to the MEP by implementing stormwater BMPs, programmatic initiatives or alternative control practices in accordance with the 2021 Accounting Guidance.	11/4/26	**On-track**. See Section 6.1.
	Complete the stormwater BMPs, programmatic initiatives or alternative control practices listed in Year 1 BMP Portfolio, individual practices may be replaced as long as total restoration exceeds benchmark schedule	11/4/22	**Completed with alternatives** to meet the milestone goal. See Section 6.1.
	Evaluate progress toward meeting its annual restoration benchmark (Table 1 of the permit).	Annual Report	**On-track**. No adjustments requested.
Part IV. F Citywide TMDL Stormwater Implementation Plan	Address all outstanding comments needed for Department's approval of TMDL Implementation Plans that have not yet been approved.	11/5/2022	**On track**. See Section 6.3

Permit Condition	Description	Due	Status as of June 30, 2022
	TMDL Implementation Plan to document progress toward meeting TMDL WLAs as net pollutant reduction achieved annually and cumulatively	Annual Report	**Completed** as TIPP for nutrients and sediment. See Section 6.3 and Appendix M.
	Update of City's efforts to reduce trash, floatables, and debris	Annual Report	**Completed**. See Section 5.4.3.
Part IV.F.1 BMP Effectiveness Monitoring	Decision to (1) collaborate with the MDE in the CBT Pooled Monitoring Advisory Committee or (2) continue monitoring the Moore's Run Watershed for BMP effectiveness	5/5/22	**Completed**. Selected Pooled Monitoring. See Section 3.4.
	For pooled monitoring on BMP effectiveness: MOU with CBT for annual payment of $100,000	9/1/22 and each year following	**Completed**. See Section 3.4.
Part IV.F.2 Watershed Assessment Monitoring	Decision to (1) collaborate with the MDE in the CBT Pooled Monitoring Advisory Committee or (2) watershed assessment and trend monitoring	3/5/22	**Completed**. Selected Watershed assessment and trend monitoring. See Section 3.2.
	Comprehensive plan for watershed assessment and trend monitoring related to stream biology and habitat, bacteria, and chlorides, following the 2021 Monitoring Guidelines	3/5/23	**On track**. See Section 3.2.
Part IV.F.3 PCB Source Tracking	PCB Source Tracking Monitoring Plan	11/5/22	**On track**. See Section 6.3.4.
Part IV.G. Program Funding	Fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit	Annual Report	**Completed**. See Section 4 and Appendices H and I.

In FY 2022, Baltimore City initiated the migration of the source identification data to the revised geodatabase schema, per MDE's "Draft Supplement User's Guide to the Database", dated November 2021. A summary of the migration efforts is provided in Appendix B. The majority of the effort was focused on the BMP and Alternative BMP tables. In addition to the geodatabase schema upgrades, the City's addressed the following comments from MDE:

- Rest BMP feature class: The are no BMPs or restoration BMPs with built dates after 2016. Provide the missing data.
- BMP inspections: 36 BMP inspection records have incomplete BMP inspection records had an incomplete BMP ID “BC00BMP00000”.
- BMP inspections: 89 records were not assigned a BMP_ID
- Rest BMP – 57 had incomplete RESTBMP_ID “BC18RST000”
- Some BMP inspection records are duplicates and need to be removed
- Historical inspection records should not be included.
- AlterBMPLine Inspections and AltBMPPoly inspection tables must include inspection frequencies.
- Clarification on impervious acres removed data associated with FPU. Use the right term.
- Rest BMP FC – confirm status of projects.

The geodatabase also included rules for completed records related to mandatory fields. As a short-term solution to complete the database, Baltimore City used designated values as a “null” value. These values are listed in Appendix B.

3 Narrative Summary of Data

3.1 Weather Conditions

3.1.1 Rainfall

BWI Airport is the nearest NOAA weather station to the City. Precipitation data from that weather station in shown in Table 3-1. FY 2022 had the lowest number of rain events (daily precipitation exceeding 0.1 inch) in the last 8 fiscal years; however, the total rainfall was within the typical range. Twelve (12) rain events totaled more than one inch during the calendar day at BWI, with the largest event recorded as 4.13 inches on September 1, 2021. According to Atlas 14, this 24-hour storm at BWI is equivalent to a 5-year storm.

Table 3-1: Summary of Annual Rainfall (NOAA)

Fiscal Year	2015	2016	2017	2018	2019	2020	2021	2022
Rainfall, in.	55	42	38	44	68	39	53	42
Days > 0.1 in	85	76	73	74	96	75	89	62
Days > 1 in	11	8	9	13	14	8	13	12

Baltimore City DPW operates and maintains a series of rain gauges as part of the City's Flood ALERT system. Figure 3-1 shows all rain gauges in the system; the stations listed in Table 3-2 are highlighted in yellow. Sixteen (16) rain events totaled more than one inch during the calendar day; however, only six (6) of those events measured more than one inch of rainfall at all four locations. The top three highest rainfalls occurred on September 1, 2021 (3.72 inches); October 25 (2.20 inches); and October 29, 2021 (2.96 inches); all other rain events totaled less than 1.5 inches within the calendar day. The rainfall records for the four rain gauges demonstrate variability of rainfall across the City and compared to NOAA's BWI Airport system, as shown in Table 3-2 and Figure 3-2. This variability can affect evaluations of the influence on rain events on stream monitoring results and trash / debris collection operations.

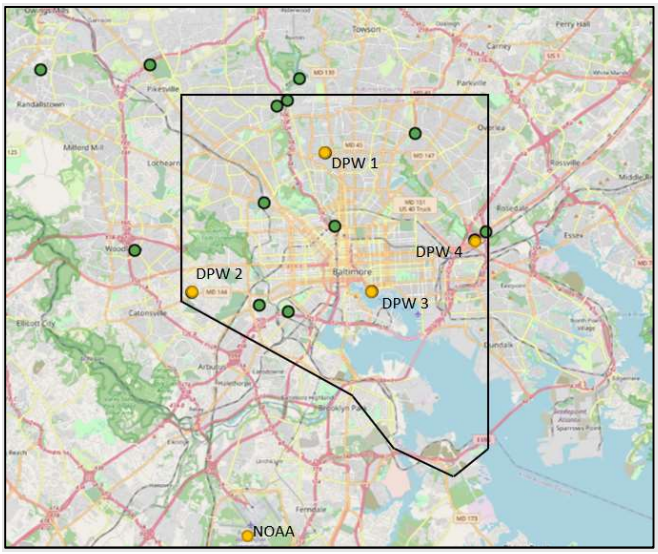


Figure 3-1: Map of DPW Rainfall Gauges within City

Table 3-2: Summary of Variability in Rainfall Data for Baltimore in FY 2022

Location	NOAA	DPW 1	DPW 2	DPW 3	DPW 4
Total Rainfall, in	42	36.8	36.9	40.6	41.2
Days > 0.1 in	62	68	69	66	62
Days > 1.0 in	12	10	9	12	12
Max. Daily Rainfall	4.1	2.0	3.0	2.9	3.7

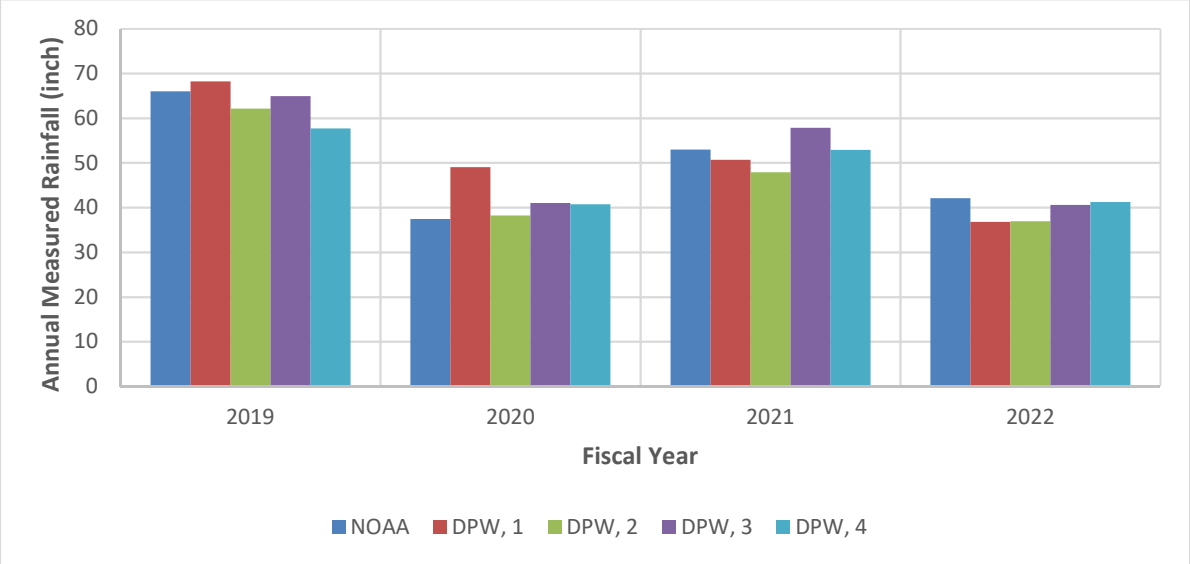


Figure 3-2: Summary of Annual Rainfall Variability

3.1.2 Temperature

Temperature data from the NOAA weather station at BWI Airport is shown in Figure 3-3, in addition to daily rainfall data from BWI and the maximum daily rainfall measured within the City. Actual temperatures within the City may vary to heat island effect; however, DPW has not established temperature monitoring stations throughout the City to measure variability, similar to the Flood ALERT system described in Section 3.1.1 of this report. The NOAA weather station data is sufficient to assess the potential impacts of temperature and precipitation on trees and plants (i.e. performance of green infrastructure), plus old water mains.

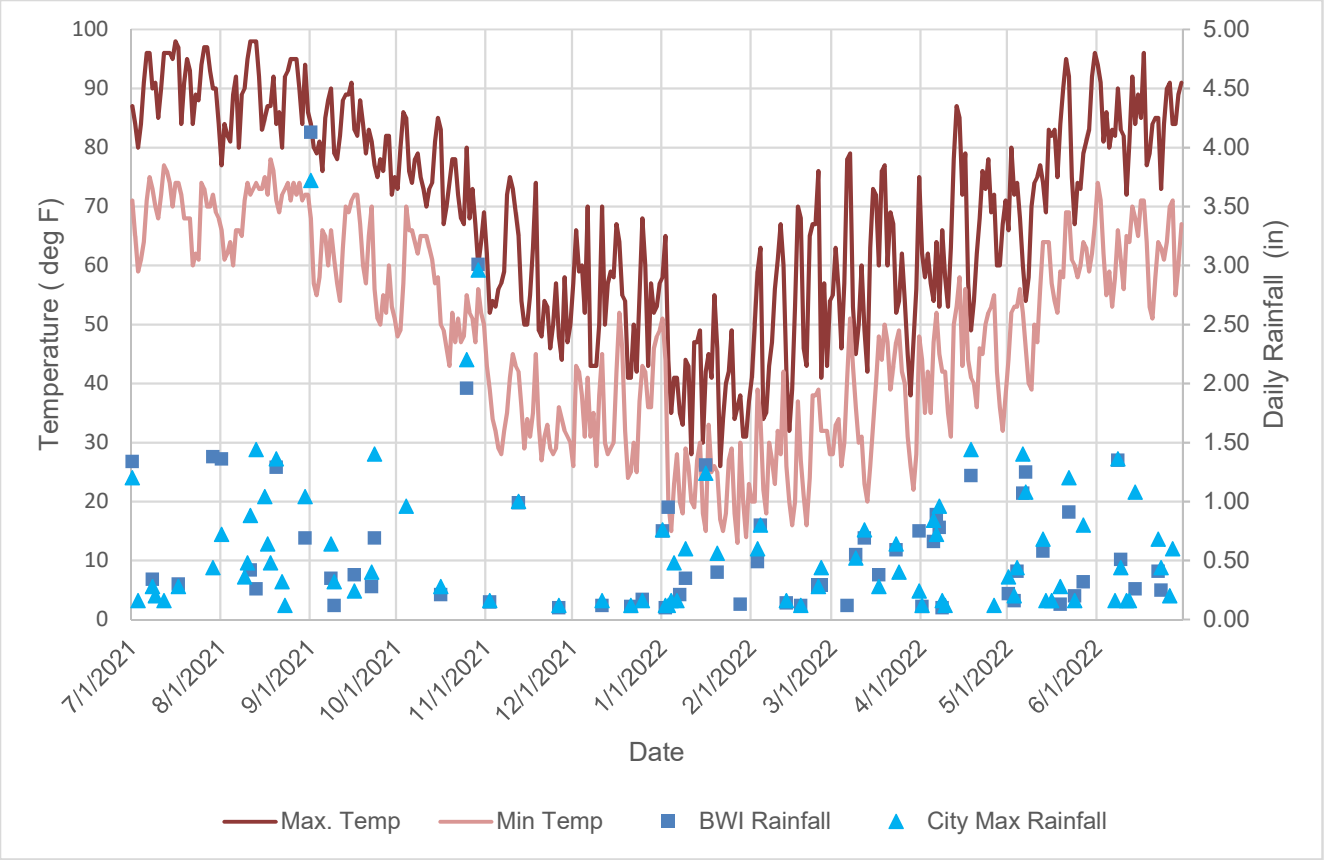


Figure 3-3: Daily Rainfall and Temperature Data for FY 2022

During FY 2022, air temperatures measurements were reported above 90 degrees Fahrenheit (32.2 degrees Celsius) for 41 days: 31 days between July 5 and September 15, 2021 and 10 days between May 21 and June 30, 2022. NOAA historic data for the last 40 years showed this total to range between 8 to 44 days. Freezing temperatures (below 32 degrees Fahrenheit or 0 degrees Celsius) were reported for 81 days between November 5, 2021 and April 11, 2022. Only 5 of those days measured freezing temperatures as both the high and low for the day, with only 2 days being contiguous, so there were no long periods of freezing weather. Snowfall measurements are further described in Section 5.4.6 of this report.

3.2 Stream Impact Sampling

DPW continued the Stream Impact Sampling (SIS) program, which now includes monthly sampling at 33 outfall or stream locations. The SIS program was initiated in 1997; the results are available on-line at the City's website and updated quarterly. The SIS program monitors surface waters for nutrients, sediment, bacteria, metals and other health indicators. The results of the sampling events for this reporting period are included as electronic files (excel format) in Appendix D of this report. Starting in November 2020, DPW temporarily suspended sampling at the Reedbird Ave. site due to construction. Consequently, a new sampling site, Potee St., was established further downstream on the Patapsco River; sampling began on November 17, 2020.

3.2.1 Nutrient Monitoring

During FY 2022, DPW analyzed 371 samples for nutrients (phosphorus and nitrogen). Tables 3-3 and 3-4 show the evaluation of historic nutrient analysis (2009 through the reporting period), following a concept that the State used in its Maryland Water Quality Inventory, 1993-1995. The evaluation identifies the portion of sampling results above the designed threshold for the parameter (0.1 mg/L for total phosphorus and 3 mg/L for total nitrogen). A water quality level was then assigned for each station's sample sets compared to the prescribed threshold: "normal" if the percentage was less than 11% (shaded light green); "elevated" if it was between 11% and 25% (shaded yellow); and "high" if it was greater than 25% (shaded pink).

In addition to the individual sampling results for total phosphorus and total nitrogen components (Appendix D), graphs of the annual results for total phosphorus and total nitrogen (percent of samples in relation to threshold and geometric mean) from FY 2010 to FY 2022 for each station are included in Appendix E and F of this report, respectively.

Every station showed a decrease of annual geometric mean for total phosphorus since FY 2021, except for Western Run which increased from 0.030 to 0.033 mg/L. JF 11.5 showed the largest trending decline in the annual geometric mean from FY 2016 (0.246 mg/L) to FY 2022 (0.073 mg/L). All of the stations showed an annual geometric mean below 0.1 mg / L for FY 2021 and FY 2022. Fifteen (15) stations had no results above the 0.1 mg/L in FY 2022. Only the stations in the Baltimore Harbor (except for Light Street) had 25% or more of the samples above the threshold, indicating consistently high levels.

Only one station (Hamilton Ave.) reported a maximum total phosphorus result exceeding historic data; however, this was a one-time spike coinciding with abnormally high ammonia-nitrogen measurements and TKN results, indicating a potential illicit discharge plume and not a trend. This measurement occurred at the end of the fiscal year; any pollution source tracking investigations will be reported in the FY 2023 MS4 Annual Report. Only Tiffany Run exhibited a higher percentage of total phosphorus above the 0.1 mg/L threshold for FY 2022 compared to the total pre-FY 2022 data set, but 40% of the FY 2011 results above the 0.1 mg/L threshold.

Table 3-3: Summary of Total Phosphorus for SIS Program

Station	Percent of Samples Total Phosphorus >=0.1 mg/L			Maximum Total Phosphorus Results	
	Pre-FY 2022[1]	FY 2022	All Samples	Pre-FY 2022[1]	FY 2022
Back River Watershed Herring Run Sub-watershed					
PERRING PKWY	14%	8%	13%	0.27	0.15
MT. PLEASANT GC	19%	0%	18%	0.42	0.08
CHINQUAPIN RUN	22%	0%	20%	0.46	0.07
TIFFANY RUN	11%	17%	12%	0.29	0.17
HARFORD RD.	14%	0%	13%	0.41	0.05
WRIGHT AVE.	21%	17%	21%	0.42	0.11
PULASKI HWY.	9%	8%	9%	0.51	0.13

Station	Percent of Samples Total Phosphorus >=0.1 mg/L			Maximum Total Phosphorus Results	
	Pre-FY 2022[1]	FY 2022	All Samples	Pre-FY 2022[1]	FY 2022
Back River Watershed Moores Run Sub-watershed					
MARY AVE.	35%	0%	32%	0.87	0.08
HAMILTON AVE.	35%	17%	34%	0.50	0.66
RADECKE AVE.	18%	8%	17%	0.32	0.11
BIDDLE ST. & 62ND ST.	25%	0%	23%	0.40	0.08
Jones Falls Watershed					
SMITH AVE.	21%	0%	19%	0.36	0.05
WESTERN RUN	21%	0%	19%	0.52	0.05
STONY RUN	18%	0%	16%	0.33	0.07
JF 11.5 [2]	76%	17%	67%	3.10	0.28
LOMBARD ST.	27%	0%	25%	0.61	0.09
Gwynns Falls Watershed					
POWDER MILL	34%	17%	33%	0.94	0.13
PURNELL DR.	19%	0%	18%	16.40	0.05
DEAD RUN DNST.	25%	0%	23%	0.33	0.07
GWYNNS FALLS PKWY.	31%	17%	30%	0.42	0.12
GRUN HILTON ST.	29%	0%	27%	0.51	0.08
GF HILTON ST.	21%	0%	19%	0.34	0.06
MAIDENS CHOICE	22%	0%	20%	0.48	0.08
GRUN CARROLL PARK	53%	25%	51%	0.51	0.11
WASHINGTON BLVD.	26%	0%	24%	0.49	0.08
Baltimore Harbor Watershed					
LINWOOD & ELLIOTT [3]	48%	42%	47%	0.58	0.23
LAKEWOOD & HUDSON [3]	37%	25%	35%	0.28	0.24
CENTRAL & LANCASTER [4]	47%	33%	46%	1.40	0.18
LIGHT ST.	34%	8%	32%	2.90	0.14
WARNER & ALLUVION	43%	25%	41%	0.77	0.14
WATERVIEW AVE.	24%	25%	24%	1.90	0.19
JANEY RUN	30%	25%	29%	0.68	0.16
Patapsco River Watershed					
REEDBIRD AVE. [5]	29%	---	29%	0.37	---
POTEE ST. [5]	25%	8%	15%	0.15	0.12

Notes:

1 Pre-FY 2022 includes samples from January 2009 to June 2021.

2 Sampling began at JF 11.5 in January 2016.

3 Sampling began at LINWOOD & ELLIOTT and LAKEWOOD & HUDSON in March 2013.

4 No samples were collected at the CENTRAL & LANCASTER station from January 2017 through March 2019 because access to the station was blocked by construction.

Station	Percent of Samples Total Phosphorus >=0.1 mg/L			Maximum Total Phosphorus Results	
	Pre-FY 2022[1]	FY 2022	All Samples	Pre-FY 2022[1]	FY 2022
5 Construction near REEDBIRD AVE. blocked access to sampling site: last sample collected in October 2020. Began sampling POTEE ST. in November 2020.					
Key					
	Normal: <= 11% of Samples				
	Elevated: Between 11-25% of Samples				
	High: >25% of Samples				

Two (2) stations, Tiffany Run and Hamilton Ave. reported total nitrogen results above historic data during FY 2022. The historically high measurement at Tiffany Run was due to a TKN result of 15.2 mg / L on August 24, 2021; however, the Nitrate+Nitrite+Nitrogen results and Ammonia-nitrogen measurement for the same event were within normal range for that station. All other TKN results were below 0.7 mg / L, indicating a singular event rather than a trend. As previously noted, the Hamilton Ave. result is also considered a singular event.

Seventeen (17) stations had no results above the 3 mg/L for total nitrogen in FY 2022. Only four stations (Hamilton Ave., JF 11.5, Linwood & Elliot, and Lakewood & Hudson) are considered as high, based on the sample results above 3 mg / L, for both historic data and FY 2022.

Table 3-4: Summary of Total Nitrogen for SIS Program

Station	Percent of Samples Total Nitrogen >=3 mg/L			Maximum Total Nitrogen Results	
	Pre-FY 2022[1]	FY 2022	All Samples	Pre-FY 2022[1]	FY 2022
Back River Watershed Herring Run Sub-watershed					
PERRING PKWY	3%	0%	3%	3.74	1.93
MT. PLEASANT GC	11%	0%	10%	8.07	2.51
CHINQUAPIN RUN	23%	0%	21%	5.78	2.75
TIFFANY RUN	9%	8%	9%	4.91	16.25
HARFORD RD.	9%	0%	8%	6.86	2.14
WRIGHT AVE.	3%	0%	3%	5.49	1.84
PULASKI HWY.	8%	0%	7%	4.24	2.78
Back River Watershed Moores Run Sub-watershed					
MARY AVE.	18%	0%	17%	8.91	2.95
HAMILTON AVE.	55%	50%	55%	8.73	18.10
RADECKE AVE.	13%	8%	13%	7.10	3.09
BIDDLE ST. & 62ND ST.	2%	0%	2%	10.02	2.36
Jones Falls Watershed					
SMITH AVE.	3%	0%	3%	4.18	2.41
WESTERN RUN	4%	0%	3%	6.04	2.69
STONY RUN	29%	0%	27%	5.66	2.99

Station	Percent of Samples Total Nitrogen >=3 mg/L			Maximum Total Nitrogen Results	
	Pre-FY 2022[1]	FY 2022	All Samples	Pre-FY 2022[1]	FY 2022
JF 11.5 [2]	89%	67%	85%	16.56	5.39
LOMBARD ST.	6%	8%	6%	9.99	4.81
Gwynns Falls Watershed					
POWDER MILL	17%	8%	16%	14.89	10.43
PURNELL DR.	2%	0%	2%	5.26	2.33
DEAD RUN DNST.	2%	8%	3%	5.69	4.10
GWYNNS FALLS PKWY.	15%	17%	15%	6.20	3.06
GRUN HILTON ST.	11%	8%	11%	4.63	3.16
GF HILTON ST.	4%	8%	4%	5.23	3.01
MAIDENS CHOICE	8%	8%	8%	201.07	3.25
GRUN CARROLL PARK	47%	25%	46%	4.91	3.42
WASHINGTON BLVD.	4%	0%	4%	13.00	2.26
Baltimore Harbor Watershed					
LINWOOD & ELLIOTT [3]	91%	42%	86%	7.66	3.99
LAKEWOOD & HUDSON [3]	83%	67%	81%	7.20	4.13
CENTRAL & LANCASTER [4]	19%	17%	19%	7.78	4.17
LIGHT ST.	11%	0%	10%	25.02	2.60
WARNER & ALLUVION	19%	0%	17%	8.55	2.98
WATERVIEW AVE.	26%	17%	26%	13.31	3.91
JANEY RUN	10%	0%	9%	4.79	2.85
Patapsco River Watershed					
REEDBIRD AVE. [5]	14%	---	14%	4.54	---
POTEE ST. [5]	13%	0%	5%	3.24	2.54

Notes:

1 Pre-FY 2021 includes samples from January 2009 to June 2020.

2 Sampling began at JF 11.5 in January 2016.

3 Sampling began at LINWOOD & ELLIOTT and LAKEWOOD & HUDSON in March 2013.

4 No samples were collected at the CENTRAL & LANCASTER station from January 2017 through March 2019 because access to the station was blocked by construction.

5 Construction near REEDBIRD AVE. blocked access to sampling site: last sample collected in October 2020. Began sampling POTEE ST. in November 2020.

Key

	Normal: <= 11% of Samples
	Elevated: Between 11-25% of Samples
	High: >25% of Samples

3.2.2 Bacteria Monitoring

3.2.2.1 E. Coli Monitoring

During FY 2022, DPW analyzed 419 SIS samples for fecal bacteria as e.coli at twenty-four (24) stations that are in non-tidal waterways. Appendix G contains graphs of the annual geometric mean for e. coli results for each station from FY 2010 to FY 2022. Table 3-5 summarizes the results compared to the following water quality criteria for bacteria indicators cited in COMAR 26.08.02.03-3:

- Geometric mean (GM) for e. coli for 90+ days must be less than 126 MPN / 100 ml
- Less than 10% of single sample results of e. coli may be greater than the standard threshold value (STV) of 410 MPN / 100 ml
- Dissolved oxygen must be greater than 5 mg /L
- pH must be between 6.5 and 8.5
- Water temperature may not exceed 90°F (32° C) for Class I and 75°F (23.9°C) for Class IV waters

None of the stations met all of the water quality criteria for FY 2022, although Smith Avenue met all of the criteria except for pH. Smith Avenue was the also the only station that met the criteria specific to e. coli., however the histogram of the annual geometric mean for each station indicate a decreasing trend since 2010. The following stations continue to show consistently high levels of bacteria (majority of results exceeding 2,419 MPN/ 100 ml which is the upper reporting limit of the test method, using undiluted samples) but are anticipated to be improved by DPW efforts under the Modified Consent Decree for Sanitary Sewer Overflows:

- Mary Ave.: manhole sampling location of historic, piped stream in Back River – Moore's Run
- Hamilton Ave.: stream location in Back River – Moore's Run, downstream of Mary Ave.
- JF 11.5: outfall location in Jones Falls, large drainage area which includes sanitary sewer overflow structure #72
- Gwynns Run Carroll Park: outfall location in Gwynns Falls, large drainage area which extends up to Mondawmin Mall

Table 3-5: Summary of E. Coli Sampling for SIS Program for FY 2022

Station	Class	E. Coli (MPN/100 ml)		Min. DO (mg/L)	Max. Temp (°C)	pH Range
		GM	% > STV			
Back River Watershed Herring Run Sub-watershed						
PERRING PKWY	IV	438	71%	7.40	26.5	7.63 - 8.58
MT. PLEASANT GC	IV	228	29%	8.03	26.9	7.69 - 8.76
CHINQUAPIN RUN	IV	155	24%	9.05	28.1	7.82 - 9.26
TIFFANY RUN	IV	217	24%	7.71	26.6	7.79 - 8.37
HARFORD RD.	IV	195	35%	7.83	26.6	7.68 - 8.76
WRIGHT AVE.	IV	599	59%	3.31	27.9	7.47 - 8.82
PULASKI HWY.	IV	195	29%	7.80	28.6	7.55 - 8.37

Station	Class	E. Coli (MPN/100 ml)		Min. DO (mg/L)	Max. Temp (°C)	pH Range
		GM	% > STV			
Back River Watershed Moores Run Sub-watershed						
MARY AVE.	I	1,681	88%	7.35	24.1	7.10 - 8.20
HAMILTON AVE.	I	1,397	94%	3.15	24.6	7.50 - 8.96
RADECKE AVE.	I	588	53%	5.58	26.3	7.27 - 8.63
BIDDLE ST. & 62ND ST.	I	418	47%	5.74	27.6	6.91 - 8.04
Jones Falls Watershed						
SMITH AVE.	I	49	0%	6.40	26.6	7.59 - 8.79
WESTERN RUN	I	225	28%	8.46	25.8	7.63 - 8.78
STONY RUN	IV	213	22%	7.24	23.7	7.51 - 8.51
JF 11.5	IV	2,013	100%	4.42	23.1	7.67 - 8.42
Gwynns Falls Watershed						
POWDER MILL	I	214	33%	7.66	23.5	7.34 - 8.03
PURNELL DR.	I	347	47%	7.92	24.5	7.49 - 8.26
DEAD RUN DNST.	IV	157	24%	8.33	24.1	7.64 - 8.28
GWYNNS FALLS PKWY.	I	574	67%	8.24	20.7	7.16 - 8.33
GRUN HILTON ST.	I	493	56%	8.12	25.2	7.68 - 8.72
GF HILTON ST.	I	235	33%	7.93	24.8	7.85 - 8.56
MAIDENS CHOICE	I	161	22%	7.98	25.6	7.71 - 8.48
GRUN CARROLL PARK	I	1,559	94%	7.08	24.3	7.54 - 8.17
WASHINGTON BLVD.	I	734	67%	8.05	24.9	7.69 - 8.74

3.2.2.2 Enterococci Monitoring

During FY 2022, DPW analyzed 218 SIS samples for fecal bacteria as enterococci at nine (9) stations in the tidal waterways. Appendix G contains graphs of the annual GM for enterococci for each station from FY 2010 to FY 2022. Table 3-6 summarizes the results compared to the following water quality criteria for bacteria indicators cited in COMAR 26.08.02.03-3:

- Geometric mean (GM) for enterococci for 90+ days must be less than 35 MPN / 100 ml
- Less than 10% of single sample results of e. coli may be greater than the standard threshold value (STV) of 130 MPN / 100 ml
- Dissolved oxygen must be greater than 5 mg /L
- pH must be between 6.5 and 8.5
- Water temperature may not exceed 90°F (32° C) for Class I and 75°F (23.9°C) for Class IV waters

None of the stations met all of the water quality criteria for FY 2022. Two stations (Lakewood & Hudson and Linwood & Elliot) continue to show consistently high levels of bacteria (majority of results exceeding 2,419 MPN/ 100 ml which is the upper reporting limit of the test method, using undiluted samples) despite exhaustive pollution source tracking investigations through the interconnected drainage areas associated with the piped historic streams.

Table 3-6: Summary of Enterococci Sampling for SIS Program for FY 2022

Station	Class	Enterococci (MPN/100 ml)		Min. DO (mg/L)	Max. Temp (°C)	pH Range
		GM	% < STV			
Jones Falls Watershed						
LOMBARD ST.	I	1,009	96%	3.93	27.7	7.35 - 8.73
Baltimore Harbor Watershed						
WATERVIEW AVE.	I	384	79%	7.03	23.9	6.95 - 8.48
WARNER & ALLUVION	I	1,329	100%	4.23	26.4	7.14 - 8.23
LIGHT ST.	I	358	63%	3.15	27.6	6.93 - 8.09
CENTRAL & LANCASTER	I	730	83%	2.62	27.3	7.37 - 9.09
LAKEWOOD & HUDSON	I	2,056	100%	7.45	25.1	7.67 - 8.41
LINWOOD & ELLIOTT	I	1,922	100%	3.72	25.1	6.50 - 8.17
JANEY RUN	I	787	83%	4.87	26.4	7.07 - 8.96
Patapsco River Watershed						
POTEE ST.[1]	I	186	63%	5.94	27.6	7.20 - 7.88
[1] Sampling suspended at REEDBIRD AVE. after October 2020 because of construction and started at POTEE ST. in November 2020.						

3.3 Biological and Habitat Monitoring

It takes several months to complete the sorting and identification of the macroinvertebrates from the time the sample is collected in the spring. DPW was not able to complete the process for the 2022 samples in time for this report. Instead, the results from 2021 are presented in this report and are included in the "Biological Monitoring" (BIO) associated table in the MS4 geodatabase (Appendix C).

DPW uses a combination of fixed and random sampling. There are eight (8) fixed stations, two of which are associated with the long-term discharge characterization of Moores Run. The results for those two stations are discussed in Section 3.4.2 of this report.

Table 3-7 presents the 2021 scores and ratings for six (6) fixed stations for benthic index of biotic integrity (BIBI), embeddedness, epifaunal and habitat. Table 3-8 lists the BIBI scores for six (6) fixed stations from 2002 through 2021. For FY 2021, five (5) stations had a BIBI score below 2, which means a rating of "very poor". Station 250 on Dead Run had a BIBI score of 2.0, which means a rating of "poor".

DPW could not complete the 2020 sampling due to emergency protocols associated with COVID-19; only three (3) of these stations were sampled. The results of those three stations showed a consistent rating as "very poor" for both years. Preliminary evaluation of historic data does not show a relationship between BIBI score with habitat score nor epifaunal score nor embeddedness score.

Table 3-7: 2021 Scores and Ratings for Fixed Stations

	Gwynns Falls		Jones Falls			Back River
Criteria	Station 250: Dead Run	Station 430: Maidens Choice Run	Station 880: Stony Run	Station 949: Stony Run	Station 1053: Stony Run	Station 1235: Biddison Run
BIBI Score	2.0	1.3	1.7	1.0	1.7	1.9
BIBI Rating	poor	very poor	very poor	very poor	very poor	very poor
Embed Score	10	11	11	17	11	17
Embed Rating	marginal	suboptimal	suboptimal	optimal	suboptimal	optimal
Epifaunal Score	11	15	11	12	15	4
Epifaunal Rating	suboptimal	suboptimal	suboptimal	suboptimal	suboptimal	poor
Habitat Score	9	16	16	11	16	6
Habitat Rating	marginal	optimal	optimal	suboptimal	optimal	marginal

Table 3-8: Macroinvertebrate BIBI Scores for Fixed Stations

	Gwynns Falls		Jones Falls			Back River
Year	Station 250: Dead Run	Station 430: Maidens Choice Run	Station 880: Stony Run	Station 949: Stony Run	Station 1053: Stony Run	Station 1235: Biddison Run
2002	1.7	no sample	no sample	no sample	1.3	no sample
2003	1.0	no sample	no sample	no sample	1.0	3.3
2004	1.0	no sample	no sample	no sample	1.0	1.3
2005	1.0	no sample	no sample	no sample	1.3	1.9
2006	1.7	no sample	no sample	no sample	no sample	1.3
2007	no sample	no sample	no sample	no sample	1.0	1.3
2008	no sample	no sample	no sample	no sample	1.0	1.6
2009	1.3	no sample	no sample	no sample	1.3	1.0
2010	1.3	1.0	1.3	1.7	2.3	1.9
2011	2.3	1.7	1.3	1.0	1.7	1.3
2012	1.0	1.0	1.0	1.0	1.0	1.6
2013	1.0	1.0	1.0	1.0	1.0	2.1
2014	1.7	1.3	1.7	1.3	2.0	1.9
2015	2.3	1.7	1.3	1.3	1.3	2.4
2016	1.0	1.3	1.0	1.0	1.0	1.9
2017	2.7	2.0	1.3	1.0	1.7	3.0
2018	1.3	1.3	1.3	1.0	1.7	2.4
2019	1.0	1.0	1.0	1.7	1.7	1.6
2020	no sample	no sample	1.0	1.3	1.0	no sample
2021	2.0	1.3	1.7	1.0	1.7	1.9

From 2002 through 2019, the random sites were chosen for non-tidal waterways within three watersheds: Jones Falls, Gwynns Falls or Back River, rotating watersheds each year. The new protocol is to select random sites throughout the three watersheds. Then in 2021, DPW modified its random site selection to be City-wide to match the MDE guidance on biological monitoring. For FY 2021's biological monitoring event, 20 random sites selected: 5 in Jones Falls; 7 in Gwynns Falls; and 8 in Back River. Figure 3-4 shows the BIBI scores for the 20 random sites. Table 3-9 presents a summary of the BIBI, habitat, epifaunal and embeddedness scores for the FY 2021 random sites. The average ratings for all of the sites were as follows:

- BIBI: very poor;
- Habitat: marginal;
- Epifaunal: marginal; and
- Embeddedness: suboptimal.

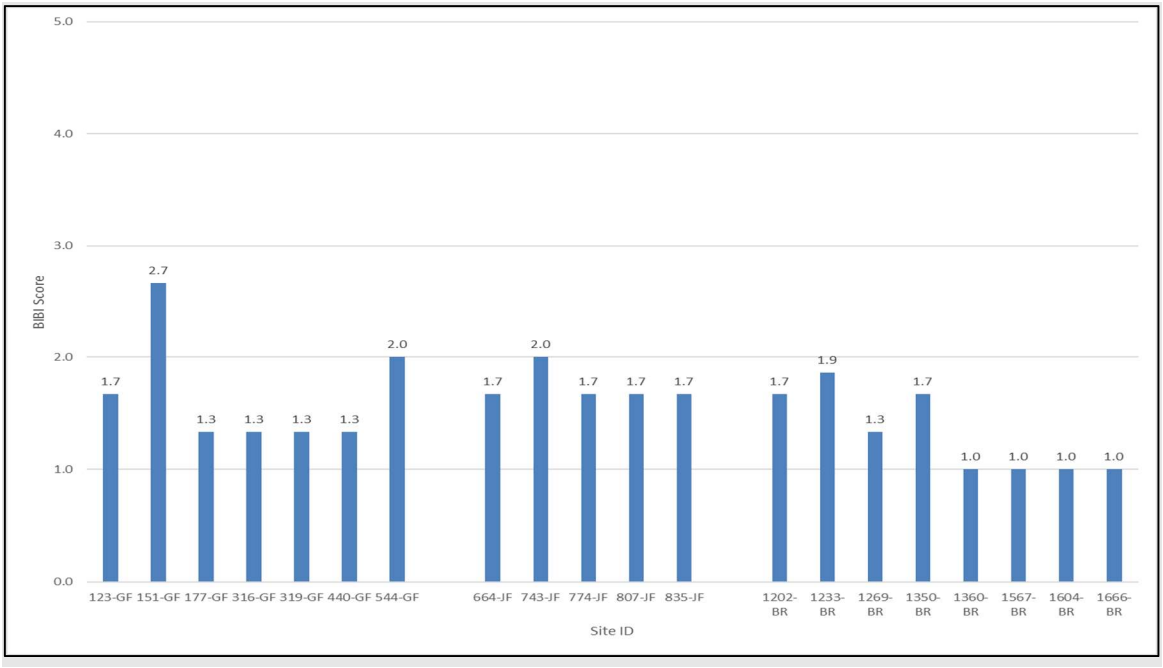


Figure 3-4: BIBI Scores for Random Sites FY 2021

Table 3-9: Summary of Scores for 2021 Random Stations

Watershed	Number of Sites	Range BIBI Score	Ratings from BIBI Scores	Average BIBI	Average Habitat Score	Average Epifaunal Score	Average Embeddedness Score
Gwynns Falls	7	1.3-2.7	(5) very poor; (2) poor	1.7	12	10	11
Jones Falls	5	1.7-2.0	(4) very poor; (1) poor	1.7	7	10	12
Back River	8	1.0-1.9	(8) very poor	1.3	11	11	10
Overall	20	1.0-2.7	(17) very poor; (3) poor	1.5	10	10	11

3.4 Watershed Assessment at Moores Run

In FY 2022, Baltimore City decided to participate in the pooled monitoring program with the Chesapeake Bay Trust (CBT) to meet the current permit conditions for BMP Effectiveness Monitoring. DPW executed a 5-year, $500,000 MOU with CBT for the term of the permit. Section 3.4.1 includes the results of chemical monitoring for rain events completed prior to this decision. DPW plans to continue the biological monitoring the two fixed locations on the Moores Run as part of the Watershed Assessment and Trend Monitoring Program.

3.4.1 Chemical Monitoring

During FY 2022, from July 2021 through January 2022, four (4) storm events and seven (7) base flow events were monitored at Hamilton Avenue, the outfall station associated with the long-term discharge characterization for the Moores Run; and at Radecke Avenue, the in-stream station associated with the long-term discharge characterization for the Moores Run, there were three (3) storm events and seven (7) base flow events monitored. For the storm monitored on September 23, 2021, there were problems with the sampling equipment at the Radecke Avenue station; thus, no samples were collected. In February 2022, it was announced that the City would choose the pooled monitoring option of the new permit. WQMI ended the long-term discharge characterization for the Moores Run. However, WQMI continues to collect samples at the Hamilton Avenue and Radecke Avenue stations as part of the Stream Impact Sampling (SIS) and the Ammonia Screening (AS) programs.

The results of the chemical monitoring are included in the “Chemical Monitoring” (CHM) associated table in the MS4 geodatabase (Appendix C). Monitoring results from AS and SIS for these two locations are included in Appendix D of this report.

3.4.2 Biological Monitoring

WQMI collects macroinvertebrate samples at two fixed locations for the long-term discharge characterization of the Moores Run during the spring. However, WQMI did not sample these two sites during 2020 due to COVID safety protocols. WQMI has not finished processing the samples collected for 2022. Instead, the results from 2021 are presented in this report and are included in the “Biological Monitoring” (BIO) associated table in the MS4 geodatabase (Appendix C).

Table 3-10 presents the scores and assigned ratings for BIBI, embeddedness, epifaunal and habitat for these two fixed stations. Table 3-11 presents the BIBI scores from 2002 through 2021. Once again, the BIBI scores from 2021 rated in the “very poor” for both stations.

Table 3-10: 2021 Scores and Ratings for Moores Run Fixed Stations

Criteria	Station 1367: Moores Run	Station 1659: Moores Run Tributary
BIBI score	1.7	1.3
BIBI Rating	very poor	very poor
Embeddedness Score	7	13
Embeddedness Rating	marginal	suboptimal
Epifaunal Score	10	17
Epifaunal Rating	marginal	optimal
Habitat Score	12	15
Habitat Rating	suboptimal	suboptimal

Table 3-11: Historic BIBI Scores for Moores Run Fixed Stations

Fiscal Year	Station 1367: Moores Run	Station 1659: Moores Run Tributary
2002	1.3	1.3
2003	1.3	1.7
2004	1.0	1.0
2005	1.3	1.3
2006	1.7	1.7
2007	1.3	1.3
2008	not sampled	1.7
2009	1.3	1.3
2010	1.3	1.7
2011	1.3	1.7
2012	1.7	1.0
2013	1.3	1.3
2014	1.7	1.3
2015	1.3	1.0
2016	1.7	1.0
2017	1.3	1.7
2018	1.7	1.3
2019	1.3	1.7
2020	not sampled	not sampled
2021	1.7	1.3

4 Expenditures and Proposed Budget

4.1 Expenditures and Budgets Related to MS4 Permit Compliance

DPW is predominantly responsible for compliance with the City's MS4 permit. Although the efforts of other City agency services are reported in this Annual Report for permit conditions, such as property maintenance, inspections and enforcement, the expenditure information shown in Table 4-1 is strictly limited to DPW services. Annual expenditures and budgets for FY 2022 and 2023 are summarized in Table 4-2. This information is also included in the "Fiscal Analysis" (FIS) associated table in the MS4 geodatabase (Appendix C).

The expenditures and budgets shown in Tables 4-1 and 4-2 do not include debt service payments, to avoid confusion with expenditures made using debt service mechanisms like bonds. Debt service payments for the City's stormwater program in FY 2022 were on the order of $4,577,024; approximately $2,180,701 was attributed to capital projects to meet the MS4 Permit.

Table 4-1: Fiscal Analysis of FY 2022 Expenditures

Description	Annual Cost
Source ID (Geodatabase Mgt.)	$328,602
Stormwater management	$870,000
Erosion and sediment	$767,683
Illicit detection/elimination (IDDE)	$1,651,285
Trash elimination	$413,060
Property management	$7,730
Inlet cleaning	$4,798,576
Street sweeping	$5,386,406
Public education	$164,377
Watershed assessment	$188,720
Watershed restoration (all projects)	$7,027,840
Chemical monitoring	$108,180
Biological monitoring	$22,986
TMDL assessment	$107,699
Total NPDES program	$21,843,143
Other activities related to stormwater*	$13,792,678
Total Stormwater	**$35,635,821**
Funded by Stormwater Utility	$24,779,392
Funded by W/WW Utility	$1,912,822
Funded by Other Sources	$8,896,085

Note: "Other activities" include the maintenance and remediation of stormwater infrastructure (collection system).

Table 4-2: NPDES Program Expenditures and Budgets

Fiscal Year	Operations	Capital	Total
FY 2022 (Expenditure)	$13,792,678	$5,517,001	$21,843,143
FY 2023 (Budget)	$18,303,001	$8,390,091	$26,693,092

4.2 Stormwater Fee and Stormwater Utility

The Stormwater Utility is an enterprise fund, established in 2013, to protect the use of revenue received from the stormwater restoration fee and other miscellaneous. The predominant source of revenue for the stormwater utility is the stormwater restoration fee. Other sources of revenue are as follows:

- Plans review fees for stormwater management and erosion and sediment control
- Penalty fines for stormwater management and erosion and sediment control
- Fees in lieu of on-site stormwater management (quantitative and qualitative control)

The stormwater restoration fee structure, rate, and credit program were established under Article 27 of the City Code in June 2013. The fee structure is based on impervious area, to align with the metric used for stormwater management design and MS4 watershed restoration goals. The stormwater fee rate was constant FY 2014 through 2019. A rate increase of 9% / year was approved by the Board of Estimates for FY 2020 through 2022. A second rate increase of 3% / year was approved by the Board of Estimates for FY 2023 through 2025. The credit program allows for customers to reduce their fee by implementing on-site practices or performing activities that will reduce pollution stormwater water runoff.

Section 4-202.1 of the Environment Article of the Annotated Code of Maryland require two financial reports be submitted to MDE as part of the MS4 Annual Report. The Watershed Protection and Restoration Program (WPRP) report (Appendix H) presents annual revenue and expenditure information related to the stormwater utility in a prescribed format to meet the requirements of COMAR Article 4-202.1. In the WPRP report, the expenditure for capital projects includes the payment of debt service mechanisms from the fund. The Financial Assurance Plan (FAP) (Appendix I) demonstrates that the City has sufficient funding to meet the watershed restoration conditions of the current permit. The FAP provides details of the types of debt service mechanisms used for capital projects.

On February 8, 2022, the City launched Water4All, a new water discount program to provide more access to financial assistance for eligible who need help paying their water bills. The Water4All assistance program was created under the comprehensive Water Accountability and Equity Act. Water4All replaced the BH2O Assists and BH2O Plus assistance program. Residents (SFP Customers) who qualify for the program are not charged a stormwater fee for one year.

4.3 Grant Support by DPW

Since 2017, DPW has provided funding to the Chesapeake Bay Trust (CBT) Outreach & Restoration grant program to support Baltimore City community-based restoration projects and environmental education programs. The funding is from the stormwater utility fund.

In FY 2022, DPW provided $215,472 in direct funding[1], matched by $72,084 from the Chesapeake Bay Trust, for the following projects:

- Civic Works ($25,000 CBT). Civic Works will partner with The Corps Network and local landscaping employers to operate a pilot Landscape Pre-Apprenticeship Program for Baltimore City youth, ages 18 – 25. During the one-year pilot phase, 12 youth will receive pre-apprenticeship training with units on water conservation and stormwater management.
- National Aquarium ($17,916 DPW, $12,084 CBT). Funding will support monthly workshops, community and shoreline trash clean-ups, interpretive signage, and outreach activities at Masonville Cove that focus on LatinX communities.
- Central Baltimore Partnership ($73,984 DPW). Installation of a 6,900sf wetland at Union Collective that will treat 1.5 acres of impervious parking lot, as well as offering a series of environmental workshops.
- Canton Canopy ($31,400 DPW). Project will plant and maintain 120 trees through volunteer events that aim to engage the community, increase the tree canopy, and reduce stormwater runoff.
- Greater Grace World Outreach Greater Grace Campus Greening, Phase 1 ($57,012 DPW). The project will construct three bioretention practices (treating 1.29 ac of impervious surface), plant 100 trees, and hold several environmental workshops for the congregation and school students.
- Blue Water Baltimore: Bugs and Blitzes ($20,000 DPW, $10,000 CBT). Funding will support the Outfall Screening Blitz and “It’s Alive!” water bug hunting programs, with the goal of increasing awareness of water quality issues by engaging 80 community members in 12 events.
- Interfaith Partners for the Chesapeake ($15,160 DPW). Green Team Leadership Development Program to increase the impact of the faith community on Chesapeake Bay Watershed improvements. IPC will train 40 individuals from 10 congregations from Baltimore City to develop action plans for restoration projects on their property, as well as work with regional partners to host 6 outreach and education events that engage 250 individuals.
- Patterson Park Audubon Center: Avian Ambassadors ($25,000 CBT). funding to support the Avian Ambassador program that works with the LatinX community in East Baltimore.

[1] DPW provided $200,000 for Chesapeake Bay Trust’s Outreach & Restoration grant program. One grantee from the year previously declined the grant so their award was added into the funding amount for FY22.

5 Enforcement Actions, Inspections and Public Education

5.1 Stormwater Management / Erosion and Sediment Control Program

5.1.1 Regulatory Authority, Policy and Process Modifications

DPW's Plans Review and Inspection Section (DPW-PRI) has the delegated authority from MDE to operate the City's stormwater management (SWM) program and erosion and sediment control (ESC) program for all land disturbance activities, except those performed by or performed on land owned by state and federal agencies. Unlike other counties that use Soil Conservation Districts, DPW-PRI completes all plan review and inspection functions for the SWM/ESC program. Article 7, Division II of the City Code addresses the SWM program and was last amended in 2010 to comply with the Stormwater Management Act of 2007. Article 7, Division III of the City Code addresses the City's ESC program and was last amended in 2013 to comply with model ordinance issued by MDE in February 2012. No changes were proposed or adopted to Article 7, Divisions II and III during FY 2022; however, DPW plans to introduce an ordinance for Article 7, Division II in 2023 to address restoration projects; clarify waiver requirements and processes; and align SWM plan approval / inspection processes with the City's grading and construction permitting processes. The schedule for introducing this ordinance is pending any legislation changes adopted by the State as a result of MDE's A-Storm initiative.

DPW-PRI defers the 2000 Maryland Stormwater Design Manual and the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. DPW-PRI has not issued any separate guidance or policy documents, except for the following which are available on the City's website:

- Article 7, Division II and III of the City Code
- "Stormwater Management Minimum Requirements" (2020)

Since FY 2021, DPW has worked with MDE and other advisors, including the Baltimore County Soil Conservation District, Prince George's County Soil Conservation District, the Baltimore Office of Sustainability and private urban farmers, to develop guidance documents and processes for urban agriculture projects, clarifying exemption criteria and plan submittal requirements. The final documents are scheduled to be issued in FY 2023.

In May 2022, MDE approved the use of a "Standard Plan for Minor Disturbance Activities" for projects disturbance activities less than 5,000 square feet in area, but between 100 and 1,000 cubic yards in volume. This new process does not require a professional design and only has a single-phase review process under the ESC program.

Since 2018, DPW-PRI has used a simple single-phase process (focused only on ESC) for demolition projects performed under the Project C.O.R.E. (Creating Opportunities for Renewal and Enterprise) initiative. Based on the vision of Project C.O.R.E., any impervious area removal is not considered permanent and therefore is not included in the "BMP" table of the MS4 geodatabase (Appendix C). In FY 2013, DPW-PRI plans to modify and expand the C.O.R.E. demolition plan review process to include other demolition projects that are meant to be an

interim site condition, will not disturb sensitive areas and will not alter the drainage patterns of the site.

On February 22, 2022, the City launched the Baltimore City Natural Resources (BCNR) on-line plans review system, using ProjectDox software. This system allows for the 3-phase SWM/ESC plan review process (to be performed concurrently with the Office of Sustainability's plan reviews for forest conservation, floodplain management, and critical area management program. The Department of Recreation and Parks Forestry Division is also able to use the BCNR system to review projects proposed on forested park land and projects impacting street trees. The BCNR system is used for the review of modified SWM/ ESC and as-built SWM plan reviews. All of these reviews are associated with Article 7 (Natural Resources) of the City Code. In addition to increasing transparency and agency accountability of the plan review processes (aligning with the Clean and Healthy Communities pillar of Mayor's Action Plan), the BCNR system will reduce paper waste by at least 5 pounds per project and reduce greenhouse gases by eliminating the need for applicant to deliver project submittals.

Prior to the launch, the City provided a 2-hour, virtual training session to over 280 attendees on February 18, 2022. A copy of the DPW-PRI presentation from that session is included in Appendix J of this report. In FY 2022, 149 projects were submitted to the BCNR system; 70 were projects initially submitted under the former, paper-based system.

5.1.2 Plans Review Performance

DPW-PRI has 14 full-time employees dedicated to SWM/ESC plans reviews, wet utility connection permitting, and MS4 geodatabase management; however, 6 positions, including the Section Chief, were vacated during FY 22. To augment this staff shortage, DPW-PRI allowed applicants to directly contract a third-party consultant (known as expeditors), however, DPW-PRI was still responsible for the final approval of each phase of the project review. A summary of plan review activities is provided in Table 5-1, in addition to the "Stormwater Management" (SWM) associated table of the MS4 geodatabase (Appendix C). Only the initial submittal of each phase of the project is counted; re-submittals / responses to comments are not counted.

Table 5-1: Summary of Plan Review Activities

Description	Received	Approved
Concept SWM/ ESC	143	64
Site Phase SWM/ ESC	80	59
Final SWM/ ESC	100	88
SWM/ESC Exempt	294	294
Modified SWM Plans	12	10
As-built SWM Plans	14	11

Quasi-new development projects are development projects that meet the criteria of redevelopment projects but propose to increase impervious area. Master plans are used large, multi-phase projects. Master plan approval is considered the same as concept approval; subsequent phases will be submitted individually for the site development and final phases. Underground utilities projects and maintenance/ landscaping projects are typically reviewed only

for ESC, since SWM requirements are waived since the project returns the disturbed area to a pre-development runoff condition.

The “BMP” (BMP) feature class table of the MS4 geodatabase (Appendix C) does not include all BMPs approved by DPW-PRI; it only includes constructed BMPs with approved as-built records, plus the restoration projects proposed by DPW to meet the restoration requirements of the MS4 permit. In FY 2023, DPW-PRI will also be modifying the BMPs implemented for quasi-new development projects based on the method shown in Appendix A of the NPDES MS4 Draft Supplement to the Geodatabase Design and User’s Guide (November 2021). Additionally, DPW-PRI will add impervious area reduction records to the “Alternate BMP Polygon” (APY) feature class table in the MS4 geodatabase (Appendix C) for all construction completed after December 2018 (expiration of last permit) to reflect land cover conversions which may be credited towards the stormwater restoration requirements of the current MS4 permit.

DPW-PRI only acknowledges a waiver or variance request once the applicant and reviewer have agreed to the applicability (i.e. demonstrated ESD to the MEP) and issued the public notice. The public notifications yielded no information to deny to the request; therefore, all waiver / variance requests were granted. Table 5-2 lists the waivers and variances for FY 2022, based on the date of the public notification. A single project may be considered for both quantitative and qualitative waivers.

Table 5-2: Summary of Waivers and Variances

Description	Number
Quantitative Control Waiver	3
Qualitative Control Waiver	14
Combination Qualitative-Quantitative	25
Redevelopment Waiver	11
Variance	0
Total	53

The Department of Housing and Community Development (DHCD) is responsible for issuing demolition, grading, and building permits for constructions outside of the right-of-way. The Department of Transportation (DOT) is responsible for issuing temporary use permits, developer’s agreements, and minor privilege permits within the right-of-way. A “Final SWM/ESC” or “ESC Only” plan approval may serve as the reference for multiple permits issued by DHCD and DOT. In FY 2022, DHCD issued the following 15 demolition projects and 115 grading / building permits. Twenty-nine (29) of the permits had grading activities which exceeded 1 acre; those permits are listed in “Quarterly Grading Permit” (QGP) feature class table of the MS4 geodatabase (Appendix C).

5.1.3 Stormwater Management Inspections

DPW-PRI has 10 full-time employees dedicated to SWM/ESC inspection activities. In FY 2022, DPW-PRI approved as-built records on 21 BMPs in the City and conducted 241 construction inspections and 38 maintenance inspections. A summary of these BMPs are included in the “BMP” feature class table of the MS4 geodatabase (Appendix C). Between February 16 and June 23, 2021, DPW-PRI contracted a third-party consultant to conduct maintenance

inspections on 422 BMPs at 239 project sites: 108 were considered failing (though no notices were provided to the BMP owner) and 82 could not be accessed or found in the field. The results were provided to DPW in FY 2022 to evaluate. In FY 2023, DPW-PRI will conduct the follow up inspections and associated enforcement, in addition to completing maintenance inspections on BMPs that are due for triannual inspections. DPW-PRI will also be aggressively pursuing as-built records for project sites with completed construction.

5.1.4 Erosion and Sediment Control Inspections

Since 2014, the City has had a customer service request for "Sediment and Erosion Problem". Complaints may be reported via phone, internet or mobile phone application and tracked through the 3-1-1, non-emergency system. During FY 2022, a total of 40 service requests were received but only 9 service requests were applicable to ESC issues. In FY 2022, DPW plans to improve efficiency, consistency and accountability of inspection processes by developing tablet applications for both ESC inspections and SWM BMP construction inspections.

During FY 2022, 2,897 inspections were conducted at 243 project sites for compliance with approved ESC plans. DPW-PRI issued 52 violation notices.

- 20 notices included a fine, but only $32,800 of penalty fines were received (either due to non-payment or appeal).
- 6 notices were issued stop work orders.
- None of the notices have resulted in a court case.

A summary of the ESC inspections for FY 2022 is included in the in "Erosion and Sediment Control" (ESC) associated table of the MS4 geodatabase (Appendix C).

5.2 Illicit Discharge Detection and Elimination (IDDE)

5.2.1 Routine Field Screening Locations

WQMI conducts an MDE-approved alternative to IDDE: ammonia screening (AS) and stream impact sampling (SIS) to initiate pollution source tracking (PST) investigations. The AS and SIS sampling locations are shown in Figure 5-1. The monitoring results from the surveys for the AS and SIS programs for FY 2022 are included in Appendix D of this report. These monitoring results, plus historic data, are also available on-line at the City's DPW website.

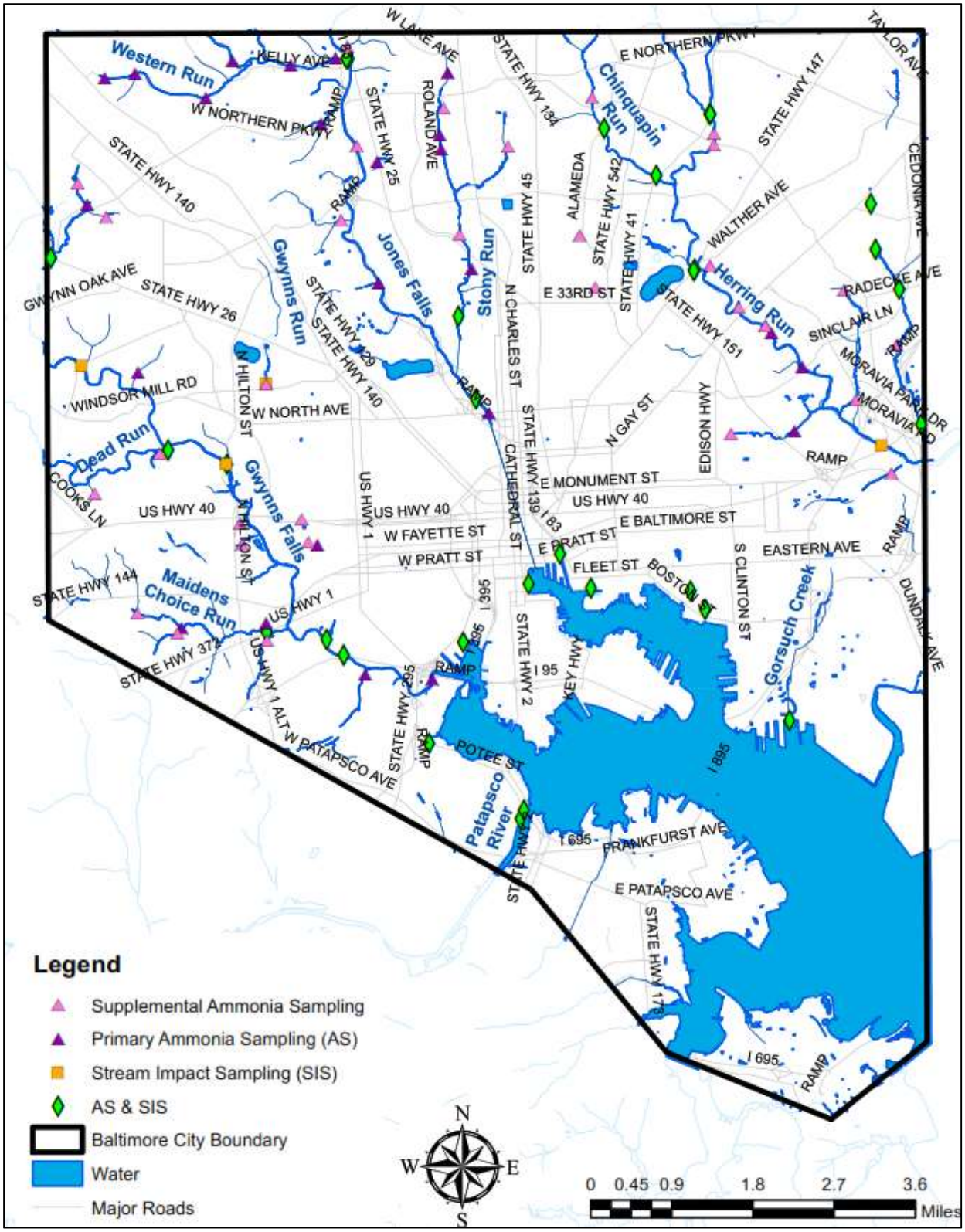


Figure 5-1 Map of DPW Routine Monitoring Locations

5.2.2 3-1-1 Customer Service Request for Polluted Water

Complaints are reported via phone, internet or mobile phone application and tracked through the 3-1-1 system. Complaints that are designated with the type "WW Waterway Pollution Investigation" are initially assigned to the Water Quality Monitoring and Investigations (WQMI) Section of OCR. During FY 2022, a total of 82 service requests were received. Fifty-two (52) complaints resulted in a pollution source tracking investigation. Nineteen (19) of these investigations led to the discovery of an illicit discharge or activity that was removed or corrected; and one other illicit discharge that has been identified with repairs pending:

- 2 sanitary sewage overflows entering the storm drain system;
- 5 water distribution leaks abated, and one leak located with repairs pending;
- 8 sediment discharges into stream or storm drain inlets from improper erosion and sediment controls (joint efforts with DPW inspectors and MDE inspectors);
- 2 industrial discharges from a private company (joint investigation with MDE);
- one fuel leaking from a barrel; and
- one improper grease disposal.

These illicit discharges are included among those further discussed in Section 5.2.3 of this report.

5.2.3 Pollution Source Tracking (PST)

DPW-WQMI initiates PST investigations based on the results of field screening, 3-1-1 customer service requests or requests from other programs (such as Blue Water Baltimore, MDE or EPA). During FY 2022, a total of 231 PST investigations were conducted: 210 PST investigations were initiated during FY 2022 and the other 21 were a continuation of PST investigations initiated prior to FY 2022. The PST investigations resulted in mobilizing to 1,393 locations in the open channel and storm drain system to conduct water quality chemical analyses, make observations, drop dye, etc. As a result of the PST investigations, the following 112 illicit discharges were identified and abated, with further details provided in Appendix K of this report:

- 43 dry weather sanitary sewer overflows (SSOs) from the public sewer; seven (7) of these were designated as sanitary discharge of unknown origin (SDUOs) at some point during their investigations;
- 8 sewage inputs from private properties to the storm drain system; six (6) of these were designated as sanitary discharge of unknown origin (SDUOs) at some point during their investigations;
- 39 drinking water transmission losses; and
- 22 with other types of illicit discharge:
    - 14 sediment discharges into stream or storm drain inlets from improper sediment and erosion controls (joint efforts with SEC inspectors and MDE inspectors);
    - 3 polluted water discharges from private companies (joint investigations with MDE);
    - 2 improper grease disposal;
    - 2 fuel discharges; and
    - one paint entering a storm drain inlet.

Additionally, 15 illicit discharge sources were located and await further repairs:

- one sanitary sewage discharge from private property, which was initially designated as a sanitary discharge of unknown origin (SDUO);
- 9 sanitary sewage discharges from the public sewer, each of which was initially designated as a sanitary discharge of unknown origin (SDUO); and
- 5 drinking water transmission losses.

5.2.4 FOG Program

Since November 2013, DPW has conducted an inspection program to reduce fats, oils and grease (FOG) within the sanitary sewer system. The FOG Program has a two-pronged approach that manages FOG from both the private and public sides of the property line by:

- Requiring all food services establishments (FSE) that have the potential to discharge FOG-laden wastewater to have an adequate grease control device (GCD), and
- Reducing build-up of fats, oils and grease in the sewer lines using a commercial grade degreaser.

FOG education efforts are focused on both residents and owners of FSEs. Flyers are included with water bills. Outreach at festivals and community meetings have included distribution of education materials. All education materials are available on the City's DPW website.

The DPW - Pollution Control Section performs the inspections and educates FSEs about FOG best management practices. During FY 2022 there were 592 notices of violation (NOV) issued to the non-compliant FSEs. A breakdown by type of NOV is included in Appendix K of this report.

5.2.5 Exterior Lead Paint Removal Waste Control Program

This program is administered by the DPW - Pollution Control Section. During FY 2022, there were 109 permitted sites. Inspectors made 109 site visits and issued 30 stop work notices requiring corrective action. There were no documented illegal discharges to the storm drain system.

5.3 Property Management and Maintenance

5.3.1 NPDES Industrial Discharge Permits

The City owns and operates fourteen (14) municipal facilities covered under the NPDES Industrial Discharge Permit under 12-SW, as listed in Table 5-3 and in the Municipal Facilities (MUN) feature class table in the MS4 geodatabase (Appendix C). Permit conditions related to staff training and routine inspections are managed by the responsible agency.

Table 5-3 – Summary of NPDES Permitted Municipal Facilities

Facility Name	Agency	Address	State	SIC Description
Reedbird Landfill	DPW	701 Reedbird Ave	12SW0252	Sector L.3 – Landfills and Land Application Sites
Bowley's Lane Sanitation Yard	DPW	6101 Bowleys Lane	12SW0254	Sector L – Landfills and Land Application Sites
Quarantine Road Municipal Landfill	DPW	6100 Quarantine Rd	12SW0257	Sector L – Landfills and Land Application Sites
Northwest Transfer Station	DPW	5030 Reisterstown Road	12SW1307	Sector L – Landfills and Land Application Sites
Quarantine Road Landfill	DPW	5701 Quarantine Rd	12NE0684	Sector L – Landfills and Land Application Sites
Northeastern Substation	DGS	4325 York Rd	12SW0702	Sector P – Land Transportation and Warehousing
Western Substation	DGS	239 N Calverton Rd	12SW0703	Sector P – Land Transportation and Warehousing
Middletown Fueling Station	DGS	410 Front St	12SW0704	Sector P – Land Transportation and Warehousing
Northwestern Substation	DGS	4410 Lewin Ave	12SW0705	Sector P – Land Transportation and Warehousing
Fallsway Substation	DGS	201 Fallsway	12SW0707	Sector P – Land Transportation and Warehousing
Mechanic Shop	DGS	6400 Pulaski Hwy	12SW0708	Sector P – Land Transportation and Warehousing
Central Garage	DGS	3800 E Biddle St	12SW2123	Sector P – Land Transportation and Warehousing
Patapsco WWTP	DPW	3501 Asiatic Ave	12SW0629	Sector T – Treatment Works
Back River WWTP	DPW	8201 Eastern Avenue	12SW0630	Sector T – Treatment Works

5.3.2 Good Housekeeping Plans (GHP) for City-owned Properties

During FY 2022, DPW worked with the City's Department of General Services to identify all properties owned by the Mayor and City Council, occupied by a city agency, not listed in Table 5-3 but on-activities could potentially pollute stormwater runoff (i.e. storage of equipment, fertilizers, pesticides, and other hazardous materials). DPW also coordinated with other Phase I MS4 jurisdictions to develop a template GHP format.

5.3.3 Street Sweeping and Trash Reduction

In FY 2022, the mechanical street sweepers operated by DPW- Bureau of Solid Waste removed 6,430 tons of debris while sweeping 53,567 miles of street surface. To encourage residents to remain home and practice social distancing related to COVID, street sweeping was suspended starting March 23, 2020. Street sweeping of gateways (main roadways) resumed in May 2020. Although the street sweeping performance in FY 2022 was higher that reported for FY 2021, it was still less than the level estimated for continued performance for the previous permit (80,187 miles / year). Street sweeping tonnage and mileage for qualifying activities (minimum frequency of 2 passes / month) for FY 2022 are listed in the MS4 geodatabase (Appendix C). DPW will resume street sweeping operations in FY 2023.

5.3.4 Inlet Cleaning

DPW- Utility Maintenance Division continued a targeted pro-active inlet cleaning program in 2017. In FY 2022, DPW proactively cleaned 1,811 inlets (about 857 were cleaned quarterly), with an estimated 567 tons of debris collected. This is higher than level estimated for continued performance for the previous permit (556 tons / year). Only the pro-active cleaning has been considered for the watershed restoration (see Section 6). Additionally, DPW continued its daily reactive cleaning of the City's storm drain inlets, removing approximately 1,513 tons of debris from 1,304 inlets in the City's public storm drain system. Since Quarantine Road landfill prohibits the unloading of saturated debris, the weight measurement is based on the weight of the debris after it was spread and dried within a bermed area at the maintenance yard. The tonnage is based on landfill records; however, data from November 2021, and February, May, and June, 2022 were not available at the time of this report, so the performance of FY 2022 may increase once the data is available. Additionally, the tonnage estimated for pro-active vs. re-active, plus the organic content is estimated, not directly measured.

5.3.5 Integrated Pest Management

During FY 2022, the Baltimore City Department of Recreation and Parks (BCRP) Horticulture Division applied 1.25 gallons of concentrated glyphosate (Round Up equivalent), which contained 3.75 pounds of glyphosate acid, while the BCRP Forestry Division applied 3 ounces of 25% concentrated glyphosate (Rodeo, EPA Reg. # 62719-324), 6.5 ounces of 25% concentrated triclopyr, and 6 ounces of 40% concentrated triclopyr (Garlon 4 Ultra, EPA Reg. #62719-527), to various forested natural area project sites. BCRP currently has five (5) Public Agency Applicators who are certified by MDA (2 in Horticulture, 2 in Parks, and 1 in Forestry). All have attended MDA approved training to maintain their certifications. BCRP is committed to reducing the use of glyphosate and is carefully reviewing its use. Compared to the 53.6 pounds of glyphosate applied during FY 2021, the 3.89 pounds applied during FY 2022 represents a 93% reduction. For more information visit https://bcrp.baltimorecity.gov/glyphosate.

During FY 2022, the Department of Transportation (DOT) did not apply any herbicide because there was no one on staff with a license to apply herbicide. The Baltimore City Public Schools System, as well as the Department of General Services (which manages most of the City buildings), report that no herbicides were applied on properties during FY 2022.

Baltimore City Department of Recreation and Parks as utilizes two non-herbicide programs to manage invasive species. Baltimore City Weed Warriors is a city-wide program that was developed to maintain the health of Baltimore's urban forest. Certified Weed Warriors are environmental stewards trained in non-native invasive (NNI) plant management and enhancing native ecosystems. The Baltimore TreeKeepers is a free city-wide tree stewardship program that promotes healthy trees by educating residents and increasing their role in the care of the City's trees. Training includes proper pruning techniques and invasive vegetation removal.

5.3.6 Deicing Materials

There were seven (7) storms and ten (10) dates of icy conditions for which DOT applied road salt (sodium chloride) during FY 2022. In addition, DOT applied a brine solution to roads just prior to those storms for four out of seven of the storms. In total, DOT applied 14,990 tons of road salt, and used an additional 107 tons of road salt to make the brine solution; for a grand

total of 15,097 tons of road salt for FY 2022. This is a decrease of 54% from the 32,729 tons that were applied during FY 2021. The snowfall total recorded at BWI for FY 2022 was 14.4 inches- compared to 10.9 inches for FY 2021.

Figure 5-1 depicts the amount of road salt and the amount of snowfall recorded at the National Weather Service station at BWI Airport for each fiscal year, from FY 2011 through FY 2022. Note that 30 inches out of the 35.1 inches of snow fell in one event in FY 2016, specifically on January 21-22, 2016. That is why that pair of numbers (20,994 tons of road salt applied and 35.1 inches of snowfall) are not well related with the other pairs of numbers.

Note: For FY 2015 through FY 2022, S = number of snow events; I = number of Ice events

Figure 5-2: Road Salt Applied by City of Baltimore and Snowfall at BWI by Fiscal Year

5.4 Public Education and Outreach

5.4.1 DPW Website

DPW maintains a website that includes information and resources on stormwater management, cleaning and greening services, Less Waste Master Plan, litter reduction, recycling, and the Sanitary Sewer Consent Decree. These are pages available on DPW's webpage. Table 5-4 is organized according to the educational requirement as per Part IV: D.5.c of the MS4 Permit (A-J) in addition to two topic areas (K-L). Web addresses are included in the table:

A. Increasing water conservation
B. Residential and community stormwater management implementation and facility maintenance
C. Proper erosion and sediment control practices
D. Removing debris from storm drain inlets to prevent flooding
E. Increasing proper disposal of household hazardous waste
F. Improving lawn care and landscape management (e.g., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal)
G. Proper residential car care and washing
H. Litter reduction
I. Reducing, reusing, and recycling solid waste
J. Proper pet waste management
K. Flood preparedness and reporting
L. Sanitary sewer overflows and basement backups

Table 5-4: Summary of Web Pages

Website	A	B	C	D	E	F	G	H	I	J	K	L
Public Works- Stormwater - Be A Part of the Solution	■	■	■	■	■	■	■	■				
Public Works -Cleaning and Greening Services					■	■		■				
Public Works -Recycling Services					■			■	■			
Public Works - Less Waste Master Plan					■	■			■	■		
Public Works – Sanitary Consent Decree Program												■
Office of Sustainability	■	■						■	■		■	
Office of Emergency Management											■	
Health Department												■
DHCD – Housing & Homeownership	■										■	
DHCD – Adopt a Lot		■				■		■				
Environmental Control Board – B'More Beautiful		■			■	■		■				

Additionally, the City of Baltimore has an online data hub called "Open Baltimore". The site contains hundreds of datasets published by the city and its partners, including Surface Water Quality data (1995 – present), vacant lot data, 311 service requests, and community-managed open spaces.

Finally, DPW provides interactive maps for sanitary sewer overflows, recycling and trash collection, and water main breaks. Individuals can also sign-up to receive sanitary sewer overflow notifications.

5.4.2 3-1-1 Services

The city of Baltimore utilizes a 311 system for reporting and tracking non-emergency issues. People can call, report online, or through a phone app. Water quality and quantity related service requests include:

- Sediment or Erosion Problem (see Section 5.1.4)
- Sewer Overflow

- Waterway Pollution Investigation (See Section 5.2.2)
- Flooded Street
- Storm Inlet Choke
- Illegal Dumping
- Dirty Street / Alley Cleaning

Service requests (SRs) are issued an SR number and, depending on the 3-1-1 service request, routed to the appropriate agency (typically DPW or the Department of Housing and Community Development (DHCD). The SR is assigned a work order for investigation, follow-up, and resolution. If the individual reporting the issue provides an email address, they are sent notifications on the status of the issue.

5.4.3 Outreach and Education Documents

DPW provides information on its website, handouts and flyers, and social media to inform the general public about the benefits of various water quality related items. Table 5-5 indicates DPW's educational series, "Trash Talk Tuesdays" are posted on the website and social media. These are short videos address a range of topics, including recycling, stormwater management, and food waste reduction. In FY22, 13 videos were posted, with 2,136 views.

Table 5-5: Inventory of Documents and Communications

Document / Communication	Description	A	B	C	D	E	F	G	H	I	J	K	L
DPW Calendar	Street sweeping and recycling pick-up schedules, household hazardous waste dates, and Shred Events. (HC,WB)					■			■	■			
Baltimore City Clean Guide	Information for residents to keep their property and neighborhood clean, and where to go for help. (HC,WB)								■	■			
Residential Drop-off Locations	Locations and hours of operation for DPW's Residential Drop-off Centers (WB)								■				
Stormwater Fee Credits Fact Sheets	Credits available to both residential and non-residential customers. (HC,WB)		■						■				
Creating a Stormwater Participation Event	Tips for organizing and registering an event that qualifies residents for stormwater fee credits. (HC,WB)								■				
Water Quality Monitoring and IDDE	City efforts for stream monitoring and pollution reduction, with tips on pollution prevention and reporting. (HC)		■				■	■	■		■		
Commercial FOG Brochure	What commercial foodservice establishments must know to comply with rules regarding fats, oils, and grease. (HC)												■
FOG Poster	This poster is designed for commercial kitchens, but it has												■

Document / Communication	Description	A	B	C	D	E	F	G	H	I	J	K	L
	good ideas for homes as well. (HC)												
Residential FOG flyer	Avoid the accumulation of fats, oils, and grease in your sewer lines, which can block pipes and lead to sewer backups. (HC)												
Sewage Onsite Support (SOS) Cleanup Program	Information on cleaning, disinfection and disposal services available in the aftermath of a sewage backups. (HC, WB)												
Expedited Reimbursement Program for Sewage Backups	Information on applying for the Expedited Reimbursement Program for sewage backups caused by capacity-related wet weather events. (HC,WB)												
Handling Sewage Backups	Step-by-step information on what to do in the event of a sewage backup at their property. (HC, WB)												
Understanding and Preventing Backups	Information regarding sewage backups and how to prevent them. (HC)												
Small Haulers Program	Information for small commercial haulers to properly dispose of trash and reduce instances of illegal dumping. (HC, WB)												
Recycling Guide	Simple guide (English and Spanish) on what to recycle and what not to recycle. (HC,WB)												
Durable Medical Equipment Reuse Program	Frequently Asked Questions and list of acceptable and unacceptable Items. (HC,WB)												
Residential Food Scrap Drop-off Locations	Locations, hours of operation, and acceptable materials for DPW's Food Scrap Drop-off Centers. (HC,WB)												
Trash Talk Tuesday	Short videos on a range of topics, including recycling, stormwater management, and food waste reduction. (SMV)												
Baltimore City Guide to Home Composting	Easy-to-remember steps to start composting food waste at home (HC,WB)												
Nuisance Flood Plan	Overview and mitigation strategies for addressing nuisance flooding in the city. (WB)												

5.4.4 Stormwater Fee Credit Program

Baltimore's stormwater restoration fee has a credit program which includes a fee reduction for:

- Tree planting
- Rain barrels
- Rain gardens and other BMPs
- Community clean-ups

Information promoting these types of trash reduction efforts and BMP installations are listed in Table 5-5 and available on DPW's web site and provided at various outreach events.

5.4.5 Outreach and Engagement Events

DPW conducts a variety of community outreach and engagement efforts where information and resources are provided. Major events are listed below. The table shows that the City exceeded the 15 outreach efforts per year required of the Permit.

In FY 2022, the GROW Center pop-up events and workshops attracted approximately 900 people. See Section 5.4.5 for a detailed description of the GROW Center program.

Additionally, DPW's community liaisons attend over 100 community meetings and events and distribute handouts and informational flyers (as listed in Table 5-5). In addition to providing information, the liaisons answer questions and gather concerns from residents, directing then to the best source of information.

Finally, DPW partnered with the University of Maryland to conduct research and public education on rainwater harvesting (see Baltimore City MS4 Annual Report FY21). During FY 2022, UMD and DPW conducted three workshops, with a total of 149 registrants:

- Rainwater harvesting system design
- Rainwater harvesting system funding
- Rainwater harvesting system maintenance

Table 5-6 – Inventory of Outreach and Engagement Events

Event	Date	A	B	C	D	E	F	G	H	I	J	K	L
Mayor's Fall Clean-up	10/23/21								■	■			
Shred Event (free shredding of documents)	10/31/21 4/2/22								■	■			
Earth Day in Harlem Park	4/23/22				■				■				
Mayor's Spring Clean-up	4/23/22								■	■			
Big Truck Day	5/10/22								■	■			■
Sustainability Open House	6/14/22		■						■		■		
GROW Center pop-ups events	13 held in FY22		■			■				■	■		■
Home Composting Workshops	8 held in FY 22						■			■			
Rain Garden Workshop	10/20/21		■										
Bee Keeping Workshop	4/7/22						■						

Event	Date	A	B	C	D	E	F	G	H	I	J	K	L
Pollinator Gardens Workshop	5/19/22												
University of Maryland rainwater harvesting workshops	12/15/21 1/19/22 2/16/22												

5.4.6 GROW Center

In Fiscal Year 2018, DPW launched a program known as "GROW Center". GROW stands for Green Resources and Outreach for Watersheds and is envisioned to be events and places that link residents and community groups to community greening and resiliency resources and sources of free/low-cost materials and technical expertise for stormwater management installation and vacant lot revitalization. The GROW Centers provide the following:

- Materials for free/purchase. Mulch, trees, chaff, native plants, and seeds have been available for free and/or for purchase to city residents and non-profits to use in micro-practice installation such as rain gardens, community gardens, tree pits, and residential gardens. Future plans are to have bricks, crushed concrete, wood products, salvaged building materials and other quality-controlled materials like bio-soils.
- Education and training. Experts provide advice and guidance on green infrastructure projects, including hands-on training sessions, workshops, and educational classes on design, the proper use of the materials, securing funds and resources, and maintenance.

DPW received a grant from the USDA Forest Service in FY2017 to support the development of the GROW Center. Funding supports two efforts – 1) testing different delivery methods through a series of "pop-up" events and workshops, and 2) the development of an Alternatives Analysis and Business Plan.

The GROW Center was able to expand the number of pop-ups and workshops held during FY22. In Fall 2021, six pop-up events were held:

- 300 people attended
- 100 trees were given away along with 5 truckloads of mulch

Additionally, 7 workshops were held: 6 on home composting and one virtual rain garden workshop. About 100 people attended and 40 free compost bins were given.

In Spring 2022, 7 pop-ups were held, with one pop-up in partnership with a DPW Shred event. The pop-ups were again supported by TreeBaltimore (trees) and Camp Small (mulch). Additionally, DPW held five workshops: three for home composting, one bee keeping workshop, and a virtual pollinator garden workshop. Summary results are:

- 600 people attended the pop-ups and 60 the workshops
- 100+ trees were given away along with 7 truckloads of mulch

Finally, in February 2022 DPW completed the Feasibility Study and Business Plan for the GROW Center by the consulting firm Council Fire.

Figure 5-3: Photos of GROW Center Pop-up events from FY 2022.

5.4.7 Effectiveness of Education Program for Trash and Litter

Public education and outreach are essential strategies to achieve the long-term, sustained prevention of trash entering our streams and waterways. Whereas DPW is the responsible party for implementing and providing solid waste services, public education and outreach requires partnerships to be effective. Partnerships involve voluntarily actions and/or cooperation by State, federal, private, non-profits, and community groups and residents, and can be both structural and non-structural practices.

5.4.7.1 B'More Beautiful

BMORE Beautiful is a City-led peer to peer beautification program that launched in April 2017. The goal of the program is to change behaviors and attitudes towards the beautification of the City as well as encourage residents, businesses, and organizations to become directly involved in activities and projects that will keep their neighborhoods clean. To meet this goal, the City works closely with neighborhoods on beatification projects and cleanliness challenges, as well as provides educational literature, outreach materials and other resources that residents can use to Keep BMORE Beautiful.

After completing a 2-year pilot, BMORE Beautiful expanded citywide. While the interest and decision to expand citywide is ambitious, staffing limitations remain a concern. In order to join BMORE Beautiful, interested groups must meet at least 3 of the following requirements

- Identified a primary coordinator (block captain)
- Neighborhood/interested party recommended by participating captain or partnering organization
- At least five dedicated volunteers
- Completed at least one successful cleanup/beautification project

BMORE Beautiful is currently active in 59 neighborhoods; no new neighborhoods were added in FY 22. In each neighborhood, a volunteer resident block captain is responsible for:

- RECRUITING neighbors to sign the pledge and participate in BMORE Beautiful;
- ORGANIZING ongoing beautification and cleaning activities;
- LEADING others to change their negative behaviors regarding neighborhood cleanliness; and
- EDUCATING their neighbors on how to comply with specific City Code requirements and how they can keep their neighborhood beautiful through simple, easy-to-follow behaviors.

BMORE Beautiful continues to support neighborhood beautification efforts through three grant programs:

- Love Your Block Grant**:** The Love Your Block Grant was designed to support the City's goals of "revitalizing and renewing" neighborhoods. Eligible groups may receive funding ($500- $1,500) for the purpose of enhancing neighborhood appearance.
- Say Yes! (Youth Environmental Stewards) Grant: The Say YES! Program was designed as a community engagement opportunity for youth to earn while they learn. Organizations may apply for a grant to engage within their community on a variety of beautification projects. Youth are selected and supervised by community leaders. The Say YES! Program has a 10-week Spring and Fall session and a 6-week summer session. Youth are responsible for completely weekly perception surveys that are submitted at the end of the session.
- Care-A- Lot Grant: This grant is an opportunity for organizations to provide maintenance services for up to 25 vacant lots during the "Grow Season". Maintenance services include mowing and removing trash and litter. This program is targeted to support the maintenance of City-owned vacant lots. In FY 2019, BMORE Beautiful introduced an equipment funding opportunity to help support community maintaining and transforming Care-A-Lot locations.

COVID-19 continued to impact BMORE Beautiful programs and activities. DPW staffing and service interruptions, a decrease in volunteer sizes, requests to extend project timelines, and cancellation of captain meetings reduced efforts, especially since a large portion of the work takes place during the Spring and Summer. New variants coupled with vaccine hesitancy has still caused significant impact on activities.

In FY 2022, BMORE Beautiful achieved the following:

- 35 BMORE Beautiful Community Clean-ups
- 10 Urban Garden Workshops
- 1.019 Care-A-Lot vacant lots
- 226 Say YES! Participants 175 Say YES! Participants

5.4.7.2 Mayor's Fall and Spring Clean-ups / Community Pitch-ins

The Mayor's Spring and Fall Clean-ups are opportunities for residents to organize community clean-ups and beautification projects. The purpose of the clean-ups is to collect litter and trash. DPW provides bags to residents and picks up the trash from each location.

- 169 groups registered for the Fall 2021 clean-up, with 1,915 people volunteering.
- 126 groups registered for the Spring 2022 clean-up, with 1,946 people volunteering.

Together, the two clean-ups resulted in over 15 tons of trash being removed from neighborhood streets and public spaces.

DPW also coordinates the Community Pitch-in program, which provides up to 4 dumpsters/year to community groups. In FY22, eight hundred and eighty-seven requests were made, with 1,510 tons of debris collected.

Finally, residents can register through 311 Volunteer Clean-up Events. This allows DPW to coordinate trash pick-up locations. During FY22, 84 clean-up events were registered with an estimated 2,573 volunteers (volunteer estimates are submitted as part of the service request – due to the nature of the service request, the actual number of volunteers or bags of trash collected is not collected). Stormwater participation event certificates and application information is sent to organizers that provided email addresses.

6 Water Quality Improvements

6.1 Watershed Restoration

The current MS4 permit continued to use impervious surface restoration (ISR) as the metric for estimating watershed restoration efforts. The ISR requirements of the current permit consist of two main components:

1. Continued operations (street sweeping and inlet cleaning) at the same level as the previous permit which has an equivalent ISR of 5,701 acres, based on MDE's 2014 Accounting Guidance. This requirement exceeded the ISR requirement from the previous permit (4,291 acres).
2. Proposed implementation of stormwater BMPs, programmatic initiatives, or alternative control practices between December 2018 (expiration of previous permit) and November 2026, to achieve the equivalent ISR of 3,696 acres. The ISR estimates are based on the current MS4 Accounting Guidance (2021).

The current permit was based on multiple versions of a Restoration Portfolio of capital projects and operational programs, submitted to MDE between August 2019 and May 2020. The City's current plan to meet the ISR requirement is listed in the "All Actions" table of the FAP (Appendix I). BMPs installed after December 2018 as redevelopment projects or volunteer restoration projects are listed in the "All Actions" under category of "Other". The implementation schedule listed in the "All Actions" table included the following modifications from the Restoration Portfolio:

- Increased implementation costs projects currently in design based on updated engineer's estimates and the impacts on supply chains in the last 3 years due to COVID.
- Delays in stream restoration projects to modify design and maintenance plans with respect to forest impacts.
- Replacement of district level rainwater harvesting projects with urban soil restoration projects and a shoreline management project, plus increased tree planting and ESD projects. The shoreline project will be in the Middle Branch, implemented by the South Baltimore Gateway Partnership, using funding provided by DPW.

As discussed in Section 5.3.3, street sweeping operations in FY 2022 had been significantly reduced due to COVID. However, the City fully resumed operations in July 2022 and does not plan to replace the annual operations with any capital projects.

In addition to the ISR requirements to be achieved by the end of the permit, the current MS4 permit includes an annual implementation benchmark schedule (Table 1 of the current permit). which listed quantifiable targets to be used to assess progress toward meeting the ISR implementation goal. The benchmarks schedule is based on the permit year (PY) which straddles the FY, which is the metric for the City's MS4 progress reporting. Table 6-1 illustrates the schedule alignments and demonstrates that the City is on track to comply with this permit condition. FY 2022 progress is also included in the "Impervious Surface" (IMP) associated table in MS4 geodatabase (Appendix C).

Table 6-1: ISR Implementation Benchmark Schedule

Permit	Metric		PY 1	PY 2	PY 3	PY 4	Year 5	
	End of Metric		11/5/2022	11/5/2023	11/5/2024	11/5/2025	11/5/2026	
	% Complete		20%	40%	55%	75%	100%	
	Total ISR		739 ac	1,478 ac	2,033 ac	2,772 ac	3,696 ac	

Planned / Reported	Metric	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
	End of Metric	7/1/2022	7/1/2023	7/1/2024	7/1/2025	7/1/2026	7/1/2027
	% Complete	21%	51%	68%	88%	100%	110%
	Operation	*239 ac*	*1,315 ac*	*1,916 ac*	*2,190 ac*	*2,395 ac*	*2,498 ac*
	Capital	*336 ac*	*342 ac*	*365 ac*	*831 ac*	*913 ac*	*1,184 ac*
	Other	*216 ac*	*216 ac*	*216 ac*	*216 ac*	*382 ac*	*382 ac*
	Total ISR	791 ac	1,873 ac	2,497 ac	3,237 ac	3,690 ac	4,064 ac

6.2 Nutrients and Sediment TMDL

Loading and reduction scenarios for both the Chesapeake and local TMDLs were estimated using the TMDL Implementation Planning and Progress (TIPP) tool, developed by MDE to standardize the calculated estimates of pollutant load reductions for nutrient and sediment TMDLs at various points in the watershed planning process. The TIPP tool is based on the Chesapeake Bay Phase 6 CAST-2017d Watershed Model. Some practices that are included in the 2021 Accounting Guidance and used towards ISR goals (like street trees and elimination of illicit discharges) were not available to include in a load reduction.

TIPP reports were developed for each local or Chesapeake Bay TMDL issued to the City; as listed in Appendix A of the current permit. Electronic files (excel format) of each TIPP report are provided as Appendix M of this report. The results are summarized in Table 6-2 and included in the "Chesapeake Bay Progress" (CSW) and "Local TMDL Progress" (LSW) associated table in the MS4 geodatabase (Appendix C).

The TIPP milestones are as follows:

- Baseline– year of TMDL Approval
- Permit – Start of current permit but with fully operating street sweeping
- Progress – Actual performance at the end this Annual Report period, recognizing decreased street sweeping operations
- Implement Milestone 1: Implementation of planned efforts by the end of this permit
- Implementation Planned: Potential efforts (listed in Table 6-3) to meet reduction goal for the Chesapeake Bay TMDL for total nitrogen. The feasibility of this effort has not been evaluated.

Table 6- 2: Summary of TIPP Reports

TMDL	Red. Goal	Year	Load (lb / year)			% Reduction			
			Base	Target	IP	Perm	Prog	MS 1	IP
Bay BAC TN	27%	2010	78,554	57,344	57,333	1%	0%	4%	27%
BR TN	15%	2005	111,433	94,718	82,719	1%	0%	4%	26%
Bay BAC TP	49%	2010	11,8644	6,051	4,063	8%	0%	17%	66%
BR TP	15%	2005	11,915	10,128	4,409	8%	0%	17%	63%
BR TSS	75%	2018	28.3 M	7.1 M	1.1 M	11%	-2%	28%	96%
Bay PAT TN	31%	2010	200,212	138,146	137,955	2%	-2%	5%	31%
Harbor TN	15%	2007	381,402	324,192	267,045	3%	-2%	5%	30%
Bay PATMH TP	47%	2010	16,852	8,931	3,925	5%	-4%	16%	77%
Harbor TP	15%	2007	32,459	27,590	267,045	0%	-4%	14%	69%
GF TSS	47%	2010	17.4M	9.2 M	4.8 M	18%	-30	73%	
JF TSS	26%	2011	24.3M	18 M	15.8M	13%	-17	35%	
LNBP TSS	25%	2011	0.7 M	0.5 M	0.4 M	6%	-7	40%	

Note: Bay BAC = Chesapeake Bay TMDL for Back River Oligohaline segment; TN = Total nitrogen; TP = Total Phosphorus; BR = Local TMDL for Back River 8-digit watershed; Bay PATMH = Chesapeake Bay TMDL for Patapsco River Mesohaline segment, Harbor = Local TMDL for Baltimore Harbor; GF = Local TMDL for Gwynns Falls; JF = Local TMDL for Jones Falls; LNBMP = Local TMDL for Lower North Branch Patapsco; TSS = Total Suspended Solids

Table 6-3 Summary of Implementation Scenarios

Practice	Back River	Baltimore Harbor	City	Basis
Shoreline Management (LF)	0	10,000	10,000	Middle Branch and Inner Harbor
Stream Restoration (LF)	35,552	64,093	99,645	Stabilize all identified degraded stream reaches, plus 50% of non-tidal outfalls
Street Sweeping (miles)	10,250	62,000	72,250	Double monthly sweeping and increase bi-weekly routes by 5%
Storm Drain Cleaning (lb)	200,700	5,000,000	5,200,700	Double material collected (based on weight)
Land Use Conversion (ac)	1,660	864	2,524	Achieve City's goal of 40% canopy
Stormwater BMP Drainage Area (ac)	4,100	1,533	5,633	Remaining combination to achieve goal

Land use for baseline was based on land use conditions from the Chesapeake Bay Program high resolution land cover dataset from 2017/ 2018. Baltimore City Department of Recreation and Parks- Forestry Division has reported an increase in tree canopy over the last 10 years. In FY 2023, the City will revise this estimate for the specific approval years following MDE's guidance entitled *Backcasting Land-use for Implementation Planning Methodology*.

The progress load recognized the reduced street sweeping operation in FY 2022 due to COVID, demonstrating the influence of this operation. The TIPP tool relies on an accounting methodology, the City's stream impact sampling program (Section 3.2.2) has not shown a notable increase in the monthly total nitrogen and phosphorus monitoring results in the last two

years but has demonstrated a decreasing trend since 2010. The street sweeping operations for the baseline load were based a conservative assumption that the annual mileage reported in previous MS4 annual reports was performed on a bi-weekly basis, using vacuum technology. In FY 2023, the City may adjust this estimate based on available historic performance data that could better align the monitoring results with estimated loadings from the TIPP tool.

The progress analysis in Table 6-2 shows the current planned efforts for the permit will be sufficient for meeting the target loads (based on percent reduction) for sediment for the local TMDLs for Gwynns Falls, Jones Falls, and Lower North Branch Patapsco, but it will not be met for the other TMDLs. The Bay TMDL for nitrogen required the most effort to meet the reduction goals, especially if only relying BMPs to treat stormwater runoff and not recognizing the potential of nitrogen loadings from subsurface discharges to the storm drain system. Furthermore, these efforts created an imbalance in the reduction associated with the other TMDLs. In FY 2023, the City will further explore the feasibility and effectiveness of potential efforts listed in Table 6-3, as it relates to long-term TMDL implementation planning. the City's SIS monitoring results show a decrease in nutrient and phosphorus concentrations since FY 2012, as described in Section 3.1.1 of this report.

6.3 Bacteria TMDL

The City is under a consent decree in Civil Action No. JFM-02-1524 for unpermitted discharges from the wastewater collection system. A modification to the consent decree was approved on October 6, 2017 in the United States District Court for the District of Maryland by the U.S. Department of Justice, the U.S. Environmental Protection Agency, and the Maryland Department of the Environment. In 20118, the City submitted a modified Bacteria TMDL implementation plan to reflect the schedule approved as part of the modified Consent Decree. In FY 2022, the City completed the majority of projects under Phase I of the Modified Consent Decree (including the Back River Head Works project) and continued post-construction flow monitoring analysis, which will identify projects for Phase II. Further information on these efforts and progress towards eliminating SSOs is provided in quarterly Consent Decree reports, posted on the City's website.

The results of the City's routine stream sampling for bacteria are provided in Section 3.1.2 of this report. None of the stations meet all of the criteria for recreation; however, the station at Smith Ave. did meet the criteria related to bacteria and dissolved oxygen. Generally, the historic monitoring data indicates a decreasing trend in bacteria concentrations.

6.4 Trash TMDL

On January 5, 2015, EPA approved the report entitled "Total Maximum Daily Loads (TMDL) of Trash and Debris for the Middle Branch and Northwest Branch Portions of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment, Baltimore City and County, Maryland". In compliance with the MS4 permit, the City developed the "Baltimore City Trash TMDL Implementation Plan", submitted to MDE on January 4, 2016, to present strategies to meet the TMDL waste load allocations. Although the TMDL Implementation Plan demonstrated that the City was reducing 100% of the waste load allocation, the City continues its commitment to remove trash from the waterways beyond the prescribed annual trash removal target.

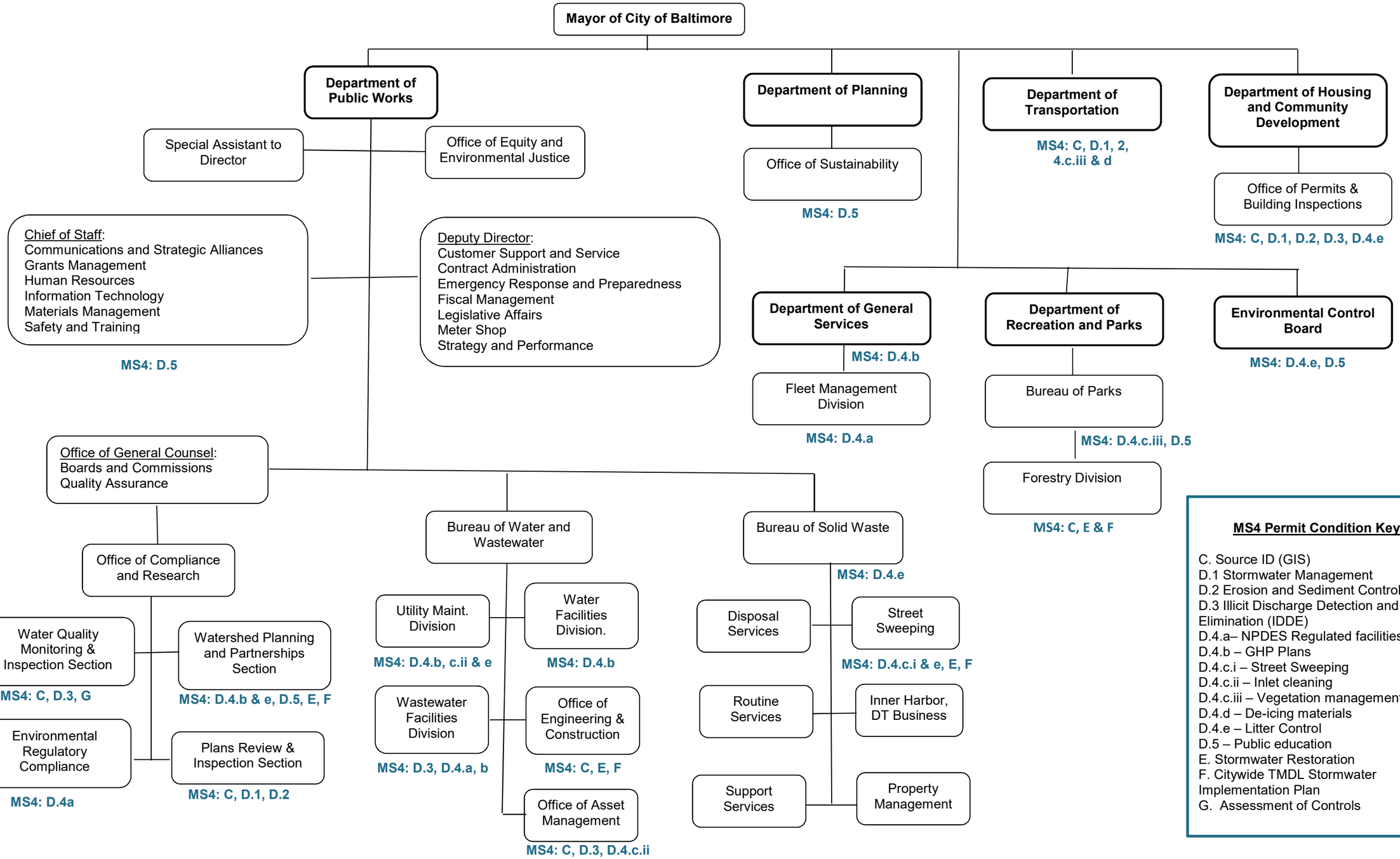
6.5 PCB TMDL

The City submitted a revised PCB TMDL implementation plan to MDE in September 2018. The plan included details of a collaborative study with USGS and UMBC in the Back River watershed, which was completed by FY 2020. The results of the study were published in June 2022 as "*USGS Scientific Investigations Report (SIR) 2022–5012: Refining Sources of Polychlorinated Biphenyls in the Back River Watershed, Baltimore, Maryland, 2018–2020*".

In FY 2022, the City contracted USGS to perform a supplemental study within the Herring Run subwatershed of the Back River Watershed, which was started in the summer of 2022. The scope of work for the 2-year study is as follows:

- Categorize and identify possible sediment sources
- Sample suspended sediment from storm events.
- Assess bioavailability of PCBs in suspended sediment and cores to determine the potential impacts of stormwater to the aquatic food chain.
- Calculate the source contribution to the sediment load (and potential associated PCB load)

Appendix A: Organization Chart



MS4 Permit Condition Key:

C. Source ID (GIS)
D.1 Stormwater Management
D.2 Erosion and Sediment Control
D.3 Illicit Discharge Detection and Elimination (IDDE)
D.4.a– NPDES Regulated facilities
D.4.b – GHP Plans
D.4.c.i – Street Sweeping
D.4.c.ii – Inlet cleaning
D.4.c.iii – Vegetation management
D.4.d – De-icing materials
D.4.e – Litter Control
D.5 – Public education
E. Stormwater Restoration
F. Citywide TMDL Stormwater Implementation Plan
G. Assessment of Controls

City of Baltimore Organization Chart in Reference to MS4 Permit Conditions as of June 30, 2022

Department of Public Works
Organization Chart
as June 30, 2022

Jason Mitchell, Ed. D.
Director

Matt Garbark,
Deputy Director
Customer Support and Services, LaToya Curtis (Acting)
Contract Administration, Tonorah Houston-Burgee
Emergency Response & Preparedness, Antoine Smith (Acting)
Fiscal Management, Aaron Moore
Legislative Affairs, Marcia Collins
Meter Shop Initiative, Steve Stricklin (Acting)
Strategy and Performance, Krystina Bryant

Audree Jones Taylor,
Chief of Staff
Communications and Strategic Alliance, Yolanda Winkler
Grants Management, Anne Haskins-Brookover
Human Resources, Tamiko Bryant
Information Technology, Yugandhar Narala
Materials Management, Ingrid Rivera
Safety and Training, Barbara Rodgers

Darnell Ingram, Esq.
General Counsel, Chief Compliance Officer
Boards and Commissions, Deena Joyce
Compliance and Research, Kimberly Grove, P.E.
Quality Assurance, Stephen Lesniewski (Acting)

Marco Merrick,
Chief, Office of Equity and Environmental Justice

Yvonne Moore-Jackson,
Head (Acting) of Bureau of Solid Waste
Solid Waste Administration, Toya Sykes-Coates
Disposal Services, Vacant
Inner Harbor, Downtown Business District, Michael Lucas
Property Management, Humphrey Awomolo
Routine Services, Jerome Ragsdale
Street Sweeping/ Convenience Centers, Yolanda Cason
Special Services, Yolanda Cason (Acting)
Support Services, Kristyn Oldendorff
Waste Diversion , Vacant

Yosef Kebede, P.E.
Head of Bureau of Water and Wastewater
Administrative Affairs Manager, Kedrick McIntyre
Asset Management, Brian Ball, P.E.
Chief Technical Officer, Mohammed Rahman
Engineering and Construction, Tim Wolfe, P.E.
Laboratory Operations Division, Deborah Pitts
Special Projects, Ramona Harry
Utility Maintenance, James Patrick
Water Facilities Services, Herb Naylor (Acting)
Wastewater Facilities, Mike Hallman

Appendix B: MS4 Geodatabase Progress

Table B-1
Summary of Transition to Updated Schema

Code	Title	Type[2]	Status[3]	Notes
I. Permit Administration				
PER	Permit Info	AT	Complete	
II. BMPs				
BMP	BMP	FC-PT	In progress	Combines records from BMP plus BMPPOI and Rest BMP; assigned all new BMP_ID as "BC22BMP000XXX". Addressed MDE Comments. See Table B-2 and 3 for plan to address mandatory fields listed as null or using assumed values. Proposed restoration BMPs to meet MS4 permit will be added in the FY 2023 MS4 Annual Report.
BDA	BMP Drainage Area	FC-PT	Complete	Additional BMP Drainage areas to address nulls in BMP table will be added per Table B-2.
BIN	BMP Inspections	AT	Complete	Combines records from pervious Rest BMP Inspect. Addressed MDE comments regarding use of only latest inspection. See main text of FY 22 Annual Report for plan to address triannual inspection gaps.
III. Alternative BMPs				
ALN	Alt BMP Line	FC-L	In progress	Same stream restoration projects as FY 2022. Proposed stream restoration project to meet current MS4 permit will be added in FY 2023 MS4 Annual Report.
SRP	Str Rest Protocols	AT	In progress	See Table B-2 for plan to address mandatory fields listed as null.
SHR	Shoreline Management Practices	AT	Pending	Proposed restoration project will be added in FY 2023 MS4 Annual Report.
APT	Alt BMP Point	FC – PT	Complete	First submittal, previously reported in IDD table.
DGI	Discharges from Grey Infrastructure Protocols	AT	Complete	Associated with Abated Illicit Discharges (Appendix L) and IDDE Calc (Appendix N). Previously reported in IDD table.
APY	Alt BMP Poly	FC – PG	Complete	Addressed MDE comments. Changed BMP types for tree planting, plus associated calculations for EIA and nutrient reduction. FY 22 tree planting data not availble, will be added in FY 2023 MS4 Annual Report. Proposed restoration projects to address current permit will be added in the FY 2023 MS4 Annual Report.
AIN	Alt BMP Inspections	AT	Complete	First Submittal. Combines previous tables for all alternative BMP types.

Table B-1
Summary of Transition to Updated Schema

Code	Title	Type[2]	Status[3]	Notes
IV. TMDLs				
CSW	Chesapeake Bay Progress	AT	Complete	Previously known as Countywide Watershed Assessment. Associated with TIPP (Appendix P)
LSW	Local TMDL Progress	AT	Complete	Previously included in Countywide Wastershed Assessment. Associated with TIPP for local TMDLs (Appendix P).
V. Management Programs				
SWM	Stormwater Management	AT	Complete	
ESC	Erosion Sediment Control	AT	Complete	Should match submittal for ESC delegation, submitted as separate portal in December 2022.
QGP	ESC Quarterly Grading Permits	FC-PT	Complete	
VI. IDDE				
OUT	Outfall	F-PT	In progress	See Table B-2 for plan to address mandatory fields listed as null.
ODA	Outfall Drainage Area	F-PG	In progress	See Table B-2 for plan to address mandatory fields listed as null.
IDD	IDDE Screening	AT	Pending	Will submit in FY 2023 Annual Report pending MDE regarding guidance on comprehensive monitoring, plus applicability to City's Alternative IDDE program
MUN	Municipal Facilities	F – PT	Complete	See Table B-2 for plan to address mandatory fields listed as null.
CAP	Chemical Application	AT	Complete	
VII. Assessment of Controls				
MSI	Monitoring Site	F-PT	Complete	Last submittal. CBT Pooled monitoring as of 3/5/2022 for BMP Effectectivieness- no other records proposed for future Annual Reports
MDA	Monitoring Drainage Area	F-PG	Complete	Last submittal. CBT Pooled monitoring as of 3/5/2022 for BMP Effectectivieness- no other records proposed for future Annual Reports
CHM	Chemical Monitoring	AT	Complete	Last submittal. CBT Pooled monitoring as of 3/5/2022 for BMP Effectectivieness- no other records proposed for future Annual Reports

Table B-1
Summary of Transition to Updated Schema

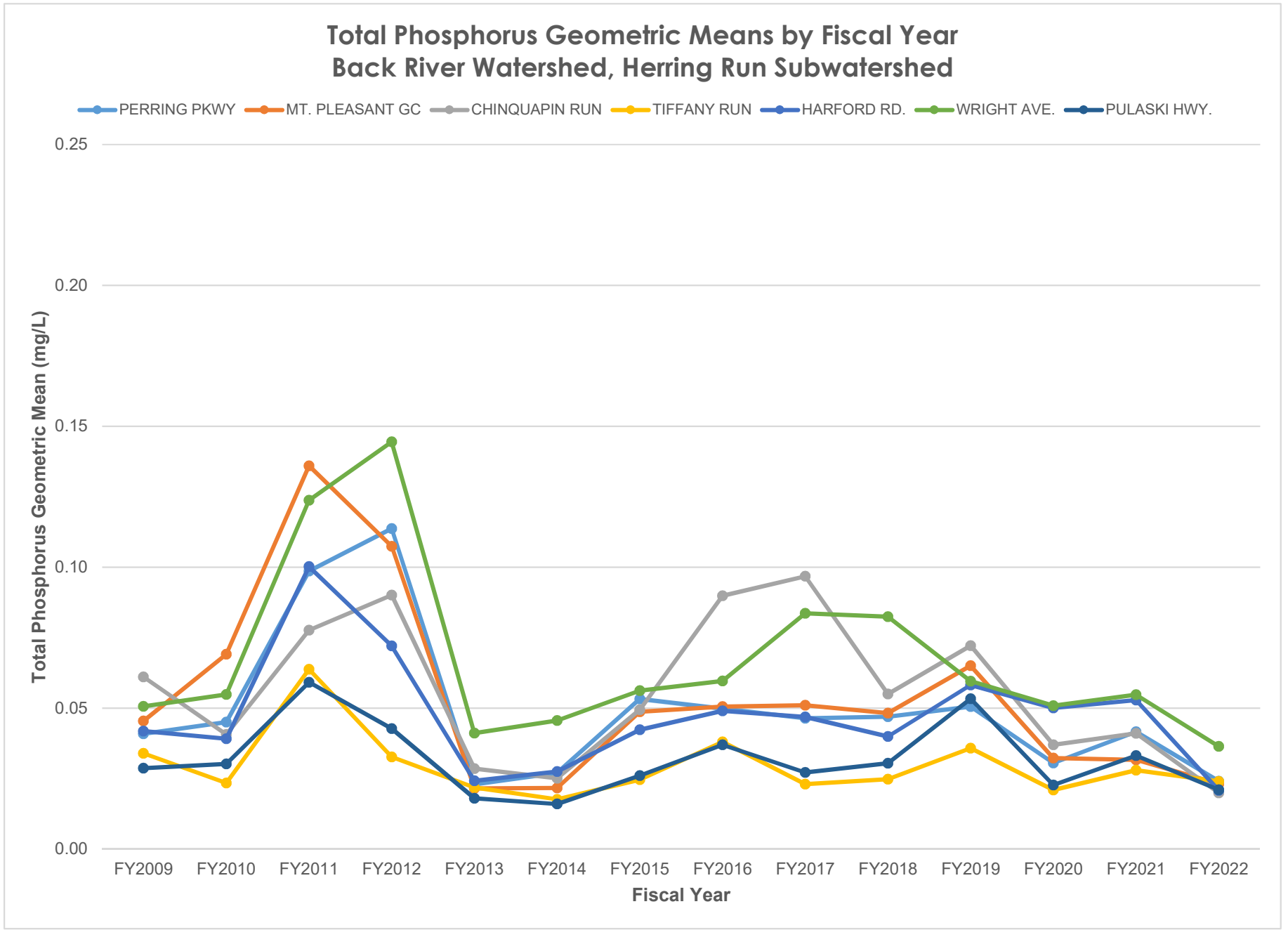
Code	Title	Type[2]	Status[3]	Notes
BIO	Biological Monitoring	AT	Complete	Last submittal. CBT Pooled monitoring as of 3/5/2022 for BMP Effectectivieness- no other records proposed for future Annual Reports
LOC	Local Concern	AT	NA	NA
VIII. Other				
FIS	Fiscal Analysis	AT	Complete	
IMP	Impervious Area	AT	Complete	
NAR	Narrative Files	AT	Complete	

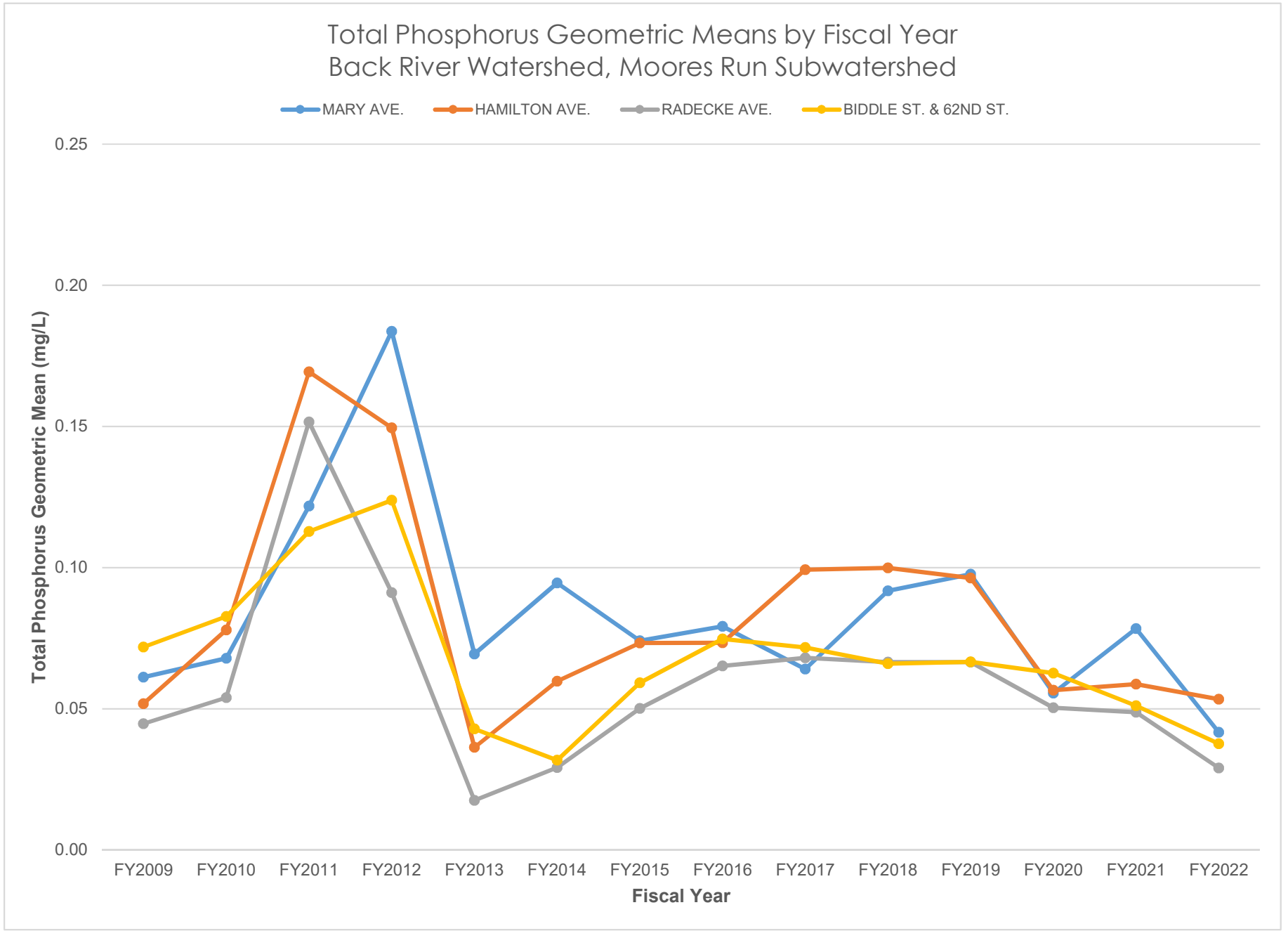
Note: 1. Code designation is based on MDE NPDES MS4 Draft Supplement to Geodatabase Design and User's Guide (Nov. 2021)
2. AT = Associated table, FC = Feature Class table; PT = point shape file; L - Line shape file; PG = polygon shape file
3. In progress status means the new fields have not been completely addressed yet.

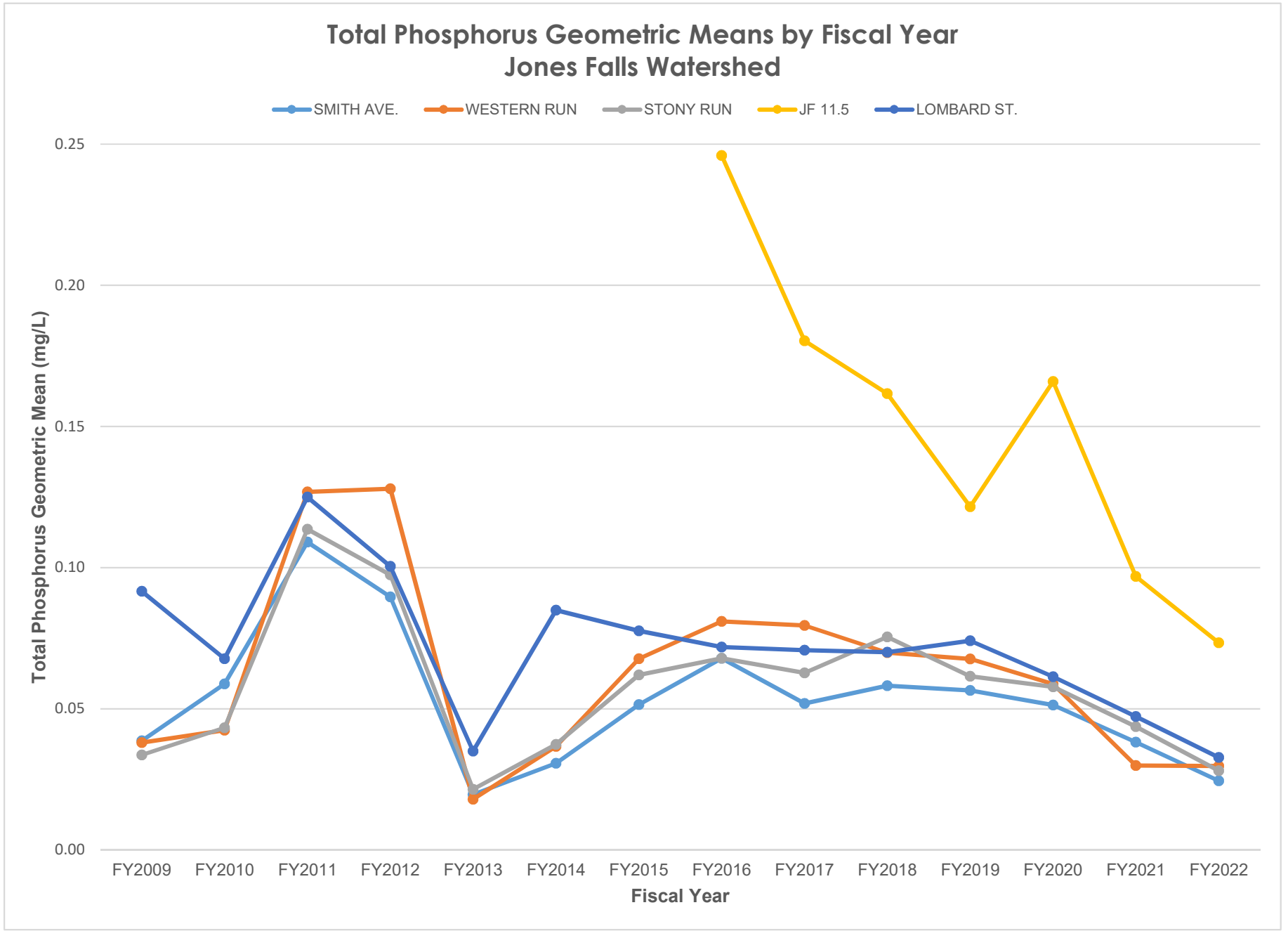
Appendix C: Source Information using MS4 Geodatabase (*electronic files only*)

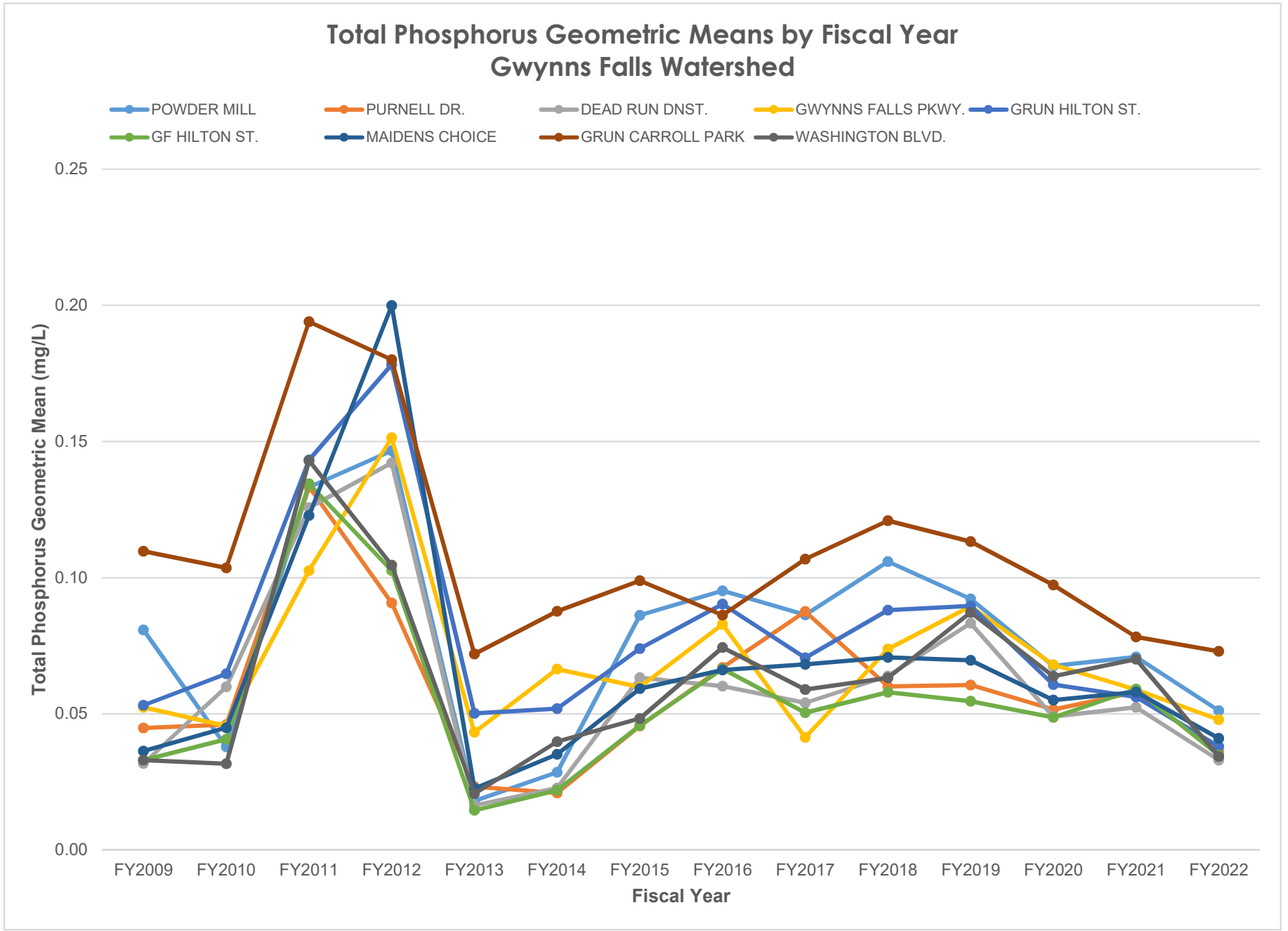
Appending D: Ammonia Screening and Stream Impact Sampling Results (*electronic files only*)

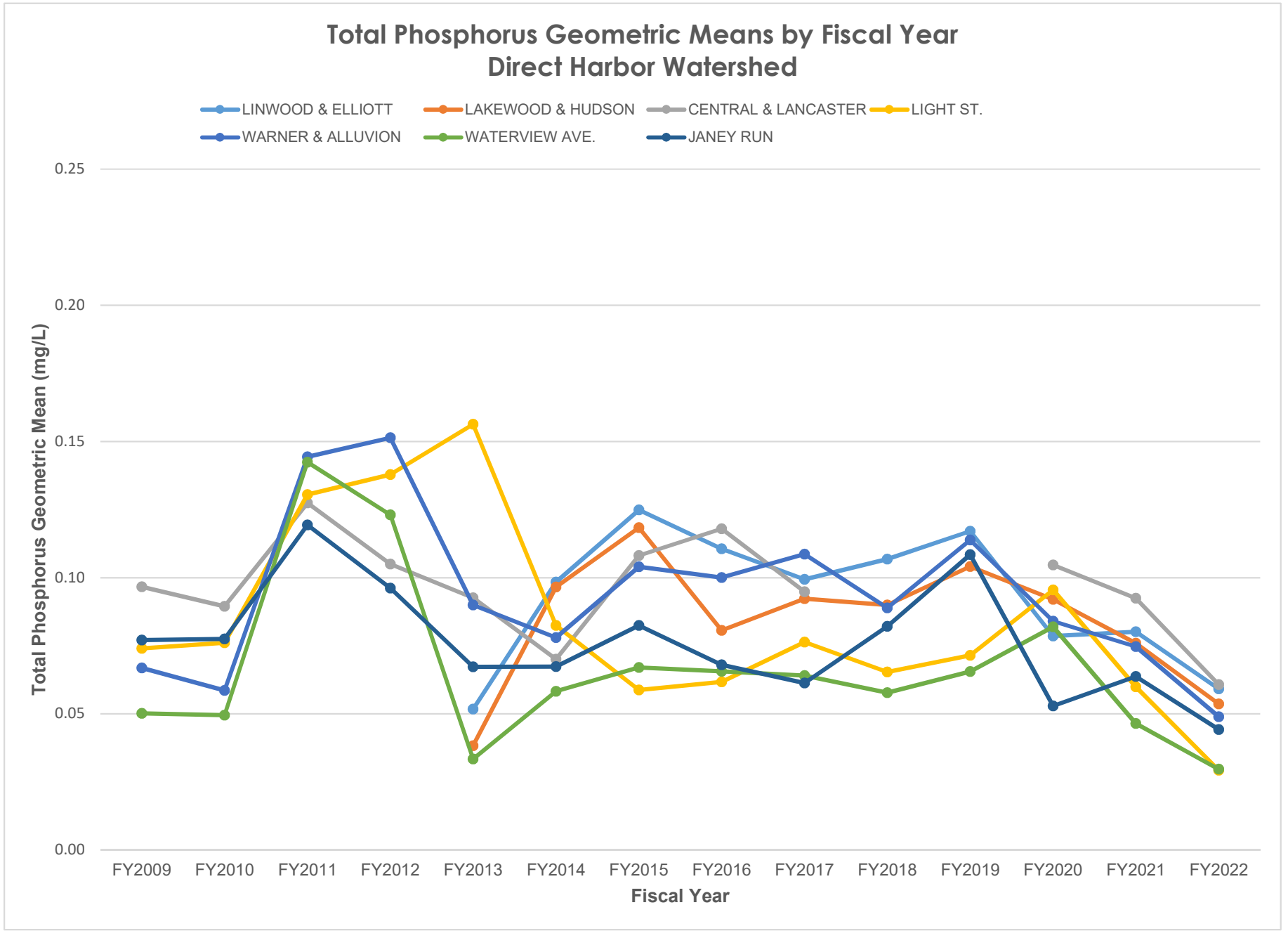
Appendix E: Total Phosphorus Monitoring Histographs

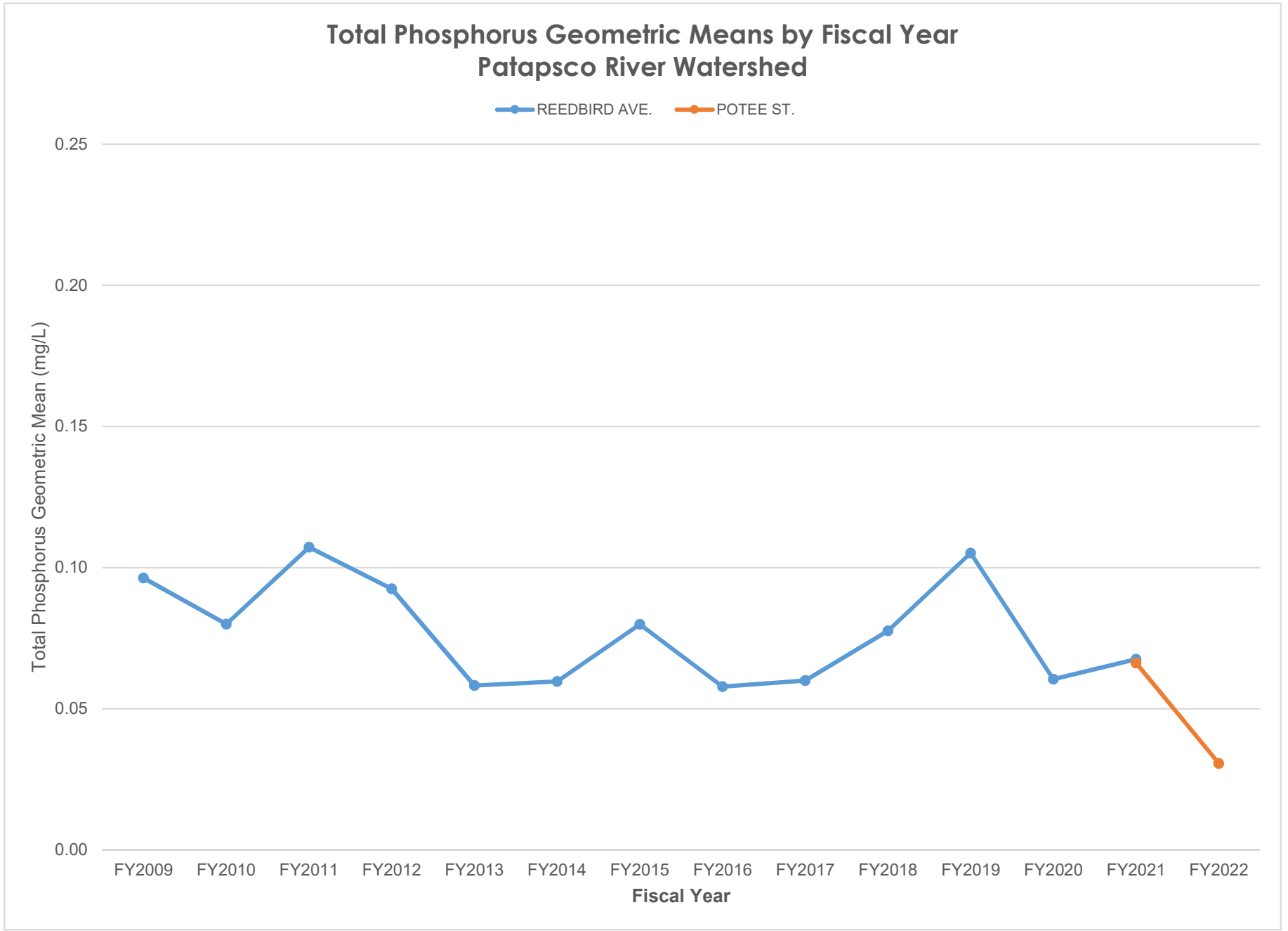

Total Phosphorus Geometric Means by Fiscal Year
Back River Watershed, Herring Run Subwatershed
PERRING PKWY
MT. PLEASANT GC
CHINQUAPIN RUN
TIFFANY RUN
HARFORD RD.
WRIGHT AVE.
PULASKI HWY.
0.25
0.20
0.15
0.10
0.05
0.00
Total Phosphorus Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

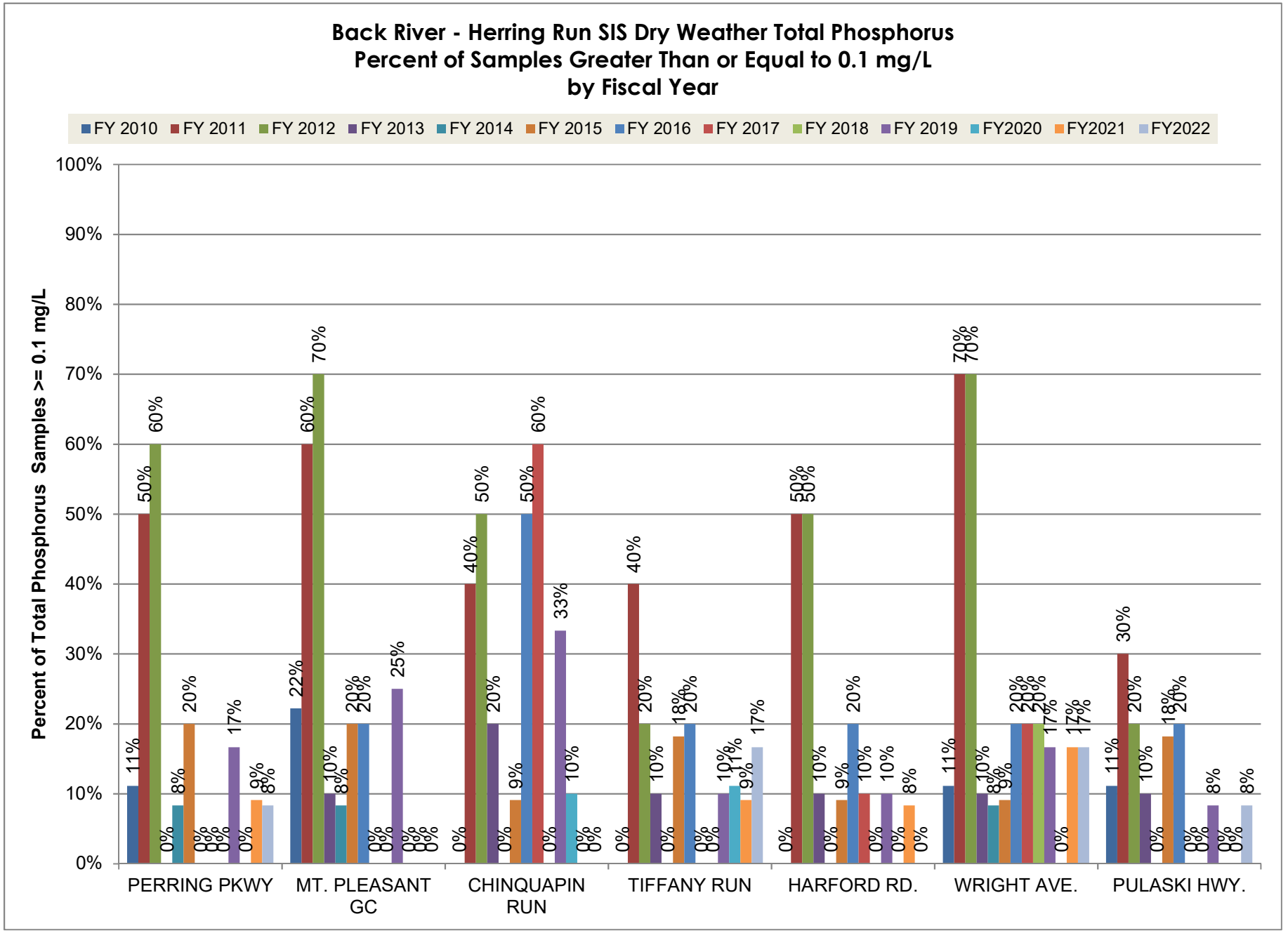

Total Phosphorus Geometric Means by Fiscal Year
Back River Watershed, Moores Run Subwatershed
MARY AVE.
HAMILTON AVE.
RADECKE AVE.
BIDDLE ST. & 62ND ST.
0.25
0.20
0.15
0.10
0.05
0.00
Total Phosphorus Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

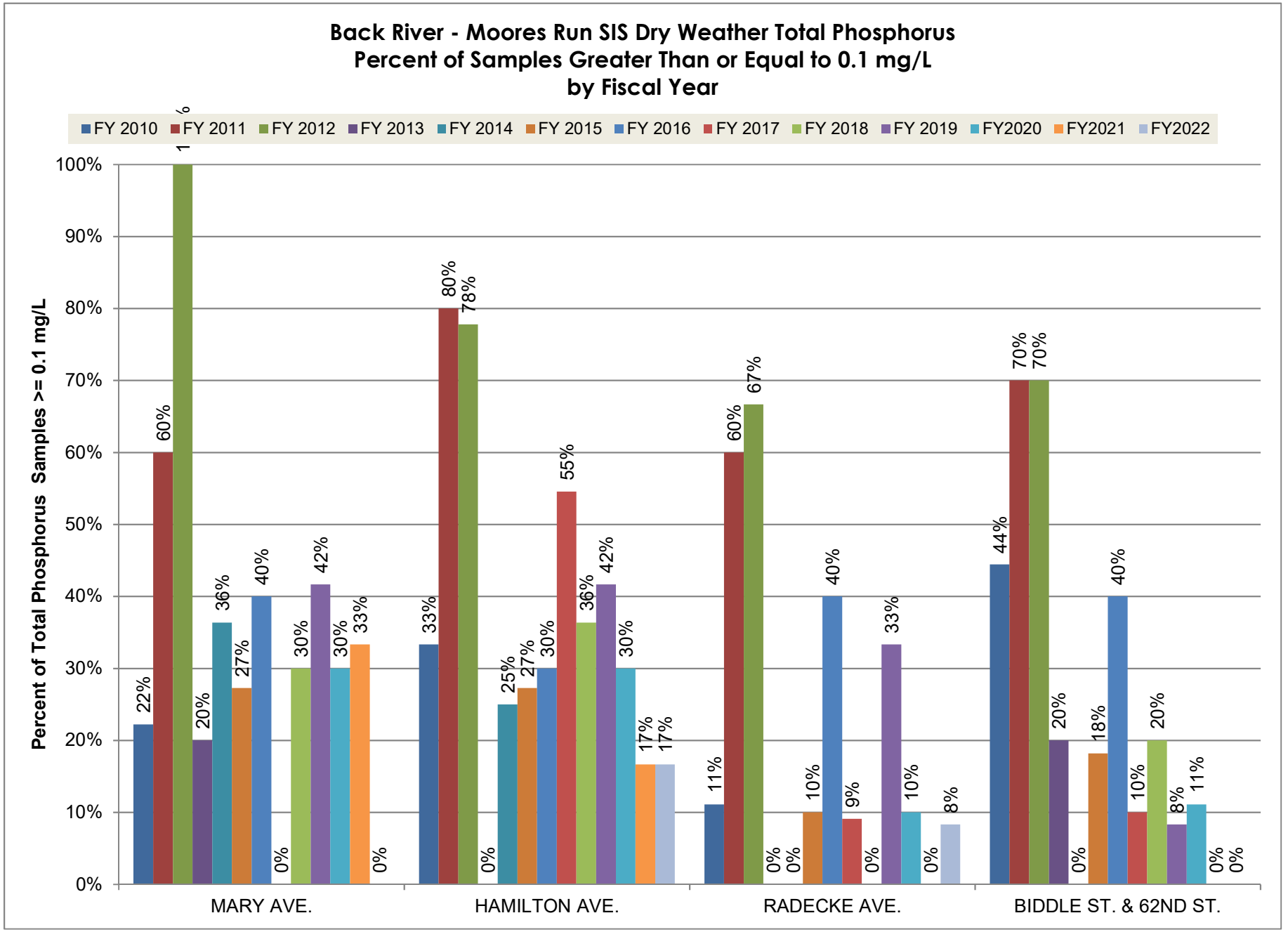

Total Phosphorus Geometric Means by Fiscal Year
Jones Falls Watershed
SMITH AVE.
WESTERN RUN
STONY RUN
JF 11.5
LOMBARD ST.
Total Phosphorus Geometric Mean (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

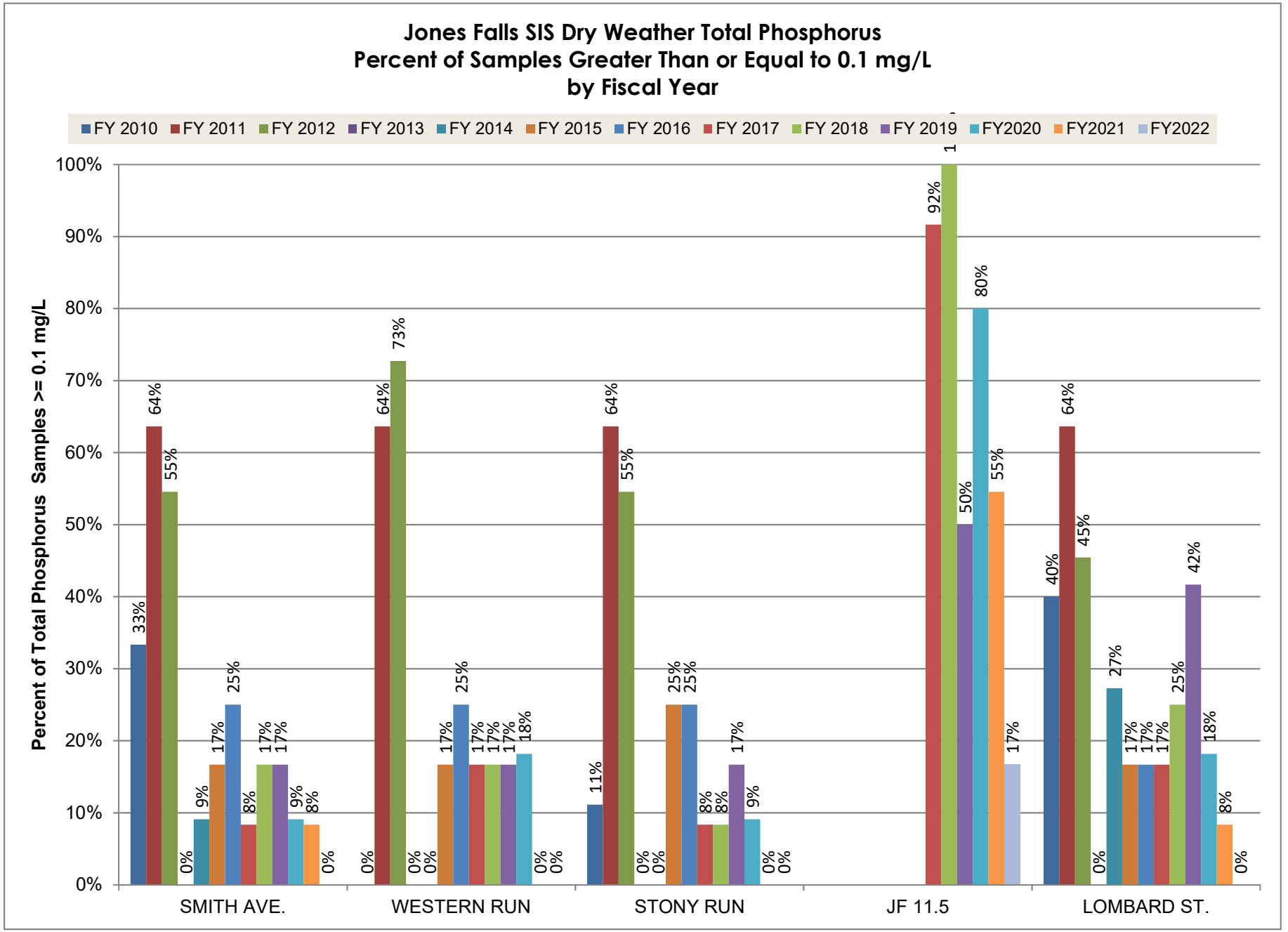

Total Phosphorus Geometric Means by Fiscal Year
Gwynns Falls Watershed
POWDER MILL
PURNELL DR.
DEAD RUN DNST.
GWYNNS FALLS PKWY.
GRUN HILTON ST.
GF HILTON ST.
MAIDENS CHOICE
GRUN CARROLL PARK
WASHINGTON BLVD.
0.25
0.20
0.15
0.10
0.05
0.00
Total Phosphorus Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

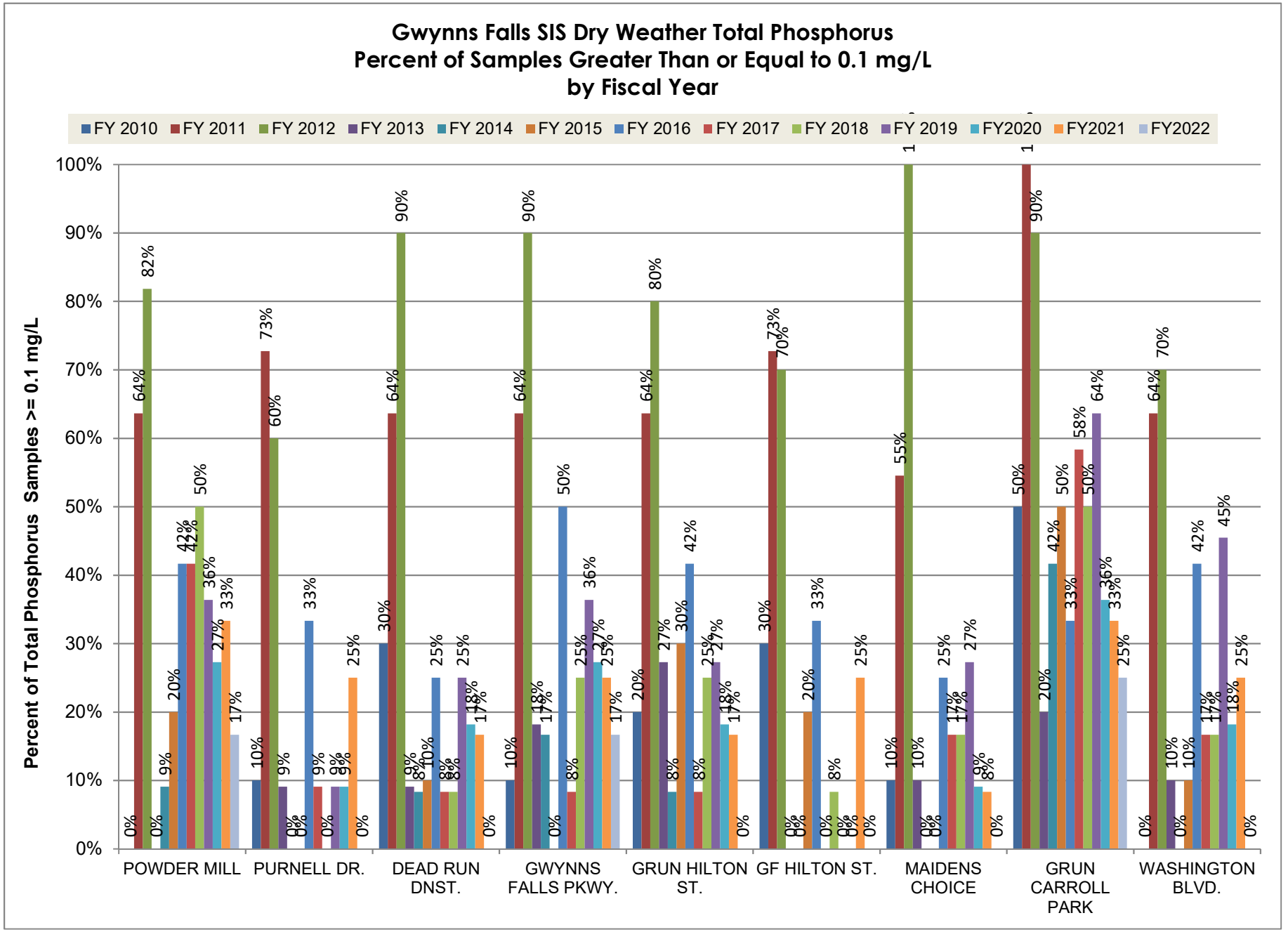

Total Phosphorus Geometric Means by Fiscal Year
Direct Harbor Watershed
LINWOOD & ELLIOTT
LAKEWOOD & HUDSON
CENTRAL & LANCASTER
LIGHT ST.
WARNER & ALLUVION
WATERVIEW AVE.
JANEY RUN
Total Phosphorus Geometric Mean (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year


Total Phosphorus Geometric Means by Fiscal Year
Patapsco River Watershed
REEDBIRD AVE.
POTEE ST.
0.25
0.20
0.15
0.10
0.05
0.00
Total Phosphorus Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

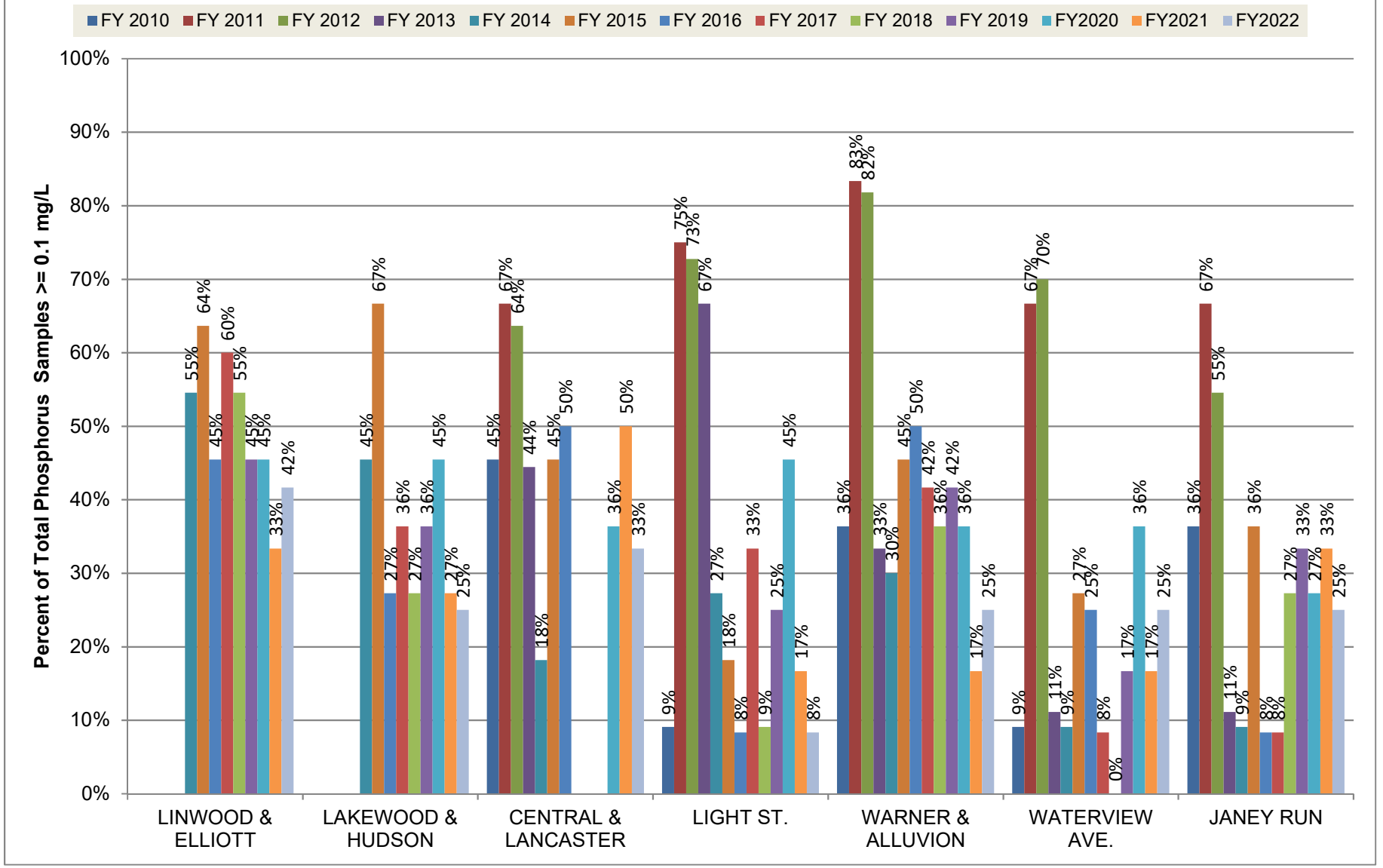

Back River - Herring Run SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY2020
FY2021
FY2022
Percent of Total Phosphorus Samples >= 0.1 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PERRING PKWY
MT. PLEASANT GC
CHINQUAPIN RUN
TIFFANY RUN
HARFORD RD.
WRIGHT AVE.
PULASKI HWY.

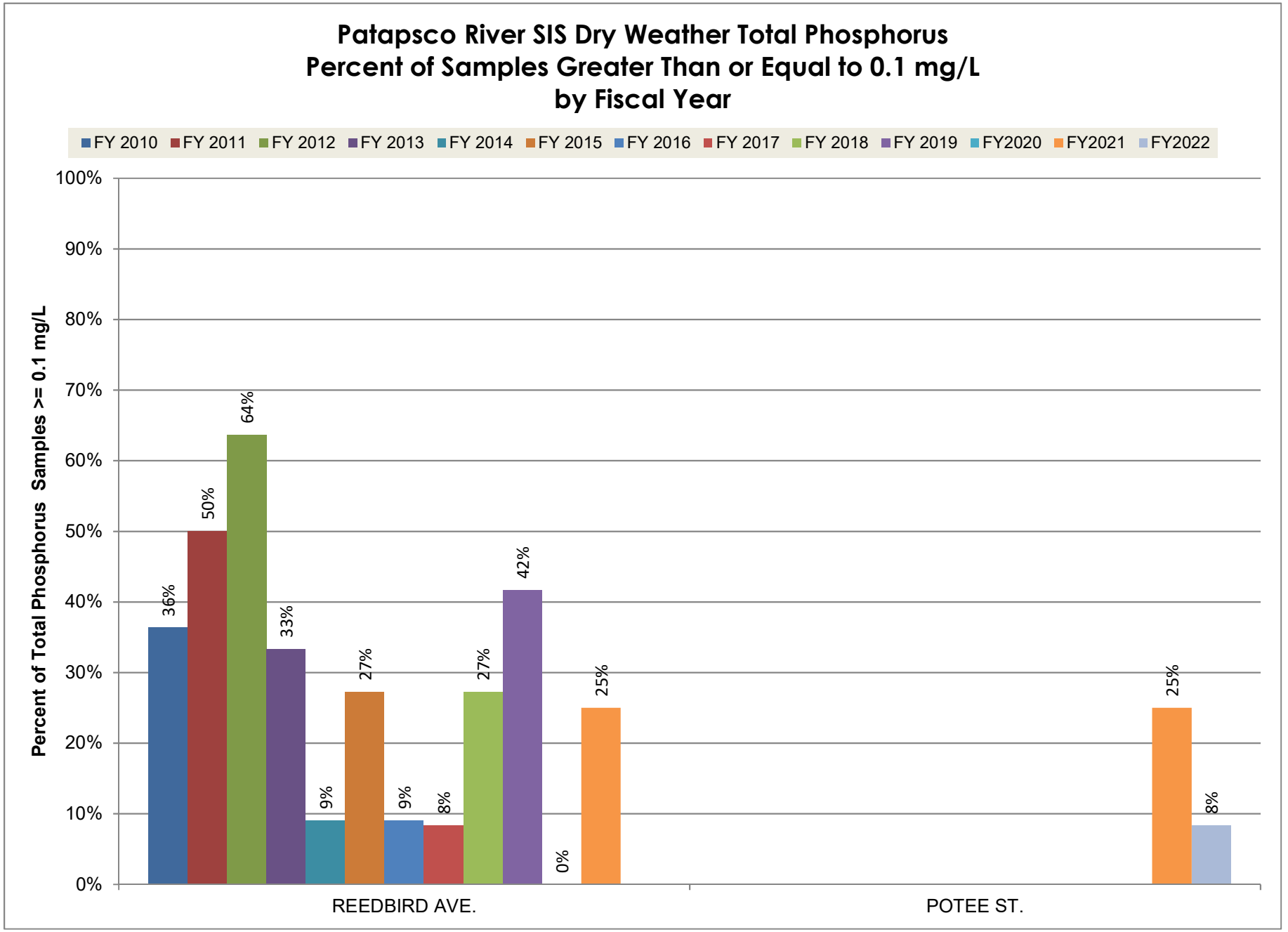

Back River - Moores Run SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY2020
FY2021
FY2022
Percent of Total Phosphorus Samples >= 0.1 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MARY AVE.
HAMILTON AVE.
RADECKE AVE.
BIDDLE ST. & 62ND ST.


Jones Falls SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY2020
FY2021
FY2022
Percent of Total Phosphorus Samples >= 0.1 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
SMITH AVE.
WESTERN RUN
STONY RUN
JF 11.5
LOMBARD ST.

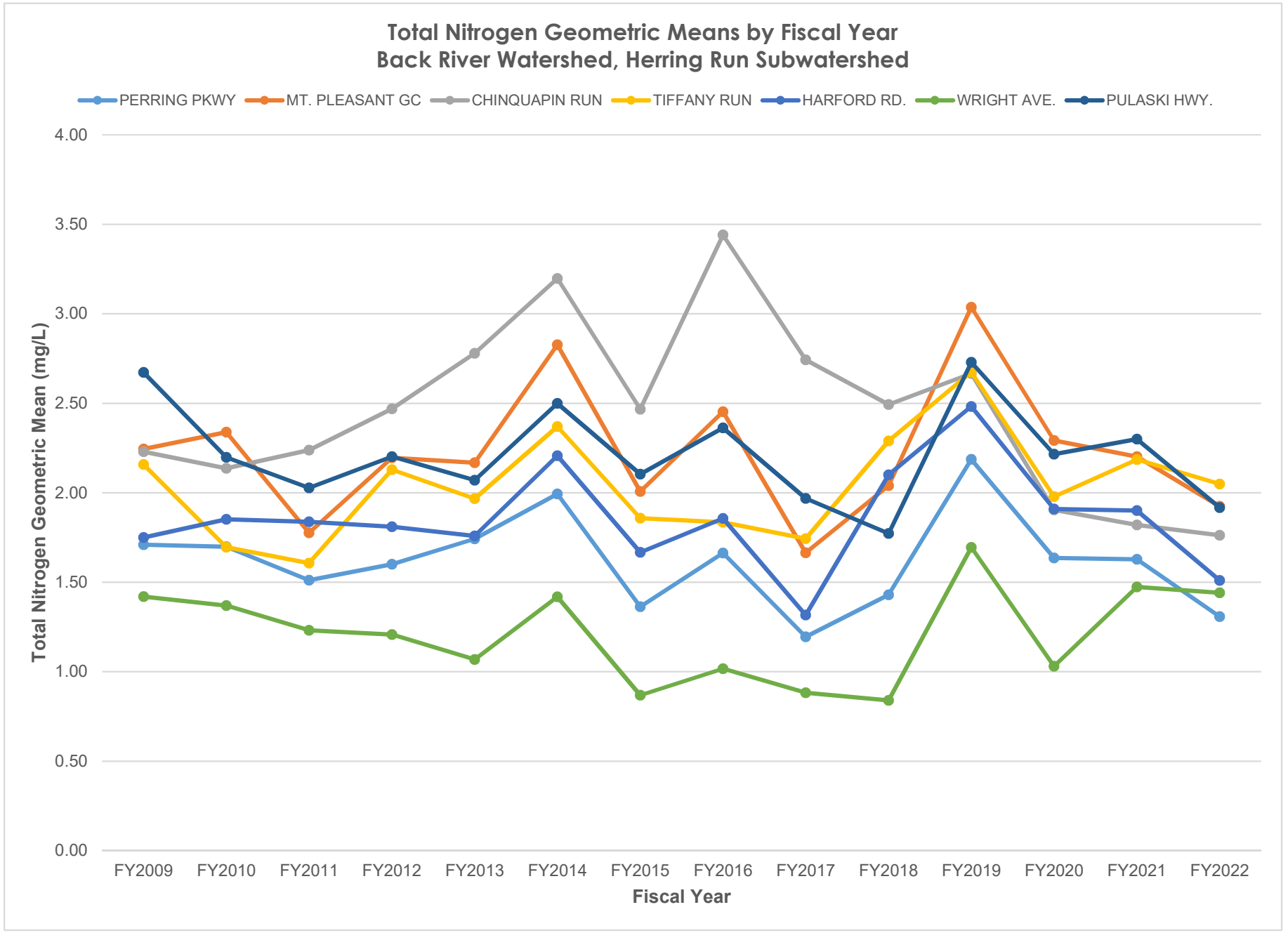

Gwynns Falls SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY2020
FY2021
FY2022
Percent of Total Phosphorus Samples >= 0.1 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
POWDER MILL
PURNELL DR.
DEAD RUN DNST.
GWYNNS FALLS PKWY.
GRUN HILTON ST.
GF HILTON ST.
MAIDENS CHOICE
GRUN CARROLL PARK
WASHINGTON BLVD.

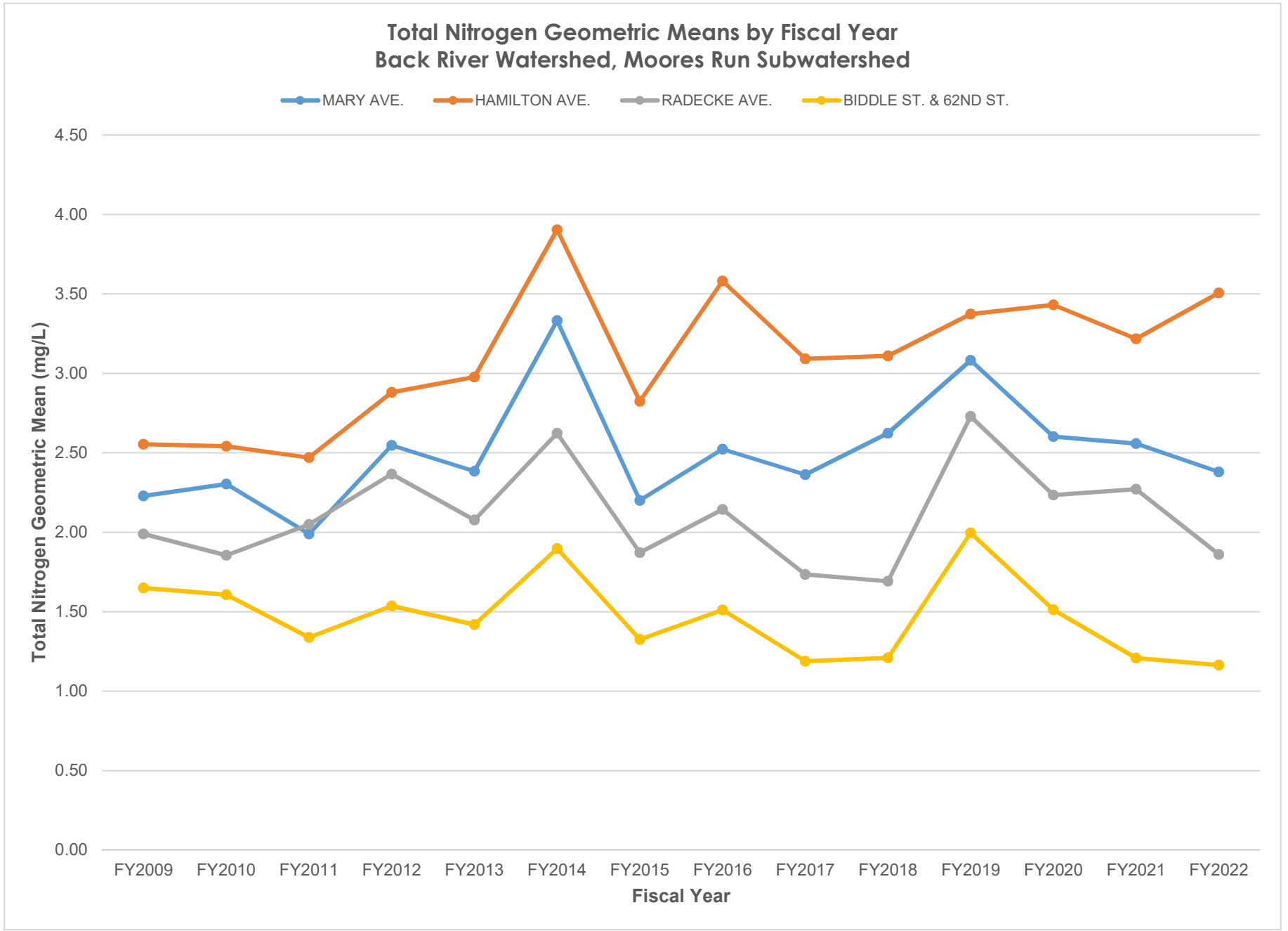
Harbor SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year

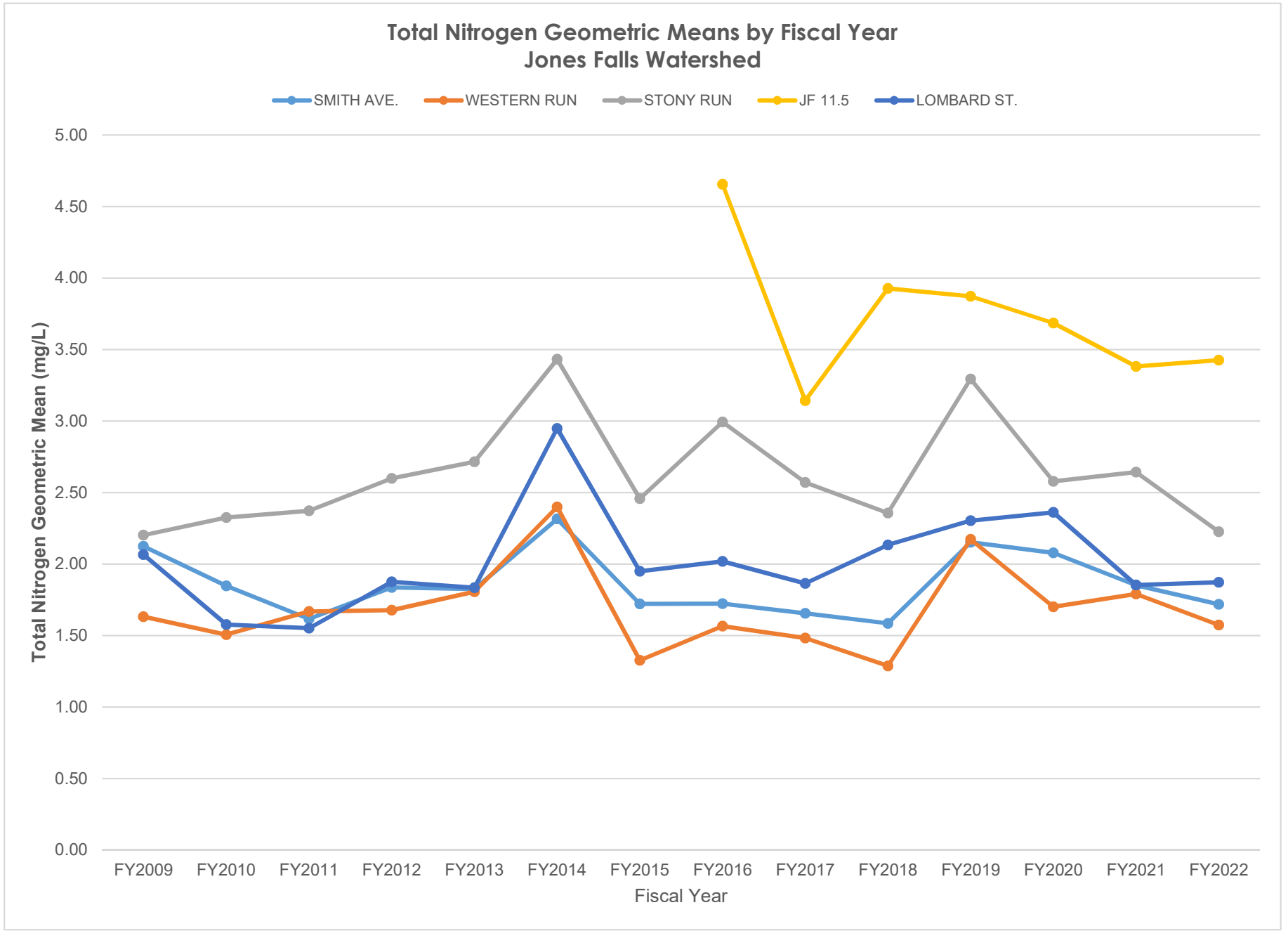


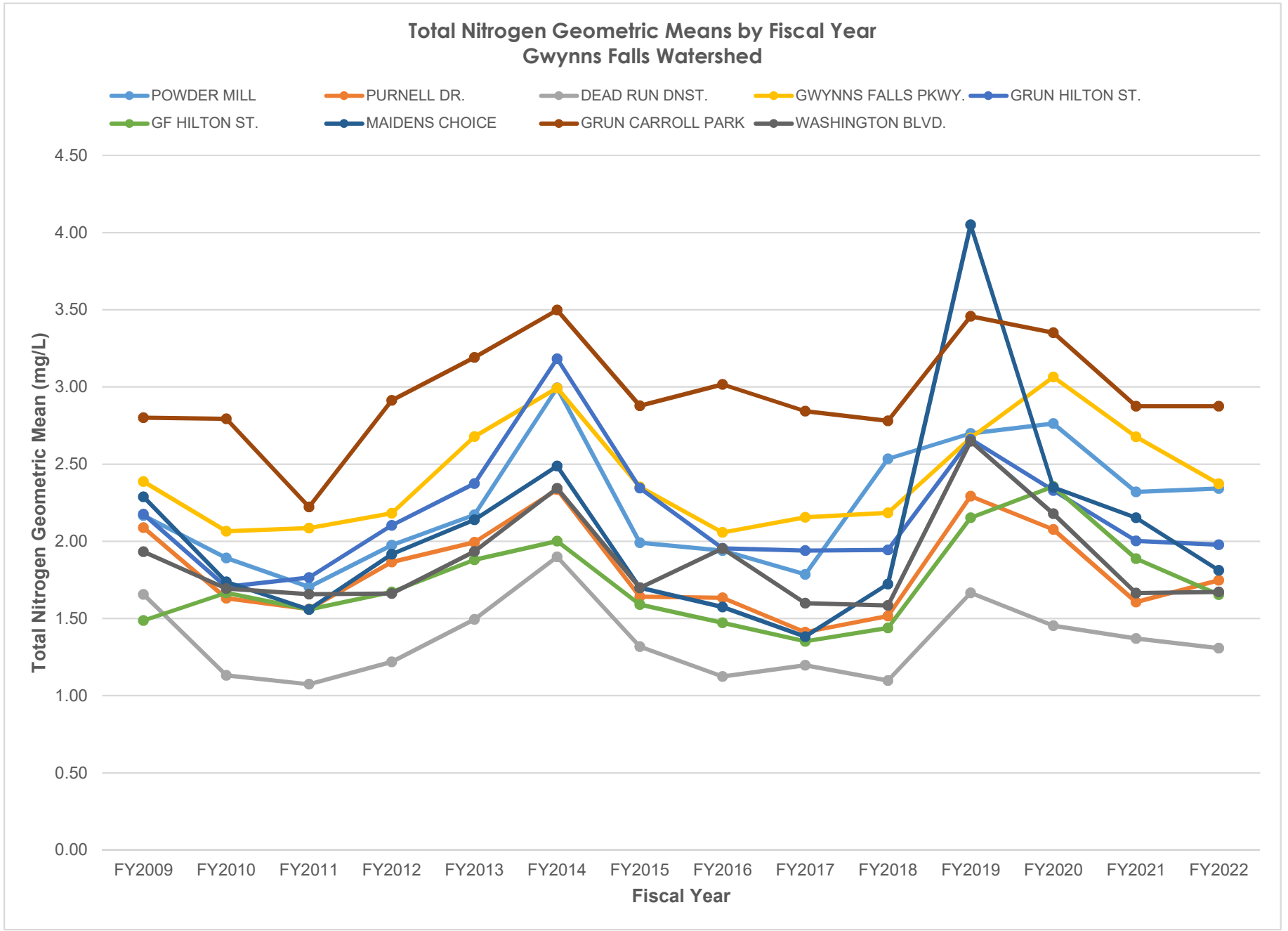

Patapsco River SIS Dry Weather Total Phosphorus
Percent of Samples Greater Than or Equal to 0.1 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY2020
FY2021
FY2022
Percent of Total Phosphorus Samples >= 0.1 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
36%
50%
64%
33%
9%
27%
9%
8%
27%
42%
0%
25%
25%
8%
REEDBIRD AVE.
POTEE ST.

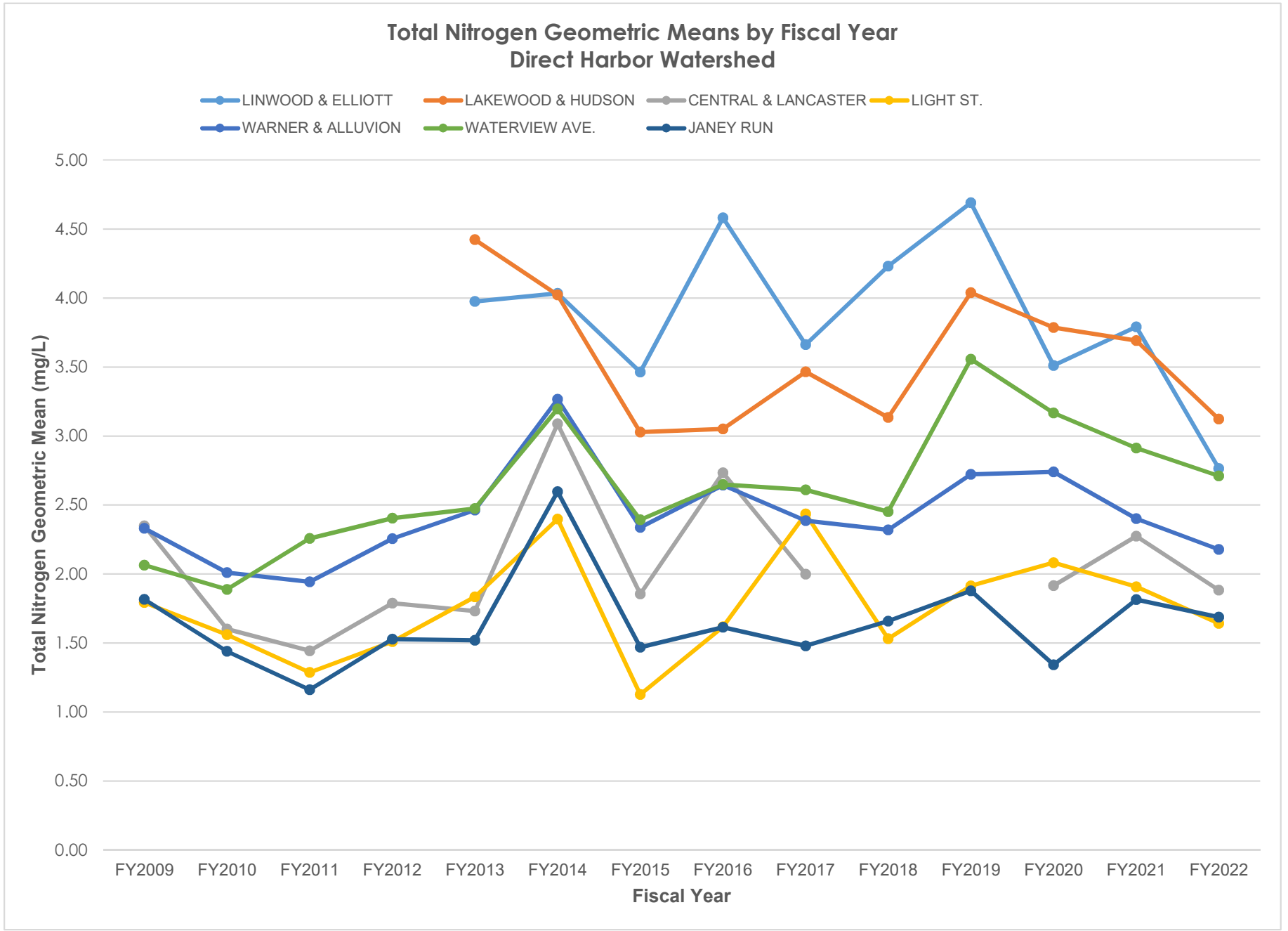
Appendix F: Total Nitrogen Monitoring Histographs

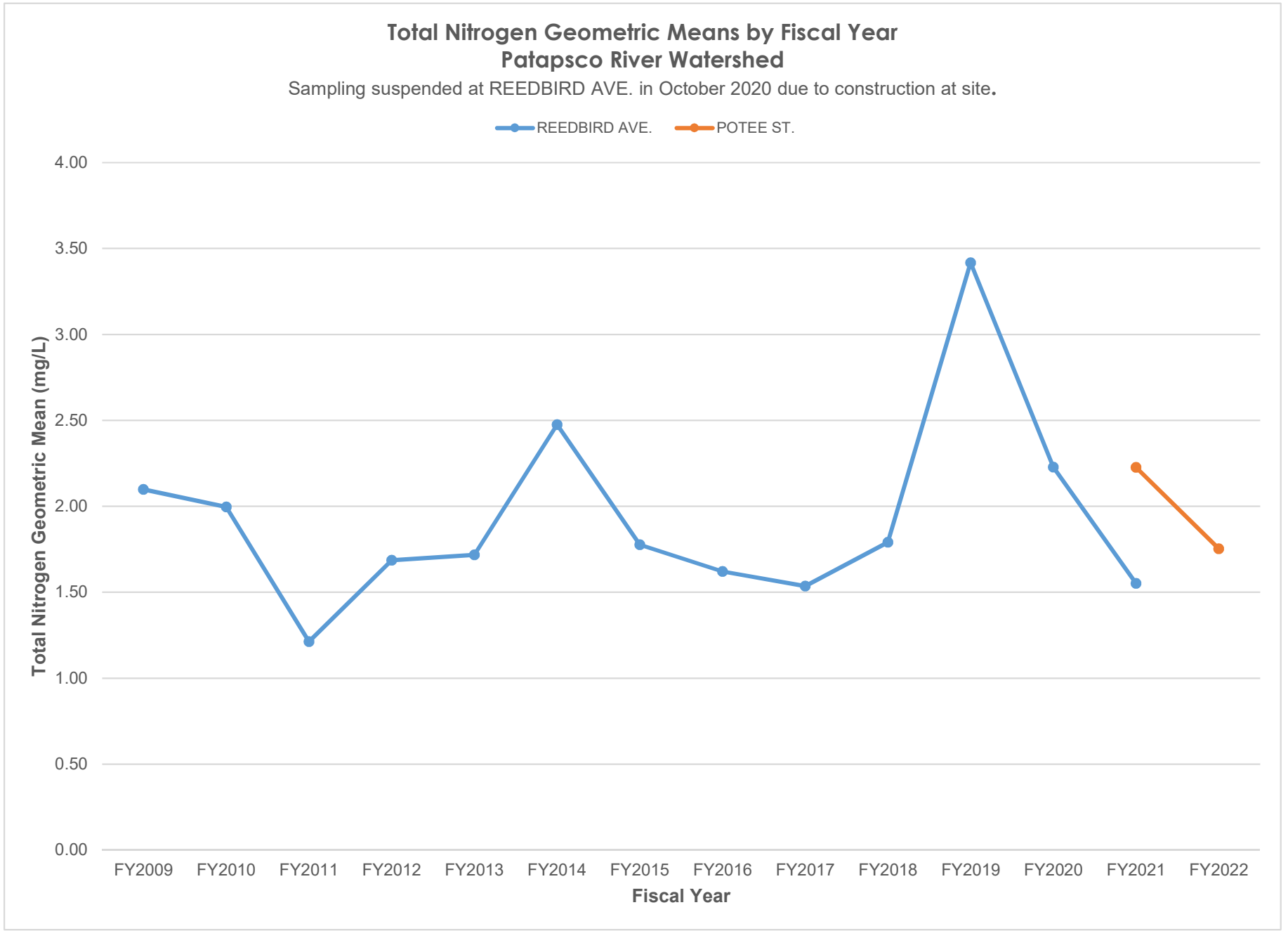

Total Nitrogen Geometric Means by Fiscal Year
Back River Watershed, Herring Run Subwatershed
PERRING PKWY
MT. PLEASANT GC
CHINQUAPIN RUN
TIFFANY RUN
HARFORD RD.
WRIGHT AVE.
PULASKI HWY.
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Total Nitrogen Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

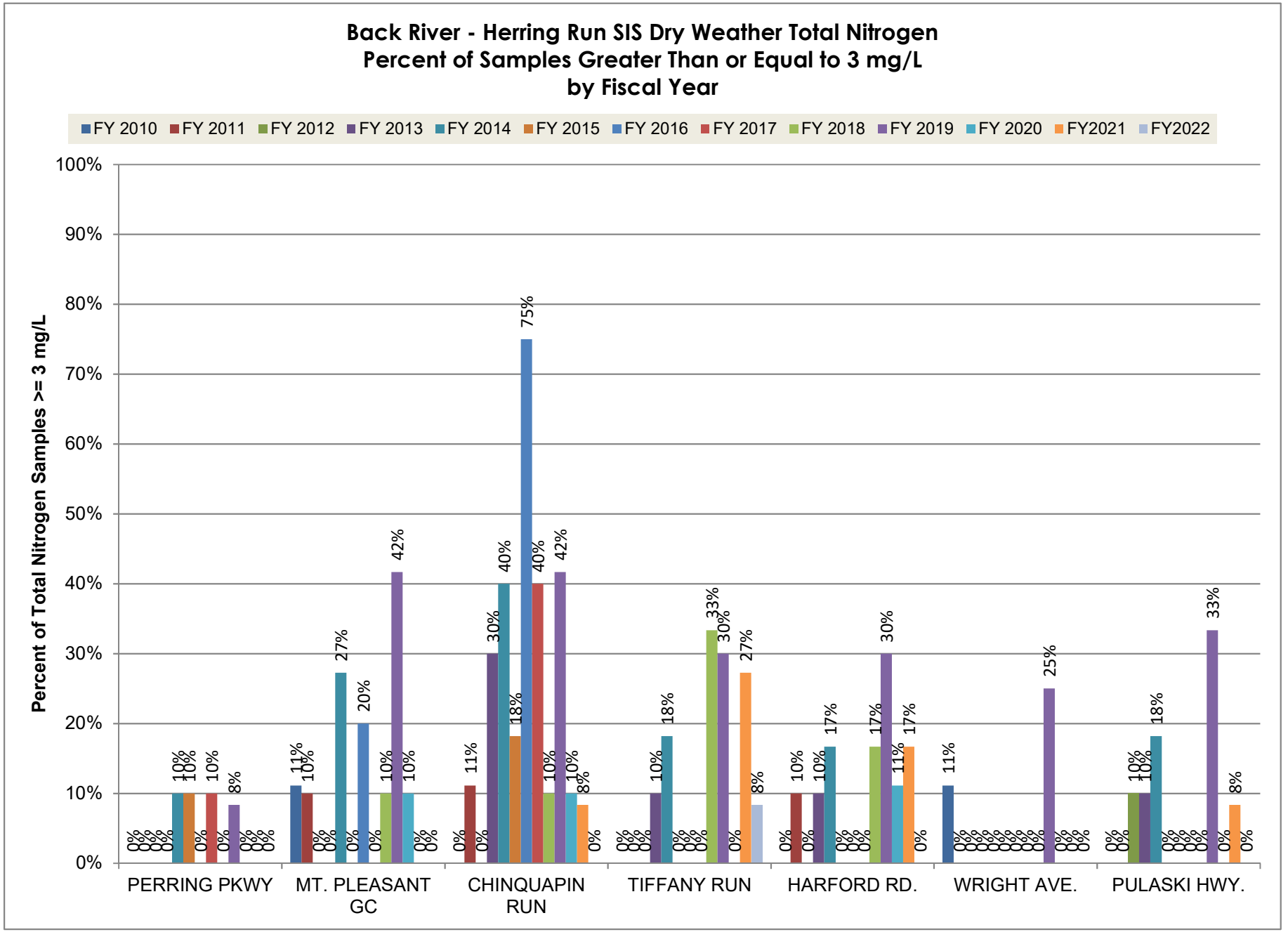

Total Nitrogen Geometric Means by Fiscal Year
Back River Watershed, Moores Run Subwatershed
MARY AVE.
HAMILTON AVE.
RADECKE AVE.
BIDDLE ST. & 62ND ST.
Total Nitrogen Geometric Mean (mg/L)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

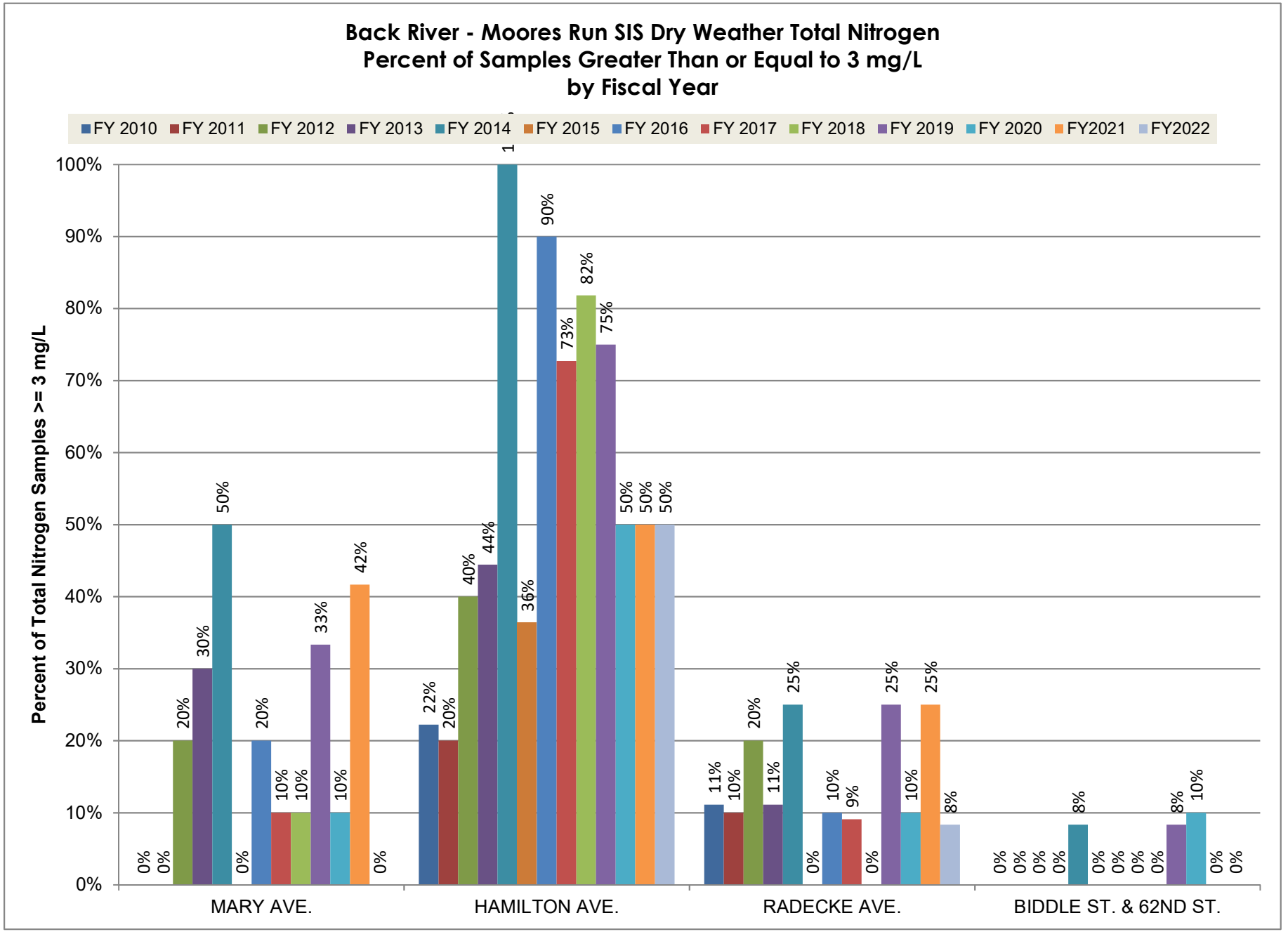

Total Nitrogen Geometric Means by Fiscal Year
Jones Falls Watershed
SMITH AVE.
WESTERN RUN
STONY RUN
JF 11.5
LOMBARD ST.
Total Nitrogen Geometric Mean (mg/L)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

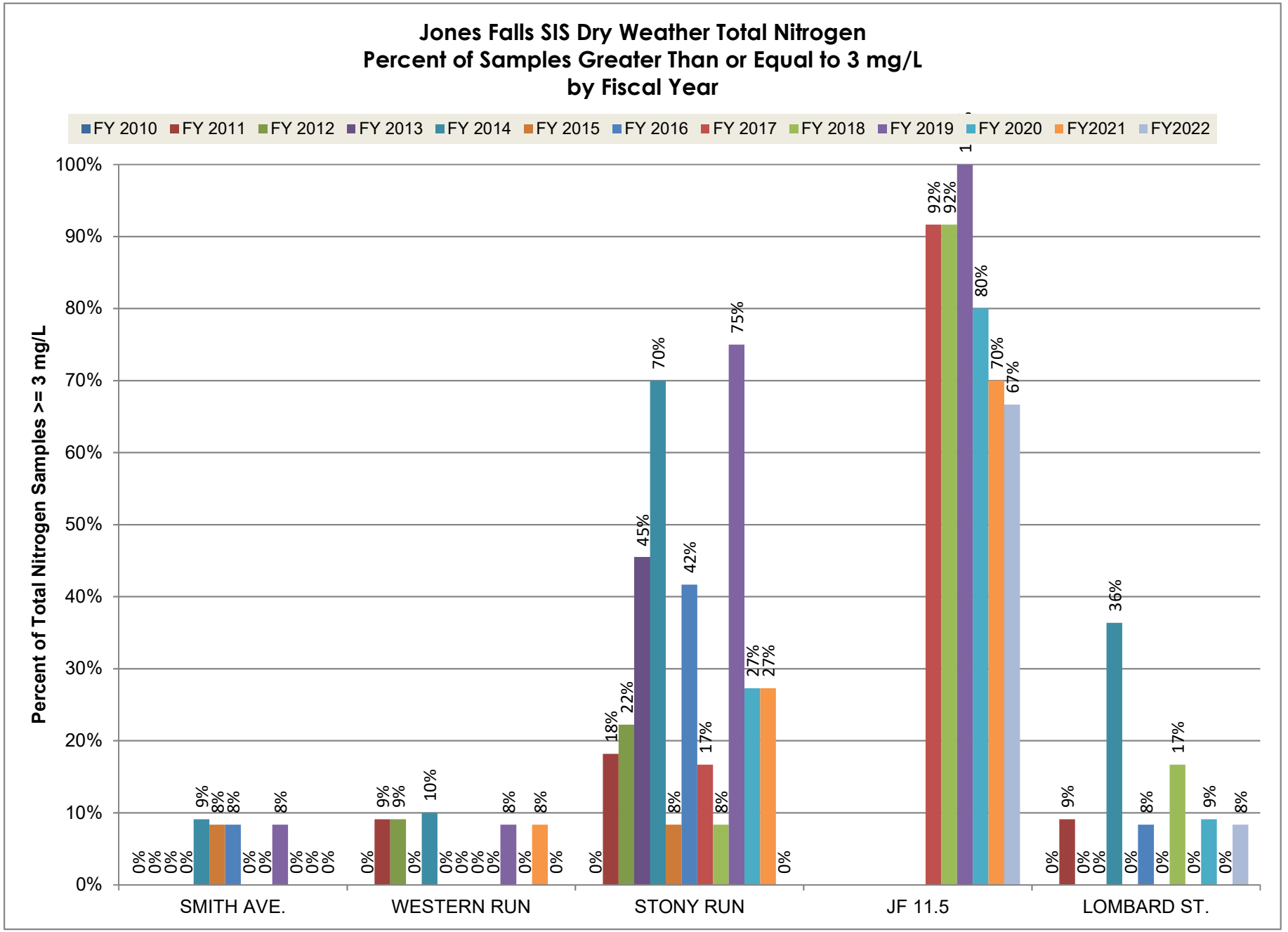

Total Nitrogen Geometric Means by Fiscal Year
Gwynns Falls Watershed
POWDER MILL
PURNELL DR.
DEAD RUN DNST.
GWYNNS FALLS PKWY.
GRUN HILTON ST.
GF HILTON ST.
MAIDENS CHOICE
GRUN CARROLL PARK
WASHINGTON BLVD.
Total Nitrogen Geometric Mean (mg/L)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

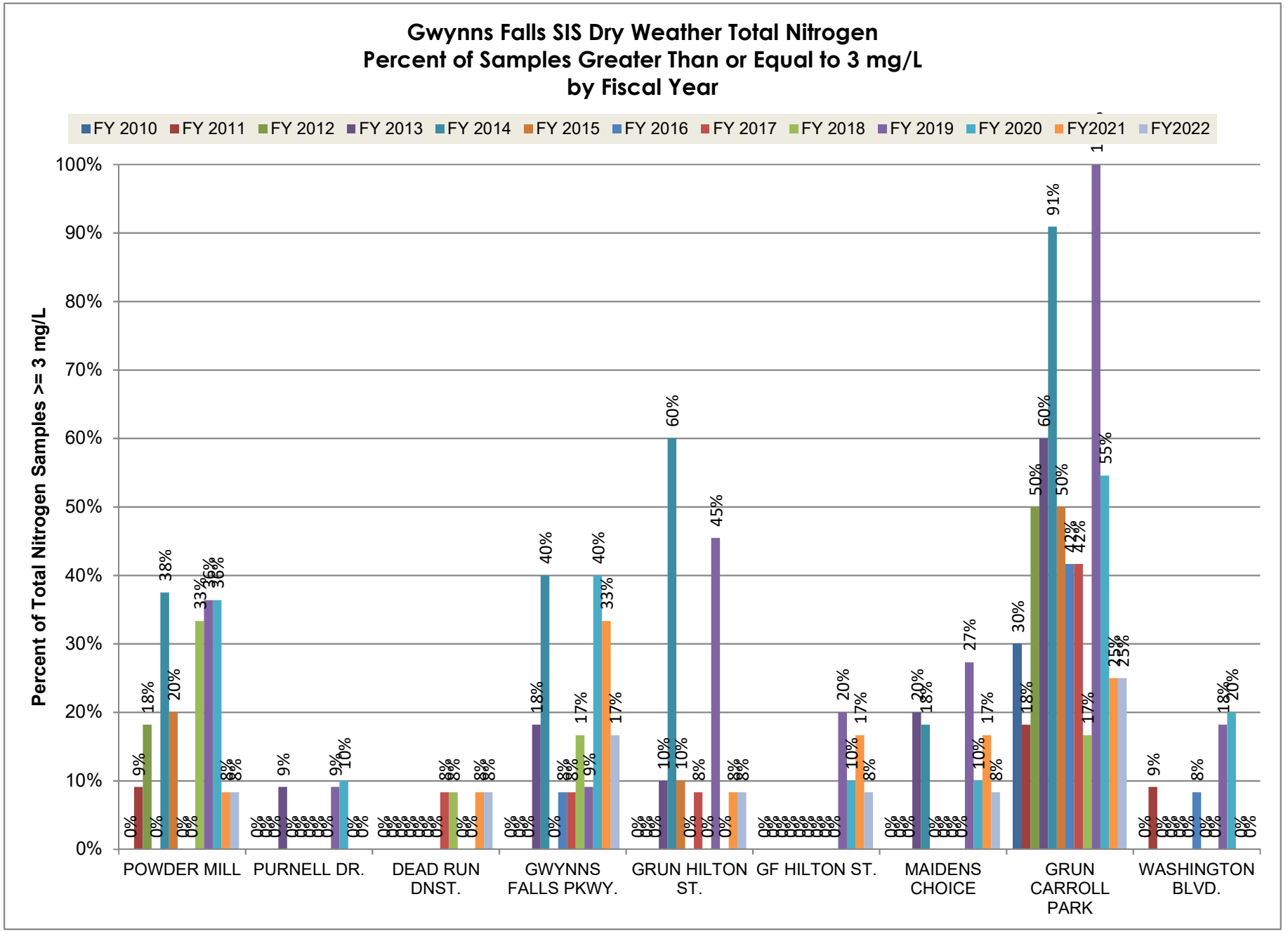

Total Nitrogen Geometric Means by Fiscal Year
Direct Harbor Watershed
LINWOOD & ELLIOTT
LAKEWOOD & HUDSON
CENTRAL & LANCASTER
LIGHT ST.
WARNER & ALLUVION
WATERVIEW AVE.
JANEY RUN
Total Nitrogen Geometric Mean (mg/L)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

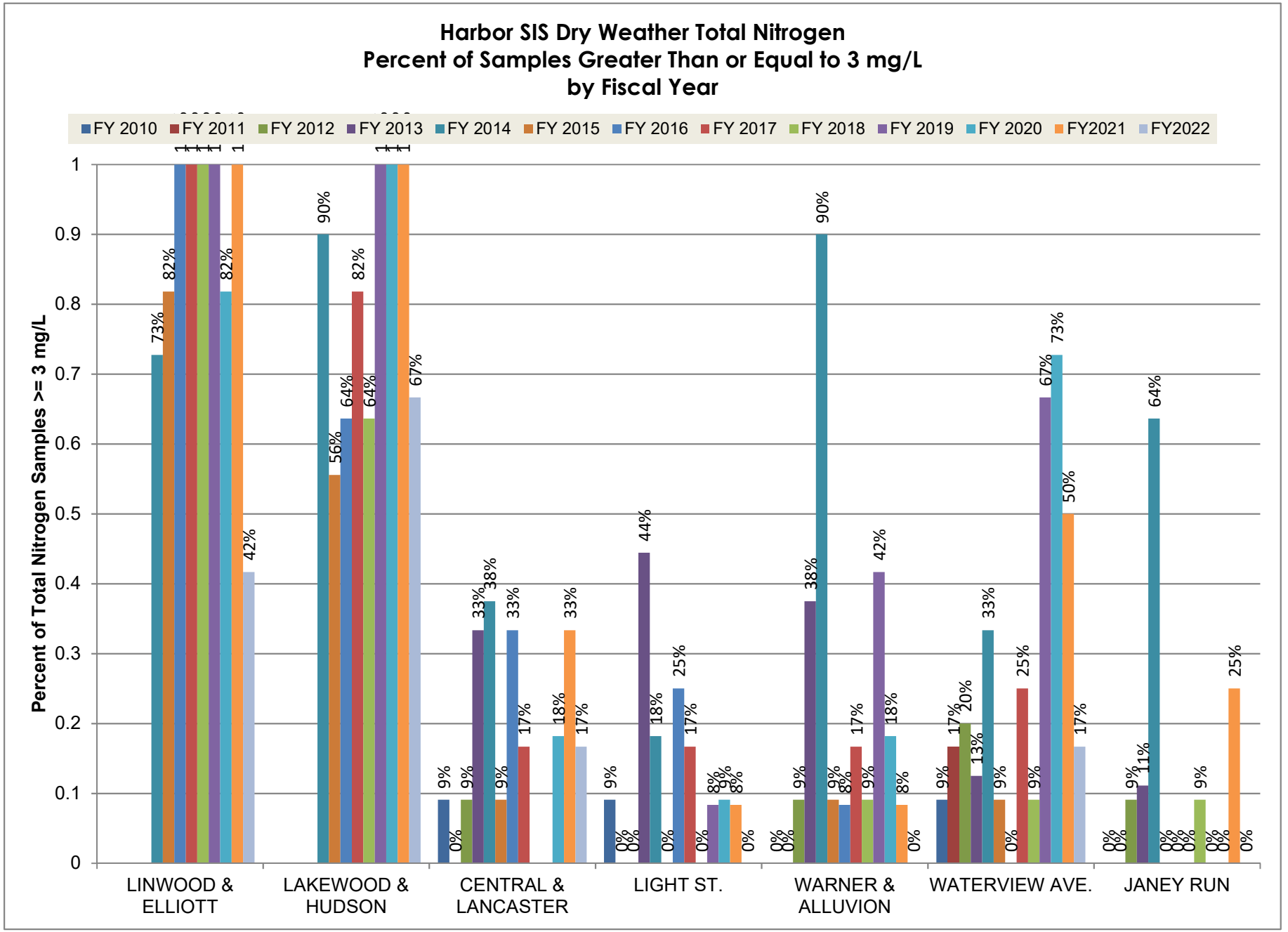

Total Nitrogen Geometric Means by Fiscal Year
Patapsco River Watershed
Sampling suspended at REEDBIRD AVE. in October 2020 due to construction at site.
REEDBIRD AVE.
POTEE ST.
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Total Nitrogen Geometric Mean (mg/L)
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
FY2021
FY2022
Fiscal Year

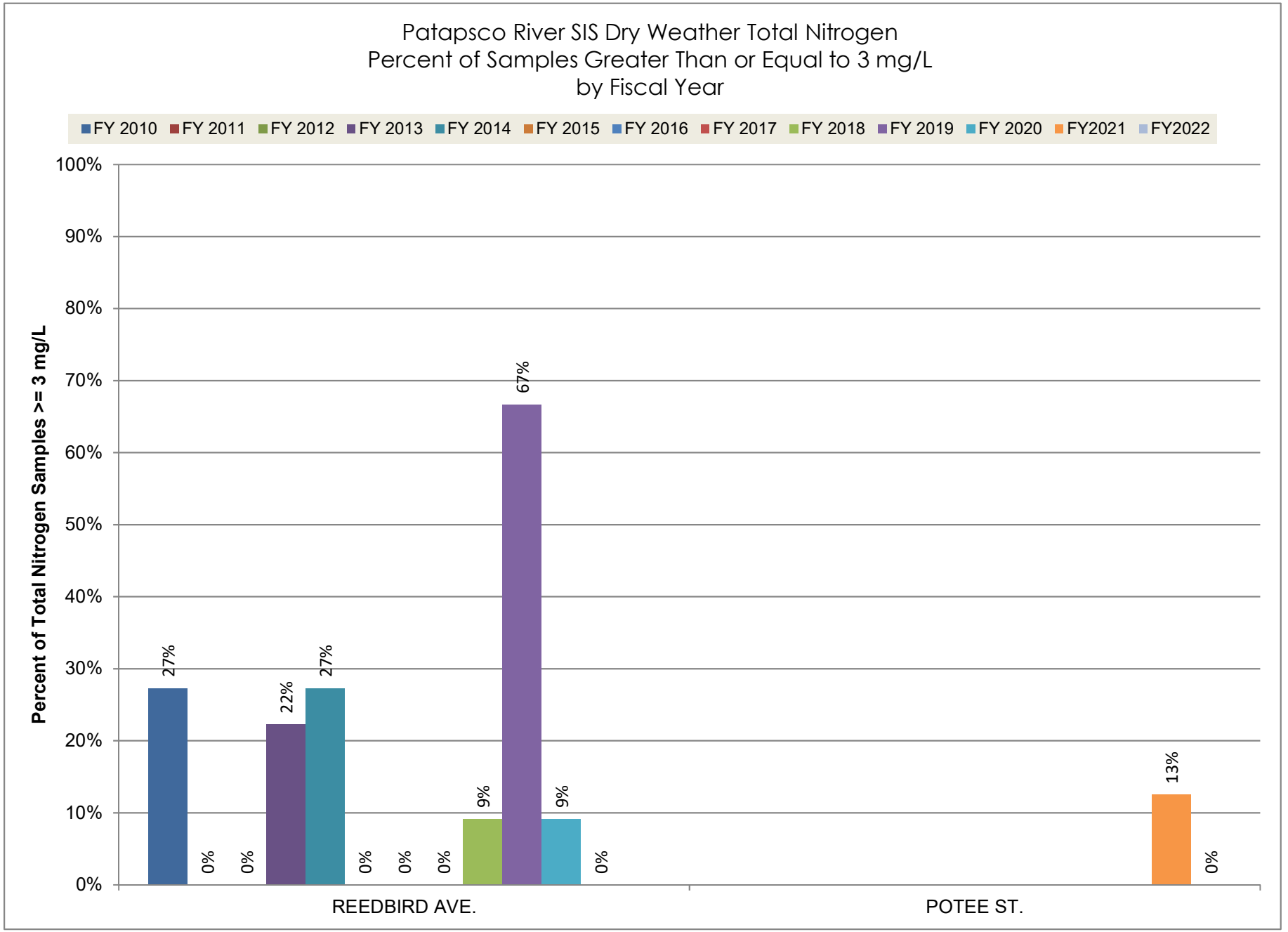

Back River - Herring Run SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PERRING PKWY
MT. PLEASANT GC
CHINQUAPIN RUN
TIFFANY RUN
HARFORD RD.
WRIGHT AVE.
PULASKI HWY.


Back River - Moores Run SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MARY AVE.
HAMILTON AVE.
RADECKE AVE.
BIDDLE ST. & 62ND ST.

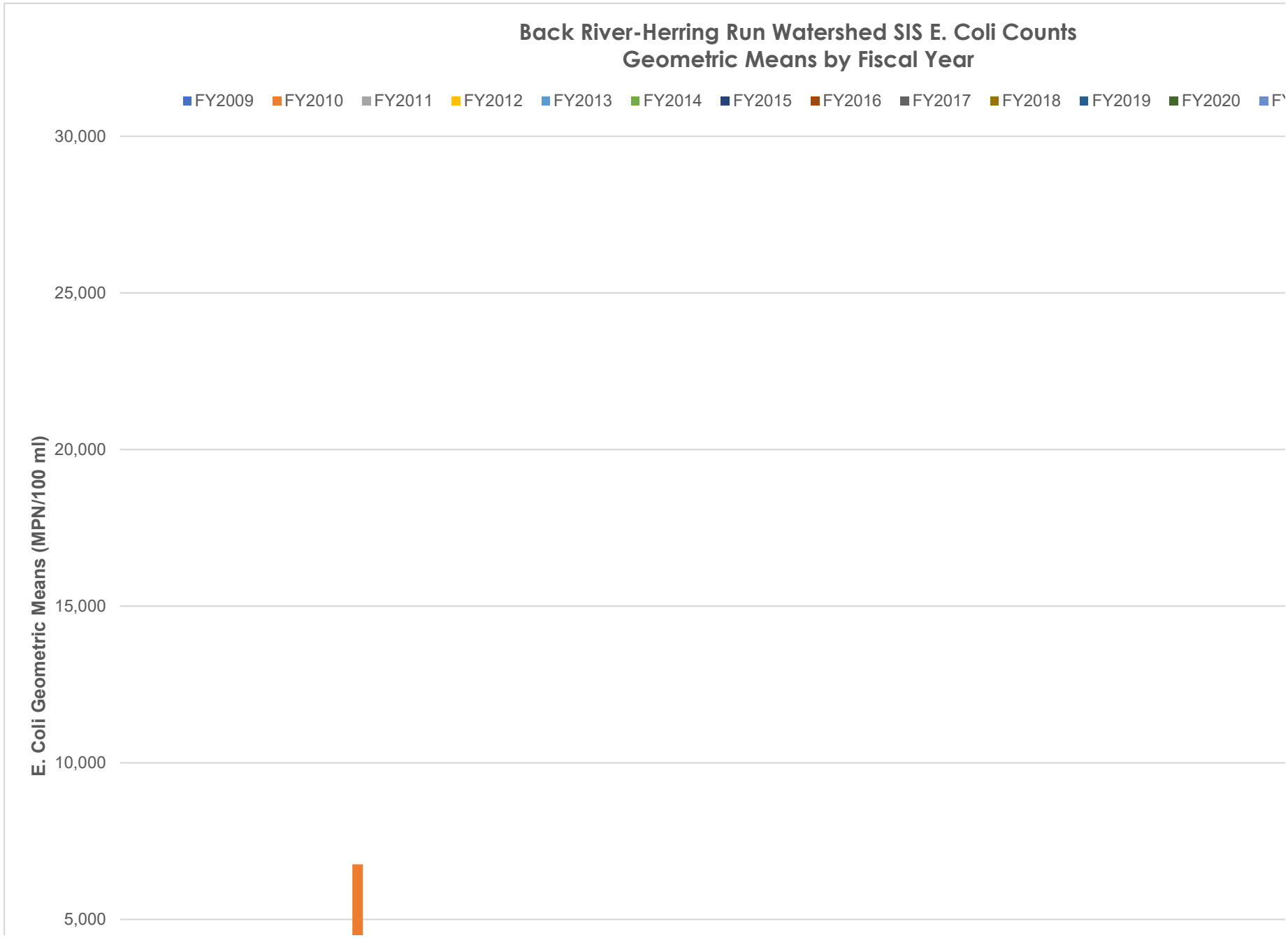

Jones Falls SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
SMITH AVE.
WESTERN RUN
STONY RUN
JF 11.5
LOMBARD ST.

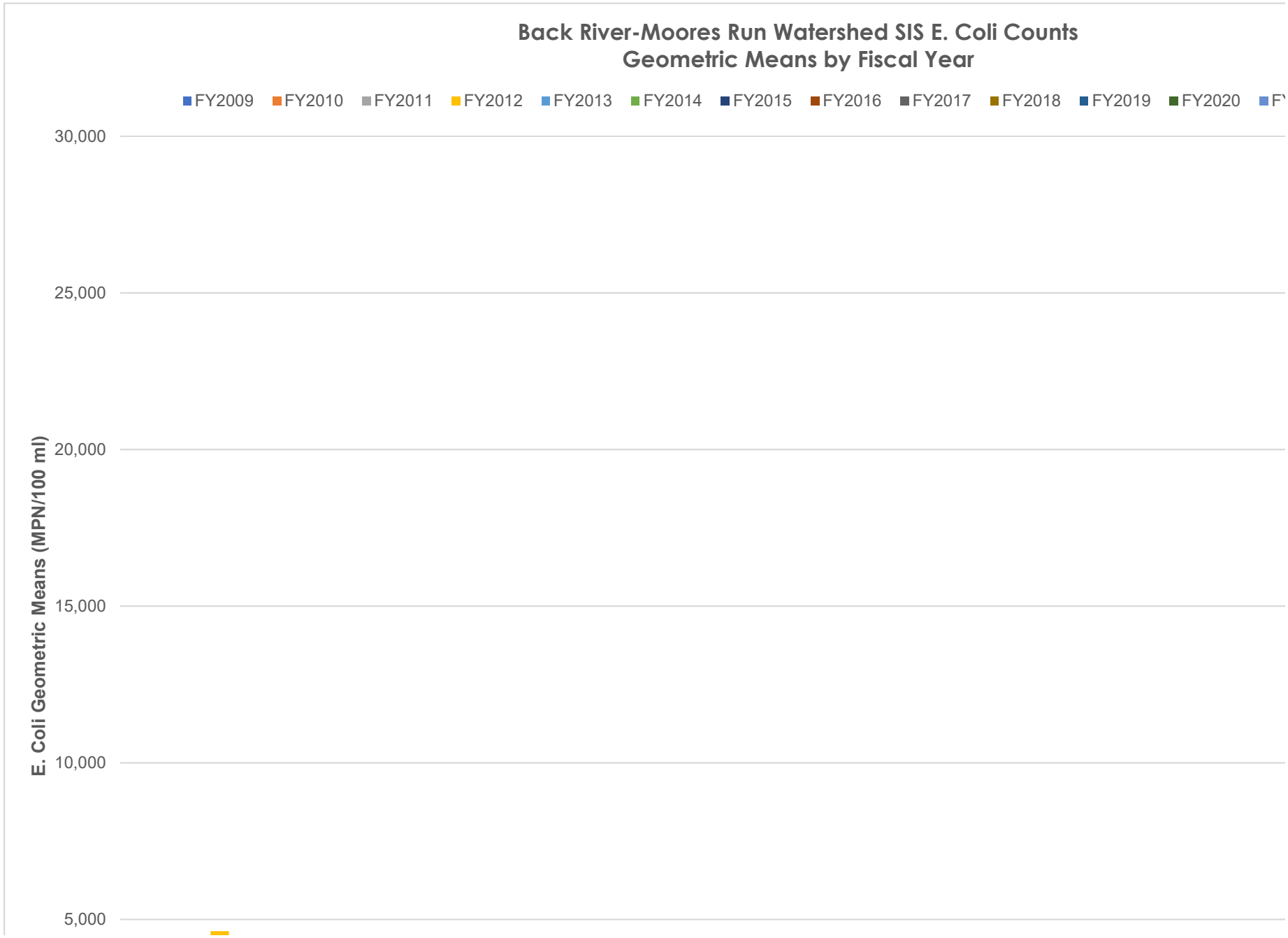

Gwynns Falls SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
POWDER MILL
PURNELL DR.
DEAD RUN DNST.
GWYNNS FALLS PKWY.
GRUN HILTON ST.
GF HILTON ST.
MAIDENS CHOICE
GRUN CARROLL PARK
WASHINGTON BLVD.


Harbor SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
LINWOOD & ELLIOTT
LAKEWOOD & HUDSON
CENTRAL & LANCASTER
LIGHT ST.
WARNER & ALLUVION
WATERVIEW AVE.
JANEY RUN

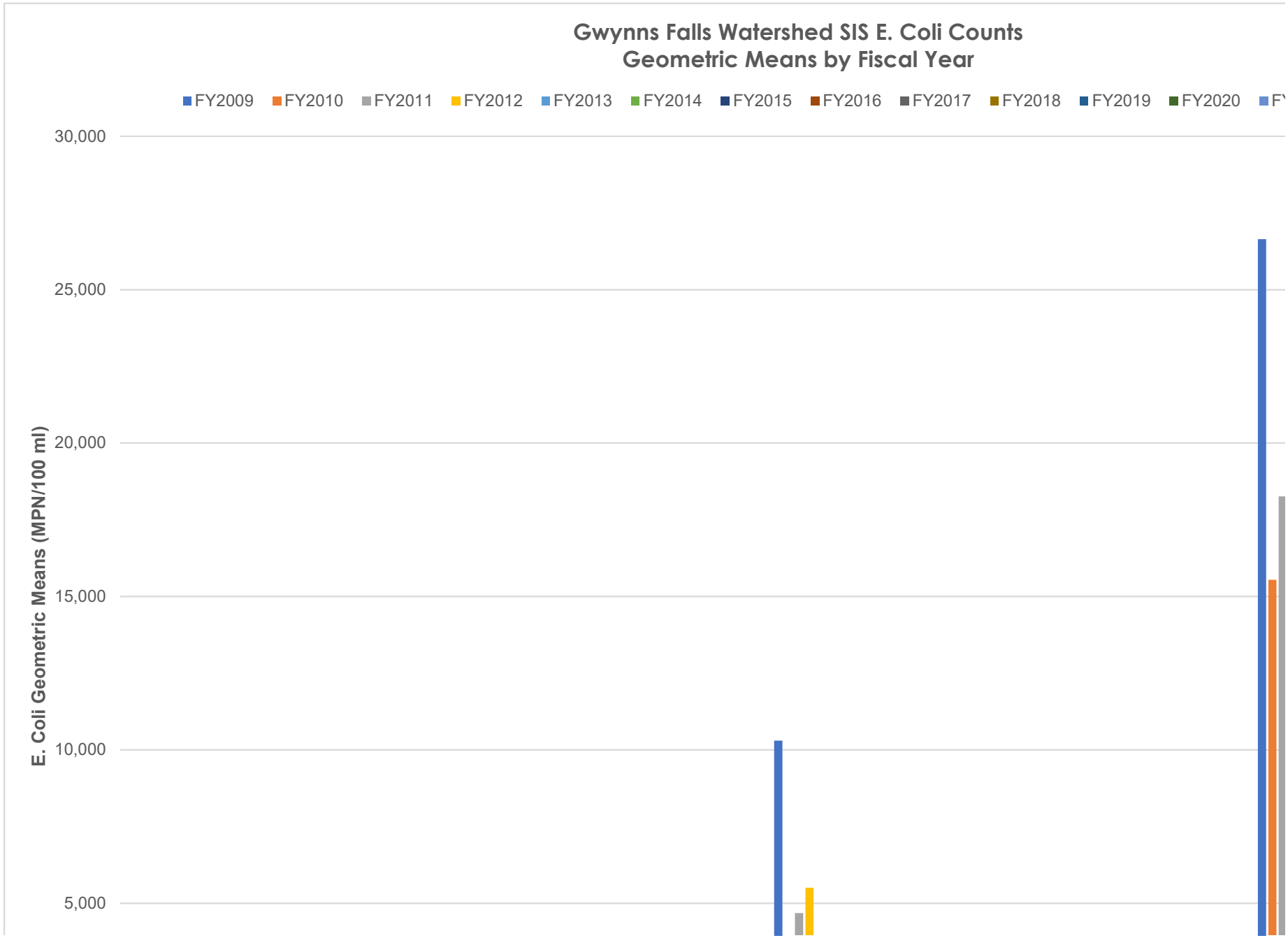

Patapsco River SIS Dry Weather Total Nitrogen
Percent of Samples Greater Than or Equal to 3 mg/L
by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY2021
FY2022
Percent of Total Nitrogen Samples >= 3 mg/L
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
27%
0%
0%
22%
27%
0%
0%
0%
9%
67%
9%
0%
13%
0%
REEDBIRD AVE.
POTEE ST.

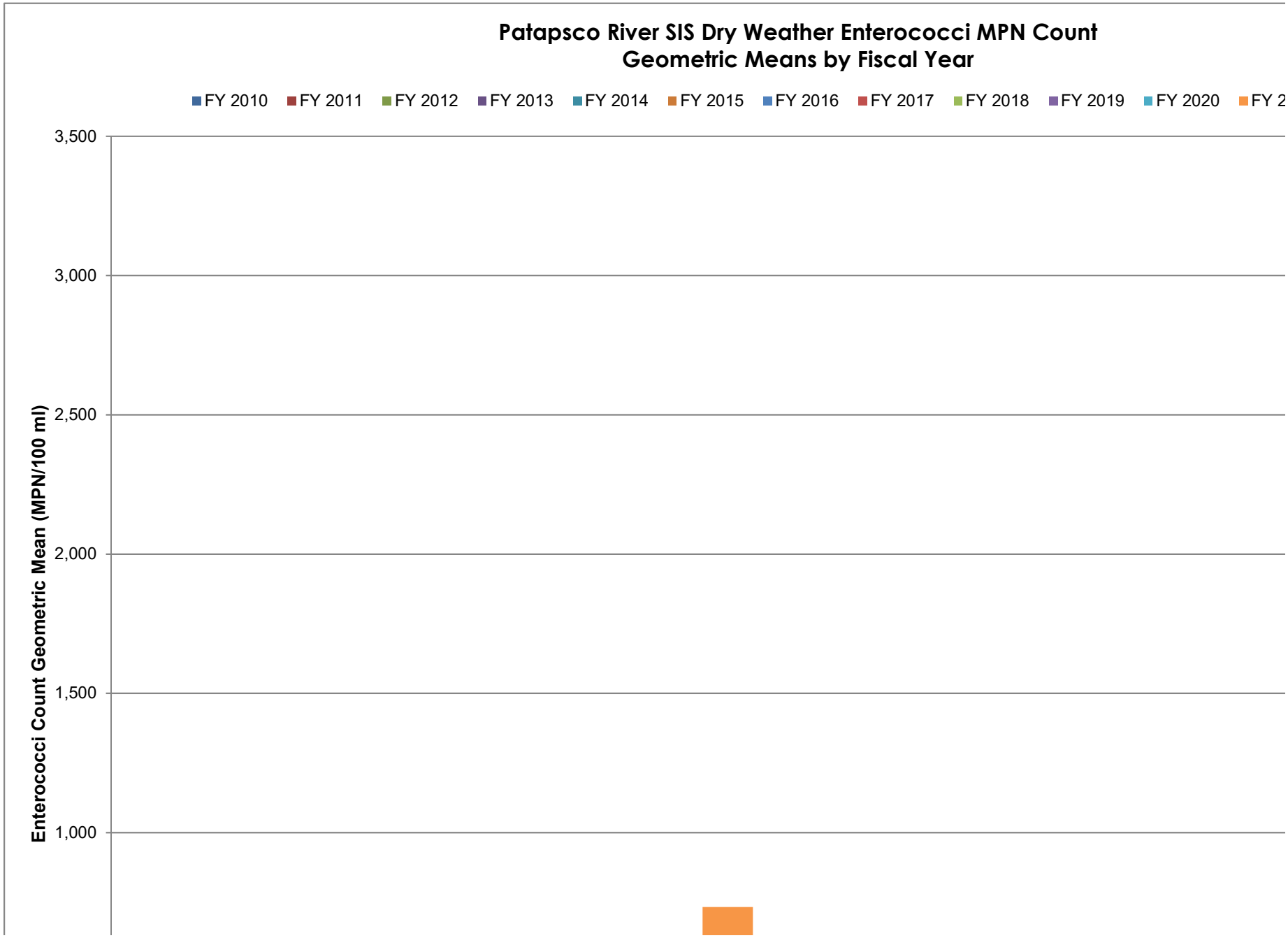
Appendix G: Bacteria Monitoring Histographs

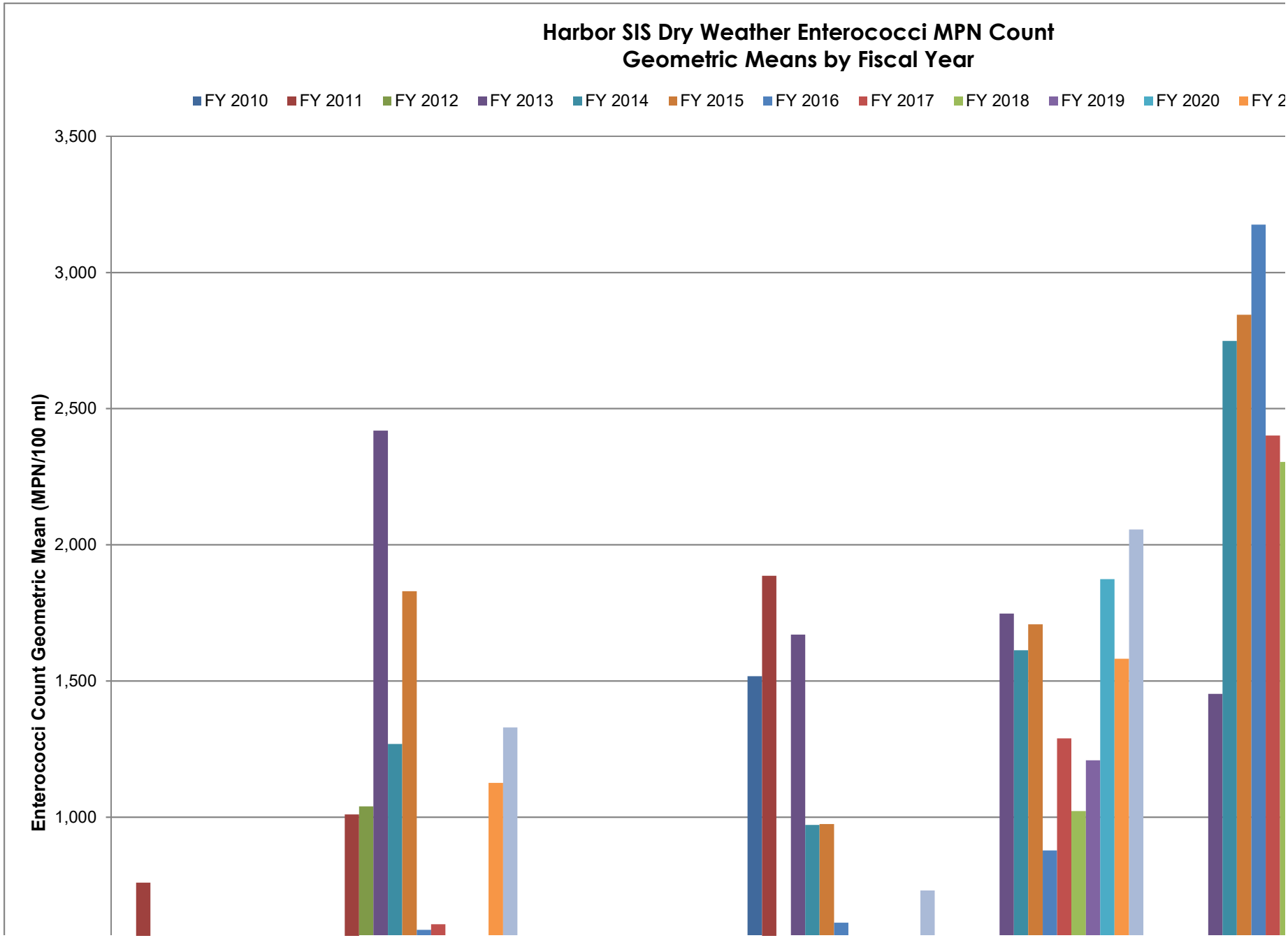

Back River-Herring Run Watershed SIS E. Coli Counts
Geometric Means by Fiscal Year
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
30,000
25,000
20,000
15,000
10,000
5,000
E. Coli Geometric Means (MPN/100 ml)

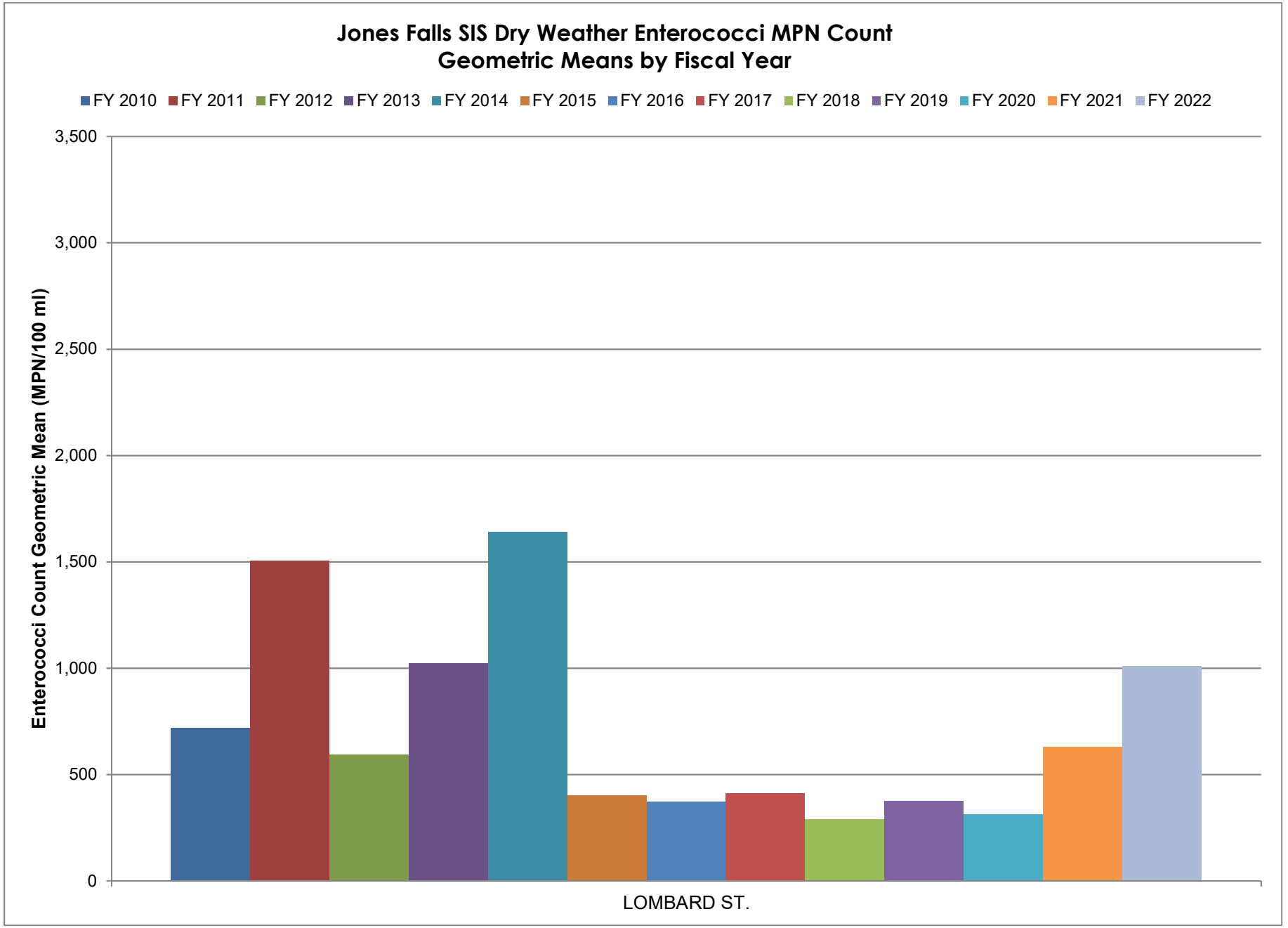

Back River-Moores Run Watershed SIS E. Coli Counts
Geometric Means by Fiscal Year
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
30,000
25,000
20,000
15,000
10,000
5,000
E. Coli Geometric Means (MPN/100 ml)


Jones Falls Watershed SIS E. Coli Counts
Geometric Means by Fiscal Year
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
30,000
25,000
20,000
15,000
10,000
5,000
E. Coli Geometric Means (MPN/100 ml)


Gwynns Falls Watershed SIS E. Coli Counts
Geometric Means by Fiscal Year
FY2009
FY2010
FY2011
FY2012
FY2013
FY2014
FY2015
FY2016
FY2017
FY2018
FY2019
FY2020
30,000
25,000
20,000
15,000
10,000
5,000
E. Coli Geometric Means (MPN/100 ml)


Patapsco River SIS Dry Weather Enterococci MPN Count
Geometric Means by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY 2
Enterococci Count Geometric Mean (MPN/100 ml)
3,500
3,000
2,500
2,000
1,500
1,000


Harbor SIS Dry Weather Enterococci MPN Count
Geometric Means by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY 2
Enterococci Count Geometric Mean (MPN/100 ml)
3,500
3,000
2,500
2,000
1,500
1,000


Jones Falls SIS Dry Weather Enterococci MPN Count
Geometric Means by Fiscal Year
FY 2010
FY 2011
FY 2012
FY 2013
FY 2014
FY 2015
FY 2016
FY 2017
FY 2018
FY 2019
FY 2020
FY 2021
FY 2022
Enterococci Count Geometric Mean (MPN/100 ml)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
LOMBARD ST.

Appendix H: Watershed Protection and Restoration Program (WPRP) Annual Report

CERTIFICATION

WHEREAS, the provisions of § 4-202.1 of the Environment Article of the Annotated Code of Maryland require Baltimore City to file a financial assurance plan to the Maryland Department of the Environment that demonstrates that it has sufficient funding to meet the impervious surface restoration plan requirements of the City's National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit; and

WHEREAS, the provisions of this law require that "a county or municipality may not file a financial assurance plan under this subsection until the local governing body of the county or municipality: (i) Holds a public hearing on the financial assurance plan; and (ii) Approves the financial assurance plan."

NOW, THEREFORE, I certify that:

1. A public hearing was held on the financial assurance plan on December 8, 2022;
2. The local governing body approves the aforementioned financial assurance plan; and
3. Under penalty of law, the information in this financial assurance plan is, to the best of my knowledge and belief, true, accurate, and complete.

Signature of County Executive/Municipal Mayor or Chief Financial Officer

12/13/22
Date

Brandon M. Scott
Printed Name of County Executive/Municipal Mayor or Chief Financial Officer

Mayor
Title

Baltimore City– Fiscal Year 2022
Financial Assurance Plan
as required under the
Watershed Protection and Restoration Program
December 2022

Executive Summary

The submission of Baltimore City's Financial Assurance Plan (FAP) to the Maryland Department of the Environment (MDE) fulfills requirements specified in the Maryland Article – Environment, Section 4-202.1. This plan is being filed with MDE in order to document all actions implemented by Baltimore City to comply with its National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permit and demonstrate the City's ability to pay for these activities through the Watershed Protection and Restoration Fund.

An MS4 permit was issued to Baltimore City on November 5, 2021, replacing the previous MS4 permit that had been administratively extended since December 27, 2018. Annual reports for Fiscal Years (FY) 2014 through 2021 have been submitted to MDE by the City and are available on the City's website https://publicworks.baltimorecity.gov/regulatory-mandates-plans-and-reports. The FY 2022 Annual Report will be submitted to MDE by December 31, 2022, and will include the Watershed Protection and Restoration Program (WPRP) report for FY 2022. These annual reports are based on the City's fiscal year (FY) and include updates on the City's MS4 programs and impervious surface area restoration. Baltimore City has continued implementing its MS4 program. This Executive Summary documents achievements used to meet the current permit, which occurs between FY 2022 and FY 2027.

In compliance with the Maryland Article Section 4-202.1, the following FAP includes all activities that have been completed in compliance with Baltimore City's current MS4 permit and five-year projections for the implementation of its stormwater program and best management practices (BMPs) necessary for meeting specific permit requirements. The following FAP documents implementation and financial data for operations since the beginning of the current permit (FY 2022) and for capital projects since the expiration of the previous permit (FY 2019).

A major tenet of the FAP is to demonstrate the financial wherewithal for meeting the current MS4 permit impervious surface area restoration requirements. In order to document this ability, Baltimore City is providing MS4 program implementation projections for FY 2023 through 2027, although the current permit technically expires on November 5, 2026. The sections in this Executive Summary follow the order of Baltimore City's MS4 permit found in Part IV, Standard Permit Conditions, and highlight the major achievements for each program element.

- **Part IV.C. Source Identification** – The City initiated the migration of the source identification data to the revised geodatabase schema, per MDE's "Draft Supplement User's Guide to the Database", dated November 2021, in addition to addressing comments from MDE regarding previously submitted records. The FY 2022 MS4 Annual Report included all planned restoration BMPs and all constructed BMPs, except for impervious area removal / land conversion and the stream restoration protocols. The City plans to complete those records in FY 2023. This effort was primarily completed by in-house resources within the Department of Public Works (DPW). Funding to comply with the permit condition is provided by the City's storming utility (also known as the Watershed Protection and Restoration fund or WPR fund).

- **Part IV.D.1 and 2. Stormwater Management and Erosion and Sediment Control**– By FY 2023, the City funded 21 full-time, dedicated positions within DPW Plans Review and Inspection Section to fulfill both the plan review and inspection obligations of these permit conditions. The City still allowed a 3rd party expeditor, upon request by the applicant, for plan reviews. On February 22, 2022, the City launched an on-line plan review system for programs under Article 7 (Natural Resources) of the City Code, allowing concurrent, transparent reviews for stormwater management; erosion and sediment control; critical area management; floodplain management; and forest conservation. Funding to comply with the permit condition is provided WPR, with revenues from the stormwater remediation fee (initiated in FY 2014) and miscellaneous fees related to plans reviews and penalty fines from enforcement.

- **Part IV.D.3. Illicit Discharge Detection and Elimination (IDDE)–** By FY 2023, the City funded 12 full-time, dedicated positions within DPW- Water Quality Monitoring and Investigations Section to fulfill this permit condition (and Part IV.F. Assessment of Controls). Currently, the City measures nitrogen-ammonia, chloride, and other field parameters at 130 locations (outfalls, streams, and manholes) on a weekly basis as part of the Ammonia Screening program. Additionally, the City tests surface waters for bacteria, metals, and nutrients at 25 locations on a monthly basis. All test data is posted quarterly on-line. Since 2015, the City found over 150 illicit discharges to the storm sewer system, a result of investments in technology (camera, IPad applications, new probes, etc.) om field investigations. Funding to comply with the permit condition is provided by the WPR fund, plus the City's water and wastewater utilities.

  IDDE activities resulting in the reduction of sanitary direct connections, sewage pipe exfiltration, drinking water transmission loss will be used towards meeting equivalent impervious surface restoration (ISR) requirements of the permit. Per the MS4 Accounting Guidance, an individual discharge credit cannot exceed10 years. The credit at the end of the permit is based on the final ISR amount at the end of the permit (FY 2027). The costs listed for IDDE in the "All Actions" table only reflect

detection efforts; abatement efforts (performed by the DPW Utility Maintenance Division or private property owners) were not included.

- **Part IV.D.4. Property Management and Maintenance** –
  - **Part IV.D.4.a NPDES Industrial Permits:** The City-owned facilities covered under Maryland's NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity remained the same as originally identified in FY 2014; the City has no plans to build more public facilities requiring this regulatory permit. Compliance with the NPDES permits is the responsible of the agency managing the facility and is incorporated into their operational budget / staff. Funding is not specifically designated for compliance with the permit condition and is therefore not listed in the FAP.
  - **Part IV.D.4.b. Good Housekeeping Plan (GHP)** The City worked with MDE and other MS4 jurisdictions regarding the format and content requirements of a standard GHP for all City-owned properties not required to be covered under the Maryland's NPDES General Permit for Discharges of Stormwater Associated with Industrial Activity. The final format and content of the standard GHP are still pending; the GHPs will be submitted in the FY 2024 Annual Report. Development of the GHPs is planned to be completed by in-house staff. No additional staff is proposed to comply with this permit condition.
  - **Part IV.D.4.c.i, c.ii and e. Street Sweeping and Inlet Cleaning:** As of FY 2023, the City funded 36 full-time positions within DPW- Bureau of Solid Waste for street sweeping operations and 60 full-time positions within the DPW-Bureau of Water and Wastewater- Utility Maintenance Division to fulfill this permit condition. These operational programs are specifically required to continue at levels reported under the previous permit (as an alternative and at expanded levels proposed in this current permit to achieve the impervious surface restoration goals. The equivalent impervious surface restoration (ISR) and implementation costs for these operations are listed in the "All Actions" table of the FAP. The method for calculating the equivalent ISR for street sweeping to meet the previous permit was based on the former MS4 Accounting Guidance (2014); however, the calculations for street sweeping efforts to meet additional restoration requirements in the new permit are based on the current MS4 Accounting Guidance (2021). The street sweeping operations credited to the new permit include monthly street sweeping in the outer portions of the City plus anticipated operational efficiencies due to parking enforcement and new routing software implementation. Additional staffing for inlet cleaning proposed in FY 2025 will increase the productivity of this effort (i.e. allow more inlets to be cleaned), targeting areas prone to litter, flooded street complaints, and choked inlet service requests. Although these operations are listed as obligations from

the previous permit and restoration for the new permit, the total cost of the operations are only listed under Obligations section of the "All Actions" table of the FAP. Funding to comply with the permit condition is provided by the WPR fund.

In addition to nutrient and sediment reduction associated with ISR; these two routine operations are significant in the addressing the City's trash TMDL and reducing potential roadway flooding. Both of these operations were impacted (suspended or minimalized) due to COVID starting in Spring 2020, to allow residents to quarantine at home. Street sweeping operations did not fully resume until July 2022 (FY 2023).

- **Part IV.D.4.c.ii Pollutant reduction associated with vegetation management** Although many City agencies are responsible for ground maintenance; herbicide and pesticide applications are primarily performed the City's Department of Recreation and Parks (BCRP), who employed five (5) employees certified by Maryland Department of Agriculture as public agency applicators. BCRP Forestry Division plans to expand its capacity as part of its integrated vegetation management program via staff, contracted resources, volunteers (Treekeeper and Weed Warrior programs); however, the specific details have not been finalized so this effort is not included in the FAP. Funding for this effort is provided by the City's general fund and grants.

- **Part IV.D.6. Public Education** - In addition to website modifications and participations in various public outreach events, the City continued to host pop-up events and workshop under the GROW Center program. GROW Centers are an incentive program to connect property owners with resources (technical expertise, materials, and equipment) to promote the installation of green practices on their private property or vacant lots, while diverting re-usable materials from the solid waste disposal stream. The GROW Center program is managed by DPW, but several state and city agencies participate in the events. The City plans to expand the GROW Center program with dedicated staff and resources, in addition to creating a dedicated volunteer coordination program focused on litter reduction in FY 2023. The revenue listed in the FAP are related to the efforts by manage the GROW Center and expand the volunteer coordination program. Funding to comply with the permit condition is provided by the WPR fund.

- **Part IV. E. 1. Watershed Restoration**— By FY 2023, the City funded the operations of the DPW Watershed Planning and Partnership Section and the DPW Office of Engineering and Construction (OEC) to fulfill planning, design, and construction of capital projects to meet this permit condition. OEC staff also implement flood reduction and storm sewer rehabilitation capital projects, which are not applicable to meeting the MS4 permit. Between August 2019 and May 2020, the City submitted a Restoration Portfolio of capital projects and operational programs.

This portfolio was the basis of the current permit conditions for ISR from continuing operations (5,701 acres) and new efforts completed under the current permit (3,696 acres). The current permit's requirement for continuing operations exceeds the ISR requirement from the previous permit: 20% of the baseline impervious area (4,291 acres). The City's plan to meet the ISR requirement is listed in the "All Actions" table of the FAP. Funding to comply with the permit condition is provided by the WPR fund, plus grants and debt service mechanisms associated with the fund.

All ISR estimates (acreage) listed under "Restoration for the New Permit" are based the current MS4 Accounting Guidance (2021). BMPs installed after the expiration of the previous permit (December 2018) as redevelopment projects or volunteer restoration projects are listed in that table under category of "Other" and costs were listed as zero since funding obligations were not considered as the City's responsibility.

The capital projects include restoration projects completed after December 2018. The cost estimates for capital projects only include contracted costs for design and construction services, plus land acquisition, permit fees, and mitigation efforts. The costs listed in the FAP for ISR actions do not include maintenance. Annual escalation (2%) was assumed for operational costs.

The City is on track to meet the Annual Restoration Benchmark Schedule (Table 1 of the current permit), which will occur in the middle of FY 2027. The implementation schedule listed in the "All Actions" table included the following modifications from the 2020 Restoration Portfolio:

- Increased implementation costs projects currently in design based on updated engineer's estimates and the impacts on supply chains in the last 3 years due to COVID.
- Delays in stream restoration projects to modify design and maintenance plans with respect to forest impacts.
- Reduced street sweeping operations due to COVID, impacting both continuing operations and new restoration. The City resumed operations in July 2022 and does not plan to replace the annual operations with any capital projects.
- Replacement of district level rainwater harvesting projects with urban soil restoration projects and a shoreline management project, plus increased tree planting and ESD projects. The shoreline project will be in the Middle Branch, implemented by the South Baltimore Gateway Partnership, who used funding from the WPR fund as match for grant funding.

- **Part IV.F. City-wide TMDL Compliance** –
  - **Nutrients and Sediment**: Nutrient and sediment TMDL compliance is aligned with the watershed restoration conditions of the permit. Starting with the FY 2022 MS4 Annual Report, the City will be reporting compliance with

both Chesapeake Bay TMDL goals and regional TMDL goals using MDE's TMDL Implementation Progress and Planning (TIPP) Tool.

- **Trash**: The Trash TMDL implementation plan was submitted in FY 2016, efforts for compliance will primarily be addressed with street sweeping, inlet cleaning, enforcement activities, public education / engagement campaigns, and private collection efforts like the four trash wheels managed by the Waterfront Partnership. In FY 2021, the City launched the distribution of large recycling bins with lids to all single-family residential properties. This coincided with a reduced recycling collection frequency (bi-weekly) to address staffing shortages due to COVID impacts. DPW plans to increase volunteer coordination and public education efforts to reduce litter, starting in FY 2023. Only the efforts for street sweeping, inlet cleaning, and public education were included in the FAP; funding for these specific efforts are provided by WPR fund.

- **Bacteria:** The City's implementation plan for addressing the bacteria TMDL primarily relies on the City' efforts to comply with the Modified Consent Decree (MCD) for sanitary sewer overflows (Civil Action JFM-02-1524) by 2031. Although none of the City's waterways meet the state's criteria for recreation, the City's stream impact sampling program shows decreasing trends in bacteria concentrations over the last 15 years. Furthermore, quarterly reports for the MCD show a decrease in both the number and volumes associated with wet weather SSOs. Only the costs and funding associated with the IDDE program are included in the FAP. Costs associated directly with capital projects and operation programs for the MCD were not included in the FAP, since they are already reported to MDE as part of the quarterly MCD reports, which are posted on-line.

- **PCB**: In November 2022, the City submitted its plan to address the PCB TMDL, following MDE's "Guidance for Developing Local PCB TMDL (Total Maximum Daily Load) Stormwater Wasteload Allocation (SW-WLA) Watershed Implementation Plans (WIPs)", issued in August 2022. The City had already partnered with USGS on a study in the Back River watershed; the results were published in June 2022 as "USGS Scientific Investigations Report (SIR) 2022–5012: Refining Sources of Polychlorinated Biphenyls in the Back River Watershed, Baltimore, Maryland, 2018–2020". In addition to the proposed efforts of backtracking PCB sources, the City has partnered again with USGS to conduct a 2-year follow-up study in the Back River watershed to assess potential relationships between PCB concentrations and sediment sources. The efforts associated with these studies and field investigations are only shown in the Fund Sources table of the FAP, since these efforts are not directly associated with ISR activities.

- **Part IV.G. Assessment of Controls** – The efforts associated with these studies and field investigations are only shown in the Fund Sources table of the FAP, since these efforts are not directly associated with ISR activities.

    - **Part IV.G.1 BMP Effectiveness Monitoring:** The City will be meeting this permit condition by providing $100,000 / year to the Chesapeake Bay Trust's Pooled Monitoring Program. Funding to comply with the permit condition is provided by the WPR fund.

    - **Part IV.G.2 Watershed Assessment Monitoring:** The City will submit a comprehensive plan for watershed assessment and trend monitoring in March 2023, following MDE's 2021 Monitoring Guideline. The plan will include minor modifications to the current stream impact sampling program and annual biological assessments conducted by DPW-Water Quality Monitoring and Investigations Section, with no proposed staffing requirements. Chloride assessments (continuous monitoring) will be implemented as part of the City's Flood ALERT system upgrade. Funding to comply with the permit condition is provided by the stormwater remediation fee.

    - **Part IV.G.2 PCB Source Tracking:** This effort will include both field investigations conducted by DPW-Water Quality Monitoring and Investigations Section and a partnered study with USGS, previously described under the City-wide TMDL compliance. Funding to comply with the permit condition is provided by the stormwater remediation fee.

- **Other FAP information:**
    - The FAP assumed 70 percent of stormwater remediation fee revenue being available for NPDES compliance. This assumed amount is less than previous years since the City has increased its efforts and thus demand of the other portions of the revenue:
        - BMP maintenance;
        - Flood reduction capital projects;
        - Repairs (including emergencies) and asset management of the public storm sewer system;
        - Development of a district level H & H Model;
        - Flood ALERT system enhancements;
        - Research support (excluding the CBT Pooled Monitoring Program) related to climate change, flooding, and innovative technologies; and
        - Customer assistance programs, based on hardship.

    - The stormwater fee rates were approved by the City's Board of Estimates on June 15, 2022 for FY 23-25 at an annual adjustment of 3%. To be conservative, the FAP assumed a no rates adjustments for FY 2026-2027.

- Bond amounts listed in the "Fund Sources Table" of the FAP are based on currently approved bond appropriations. To be conservative, the FAP assumes no additional bond sales or applications to WIFIA or other federal loan programs are proposed to meet this current permit.

- State revolving loan fund amounts listed in the "Fund Sources Table" of the FAP include both approved and potential amounts, based on demand and applicability to the state's current criteria.

- The City will continue to pursue grants from both state and federal agencies to implement the proposed compliance efforts of this permit; however, to be conservative, the FAP assumed only the single grant associated with the Middle Branch shoreline project.

MS4 Information	
Jurisdiction	Baltimore City
Contact Name	Kimberly Grove
Phone	410-396-0732
Address	3001 Druid Park Drive
City	Baltimore
State	MD
Zip	21215
Email	kimberly.grove@baltimorecity.gov
Continued Annual Alternative ISR (ac)	5701.00
Required ISR New Permit (ac)	3696.00
Total ISR (ac)	9,397
Permit Num	20-DP-3315 MD0068292
Permit Period (FY)	2022-2027
Reporting FY	2022

Check with MDE Geodatabase:

Should match Permit info table of Geodatabase, except for ISR requirements for continuing alternative controls and additional- that should match permit language of E.1.b and E.3

Check with Permit Language:

Continued annnual alternative ISR and required ISR new permit should match MS4 Permit condition E. Stormrwater Restoration.

Version 6-22-22

Article 4-202.1(j)(1)(i)1: Actions that will be required of the county or municipality to meet the requirements of its National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit.

Note: To identify all "actions" required under the MS4 permit, provide an executive summary of the jurisdiction's MS4 programs. See MDE's FAP Guidance. For proposed actions to meet the impervious surface restoration plan, fill in the table below.

Continued Annual Alternative ISR (ac)	**5,701**	**61%**
Required ISR New Permit (ac):	**3,696**	
Total ISR (ac):	**9,397**	

REST BMP TYPE[1]	BMP CLASS	IMPERVIOUS ACRES	% ISR GOAL	IMPLEMENTATION COSTS	IMPLEMENTATION STATUS	IMPLEMENTATION COMPLETION YEAR (FY)
Obligations from Previous Permit That Must Be Continued or Met						
Operational Programs[2,3]						
VSS	A	3,657	64%	$5,386,406	COMPLETE	2022
VSS	A	5,475	96%	$5,945,483	UNDER CONST	2023
VSS	A	5,475	96%	$8,964,393	PLANNING	2024
VSS	A	5,475	96%	$9,143,681	PLANNING	2025
VSS	A	5,475	96%	$9,326,554	PLANNING	2026
VSS	A	5,475	96%	$8,063,085	PLANNING	2027
CBC	A	230	4%	$4,798,576	COMPLETE	2022
CBC	A	226	4%	$4,904,995	UNDER CONST	2023
CBC	A	226	4%	$5,003,095	PLANNING	2024
CBC	A	226	4%	$6,368,600	PLANNING	2025
CBC	A	226	4%	$5,930,972	PLANNING	2026
CBC	A	226	4%	$6,049,591	PLANNING	2027
Operations Next Two Years (FY23-24)[4]		5,701	100%	$24,817,966		
Operations Next Five Years (FY23-27)[4]		5,701	100%	$69,700,448		
Operations Permit Term (FY22-27)[4]		5,701	100%	$65,772,754		
Capital Projects (Completed to Replace Annual Obligations)[2,3]						
			0%			
			0%			
Subtotal Capital Next Two Years		0	0%	$0		
Subtotal Capital Next Five Years (FY23-27)		0	0%	$0		
Subtotal Capital Permit Term (FY22-26)		0	0%	$0		
Other (Completed to Replace Annual Obligations)[2,3]						
			0%			
			0%			
Subtotal Other Next Two Years (FY23-24)		0	0%	$0		
Subtotal Other Next Five Years (FY23-27)		0	0%	$0		
Subtotal Other Permit Term (FY22-26)		0	0%	$0		
Total Continued Obligations Next Two Years (FY23-24)		**5,701**	**100%**	**$24,817,966**		
Total Continued Obligations Next Five Years (FY23-27)		**5,701**	**100%**	**$69,700,448**		

REST BMP TYPE[1]	BMP CLASS	IMPERVIOUS ACRES	% ISR GOAL	IMPLEMENTATION COSTS	IMPLEMENTATION STATUS	IMPLEMENTATION COMPLETION YEAR (FY)
Total Continued Obligations Permit Term (FY22-27)		**5,701**	**100%**	**$65,772,754**		
Restoration for the New Permit						
Operational Programs[3,5]						
VSS	A	2,027	55%	$0	UNDER CONST	2023
VSS	A	2,806	76%	$0	PLANNING	2024
VSS	A	2,806	76%	$0	PLANNING	2025
VSS	A	2,806	76%	$0	PLANNING	2026
VSS	A	2,806	76%	$0	PLANNING	2027
CBC	A	25	1%	$0	UNDER CONST	2023
SDV	A	90	2%	$0	UNDER CONST	2023
CBC	A	25	1%	$0	PLANNING	2024
SDV	A	90	2%	$0	PLANNING	2024
CBC	A	25	1%	$0	PLANNING	2025
SDV	A	90	2%	$0	PLANNING	2025
CBC	A	49	1%	$0	PLANNING	2026
SDV	A	197	5%	$0	PLANNING	2026
CBC	A	49	1%	$0	PLANNING	2027
SDV	A	197	5%	$0	PLANNING	2027
DGI	A	239	6%	$1,630,625	UNDER CONST	2022
DGI	A	249	7%	$1,629,264	PLANNING	2023
DGI	A	235	6%	$1,661,849	PLANNING	2024
DGI	A	201	5%	$1,695,086	PLANNING	2025
DGI	A	194	5%	$1,728,988	PLANNING	2026
DGI	A	155	4%	$1,763,568	PLANNING	2027
Operations Next Two Years (FY23-24)[4,6]		2,767	75%	$3,291,113		
Operations Next Five Years (FY23-27)[4,6]		2,973	80%	$8,478,755		
Operations Permit Term (FY22-27)[4,6]		2,973	80%	$10,109,380		
Capital Projects[3,5]						
STR	A	332	9%	$26,393,299	COMPLETE	2022
STR	A	314	8%	$30,112,333	PLANNING	2025
STR	A	211	6%	$24,900,000	PROPOSED	2027
IMPP	A	4.1	0%	$1,033,677	COMPLETE	2022
IMPP	A	1.6	0%	$1,083,667	PLANNING	2023
IMPP	A	0.9	0%	$522,850	PLANNING	2025
IMPP	A	5	0%	$1,299,000	PROPOSED	2026
FBIO	S	6.7	0%	$3,903,362	PLANNING	2024
FBIO	S	5.9	0%	$2,014,252	PLANNING	2025
MMBR	E	4.2	0%	$2,065,195	PLANNING	2023
MMBR	E	2	0%	$1,037,603	PLANNING	2024
MMBR	E	4.7	0%	$1,124,962	PLANNING	2025
MMBR	E	23.5	1%	$6,160,000	PROPOSED	2025
MENF	E	2.1	0%	$1,088,072	PLANNING	2025
WPWS	S	0.8	0%	$150,909	PLANNING	2025
UTC	A	0.5	0%	$708,950	PLANNING	2023
UTC	A	3	0%	$90,500	PROPOSED	2025
STCI	A	5.3	0%	$160,000	PROPOSED	2025
UTC	A	3	0%	$90,500	PROPOSED	2026
STCI	A	5.3	0%	$160,000	PROPOSED	2026
OUT	A	60	2%	$5,685,000	PROPOSED	2026

REST BMP TYPE[1]	BMP CLASS	IMPERVIOUS ACRES	% ISR GOAL	IMPLEMENTATION COSTS	IMPLEMENTATION STATUS	IMPLEMENTATION COMPLETION YEAR (FY)
OUT	A	60	2%	$5,685,000	PROPOSED	2027
USRP	A	7.5	0%	$428,800	PROPOSED	2024
USRP	A	7.5	0%	$428,800	PROPOSED	2025
USRI	A	2.4	0%	$211,200	PROPOSED	2024
USRI	A	2.4	0%	$211,200	PROPOSED	2025
SPSD	A	3.5	0%	$1,367,629	PLANNING	2024
SHST	A	105	3%	$8,600,000	PLANNING	2025
Subtotal Capital Next Two Years (FY23-24)		28	1%	$10,806,406		
Subtotal Capital Next Five Years (FY23-27)		848	23%	$99,289,784		
Subtotal Capital Permit Term (FY22-27)		1,184	32%	$126,716,760		
Other[3,5]						
IMPP	A	2.3	0%	$0	COMPLETE	2022
MMBR	E	23.7	1%	$0	COMPLETE	2022
FSND	S	30.8	1%	$0	COMPLETE	2022
WPWS	S	6.1	0%	$0	COMPLETE	2022
STCI	A	77.1	2%	$0	COMPLETE	2022
UTC	A	76.2	2%	$0	COMPLETE	2022
IMPP	A	6	0%	$0	PROPOSED	2026
MMBR	E	82	2%	$0	PROPOSED	2026
FSND	S	41	1%	$0	PROPOSED	2026
WPWS	S	26	1%	$0	PROPOSED	2026
IMPP	A	1	0%	$250,000	PROPOSED	2026
MMBR	E	10	0%	$750,000	PROPOSED	2026
Subtotal Other Next Two Years (FY23-24)		0	0%	$0		
Subtotal Other Next Five Years (FY23-27)		166	4%	$1,000,000		
Subtotal Other Permit Term (FY22-27)		382	10%	$1,000,000		
Total Next Two Years (FY23-24)		**2,795**	**76%**	**$14,097,519**		
Total Next Five Years (FY23-27)		**3,986**	**108%**	**$108,768,539**		
Total Permit Term (FY22-27)		**4,539**	**123%**	**$137,826,140**		

Check with MDE Geodatabase:

Type, class, impervious acres, implementation cost and implementation status should match the various geodatabase tables for BMPs (AltBMPLine, AltBMPPoint, AltBMPPoly, and RestBMP)-- aggregated by type and status.

Notes

1. Use BMP domains from MDE Geodatabase.
2. % ISR Complete compared to continued annual alternative ISR.
3. Insert additional rows as necessary.
4. Impervious Acres are the average for the last five fiscal years of the permit term. Implementation Costs are totaled.
5. % ISR Complete compared to ISR new permit.
6. ISR for IDDE is only the amount of the last year of the time period, not an average.

Version 6-22-22

Article 4-202.1(j)(1)(i)2: Projected annual and 5-year costs for the county or municipality to meet the impervious surface restoration plan requirements of its National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit.

DESCRIPTION	PREVIOUS YEAR FY 2021	CURRENT YEAR FY 2022	PROJECTED YEAR 1 FY 2023	PROJECTED YEAR 2 FY 2024	PROJECTED YEAR 3 FY 2025	PROJECTED YEAR 4 FY 2026	PROJECTED YEAR 5 FY 2027	TOTAL PERMIT CYCLE[4]
Operating Expenditures (costs)								
Street Sweeping Program	$4,956,363	$5,386,406	$5,945,483	$8,964,393	$9,143,681	$9,326,554	$8,063,085	$51,785,964
Inlet Cleaning	$5,092,014	$4,798,576	$4,904,995	$5,003,095	$6,368,600	$5,930,972	$6,049,591	$38,147,843
IDDE	$1,630,625	$1,629,264	$1,661,849	$1,695,086	$1,728,988	$1,763,568	$1,798,839	$11,908,219
Support of Capital Projects	$561,270	$1,229,846	$1,254,443	$1,279,532	$1,305,122	$1,331,225	$1,357,849	$8,319,287
Debt Service Payment[1]	$2,755,494	$2,180,701	$2,760,962	$3,392,610	$4,373,068	$4,373,068	$4,373,068	$24,208,972
Other (please stipulate program expenditure)[2]	-	-	-	-	-	-	-	$0
Capital Expenditures (costs)[3]								
General Fund (Paygo)								$0
WPR Fund (Paygo)	$2,030,904	$170,411	$200,971	$4,264,061	$6,986,913	$8,008,797	$5,800,659	$27,462,716
Debt Service	$24,082,043	$5,346,590	$8,189,121	$12,643,760	$23,893,388	$12,894,194	$8,061,885	$95,110,980
Grants & Partnerships		$477,898		$2,871,619				$3,349,517
Other (please stipulate capital expenditure)[2]	-	-	-	-	-	-	-	$0
Subtotal operation and paygo:	$17,026,670	$15,395,204	$16,728,703	$24,598,776	$29,906,372	$30,734,184	$27,443,092	$161,833,001
Total expenditures:	**$41,108,713**	**$21,219,692**	**$24,917,824**	**$40,114,155**	**$53,799,760**	**$43,628,378**	**$35,504,977**	**$260,293,498**

Total ISRP costs except debt service:	**$236,084,527**
Compare ISRP costs (except debt service) / total ISRP proposed actions for permit term:	**171%**
Total capital expenditures:	**$125,923,213**
Compare total capital expenditures / total ISRP proposed actions capital costs for permit term:	**99%**

Check with MDE Geodatabase:

The total current FY 2022 expenditure should be less than the combined total of the "OP_cost" and "CAP_Cost" fields in the fiscal analyses table of the geodatabase

The total projected FY 2023 expenditure should be less than the combined total of the "OP_budget" and "CAP_budget" fields in the fiscal analyses table of the geodatabase

Notes:

1. Debt service payments include debt service used to support capital projects from current and previous permit.
2. Insert additional rows as necessary.
3. Capital costs shown in FY 2021 include costs in FY 2021 and previous years, spent on capital projects attributed to the current permit. Total permit cycle includes the previous yea
4. Total permit cycle includes FY 2021 (costs associated with capital projects attributed to the current permit) to FY 2026

Version 6-22-22

Article 4-202.1(j)(1)(i)3: Projected annual and 5-year revenues or other funds that will be used to meet the cost for the county or municipality to meet the impervious surface restoration plan requirements under the National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit.

DESCRIPTION	PAST UP THRU FY 21	CURRENT YEAR FY 22	PROJECTED YEAR 1 FY 23	PROJECTED YEAR 2 FY 24	PROJECTED YEAR 3 FY 25	PROJECTED YEAR 4 FY 26	PROJECTED YEAR 5 FY 27	TOTAL NEXT 2-YEARS FY 23-24[1]	TOTAL
Annual Revenue[2] Appropriated for ISRP	$155,048,545	$19,724,793	$38,366,732	$55,201,716	$22,919,459	$22,725,387	$21,642,433	$93,568,448	$335,629,064
Annual Costs towards ISRP[3]	$41,108,713	$21,219,692	$24,917,824	$40,114,155	$53,799,760	$43,628,378	$35,504,977	$65,031,979	$260,293,498
							Compare revenue appropriated / annual costs:	**144%**	
							Reporting Criteria:	**100%**	

Note

1. Article 4-202.1(j)(2): Demonstration that county or municipality has sufficient funding in the current fiscal year and subsequent fiscal year budgets to meet its estimated cost for the 2-year period immediately following the filing date of the FAP. Note that the appropriations and expenditures include time period up to FY 22.
2. Revenue means "dedicated revenues, funds, or sources of funds (per Article 4-202.1(j)(4)(ii). Note that budget appropriations have only been approved by governing bodies through FY 23 at the time of FAP reporting.
3. See table of ISRP Cost.

Version 6-22-22

Article 4-202.1(j)(1)(i)4: Any sources of funds that will be utilized by the county or municipality to meet the requirements of its National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit.

SOURCE	PAST UP THRU[1] FY 21	CURRENT YEAR FY 22	PROJECTED YEAR 1 FY 23	PROJECTED YEAR 2 FY 24	PROJECTED YEAR 3 FY 25	PROJECTED YEAR 4 FY 26	PROJECTED YEAR 5 FY 27	TOTAL PERMIT CYCLE
Paygo Sources								
Stormwater Remediation Fees (WPR Fund)	$ 25,736,242	$ 28,016,285	$ 28,856,773	$ 29,722,477	$ 30,614,151	$ 30,614,151	$ 30,614,151	$ 173,560,079
Miscellaneous Fees (WPR Fund)	$ 286,704	$ 203,508	$ 220,000	$ 220,000	$ 220,000	$ 220,000	$ 220,000	$ 1,370,212
General Fund								$ -
Other Funds 1 (W/ WW)	$ 1,351,245	$ 1,481,946	$ 1,511,585	$ 1,541,817	$ 1,572,653	$ 1,604,106	$ 1,636,188	$ 9,063,351
Other Funds 2 (please stipulate funding source)								$ -
Other Funds 3 (please stipulate funding source)								$ -
Subtotal Paygo Sources	$ 27,374,191	$ 29,701,739	$ 30,588,358	$ 31,484,293	$ 32,406,804	$ 32,438,257	$ 32,470,339	$ 183,993,642
Debt Service (paygo sources will be used to pay off debt service. Note that previous appropriations for debt service used for ISRP is listed in FY 2021).								
County Transportation Bonds	$ 1,621,757							$ 1,621,757
General Obligation Bonds	$ -							$ -
Revenue (Utility) Bonds	$ 71,181,805	$ 1,000,000	$ 21,839,000	$ 27,219,000	$ -	$ -	$ -	$ 121,239,805
State Revolving Loan Fund	$ 21,655,730			$ 6,680,000				$ 28,335,730
Public-private partnership (debt service)								$ -
Subtotal Debt Service	$ 94,459,292	$ 1,000,000	$ 21,839,000	$ 33,899,000	$ -	$ -	$ -	$ 151,197,292
Grants and Partnerships (no payment is expected)								
State funded grants								$ -
Federal funded grants								$ -
Public-private partnership (matched grant)		$ 3,500,000						$ 3,500,000
Subtotal Grants and Partnerships	$ -	$ 3,500,000	$ -	$ -	$ -	$ -	$ -	$ 3,500,000
Total Annual Sources of Funds	**$ 121,833,483**	**$ 34,201,739**	**$ 52,427,358**	**$ 65,383,293**	**$ 32,406,804**	**$ 32,438,257**	**$ 32,470,339**	**$ 273,845,874**
Percent of Funds Directed Toward ISRP								

Compare total permit term paygo ISRP costs / subtotal permit term paygo sources: 88%

Compare total ISRP expenditures / total permit term annual sources of funds: 86%

* WPR Fund: Watershed Protection and Restoration Fund.

Check with MDE Geodatabase:

The total sources related to WPR Funds in Current FY 22 should march the "WPR_Fund" field of the geodatabase.

Note

1. Previous accumulated revenue should be specifically designated for use for this current permit.

Version 6-22-22

Article 4-202.1(j)(1)(i)5: Specific actions and expenditures that the county or municipality implemented in the previous fiscal years to meet its impervious surface restoration plan requirements under its National Pollutant Discharge Elimination System Phase I Municipal Separate Storm Sewer System Permit.

REST BMP ID	REST BMP TYPE[1]	BMP CLASS[1]	NUM BMP	IMPERVIOUS ACRES	% ISRP COMPLETE	IMPLEMEN-TATION COST	BUILT DATE	IMPLEMENTATION STATUS	GENERAL COMMENTS
Obligations from Previous Permit That Must Be Continued or Met				**5,701**					
Operational Programs[2,3]									
					0%				
					0%				
					0%				
					0%				
					0%				
Subtotal Operations[4]			0	-	0%	$0			
Capital Projects (Completed to Replace Annual Obligations)[2,3]									
					0%				
					0%				
					0%				
					0%				
Subtotal Capital			0	0	0%	$0			
Other (Completed to Replace Annual Obligations)[2,3]									
					0%				
					0%				
Subtotal Other			0	0	0%	$0			
Total Continued Obligations from Previous Permit			**0**	**0**	**0%**	**$0**			

REST BMP ID	REST BMP TYPE[1]	BMP CLASS[1]	NUM BMP	IMPERVIOUS ACRES	% ISRP COMPLETE	IMPLEMEN-TATION COST	BUILT DATE	IMPLEMENTATION STATUS	GENERAL COMMENTS
Restoration for the New Permit				**3,696**					
Operational Programs[3,5]									
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
Subtotal Operations[4]			0	#DIV/0!	#DIV/0!	$0			
Capital Projects[3,5]									
BC21ALN001	STR	A	1	254	7%	$ 12,492,000	12/8/2021	COMPLETE	Chinquapin Run
BC22ALN002	STR	A	1	78	2%	$ 10,942,099	4/28/2022	COMPLETE	Powder Mill Run
BC22BMP001	IMPP	A	14	4.1	0%	$ 1,033,677	12/13/2019	COMPLETE	ER-4125
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
					0%				
Subtotal Capital			16	336.1	9%	$24,467,776			

REST BMP ID	REST BMP TYPE[1]	BMP CLASS[1]	NUM BMP	IMPERVIOUS ACRES	% ISRP COMPLETE	IMPLEMEN-TATION COST	BUILT DATE	IMPLEMENTATION STATUS	GENERAL COMMENTS
Other[3,5]									
					0%		6/30/2022		
					0%		6/30/2022		
					0%		6/30/2022		
					0%		6/30/2022		
					0%		6/30/2022		
					0%		6/30/2022		
Subtotal Other			0	0	0%	$0			
Total Additional Restoration			**16**	**#DIV/0!**	**#DIV/0!**	**$24,467,776**			

Check with MDE Geodatabase:

Rest BMP ID, type, class, number of BMPs, impervious acres, built date, implementation cost should match the various geodatabase tables for BMPs (AltBMPLine, AltBMPPoint, AltBMPPoly, and RestBMP)--aggregated by type and status.

Notes:

1. Use BMP domains from MDE Geodatabase.
2. % ISR Complete compared to continued annual alternative ISR.
3. Insert additional rows as necessary.
4. Impervious Acres are the average for the time period, Implementation Costs are totaled.
5. % ISR Complete compared to ISR new permit.

Version 6-22-22

Code Description	Code	Class
Ponds		
Micro-Pool Extended Detention Pond	PMED	S
Multiple Pond	PMPS	S
Pocket Pond	PPKT	S
Wet Extended Detention Pond	PWED	S
Wet Pond	PWET	S
Wetlands		
ED Shallow Wetland	WEDW	S
Pocket Wetland	WPKT	S
Pond Wetland System	WPWS	S
Shallow Marsh	WSHW	S
Infiltration		
Infiltration Basin	IBAS	S
Infiltration Trench	ITRN	S
Landscape Infiltration	MILS	E
Infiltration Berm	MIBR	E
Dry Well	MIDW	E
Filtering Systems		
Surface Sand Filter	FSND	S
Underground Filter	FUND	S
Perimeter Filter	FPER	S
Organic Filter	FORG	S
Pocket Filter	FPKT	S
Bioretention	FBIO	S
Submerged Gravel Wetland	MSGW	E
Micro-Bioretention	MMBR	E
Rain Garden	MRNG	E
Enhanced Filter	MENF	E
Open Channel Systems		
Dry Swale	ODSW	S
Wet Swale	OWSW	S
Bio-Swale	MSWB	E
Grass Swale	MSWG	E
Wet Swale	MSWW	E
Alternative Surfaces		
Green Roof - Extensive	AGRE	E
Green Roof - Intensive	AGRI	E
Permeable Pavement	APRP	E
Reinforced Turf	ARTF	E
Nonstructural Techniques		
Non-Rooftop Disconnect	NDNR	E
Rooftop Disconnect	NDRR	E
Sheetflow to Conservation Area	NSCA	E
Other Systems		
Rainwater Harvesting	MRWH	E
Other Practices		
Extended Detention Structure, Dry	XDED	S

Detention Structure (Dry Pond)	XDPD	S
Flood Management Area	XFLD	S
Oil Grit separator	XOGS	S
Other	OTH	
Alternative BMP		
Mechanical Street Sweeping	MSS	A
Regenerative/Vacuum Street Sweeping (i.e., Advanced Street Sweeping)	VSS	A
Catch Basin Cleaning	CBC	A
Storm Drain Vacuuming (i.e., Storm Drain Cleaning)	SDV	A
Stream Restoration	STRE	A
Outfall Stabilization	OUT	A
Shoreline Management	SHST	A
Septic Connections to WWTP	SEPC	A
Septic Denitrification	SEPD	A
Septic Pumping	SEPP	A
Elimination of Discovered Nutrient Discharges from Grey Infrastructure	DGI	A
Floating Treatment Wetlands	XFTW	A
Impervious Surface Reduction (i.e., impervious to pervious)	IMPP	A
Impervious Surface to Forest (i.e., IMPP + FPU)	IMPF	A
Forestation on Pervious Urban (i.e., Forest Planting)	FPU	A
Conservation Landscaping	CLTM	A
Forest Conservation	FCO	A
Riparian Conservation Landscaping	RCL	A
Riparian Forest Planting	RFP	A
Street Trees	STCI	A
Urban Soil Restoration (Compacted Pervious Surfaces)	USRP	A
Urban Soil Restoration (Removed Impervious Surfaces)	USRI	A
Urban Tree Canopy (i.e., Pervious Turf to Tree Canopy over Turf)	UTC	A
Dry Channel Regenerative Step Pool Stormwater Conveyance System	SPSD	A

Appendix I: Financial Assurance Plan (FAP)

Watershed Protection and Restoration Program Annual Report Table

Article 4-202.1(i)(4): "The percentage and amount of funds in the local watershed protection and restoration fund spent on each of the purposes provided in subsection (h)(4) of this section;"

Program Element		Cost	Percent of WPRF
Capital Improvements for Stormwater Management	$	10,076,017	36.92%
O & M of SWM Systems and Facilities	$	13,125,076	48.09%
Public Education and Outreach	$	304,174	1.11%
Stormwater Management Planning (see Md. Environment Code Ann. § 4-202.1(h)(4)(iv))	$	1,324,845	4.85%
Review of Stormwater Management Plans and Permit Applications for New Development	$	1,826,898	6.69%
Grants to Nonprofit Organizations	$	203,994	0.75%
Adminstration of WPRF	$	431,878	1.58%
TOTAL		$27,292,882.00	100.00%

Number of Properties Subject to Fee	237,391
Reporting Year	2022
Permit Number	20-DP-3315
Comments:	Capital improvements of stormwater management includes payment of debt

VERSION 2-28-18

					Rate Structures									Additional Sources of Funds				
Jurisdiction	**Agency**	**Local Ordinance Submitted to MDE**	**MDE Approval of Fee Reduction Policy**	**Fee Reduction Amount**	**Annual Single Family Residential Rate**	**Annual Commercial Rate**	**Equivalent Residential Unit (ERU) impervious**	**Commercial Capped Rates**	**Non-profits, Religious Organizations**	**Exemptions**	**Federal Facilities Status**	**Federal Facility Fee(s)/Rate(s)**	**Additional Source 1**	**Additional Source 2**	**Additional Source 3**	**Estimated Annual Revenue**	**Notes**
Baltimore City	Department of Public Works	Yes	NA	NA	$52.00 - 156.00	$78.00 / ERU	1,050 sf	Capped at 20% of all State and local property taxes	$12 / ERU on religious and K-12 education structures	IA permitted to public ww system; streets privately maintained and open to public in SFR communities; IA requires as a superfund cap; solar panel bases; driveways for cemetaries	Charged	$78.00 / yr / ERU	SWM/ESC Misc. Fees for permitting and penalties as part of development			$40,226,772.00	
		Use: Yes or No	**Use the approval date or N/A**	**Reduction amount(s), if any, with reason for reduction(s)**		**Use: N/A, amount of flate rate, rate amount per ERU, etc.**				**General description of exemption(s), if any**	**Use: No Facilities, Exempt, or Charged**	**Use: N/A or the fee and rate structures for federal facilities**					

Directions:
Notes:
ERU = Equivalent residential unit

VERSION 2-28-18

5.95

Article 4-202.1(i)(3): "The amount of money deposited into the watershed protection and restoration fund in the previous fiscal year by source;"

Source	Amount
Annual Single Family Residential Fees Collected	$13,306,940
Annual Commercial Fees Collected	$23,515,995
Non-profits, Religious Orgs Fees Collected	$3,200,329
Miscellaneous fees related to development	$203,508
Total	$40,226,772

VERSION 2-28-18

Note: Revenue by source is estimated based on the total revenue for the stormwater fee, proportional to the customer base (billing) and may not reflect actual proportion of revenue received for the fiscal year.

All SWM Projects Implemented in FY 2022 for the Watershed Restoration

REST BMP ID	REST BMP TYPE	BMP CLASS	NUM BMP	IMP ACRES	BUILT DATE	IMPL COST	IMPL STATUS	IMPL COMP YR
BC21ALN001	STR	A	1	254	12/8/2021	$12,492	Complete	2022
BC22ALN002	STR	A	1	78	4/28/2022	$10,942,099	Complete	2022
BC22BMP001	IMPP	A	14	4.1	12/13/2019	$1,033,677	Complete	2022

VERSION 2-28-18

Appendix J: BCNR System Presentation

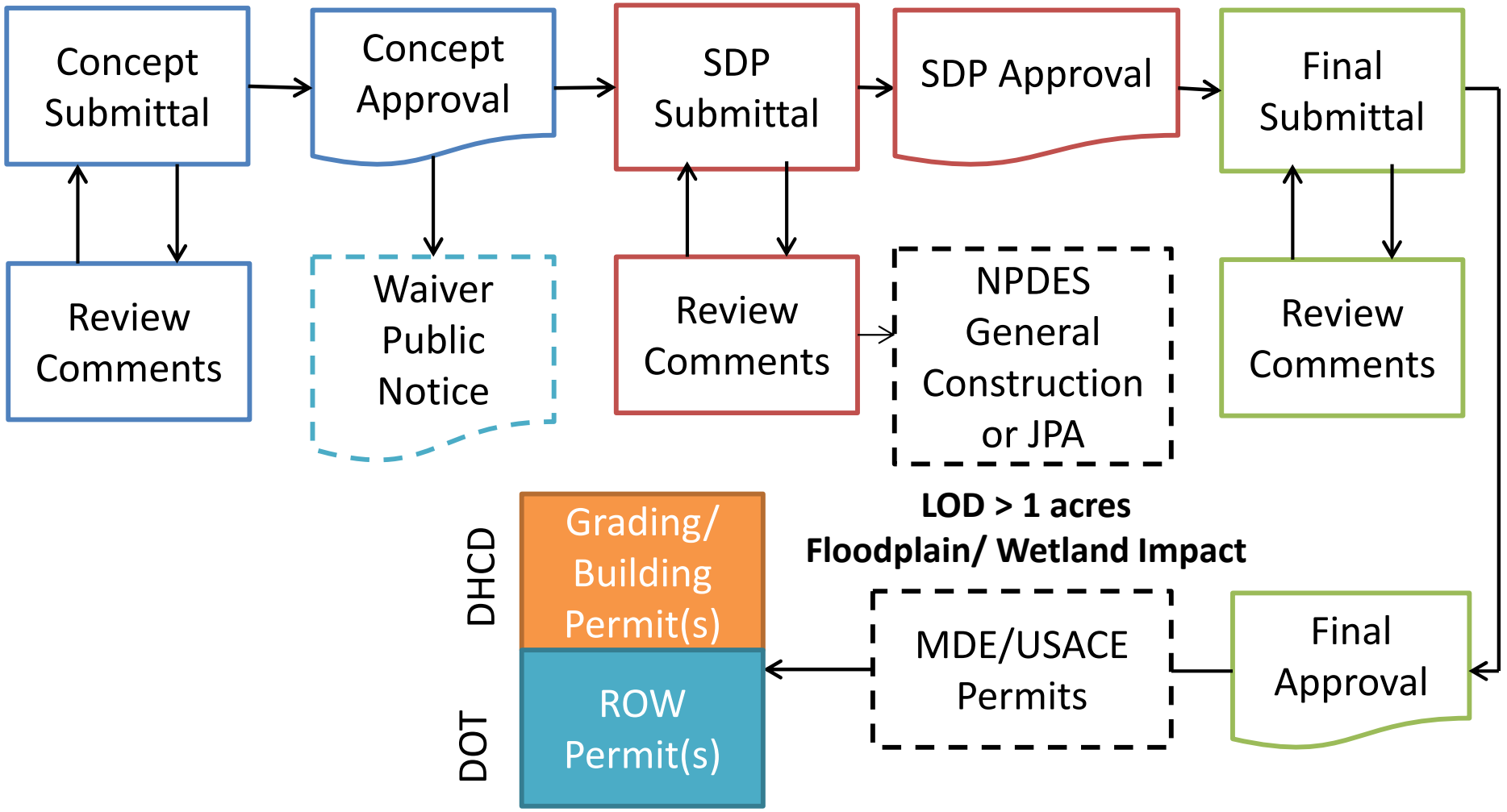
On-line Plans Review System

February 17, 2022

New On-line Plans Review System and the City Plan Review Process

- What is changing and why?
- Account creation
- On-line submittal forms
- Project identification / tracking
- Communications with reviewers
- Process for projects currently under review by the City
- Expedited reviews
- Master plans
- Fee payments
- Alignment with City permitting systems
- Other upcoming initiatives related to development

DPW: SWM /ESC Review Process (3 phase)



Business Case for Change

Hard copy submittals	Digital submittal, auto notification
Process dependent on manual, on-site receipt and distribution	Cloud-based storage
Review status?	Transparency
Multiple modes of communication	Accountability
Review silos	Consolidated communication
	Agency collaboration at concept

Regulatory Plans Review

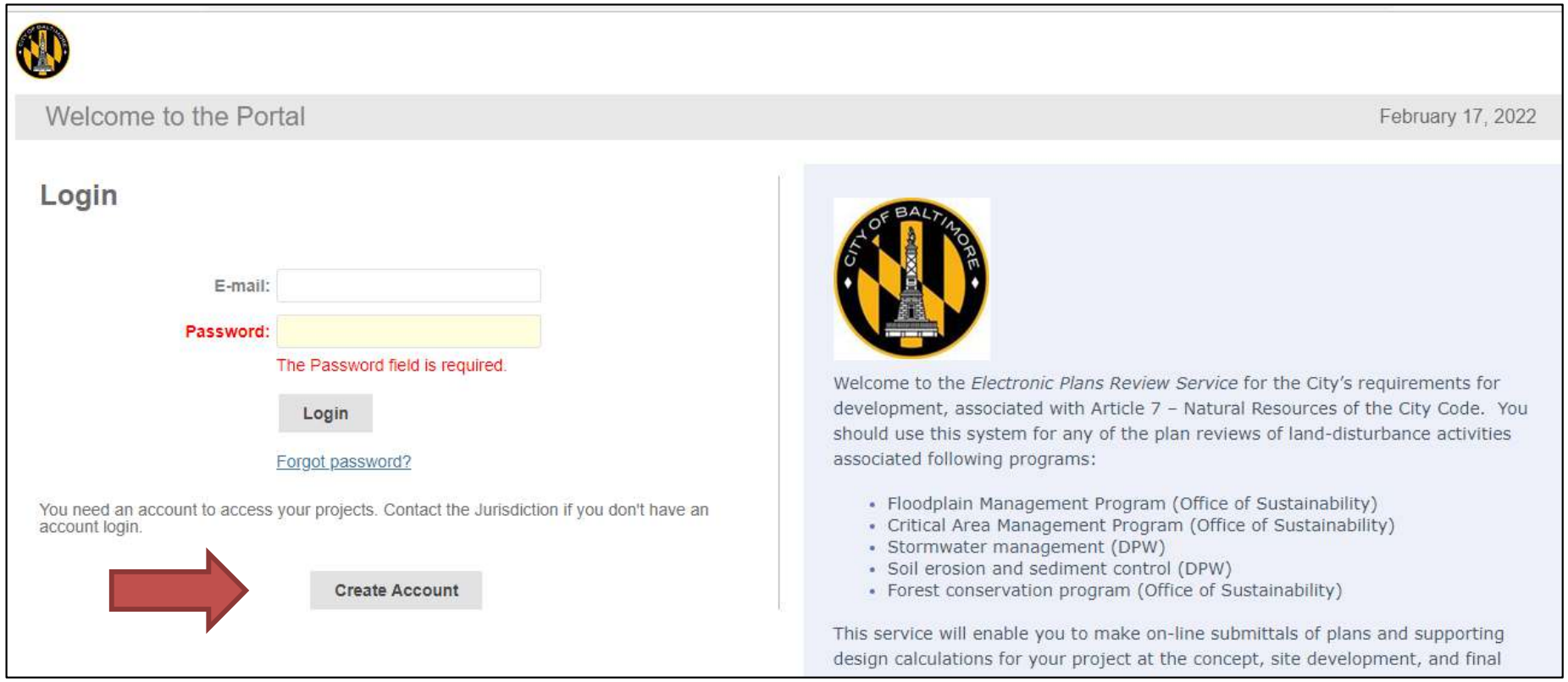
City Code Article 7: Natural Resources

DOP - Sustainability	DPW- Plans Review and Inspection	BCRP – Forestry

Div. I: Floodplain Mgt	Div. I: Critical Area Mgt	Div. IV: Forest Conservation	Div. II: Stormwater Management	Div. III: Erosion and Sediment Control	Div. V: City Parks and Street Trees

Account Creation

All users must create an account,
even if you have one with e-plans (DHCD).



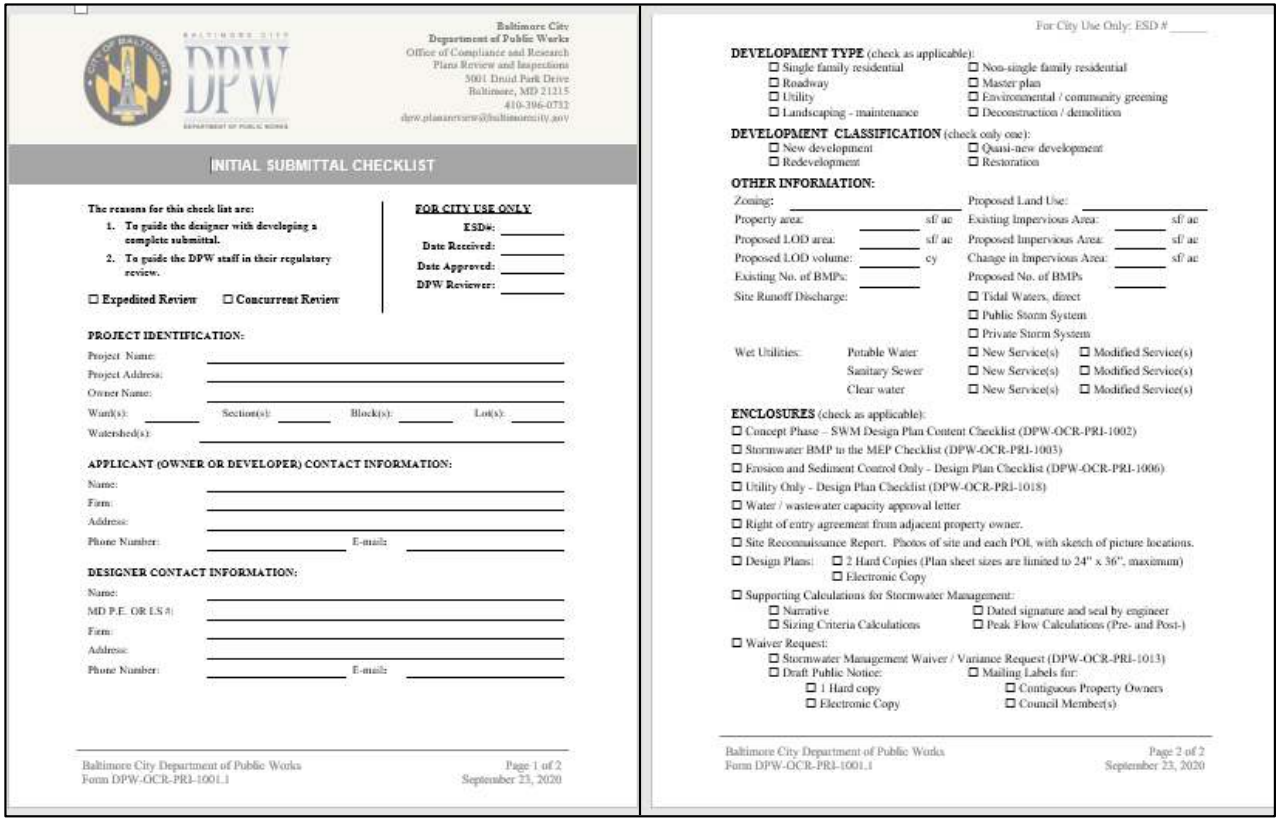
Portal link: Direct e-mail ● Website ● Message in permitting systems

Forms and Checklists

Replaced by System	Uploads to System	Separate from System
• Submittal Forms • Waiver / variance approval • Final Approval (batch stamp)	• Plan Content Checklists • ESD/BMP to MEP • Waiver / variance request • Plans and reports	• Public Notice • DOC, sureties, and payment transmittals

All files uploaded to ProjectDox must be .pdf.

Current Submittal Forms



Baltimore City
Department of Public Works
Office of Compliance and Research
Plans Review and Inspections
5001 Druid Park Drive
Baltimore, MD 21215
410-396-0732
dpw.planreview@baltimorecity.gov

INITIAL SUBMITTAL CHECKLIST

The reasons for this check list are:
1. **To guide the designer with developing a complete submittal.**
2. **To guide the DPW staff in their regulatory review.**

FOR CITY USE ONLY
ESD#: _____
Date Received: _____
Date Approved: _____
DPW Reviewer: _____

☐ **Expedited Review** ☐ **Concurrent Review**

PROJECT IDENTIFICATION:
Project Name: _____
Project Address: _____
Owner Name: _____
Ward(s): _____ Section(s): _____ Block(s): _____ Lot(s): _____
Watershed(s): _____

APPLICANT (OWNER OR DEVELOPER) CONTACT INFORMATION:
Name: _____
Firm: _____
Address: _____
Phone Number: _____ E-mail: _____

DESIGNER CONTACT INFORMATION:
Name: _____
MD P.E. OR LS #: _____
Firm: _____
Address: _____
Phone Number: _____ E-mail: _____

Baltimore City Department of Public Works
Form DPW-OCR-PRI-1001.1
Page 1 of 2
September 23, 2020

For City Use Only: ESD # _____

DEVELOPMENT TYPE (check as applicable):
☐ Single family residential ☐ Non-single family residential
☐ Roadway ☐ Master plan
☐ Utility ☐ Environmental / community greening
☐ Landscaping - maintenance ☐ Deconstruction / demolition

DEVELOPMENT CLASSIFICATION (check only one):
☐ New development ☐ Quasi-new development
☐ Redevelopment ☐ Restoration

OTHER INFORMATION:
Zoning: _____ Proposed Land Use: _____
Property area: _____ sf/ ac Existing Impervious Area: _____ sf/ ac
Proposed LOD area: _____ sf/ ac Proposed Impervious Area: _____ sf/ ac
Proposed LOD volume: _____ cy Change in Impervious Area: _____ sf/ ac
Existing No. of BMPs: _____ Proposed No. of BMPs _____
Site Runoff Discharge: ☐ Tidal Waters, direct
☐ Public Storm System
☐ Private Storm System

Wet Utilities:		
Potable Water	☐ New Service(s)	☐ Modified Service(s)
Sanitary Sewer	☐ New Service(s)	☐ Modified Service(s)
Clear water	☐ New Service(s)	☐ Modified Service(s)

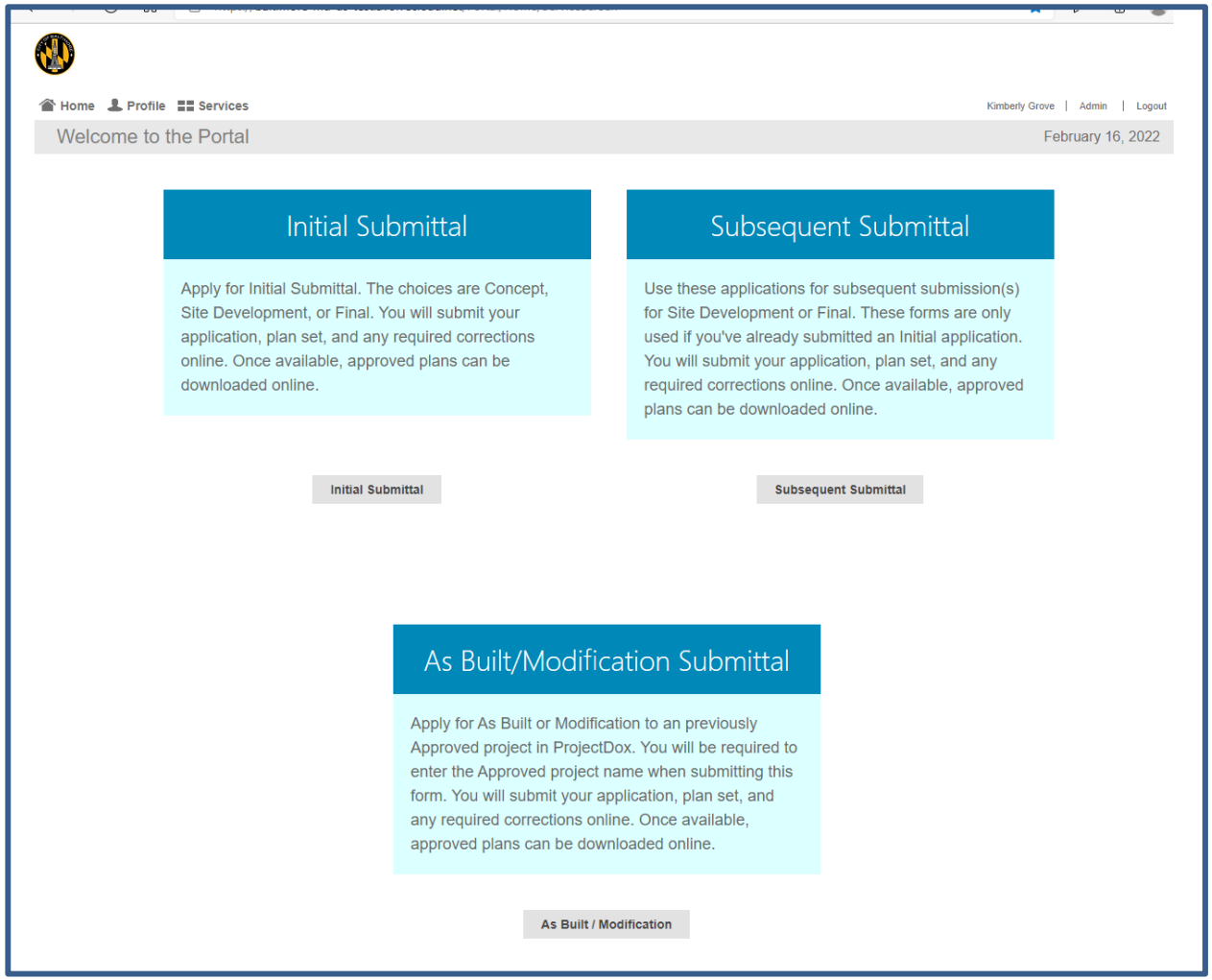
ENCLOSURES (check as applicable):
☐ Concept Phase – SWM Design Plan Content Checklist (DPW-OCR-PRI-1002)
☐ Stormwater BMP to the MEP Checklist (DPW-OCR-PRI-1003)
☐ Erosion and Sediment Control Only - Design Plan Checklist (DPW-OCR-PRI-1006)
☐ Utility Only - Design Plan Checklist (DPW-OCR-PRI-1018)
☐ Water / wastewater capacity approval letter
☐ Right of entry agreement from adjacent property owner.
☐ Site Reconnaissance Report. Photos of site and each POI, with sketch of picture locations.
☐ Design Plans: ☐ 2 Hard Copies (Plan sheet sizes are limited to 24" x 36", maximum)
☐ Electronic Copy
☐ Supporting Calculations for Stormwater Management:
☐ Narrative ☐ Dated signature and seal by engineer
☐ Sizing Criteria Calculations ☐ Peak Flow Calculations (Pre- and Post-)
☐ Waiver Request:
☐ Stormwater Management Waiver / Variance Request (DPW-OCR-PRI-1013)
☐ Draft Public Notice: ☐ Mailing Labels for:
☐ 1 Hard copy ☐ Contiguous Property Owners
☐ Electronic Copy ☐ Council Member(s)

Baltimore City Department of Public Works
Form DPW-OCR-PRI-1001.1
Page 2 of 2
September 23, 2020

- Initial / Concept
- Site Development
- Final
- Modification
- As-built

- Project location
- Contacts
- Development type
- Development classification
- Project Info.
- Submittal requirements

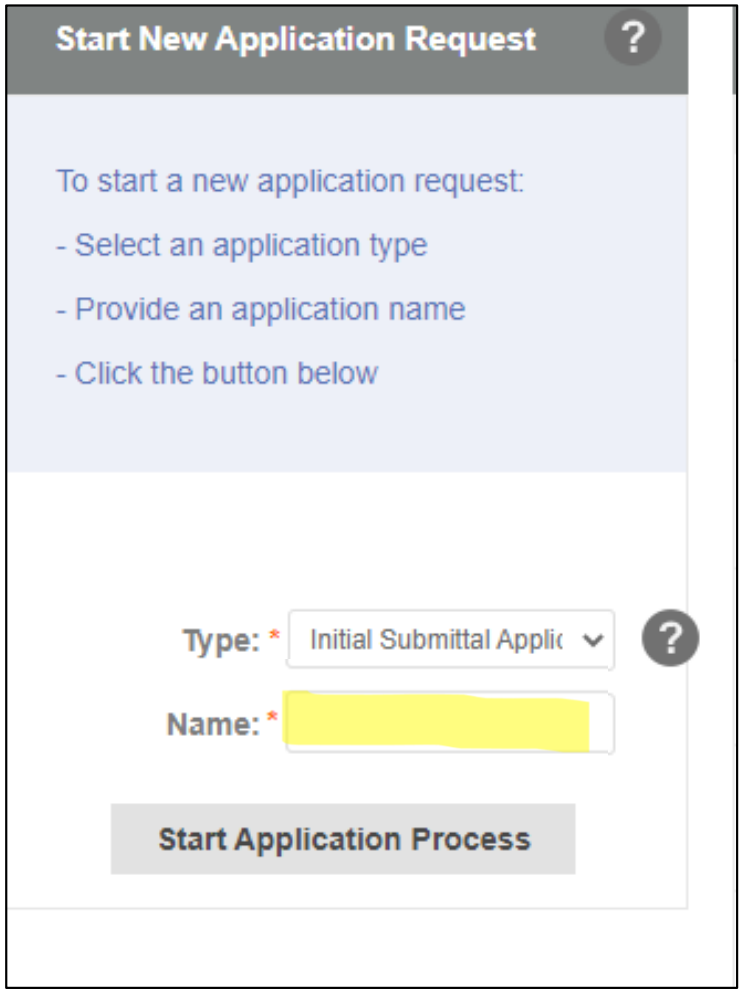
On-line Application System (OAS)

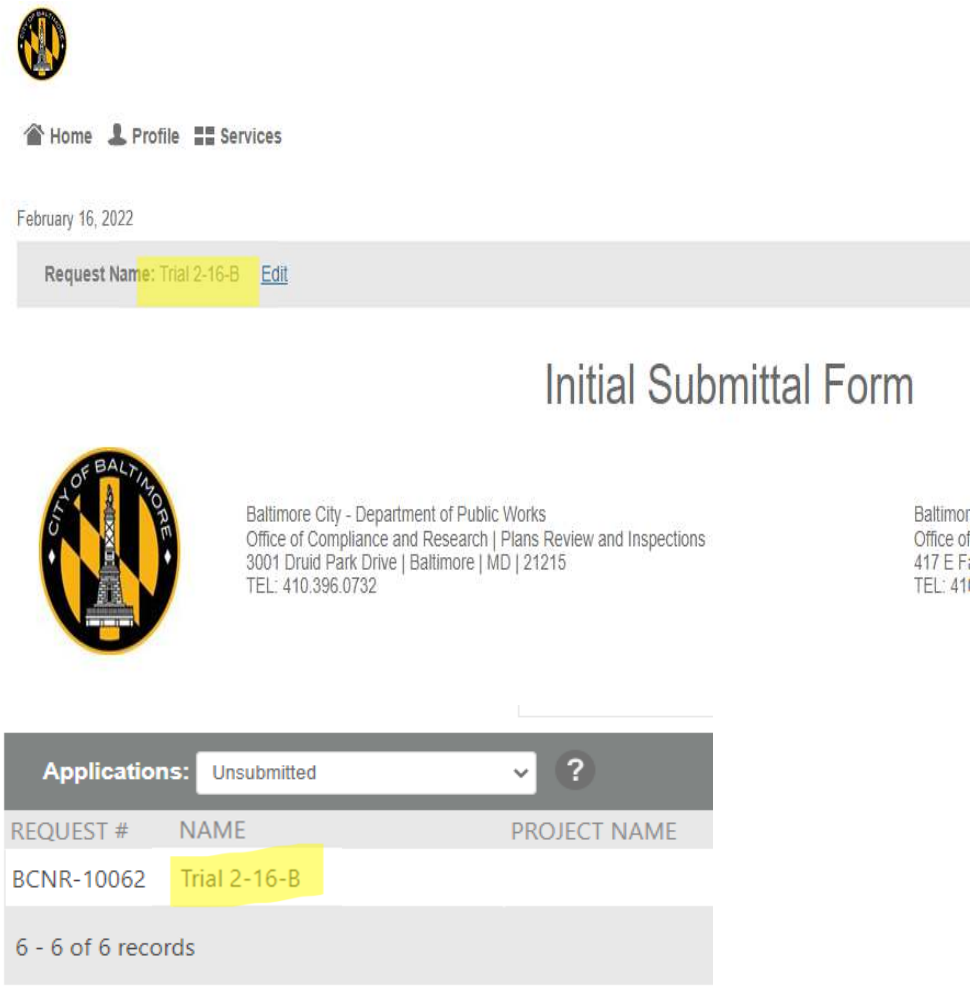


New Questions:

- Is the project in a regulatory floodplain (1% or 0.2% area)?
- Is the project in the Critical Area?
- Does the property have a forest conservation easement?

Request Name





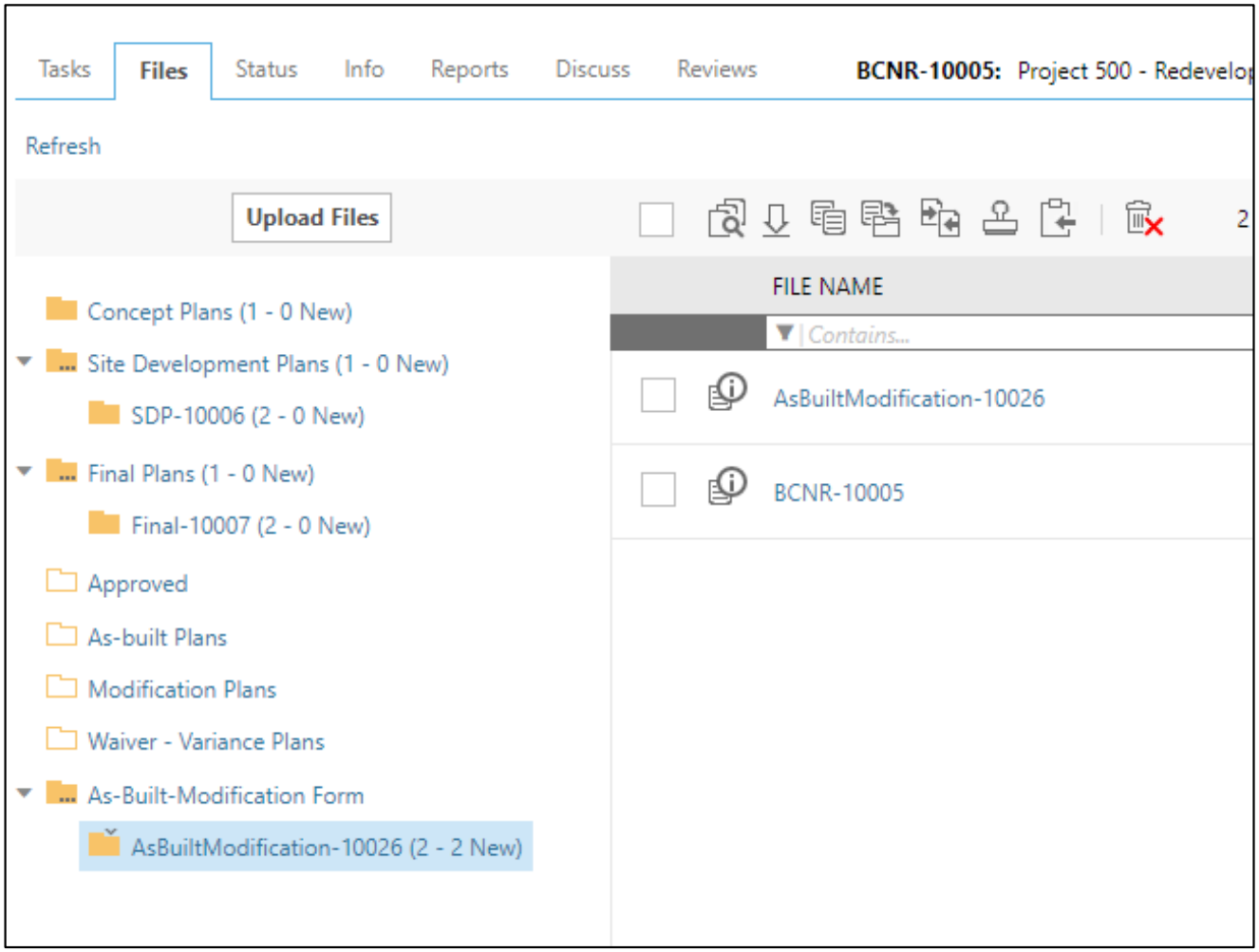
Project ID vs. OAS Form Reference

BCNR-10005

SDP-10006

Final-10007

As-built Modification-10026



Communications with Review Team

Review Comments

Info Only

Question

Resolved

Unresolved

Review Cycle

Correction required

Approved

No review required

Approved with condition

Discuss

Expedited reviewer approval

Fees and payment receipt

DHCD / DOT permit reference

Waiver/ variance public comment

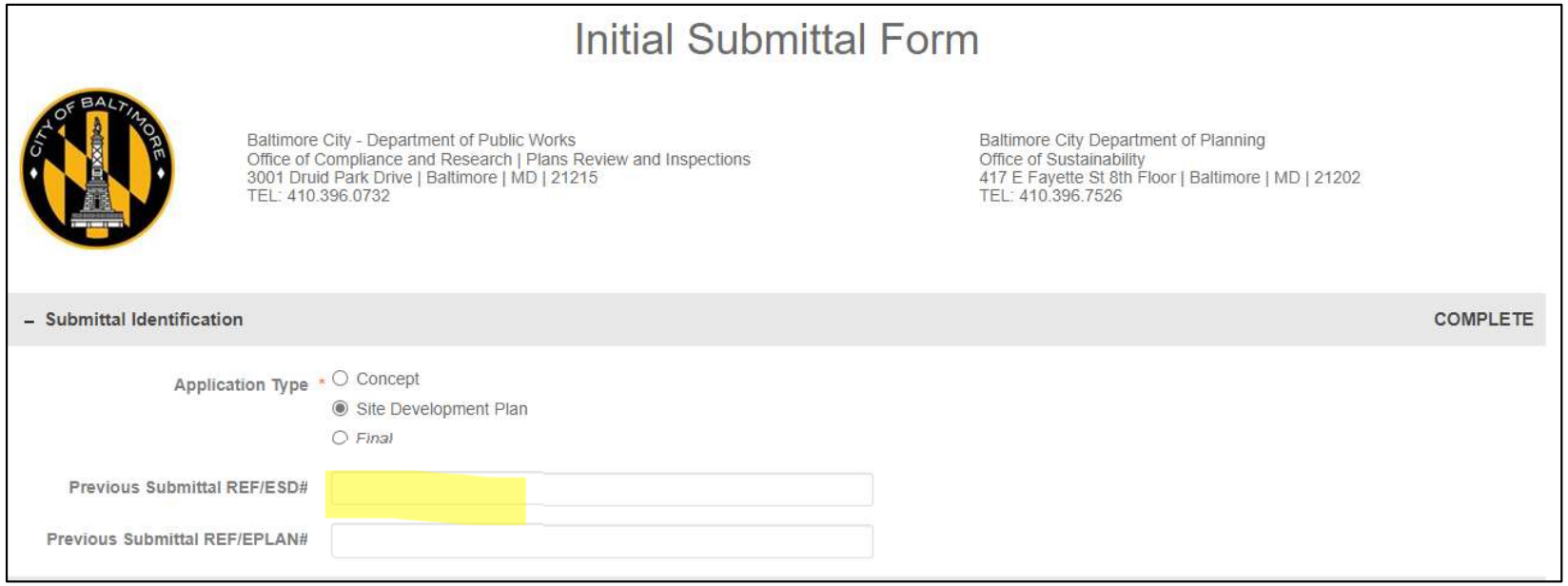
Task assignment changes

Accept the Task! → **Do the Work!** → **Complete the Task!**

Projects Already under Review

ESD XXXX → BCNR XXXXX

Assigned with Initial Submittal



Initial Submittal Form

Baltimore City - Department of Public Works
Office of Compliance and Research | Plans Review and Inspections
3001 Druid Park Drive | Baltimore | MD | 21215
TEL: 410.396.0732

Baltimore City Department of Planning
Office of Sustainability
417 E Fayette St 8th Floor | Baltimore | MD | 21202
TEL: 410.396.7526

– Submittal Identification — COMPLETE

Application Type * ○ Concept ◉ Site Development Plan ○ Final

Previous Submittal REF/ESD#

Previous Submittal REF/EPLAN#

Existing Reviews Transition to ProjectDox

Applicant identifies

- ESD #
- Current Review Phase
- Expeditor
- Uploads last response/ approval

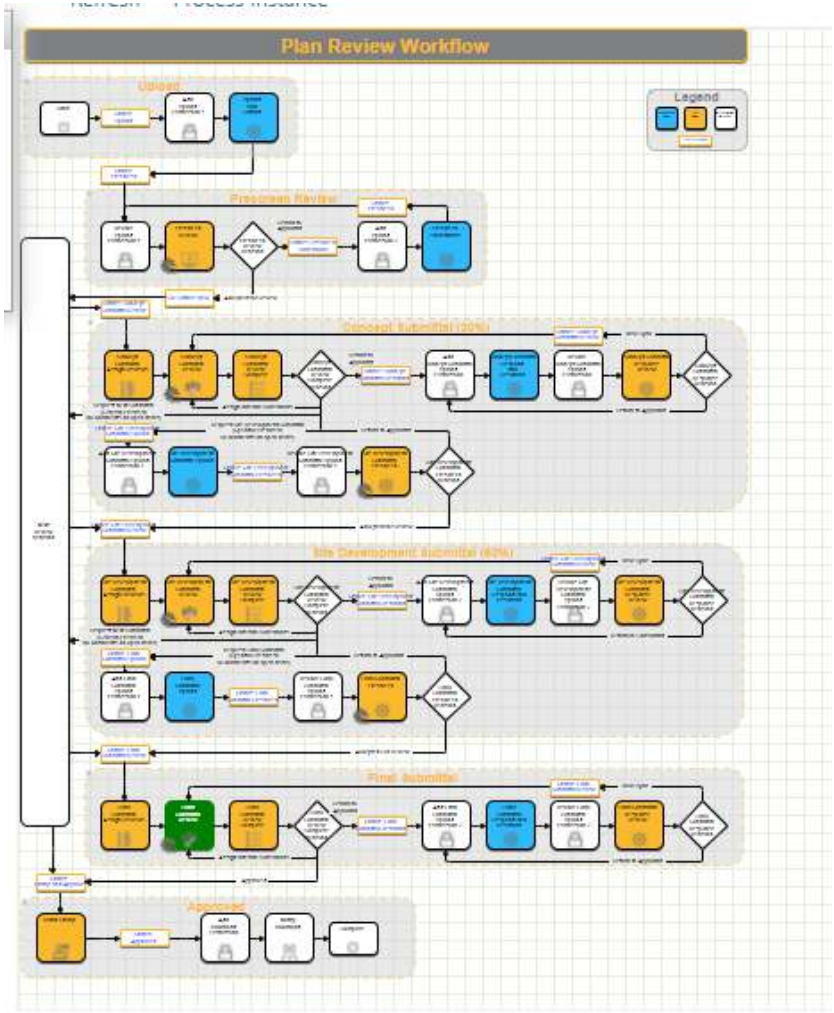
Pre-screener confirms

- Status
- Project Info.
- Assigned reviewer (Discuss Tab)

Review proceeds

Example Workflow

1. Initial Submittal
2. Pre-Screen
~~Concept Review~~
3. SDP Review
4. Final Review
5. Stamp / Approval



Modification /As-built Review

Initial Submittal

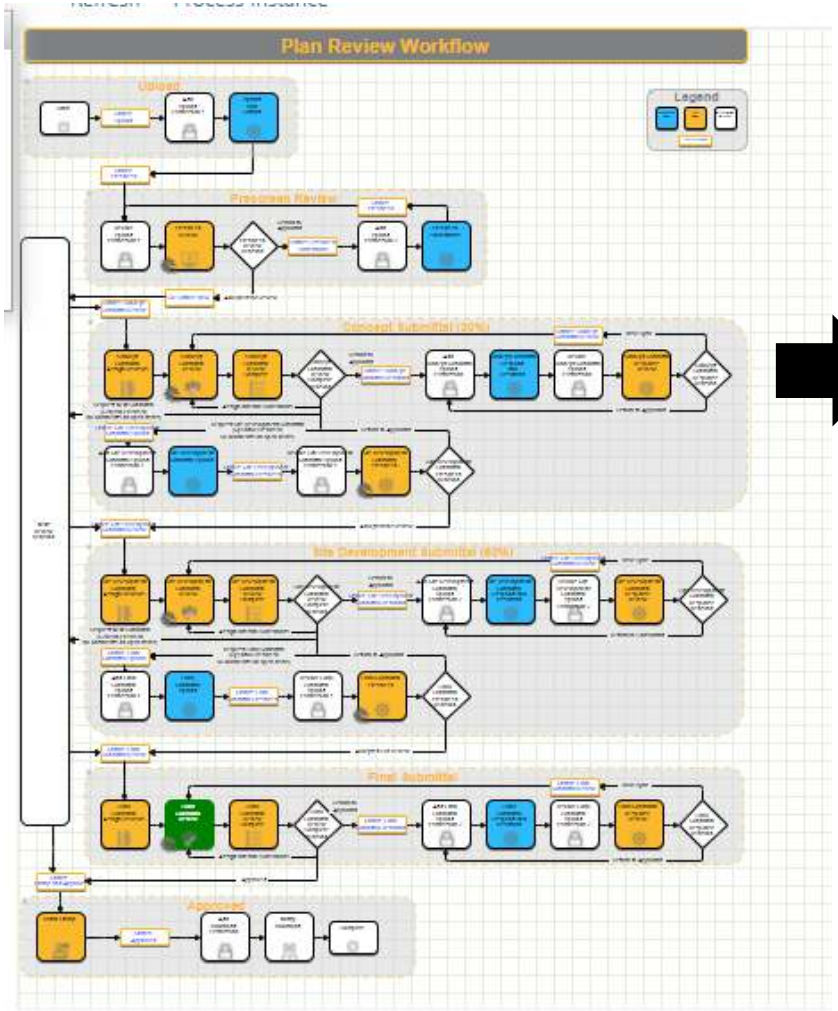
Pre-Screen

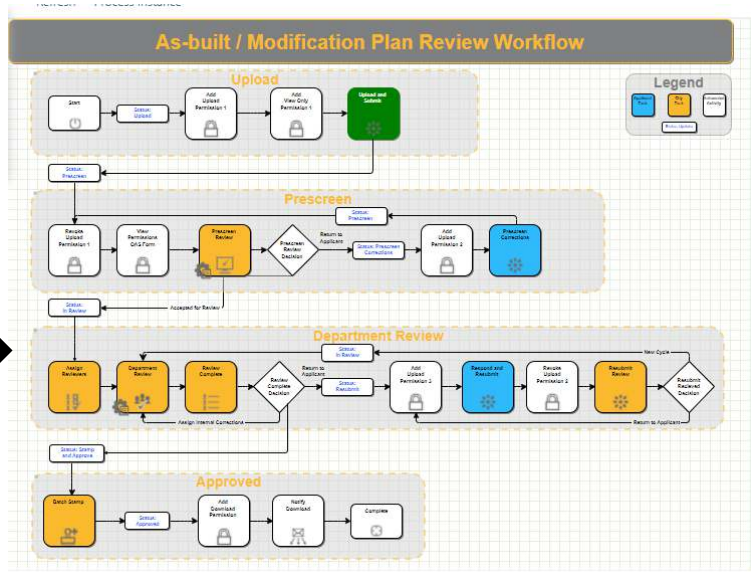
Concept Review

SDP Review

Final Review

Stamp / Approval





If final approval was pre-ProjectDox, the approved plans need to be uploaded as an initial submittal, so the as-built review can be completed.

Master Plan Approval / Tracking

Current: Approval letter at each phase

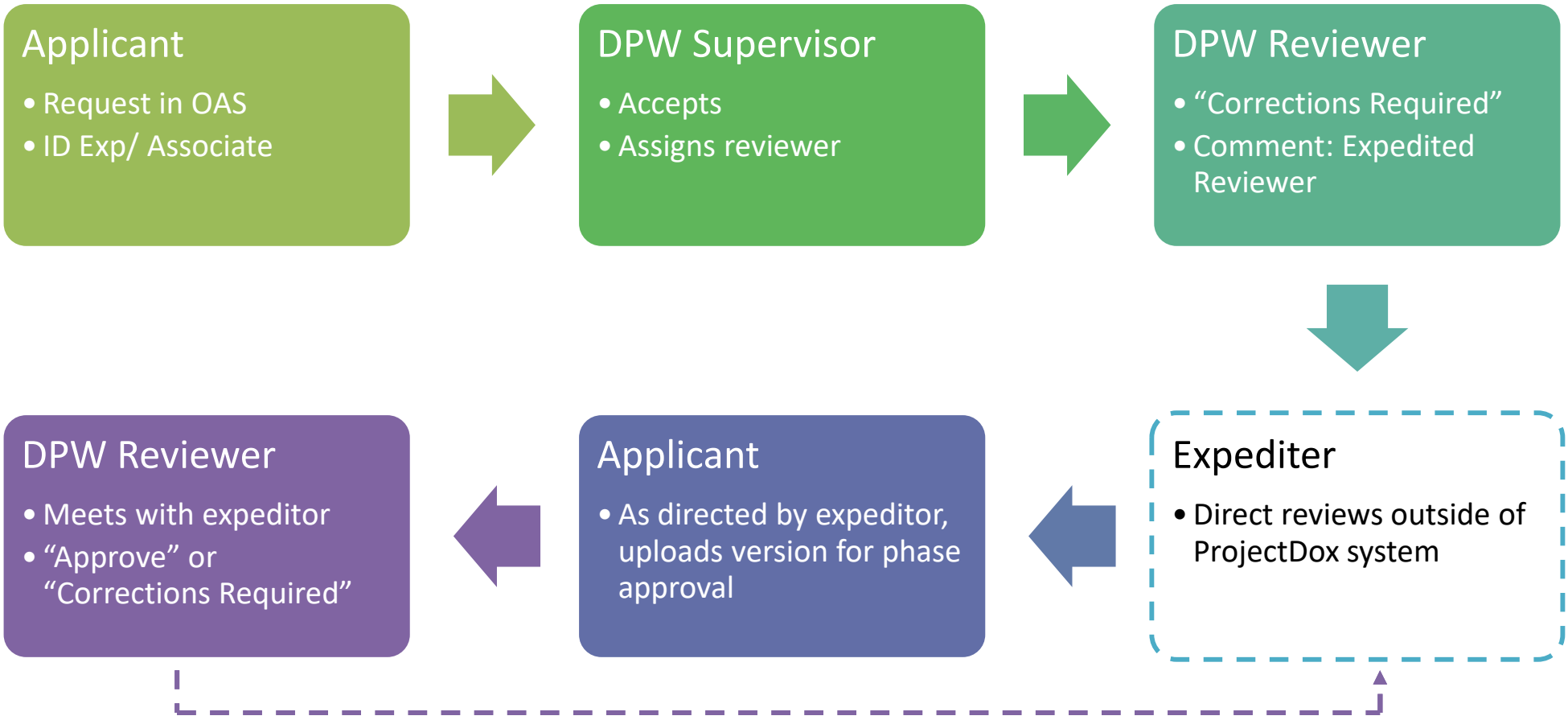
Concept	Master Plan: ESD - 1234		
SDP	Phase 1 ESD-1234A	Phase 2 ESD-1234B	Phase 3 ESD-1234C
Final			

ProjectDox: System stamp for Master Plan, then Final for each phase

Initial: Concept Master Plan	Master Plan: BCNR- 10001		
Initial: SDP Non-SFR	Phase 1 BCNR-10005, *Final-10015*	Phase 2 BCNR-10018, *Final-10023*	Phase 3 BCNR-10050, *Final-10060*
Subsequent: Final Non-SFR			

List as Previous Submittal Ref/ ESD

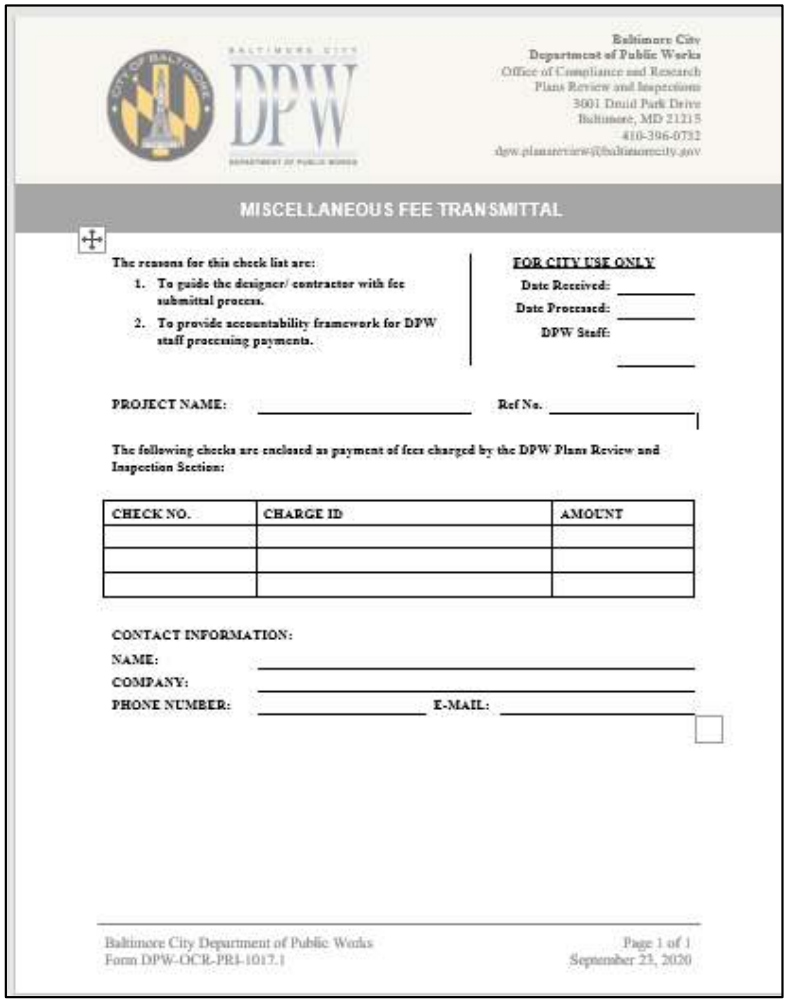
Expedited Reviewer



Fees and Payments

- Charges assigned by DPW
  - Review fees
  - Fee in lieu
- ***Discuss tab***: Charge ID and $$$
- Submittal: transmittal with payment
  - Charge ID and $$$
  - Check # or BAN
  - Contact Information
- ***Discuss tab***: Receipt of payment
- Approval pending receipt
- ESC Inspection still charged through DHCD permitting system

One check per charge ID



Baltimore City
Department of Public Works
Office of Compliance and Research
Plans Review and Inspections
3001 Druid Park Drive
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MISCELLANEOUS FEE TRANSMITTAL

The reasons for this check list are:

1. To guide the designer/ contractor with fee submittal process.
2. To provide accountability framework for DPW staff processing payments.

FOR CITY USE ONLY
Date Received: _____
Date Processed: _____
DPW Staff: _____

PROJECT NAME: _____ Ref No. _____

The following checks are enclosed as payment of fees charged by the DPW Plans Review and Inspection Section:

CHECK NO.	CHARGE ID	AMOUNT

CONTACT INFORMATION:
NAME: _____
COMPANY: _____
PHONE NUMBER: _____ E-MAIL: _____

Baltimore City Department of Public Works
Form DPW-OCR-PRI-1017.1

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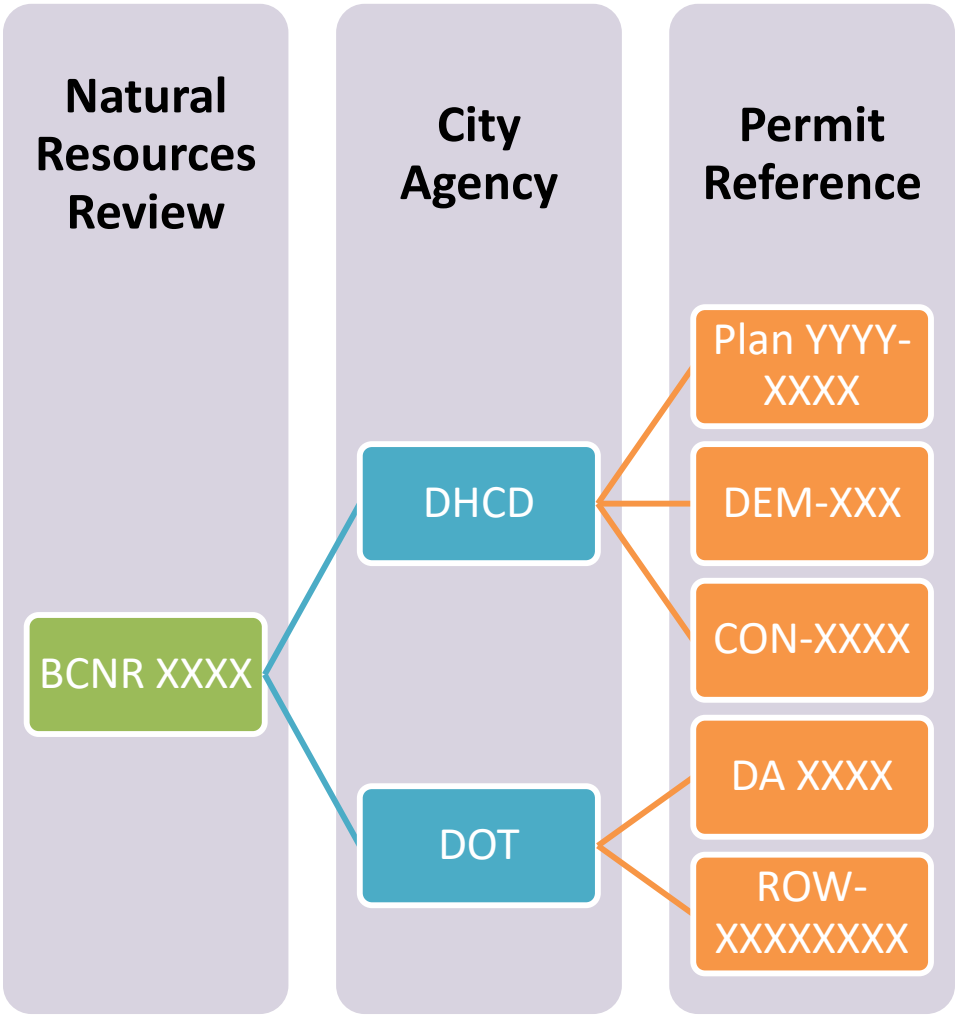
September 23, 2020

Final Approval and City Permitting



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APPROVED

Floodplain Management (BOS)
Critical Area Management (BOS)
Forest Conservation (BOS)
Stormwater Management (DPW)
Erosion and Sediment Control (DPW)
Street Trees / City Forests (BCRP)

Project ID: BCNR: 10001
Approved: 2/23/2022

Upcoming Initiatives

- **DPW Website**
  - Checklists
  - References
  - Plan content examples
  - Construction / maintenance
- **On-line payment portal**
- **Wet Utilities**
  - Processes
  - Bonded drain layer policy
- **Shape files/ geodatabase inputs**
- **Standard Plans** (demo and SFR)
- **Urban Agriculture**
- **Article 7 Ordinance**
  - Restoration projects
  - Public comment direct mailings

ProjectDox

- System access
- Session recording
- Go Live! 2/22/22
- Supplemental trainings
- FAQ and guidance

MDE: Advancing Stormwater Resiliency in Maryland (A-StoRM)

Thank you for your time.

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Office of Compliance and Research
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Appendix K: Summary of PST Investigations

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
0	Tucker Lane Water Leak	2300 block of Tucker Lane	Gwynns Falls	Water main break in the 2300 block of Tucker Lane. The break is not above ground, it can only be seen inside the storm drain manhole at 2316 Tucker Lane. Sent to OAM. As of 2/17/2016 still active. Nick 2/22/16 contact Kris about info. Still active 1/20/2017. On 4/4/17 new leak detection and water joint repair work orders created. On 4/13/17 water maintenance suspected city water was entering storm drain further upstream. OCAL - investigated upstream and found no additional city water entering above the 2300 block of Tucker Ln. 6/19/18 NM sent to	Citizen	2/12/2008	Potable Water
2519	2900 Block Taney Rd Water Leak	2900 block of Taney Rd, between 2907 Taney Rd and Baywood Rd	Jones Falls	High (0.14 mg/l) chlorine detected at outfall. Unable to pinpoint source, but was able to narrowed the problem, between two manholes. The manhole at 2905 Taney Rd has low flow and very high (0.69 mg/l) chlorine; while the manhole at Taney Rd & Baywood Ave is dry. L2L discovered leak at 2901 Taney. 6/1/20 still active	DPW-WQMI	11/1/2017	Potable Water
2663	4900 Snader Ave Water Leak		Gwynns Falls	Heavy flow in storm drain. Suspect water main. L2L found water joint leak. 12/24/18 WO order still open. 4/3/22 Repair was been completed on 3/15/22 and follow-up shows problem is abated.	DPW-WQMI	6/13/2018	Potable Water
3036	5204 Baltimore National Pike Water Leak	5204 Baltimore National Pike	Gwynns Falls	High Chlorine (0.25 mg/L) reported during ammonia survey on 3/28/18. Investigation led to a subsurface water main leak in Baltimore County along route 40 (Baltimore National Pike). 5/27/20 still active at 25 GPM 10/26/21 Received an email from OEC (Remeke Merton) stating the repair has been completed	DPW-WQMI	3/28/2018	Potable Water
3118	NW Corner of York Rd & Northern Parkway Water Leak		Back River	Water leak discovered during requested investigation for OEC. (NW Corner of York Rd & Northern Parkway Special Project). Request for leak detection was send. Leak was previously marked for repair but repair was never completed. Leak Detection remarked and sent to UMD for repair. 5 GPM 1/6/21 Site visit found new patch at location of marking. Water still infiltration the manhole and vaults	DPW-WQMI	12/15/2020	Potable Water
3144	3801 Clarks Ln SDUO	Rear of 3801 Clarks Ln	Jones Falls	A complaint was received about a suspected illegal discharge to the sanitary system behind 3723 Midheights Rd. 1/25/2021 found a suspected sump pump discharge pipe from a basement window of a midsized apartment building stretching approximately 50' across the rear yard to a sanitary manhole. The pipe was originally placed under a partially open sanitary manhole lid and had no evidence of resent discharge. View of the sump pit through the open window found the pit full and beginning to overflow in basement, therefore, the pump was	Citizen	1/25/2021	Other
3151	1530 E Baltimore St & N Bond St Water Leak	Somewhere along Baltimore St in between Bond St and City Springs Park.	Harbor	2/4/21: High chlorine found at Central & Lancaster site during Harbor Bacteria Sampling. Tracked up to MH @ City Springs Elem. on Pratt St before running out of chlorine reagents. Moderate flow, water clear. 2/5/21: Leak narrowed to small stretch across E. Baltimore St between Bond St and City Springs Park. Manhole just outside of park fence had high chlorine. But manhole at Bond St intersection was low. Manhole in between had a car parked on top so couldn't access. Leak to locate	DPW-WQMI	2/4/2021	Potable Water
3230	5140 Reisterstown Rd Water Leak	Potable water entering 18" line running from inlet @ 5200 Riestertown rd somewhere under Belvedere rd	Gwynns Falls	Problem discovered while tracking high chlorine readings from investigation #3182. 6/1/21 WO for leak detection created 936150. 5 gpm 6/4/21 Per Cityworks; Need to do L2L during the night shift due to traffic. 7/6/21 No change in status	DPW-WQMI	5/12/2021	Potable Water
3247	2913 N Loudon Water Leak	2913 N Loudon Ave	Gwynns Falls	Elevated chlorine (0.28 mg/l) detected at the Clifton & Fairfax survey site. Chlorine was tracked to a subsurface water leak at 2913 N Loudon Ave. Water Leak to Locate work order was created. 6/2/21 Per Cityworks; Refer to Construction Management, Wazir 6/10/21: checked manhole, problem still ongoing	DPW-WQMI	5/24/2021	Potable Water
3252	900 Fagley St (3701 - 3901 Hudson St.) SDUO	Alley next to 900 Fagley St	Harbor	During excavation to retrieve a lodged rodder cable in the house connection at 3729 Hudson St contractors discovered that the home was connected to an old 10" storm drain (suspected historical combined system) instead of the sanitary mainline. The contractors disconnected the house from the 10" storm drain and then attached it to the correct sanitary mainline. While the work was taking place they noticed upstream wastewater flow in the 10" storm drain and suspected that more homes in the 3701 block of Hudson St may have direct house connections to	DPW-OAM	6/23/2021	SDUO, SSO-Subsurface
3254	2510 Queen Anne Rd SSO#7176 SDUO	East side of 2510 Queen Anne Rd House Connection	Gwynns Falls	On May 2021 we located an SSO at this same residence where there was an offset joint in the house connection was identified with CCTV and proved to infiltrate the storm drain by dye testing. We determined the leak was on the City side of the property line and UMD made the repair. The repair was tested multiple times both with the repair exposed and after it was backfilled and each time the dye didn't appear at the storm drain manhole on Clifton Rd behind the house. However, the storm drain manhole on Clifton Rd remained elevated for ammonia after some	Citizen	7/7/2021	SSO-Subsurface
3255	102 S Wolfe St (BGE punctured Watermain) (Cityworks SR# 625667)	102 S Wolfe St	Harbor	Cityworks complaint received about sediment plume in the harbor at Fells Point. The sediment laden water was tracked through the storm drain to 102 S Wolfe St. A BGE crew had punctured a watermain. 100 GPM of sediment-laden city water was entering a nearby storm drain inlet. A city scout was onsite and was making contact with water maintenance. Follow up on 7/15/2021 found repairs made to watermain and no longer leaking	Blue Water Baltimore	7/9/2021	Potable Water
3260	2825 S Hanover St Water Leak		Harbor	Water leak discovered under bridge at the base of the stair. Discovered while investigating the complaint under the bridge over the Patapsco. This complaint was already in the hands of OEC. Leak detection recent the WO on 6/28. They requested to have an exploratory pit dug. 25GPM 7/28/21 is in "in progress" status waiting for excavation	DPW-WQMI	7/15/2021	Potable Water
3262	3509 Woodstock Ave Watermain Break (Cityworks SR#628195)	3509 Woodstock Ave	Back River	Cityworks complaint received about sediment discharge from an outfall near Cardenas Ave & Chesterfield Ave. Sediment discharge was the result of a water main break at 3509 Woodstock Ave. Several citizen complaints for exterior water leak were also received by UMD and emergency repairs began immediately. OCR visit the following morning found repairs underway and no longer discharging any sediment or water	Blue Water Baltimore	7/15/2021	Potable Water
3263	300 Allendale St Water Leak	Allendale St and W Saratoga St intersection. Temporary water system by side of 300 Allendale	Gwynns Falls	High chlorine at Culver & Hilton site during DM survey. Tracked to Allendale & Saratoga where there was a "temporary above ground water system" put in place for presumed water main bypass. Water system was discharging excess potable water directly into the storm drain as well as leaking lesser volumes along the street. No dechlorination methods used. About 30 GPM. Could not find anyone nearby responsible for the water system. Referred to Carroll Brown/inspectors to contact contractor	DPW-WQMI	7/16/2021	Potable Water
3268	N Wolfe St & Eager St Watermain Break	SE corner of N Wolfe St & Eager St	Harbor	High chlorine(0.55 ppm) found during Lakewood Lateral Sampling 2019/2020/2021. City water infiltrating storm drain at the SE corner of N Wolfe St & Eager St at 50GPM. 8/23/21 Per Cityworks L2L in Progress status due to to much traffic and need to do at night. 9/13/21 same status	DPW-WQMI	7/22/2021	Potable Water
3271	N Washington St & N Gay St Watermain Leak	SE section of N Washington St & N Gay St	Harbor	High Chlorine value (0.29mg/l) during Lakewood Lateral Sampling 2019/2020/2021 on 7/23/2021 was tracked to city water infiltrating the storm drain. The infiltration was found on an uncharted inlet connection at the SE side of N Washington St & N Gay St at 25 GPM. Leak Detection workorder created. 8/23/21 Still in Open Status due to needing to further L2L investigation	DPW-WQMI	7/23/2021	Potable Water

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3274	3917 Wabash Ave Water Leak	Storm drain inlet at 3917 Wabash Ave	Gwynns Falls	Elevated chlorine recorded at Carlin Pkwy manhole. The problem was tracked to a subsurface water leak at 3917 Wabash Ave inlet. At 3917 Wabash Ave, potable water is infiltrating inside the inlet, approximately 20 GPM. A Leak to Locate work order was sent to OAM. 8/23/21 Per Cityworks in New status for Water Service Repair. 9/13/21 same status	DPW-WQMI	7/29/2021	Potable Water
3277	Lombard Outfall Reddish Discharge		Jones Falls	Received complaint regarding reddish discharge from Lombard St outfall. Investigated area and confirmed reddish water discharging from outfall at Lombard St. The drainage area is very large with minimal access points to test the water in the storm drain. Appeared to be coming from the western cell. Did not check JF above entrance to the tunnel because other DPW-WQMI staff were at North Ave and JF 11.5 were sampling and did not observe any turbidity. Area recon did not show any sources. Continued investigation on 8/3/21 at Lombard outfall and	Citizen	8/2/2021	Other
3282	E Lanvale St & N Bond St Water Leak	All the storm drain manholes in this intersection have water leaking into them at E Lanvale St & N Bond St	Harbor	While working on Lakewood Lateral Sampling 2019/2020/2021 we received an elevated chlorine value (0.15 ppm) at Wolfe St & Federal St (West Branch) with heavy flow. This was tracked to two separate leaks, one of them was found at E Lanvale St & N Bond St. At this intersection there four storm drain manholes all of them except one (MH 20' West of the NW corner) have water leaks and test for high chlorine. This problem has been reported to OAM Leak to Locate - 25gpm	DPW-WQMI	7/23/2021	Potable Water
3283	1609 N Caroline St Rear Water Leak	Rear of 1609 N Caroline St in Alley	Harbor	While working on Lakewood Lateral Sampling 2019/2020/2021 we received an elevated chlorine (0.15 ppm) at Wolfe St & Federal St (West Branch) with heavy flow. This was tracked to two separate leaks, one of them was found at the in the alley. Water can be seen flowing both out of the surface and into an unmapped pipe in the storm drain. The leak into the storm drain can be seen with CCTV pipe crawler at the intersection of E Federal St & N Caroline Dallas(alley) and on the surface behind 1609 N Caroline St in the alley. Met the scout in the field after	DPW-WQMI	7/23/2021	Potable Water
3286	2415 Brambleton Rd SDUO		Jones Falls	Grey, scummy, and grease floating on top of water. Elevated ammonia but low chlorine. Lead to a manhole at Rockspring & Brambleton that had a high ammonia. CCTV inspection found sewage and solids in the pipe. 8/30/21 Notice of Concern sent. 9/2/21 Review of older cctv found the lateral for 2425 to be active at time of inspection. HCD database shows a permit was pulled in 5/20 for	DPW-WQMI	8/26/2021	SDUO, Private
3287	2436 Brambleton Rd Water Leak		Jones Falls	Tracked heavy flow in the storm pipe. At the top of the system can hear water entering the pipe from the manhole. 25 gpm 8/30/21 Leak Detection marked a box and created a WO for Water Leak. 9/13/21 same status Per Cityworks repair was completed on 10/15/21	DPW-WQMI	8/26/2021	Potable Water
3288	Domino Sugar Plant		Harbor	8/26/21 Received a complaint from ESC Inspector Larkin Little about smelling sewage near Domino Sugar plant. The source was determined to be a green concrete open air basin which is a modular wetland to treat surface water runoff.. The tank has a discharge pipe which is discharging into the harbor with a foamy turbid water. The rocks were stained orange. MDE was contacted to see if they have a discharge permit to discharge into the harbor	DPW-PRI	8/26/2021	Private
3291	6700 Block Laurelton Ave Water Leak		Back River	Water leaking from street. Water joint leak 8/31/21 Per Cityworks Water Joint leak in New status 9/13/21 Same status 10/18/21 Same status in Cityworks	DPW-WQMI	8/5/2021	Potable Water
3296	Turbid Stony Run @ 4900 Wilmslow Rd (Cityworks # 643647)	Stony Run @ 4900 Wilmslow Rd	Jones Falls	Received a Cityworks complaint about "milky brown water" in Stony Run. It was tracked to water main break and repair already in progress at N Charles St & W Melrose Ave (w/o # 968144).	Citizen	8/19/2021	Other
3297	Druid Lake Construction Sediment (Cityworks #651820)	Druid Lake near Druid Park Lake Dr & Eutaw Pl	Jones Falls	Received cityworks complaint for sediment discharge from outfalls into the Jones Falls. The sediment was tracked from the outfalls and through the storm drain system to the Druid Park Lake construction project. Excess sediment was leaving the area around a frack tank. SEC was notified and contractors made necessary adjustments. The outfalls were nearly clear by the afternoon.	Blue Water Baltimore	9/7/2021	Other
3298	6513 Fairdel Ave SSO# 7257	Walther Ave & Fairdel Ave intersection. Manhole in the northbound lane of Walther Ave at Fairdel Ave	Back River	9/8: High ammonia observed at Mary Ave site during routine surveys. Tracked line up to Glenmore Ave. See [Mary Ave Ammonia 9/8/2021] investigation for details on that day. 9/13: Continued PST from Glenmore onwards. High ammonia observed on the mainline at Glenmore and tracked up to sanitary choke on Walther and Fairdel. Unable to open storm manholes near choke to properly estimate overflow flow but approximately 50 GPM based on	DPW-WQMI	9/8/2021	SSO-Subsurface
3299	Bellona Ave & Hollen Ave Sediment		Jones Falls	Street cutting causing sediment load discharging from Homeland outfall. Riggs distiller is the general contractor. The cutting contractor and Forman for Riggs were instructed that they need to clean the area and install inlet protection. They said they would clean the area. Reported the incident to Carroll Brown who is referring it to the ESC inspector Lanny Boddy. Lanny visited site on Tuesday and issued them a warning. 9/16/21 Drove past outfall on way home from work on 9/16 and saw outfall pool turbid. Notified Carroll and Lanny. Lanny visited site on Friday	DPW-WQMI	9/14/2021	Other
3301	4001 Glenmore Ave SSO# 7261	4001 Glenmore Ave house connection	Back River	High ammonia found on 15" line on Glenmore Ave while tracking another problem that initiated from Mary Ave sampling site. See investigation [Mary Ave 9/8/2021] for details. 9/15: Tracking narrowed the ammonia input somewhere between storm manholes at 4002 Glenmore Ave and the Everall/Glenmore intersection. CCTV of line showed dripping/leakage in the storm about 63' south of Everall and Glenmore intersection. Maps show there is a	DPW-WQMI	9/8/2021	SSO-Subsurface
3303	1900 Brand Ave (Fleischmanns Vinegar)		Jones Falls	Blue Water Baltimore received a citizen complaint regarding a fish kill on the Jones Falls near Fleischmann's Vinegar on 9/12/2021. Barbara Johnson visited the site and reported it to the National Response Center. EPA, MDE, and the Coast Guard responded to the complaint. The suspected cause for the fish kill was a failed de-chlorinator or acidic water discharge. OCR inspected the property on 9/17/2021 and found the following:	Blue Water Baltimore	9/17/2021	Private
3304	3840 Bank St SDUO		Harbor	OAM notified OCR regarding a property that may be attached to the storm drain. The property owner notified OAM of the connection they found but didn't acknowledge there is an active discharge. The property is being redeveloped and they are asking the city to install a new sewer connection on the east side of the building for them. There is a line and manhole on the east side but this was abandoned because it was part of an old combined system and leads to the storm pipe	DPW-OAM	9/14/2021	SDUO, Private
3314	40th St & Beech St Sediment		Jones Falls	DPW contractor (Metra) repairing a water main break. They did not have sediment control devices in place. They had a pipe discharging sediment laden water onto a sediment bag. The inspector on site said the hose popped out but fail to have the contractor replace the hose. They also had at least two hydrants open with out dechlorinating devices. This was reported to OEC (Romecko and Wazir) and OCR ESC (Carroll Brown) to ensure contractors are putting proper devices in place and the inspector are holding them accountable	Blue Water Baltimore	10/7/2021	Other
3315	1900 Brand Ave Fleischmann's Vinegar		Jones Falls	OCR received a complaint (Cityworks SR#665147 and complaint email) from Blue Water Baltimore Barbara Johnson regarding a possible illicit discharge from the storm water outfall at the Fleishmann's Vinegar plant. The liquid discharge was reported to have a medium flow and have a pH of 3.77. The pictures sent along with the complaint showed a light brown to tan liquid. 10/12/21 An investigation found that water was dripping from the outfall. There were remnants of a recent discharge on the rock and	Blue Water Baltimore	10/8/2021	Private

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3319	532 E 25th St SDUO (Double Envelope)[Verizon Vault Overflowing Inked Wastewater]	Double Envelope @ 532 E 25th St Ink Mixing Room slop sink & Bathroom sinks and toilets	Jones Falls	We received a call from Eastside UMD Superintendent (Jovan DeGroat) about a complaint they received from Verizon staff about a utility vault of theirs filling up with heavily inked wastewater. UMD wasn't making any headway locating the source so we were asked to help. On 8/26/21 we started investigating we met with Plant Manager (Nick Larichiuta 410-507-8805) pumped the liquid out of the vault with a sump pump and dye tested the bathrooms and slop sinks (used to wash ink plates when done) on the back wall facing Loch Raven Rd and they all went to the	DPW-UMD	8/25/2021	SDUO, Private
3320	Northwood Elementary School Paint	Northwood Elementary School, 5201 Loch Raven Blvd. The outfall is located in the wooded area south of	Back River	Matthew Rescott of Baltimore City Recreation and Parks reported to Erosion and Sediment Control (ESC) about a heavy discharge of what appeared to be white paint coming out of a storm drain outfall. PCAs assisted ESC Inspector to investigate the source of the white discharge. During the investigation the discharge from the outfall was clear. So the investigation continued by inspecting the major construction area at the Northwood Elementary School. There was no evidence of any white substance in the construction area. Met with the construction	BCRP	10/6/2021	Other
3322	724 N Wolfe St (Johns Hopkins Steam Power Plant)	SW corner of N Wolfe St & E Madison St	Harbor	High flow of Chlorinated water remains in the South branch at Wolfe & Eager after previously discovered watermain break was repaired(see N Wolfe St & Eager St Watermain Break). High flow of Chlorinated water at 200 GPM was tracked to an uncharted connection to a storm drain inlet at N Wolfe St & E Madison St. The connection was from the Johns Hopkins steam power plant at 724 N Wolfe St. JH facilities was contacted and stated that they have a state and EPA discharge permit but admitted that the chlorine should not be so high. The plant engineer	DPW-WQMI	10/19/2021	Potable Water
3323	Druid Lake Construction Sediment (Druid Park Lake Dr) (Cityworks #669116)	Druid Park Lake Dr & Lakeview Ave	Jones Falls	Cityworks complaint received regarding brown water discharge from outfalls into the Jones Falls. The sediment was tracked to the Druid Lake construction project. Contractors were pumping water out of an excavation and allowing it to run along the dirt surface and enter the storm drain without any sediment controls in place. The point of entry into the storm drain was at Druid Park Lake Dr & Lakeview Ave were contractor had made a cut into the storm drain and placed a metal plate over it. OCR staff met SEC inspector Brian Hartman onsite. He was	Blue Water Baltimore	10/19/2021	Other
3333	4712 Club Rd SSO#7325		Jones Falls	Surcharging Sanitary manhole are a rate of 25 gpm flowing into adjacent stream. Utility investigator on site whom called in the SSO and started the SSO report. The manhole down from this one appears to have recently overflowed as well dry sewage was present. SSO Report 15 gpm total 2565 gal	Citizen	11/9/2021	SSO-Surface
3334	4250 Greenspring Ave rear SSO#7326	West side of Greenspring Ave about 100 ft south of Coldspring Ln at top of hill.	Jones Falls	Overflowing manhole. Flowing down hill into the street then into an inlet. Discovered while driving. 20gpm SSO Report 20gpm total 1900 gal	DPW-WQMI	11/9/2021	SSO-Surface
3338	3635 Keswick Rd (Royal Farms Store)	3635 Keswick Rd	Jones Falls	Complaint received through Cityworks regarding heavy grease leaking from used grease storage receptacle. OCR staff found that the grease receptacle is leaking and causing greasy runoff from the rear of the property. Royal Farms staff has made efforts to contact their grease vendor for remediation. Pollution Control has been contacted to submit a notice of violation.	Citizen	11/23/2021	Private
3339	2618 Fairmount Ave SSO# 7344	Sanitary at intersection of Franklintown and Fairmount Ave. 29 N. Franklintown Rd	Gwynns Falls	High optical brightener was observed at Lexington Ave survey site during a routine survey on 11/22/21. Bacteria came up high. Investigation on 11/24/21 led to a choked sanitary manhole at Franklintown and Fairmount. Relieved by UMD. 11/29/21 Lexington survey manhole still had high optical brightener (66.85) 11/30/2021 Ammonia value below threshold (0.32 mg/l) at Lexington St and previously choked sanitary system flowing free. Investigation	DPW-WQMI	11/22/2021	SSO-Subsurface
3341	Lazear Rd SSO# 7346	Wooded area about 375' west of Woodington Rd. & Lindley Rd. Sanitary line at the convergence of the sanitary	Gwynns Falls	During routine sampling on 11/22/21, the Lazear Rd site produced elevated optical brightener results, and a large amount of suds/foam was present below the outfall. A bacteria sample was taken, and confirmed presence of human fecal bacteria. 11/26/21, Investigation lead to visual confirmation of broken sanitary line at the convergence of the sanitary lines running north from Kevin-Woodington and west from Lindley Rd	DPW-WQMI	11/22/2021	SSO-Surface
3342	1204 Seminole Ave SSO#7358	225 ft from the road on the west bank of the gully	Gwynns Falls	Appears a tree limb fell on the pipe and the pipe joint separated at the Fernco coupling. Sewage discharging into stream. UMD put the pipes back together. Permanent repairs will be made by OEC and on-call contractors. Per SSO Report 30gpm, total 12990 gallons	DPW-WQMI	12/1/2021	SSO-Surface
3343	1204 Seminole Ave SSO#7260	225 ft from the road on the west bank of the gully	Gwynns Falls	Pipe joint separated at the Fernco coupling. Sewage discharging into stream. This was discovered by a contractor working on a MS4 stream project. Made its way to Kim whom sent it to PCAs to inspect. NM arrived at the site and UMD utility investigator was on site and had already located the pipe break. UMD did the SSO report. NM estimation of discharge is 5 gpm. Per SSO report 1 gpm total 105 gal	DPW-Contractor	9/15/2021	SSO-Surface
3345	4729 Melbourne Ave		Gwynns Falls	Turbid stream complaint through Cityworks at Maiden Choice stream at Collins Ave. Source was a watermain break. Water pushing up through pavement. Already in Cityworks and sent to OEC for contractor to repair. Per Cityworks Repair Work completed 12/30/21 250GPM 1/4/21 Repair were made but still active at 1/4 the flow. Clear water no sediment. Reported to 311 (22-00005346) and emailed Romeko and	Citizen	12/26/2021	Potable Water
3348	605 Orkney Rd SSO#7523	605 Orkney Rd	Back River	Found while tracking separate issue from Herring Run ammonia screening on 1/5/21 (see investigation ID 3349). PCAs had dyed the sanitary line on the first day, but the dye must've ran through before PCAs rechecked (omitted from PST to avoid confusion). 1/6/22 CCTV of storm drain showed sewage leaking into storm drain approximately 8 ft from manhole at 605 Orkney Rd at a rate of 0.5 gpm. Dye test from 601 Orkney Sanitary confirmed pipe is leaking. UMD jetted the line which increased the flow in the storm drain pipe. Repeat dye	DPW-WQMI	1/5/2022	SSO-Subsurface
3349	Belvedere & York SSO#7521	The west side of the intersection of Belvedere Ave & York Rd (between 5910 and 5914 York Rd)	Back River	High levels of ammonia were detected during routine sampling. Found choked sanitary at Belvedere Ave & York Rd. Note: Results found during investigation also initiated investigation #3348 Per SSO Report 25 GPM, Total 36750 gal	DPW-WQMI	1/5/2022	SSO-Subsurface
3350	1201 S Caton Ave Sediment	Former location of Holy Angels Catholic School. Inlet on where road crosses stream.	Gwynns Falls	Elevated ammonia found at Wilmington Ave survey site during Dead Maidens survey. Water was also turbid and discolored. Followed stream up to construction site at 1201 Caton Ave (Holy Angels Catholic School) where construction runoff was draining through an inlet and into the stream. Stream upstream of the inlet is clearer and has below threshold ammonia. Suspected that the high ammonia values were mostly due to interference from construction site. Walked parts of stream downstream and didn't notice any other active problems though iron bacteria was	DPW-WQMI	1/6/2022	Other
3351	5015 Boxhill Ln Rear	Alley behind 5015 Boxhill Ln	Jones Falls	High ammonia value (0.51mg/l) at Lawndale outfall during Stony-Western Survey on 1/5/2022 led to a choked sanitary mainline and suspected SSO in the alley behind 5015 Boxhill Ln. The sanitary mainline towards the Friends School appeared blocked when viewing from the sanitary manhole behind 5015 Boxhill Ln. The manhole was very shallow and OCR staff used hand tools to pull the blockage from the connection and relieve the choke. The following day the ammonia values had returned to normal. Although, a SSO was likely, it was abated before the	DPW-WQMI	1/5/2022	SSO-Subsurface
3358	Ashburton Chlorination Leak	Pecks Branch at Hanlon Park, west bank about 1100 feet upstream from Gwynns Falls Pkwy	Gwynns Falls	1/20/22: Over range chlorine found at Gwynns Run Hilton site during GF ammonia screening. Chlorine was a deep red color. Tracked backed to Pecks Branch in Hanlon Park. There is an uncharted outfall that was discharging water that smelled of chlorine but when tested turned the sample orange. Upstream of the outfall, the stream tested around 0.5 ppm for chlorine- pink but not deep red. It appears that the combination of the outfall discharge plus the high chlorine upstream resulted in the deep red chlorine test downstream. A sample was taken of the outfall	DPW-WQMI	1/19/2022	Potable Water

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3359	3213 Cliftmont Ave	3213 Cliftmont Ave	Back River	1/14/22 High ammonia received during BR Survey at Mannasota Ave & Shannon Dr Sample Site (1.34 ppm). High ammonia was tracked to a residence which was pumping sewage from the basement into the storm drain. 1/18/22 Property had a WO for sewer water in basement. Due to no cleanout UMD left door hanger stating owner needs to hire a plumber to	DPW-WQMI	1/14/2022	Private
3362	2115 Letitia Ave SSO #7563	Sanitary manhole in woods, roughly 15yds SW past where Letitia Ave ends.	Gwynns Falls	Routine ammonia screening at Berlin Ave site had a ammonia of 0.26 mg/L on 1/26/22. Follow-up found over range ammonia reading. . This was tracked visually to an un-mapped outfall 150 yards south of the end of Letitia Ave. Source was discovered to be an overflowing manhole in the woods, roughly 15yds SW past where Letitia Ave ends. 15GPM 2/3/22 No work has been done to stop the overflow. The discharge rate was much higher than originally reported. Estimate 250 GPM	DPW-WQMI	1/28/2022	SSO-Surface
3363	2810 Shirley Ave Water Main Break	Near the southeast corner of the Creative City Charter School at 2810 Shirley Ave	Gwynns Falls	Elevated chlorine was detected during the ammonia survey, so a follow-up testing on the Ashburton Chlorination Leak found the chlorine upstream of the uncharted pipe to be high. Tracked problem to a broken water main break, where potable water is discharging from 15" pipe lateral to the 120" storm drain in the grass area at the southeast corner of the school. 2/4/22: Virtual meeting with UAM, Ashburton Facilities and Xylem discussed possible sources and ideas to pinpoint the problem.	DPW-WQMI	2/2/2022	Potable Water
3365	3114 Cedarhurst Rd SSO #7581	In backyard of 3135 Rosekemp Ave. Most accessible by entering alley behind 3114 Cedarhurst	Back River	High ammonia found during routine Back River survey. Tracked problem to a surcharging sanitary manhole in the backyard of 3135 Rosekemp Rd. Sewage was escaping the manhole and flowing into an inlet. ~5 GPM UMD responded and relieved the blockage with pressure truck around 2:17 pm. Per SSO report 5PGM total 855 gal	DPW-WQMI	2/2/2022	SSO-Surface
3367	4727 Old York Road SSO# 7592	Sanitary manhole at 4727 Old York Road.	Back River	An investigation was initiated due to high ammonia recorded during survey 0.46mg/l on 2/8. Found choked sanitary manhole at 4727 Old York Rd. Sewage leaking into a nearby storm drain, 0.25 GPM. OCR stayed onsite until choked was removed to confirm abatement. Per SSO Report 0.25GPM, total 29 gallons	DPW-WQMI	2/9/2022	SSO-Subsurface
3368	5204 Liberty Height Ave SSO#7504		Gwynns Falls	Elevated ammonia discovered during the Upper Gwynns Falls Ammonia Screening survey. A choked manhole was discovered at 5204 Liberty Heights Ave. The sewage was flowing into the adjacent storm drain pipe at a rate of 25 gpm. Per SSO Report 25 gpm, 2300 total gallons	DPW-WQMI	2/9/2022	SSO-Subsurface
3369	Ethland Ave & W Forest Park Ave Water Leak		Gwynns Falls	Heavy flow of chlorinated water in pipe at 4505 Carlview Rd. Found during PST for "5204 Liberty Heights Av SSO#7504" 2/15/22 Further investigation found water entering the storm near 4100 Ethland Ave. 200 GPM 2/16/22 Created a WO for leak to locate. 3/4/22 Per Cityworks Water Joint Leak WO was created	DPW-WQMI	2/9/2022	Potable Water
3374	Alto-Piedmont Water Leak		Gwynns Falls	2/16/22: Tracking high chlorine discovered at 42" outfall that empties into Pecks Branch. Narrowed to a storm drain manhole in the alley of Alto-Piedmont. 2/17/22 Unable to pinpoint water leak but was able to narrow it. The water break seems to be entering the 15 inch sanitary sewer and the 8 inch sanitary sewer along the 3400 and 3300 blocks. Referred water leak to Leak Detection	DPW-WQMI	2/16/2022	Potable Water
3377	12 Beechdale Rd SSO#7604		Jones Falls	Choked sewer pipe overflowing into adjacent storm manhole. 25gpm 2/18/2022 follow up after UMD cleared the choke found the sanitary line flowing freely. Per SSO Report 25 gpm, total 61625 gallons	Citizen	2/17/2022	SSO-Subsurface
3378	Powder Mill 42 inch outfall at city/county line Water Leak		Gwynns Falls	Heavy flow of water discharging from 42 inch outfall. Referred to Leak detection 3/10/22 Per Cityworks Leak detection started but they did not finish. 5/9/22 Further investigation discovered the leak entering the storm pipe between Tulsa Rd and Venetian Rd. Suspect leak is in the vicinity of 6020 Liberty Rd	DPW-WQMI	2/17/2022	Potable Water
3379	3228 Woodhome Ave SSO#7622		Back River	Elevated ammonia found during ammonia screening. Choked sanitary found to be overflowing into adjacent storm drain.	DPW-WQMI	2/24/2022	SSO-Subsurface
3381	3400 Chesley Ave SSO#7625		Back River	Sewage discovered in pipe while investigating a elevated ammonia at Lillyan Ave. Choked sanitary sewer was discovered. The pipe is backed up through two manholes. Per SSO Report 5 gpm total 1634 gallons	DPW-WQMI	2/24/2022	SSO-Subsurface
3383	7601 Harford Rd Water leak		Back River	Water leak discovered during Lilyian Ave investigation. Reported to leak Detection but they were unable to locate the source. Further investigation discovered a water leak at Parkville Shopping Center. The water was discharging from a hillside into a gutter then flowing into an inlet. This is a private water system that is leaking. Called Scott Herman HR and left a message regarding the issue. 3/2/22 Spoke to the property manager Don 703-442-4351 office, 703-864-0574. He dispatched his plumber within minutes. Sent him pictures	DPW-WQMI	2/28/2022	Potable Water
3384	6107 Eastern Parkway SSO#7631		Back River	Choked sanitary sewer overflowing into the adjacent storm drain. Per SSO Report 3 gpm total 4980 gallons	DPW-WQMI	3/1/2022	SSO-Subsurface
3385	Hollander Ridge-East Boundary Ave (Baltimore County) SSO	In a fenced-off area at the beginning of 2100 Block of East Boundary Ave. (Balto Co., Rosedale area)	Back River	High ammonia recorded at Biddle & 62nd St site. The investigation tracked the problem to an overflowing sanitary manhole at the end of East Boundary Ave, Baltimore County. The problem was reported to Baltimore County Sanitary Emergency Hotline 410-887-7415 Confirmation # 345705, 5.0 GPM This is a Baltimore County SSO Surface	DPW-WQMI	2/22/2022	SSO-Surface
3387	Carter Ave & Glenmore Ave Water leak		Back River	Elevated chlorine found during Lilyian Ave investigation. 3-4 gpm 3/10/22 Per Cityworks on 3/4 L2L found valve leaking. Repair was made on 3/9/22 3/14/22 Followup found repair was repair was made and chlorine in zero.	DPW-WQMI	3/1/2022	Potable Water
3388	3700 Charles St Sediment		Jones Falls	Citiworks complaint regarding turbid water in stony run. Tracked back to work being done at apartment building. Contractor has filter bag on pump discharge and is cleaning up the site. At time of inspection the outfall is only discharging slightly turbid water. Met with Ian Fergusin the ESC inspector whom is monitoring the site.	Citizen	3/2/2022	Other

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3389	Drain pipe from Northwood Shopping Center Sediment		Back River	A pipe in the grass next to the sidewalk is discharging a large volume of sediment-laden water. Referred to ESC inspection Carrol Brown. Brain Hartman said he visited the site and the construction manager stated it is just a drain pipe for the wall at the top of the hill. Two hours after the initial finding the flow had all but stopped. It is evident the pipe may be attached to something. CCTV inspection may be needed.	DPW-WQMI	3/3/2022	Other
3390	1930 Annapolis Rd Water Leak	Monroe St sampling site, by intersection of Monroe St & Annapolis Rd	Gwynns Falls	During DM ammonia screening on 1/31, high chlorine was found at the Monroe St site. During investigation on 2/2, a low but steady flow of water was noticed entering the storm drain inlet just upstream of the site outfall (see picture). Referred to Leak Detection. 3/2: Per Cityworks, referred for Water Joint Repair. WO# 1022827. Contractor onsite while leak detection was there so they marked a box on top of a steel plate. See photo.	DPW-WQMI	2/2/2022	Potable Water
3391	4720 York Rd SSO#7643 SSO#7652	Sidewalk in front of 4720 York Rd	Back River	High ammonia (0.47 mg/l) recorded at North Hill sampling site on 2/28/22. High ammonia was tracked to a choked sanitary mainline causing sewage to infiltrate the storm drain at 4720 York Rd. Follow up on 3/8/2022 found the choke and overflow still active despite comments in SSO report that it had been cleared. A new SSO report and work order were submitted. OCP staff was able to remain on scene until UMD cleared the choke. SSO abated.	DPW-WQMI	2/28/2022	SSO-Subsurface
3394	4410 Frankford Ave SSO#7640	Sanitary in middle of street across from Baltimore International Academy.	Back River	During routine HR survey, high ammonia received at Hamilton site. Investigation the following day led to a choked 8" sanitary line and manhole by 4110 Frankford Ave ~5 GPM. UMD responded and relieved the line with pressure truck. Per SSO Report 5 gpm total 505 gallons	DPW-WQMI	3/3/2022	SSO-Subsurface
3395	204 Westway Sediment		Jones Falls	Cityworks complaint for East Stony Run. Sediment in stream led to recent water main repair work. Repair work was complete.	Citizen	3/5/2022	Other
3396	6212 Laurelton Ave SSO#7650		Back River	Overflowing cleanout and flowing into storm inlet. 3 gpm Found during the Herring Run Large Diameter Storm Drain survey. Per SSO Report 3 GPM total 82 gallons	DPW-WQMI	3/7/2022	SSO-Surface
3399	4705 Parkwood Ave in Woods Water Leak		Back River	Water leak in wood approximately 120 ft from end of road discharging 5 gpm. 5/18/22 Repair complete.	DPW-WQMI	3/8/2022	Potable Water
3400	5916 York Rd SSO# 7639, #7644	At the northwest corner of York Rd and Belvedere Ave (at 5916 York Rd.)	Back River	High ammonia (0.78 mg/l) was recorded at the Chinquapin @ The Alameda survey site. The investigation found a choked sanitary manhole at 5916 York Rd. The sewage from this choke is discharging from an uncharted pipe at the storm drain manhole (537CC2051MH) at 5916 York Rd (bus pad), approximately 20 GPM. Recommend exploring the uncharted pipe. 10K SSO sampling on 3/4/22 discover the choke and overflow were still active. This was reported again as an SSO.	DPW-WQMI	3/3/2022	SSO-Subsurface
3402	4119 St. Georges Ave Water Leak	Wooded lot to the west of 4119 St. Georges Ave.	Back River	While investigating another problem, saw potable water flowing over the sidewalk from the wooded area (Springfield Woods) before entering a storm drain inlet. Flow ~5 GPM. Work Order: 1024647 Attempted to narrow down the source of water within the woods, but the flow seems to simply percolate out of the hillside. Both creek branches had elevated chlorine. Some flow appears natural since residents have built a footbridge over part of it and the flow channel seems to have	DPW-WQMI	3/3/2022	Potable Water
3403	5205 Eugene Ave Water Leak		Back River	Water main leak entering storm and sanitary manholes. 5 gpm 3/15/22 Service repair WO was created by Leak Detection 3/31/22 Repair completed. Problem is abated.	DPW-WQMI	3/14/2022	Potable Water
3404	3822 Ridgecroft Ave Water Leak		Back River	Water leak entering storm pipe. 10 gpm 3/16/22 Water Joint Leak WO was created by Leak Detection. 4/18/22 Chlorine still high in storm drain. Leak detection box in front of 3903 Ridgecroft. Also saw potable water infiltrating a storm inlet at 5013 Eugene Ave. Unsure if it is the same leak, so have added to this PST for now.	DPW-WQMI	3/14/2022	Potable Water
3405	3604 Echodale Ave Water Leak		Back River	Water leak entering storm manhole through 3 incoming pipes and through the brick joints. 100 gpm 3/31/22 repair complete problem is abated.	DPW-WQMI	3/15/2022	Potable Water
3406	3502 Echodale Ave Water Leak		Back River	Water leak into storm pipe. 5 gpm Per Cityworks Leak Detection did not locate a leak. 3/31/22 Followup in lower manhole found no Cl in pipe flow.	DPW-WQMI	3/15/2022	Potable Water
3407	3100 Batavia Ave SSO#7664		Back River	High ammonia discovered at the outfall. Discovered a choked sanitary sewer on Batavia that was overflowing into the adjacent storm pipe. 3/21/22 Followup determined SSO has been abated. Per SSO Report 5gpm total 460 gallons	DPW-WQMI	3/15/2022	SSO-Subsurface
3408	Woodlea Ave & Belair Rd SSO#7674		Back River	Grey sewage found entering a storm inlet pipe. 3/23/22 UMD tried to flush the incoming pipe from the west but determined the pipe is broken at the drop. They brought back rock, mud, and pieces of vc pipe. UMD turned over to construction for repair. 3/30/22 Dye drop to test over night. Mud in storm pipe so it is difficult to see if flow has completely stopped.	DPW-WQMI	3/15/2022	SSO-Subsurface
3409	4309 Frankford Ave SSO# 7662	In front of Baltimore International Academy in southbound lane of Frankford. Near intersection of Frankford	Back River	While conducting biomonitoring at Hamilton fixed site, high ammonia and sewage odor detected in the stream. Investigation led to a choked sanitary line and manhole at 4309 Frankford Ave. (The same issue had been found and relieved a couple weeks prior.) ~5 GPM UMD supervisor notified PCAs that they were backlogged and would probably not reach site until the next shift. Per Cityworks, the inspection is still "in progress" as of the following morning.	DPW-WQMI	3/15/2022	SSO-Subsurface
3410	Overland Outfall SDUO 2		Back River	8inch pipe on right wall 34ft from end found to be discharging sewage again. 4/28/22 This investigation is on hold until we receive smoke testing candles. The plan is to smoke test the pipe. 7/28/20 Sent to OEC to have pipe sealed. 9/22/22 The pipe has been sealed and sewage discharge has been abated.	DPW-WQMI	3/15/2022	SDUO, Private

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3411	Echodale Ave SDUO		Back River	Elevated ammonia discover while investigating 3100 Batavia Ave SSO. 4/12/22 CCTV and dye testing found 3 laterals (3014, 3104, 3106) that are leaking into the storm pipe. 4/20/22 Sent to OAM for CCTV and CIPP install. 4/22/22 Transmittal was sent to On-call contractor Spinello	DPW-WQMI	3/16/2022	SDUO, SSO-Subsurface
3412	4507 Wakefield Rd SDUO		Gwynns Falls	Need comments of work	DPW-WQMI	4/16/2022	SDUO, Private
3413	12 Beechdale Rd SSO#7688		Jones Falls	Choked sanitary sewer overflowing into adjacent storm pipe. Discharging from outfall at 15 Edgevale Rd. This same location was overflowing on 3/24/22. UMD called NM to help locate the source since the complaint came in for 15 Edgevale Rd. 3/31/22 Followup determined the choke was relieved and the SSO has been abated. Spoke to the owner John Miller 410-908-3500of 12 Beechdale Rd. He did have a backup in his basement. Has had several over the years. He received a letter from DPW that the sewer next to	DPW-WQMI	3/30/2022	SSO-Subsurface
3415	4722 York Rd SSO# 7698	4722 York Rd. Both sanitaries choked.	Back River	4/4: Ammonia was high during the ammonia survey. Engineers at the site inspecting the Tiffany Run system, by conducting a pipe walk. The flow was greatly reduced by shutting off flow from the gatehouse to conduct the inspection. The trail of ammonia stopped during the investigation. Recommend follow-up. 4/8: Northhill Alley site was still elevated so PST was continued. Choked sanitary manholes found at 4722 York Rd. UMD responded around	DPW-WQMI	4/4/2022	SSO-Subsurface
3416	Hollins St & S Warwick Ave SSO#7694	100 Block of S Warwick Ave	Gwynns Falls	Carroll Park survey site has had consistently elevated ammonia for 2 weeks (0.59 mg/l on 3/23) (0.73mg/l on 3/30). The start of the investigation also found the manhole at 2320 Wilkens was also high. On 4/5/22 the continued investigation found a choked sanitary mainline at Hollins St & S Warwick Ave causing wastewater to infiltrate the storm drain. UMD cleared the choke and abated the SSO. Other elevated ammonia values were found in the storm drain and will be	DPW-WQMI	3/30/2022	SSO-Subsurface
3417	4128 Westchester Rd SSO#7695		Gwynns Falls	Surcharging manhole discovered while driving down the street. Choke was in pipe 12 inches from the downstream manhole. There was a blockage of gravel in the 3 pipe. The upstream manhole was filled with gravel and needed to be vacuumed. Gravel seemed to be coming from upstream. 30 gpm Stayed onsite while choke was relieved	DPW-WQMI	4/6/2022	SSO-Surface
3419	207 E Redwood St (Red Lion Hotel)	Calvert St side of 207 E Redwood St	Harbor	A plumbing contractor that has been working on an unrelated SDUO contacted OCR regarding water in the basement at the Red Lion Hotel, 207 E Redwood St. A private leak detection company determined a leak was on the fire service line on the Calvert St side of the building. After reviewing the history of the property, this agrees with previous leak detection work done by the city. However, repairs were not made and the workorder was inappropriately closed by water maintenance. A new workorder was created for OAM Leak Detection to reconfirm the leak.	DPW-Contractor	3/29/2022	Potable Water
3420	York Rd & Northern Pkwy Water Leak	York Rd and Northern Pkwy intersection, north of topmost manhole.	Back River	During ammonia screening on the Upper Herring Run survey, elevated chlorine was found from Belvedere/Northwood outfall. Chlorine tracked up to York Rd and Northern Pkwy intersection where the flow was ~40 GPM. All available upstream storm manholes had low flow (some listed on the map do not exist.) A nearby water vault was filled with water. Referred to Leak to Locate. 5/17/22 Per Cityworks I-2L is in New Status	DPW-WQMI	4/14/2022	Potable Water
3427	Pimlico Race Track Sediment	intersection of W.Rogers Ave and Woodcrest Ave.	Jones Falls	Heavy sediment discharge from the Merville Outfall during Ammonia Survey. Investigation began immediately upstream and soon the sediment-laden water had subsided. Deposited sediment and high water lines lead to the Pimlico Race Track. 4/21/22 Followup to a high ammonia on 4/19/20 found very turbid water discharging from the outfall. This lead to Pimlico. Referred to ESC Carroll Brown. Ammonia was low at the outfall	DPW-WQMI	4/14/2022	Other
3429	3630 Ednor Rd SDUO		Back River	Sewer lateral leaking into storm pipe. 4/26/22 Dye testing of the new clean out was absent in the storm pipe. Dye testing from within the house was present in the storm pipe. It is determined that the leak prior to the cleanout. 9/26/22 Work done by contractor must have repair the issue. The storm pipe is now dry	DPW-WQMI	4/19/2022	SDUO, SSO-Subsurface
3430	3106 Echodale Rd SDUO		Back River	Sewer lateral pipe leaking into the storm pipe. 4/20/22 Sent to OAM for CCTV and CIPP install. 4/22/22 Transmittal was sent to On-call contractor Spinello. 9/8/22 Repair complete. Problem abated	DPW-WQMI	4/12/2022	SDUO, SSO-Subsurface
3431	3104 Echodale Rd SDUO		Back River	Sewer lateral leaking into storm pipe. 4/20/22 Sent to OAM for CCTV and CIPP install. 4/22/22 Transmittal was sent to On-call contractor Spinello 9/8/22 Repair complete. Problem abated	DPW-WQMI	4/12/2022	SDUO, SSO-Subsurface
3432	3014 Echodale Ave SDUO		Back River	Sewer lateral leaking into the storm pipe. 4/20/22 Sent to OAM for CCTV and CIPP install. 4/22/22 Transmittal was sent to On-call contractor Spinello 9/8/22 Repair complete. Problem abated	DPW-WQMI	4/12/2022	SDUO, SSO-Subsurface
3437	North Hill Ammonia & Sediment	4904 York Rd	Back River	Ammonia elevated during survey and sample sediment-laden. Sediment was tracked to pipe repair at 4904 York Rd., where the sediment bladder was overloaded. Problem reported to Sediment and Erosion Control. Bacteria low at 922 MPN.	DPW-WQMI	4/20/2022	Other
3439	Ellwood Ave Water Leak (Cityworks SR#74039)	911 S Ellwood Ave, 3104 Elliott St	Harbor	Waterway pollution investigation request received for sediment discharge at Korean War Memorial Park. Inspection of the storm drain found the outfall flowing clear, however, chemical indicators showed the presence of city water. Upstream investigation found 2 separate city water leaks. One was under current repair, the other was already reported and awaiting water maintenance.	Blue Water Baltimore	4/27/2022	Potable Water
3441	7301 Park Height Ave Sediment		Jones Falls	Turbid water discovered at the Cross Country Blvd & Gully Ave sampling site. Tracked to a construction site. Referred to Carrol Brown whom is sending it to ESC Ian Ferguson. Ian was out there earlier in the morning and the discharge was not present. Visited the stream site an hour later and the discharge stopped.	DPW-WQMI	5/2/2022	Other
3443	3125 Pelham Ave Water Leak (Cityworks SR# 741478)	Pelham Ave & Finlay Rd	Back River	BWB sent a request on 4/29 about high fluoride (4.5 PPM) at the Kavon & Shannon outfall during one of their outfall blitzes. Investigation on 5/2 led to a small water leak somewhere near 3125 Pelham Ave. There was potable water pooled and audibly dripping in the manhole at the end of that line, but no obvious leak found in the area or near inlets. Light flow in downstream manholes. Referred to Leak to Locate. ~5 GPM 5/9/22: Leak Detection did not find anything. They noticed flow from 3121 Pelham's sump pump running into the storm drain. Will need to	Blue Water Baltimore	4/29/2022	Potable Water

PST ID	PST Name	Location Description	Watershed	PST Comments	Complainant	Inv. Date	Discharge Type
3445	12 Beechdale Rd SSO#7733		Jones Falls	Choke sewer overflowing into storm pipe. 25 GPM. CCTV showed rootballs in pipe. 38 ft from DMH and 44ft from UMH. UMD used 4 inch root cutter to open the pipe.	DPW-WQMI	5/5/2022	SSO-Subsurface
3448	1839 W Fairmount Ave Illicit Fuel Disposal	1839 W Fairmount Ave rear alley	Gwynns Falls	Complaint received through Pat Boyle from a resident concerned about trash cans with fuel in the them illegally disposed in an alley. One of the cans has been knocked over and an estimated 10 gallons of mixed fuel and oil has spilled onto the road surface and reached a nearby storm drain inlet. OCR originally notified MDE emergency response but was then advised to call 911 for the local fire department. BCFD arrived and contained all of the fuel/oil mix with absorbent material.	Citizen	4/29/2022	Other
3450	Lakewood & Hudson Petroleum	S. Lakewood Ave & Hudson St.	Harbor	Strong petroleum odor and oil sheen at Lakewood and Hudson site during SIS. The outfall was checked but on signs of petroleum discharge. Also checked storm drain system on Eastern Ave at Patterson Park, petroleum present. Reported problem to MDE Emergency Response. 5/18/22 Received CityWorks (SR#22-0377055) reporting oil sheen at Harris Creek. Called MDE to get an update on the referral. Was informed that MDE Emergency Response Team and Baltimore City Fire Department are currently investigating the complaint.	DPW-WQMI	5/17/2022	Other
3458	4803 York Rd SSO# 7763	Sanitary manhole in front of Greater Faith Christian Community.	Back River	Elevated NH3 readings at North Hill survey during routine sampling. Tracked the problem to a choked sanitary manhole at 4806 York Rd.	DPW-WQMI	5/26/2022	SSO-Subsurface
3463	3927 Cloverhill Rd SDUO 2		Jones Falls	A previous SDUO was at this location and a public side repair stopped the discharge into the storm. 4/5/22 Follow-up to abatement of 3925 found that the lateral for 3927 seems to be leaking. There was a lot of grey build up at the lateral and main, and had a trickle of flow. The lower manhole had an ammonia of 0.80 mg/L. Nocked on the door and it appears people are home but no one answered. A door hanger was left in the rear door. When looking that the lateral picture attached to the sample from our previous dye test	DPW-WQMI	4/5/2022	SDUO, Private
3466	2000 N. Howard St (SSO# 7778)	Manhole labelled as sanitary by the Popeyes drive-thru lane. By north/right side of the Popeyes	Jones Falls	6/8/22: High ammonia and greyish water received at North Ave OF site during LJF survey. It was tracked to an overflowing grease pit at the Popeyes at 2000 N. Howard St. The manhole is labelled as a sanitary and not mapped in our systems. Manhole was full of grease and dirty water was surfacing out of the eyeholes and cleanouts and entering a storm inlet. It was initially thought to be an SSO, so UMD responded. Since they were onsite they vacuumed up the grease and fat to relieve the overflow. However, this was likely not sewage related.	DPW-WQMI	6/8/2022	Other
3467	3400 Carlins Park Dr (SSO#7784)	Sanitary manhole on MTA access road behind 3400 Carlins Park Dr	Gwynns Falls	Found evidence of previous overflow via smell and visual evidence during routine ammonia survey. Estimated overflow = 1000 Gal	DPW-WQMI	6/10/2022	SSO-Surface
3468	NORTHWICK RD & WELBOURNE RD Sediment		Back River	Water main break making heavy sediment in Herring Run. Repair crews on scene when arrived.	Citizen	6/7/2022	Other
3478	Most Holy Redeemer Cemetery & 4000 Eierman Ave SDUO		Back River	Received high ammonia (0.58 ppm) value at Prior Sampling site during ammonia screening survey. Dye tests narrowed the problem within the Holy Redeemer Cemetery. 7/14/22 UMD cleaned the sewer and manholes. Removed a lot of debris from the manhole just inside the cemetery next to the dumpster. Cleaned the sewer pipe from Firman Ave to S55CC_1004MH near where the ammonia is low.	DPW-WQMI	6/24/2022	SDUO, SSO-Subsurface
3494	4312 Willshire Ave SSO# 7795	4312 Willshire Ave	Back River	High ammonia (10.0 mg/L) at Hamilton sampling site, during SIS. Tracked problem to a choked sanitary manhole at 4312 Willshire Ave. ~5 GPM	DPW-WQMI	6/28/2022	SSO-Subsurface

VIOLATION TYPE	1ST	2ND	3RD*	TOTAL
Inaccessible GCD	6	0	0	6
Inadequate Maintenance of Waste/Recycle Grease Area	24	0	0	24
Inadequate/No Maintenance Log	156	57	19	232
Other				0
Plumbing Code	7	0	0	7
Refused Admittance	34	0	0	34
Unauthorized Discharge**	187	70	32	289
TOTAL NOVS ISSUED	**414**	**127**	**51**	**592**

* Penalties Assessed

** Failed 25% Rule, No or Missing Baffles, No GCD, Certain appurtenances (ex. Pre-rinse sink) require GCD coverage

Appendix L: Supporting calculations for IDDE Credit

Table L-1
DGI Calculations for Sanitary Direct Connections

SDUO ID	Location Description	WS[1]	Start Date	End Date	Elimination FY	Measured In-flow (gpm)	Observed Flow Consistency	Calc. Daily Flow (gpd)[2]	TN Red (lb/year)[3]	TP Red (lb/year)[4]	ISR (ac)[5]
15BR01	3018 Pinewood Avenue	BR	12/14/15	2/19/16	2016	0.03	1	43.2	4.3	0.8	0.2
15GF01	4500 Block of Bonner St	GF	7/20/15	9/17/15	2016	0.60	0.8	691.2	69.5	12.6	3.2
15GF02	4520 Wakefield Road	GF	7/30/15	10/22/15	2016	0.03	1	43.2	4.3	0.8	0.2
15HB01	707 S President St.	BH	12/4/15	1/6/16	2016	0.03	1	43.2	4.3	0.8	0.2
15HB02	114 E Lexington St	BH	11/18/15	5/18/16	2016	2.00	1	2880.0	289.5	52.6	13.3
15JF02	3731 Greenmount Ave	JF	7/10/15	3/12/16	2016	0.10	1	144.0	14.5	2.6	0.7
15JF03	3804 Juniper Road	JF	7/21/15	10/19/15	2016	0.10	1	144.0	14.5	2.6	0.7
15JF07	3501 St Paul Street	JF	12/9/15	12/19/15	2016	10.00	0.3	4320.0	434.2	79.0	19.9
16BR02	1501 Edison Highway	BR	6/14/16	8/18/16	2017	0.05	1	72.0	7.2	1.3	0.3
16JF03	Friends School (Pre-K building)	JF	4/18/16	5/31/16	2016	3.00	0.3	1296.0	130.3	23.7	6.0
16BH05	3807 Bank St	BH	11/22/2016	1/4/2017	2017	0.10	1	144.0	14.5	2.6	0.7
17BR02	6001 Harford Rd	BR	10/17/2017	11/3/2017	2018	0.22	1	316.8	31.8	5.8	1.5
17BH01	2024 Fleet Street	BH	4/21/2017	5/17/2017	2017	0.10	1	144.0	14.5	2.6	0.7
17JF02	101 W Read Street	JF	6/1/2017	1/19/2018	2018	3.90	1	5616.0	564.5	102.6	25.9
17JF03	217-221 W Read St	JF	6/8/2017	9/27/2017	2018	0.07	1	100.8	10.1	1.8	0.5
18GF05	813 Spedden St	GF	12/11/2018	8/15/2019	2020	0.10	1	144.0	14.5	2.6	0.7
19BR01[6]	4505 Lasalle Ave	BR	4/26/2019	6/18/2019	2019	0.05	1	72.0	7.2	1.3	0.3
19BR02	4701 Hazelwood Ave	BR	8/22/2019	11/6/2019	2020	0.16	1	230.4	23.2	4.2	1.1
19JF01	4 Elmwood Rd	JF	3/28/2019	11/6/2019	2020	0.20	1	288.0	28.9	5.3	1.3
19JF02	211 Longwood Rd	JF	4/4/2019	9/18/2019	2020	0.13	1	187.2	18.8	3.4	0.9
19JF04	2000 Cecil Ave-1	JF	7/26/2019	11/5/2019	2020	0.16	1	230.4	23.2	4.2	1.1
19JF05	2000 Cecil Ave-2	JF	7/30/2019	11/14/2019	2020	5.00	1	7200.0	723.7	131.6	33.2
20BR01	6660 Belair Rd	BR	2/26/2020	6/22/2020	2020	0.17	1	244.8	24.6	4.5	1.1
19GF05	Piedmont Allendale	GF	10/2/2019	7/1/2020	2021	0.50	1	720.0	72.4	13.2	3.3
20BH01	2545 Eastern Ave	BH	1/15/2020	7/17/2020	2021	0.25	1	360.0	36.2	6.6	1.7
20BR02	Overland Ave Outfall	BR	3/5/2020	9/22/2020	2021	0.04	1	57.6	5.8	1.1	0.3
20BR03	6515 Belair Rd	BR	2/27/2020	7/7/2020	2021	0.04	1	50.4	5.1	0.9	0.2
21BH01	22 Light St	BH	1/29/2021	3/10/2021	2021	0.29	1	417.6	42.0	7.6	1.9
21BH02	900 Fagley (multiple)	BH	6/24/2021	10/13/2021	2022	10.00	1	14400.0	1447.4	263.2	66.4
21JF01	2415 Brambleton Rd	JF	8/26/2021	1/11/2022	2022	0.18	1	259.2	26.1	4.7	1.2
21BH03	3840 Bank St	BH	9/16/2021	10/18/2021	2022	0.07	1	96.5	9.7	1.8	0.4
Total Credit for Direct Connections for FY 2022:									**2544.6**	**462.6**	**116.8**

Notes

1. WS = Watershed. BH = Baltimore Harbor, BR = Back River, GF = Gwynns Falls, JF = Jones Falls
2. Daily Flow = Measured In-flow (gpm) * Observed Consistency * 60 min / hr * 24 hr / day
3. TN Red =Total Nitrogen Reduction = Daily flow * 33 mg / L * (8.345 x 10^{-6} lbs*L/ gal*mg) * 365 days / year [Ref. Protocol 1, IDDE Expert Panel]
4. TP Red = Total Phosphorus Reduction = Daily flow * 6 mg / L * (8.345 x 10^{-6} lbs*L/ gal*mg) * 365 days / year [Ref. Protocol 1, IDDE Expert Panel]
5. ISR = Impervious Surface Restoration = ((TN Load Reduction / 17.81 lb / acre* year) + (TP Load Reduction / 2.23 lb / acre* year)) /3. Different method from FY 2019 report.
6. Previously listed as SDUO in FY 2019 report.

Table L-2
Sewer Exfiltration Identified as SDUO

SDUO ID	Location Description	WS[1]	Start Date	End Date	Elimination FY	Measured In-flow (gpm)	Flow consist-ency	Calc. Daily Flow (gpd)[2]	Duration (days)	Limited Duration (calc)[3]	TN Red (lb / yr)[4]	TP Red (lb / yr)[5]	ISR (ac)[6]
15JF01	3513 3521 N Calvert St	JF	7/7/15	8/21/15	2016	0.20	1	288	45	45	1.78	0.32	0.08
15JF04	3119 N. Calvert St	JF	7/23/15	8/29/15	2016	0.05	0.5	36	37	37	0.18	0.03	0.01
15JF05	224 39th St	JF	7/30/15	4/20/17	2017	0.09	1	130	630	365	6.51	1.18	0.30
15JF06	2101 Rogene Drive	JF	11/14/15	12/15/15	2016	5	0.05	360	31	31	1.54	0.28	0.07
15PT01	Fairhaven Avenue	LNBP	7/17/15	8/5/15	2016	0.25	0.3	108	19	19	0.28	0.05	0.01
16BR01	1501 Hartsdale Rd	BR	3/1/16	6/6/17	2017	0.25	1	360	462	365	18.09	3.29	0.83
16GF01	4500 Block of Wakefield Rd	GF	11/14/2016	7/14/2017	2018	0.02	0.5	14	242	242	0.48	0.09	0.02
16GF02	2402 Talbot Road	GF	10/18/2016	12/11/2016	2017	1	1	1,440	54	54	10.71	1.95	0.49
16HB01	Perkins Homes	BH	4/15/16	10/12/17	2018	0.7	1	1,008	545	365	50.66	9.21	2.32
16HB02	2400 Fairmount Ave	BH	5/31/16	6/24/16	2016	0.1	0.05	7	24	24	0.02	0.00	0.00
16HB03	Perkins Homes (Ballou Court)	BH	9/2/2016	10/12/2017	2018	1	1	1,440	405	365	72.37	13.16	3.32
16HB04	2109 E North Ave	BH	11/22/2016	1/13/2017	2017	0.02	1	29	52	52	0.21	0.04	0.01
16JF01	Dale Rd & Cross Country Blvd	JF	1/7/16	4/20/16	2016	1.5	1	2,160	104	104	30.93	5.62	1.42
16JF02	Crest Rd & Greenspring Rd	JF	1/8/2016	11/14/2016	2017	1.1	1	1,584	311	311	67.83	12.33	3.11
16JF04	2900 block of Woodland Ave	JF	11/1/2016	9/7/2017	2018	0.05	1	72	310	310	3.07	0.56	0.14
16JF05	5400 Block of Purlington Way	JF	11/21/2016	6/14/2017	2017	0.1	1	144	205	205	4.06	0.74	0.19
17GF01	3208 Milford Ave	GF	8/9/2017	12/7/2017	2018	0.16	1	230	120	120	3.81	0.69	0.17
17GF02	4202 Maine Ave	GF	8/15/2017	9/15/2017	2018	0.1	1	144	31	31	0.61	0.11	0.03
17GF03	5104 Norwood Ave	GF	9/27/2017	8/21/2018	2019	0.017	1	24	328	328	1.11	0.20	0.05
17JF01	5114 N Charles St, Friends School	JF	3/30/2017	7/26/2017	2018	10	0.2	2,880	118	118	46.79	8.51	2.15
17JF04	1001 Wilmot Court	JF	7/14/2017	10/19/2017	2018	1.5	1	2,160	97	97	28.85	5.25	1.32
17JF05	1035 Wilmot Court	JF	10/19/2017	1/3/2018	2019	1.5	1	2,160	76	76	22.60	4.11	1.04
17JF06	2231 Crest Rd	JF	11/8/2017	11/22/2017	2018	0.05	1	72	14	14	0.14	0.03	0.01
18BR01	4206 Frankford Ave	BR	1/25/2018	1/25/2018	2019	2	1	2,880	1	1	0.24	0.04	0.01
18BR02	York Rd & E Coldspring Ln (4711 Yo	BR	2/14/2018	8/15/2018	2019	0.01	1	14	182	182	0.36	0.07	0.02
18BR03	Kavon & Shannon Dr Outfall	BR	12/13/2018	2/6/2019	2019	0.05	1	72	55	55	0.55	0.10	0.03
18GF01	Frederick Ave & Catherine St	GF	6/8/2018	7/26/2018	2019	0.5	1	720	48	48	4.76	0.87	0.22
18GF02	2800 Block of Springhill Ave	GF	7/12/2018	11/21/2018	2019	0.015	1	22	132	132	0.39	0.07	0.02
18GF03	Artaban Townhome Sanitary	GF	9/7/2018	12/6/2018	2019	0.5	1	720	90	90	8.92	1.62	0.41
18GF04	5322 Frederick Ave.	GF	11/28/2018	12/12/2018	2019	13.64	1	19,642	14	14	37.86	6.88	1.74
18JF01	4801 Laurel Ave.	JF	1/24/2018	11/21/2018	2019	0.03	1	43	301	301	1.79	0.33	0.08
18JF02	3316 Bancroft Road	JF	4/6/2018	10/22/2018	2019	1	1	1,440	199	199	39.36	7.16	1.81
18JF02	3316 Bancroft Road	JF	10/22/2018	2/23/2019	2019	0.5	1	720	123	123	12.23	2.22	0.56
18JF03	3732 Old York Rd	JF	8/29/2018	9/5/2018	2019	0.167	1	240	7	7	0.23	0.04	0.01
18JF04	Homewood Ave & Walpert Ave	JF	11/1/2018	3/8/2019	2019	0.103	1	148	127	127	2.59	0.47	0.12
19GF01	4001 Alto Rd	GF	1/10/2019	1/18/2019	2019	0.1	1	144	8	8	0.16	0.03	0.01
19GF02	3000 presbury st.	GF	3/13/2019	6/20/2019	2019	0.055	1	79	99	99	1.08	0.20	0.05
19GF03	1705 N Longwood st	GF	3/13/2019	6/20/2019	2019	0.268	1	386	99	99	5.26	0.96	0.24

Table L-2
Sewer Exfiltration Identified as SDUO

SDUO ID	Location Description	WS[1]	Start Date	End Date	Elimination FY	Measured In-flow (gpm)	Flow consist-ency	Calc. Daily Flow (gpd)[2]	Duration (days)	Limited Duration (calc)[3]	TN Red (lb / yr)[4]	TP Red (lb / yr)[5]	ISR (ac)[6]
19GF04	1701 N Longwood st	GF	4/9/2019	6/20/2019	2019	0.002	1	3	72	72	0.03	0.01	0.00
19JF03	Green spring Ave and Dupont Ave	JF	04/11/19	5/29/2019	2019	0.003	1	4	48	48	0.03	0.01	0.00
20BH02	808 N Luzerne Ave	BH	01/22/20	3/20/2020	2020	0.017	1	24	58	58	0.20	0.04	0.01
19JF07	2000 Cecil Ave	JF	11/14/19	12/8/2020	2021	0.25	1	360	390	365	18.09	3.29	0.83
19JF08	Worsley St. and Cecil Ave.	JF	11/14/19	10/7/2020	2021	0.07	1	101	328	328	4.55	0.83	0.21
19JF09	3935 Cloverhill Rd	JF	12/03/19	3/18/2021	2021	0.016	1	23	471	365	1.16	0.21	0.05
19JF11	3927 Cloverhill Rd	JF	12/06/19	10/22/2020	2021	0.07	1	101	321	321	4.46	0.81	0.20
20JF01	530 N Milton Ave	JF	02/20/20	12/30/2020	2021	0.17	1	245	314	314	10.58	1.92	0.49
20BH03	604 Oldham St	BH	07/23/20	8/11/2020	2021	0.26	1	374	19	19	0.98	0.18	0.04
20JF02	3421 Olympia Ave	JF	08/07/20	9/22/2020	2021	0.25	1	360	46	46	2.28	0.41	0.10
20GF01	N. Pulaski & W Saratoga (2033 Pen	GF	09/14/20	3/2/2021	2021	0.1	1	144	169	169	3.35	0.61	0.15
20BH04	247 S Chapel St	BH	09/17/20	10/6/2020	2021	0.125	1	180	19	19	0.47	0.09	0.02
20GF02	2905 Wynham Rd	GF	11/20/20	12/29/2020	2021	1	1	1,440	39	39	7.73	1.41	0.35
21GF01	2510 Queen Anne Rd	GF	04/21/21	5/27/2021	2021	0.01	1	14	36	36	0.07	0.01	0.00
21JF02	3801 Clarks Ln	JF	08/27/21	1/31/2022	2022	0.01	1	14	157	157	0.31	0.06	0.01
21JF03	3925 Cloverhill Rd	JF	09/09/21	4/6/2022	2022	0.02	1	29	209	209	0.83	0.15	0.04
21JF04	525 E 25th St	JF	08/26/21	12/14/2021	2022	0.017	1	24	110	110	0.37	0.07	0.02
22GF01	4700 Wakefield Rd	GF	03/16/22	3/30/2022	2022	3	1	4,320	14	14	8.33	1.51	0.38
Total Credit for Exfiltration via SDUOs for FY 2022:											**552.27**	**100.41**	**25.35**

Notes

1. WS = Watershed. BH = Baltimore Harbor, BR = Back River, GF = Gwynns Falls, LNBP = Lower North Branch Patapsco, JF = Jones Falls
2. Daily Flow = Measured In-flow (gpm) * Observed Consistency * 60 min / hr * 24 hr / day
3. Duration is limited to 365 days for calculation of annual load reduction.
4. TN Red =Total Nitrogen Reduction = Daily flow * 33 mg / L * (8.345×10^{-6} lbs*L/ gal*mg) * 365 days / year * 0.5 [Ref. Protocol 2, N-6, IDDE Expert Panel]
5. TP Red = Total Phosphorus Reduction = Daily flow * 6 mg / L * (8.345×10^{-6} lbs*L/ gal*mg) * 365 days / year * 0.5 [Ref. Protocol 2, N-6, IDDE Expert Panel]
6. ISR = Impervious Surface Restoration = ((TN Load Reduction / 17.81 lb / acre* year) + (TP Load Reduction / 2.23 lb / acre* year)) /3. Different method from FY 2019 report.

Table L-3
Sewer Exfiltration Identified as Subsurface SSO

SSOID	LOCATION	WS[1]	Report Date	Elimination FY	Reported Volume (gal)[2]	Est Flow (gpm)[2]	Duration (Day)	TN Red (lb / yr)[3]	TP Red (lb / yr)[4]	ISR (ac)[5]
3498	977 Ellicott Driveway	GF	1/15/2015	2015	19,500	25	0.5	2.69	0.49	0.12
3512	252 N Hilton St	GF	1/25/2015	2015	46,650	50	0.6	6.42	1.17	0.29
3516	Greenspring Ave & Loyola Southway	JF	1/28/2015	2015	8,325	5	1.2	1.15	0.21	0.05
3645	Orville Ave and E Federal St	GF	4/8/2015	2015	34,940	20	1.2	4.81	0.87	0.22
3699	Guilford Ave and 26th St	JF	5/1/2015	2015	7,575	25	0.2	1.04	0.19	0.05
3702	203 Chancery Rd	JF	5/5/2015	2015	9,900	100	0.1	1.36	0.25	0.06
3826	4000 Edmondson Ave	GF	7/7/2015	2016	62,050	50	0.9	8.54	1.55	0.39
3939	5113 Falls Rd	JF	9/16/2015	2016	32,799	0.25	91.1	4.52	0.82	0.21
4036	5100 Perring Pkwy	BR	11/17/2015	2016	55,400	10	3.8	7.63	1.39	0.35
4074	2900 Waterview Ave & Cherry Hill Rd	LNBP	12/14/2015	2016	12,450	50	0.2	1.71	0.31	0.08
4110	1901 Eagle Dr	GF	1/6/2016	2016	8,275	5	1.1	1.14	0.21	0.05
4225	5810 Greenspring Ave	JF	3/17/2016	2017	34,992	0.1	243.0	4.82	0.88	0.22
4402	N Pine St and W Saratoga St	BH	7/4/2016	2017	48,000	100	0.3	6.61	1.20	0.30
4476	1500 N Chapel St	BH	8/18/2016	2017	83,990	10	5.8	11.56	2.10	0.53
4538	226 S Mount Olivet Ln	GF	10/14/2016	2017	7,779	0.1	54.0	1.07	0.19	0.05
5024	2501 W Lexington St	GF	8/25/2017	2018	44,250	10	3.1	6.09	1.11	0.28
5051	2505 W Lexington St	GF	9/12/2017	2018	582,639	9	43.9	80.23	14.59	3.68
5073	3500 Parkdale Ave	JF	9/29/2017	2018	57,750	5	8.0	7.95	1.45	0.36
5090	508 E Preston St	JF	10/20/2017	2018	41,600	10	2.9	5.73	1.04	0.26
5099	2585 Edmondson Ave	GF	10/25/2017	2018	17,710	2	6.1	2.44	0.44	0.11
5492	301 S Beechfield Ave	GF	7/23/2018	2019	1,309,300	100	9.1	180.28	32.78	8.27
5906	3700 Tudor Arms Ave	JF	3/21/2019	2019	72,080	170	0.3	9.92	1.80	0.46
5986	2501 Shirley Ave	JF	5/9/2019	2019	7,349	1	5.1	1.01	0.18	0.05
6088	914 Wilmington Ave	GF	8/28/2019	2020	16,003	0.5	22.2	2.20	0.40	0.10
6099	1232 N Franklintown Rd	GF	9/13/2019	2020	1,142,800	200	4.0	157.35	28.61	7.22
6642	5600 Harford Rd	BR	8/20/2020	2020	14,040	10	1.0	1.93	0.35	0.09
6667	E Coldspring Ln & York Rd	BR	9/9/2020	2021	9,785	0.5	13.6	1.35	0.24	0.06
6701	203 N. Central Ave	BH	10/9/2020	2021	4,325	25	0.1	0.60	0.11	0.03
6833	310 N Culvert St	GF	12/29/2020	2021	50,295	5	7.0	6.93	1.26	0.32
6874	3700 Eastwood Dr	BR	2/26/2021	2021	26,282	0.5	36.5	3.62	0.66	0.17
7261	4001 Glenmore Ave	BR	9/8/2021	2022	7,678	0.25	21.3	1.06	0.19	0.05
7523	605 Orkney Rd	BR	1/5/2022	2022	8,717	0.5	12.1	1.20	0.22	0.06
7521	Belvedere & York	BR	1/5/2022	2022	36,750	25	1.0	5.06	0.92	0.23
7504	5204 Liberty Heights Ave	GF	2/9/2022	2022	2,300	25	0.1	0.32	0.06	0.01

Table L-3
Sewer Exfiltration Identified as Subsurface SSO

SSOID	LOCATION	WS[1]	Report Date	Elimination FY	Reported Volume (gal)[2]	Est Flow (gpm)[2]	Duration (Day)	TN Red (lb / yr)[3]	TP Red (lb / yr)[4]	ISR (ac)[5]
7604	12 Beechdale Rd	JF	2/17/2022	2022	61,625	25	1.7	8.49	1.54	0.39
7644	5916 York Rd	BR	3/3/2022	2022	58,240	20	2.0	8.02	1.46	0.37
Total Credit for Exfiltration via Subsurface SSO for FY 2022:								**556.85**	**101.25**	**25.56**

Notes

1. WS = Watershed. BH = Baltimore Harbor, BR = Back River, GF = Gwynns Falls, LNBP = Lower North Branch Patapsco, JF = Jones Falls
2. Reported Volume as listed on SSO report (5-day) to MDE.
3. TN Red =Total Nitrogen Reduction = 33 mg / L * (8.345 x 10^{-6} lbs*L/ gal*mg) * Reported Volume * 0.5 [Ref. Protocol 2, N-6, IDDE Expert Panel]
4. TP Red = Total Phosphorus Reduction = 6 mg / L * (8.345 x 10^{-6} lbs*L/ gal*mg) * Reported Volume * 0.5 [Ref. Protocol 2, N-6, IDDE Expert Panel]
5. ISR = Impervious Surface Restoration = ((TN Load Reduction / 17.81 lb / acre* year) + (TP Load Reduction / 2.23 lb / acre* year)) /3.

Table L-4
Drinking Water Transmission Loss

PST ID	Location	WS[1]	Start Date	End Date	Elimination FY	Measured Flow (gpm)	Calc. Daily Flow (gpd)[2]	Duration (days)	Limited Duration (calc)[3]	TN Red (lb / yr)[4]	TP Red (lb / yr)[5]	ISR (ac)[6]
2542	2955 Frederick Ave	BR	12/6/2017	3/16/2018	2018	50	72,000	100	100	51.07	1.50	1.18
2346	5604 Hamlet Ave	BR	10/14/2016	2/14/2017	2017	50	72,000	123	123	62.82	1.85	1.45
2338	Kelly & Poplin	JF	9/21/2016	4/26/2017	2017	30	43,200	217	217	66.49	1.96	1.54
2474	3213 Southern Ave	BR	6/14/2017	7/17/2017	2018	25	36,000	33	33	8.43	0.25	0.19
2433	4000 Glenarm Ave	BR	2/8/2017	12/4/2017	2018	35	50,400	299	299	106.89	3.14	2.47
2192	901 N. Newkirk St	BR	1/7/2016	5/2/2016	2016	12.5	18,000	116	116	14.81	0.44	0.34
2012	118 W. Hamburg St	BH	2/19/2015	3/25/2016	2016	30	43,200	400	365	111.85	3.29	2.59
2286	Greenspring & Springarden	JF	7/7/2016	9/5/2016	2017	2	2,880	60	60	1.23	0.04	0.03
2057	2802 Oakford	JF	6/11/2015	7/2/2015	2015	22.5	32,400	21	21	4.83	0.14	0.11
2033	833 S Linwood	BH	5/28/2015	6/18/2015	2015	12.5	18,000	21	21	2.68	0.08	0.06
2011	23rd & Huntingdon	JF	5/15/2015	12/7/2015	2016	22.5	32,400	206	206	47.34	1.39	1.09
2029	1525 W. 41st St	JF	4/23/2015	9/14/2015	2016	50	72,000	144	144	73.54	2.16	1.70
2004	W Caton Ave & N Culver St	GF	1/27/2015	3/8/2015	2015	5	7,200	40	40	2.04	0.06	0.05
2058	3817 Clifton	GF	6/18/2015	7/10/2015	2015	5	7,200	22	22	1.12	0.03	0.03
2295	5201 Park Heights	JF	10/13/2016	6/1/2020	2020	50	72,000	1327	365	186.41	5.48	4.31
2330	5971 Western Run Dr	JF	9/21/2016	6/1/2020	2020	5	7,200	1349	365	18.64	0.55	0.43
2429	2770 Wilkens Ave	GF	1/31/2017	3/17/2020	2020	30	43,200	1141	365	111.85	3.29	2.59
2639	5609 Harford Rd	BR	4/18/2018	5/10/2020	2020	30	43,200	753	365	111.85	3.29	2.59
2864	2900 Hillsdale Rd	GF	8/1/2019	8/5/2019	2020	1,000	1,440,000	4	4	40.86	1.20	0.94
2887	Rawlings Conservatory	JF	9/19/2019	6/2/2020	2020	5	7,200	257	257	13.13	0.39	0.30
2890	2558 Oswego Ave	JF	9/11/2019	1/30/2020	2020	1	1,440	141	141	1.44	0.04	0.03
2960	Harford & St. Johns	BR	1/7/2020	5/12/2020	2020	20	28,800	126	126	25.74	0.76	0.59
3017	901 N Chester St	BH	3/4/2020	5/10/2020	2020	100	144,000	67	67	68.44	2.01	1.58
928	400 S Highland Ave	BH	1/16/2014	7/8/2021	2022	100	144,000	2730	365	372.82	10.97	8.62
2299	S. Washington St. & Eastern Av	BH	7/20/2016	3/29/2021	2021	20	28,800	1713	365	74.56	2.19	1.72
2301	Thames St. & S. Wolfe St	BH	7/20/2016	6/1/2021	2021	50	72,000	1777	365	186.41	5.48	4.31
2593	E Eager St & N calvert St	JF	2/8/2018	1/4/2021	2021	25	36,000	1061	365	93.21	2.74	2.15
2992	Cross Keys OF JF105	JF	2/19/2020	1/4/2021	2021	5	7,200	320	320	16.34	0.48	0.38
3018	Washington St & Eager St	BH	3/5/2020	5/10/2021	2021	10	14,400	431	365	37.28	1.10	0.86
3093	907 E 43rd St	BR	10/7/2020	3/29/2021	2021	500	720,000	173	173	883.54	25.99	20.42
3096	5015 Boxhill Ln	JF	10/19/2020	12/15/2020	2021	10	14,400	57	57	5.82	0.17	0.13
3101	5708 Charlestowne Dr	BH	11/2/2020	1/19/2021	2021	250	360,000	78	78	199.18	5.86	4.60
3143	2701 Latona Rd	BH	1/22/2021	1/29/2021	2021	70	100,800	7	7	5.00	0.15	0.12
3154	5315 Elsrode Ave	BH	2/8/2021	3/16/2021	2021	50	72,000	36	36	18.39	0.54	0.42

Table L-4
Drinking Water Transmission Loss

PST ID	Location	WS[1]	Start Date	End Date	Elimination FY	Measured Flow (gpm)	Calc. Daily Flow (gpd)[2]	Duration (days)	Limited Duration (calc)[3]	TN Red (lb / yr)[4]	TP Red (lb / yr)[5]	ISR (ac)[6]
3236	541 Beechfield Ave	GF	5/21/2021	6/2/2021	2021	200	288,000	12	12	24.51	0.72	0.57
3240	W Coldspring	GF	5/24/2021	6/8/2021	2021	50	72,000	15	15	7.66	0.23	0.18
2663	4900 Snader Ave	GF	6/13/2018	4/13/2022	2022	100	144,000	1400	365	372.82	10.97	8.62
3036	5204 Baltimore Nat'l Pike	GF	5/27/2020	11/3/2021	2022	25	36,000	525	365	93.21	2.74	2.15
3151	1530 E Baltimore St	BH	2/4/2021	12/16/2021	2022	5	7,200	315	315	16.09	0.47	0.37
3247	2913 N. Loudon	GF	5/24/2021	9/21/2021	2022	30	43,200	120	120	36.77	1.08	0.85
3271	N. Washington & N. Gay St	BH	7/23/2021	9/30/2021	2022	25	36,000	69	69	17.62	0.52	0.41
3274	3917 Wabash Ave	GF	7/29/2021	1/6/2022	2022	20	28,800	161	161	32.89	0.97	0.76
3282	E. Lanvale St & N. Bond St	BH	7/23/2021	9/30/2021	2022	25	36,000	69	69	17.62	0.52	0.41
3287	2436 Brambleton Rd	JF	8/26/2021	10/15/2021	2022	25	36,000	50	50	12.77	0.38	0.30
3387	Carter Ave & Glenmore Ave	BR	3/1/2022	3/14/2022	2022	3.5	5,040	13	13	0.46	0.01	0.01
3390	1930 Annapolis Rd	GF	2/2/2022	3/19/2022	2022	5	7,200	45	45	2.30	0.07	0.05
3403	5205 Eugene Ave	BR	3/14/2022	3/31/2022	2022	5	7,200	17	17	0.87	0.03	0.02
3404	3822 Ridgecroft Ave	BR	3/14/2022	4/20/2022	2022	10	14,400	37	37	3.78	0.11	0.09
3405	3604 Echodale Ave	BR	3/15/2022	3/31/2022	2022	100	144,000	16	16	16.34	0.48	0.38
Total Credit for Drinking Water Transmission Loss for FY 2022:										**3,681.75**	**108.29**	**85.09**

Notes

1. WS = Watershed. BH = Baltimore Harbor, BR = Back River, GF = Gwynns Falls, LJF = Jones Falls
2. Daily Flow = Measured In-flow (gpm) * 60 min / hr * 24 hr / day
3. Duration is limited to 365 days for calculation of annual load reduction.
4. TN Red =Total Nitrogen Reduction = Daily flow * 1.7 mg / L * (8.345×10^{-6} lbs*L/ gal*mg) * 365 days / year * 0.5 [Ref. Protocol 2, N-7, IDDE Expert Panel]
5. TP Red = Total Phosphorus Reduction = Daily flow * 0.05 mg / L * (8.345×10^{-6} lbs*L/ gal*mg) * 365 days / year * 0.5 [Ref. Protocol 2, N-7, IDDE Expert Panel]
6. ISR = Impervious Surface Restoration = ((TN Load Reduction / 17.81 lb / acre* year) + (TP Load Reduction / 2.23 lb / acre* year)) /3.

Appendix M: TMDL Implementation Progress and Planning Tool (TIPP) for Bay and Regional Nutrients and Sediment TMDLs

(electronic files only)