DISTRICT OF COLUMBIA
WATER QUALITY ASSESSMENT
2024 INTEGRATED REPORT

TO THE US ENVIRONMENTAL PROTECTION AGENCY AND CONGRESS
PURSUANT TO
SECTIONS 305(b) AND 303(d) CLEAN WATER ACT (P.L. 97-117)

DEPARTMENT
OF ENERGY &
ENVIRONMENT

Preface

The District of Columbia (District) Department of Energy and Environment (DOEE) prepared this report to satisfy the listing requirements of §303(d) and the reporting requirements of §305(b) of the federal Clean Water Act (CWA) (P.L. 97-117). This report provides water quality information for the District's surface waters and groundwaters that were assessed during 2022 and 2023 and updates the water quality information required by law.

The United States Environmental Protection Agency's (EPA) new Assessment, Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINS) database holds the official submittal of the CWA §303(d) list and §305(b) assessed waters information and contains more detailed information on the District's waterbody segments. The ATTAINS database can be viewed on the EPA website at https://mywaterway.epa.gov/.

The following DOEE divisions contributed to this report: Air Quality, Fisheries and Wildlife, Inspection and Enforcement, Regulatory Review, Toxic Substances, Watershed Protection, and Water Quality.

Contents

List of Figures

List of Tables

Acronyms /Abbreviations

ADB	assessment database
AEYS	Anacostia Environmental Youth Summit
AFF	Alice Ferguson Foundation
AQD	Department of Energy and Environment Air Quality Division
AREC	Aquatic Education Resource Center
ARK	Anacostia Riverkeeper
ARRA	American Recovery and Reinvestment Act
ATTAINS	Assessment and Total Maximum Daily Load Tracking and Implementation System
AWS	Anacostia Watershed Society
BID	business improvement district
BMP	best management practice
CDA	contributing drainage area
CEI	compliance evaluation inspections
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbon
CGP	Construction General Permit
CMB	Construction and Maintenance Branch
CMC	Chesapeake Monitoring Cooperative
C&O	Chesapeake and Ohio
CSI	compliance sampling inspection
CSN	Chesapeake Stormwater Network
CSO	combined sewer overflow
CWA	Clean Water Act
CWC	Clean Water Construction
CWP	Center for Watershed Protection
DCCR	DC Clean Rivers
DCEEC	District of Columbia Environmental Education Consortium
DCOP	District of Columbia Office of Planning
DCPS	District of Columbia Public Schools
DCMR	District of Columbia Municipal Regulations
DC Water	District of Columbia Water and Sewer Authority
DDOT	District Department of Transportation
DGS	District of Columbia Department of General Services
District	District of Columbia (DC)
DO	dissolved oxygen
DOEE	District of Columbia Department of Energy and Environment
DPR	District of Columbia Department of Parks and Recreation
DPW	District of Columbia Department of Public Works
DSLBD	District of Columbia Department of Small and Local Business Development
EA	Environmental Assessment

EISA	Energy Independence and Security Act
ELP	Environmental Literacy Plan
ENF	Earth's Natural Force
EPA	United States Environmental Protection Agency
ERU	equivalent residential unit
ES	Elementary School
FMB	Fisheries Management Branch
FWD	Department of Energy and Environment Fisheries and Wildlife Division
FY	fiscal year
GAR	Green Area Ratio
GDA	Groundwater Discharge Authorization
GI	green infrastructure
GIS	geographic information system
g/rep	grams per repetition
GSA	General Services Administration
GSI	Green Stormwater Infrastructure
GZEP	Green Zone Environmental Program
HAP	hazardous air pollutant
HOTD	Heating Operation and Transmission District
ICPRB	Interstate Commission on the Potomac River Basin
IDDEP	Illicit Discharge Detection and Elimination System Program
IED	Department of Energy and Environment Inspection and Enforcement Division
ILF	in-lieu fee
IP	implementation plan
IPM	integrated pest management
IPMT	implementation plan modeling tool
IR	Integrated Report
JD	Jurisdictional Determination
JE	joint evaluation
K	kindergarten
LID	low impact development
LMB	largemouth bass
LMRP	Lincoln Memorial Reflecting Pool
LTCP	Long Term Control Plan
MD	Maryland
ml	milliliters
MPN	most probable number
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
MWCOG	Metropolitan Washington Council of Governments
MWEE	meaningful watershed educational experience
NATA	National Air Toxics Assessment
NATTS	National Air Toxics Trends Station
NCR	National Capital Region
NE	northeast
NOI	Notice of Infraction

NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPS	National Parks Service
NRA	Natural Resources Administration
NTU	Nephelometric turbidity unit
NW	northwest
NWP	Nationwide Permit
NWS	National Weather Service
OSSE	District of Columbia Office of the State Superintendent of Education
P2 Plan	pollution prevention plan
PAH	polycyclic aromatic hydrocarbon
PCS	Public Charter School
Pepco	Potomac Electric Power Company
PFAS	per- and polyfluoroalkyl substances
ppb	parts per billion
RRD	Department of Energy and Environment Regulatory Review Division
RSC	regenerative stormwater conveyance
RSR	RiverSmart Rewards
SAV	submerged aquatic vegetation
SE	southeast
SF_6	sulfur hexafluoride
SGS	Surface Groundwater System
SRC	Stormwater Retention Credit
SSO	sanitary sewer overflow
SW	Southwest
SWAP	Source Water Assessment Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plans
SWRv	stormwater retention volume
TDA	Temporary discharge authorization
TMDL	total maximum daily load
TSB	Department of Energy and Environment Technical Services Branch
TSD	Department of Energy and Environment Toxic Substances Division
UDC	University of the District of Columbia
US	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNA	United States National Arboretum
VA	Virginia
VCP	voluntary cleanup program
WLA	Wasteload allocations
WMATA	Washington Metropolitan Area Transit Authority
WOTUS	Waters of the United States
WPD	Department of Energy and Environment Watershed Protection Division

WPP	Wetlands Protection Plan
WQC	water quality certification
WQD	Department of Energy and Environment Water Quality Division
WQS	water quality standards
WRRC	Water Resources Research Center
WSP	Wetland and Stream Permit
WWTP	wastewater treatment plant

Chapter 1 Executive Summary

1.1 Introduction

The District of Columbia Water Quality Assessment 2024 Integrated Report provides information about the state of District of Columbia (District) waters and efforts by the Department of Energy and Environment (DOEE) to protect and improve water quality. The Integrated Report (IR) combines the comprehensive biennial reporting requirements of federal Clean Water Act (CWA) Section 305(b) on the status of all waters in the District including progress made towards meeting the CWA's goals since the time of the last 305(b) Report, and updates Section 303(d) listings of waters of the District that are impaired or likely to become impaired and which do not meet the water quality standards (WQS) for specific uses for total maximum daily loads (TMDLs) that may be required.

This report has been drafted for submission to the United States Environmental Protection Agency (EPA). It includes details from the EPA Assessment and TMDL Tracking and Implementation System (ATTAINS) database and addresses comments received during the public comment period of the draft report.

1.2 District of Columbia Water Quality

To meet the District's CWA goals, DOEE monitored thirty-six (36) waterbody segments during the period of July 1, 2018 through June 30, 2023, evaluated the data, and assessed each waterbody's designated uses based on the numeric and narrative criteria outlined in the District's WQS. The evaluation found that none of the District's monitored waters are supporting all their designated uses. The uses that impact humans and aquatic life are generally not supported.

A waterbody that does not support its designated uses is considered impaired. The results of the evaluation indicate that while the District's waterbodies show signs that water quality is improving, they continue to be impaired.

This report focuses on surface water assessment, but the District also evaluates groundwater through compliance monitoring and ongoing studies. The appendices of this report contain details regarding the conditions of both surface water and groundwater.

1.3 Causes and Sources of Water Quality Impairment

Typical causes of impairment to the District's waterbodies are elevated concentrations of bacteria, PCBs, dieldrin, arsenic, and high turbidity.

Bacteria (*E. coli*)

In 2008, the water quality criterion used to evaluate bacteria was updated from fecal coliform to *E. coli*. DOEE surveyed *E. coli* for the 2024 reporting period and found the Potomac River had fewer percent exceedances than the Anacostia River. The Tidal Basin is the only waterbody segment that supports its primary contact recreation use. Chronic *E. coli* percent exceedances continue to be a problem for the majority of the District's waterbodies. Fluctuations in these constituents are due to various factors, such as weather and subwatershed activities and conditions, including failing sewer pipes and illicit discharges.

Turbidity

The upstream segments of the Anacostia and Potomac Rivers were observed to have a higher number of turbidity exceedances than their downstream segments during the 2024 reporting period. Kingman Lake, an Anacostia River watershed waterbody, consistently had the highest number of exceedances, with 37.50 percent (37.50%) of measurements taken during the 2024, review period not meeting the turbidity standard, an increase from 2022. Rock Creek tributaries are not as impacted by turbidity as the Anacostia River tributaries. The average percent exceedance for all tributaries to Rock Creek was 3.36 percent (3.36%), while the average percent exceedance for all tributaries to the Anacostia River was 21.05 percent (21.05%). The average percent exceedance for the entire main stems of Rock Creek, the Potomac River, and the Anacostia River were 21.51 percent (21.05%), 11.31 percent (11.31%), and 15.01 percent (15.01%), respectively.

The sources that have major impacts on District waters are urban stormwater runoff, MS4 discharges, and residential districts.

Programs to Address Impairment

Several DOEE divisions conduct activities to correct water quality impairments:

- Toxic Substances Division (TSD)
- Watershed Protection Division (WPD)
- Water Quality Division (WQD)
- Inspection and Enforcement Division (IED)
- Regulatory Review Division (RRD)

The WQD and IED joint water pollution control programs implement WQS, monitor and inspect permitted facilities in the District, and comprehensively monitor the District's waters to identify and reduce impairments. The water pollution control program seeks solutions and implements activities to provide maximum water quality benefits.

Given the District's urban landscape, both point source and nonpoint source pollution have a large impact on its waters. RRD manages the sediment and stormwater control programs that regulate land disturbing activities, stormwater management, and floodplain management by providing technical assistance and inspections throughout the District. WPD also conducts stream restoration activities to improve habitat and implements a RiverSmart program that provides financial incentives to help property owners install green stormwater infrastructure (GSI) to reduce polluted runoff. Further, the District provides education and outreach to residents and developers on pollution prevention to ensure their actions do not further impair the District's water quality.

Several activities are coordinated for the groundwater protection program in the TSD, including underground storage tank installation and remediation, and groundwater quality standards implementation.

DOEE also coordinates with the District pf Columbia Water and Sewer Authority (DC Water), which began construction of the Northeast Boundary Tunnel segment of the CSO Long Term Control Plan (Clean Rivers Project). The plan involves the construction of large underground tunnels that will serve as collection and retention systems for combined sewage during high flow conditions. A Consent Decree (CD) entered on March 23, 2005, in Consolidated Civil Action No. 1:00CV00183TFH by the United States District Court for the District of Columbia required implementation of the Clean Rivers Project. On January 14, 2016, the Court entered the First Amendment to the CD (Amended CD) in Consolidated Civil Action No. 1:00CV00183TFH, which extended the date for completion of the project to 2030.

1.4 Conclusions

Activities to restore water quality are an integral part of meeting CWA goals for fishable, swimmable waterbodies. Fort Dupont, Oxon Run, Park Drive Gully (portions of Texas Avenue Tributary and Fort Davis Tributary), Stickfoot Branch (an open channel up to the bend of the Suitland Parkway right across the Douglas Community Center, from where it is piped all the way and daylights into Anacostia River, just upstream of ANA19 ambient monitoring station), and Pinehurst Branch all have stream restoration projects underway. DOEE awarded a design contract for seventeen thousand (17,000) feet of stream and five 95) acres of wetland restoration at Fort Dupont Park. Design reached the ninety percent (90%) design phase during this period. DOEE executed a design contract for stream restoration designs at Oxon Run in Ward 8, that will cover approximately twenty-one thousand (21,000) feet of stream. Both, Park Drive Gully and Stickfoot Branch completed designs for their respective stream restoration projects during this period.

The negative impacts of stormwater runoff, which result from the forty-three percent (43%) of the District land area being impervious, are being mitigated by the District's Stormwater Rule (https://www.dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=21-5), which requires regulated development projects to retain stormwater on-site rather than letting it quickly run off directly to waterbodies. To meet the requirements of the Stormwater Rule, hundreds of stormwater best management practices (BMPs) were installed between 2022 and 2023. Those BMPs installed in 2020 and 2021 continue to be maintained and monitored in 2024.

The DOEE 2020 Stormwater Management Guidebook provides a menu of water quality improvement practices that developers and regulated entities can choose from (see http://doee.dc.gov/swguidebook). In addition to the regulations, the RiverSmart programs (RiverSmart Homes, RiverSmart Communities, RiverSmart Schools, and RiverSmart Rooftops) support voluntary retrofits of impervious surfaces and provide valuable educational experiences and opportunities for citizens, students, and businesses to participate in improving water quality in the city. The DC Water Clean River's Duct Bank trenching work has groundwater discharge authorization for the construction project. Continued improvements in bacteria concentrations are expected as more phases of the project are completed.

A survey was conducted of the percent exceedances of the criteria for pH and temperature, for the 2024 reporting period, no monitored surface waterbodies exceeded the water quality criteria. In the Anacostia River, measurements for pH did not exceed the ten percent (10%) threshold. For this reason, pH does not appear to be a concern in the Anacostia or the Potomac Rivers. Exceedances for pH are generally low with rare exceptions above the ten percent (10%) threshold. For example, the 2024 report has no tributaries with exceedances above the ten percent (10%) threshold.

Exceedances of DO WQS in the Anacostia River increased for the 2024 reporting period compared with the 2022 reporting period. All measurements in the Potomac River met minimum levels of DO set by WQS. For the 2024 reporting period, all monitored tributaries in the District met the DO WQS.

DOEE and its partners continue to invest a variety of resources to improve District and regional water quality and are optimistic about the incremental improvements current and planned activities will deliver.

Chapter 2 Background

The Government of the District of Columbia's environmental protection responsibilities are carried out by various divisions within DOEE. The following sections provide details on the District waters and initiatives to address point and nonpoint sources of pollution.

2.1 Atlas, Total Waters, and Maps

Table 2.1 provides a general view of the District's resources. Figure 2.1 provides a graph of the District's monthly, yearly, and normal total rainfall. The National Weather Service rain gauge site at Ronald Reagan Washington National Airport is the official source for the District's rainfall totals, which were below normal for 2021 and 2023. Figures 2.2 and 2.3 present monthly and yearly average flow data for the Anacostia and Potomac Rivers from 2021 to 2023 (Source: United States Geological Survey). Appendix 2.1 provides a map outlining the major watersheds within the District.

Table 2.1 Atlas

State population: 689,545 (2020 Census) / 678,972 (July 2023 Census Estimate)

State surface area: 69 square miles

Number of water basins: 1

Total number of river miles: 39

- Number of perennial river miles: 39
- Number of intermittent stream miles: none
- Number of ditches and canals: none
- Number of border miles: none

Number of lakes, reservoirs, and ponds: 8

Acres of lakes, reservoirs, and ponds: 238

Square miles of estuaries: 6.1

Acres of wetlands: 303

Name of border waterbody: Potomac River estuary

Number of border estuary miles: 12.5

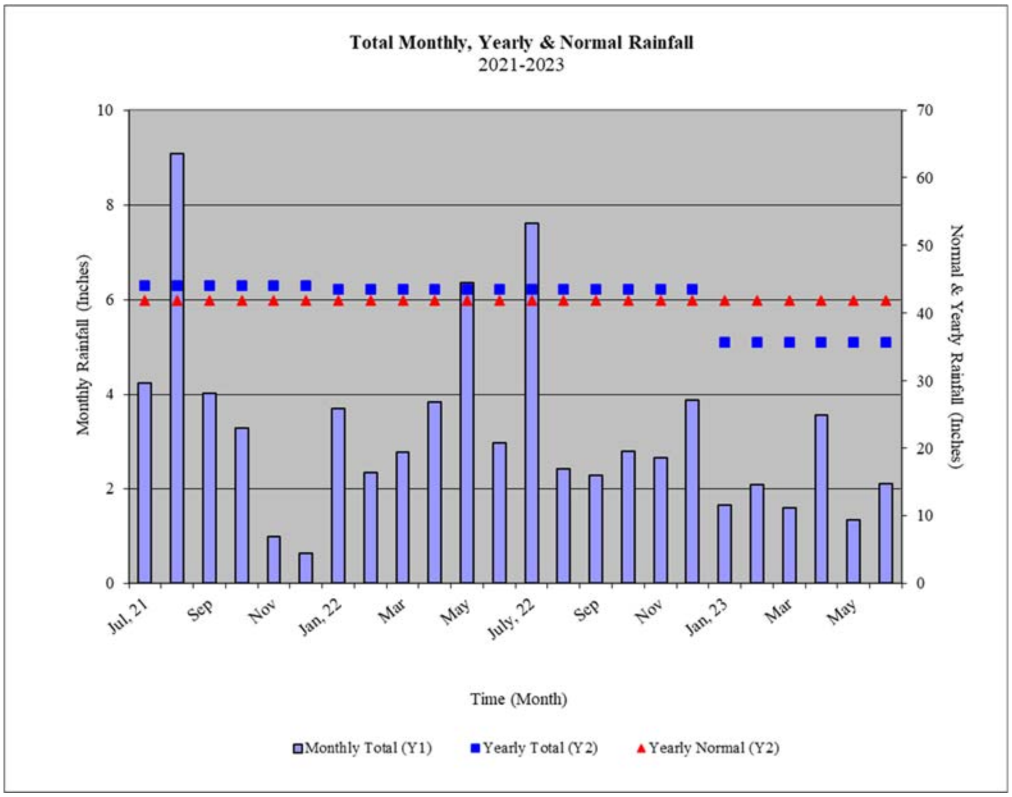


Figure 2.1 Total monthly, yearly, and normal rainfall total (inches), 2021 to 2023 (Source: NWS, Reagan Washington National Airport)

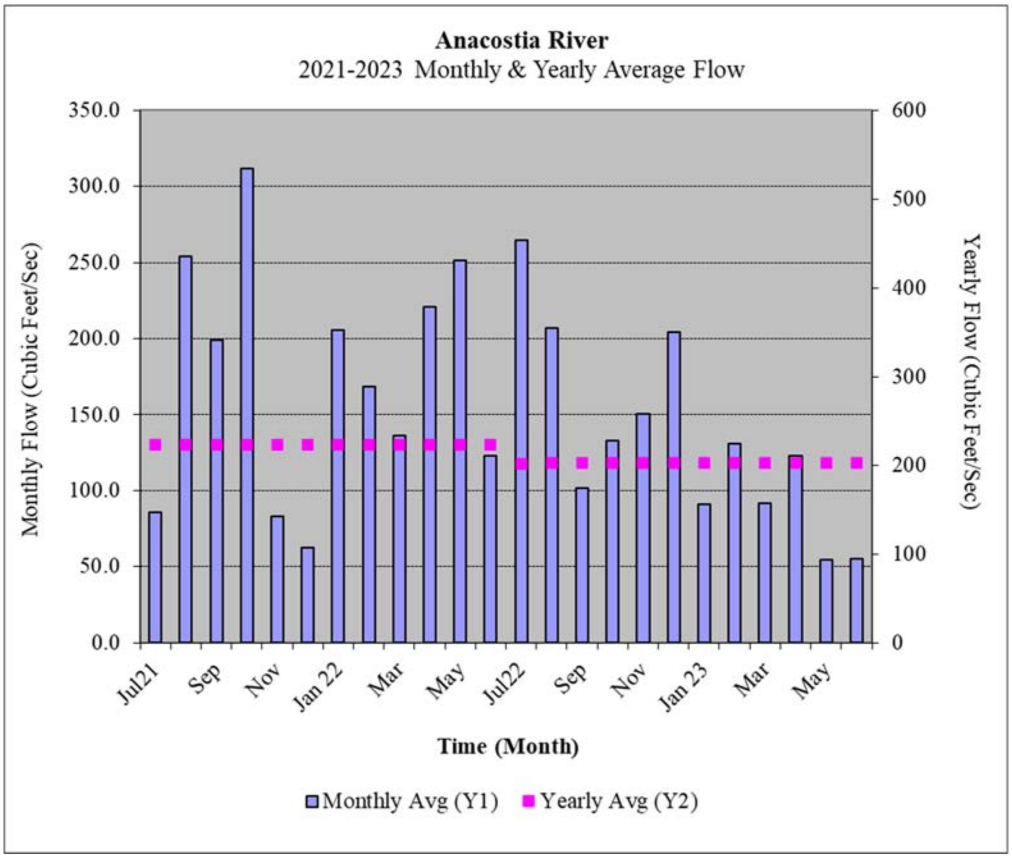


Figure 2.2 Monthly and yearly average flow of the Anacostia River, 2021-2023 (Source: USGS)

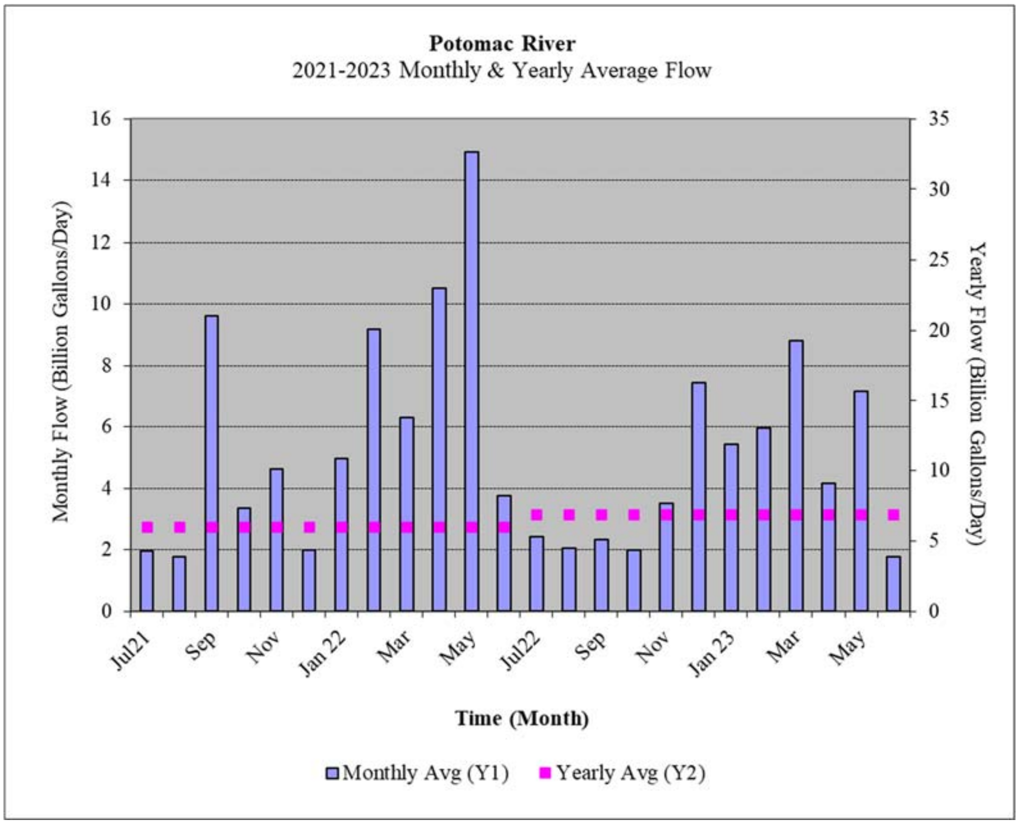


Figure 2.3 Monthly and yearly average flow on the Potomac River, 2021-2023 (Source: USGS)

2.2 Water Pollution Control Programs

Water Quality Standards Program

The District's WQS regulations are developed and revised under the authority of the federal CWA and the District of Columbia Water Pollution Control Act of 1984, D.C. Official Code § 8-103-01 *et seq*. WQS play a critical role in implementing various essential purposes and functions under the CWA. WQS are used for: reporting in water quality assessments; TMDL development; National Pollutant Discharge Elimination System (NPDES) permits; and nonpoint source programs. In compliance with the CWA, DOEE reviews the WQS every three years to determine the need for possible changes to District regulations and development of new information on water quality criteria. As part of this process, which is called the Triennial Review, DOEE solicits public participation and holds a public hearing. The review and updates enable the District to use WQS as a programmatic tool in the water quality management process and as a foundation for water quality-based control programs. Water quality standards ensure the protection of the District's waters.

2021 Triennial Review

DOEE redesignated the 2019 triennial review as the 2021 triennial review because EPA initiates the triennial review period from the date of the previous public hearing. DOEE had expected to hold a public hearing for this triennial review period in 2021. However, due to comments from EPA and further internal technical assessments, more time was needed to draft the 2021 WQS. The proposed WQS were published in the *D.C. Register* on July 7, 2023. The public hearing was held on August 23, 2023.

Initially, DOEE reviewed pH and turbidity updates, researched separating the Class B designated use into two (2) classes (one for secondary recreation and another for aesthetic use), and reviewed updated use class definitions to include examples of activities protected under the designated uses. DOEE also included general language updates to provide consistency and clarity in the 2021 triennial review.

After receiving comments on the proposed updates from EPA and internally, DOEE withdrew the proposed pH updates, the proposed separation of Class B into two (2) use classes, and updated use class definitions. DOEE continued with the turbidity update, general language updates, and included the addition of aquatic life criteria for diazinon (EPA-822-R-05-00), and updates and corrections to ground water standards.

DOEE followed EPA's suggestions and guidance on determining a numeric equivalent for turbidity that is still protective of designated uses. DOEE used the methodology in Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion IX (EPA, 2000a, EPA 822-B-00-019).

DOEE has continued to review the 2012 recreational water quality criteria (*E. coli*) for future adoption. A memorandum of understanding and contracting processes was being developed to provide services for the socioeconomic, institutional, technological, and environmental impact study (SITE) for *E. coli,* which is required by the Water Pollution Control Act to be competed for any promulgation of criteria.

DOEE separately drafted wording on the Rivers Section of its WQS. The updated language includes clarifications on the parameters that should be analyzed for swimming events, specifically, pH, turbidity, and *E. coli*, which must be below the single sample value. Updated language also included expanding the Director's discretion on revoking swimming exemptions due to health and safety concerns.

2.3 Point Source Program

National Pollutant Discharge Elimination System (NPDES) Program

The District of Columbia is not a delegated state under EPA's National Pollutant Discharge Elimination System (NPDES) program and therefore does not issue its own discharge permits. EPA issues all NPDES permits in the District of Columbia. However, DOEE's Water Quality Division (WQD) reviews technical and regulatory aspects of NPDES permit applications and EPA's draft NPDES permits for completeness and compliance with the Water Pollution Control

Act and regulations, including WQS, in accordance with Section 401 of the CWA. EPA's permits are issued for a five-year period, but contain re-opener clauses in case of changes to facility conditions, WQS, or regulations.

Table 2.2 shows individual NPDES permitted facilities in the District of Columbia. The Blue Plains Wastewater Treatment Plant (WWTP) operated by DC Water continues to be the major discharger to District waters. The WWTP, along with other industrial NPDES permitted facilities, are inspected to ensure compliance with permit conditions and the WQS.

Table 2.2 Individual NPDES Permitted Facilities in the District

Permittee/Facility	Permit No	Permit Type	Effective Date	Expiration Date
Bardon, Inc (d/b/a Aggregate Industries, aka Super Concrete)	DC0000175	Industrial	10/01/2020	9/30/2025
Washington Metropolitan Area Transit Authority (WMATA) – Mississippi Avenue Pumping Station	DC0000337	Industrial	12/11/2018	12/10/2023
Georgetown 29K Acquisition, LLC – Former General Services Administration (GSA) West Heating Plant	DC0000035	Industrial	9/11/2018	9/10/2023
D.C. Water and Sewer Authority (DC Water), Wastewater Treatment Plant at Blue Plains WWTP	DC0021199	Publicly Owned Treatment Works	8/26/2018	8/25/2023
National World War II Memorial - United States National Park Service National Mall and Memorial Parks	DC0000345	Industrial	7/03/2018	7/02/2023
Government of the District of Columbia – Municipal Separate Stormwater Sewer System (MS4)	DC0000221	Stormwater	12/20/2023	11/19/2028
Department of the Army, Baltimore District, Corps of Engineers - Washington Aqueduct Water Treatment Plant	DC0000019	Industrial	6/01/2021	5/31/2026
Potomac Electric Power Company (PEPCO), Benning Road Service Station	DC0000094	Industrial	6/01/2021	5/31/2026
John F. Kennedy Center for the Performing Arts	DC0000248	Industrial	3/01/2022	2/28/2027
CMDT Naval District Washington, DC – Washington Navy Yard	DC0000141	Industrial	2/01/2022	1/31/2027

In addition to individual NPDES permits, EPA is also responsible for issuing general NPDES permits in the District of Columbia. Table 2. 3 lists available general NPDES permits in the District of Columbia. There are several industrial facilities and construction sites that have been permitted under EPA's Multi-Sector General Permit (MSGP) or Construction General Permit (CGP).

Table 2.3 Available General NPDES Permits in the District

Available General Permits	Issuance Date	Effective Date	Expiration Date
Construction General Permit (CGP)	1/18/2022	2/17/2022	02/16/2027
Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity	1/15/2021	03/01/2021	02/28/2026
Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Vessels	4/12/2013	12/19/2013	12/18/2018[¥]
Pesticide General Permit (PGP) For Discharges from the Application of Pesticides	9/08/2021	10/31/2021	10/31/2026

Note: [¥] *EPA has administratively extended the permit per 40 CFR §*122.6(a)(1) and the *VIDA legislation which extends the 2013 VGP's provisions, leaving them in effect until new regulations are final and enforceable.*

Review of NPDES Permits and Section 401 Water Quality Certification

As stated above, DOEE's WQD reviews technical and regulatory aspects of NPDES permit applications, EPA's draft individual and general NPDES permits for completeness and compliance with the Water Pollution Control Act and regulations, including WQS, in accordance with Section 401 of the CWA. WQD may require additional information from applicants to demonstrate that the proposed discharge will comply with the District's laws and regulations. WQD may also require revisions to draft when District laws and regulations are more stringent than Federal requirements. Changes in draft permits, the announcement of which are published by EPA on EPA's website at https://www.epa.gov/dc/epa-public-notices-district-columbia, may also result from comments received from various stakeholders (the public) during the public comment period.

During this reporting period, NPDES Permit Number DC0000370 for the Lincoln Memorial Reflecting Pool (LMRP) was terminated. The discharge from the LMRP is being redirected to the Blue Plains sanitary sewer system.

WQD reviewed permit applications, held pre-filling meetings, and certified discharges from Blue Plains Wastewater Treatment Plant under NPDES Permit Number DC0021199, World War II Memorial under NPDES Permit Number DC0000345, the John F. Kennedy Center for the Performing Arts under NPDES Permit Number DC0000248, CMDT Naval District Washington DC – Washington Navy Yard under NPDES Permit Number DC0000141, and the 2022 Construction General Permit (2022 CGP).

WQD also reviewed permit modification application for PEPCO Benning Service Center (NPDES DC0000094), which has been split into two facilities: East and West. The East facility will be covered by NPDES Permit Number DC0000094 and will be called PEPCO Benning Service Center – East. The West facility will be covered by a new NPDES Permit Number DC0000390 and will be called PEPCO Benning Service Center – West. WQD held a pre-filling meeting with PEPCO and certified the discharges from PEPCO Benning Service Center – West.

WQD waived the right to certify discharges from the District of Columbia MS4 under NPDES Permit Number DC0000221.

WQD continues to work cooperatively and meet regularly with EPA Region 3 to discuss issues pertaining to the NPDES program such as permit applications, reports submitted by applicants, draft permits, and inspections. As EPA continues to implement the NPDES program in the District of Columbia, WQD's engagement with EPA on local water quality and permitting matters is invaluable.

Approval of Groundwater Discharge into DC MS4

DOEE's Regulatory Review Division (RRD) with support from WQD reviews and authorizes the discharge of uncontaminated groundwater into the District's MS4. Approved discharges predominantly consist of uncontaminated groundwater from a range of sources including construction dewatering and sub-grade sumps in completed buildings. There are over twenty (20) projects that are actively discharging groundwater into the District's MS4.

Table 2.4 lists the status of Groundwater discharge projects. Table 2.5 lists applications for which DOEE reviewed and approved, renewed, or terminated authorization to discharge uncontaminated groundwater into the District's MS4:

Table 2.4 Groundwater Discharge Projects

Project Address	Date of Action	Project Description
17 Mississippi Ave. SE	7/13/2021	Mississippi Ave. Apartments – approved construction Groundwater Discharge Authorization (GDA).
1015 Half St. NE	7/19/2021	Building sump – approved post construction GDA.
3924 Minnesota Ave. SE	8/16/2021	Senator Square – approved construction GDA.
4837 Benning Rd. SE	8/30/2021	KIPP Benning – approved post construction GDA.
4001 South Capitol St. SW	9/24/2021	Building sump – terminated construction GDA.
3950 37th St. NW	10/04/2021	Hearst Park Pool – terminated construction GDA.
4414-4430 Benning Rd. NE	10/15/2021	So Others Might Eat building sump – approved post construction GDA.
1000 4th St. SW	10/15/2021	Waterfront Station II – approved construction GDA.
3924 Minnesota Ave. NE	12/8/2021	Senator Square – terminated construction GDA.
600-800 Kenilworth Terrace NE	12/22/2021	Grove at Parkside – modified construction GDA.
17 Mississippi Ave. SE	12/27/2021	Mississippi Ave. Apartments – terminated construction GDA.
113 Potomac Ave. SE	1/11/2022	The Vermeer – approved construction GDA.
760 Maine Ave. SW	1/11/2022	Wharf Phase II – approved post construction GDA.
5211-5229 4th St. NE	1/31/2022	Art Place at Fort Totten – approved construction GDA.
100 V St. SW	2/2/2022	Buzzard Point Development – approved construction GDA.
Independence Ave. SW	2/4/2022	DC Clean Rivers (DCCR) Duct Bank trenching work - approved construction GDA.
820 Half St. SW	2/8/2022	Museum Place – approved construction GDA.

Project Address	Date of Action	Project Description
632 Howard Rd. SE	5/12/2022	The Douglass – approved construction GDA.
Delaware Ave. and Canal St. SW Intersection	5/17/2022	PEPCO Trenching – approved construction GDA.
1000 4th St. SW	5/23/2022	Waterfront Station II – terminated construction GDA.
1319 South Capitol St. SW	6/9/2022	New building – approved construction GDA.
1319 South Capitol St. SW	8/31/2022	New building – terminated construction GDA.
Independence Ave. SW	9/23/2022	DCCR Duct Bank trenching work – terminated construction GDA.
3900 Wisconsin Ave. NW	10/12/2022	City Ridge Development – approved post-construction GDA.
1650 Kenilworth Ave. NE	10/28/2022	Residences at Kenilworth – terminated construction GDA.
Delaware Ave. and Canal St. SW Intersection	2/27/2023	PEPCO Trenching – terminated construction GDA.
5300 Wisconsin Ave. NW	5/12/2023	Mazza Gallerie – approved construction GDA.

Table 2.5 Project Applications Reviewed by RRD and WQD

Project Address	Approval Status	Project Description
139 N St. SE	No discharge	The Yards Parcel I – Southeast Federal Center – discharged to sanitary under temporary discharge authorization (TDA).
300 12th St. SW	No discharge	Cotton Annex – application for construction GDA.
2323 Martin Luther King Jr. Ave. SE	No discharge	The Clara – application for construction GDA.
3300 Whitehaven St. NW	No discharge	Applied for a construction GDA, did not encounter groundwater.
3701 Benning Rd. NE	No discharge	Benning Rock – discharged to sanitary under TDA.
807 Maine Ave. SW	Under review	Application for construction GDA.
Joint Base Anacostia-Bolling	EPA permit	Applied for construction GDA, but was direct discharge to Potomac.
2650 Woodley Rd. NW	Under review	Applied for construction GDA.
1100 South Capital St. SE	Under review	Applied for construction GDA.

2.4 Compliance Inspections

Each fiscal year (October 1 to September 30), DOEE develops a Compliance Monitoring Strategy (CMS) to document the compliance monitoring activities for facilities covered under NPDES. The compliance monitoring strategy is a vital part of the District's NPDES Compliance Inspection Program, which assesses permit compliance and develops enforcement documentation. The District NPDES Compliance Inspection Program generally conducts Compliance Evaluation Inspections (CEI) to determine compliance but may perform Compliance Sampling Inspections (CSI) if required. CEI inspections are designed to verify the permittee's compliance with applicable permit effluent limits, self-monitoring requirements, and compliance schedules. CEI involves record reviews, visual observations, and evaluations of a permitted facility's treatment systems, effluent, receiving waters, and waste disposal practices. Appropriate enforcement and corrective actions are recommended to EPA for violations and/or deficiencies noted during the compliance inspections.

During this reporting period, DOEE implemented CMS for Fiscal Years 2021 and 2023. DOEE conducted CEIs for facilities in Table 2.6 and Table 2.7.

Table 2.6 NPDES Core Program Facilities Inspected

NPDES ID	Permit Name	Type of Facility
DC0000019	Washington Aqueduct	Major
DC0000094	PEPCO Environment Management Services	Major
DC0021199	D.C. WASA (Blue Plains)	Major
DC0022004	Mirant Potomac River L.L.C.	Major
DC0000370	Lincoln Memorial Reflecting Pool	Minor
DC0000141	Washington Navy Yard	Minor
DC0000248	JFK Center for Performing Arts	Minor
DC0000345	World War II Memorial	Minor

Table 2.7 NPDES Wet Weather Industrial Stormwater Program Facilities Inspected

NPDES ID	Permit Name	Type of Facility
DCR05J00K	Benning Road Trash Transfer Station	MSGP
DCR05J00G	Fort Reno Leaf Transfer Station	MSGP
DCR05J00F	Fort Reno Salt Dome	MSGP
DCR05J00C	DPW Leaf and Snow Headquarters	MSGP
DCR05J009	OSSE Southwest Bus Terminal	MSGP
DCR053018	Virginia Concrete – Vulcan SWDC	MSGP
DCR05J00P	Capital Asphalt	MSGP
DCR053009	WMATA Western Bus Division	MSGP
DCR05J00A	DPW Street and Alley Cleaning Division	MSGP
N/A	US National Arboretum Maintenance Facility	Unpermitted
N/A	Strittmatter Rock Crushing/Screening	Unpermitted
N/A	Fort Meyers Construction	Unpermitted

DOEE also conducts inspections of point source discharges of groundwater from temporary construction dewatering operations. These operations are typically covered under the NPDES General Construction Permit. However, DOEE reviews and certifies that the groundwater discharge meets District surface WQS. DOEE conducts inspections of these operations to ensure they comply with District regulations and that any required groundwater discharge treatment systems are operating correctly and efficiently.

Critical Source Inspection and Enforcement Program

DOEE maintains a database of critical sources of stormwater pollution including industrial, commercial, institutional, municipal, and federal facilities within the MS4 area. In FY 2022 and FY 2023, DOEE identified and inspected a total of one hundred thirty-six (136) facilities deemed critical sources of stormwater pollution. These inspections were documented with facility-specific inspection forms and recorded in the MS4 Inspection Tracking Database. DOEE takes appropriate actions to ensure these facilities comply with the District's MS4 Permit, and that structural controls and BMPs are in place and effectively protecting water quality.

Illicit Discharge Detection and Elimination Program (IDDEP)

IDDEP is designed to detect and eliminate illicit and unpermitted discharges, spills, and releases of pollutants to the District's MS4 and waterbodies. The IDDEP responds to reported illicit discharges, spills, or releases, and conducts targeted facility inspections and dry weather outfall inspections. In FY 2022 and FY 2023, DOEE responded to and investigated a total of one hundred and ninety-three (193) incidents of illicit discharges, spills, or releases. In the event of an incident, DOEE applies varying strategies to enforce clean up or compliance, including follow up inspections, site directives, notice of violations, administrative or compliance orders, and notice of infractions.

Additionally, DOEE maintains a watershed-based inventory of all MS4 outfalls and conducts dry weather inspections of these outfalls. In FY 2022 and 2023, DOEE conducted a total of four hundred and ten (410) dry weather outfall inspections. In the event of a suspected illicit discharge from the outfall, DOEE initiates an investigation and implements various techniques to identify and eliminate the discharge or suspected dry weather flow.

2.5 Watershed Protection Division Enforcement Programs

The Anacostia River Clean Up and Protection Fund

The Anacostia River Clean Up and Protection Act (Bag Law) requires all District businesses selling food or alcohol to charge five cents ($0.05) for each disposable paper and plastic carryout bag. The law allows businesses to keep one cent ($0.01) (or two cents ($0.02) if it offers a rebate when customers bring their own bag), and the remaining three cents ($0.03) or four cents ($0.04) is deposited into the Anacostia River Clean Up and Protection Fund. This fund generates approximately two million dollars ($2,000,000) per year, which is used to implement watershed education programs, stream restoration, trash capture projects, and to purchase and distribute reusable bags to District residents. Many of these activities also support the District's compliance with the MS4 Permit.

DOEE inspects at least five hundred and fifty (550) businesses per year for compliance with the Bag Law. Of the nine hundred and ninety-two (992) inspections completed between July 2021 and June 2023, seven hundred and thirty (730) businesses, or approximately seventy three percent (73%), were compliant.

Styrofoam Ban, Recyclable and Compostable Requirements, and Utensils by Request

The Sustainable DC Omnibus Amendment Act of 2014 bans the use of food service products made of expanded polystyrene, commonly known as Styrofoam™. The foam ban began on January 1, 2016, and applies to all District businesses and organizations that serve food. The law also required these regulated food entities to switch to recyclable and compostable food service ware products beginning January 1, 2017. Beginning October 2018, single-use plastic straws and stirrers were banned under the 2017 recyclable and compostable requirements. Effective January 1, 2021, the ban was expanded to include the retail sale of foam food service ware and coolers and packing materials like foam peanuts.

The Zero Waste Omnibus Amendment Act, signed in December 2020, furthers the District of Columbia's goal of 80% waste diversion from landfills and incinerators by 2032. Effective

January 1, 2022, the Act prohibits food-serving entities from providing “accessory” disposable food service ware items unless first requested by the customer. Additionally, third-party food ordering platforms and delivery apps must update platforms so that customers can affirmatively request disposable items for their order.

DOEE typically inspects three hundred (300) businesses per year for compliance with the foam food service ware and retail sale ban, and the food service ware material requirements. Of the five hundred and fifty-three (553) inspections completed between July 2021 and June 2023, four hundred and ninety-four (494) businesses were compliant. In 2022, DOEE conducted an outreach campaign to educate District businesses on the requirements under the Zero Waste Omnibus Amendment Act.

Coal Tar Ban and High PAH Sealant Ban

As required by Section 4.7.5 of the MS4 Permit, the District continues to enforce its prohibition on the sale, use, and permitting of coal tar-based pavement products. The coal tar ban protects human health and the environment by reducing the amount of toxic polycyclic aromatic hydrocarbons (PAHs) in our communities and environment. Rainwater washes PAH-containing sealant particles and dust into storm drains and our local streams and rivers, threatening aquatic life in the Anacostia and Potomac Rivers in Chesapeake Bay. In March 2019, the law was amended to ban products containing Ethylene Cracker Residue, known to contain high concentrations of PAHs, and any other products with PAH concentrations above one-tenth of one percent (0.1%) by weight.

DOEE inspects at least sixty (60) properties per year for compliance with the District’s pavement sealant ban. There were no violations found between July 2021 and June 2023.

2.6 Municipal Separate Storm Sewer System (MS4) Permit

The Government of the District of Columbia is responsible for ensuring that discharges through the MS4 into District waterways comply with the EPA issued MS4 NPDES permit. The District’s current MS4 permit was issued on May 23, 2018, became effective on June 22, 2018, expired on June 22, 2023. At the time of expiration, DOEE expected the permit to be administratively extended until the new permit was issued. No significant permit-related activities occurred during this brief period between the permit expiration on June 22, 2023, and the end of the reporting period on June 30, 2023.

MS4 Permit Compliance

The District continues to implement and enforce its stormwater management program in accordance with the MS4 Permit and the Revised Stormwater Management Plan (SWMP). The program uses retention practices to reduce stormwater runoff by mimicking natural landscapes through green roofs, bioretention, pervious pavers, and other green stormwater infrastructure (GSI). Table 2.8 shows the District’s compliance with quantifiable performance standards required by the MS4 Permit.

The District's MS4 Annual Reports and accompanying ArcGIS StoryMaps, which serve as a review of program implementation and compliance with the MS4 Permit, can be found at https://doee.dc.gov/publication/ms4-discharge-monitoring-and-annual-reports.

Table 2.8 Numeric Performance Standards and MS4 Permit Compliance

Numeric Requirement	Achievement During Reporting Year	Percent Complete	Achievement During Permit Term
Managed 1,038 Acres with green stormwater infrastructure in the MS4 Permit Area	215 acres (2022) 141 acres (2023)	119.7%	1,243 acres
Achieve a minimum net increase of 33,525 trees in the MS4 Permit Area	5,946 trees (2022) 6,100 trees (2023)	112.6%	37,758 trees
Install 350,000 square feet of green roofs within the MS4 Permit area	186,080 ft.^{2} (2022) 166,677 ft.^{2} (2023)	345.4%	1,208,818 ft.^{2}
Remove 108,347 pounds of trash from the Anacostia River annually	164,847 lbs. (2022) 1,914,980 lbs. (2023)	Requirement has been met each year	
Sweep 8,000 street miles within the MS4 annually	11,995 miles (2022) 11,397 miles (2023)	Requirement has been met each year	

MS4 Monitoring

The District's MS4 permit requires DOEE to conduct wet weather discharge monitoring for total suspended solids, total nitrogen, total phosphorus, copper, lead, zinc, cadmium, and *E. coli*. In addition, in situ samples are collected for water temperature, dissolved oxygen, conductivity, pH and hardness. This monitoring occurs three (3) times per year at nine (9) outfalls (three (3) each in the Anacostia River, Rock Creek, and Potomac River watersheds). Results of the wet weather discharge monitoring are provided on an annual basis to EPA in the MS4 report as well as the Net DMR website (https://npdes-ereporting.epa.gov/net-netdmr). Table 2.9 below provides the locations of the monitoring outfalls.

Table 2.9 MS4 Wet Weather Discharge Monitoring Locations

Site	Outfall	Watershed
SW1	Outfall 999 – Gallatin	Anacostia
SW2	Outfall 124 - Oxon Run	Potomac
SW3	Outfall 851 - Soapstone Creek	Rock Creek
SW4	Outfall 1035 - Kenilworth and Douglas	Anacostia
SW5	Outfall 260 - 53rd and Dix Street	Anacostia
SW6	Outfall 950 - Potomac Tributary	Potomac
SW7	Outfall 103 - Oxon Run	Potomac
SW8	Outfall 825 - Tilden and Reno	Rock Creek

Site	Outfall	Watershed
SW9	Outfall 901 - Tributary to Pinehurst Br.	Rock Creek

2.7 Wetlands Protection

The District has a policy of no net loss of wetlands or streams within its jurisdictional boundaries. To achieve this goal, RRD reviews all regulated activities and construction projects that may have the potential to impact wetlands and streams in the District for either a water quality certification (WQC) pursuant to 33 U.S.C § 1341, or a District wetland and stream permit pursuant to Chapters 25 (Critical Areas – General Rules) and 26 (Critical Areas – Wetlands and Streams) of Title 21 of the District of Columbia Municipal Regulations (DCMR). The District relies on jurisdictional determinations by the United States Army Corps of Engineers (USACE) to determine whether a proposed activity requires a WQC for regulated activities in wetlands determined to be "Waters of the United States" (WOTUS) or requires a Wetland and Stream Permit (WSP) for regulated activities in wetlands that are not consider WOTUS.

For dredge and fill projects within WOTUS, RRD reviews permits issued by USACE under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act to ensure wetland and stream impacts are avoided, minimized, and/or mitigated. RRD issues Section 401 CWA WQCs with conditions to certify these permits to ensure compliance with Section 401 of the CWA and that District WQS are not exceeded.

For regulated activities proposed in wetlands and streams that are not WOTUS, a District WSP is required in accordance with 21 DCMR Chapters 25 and 26. RRD reviews regulated activities to ensure impacts to wetlands and streams are avoided, minimized, and/or mitigated. WSPs are issued with conditions to ensure no net loss of wetlands and streams and that water quality standards are not exceeded. Table 2.10 lists permits reviewed and certified during this reporting period.

Table 2.10 Dredge and Fill Permits Reviewed and Certified

Certification Number	Permittee	Project Description
33-WQC-DC-2021-0	Messick & Associates	Construction of Point Fish House dock and floating pier.
WQC-DC-2021-51	Deputy Mayor for Planning and Economic Development	To construct a new storm sewer utility line and perform in-situ lining of an existing sanitary sewer utility line to support the redevelopment of the St. Elizabeths East Campus.
WQC-DC-2021-57	DOEE- Fish and Wildlife Division	To restore submerged aquatic vegetation in the Potomac River.
WQC-DC-2021-58	Tetra Tech	To sample sediment for the Anacostia River Sediment Project.

Certification Number	Permittee	Project Description
WSP-DC-2021-60	Washington Metropolitan Area Transit Authority (WMATA)	To install temporary scaffolding over Watts branch for bridge maintenance.
WQC-DC-2021-61	DC Water and Sewer Authority	To perform geotechnical borings for the DC Clean Rivers Project.
WQC-DC-2021-62	District Department of Transportation (DDOT)	To replace culvert 90-C in Broad Branch.
WQC-DC-2021-63	DDOT	To replace two existing pipe culverts 31-C and 39-C.
WQC-DC-2021-64	DDOT	To repair culvert 151-C.
WQC-DC-2021-68	University of Maryland Center for Environmental Science	To plant submerged aquatic vegetation in Oxon Cove.
WQC-DC-2021-70	WMATA	To conduct repairs on the Yellow Line tunnel and bridge located above the Potomac River.
WQC-DC-2021-72	DDOT	To repair Culvert-43C.
WQC-DC-2022-73	AECOM	To conduct sample collection within the Anacostia River.
WQC-DC-2022-90	DC Water and Sewer Authority	To perform streambank stabilization in a Rock Creek tributary.
WSP-DC-2022-73	Kenilworth Avenue North LLC	To temporarily impact wetlands because of adjacent construction site dewatering activities.
WQC-DC-2022-91	DOEE	To collect sediments to support the Anacostia River Sediment Project.
WQC-DC-2022-92	DFM Development Services, LLC	To perform maintenance work on the Anacostia River Metro Rail Bridge.
WQC-DC-2022-93	DC Water and Sewer Authority	To drill one geotechnical boring in the Potomac River.
WQC-DC-2022-94	DDOT	To replace a culvert along Canal Road.
WQC-DC-2022-95	AECOM	To perform surface, sediment, and groundwater sampling in the Anacostia River.

Certification Number	Permittee	Project Description
WQC-DC-2022-96	DDOT	To repair bridges 77 and 52 over Kingman Lake and the Anacostia River.
WQC-DC-2022-98	National Park Service (NPS)	To rehabilitate sections of the Chesapeake & Ohio (C&O) Canal locks and walls in Georgetown.
WQC-DC-2022-97	NPS	To repair Fletcher's Boathouse Access Road and Parking Area over the C&O Canal.
WQC-DC-2022-117	DDOT	To rehabilitate the Theodore Roosevelt Bridge over the Potomac River.
WQC-DC-2022-103	DOEE- Fish and Wildlife Division	To restore submerged aquatic vegetation in the Potomac and Anacostia rivers.
WQC-DC-2022-110	National Park Service (NPS)	To restore a previously abandoned waste weir adjacent to the C&O canal upstream of Georgetown.
WSP-2022-109	US Geological Survey (USGS)	To extract sediment cores from the Potomac River to research prehistoric floods.
WQC-DC-2022-99	DDOT	To repair the I-396 superstructure and substructure in the Potomac River.
WQC-DC-2022-111	DOEE- Watershed Protection Division	To restore Stickfoot Branch and two (2) unnamed tributaries.
WQC-DC-2022-112	DOEE- Watershed Protection Division	To restore two (2) Park Drive outfall gullies in Fort Davis Park.

2.8 Nonpoint Source Control Program

Environmental pollution from nonpoint sources occurs when water moving over land picks up pollutants, such as sediment, bacteria, nutrients, and toxics, and carries them to nearby waterbodies. Sediment and pollutant-laden water can pose a threat to public health. The pollutants may result from both natural sources and human activity. Stormwater runoff and associated soil erosion are significant causes of lost natural habitat and poor water quality in the District. Nonpoint source pollutants of concern in the District are nutrients, sediment, toxics, pathogens, oil, and grease. The origins of nonpoint pollutants in the District are diverse and include:

- Stormwater runoff due to the large number of impervious surfaces in urban areas;
- Development and redevelopment activities;
- Urbanization of surrounding jurisdictions; and
- Agricultural activities upstream of the watershed.

The District's Nonpoint Source Plan is based on the following goals, which provide the framework for the District government to continue to develop and enhance its program.

- Support activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows, and trash disposal for the purpose of attaining designated uses.
- Support and implement activities that restore degraded systems and maintain healthy habitats, species diversity, and water flows in all Anacostia River tributaries.
- Coordinate efforts with outside programs and adjoining jurisdictions to prevent and control nonpoint source pollution in the District to the maximum extent with the resources available.
- Support information and education campaigns that aim to prevent nonpoint source pollution from individual actions. These campaigns should reach at least five thousand (5,000) individuals each year and should target audiences who either visit, live, work, or teach in the District and its watersheds.
- Implement programs that aim to increase nonpoint source pollution runoff prevention practices on private property, reaching at least one thousand (1,000) properties per year.

2.9 Best Management Practices (BMP) Implementation

BMP Implementation by Sister Agencies

DOEE funds the design and installation of stormwater BMPs and GSI on municipal properties under the Clean Water Construction (CWC) grant program. For many of these projects, DOEE also provides technical expertise and project management assistance to sister agencies. During the current reporting period, eleven (11) projects completed construction (Table 2.11).

Table 2.11 Joint Clean Water Construction Funded Stormwater Projects

Sister Agency	Project Title	Project Summary
DGS/DPW	Fort Totten Residential Drop-Off Ramp	Replace residential bulk trash disposal area with a multi-bay drop-off ramp and bioretention system.
DGS/DPW	Multi-agency Equipment	Install equipment at municipal facilities to capture stormwater and prevent polluted runoff.
DCPS	Lee Montessori Public Charter School (PCS) East End Campus	Retrofit schoolyard with a cistern, an outdoor classroom, and native plantings.
DCPS	Two River Public Charter School	Retrofit schoolyard with a cistern, an outdoor classroom, and native plantings.

Sister Agency	Project Title	Project Summary
DCPS	Anacostia High School	Retrofit schoolyard with a bioretention system, an outdoor classroom, and native plantings.
DPR	Fort Stevens Recreation Center Stormwater Retrofits	Install a bioretention system to capture and retain stormwater from the recreational facility.
DPR	Branch Avenue Outfall Restoration	Restore two degraded outfalls and six hundred and twenty-one (621) linear feet of stream with a stormwater conveyance channel.

Retrofits on Parkland Sites in the District

DOEE works with the District Department of Parks and Recreation (DPR) to implement innovative stormwater retrofits on District parkland. The "Parkland Low Impact Development (LID) Retrofits" program aims to improve water quality in the Anacostia and Potomac Rivers for the benefit of District residents, visitors, wildlife, and the environment, while providing high quality outdoor recreational space and facilities for children and adults to learn, play, and connect with nature. Below is a list of completed projects.

- Amidon Park: Subsoiling techniques were applied to approximately 1.2 acres of compacted athletic fields, improving stormwater infiltration.
- Congress Heights Park: Restoration included invasive species removal and the restoration of a three hundred (300) foot stream channel.
- Palisades Recreation Center: The installation of a bioretention system was completed in FY 2021 and provides a stormwater retention volume of one thousand seven hundred and sixty-one (1,761) cubic feet.
- Douglass Recreation Center: The installation of a bioretention system was completed in FY 2021 and provides a stormwater retention volume of two thousand and thirty-one (2,031) cubic feet.
- Benning Park/Woody Ward Recreation Center: The conversion of asphalt into a pocket park for community recreational use and the installation of a bioretention system and a water quality swale was completed in FY 2021 and provides a stormwater retention volume of six thousand five hundred and seventy-four (6,574) cubic feet.
- Fort Greble Park: Two bioretention systems and large parcel tree planting were completed in FY 2021 and provides a stormwater retention volume of one thousand seven hundred and ninety-seven (1,797) cubic feet.
- Fort Stevens Recreation Center: Two bioretention systems were installed in FY 2022, as well as erosion control measures on slopes to protect mature tree canopy.

The Hamlin Street and Hickey Run retrofit projects are additional examples of retrofit work completed during the reporting period. Detailed descriptions are included below to exemplify the nature and outcomes of the parkland retrofit program's work.

Hamlin Street LID Stormwater Retrofit Project

The Hamlin Street LID Stormwater Retrofit project is located within the District's Hickey Run watershed at the southeastern side of the 2000 block of Hamlin Street NE. This project site was identified as a priority LID retrofit area by DOEE in its Hickey Run Watershed Implementation Plan because it received drainage from approximately three and one-tenth (3.1) acres of land, with approximately one and three-tenths (1.3) acres of it from impervious cover, and has a high potential for treating stormwater management practices installed through DOEE's RiverSmart Homes program. However, the street itself has no stormwater controls because it was developed prior to the promulgation of the District's stormwater regulations.

DOEE issued a contract for the design of an LID stormwater retrofit at the Hamlin Street project site in FY 2020. In FY 2021, designs for the project were completed and all permits were approved. Construction began on the project in September 2021.

Construction of the Hamlin Street, NE, Stormwater Retrofit Project began in FY 2022 and was completed in FY 2023. The two bioretention systems installed utilized innovative design approaches to increase stormwater capture. Both systems have storm chambers installed underneath the bioretention filter media in a green-grey hybrid approach. These two systems manage stormwater from approximately two and three-quarters (2.75) acres of urban land, approximately fifty percent (~50%) of which is impervious cover, providing retention of approximately two thousand and four hundred (~2,400) cubic feet of stormwater in every storm event.

Hickey Lane Stormwater Retrofit Project

The Hickey Lane LID Stormwater Retrofit project is located within the United States National Arboretum (USNA) at the intersection of R Street NE and Hickey Lane NE. The project site was identified as a priority LID retrofit area by USNA because it has a contributing drainage area of approximately eight and one-tenth (8.1) acres of land, with approximately two and two-tenths (2.2) acres of it from impervious cover. The purpose of this project is to reduce stormwater runoff and pollution, prevent erosion, restore natural hydrology, and increase natural habitat in the Hickey Run watershed.

DOEE issued a contract for the design of an LID stormwater retrofit at the Hickey Lane project site in FY 2020. In FY 2021, designs for the project were completed and the permitting process began. Permitting for the project was approved in early FY 2022.

Construction on the Hickey Lane, NE Stormwater Retrofit Project started in July 2021 and the project was substantially completed by February 2022. The first of its kind in the District, a submerged gravel wetland was designed and installed along Hickey Lane, NE within the USNA's property. The BMP has a large contributing drainage area, managing stormwater runoff from land within the USNA as well as from the public right of way. Due to a high-water table in this location (likely an old, buried tributary to Hickey Run) the BMP necessitated an internal water storage layer which ultimately acts to detain stormwater and as a result provides enhanced Nitrogen removal. Plantings for the BMP were provided by the USNA and completed by Friends of the Arboretum volunteers.

Future Projects

DOEE continues to partner with DPR on the design and development of LID stormwater retrofits for parkland. The current contract for this work (DPR III) was awarded in June, FY 2023. This effort will fund LID stormwater retrofits at two District parks - Dakota Park (South Dakota Avenue, Adams and 33rd Streets, NE) and Dwight A. Mosley Sports Complex/Taft Recreation Center (20th and Otis Street, NE Washington, DC, 20018). These projects are currently in design with construction expected to begin in 2024.

Inspection and Enforcement Updates

DOEE's Inspection and Enforcement Division (IED) Construction and Maintenance Branch (CMB) inspects construction sites in the District and assures compliance with District regulations and approved erosion and sediment control plans. DOEE also inspects existing stormwater management practices for compliance with approved stormwater management plans and to ensure the practices are effective and properly maintained.

In FY 2021 through FY 2023 CMB accomplished the following:

- Conducted a total of nine thousand six hundred and seventy-two (9,672) erosion and sediment control inspections,
- Inspected one thousand four hundred twenty-five (1,425) Stormwater Management Plans (SWMPs) that totaled five thousand three hundred twenty-one (5,321) individual stormwater best management practice (BMPs) inspected for SWMP construction compliance,
- One thousand four hundred forty-seven (1,447) stormwater management BMPs were inspected for operation and maintenance, issued *Maintenance Notices* for twenty-eight (28) SWMPs for two hundred and one (201) individual BMPs, and *Maintenance Service Completion Inspection Reports* for three hundred sixteen (316) individual BMPs,
- Received one hundred sixty-five (165) Self-Inspection Self- Reporting operation and maintenance reports for six hundred eighty-five (685) individual stormwater management BMPs.
- Issued three hundred thirty-three (333) *Request for Maintenance Information Notices*,
- Issued four hundred fifty-four (454) *Notice of Violations*, twenty (20) *Administrative Orders,* and one hundred four (104) *Notice of Infractions*.

2.10 Stream Restoration Updates

In FY 2022 and FY 2023, DOEE continued the designs of several projects and performed pre- and post-restoration monitoring at completed and future restoration sites. WPD's contractors conducted post-restoration monitoring for six (6) completed projects and pre-restoration monitoring for eight (8) planned projects during this time.

Fort Dupont Watershed Restoration

In FY 2020, DOEE awarded a design contract for seventeen thousand (17,000) feet of stream and five (5) acres of wetland restoration at Fort Dupont Park. Throughout FY 2020 and FY 2021, the design contractor advanced designs for the restoration project.

The Fort Dupont Stream and Wetland Restoration Project will cover ten (10) project areas utilizing a mix of stream restoration methods, focusing on minimizing adverse impacts to the natural resources within the park. Nine (9) of the project areas that cover approximately seventeen thousand (17,000) feet of perennial stream are exclusively stream restoration combined with outfall stabilization. The tenth project area will be a wetland and stream day lighting project area for which four hundred and twenty-five (425) feet of piped stream between the bike trail and the Anacostia River is daylighted and land around it is designed to create a tidal wetland complex behind the seawall. DOEE anticipates five to ten (5-10) acres of wetlands being restored in this area.

DOEE advanced designs and National Environmental Policy Act compliance for over eighteen thousand and six hundred feet (18,600 ft) of stream restoration and associated wetland restoration work along the Fort Dupont Tributary to the Anacostia River. Design reached the ninety percent (90%) design phase during this period. DOEE also moved forward with design and permitting process for stream daylighting and wetland restoration work where the Fort Dupont Tributary outfalls into the Anacostia River.

Oxon Run Stream Restoration

DOEE executed a design contract for stream restoration designs at Oxon Run in Ward 8 that will cover approximately twenty-one thousand (21,000) feet of stream. Stream restoration designs will work to ensure that eroded stream banks are stabilized and that the concrete lined channel along Oxon Run can be naturalized to the maximum extent practicable. Designs will also focus on ensuring that sanitary sewer line infrastructure is moved, replaced, or protected from lateral or vertical stream migration and look to reduce flood risk to property owners living along the stream corridor. In addition, the design project is developing a park master plan for Oxon Run Park to help guide future uses and facilities in the park.

Park Drive Gully Restoration

DOEE completed designs on one thousand and three hundred (1,300) feet of stream restoration for two highly eroded and incised stream channels in Southeast DC. The project is divided between two (2) different Anacostia tributaries with the Fort Davis tributary being one thousand (1,000) feet in length and the Texas Avenue Tributary being three hundred (300) feet.

Stickfoot Branch

DOEE completed designs and environmental compliance on this nine hundred and fifty (950) foot stream restoration project which will restore four (4) stormwater outfalls, reduce bank erosion, improve in-stream and riparian habitat, protect sanitary sewer infrastructure, and daylight two hundred and fifty (250) feet of stream.

Pinehurst Branch Environmental Assessment

In 2017, DOEE began the environmental assessment (EA) process for Pinehurst Branch, which originates at the District/Maryland border and flows approximately one and three-tenths (1.3) miles east–southeast on National Park Service (NPS) property to its confluence with Rock Creek. Land use in the six hundred and nineteen (619) acre Pinehurst Branch watershed is approximately seventy percent (70%) residential and commercial development and thirty percent (30%) parkland. Approximately seventy percent (70%) of the watershed lies within the District, with the remaining thirty percent (30%) in Montgomery County, Maryland. The large amount of impervious surface in the watershed has caused significant erosion in Pinehurst Branch, resulting in sediment transport to Rock Creek and exposing sanitary sewer lines in the stream. DC Water has abandoned or removed existing sanitary sewer lines in Pinehurst Branch and DOEE will coordinate with them to restore the stream within the next few years.

The Pinehurst Branch Stream Restoration project will be a comprehensive restoration project that addresses current degraded conditions in the stream, including eroding banks, exposed sewer lines, and invasive vegetation. The first step in restoration is to conduct an EA. The scope of work in this EA will explore options to implement the proposed actions of the Pinehurst Branch Stream Restoration project that would take place on NPS property. The EA will consider the potential to implement restoration activities that could meet the following objectives: restoring approximately seven thousand nine hundred (7,900) feet of degraded stream reaches; creating conditions suitable for wildlife habitat; and improving the condition of existing wetlands.

DOEE has developed a solicitation package for the completion of the EA and full construction designs for this effort. The Office of Contracts and Procurement expects to award the contract in early FY 2025.

Linnean Gully and Outfall Restoration

This project is planned to restore approximately two hundred and fifty (250) feet of a gully that starts at an outfall at the end of Linnean Avenue NW and extends down to Soapstone Valley Creek. Stormflow is destabilizing the banks, degrading water quality, and undermining nearby trees. The restoration will establish a stable channel and will be designed to promote ecological uplift in the waterbody and the surrounding area. During FY 2023, DOEE posted a design build solicitation for the project and entered negotiations with a vendor.

36th Place SE Wetland

DOEE issued a design-build contract for the restoration of a half (0.5)-acre wetland and small stream project behind residential homes in southeast DC. The project will restore the stream and wetland along with intensive invasive plant management.

2.11 Stormwater Pollution and Runoff Reduction

Private property, including commercial, residential, and nonprofit lands (religious and academic institutions), is the single largest land use in the District. These lands are one of the primary sources of pollution to District waterways, contributing pollutants through combined sewer overflow events and urban stormwater runoff.

One of the District's greatest needs and challenges is to reduce water pollution by incentivizing retrofits on individual properties. The District recognizes that it will be difficult to achieve its water pollution reduction goals unless it can convince property owners to adopt pollution prevention techniques on their lands. As such, the District has developed a variety of programs to encourage property owners to adopt nonpoint source pollution reduction techniques. These efforts include a Low Impact Development (LID) retrofit grant program and the following RiverSmart programs:

- RiverSmart Rooftops (Green Roof Rebate/Retrofit Program)
- RiverSmart Communities
- RiverSmart Homes
- RiverSmart Rewards for cisterns, impervious surface reduction, rain gardens and trees

RiverSmart Rooftops (Green Roof Rebate/Retrofit Program)

The DOEE program offers rebates for properties willing to install green roofs. Only properties within the Municipal Separate Storm Sewer System (MS4) area are eligible to participate. Residential, commercial, and institutional properties of all sizes are encouraged to apply. Participating property owners receive up to fifteen dollars ($15) per vegetated square foot. A current inventory of green roofs in the District can be found at http://doee.dc.gov/publication/inventory-green-roofs.

The RiverSmart Rebate Program was completed on September 30, 2023. The decision to end this program was based on a significant drop in participation while seeing a continued increase in green roof installations across the District.

Since 2006, the RiverSmart Rooftops rebate program supported the installation of one hundred and four (104) projects. This amounts to a total of five hundred and forty-four thousand (544,000) square feet of vegetation installed, averaging six thousand (6,000) square feet per individual project.

From FY 2021 through FY 2023, the District added a total of fourteen hundred and seventy (1,470) projects, encompassing over two million thirty-nine thousand four hundred and ninety-six (2,039,496) square feet of green roof, to its portfolio.

RiverSmart Communities Program

RiverSmart Communities is a program aimed solely at installing LID retrofits on nonprofit and religious institutional properties. The program provides full funding for design and construction costs to participants on the condition that the nonprofit partner will perform outreach and education on watershed protection and relevant DOEE programs. Participants install LID practices such as rain gardens, BayScaping, permeable pavement, and rain cisterns to control stormwater pollution.

From FY 2021through FY 2023, the RiverSmart Communities program implemented stormwater management practices at a total of eight (8) sites across the District at religious and/or nonprofit institutions. These eight (8) completed projects are treating forty thousand three hundred and fifty-four (40,354) square feet of impervious surface. Typical LID practices include permeable paving systems, bioretention, cisterns, rain gardens, BayScaping, and tree planting. Since it started in 2013, the RiverSmart Communities program has completed a total of fifty-three (53) project installations. These projects have provided treatment for over four and four-tenths (4.4) acres of nonpermeable land in the District.

RiverSmart Homes Program

The District has recognized the importance of targeting residents for pollution reduction measures because private property is the largest single land use in the city and, due to relatively small lot sizes, is the least likely to be required by regulation to install stormwater management practices. In 2008, DOEE developed RiverSmart Homes, a GSI retrofit program aimed at District single-family homes. The program started with eight (8) demonstration sites, one (1) in each of the District's wards. It then expanded to a pilot program in the Pope Branch watershed and has been open to all District residents since the summer of 2009.

Through this program, DOEE performs assessments of residential properties and provides feedback to residents on which GSI features can be safely installed on the property. DOEE also offers residents subsidized installations of any GSI recommended at the assessment, which can include shade trees, native landscaping to reduce erosion, rain gardens, rain barrels, and permeable pavers.

DOEE made some substantial changes to RiverSmart Homes in FY 2016 to increase participation. The program increased total incentives from one thousand six hundred dollars ($1,600) per property to three thousand dollars ($3,000) per property, began offering a new rain barrel for installation, and provided a rebate of five to ten dollars ($5-$10) per square foot for the removal of impervious surfaces and the replacement of vegetation and/or installation of permeable pavers. Also, in 2019, the fifty dollars ($50) copay for shade tree installations was eliminated. In fall of 2020, the program restricted permeable paver rebates to only those properties located in the MS4 and in Wards 7 and 8. Each permeable paver project has a maximum rebate of four thousand dollars ($4,000) per property. The program is popular with District residents, with an average of one thousand five hundred (1,500) residents registering per year.

For this reporting period, the RiverSmart Homes program:

- Installed seven hundred and forty-four (744) rain barrels,
- Installed one hundred and eighty-six (186) rain gardens,
- Implemented BayScaping at eight hundred and sixteen (816) properties,
- Replaced impervious surfaces with green space or pervious pavers at seventy-four (74) properties (over sixty thousand (60,000) square feet of treatment area),
- Conducted two thousand two hundred and sixty-eight (2,268) audits, and
- In FY 2020 and FY 2021, two thousand nine hundred and ninety-seven (2,297) shade trees were planted.

RiverSmart Schools

DOEE partners with District schools to install LID practices to reduce runoff and nonpoint sources of pollution while providing stormwater-related educational resources. The program offers District schools technical support, professional development, field trips, community planting events, and assistance with installing GSI practices. These practices are specially designed to be functional as well as educational to fit the school environment.

In FY 2022, RiverSmart Schools selected five (5) schools through an application process for schoolyard retrofits with stormwater green infrastructure and landscaping practices that maximize stormwater capture and infiltration. The awarded schools were Anacostia High School, Two Rivers Young Public Charter School, Lee East End Public Charter School, Friendship Collegiate Public Charter School, and Mundo Verde Calle Ocho.

The program trained twelve (12) school staff virtually and in-person on how to use the sites as outdoor classrooms for their students. These lessons have reinforced concepts being taught in the classroom, including District Public School science and environmental educational standards. Due to delays in the contracting process, the project implementation started in late FY 2022.

In FY 2023, RiverSmart Schools accomplished the following:

- Provided twenty (20) teachers with a three-day workshop on RiverSmart schools site usage and programming;
- Conducted eight (8) classroom visits with approximately twenty (20) students per class and provided six (6) boat trips to support the integration of watershed lessons for the RiverSmart Schools project at each participating school; and
- Engaged students, teachers, and volunteers in community workdays to construct and maintain designed schoolyard conservation sites.

In FY2023, DOEE also completed the design and construction of the following four RiverSmart Schools projects:

- The Anacostia High School project was a voluntary project to install large bioretention and an outdoor classroom. The BMP treated fifteen thousand five hundred sixty-eight (15,568) square feet of area and retained nine thousand three hundred six (9,306) gallons of stormwater treatment volume.
- Construction completed in May 2023 at Two Rivers – Young Public Charter School. The BMP treated two thousand three hundred ninety-two (2,392) square feet of area and retained eight hundred thirty-six (836) gallons of stormwater treatment volume. A four hundred-gallon (400-gallon) cistern was installed to collect rainwater for the gardens.
- The Lee East End Public Charter School improvement project removed compacted soil and installed two hundred (200) square feet of stormwater management BMPs, a four hundred-(400) gallon cistern, and an outdoor classroom area.

- At Shining Stars Public Charter School, the project installed a two hundred (200) square foot conservation landscape garden with outdoor classroom elements.

RiverSmart Rewards Incentive Program

Through participation in the RiverSmart Rewards program, property owners can apply for and receive discounts on their DC Water bill. District residents, businesses, and other property owners can earn a discount of up to fifty-five percent (55%) off the District Government Stormwater Fee (Stormwater Fee) when they reduce stormwater runoff by installing GSI or BMPs such as green roofs, bioretention, permeable pavement, shade trees and rainwater harvesting systems. GSI helps protect the Anacostia and Potomac Rivers and Rock Creek. GSI installed through the RiverSmart programs are automatically enrolled to receive the discount on a property's DC Water bill. A RiverSmart Rewards application period lasts three (3) years and can be renewed upon its expiration, provided the GSI practices have been maintained.

The District charges the Stormwater Fee to support the implementation of the District's MS4 permit. DOEE uses these funds to keep trash and other pollutants out of the rivers, install GSI throughout the District, ensure that new construction and redevelopment projects incorporate GSI, and provide incentives for voluntary retrofits. This fee is based on the total area of impervious surface—including roofs, driveways, and patios—on a property. Impervious surfaces prevent rainwater from soaking into the ground. The Stormwater Fee is calculated using Equivalent Residential Units (ERUs). One ERU is equal to one thousand (1,000) square feet of impervious surface. Currently, the Stormwater Fee is two dollars and sixty-seven cents ($2.67) per month per ERU.

The RiverSmart Rewards (RSR) Program enrolled nearly three thousand (3,000) applications between January 2015 and June 2021. In the following two (2) years, between July 2021 and June 2023, almost one thousand three hundred (1,300) additional applications were added, totaling approximately four thousand (4,000) applications since the beginning of 2015. Table 2.12 details the RSR program information, including the participant's combined monthly stormwater fee discounts, BMPs installed, total CDA to those BMPs, and total BMP storage volume.

Table 2.12 RiverSmart Rewards Program

	January 2015 - June 2021	July 2021 - June 2023	Total (January 2015 - June 2023)
RSR Applications	2,859	1,294	4,153
Combined Monthly Stormwater Fee Discounts	$249,996.02	$108,299.92	$358,296.00
BMPs Installed	6,450	2,534	8,984
Contributing Drainage Area (square feet)	9,018,389	2,198,651	11,217,040
Storage Volume (gal)	2,934,284	1,183,362	4,117,646

Stormwater Retention Credit Trading Program

The Stormwater Retention Credit (SRC) Trading Program is an innovative market-based program to manage stormwater in the District of Columbia. Stormwater management regulations require large development projects to install stormwater BMPs to reduce runoff. Depending on their location in the District's sewersheds, properties can meet up to one hundred percent (100%) of their regulatory requirement through off-site retention by purchasing SRCs from other properties that install runoff-reducing GSI voluntarily.

This flexibility allows regulated properties to pursue more cost-effective compliance methods and incentives properties to voluntarily install and maintain GSI that has the capacity to retain stormwater and thereby reduce the runoff that harms District streams and rivers.

From the inception of the SRC market in 2013 through June 2021, DOEE approved one hundred forty-two (142) trades for a total of one million one hundred eighty-two thousand nine hundred sixty-five (1,182,965) SRCs selling at an average price of one dollar and eighty-three cents ($1.83) per credit.

During the reporting period, the SRC market continued to show strong growth. From July 2021 through June 2023, DOEE approved one hundred three (103) trades for a total of eight hundred fifty-three thousand two hundred twenty-one (853,221) SRCs selling at an average price of one dollar eighty-one cents ($1.81) per credit.

Through the SRC Price Lock Program, participants have the option to sell their SRCs to DOEE as a buyer-of-last-resort at fixed prices, effectively creating a price floor in the SRC market. This purchase guarantee provides investors with the confidence necessary to commit funding to SRC-generating projects. DOEE made an initial eleven million five hundred thousand dollars ($11,500,000) available through the SRC Price Lock Program. During this reporting period. DOEE continued to use the SRC Price Lock Program to encourage private investment in High-Impact SRCs. High-Impact SRCs are generated when new GSI practices are built as voluntary retrofits in areas draining to the MS4. Voluntary GSI in the MS4 area does the most to protect the District's rivers because, in these areas, stormwater runoff would otherwise drain untreated into our rivers and streams, typically without any treatment.

Through the SRC Price Lock Program, nine projects have completed construction, retrofitting a total of twenty-seven and three-tenths (27.3) acres within the MS4; once the additional twelve (12) projects with approved plans are complete, the combined area retrofitted will exceed fifty-seven (57) acres. Of the eleven million five hundred thousand dollars ($11,500,000) DOEE committed to the SRC Price Lock Program, the projects that enrolled from July 2021 through June 2023 accounted for three million nine hundred fifty thousand dollars ($3,950,000) to purchase nearly four million fifty-one thousand (4,051,000) SRCs over twelve (12) years of credit certification prior to selling any of their SRCs on the market.

DOEE continued its program by offering an incentive for projects to achieve retention requirements using High-Impact SRCs. When development projects meet a portion of their regulatory requirements by using High-Impact SRCs, the highest levels of water quality restoration in the District are realized. DOEE subsidizes the sale of High-Impact SRCs when SRC Price Lock Program participants reduce the price they charge SRC buyers. DOEE will offer increased payments to sellers who further decrease the sale price in large or multi-year transactions. DOEE expects the program will make it cheaper for buyers to purchase High-Impact SRCs, thereby increasing the incentive to build more green stormwater infrastructure in the MS4.

From July 2021 through June 2023, DOEE purchased or subsidized over nine hundred twenty-seven thousand dollars ($927,000) in SRCs. SRC Price Lock Program participants also sold a total of five hundred fifty-six thousand nine hundred eighty-five (556,985) SRCs on the market during the reporting period. If not sold on the market, these SRCs would have used four hundred and one thousand six hundred eighty-three dollars and forty-four cents ($401,683.44) of DOEE's SRC Price Lock Program funds, which can now be used for other SRC Price Lock Program projects in the future.

Surface and Groundwater System (*formerly known* as Stormwater Database)

In FY 2015, DOEE launched the Stormwater Database to track projects that reduce pollution from stormwater runoff by managing submission, review, and inspection of Stormwater Management, Erosion and Sediment Control, and Green Area Ratio permit applications. In FY 2021, DOEE expanded the Stormwater Database to manage the submission and review of Floodplain Management, Wetlands and Streams, and Wells and Soil Boring permit applications, and changed the name of the database to Surface and Groundwater System (SGS) to reflect this expansion.

The SGS tracks each site's regulatory obligations and compliance, including off-site retention achieved with SRCs or payment of the in-lieu fee (ILF).

The public uses the SGS to:

- Submit compliance calculations and other information to support an application for DOEE approval of a Stormwater Management Plan, Erosion and Sediment Control Plan or Green Area Ratio Plan, Floodplain Management Plan, Wells and Soil Boring Permit Application, and Wetlands and Streams Permit Application;
- Comply with an off-site retention obligation by applying to use SRCs or notifying DOEE of an ILF fee payment;
- Apply to certify, transfer, or retire SRCs;
- View the SRC registry; and
- Participate in voluntary programs that incentivize installation and maintenance of green stormwater infrastructure, including RiverSmart Homes and RiverSmart Rewards, which provides modest discounts on the District's impervious surface-based fees.

During the reporting period, DOEE:

- Released several features and business processes to improve data collection and accuracy in the SGS, including:

  - Enhancements to the Self-Inspection, Self-Reporting application and reports that property managers use to report GSI maintenance voluntarily;
  - Updates to spatial analysis tools to better identify site and green stormwater infrastructure locations that lie within specific geographies near wetlands and floodplain areas;
  - Working with federal agencies to update GSI installation and maintenance records to improve accuracy for reporting;
  - New process for Wetland, Stream, and Water Quality Certification public notices, turbidity monitoring reports, and reviewer assignments;
  - New process to register and abandon existing wells;
  - Connection between the SGS and DOEE's GSI maintenance system to flag the BMPs DOEE will maintain and transfer related BMP data; and
  - Automated and revised RiverSmart Homes workflows for DOEE staff, grantees, and contractors who manage rain barrel requests and installations, reducing administrative workload and improving data capture.

- Improved public users' experience in the database by:
  - Launching online fee payments for wells and wetlands programs;
  - Launching a termination of covenant process for stormwater management plans;
  - Launching an online request and scheduling tool for Pre-Development Review Meetings for stormwater plans;
  - Launching an online request and scheduling tool for preconstruction inspections;
  - Implementing a new version of the user interface to streamline development across the related systems for all programs;
  - Updating public-facing training materials with online videos;
  - Making incremental improvements to improve system performance and reduce page loading times, including moving some functions to new apps; and
  - Development of a public facing application for third party inspections agencies reporting of third-party compliance monitoring inspections for land disturbances associated with erosion and sediment control plans.

More information about the SGS can be found at: http://doee.dc.gov/SGS.

Tree Planting

The District of Columbia has been called "The City of Trees." It has a tree canopy cover of thirty-seven percent (37%), which is high for a dense, urban environment, but lower than what the canopy cover has been historically, even when the city had a higher population density. To improve air and water quality, reduce the urban heat island effect, and offset greenhouse gas emissions, the District adopted a forty percent (40%) tree canopy goal. Mayor Bowser adopted a

Sustainability Plan that calls for achieving the canopy goal by 2032. To achieve that goal, the District must plant an average of ten thousand and eight hundred (10,800) trees annually.

In FY 2022, nine thousand four hundred fifty (9,450) trees were planted by DOEE and other tree-planting partners. In FY 2023, twelve thousand four hundred forty-four (12,444) trees were planted by all District tree planting groups, totaling twenty-one thousand eight hundred ninety-one (21,894) across the District. That's an average of ten thousand nine hundred forty-five (10,945) trees per year to reach this goal.

The DDOT Urban Forestry Division, which maintains the District's street trees, planted nine thousand six hundred sixteen (9,616) trees over the past two (2) fiscal years.

DOEE, through grants and contracts to various for-profit and non-profit partners and contractors (e.g. Casey Trees, BioHabitats, Acteon, and Natural Resource Design) plants trees on private, federal, and other District lands.

The following are DOEE's FY 2022 and FY 2023 tree planting accomplishments:

- Planted three thousand three hundred forty-five (3,345) trees as part of the RiverSmart suite of programs (Homes, Communities, Schools, and Tree Rebate Program);
- Planted three thousand eight hundred eighty-eight (3,888) trees across large public and private parcels including parks and schools as a part of a new effort to increase tree canopy in these areas; and
- Partner organizations such as Casey Trees, General Services Administration (GSA), and the National Park Service planted one thousand seven hundred ninety-six (1,796) trees in the District.

Pollution Prevention Plans

District Municipal Critical Source Facilities

Since July 1, 2017, DOEE has been working with District municipal critical source facilities to develop, implement, and update stormwater pollution prevention plans. DOEE has met with all agencies that operate and manage municipal critical source facilities to begin developing, updating, and finalizing stormwater pollution prevention plans (SWPPPs). Of the thirty-seven (37) critical source facilities requiring SWPPPs in the District, thirty-two (32) have up-to-date, certified SWPPPs. Four (4) facilities that do not have up-to-date, certified SWPPPs experienced either significant changes to operations or personnel at their facilities and are actively creating new SWPPPs. The fifth facility was added to the official inventory on October 1, 2023, and has an up-to-date, SWPPP that is awaiting certification.

DOEE developed an updated template SWPPP and SWPPP review checklist for municipal facilities on the official inventory to comply with the 2021 EPA Multi-Sector General Permit (MSGP) for industrial stormwater runoff. All SWPPPs were reviewed by DOEE to ensure they met MS4 Permit and, when appropriate, MSGP requirements. In total, DOEE provided assistance and feedback on two hundred five (205) SWPPPs, SWPPP updates, and SWPPP review checklists. DOEE provided comments, when necessary, on SWPPPs to clarify expectations for what a SWPPP should include, to correct errors, and to ensure all SWPPPs met MS4 Permit and MSGP requirements.

Businesses and other entities

DOEE launched the GreenWrench Technical Assistance program in the spring of 2018 with EPA funding to provide compliance assistance and encourage pollution reductions at automotive repair and body shops in the District of Columbia. Since then, DOEE has secured four (4) more years of funding for the program. These operations are critical sources of stormwater pollution in the MS4 and direct drainage areas of the District. As part of these efforts DOEE developed a template pollution prevention plan (P2 Plan) that includes the elements of a SWPPPs, but also includes sections on air quality, toxic substances, and energy use. The template P2 Plan and an accompanying GreenWrench Guidebook are being updated during this period to better incorporate electric and hybrid vehicle considerations. The Template P2 Plan and Guidebook can be found on DOEE's website (https://doee.dc.gov/service/greenwrench).

2.12 Environmental Education and Outreach

DOEE's mission includes providing environmental education and outreach to raise environmental stewardship, increase awareness of environmental challenges and initiatives, and inform stakeholders of opportunities to contribute to the restoration of the District's waters and natural habitats. The support programs aim to prevent nonpoint source pollution from individual actions by carrying out effective information and education campaigns. Specific initiatives are described in the following sections.

Meaningful Watershed Educational Experiences

Due to implementation barriers presented by COVID-19, the Overnight Meaningful Watershed Education Experience (MWEE) program, as initially designed, was closed out in 2021. DOEE's grantee met all deliverables for the Overnight MWEE. Part of the funding allocated for the MWEE ($300,000) was utilized to fund a Nature Near Schools MWEE pilot program beginning in 2021. Five (5) Nature Near Schools MWEE grants were awarded to grantees who began program implementation in August 2021. In FY 2022, the grantees conducted lessons in seventeen (17) schools, reaching one thousand (1,000) students and forty-seven (47) teachers.

In FY 2023, DOEE's Nature Near Schools program continued working with its grantees to offer District students the opportunity to learn about their local watersheds and the Chesapeake Bay while immersed in their local, school-based environment. The grantees provided MWEEs programming at schoolyards and local field trips to one thousand four hundred ninety-two (1,492) youth (exceeding the annual goal of six hundred fifty (650) youth), thirty-one (31) schools (exceeding the annual goal of fifteen (15) schools), and sixty-seven (67) teachers. The program reached twenty-six percent (26%) of District of Columbia Public School and Charter School fifth grade schools. The students experienced multiple touches on topics including watershed health, air quality, and food webs. As part of the MWEE, the students also worked on taking individual action by creating their own action projects. A few action projects created by students through the Nature Near Schools program follow:

- Students identified the single use plastic straw issue in their school's cafeteria. Students spoke with administration and got the plastic straws removed from the cafeteria.

- In completing a school community inventory, students noticed there was litter and dog debris on the ground. Students created a Public Service Announcement poster campaign to alert people to pick up their trash.
- Students wanted to advocate for more outdoor learning and recreation time, so they completed a letter-writing activity to send letters of inquiry to the Mayor and a DC State Board of Education representative.

Overall, students felt more comfortable in nature and learning outdoors over the course of the program.

The Middle School Watershed Education program was designed to provide at least one hundred twenty (120) students meaningful watershed experiences on Kingman and Heritage Islands on the topic of trash. As previously reported, this program was significantly impacted by COVID-19. During this reporting period, the program experienced hiring and scheduling challenges, as well as bus shortages. Living Classrooms provided one program to Kelly Miller Middle School students in their schoolyard in spring 2022. The grant was amended to extend the grant period through September 30, 2023. The grantee amended programming to increase lessons held outdoors on school grounds, reduce bus trips to adhere to COVID standards, and provide follow-up lessons after the trip to Kingman Island to ensure students have continued touch points.

In FY 2023, the grantee continued working with Kelly Miller Middle School and started working with Sousa Middle School. The grantee engaged ninety-one (91) students. Students learned about their watershed and their personal connection to it through hands-on experiences in the classroom and in the field. Students and teachers expressed much excitement about having real field trips again.

Project Learning Tree

Project Learning Tree (PLT) is an internationally recognized program that trains educators in innovative techniques for exploring a wide range of environmental concepts with students and teaches critical thinking skills that lead to environmental stewardship (grades K-12). DOEE offers PLT training workshops free to those who request them. In FY 2022, DOEE staff conducted one educator workshop for ten informal environmental educators. In FY 2023, the PLT lessons were incorporated in the RiverSmart Schools teacher training sessions.   No formal PLT workshops were conducted.

RiverSmart Schools

The Partnering and Environmental Conservation Branch is responsible for RiverSmart Schools and other initiatives that cultivate partnerships through engagement, education, and financial, technical, and compliance assistance to enforce District laws that achieve clean water goals and support communities.

RiverSmart Schools is a program that works with schools within the District to install LID practices to reduce runoff and nonpoint source pollution while providing stormwater-related educational resources.

During this reporting period, RiverSmart Schools selected ten (10) schools through an application process for schoolyard retrofits with stormwater green infrastructure and landscaping practices that maximize stormwater capture and infiltration. The awarded schools in FY 2022 were Anacostia High School, Two Rivers Young PCS, Lee East PCS, Friendship Collegiate PCS, and Mundo Verde Calle Ocho. For FY 2023, the awarded schools were Friendship PCS Ideal, Ketcham Elementary School (ES), Langley ES, Plummer ES, and Whittier ES.

The program trained twenty-five (25) school staff each year, virtually and in-person, on how to use the sites as outdoor classrooms for their students. These lessons have reinforced concepts being taught in the classroom, including DCPS science and environmental educational standards. Due to delays in the contracting process, the project implementation started in early FY 2022 and was completed in FY 2023. The FY 2023 cohort installation will be completed in FY 2024.

Aquatic Resources Education Center

The Aquatic Resources Education Center (AREC) is a multi-use environmental education center located in Anacostia Park, SE run by the DOEE’s Fisheries and Wildlife Division. The center has on exhibit a variety of fish, amphibians, reptiles, and invertebrates found in the District of Columbia and the Chesapeake Bay watershed. The center houses the DOEE Fisheries Research Laboratory and the Aquatic Education program. The center has three (3) exhibit rooms and two (2) classrooms where local Pre-K-12 grade students can visit for free field trips. The center also offers programs for the community including family discovery days, learn-to-fish angling events, and professional development workshops.

During this reporting period, the AREC hosted one hundred eighteen (118) Pre-K-12 field trips for local students, reaching four thousand seven hundred twelve (4,712) students. School programs included tours and nature tales for the youngest learners where Pre-K-2 grade students learn about our local waterbodies and the wildlife that resides in them. Other elementary school lessons include watershed and wetland studies, water quality investigations, and fishing lessons, which teach basic fishing and examine how DC regulations protect the fishery, river life, and amphibian adaptations. Middle school and high school students can choose lessons that include advanced amphibian inquiry, fishable waters, watershed wonders, invasive species studies, and careers in wildlife.

The Fishing in the District fishing program began in 2021 when DOEE received a donation of a mobile “First Catch” trailer provided by the Recreational Boating and Fishing Foundation. This donation provided a ten (10) foot trailer stocked with fishing rod/reel combos and tackle. The First Catch trailer allows staff to drive to various locations in the city to provide pop-up and scheduled community fishing events. These programs were especially popular post-pandemic since they provided a free, educational program outside. Biologists conducted fifty (50) Fishing in the District programs, attracting two thousand one hundred ninety-six (2,196) participants between July 1, 2021, and June 30, 2023.

The AREC staff also offers professional development workshops for Pre-K-12 grade teachers and community educators as part of their mission to educate the public about our aquatic resources and wildlife conservation. Using the national Project WILD and Growing Up WILD curricula, the staff offered ten (10) training workshops that attracted sixty-eight (68) educators during this reporting period.

The AREC had five hundred twenty-six (526) walk-in visitors at the education center during this time frame. This number is low since the building was not open to the public until the spring of 2022. However, the biologists attended District community events to provide outreach and engagement opportunities to the public reaching one thousand four hundred six (1,406) people. The total number of people who participated in AREC programs and events during this reporting period was eight thousand three hundred eighty-two (8,382).

District of Columbia Environmental Education Consortium

DOEE helps to organize a network of environmental educators throughout the District so that ideas and resources can be shared among them. The D.C. Environmental Education Consortium (DCEEC) provides opportunities for networking, event coordination, and program partnering. The program also provides environmental expertise, professional development opportunities, curricula and resources, and hands-on classroom and field studies to District schools.

In FY 2022 and FY 2023, the US Botanical Garden, DOEE, and DCEEC hosted the annual D.C. Teacher's Night, virtually. Over two hundred (200) teachers registered, and those in attendance learned about environmental programming from approximately twenty-five (25) exhibitors representing local environmental and science education organizations.

District Environmental Literacy Plan

DOEE collaborated with stakeholders to implement the Environmental Literacy Plan (ELP) and draft an updated plan released in 2020. The ELP creates the groundwork to develop academic standards and measure student environmental literacy. During this reporting period, forty-six percent (46%) of students in the District learned about environmental and sustainability concepts. At least sixty-one percent (61%) of schools are taught about the environment at every grade level. The Community Stormwater Solutions Grant continues to support adult education in historically marginalized communities and those challenged with disproportionate impacts from pollution. The ELP framework identifies the best places in the school curriculum where DOEE programming will fit. DOEE continues to work with OSSE to implement the ELP, which will bring environmental education, including meaningful outdoor experiences at home and beyond, to District youth.

The Anacostia Environmental Youth Summit

The Anacostia Environmental Youth Summit (AEYS) is a District-wide showcase that amplifies youth voices, highlights the importance of environmental literacy, and encourages stewardship for the major District waterbodies. AEYS emphasizes youth leadership and innovation while promoting environmental stewardship and responsibility. In May 2022, the event was held at Anacostia Park with a sustainable urban design theme. In May 2023, the event brought together approximately twenty-four (24) exhibitors and four hundred (400) students. According to teacher feedback, the event successfully empowered the District's youth and provided them and educators with knowledge and resources to continue efforts beyond the Summit.

Anacostia River Explorers

Anacostia River Explorers are boat tours that educate the public about the Anacostia River through one (1) or two (2) hour motorized and canoe tours. Participants learn about the Anacostia River's human and natural history, the threats it faces, and what solutions are being undertaken to help the River realize its full potential as an invaluable asset for the District and its residents.

Three grantees are responsible for implementing this program. From July 2022 to October 2023, these grantees organized four hundred fifty-nine (459) motorized or paddle tours of the Anacostia River, engaging a total of eight thousand eight hundred thirty-four (8,834) participants. Throughout this grant period, Anacostia River Explorers integrated opportunities for education, environmental stewardship, and effective natural resource management skills during on-the-water experiences.

Adopt-Your-District Program

Adopt-Your-District is a program that allows volunteers to adopt parks, blocks, or segments of streams throughout the District. This program is a collaboration effort between DOEE, the District Department of Parks and Recreation, the National Park Service, and the Mayor's Office of the Clean City.

Green Zone Environmental Programs

Every summer, DOEE partners with the Marion Barry Summer Youth Employment Program to provide youth and young adults, ages fourteen to twenty-four (14 - 24), with an opportunity to learn about energy and environmental issues, complete community-based environmental projects, and prepare for careers through the Green Zone Environmental Program (GZEP). DOEE's Watershed Protection Division (WPD) releases the GZEP Watershed Protection Grants to fund organizations to provide education, training, and activities to GZEP participants. In FY 2023, the GZEP Watershed Protection Grants funded three (3) organizations to train four (4) cohorts and over two hundred (200) youth. Over the course of six (6) weeks, youth were educated on various activities and topics related to green jobs, pollution in our watershed, environmental activism, green infrastructure, and more.

Watershed Stewards Academy

The Watershed Stewards Academy is an eight (8)-week certification course taught by Anacostia Watershed Society (AWS) staff for District residents who want to address local pollution problems in their local watersheds. The program is funded by a DOEE grant to AWS. It is part of the National Capital Region Watershed Stewards Academy, a coalition of watershed protection groups in the Potomac, Rock Creek, Anacostia, and East Patuxent watersheds. Once they've completed the course, these residents are considered Master Watershed Stewards in their local watershed. These alumni serve as resource people and community leaders in the effort to clean up local waterways and coordinate efforts to infiltrate stormwater and reduce it. In FY 2022 and FY 2023, through a hybrid class model (part virtual and part in-person) seventy (70) District residents became Watershed Stewards.

Storm Drain Marking Program

DOEE installed three hundred and ninety-one (391) storm drain markers through twenty-nine (29) different marking events, over the reporting period. Events include installations by public school students, private residents, nonprofits, and DOEE trainees and interns. DOEE has maintained its geolocated database of marked storm drains and worked with five (5) different volunteer groups that supported this work, including the National Park Service, sister agencies such as Department of General Services, schools, and citizen volunteers.

2.13 Job Training Programs

River Corps

The River Corps Program engages District residents, ages eighteen to twenty-four (18 - 24), through classroom education and field-based experiences to gain technical skills needed to install, inspect, and maintain green infrastructure (GI), and learn critical skills to secure employment. River Corps participants work on watershed protection activities involving the maintenance and inspection of recently completed stream restoration and green infrastructure projects. These projects provide trainees with entry-level skills in GI. This program is implemented by a grantee. River Corps Program participants gain experience in the technical skills needed to install, inspect, and maintain GI, and learn the soft skills to seek, find, secure, and keep long-term employment. The Program provides industry-relevant certifications, Occupational Safety and Health Administration ten (10)-hour Construction Training, cardiopulmonary resuscitation training, and life-skills workshops to program participants. Participants also receive a stipend.

Returning Citizens Workforce Development Program

DOEE also funds an environmental job training program for previously incarcerated persons (returning citizens), who are residents of the District of Columbia. Like RiverCorps, the goal of this grant program is to provide participants with classroom education and field-based experiences to gain technical skills needed to install, inspect, and maintain Green Infrastructure, and learn critical skills to secure employment. Participants also receive a stipend.

Kingman Island Rangers

The Kingman Rangers is a job training initiative led by DOEE’s grantee, Living Classrooms of the National Capital Region, that prepares out-of-work adults and District youth for entry-level jobs in the green sector while helping to beautify Kingman and Heritage Islands. The apprentices, called "Kingman Rangers," spend half of their time doing maintenance, landscaping, and construction projects on the island and the other half in the classroom working on basic job readiness skills. A key goal of the Rangers program is to train participants in how to operate and maintain green infrastructure - landscape features such as rain gardens that prevent pollution from entering streams and rivers. The Rangers learn new skills in the operations and maintenance of green infrastructure, which could help them secure long-term employment in the landscaping industry. When they are not on the island, the Rangers are working with Living Classrooms' workforce development team to build critical job readiness skills such as professionalism, financial literacy, resume development, and interview techniques. Upon completion of the program, the Rangers are assisted with long-term job placement and receive at least one year of case management support to help them mitigate any barriers that could keep them from being successful in their new position.

2.14 Cost/Benefit Assessment

The District is investing significant resources to address the sources of impairment to local waters. This includes efforts to manage and upgrade the Blue Plains Wastewater Treatment Plant, reduce combined sewer overflows, and manage stormwater runoff in the MS4 areas of the District as described in the following sections.

Cost for Managing Blue Plains Wastewater Treatment Plant and Combined Sewer Overflows

The District of Columbia has and continues to commit significant amounts of resources to improve the quality of its waters. Effective wastewater treatment, sanitary sewer system maintenance, combined sewer overflow control, and stormwater management are the principal elements in water pollution control. The Blue Plains Wastewater Treatment Plant (WWTP) (or Blue Plains) operated by DC Water provides wastewater services to over two million (2,000,000) customers in the District and the surrounding jurisdictions of Maryland and Virginia. Figure 2.4 shows the areas/jurisdictions served by the WWTP.

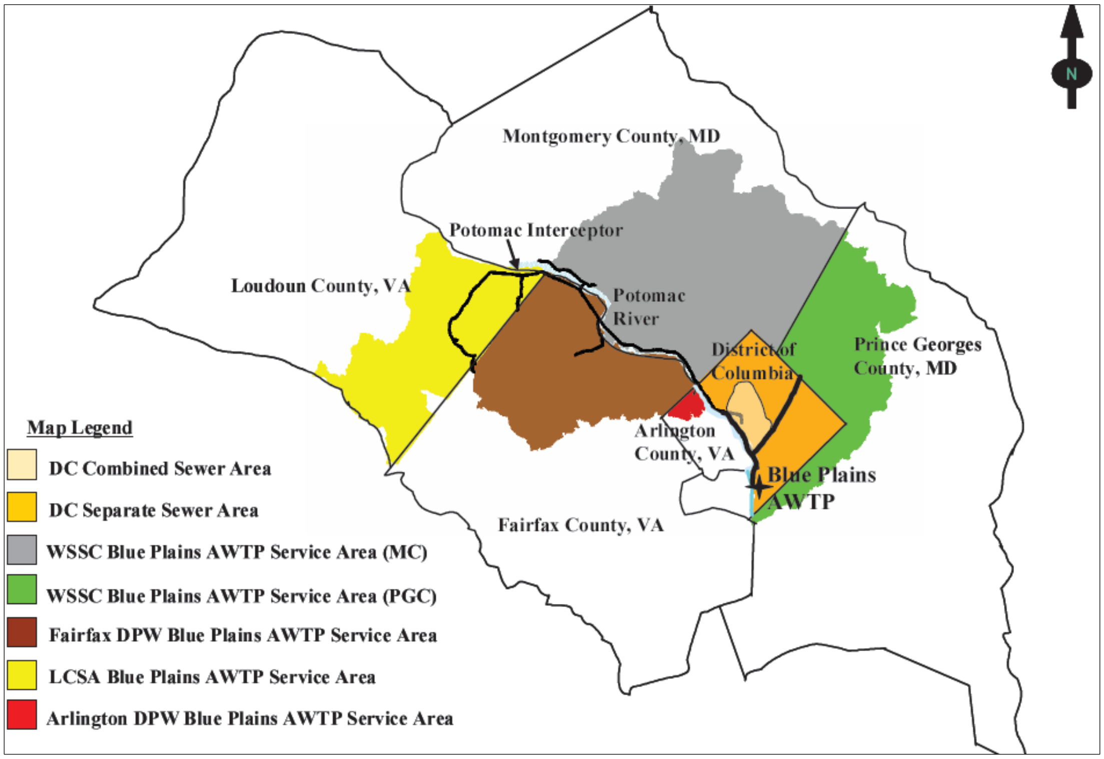


Figure 2.4 Map of Stormwater and Wastewater Treatment Service Areas

The wastewater treatment costs are apportioned between the jurisdictions served by Blue Plains. The financial responsibilities of each jurisdiction were updated under the new Blue Plains Intermunicipal Agreement of 2012, effective April 3, 2013 (http://www.mwcog.org/uploads/pub-documents/u15dVlc20130506094101.pdf). The District's portion of the capital and operations & maintenance costs for wastewater treatment, sanitary sewer maintenance and engineering and technical services constitute forty-five and eight-tenths percent (45.8%) of the total cost incurred by DC Water. As the only jurisdiction with combined sewer systems, the District is also responsible for combined sewer overflow control costs. Description of the various elements and associated costs are presented below.

Engineering and Technical Services

DC Water Engineering and Technical Services programs provide support to the planning, design, and construction of new and rehabilitation projects across all functions of the collection and treatment of wastewater. The functions include system planning, technical engineering expertise, and oversight of construction.

Sanitary Sewer System Maintenance

The bulk of the cost of the wastewater collection system is associated with the assessment, rehabilitation, and replacement of the aging infrastructure in the District. High bacteria counts in various waterways have been attributed to leaking sanitary sewers. Under a multi-year Sewer Assessment Program, DC Water completed the ten (10)-year Sewer System Facilities Plan in 2009 (Executive Summary at https://www.dcwater.com/sites/default/files/documents/Water%20System%20Facilities%20Plan-Executive%20Summary%20June%202009.pdf). The plan addresses the evaluation of the physical condition and capacity of the sewer system, identification and prioritization of rehabilitation needs, record keeping and data management, as well as ongoing inspection and rehabilitation programs. In accordance with key findings and recommendations of the plan, priority projects to rehabilitate sewer collection systems as well as pumping facilities are currently ongoing. In particular, the rehabilitation of sewers in stream valleys is critical to the significant water quality improvement in District streams.

Subsequent programs under the DC Clean Rivers (DCCR) Projects are ongoing to further reduce sewers inflows in the District's waterways. Among the programs, is a massive infrastructure and support program designed to capture and clean wastewater during rainfalls before it ever reaches the waterways (more information at https://www.dcwater.com/cleanrivers).

Wastewater Treatment

Under the Chesapeake Bay Agreement, the Blue Plains Waste Water Treatment Plant (WWTP) was the first facility to meet the nutrient reduction goals of forty percent (40%) from the 1985 levels. The WWTP operates under stringent NPDES permit conditions. Significant plant-wide upgrades and rehabilitation and installation of support systems are ongoing. Among the major projects is the Nutrient Removal project to meet regulatory requirements and the goals of the Chesapeake Bay Agreement. In 2007, DC Water proposed to interface the overall Blue Plains Nutrient Removal project with the Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) finalized in 2002. In 2015, DC Water finalized the LCTP Modification for Total Nitrogen Removal/Wet Weather Plan. The details are reported in the "Long Term Control Plan Modification for Total Nitrogen Removal/Wet Weather Plan, District of Columbia Water and Sewer Authority, Washington, DC, May 2015" (http://www.dcwater.com/sites/default/files/green-infrastructure-ltcp-modificaitons.pdf).

The major components of the project include construction of the Blue Plains Tunnel (extending from the Anacostia Tunnel System to Blue Plains), construction of a tunnel dewatering pumping station, and enhanced clarification facilities at Blue Plains. These projects will remove nitrogen at levels sufficient to meet the Blue Plains federal NPDES discharge permit requirements as well as the Chesapeake Bay Agreement for nutrient reduction. The projects will simultaneously achieve CSO reduction equal to or better than the approved LTCP.

Combined Sewer Overflow Long-Term Control Plan

DC Water developed the LTCP in 2002. The LTCP involves the construction of large underground tunnels that will serve as a collection and retention system for the combined sewer during rainfall conditions. In 2005, DC Water and the District entered into a Consent Decree with the EPA and the United States Department of Justice requiring implementation of the LTCP.

On January 14, 2016, a modification to the 2005 Long Term Control Plan (LTCP) Consent Decree was entered into by the parties to include innovative green stormwater infrastructure practices to achieve the reduction of combined sewer overflow volume by ninety-six percent (96%) system-wide (for the Anacostia and Potomac rivers and Rock Creek) and offer additional community benefits. The LTCP is to be implemented over a twenty-five (25)-year period under the amended Consent Decree.

Table 2.13 shows the predicted CSO reduction and project costs, and Table 2.14 summarizes the costs associated with the treatment of wastewater for the years 2022 and 2023.

Table 2.13 Predicted CSO Reduction and Cost

	Before CSO Controls[1]	**LTCP[2]**	**After Implementation of TN/WW Plan Selected Alternative[2]**
CSS Overflow Volume million gallons/year (mg/yr)			
Anacostia River	2,142	54	0
Potomac River	1,063	79	79
Rock Creek	49	5	5
Number of Overflows (per yr)			
Anacostia River	82	2	0
Potomac River	74	4	4
Rock Creek	30	5	5
Capital Cost Opinion ($, ENR CCI=7888)			
Capital Cost ($Million)[3]	0	$28	$783
% above the lowest alternative	0	N/A	7
% above the LTCP[4]	0	N/A	2,696

[1] Source: Combined Sewer System Long Term Control Plan, Final Report, District of Columbia Water and Sewer Authority, July 2002, Table ES-4.

[2] Source: Long Term Control Plan Modification for Total Nitrogen Removal/Wet Weather Plan, District of Columbia Water and Sewer Authority, Washington, DC, May 2015, Appendix C: TN/WW Plan, Table 5-1.

[3] Construction Cost Index = $7,888,000 million

[4] Computed. The capital cost of CSO reduction if not implemented (i.e., "Before CSO Controls"), there will be no cost incurred. Therefore, the amount is set to zero.

Table 2.14 Cost Summary of Water Pollution Control Activities

Activity Area	**FY 2022 (in $ thousands of dollars)**	**FY 2023 (in $ thousands of dollars)**	**Total FY 2022-FY 2023 (in $ thousands of dollars)**
Wastewater Treatment	63,922	71,907	135,829
Sewer Services	75,437	68,031	143,468
Combined Sewer System	165,276	108,031	273,307
Engineering and Technical Services	21,473	23,337	44,810

Source :https://www.dcwater.com/sites/default/files/finance/budgets/Approved%20FY%202024%20Budget%20Book_Adopted%20March%202%2C%202023....pdf

Cost for Stormwater Management in MS4

The District has embarked on an aggressive stormwater management program as part of the implementation and administration of activities required by MS4 Permit issued by EPA. The area covered under the permit is entirely within the jurisdiction of the District and constitutes approximately two-thirds of the city's area (DC separate sewer area in Figure 2.5).

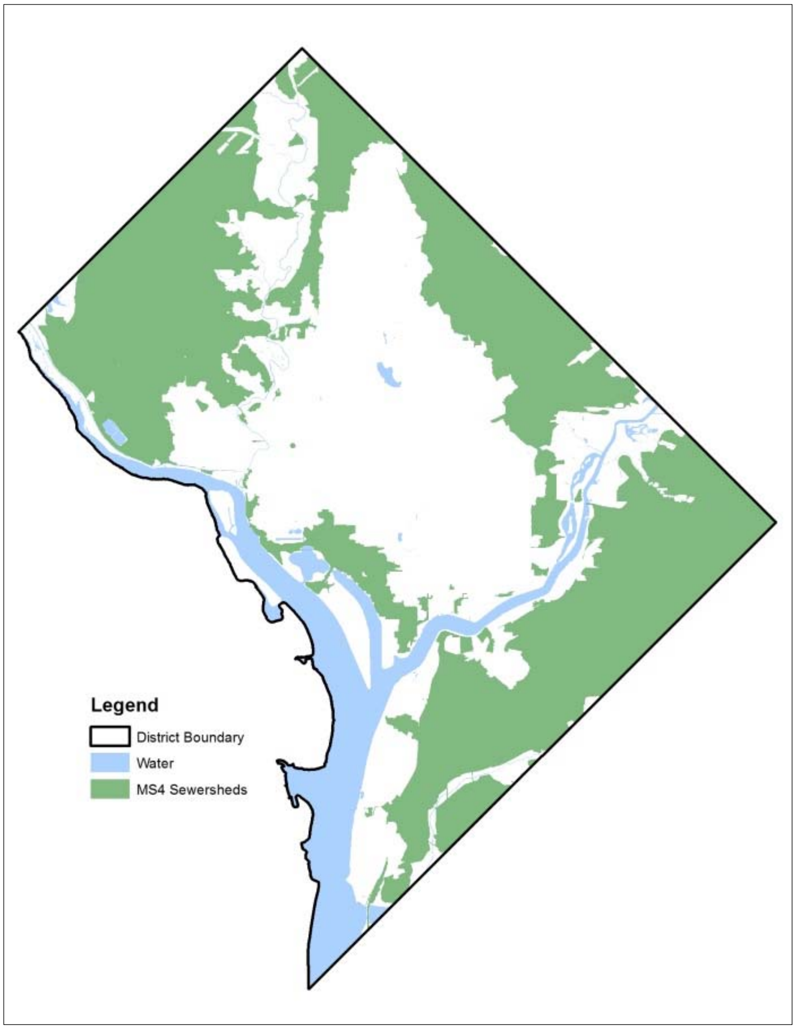


Figure 2.5 Map of MS4 Sewershed Coverage Area

The District's stormwater management efforts cover an array of activities including research and demonstration projects, drainage improvements, monitoring and control of various types of pollutants from various sources, enforcement, and public education. Six (6) different agencies collaborate to manage stormwater in the District - DOEE, DC Water, the Department of Public Works (DPW), District Department of Transportation (DDOT), the Department of General Services (DGS), and the District Office of Planning (DCOP). Table 2.15 outlines some of the related activities performed by each agency.

Table 2.15 Agency Stormwater Functions

Agency	Compliance Activity
DOEE	MS4 program administration Source identification Pollution Prevention Wet/dry weather monitoring program Wet weather screening program Flood control projects review Construction management and plan review Pollutant control from hazardous waste sites Pesticide, herbicide, and fertilizer application Promoting LID practices Illicit discharge detection Sediment erosion control Inspection/enforcement
DC Water	Floatables reduction program Pollution prevention Operation and maintenance of sewer infrastructure Catch basin cleaning Illicit discharge detection
DPW	Street sweeping Seasonal leaf and holiday tree collection program Pollution prevention Household hazardous waste collection Deicing and snow removal Stormwater management at municipal waste transfer stations
DDOT	Pollutant reduction from vehicles and roadways Pollution prevention LID practices in public right-of-way
DGS	LID practices on District-owned properties Pollution prevention
DCOP	Planning for neighborhoods, public facilities, parks, and open spaces, etc. Urban design and land use review

The District's Stormwater Permit Compliance Amendment Act of 2000 established the Stormwater Permit Compliance Enterprise Fund to provide revenue for the mitigation of pollutants in stormwater discharges. The cost for stormwater management is dependent on the MS4 permit requirements. The District is required to certify that it has "sufficient finances, staff, equipment, and support capabilities" to implement the provisions of the Permit in its MS4 Annual Report 1. Table 2.16 shows the expenditures in FY 2020 and budget for FY 2021 for DOEE's MS4 Permit-related costs.

In addition to DOEE Enterprise Fund spending, other District agencies spend local funding on programs and initiatives that also provide stormwater management benefits, such as street sweeping by DPW, and GSI projects on public buildings by DGS or in public right-of way areas by DDOT. The most recent MS4 Annual Report, including the required funding certification, can be found at: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/2019%20MS4%20Annual%20Report-FINAL-for%20web.pdf

Table 2.16 FY 2021 Enterprise Fund Expenditures and FY 2022 Enterprise Fund

Fiscal Year 2021 Expenditures	Fiscal Year 2022 Budget
$12,596,616	$17,781,806

2.15 Benefits

Comprehensive stormwater and wastewater management is making the benefits of clean rivers and streams apparent in the District. The District of Columbia Comprehensive Plan provides a foundation for policies that support ecologically sound waterfront development, which contributes to these benefits. Among the key elements of the plan is to "create and enhance relationships between the rivers and District residents, develop urban waterfronts and water related recreation in appropriate locations, and establish attractive pedestrian connections from neighborhoods to activities along the waterfronts." Development and rehabilitation of waterfront properties to include residential, retail, office space, and green space areas have significantly increased. The Washington D.C. Wharf (waterfront project) which is referred to as a place "Where D.C Meets" is completely constructed and flourishing. The Wharf is a mile-long stretch beautiful, epic, and vibrant waterfront view in the District's Southwest region along the Potomac River which has become a tourism destination that attracts people from different parts of the world. The Wharf has reestablished the city as an attractive monumental waterfront city with areas allocated to restaurants, retailers, residential, businesses, and many more recreational activities which has subsequently enhanced the recreational use of District. waters. More information about the Wharf can be found at https://www.wharfdc.com/wharf/.

One highlight is the recent development of the Anacostia River waterfront, which promotes recreational use of the waters. A recreational survey was conducted for three (3) District waterways (Rock Creek, Potomac River, and Anacostia River) in the summer of 2019 and 2021 as part of the District's citizen water quality monitoring program. The recreational activities observed in the three District waterways were rowing/sculling, powerboating, kayaking and canoeing, fishing, sailing, paddling, boating, water play by children, contact with wet dogs, contact when hiking, and others. The main recreational activities for Rock Creek and the Anacostia and Potomac Rivers are water play by children, rowing/sculling, and powerboating, respectively. The most recent report, including these findings, can be found at DC WQ Five Year Report_PB 12-21-23_0.pdf.

The restoration of the District's waters is a critical component of economic development. The quality of the District's waters continue to improve. Although a quantitative assessment of the benefits resulting from current water pollution control expenditures is difficult, the long-term benefits over time are evident. A fish tumor survey conducted by the United States Fish and Wildlife Service (USFWS) ("Temporal and Spatial Patterns in Tumor Prevalence in Brown Bullhead (*Ameiurus nebulosus*) in the Tidal Potomac River Watershed," April 2013) examined fish tissue analysis from the Anacostia River sampled in the years of 1996, 2000–2001, and 2009–2011. The survey shows a marked decrease in the prevalence of tumors in bottom-dwelling fish in the Anacostia River. In addition, annual surveys by the DOEE FWD document the general stability of the resident and migratory fish populations in the District's waters.

The improved water quality and health of fish in District waters supports fishing and other recreational activities, which benefits District residents and visitors.

Chapter 3 Surface Water Assessment

3.1 Background

Section 303(d) of the federal CWA and EPA implementing regulations require states to prepare a list of waterbodies that do not meet WQS even after all the pollution controls required by law are in place. In the District, waterbodies not meeting the appropriate District WQS are impaired.

The District assesses thirty-six (36) waterbodies and waterbody segments (Table 3.1). As shown in the table, the Potomac and Anacostia Rivers, Rock Creek, and Watts Branch are divided into two (2) or more segments for assessment purposes. Waterbodies are also classified as tidal or non-tidal.

Table 3.1 District of Columbia Waterbodies/Waterbody Segments

Tidal Waters	Non-Tidal Waters		
	Anacostia Tributaries	Potomac Tributaries	Rock Creek and Tributaries
Lower Anacostia Segment 1	Fort Chaplin Run	Battery Kemble Creek	Broad Branch
Upper Anacostia Segment 2	Fort Davis Tributary	Dalecarlia Tributary	Dumbarton Oaks
Kingman Lake	Fort Dupont Tributary	Foundry Branch	Fenwick Branch
Lower Potomac Segment 1	Fort Stanton Tributary	Oxon Run	Klingle Valley
Middle Potomac Segment 2	Hickey Run	C&O Canal	Luzon Branch
Upper Potomac Segment 3	Nash Run		Melvin Hazen Valley Branch
Tidal Basin	Pope Branch		Normanstone Creek
Washington Shipping Channel	Texas Avenue Tributary		Pinehurst Branch
	Watts Branch Lower Segment 1		Piney Branch
	Watts Branch Upper Segment 2		Portal Branch
			Rock Creek Lower Segment 1
			Rock Creek Upper Segment 2
			Soapstone Creek

The District follows EPA requirements and places each waterbody into one (1) or more of five (5) categories based on its support or non-support of designated uses. A list of categories can be found in the "Categorization" discussion in Subsection 3.2, Use Support Determination, below. Placement of waterbodies into assessment categories and development of the Category 5 list of impaired waterbodies (the 303(d) list) are significant features of the Integrated Report. Most importantly, TMDLs must be developed for waterbody segments in Category 5 of the 303(d) list of impaired waters.

Basis for Consideration of Data

Various data sources are used to assess District waters and develop the 2024 Integrated Report and the 303(d) list of impaired waters. Because the impairment listings and the 303(d) list are tools used in the TMDL process, the District ensures that the assessment process and the approved 303(d) list are based on data that utilized unbiased, scientifically sound data collection and analytical methods. The Water Quality Monitoring Regulations (Title 21, Chapter 19 of District of Columbia Municipal Regulations) were developed to ensure accurate, consistent, and reproducible water quality monitoring data for decision-making purposes. Data that satisfies these monitoring regulations was used in the assessment that led to development of the District 303(d) list in 2024.

In October 2023, a request for data was sent to organizations that may have water quality data on the District's waters. The 2024 list enumerates specific pollutants of concern in various waterbodies or waterbody segments. A summary of the data sets used to establish the 2024 303(d) list follows:

- 2022 Integrated Report and 303(d) list;
- District Ambient Water Quality Monitoring data for 2018–-2023;
- District Municipal Separate Storm Sewer System 2018-2023 Monitoring Data;
- Stream Survey data collected between 2021-2023;
- District Phytoplankton, Zooplankton and Benthic Macroinvertebrate Samples Report, 2009; and 2019;
- USGS Nontidal monitoring stations at Hickey Run (USGS station 01651770), Watts Branch (USGS station 01651800), and Rock Creek (USGS station 01648010), 2018-2023;
- The Anacostia Riverkeeper Citizen Science Project;
- USGS National Water Information System (NWIS) data, 2018-2023;
- District Fish Consumption Advisory, 2016;
- USFWS Fish Tissue Contamination Report for the District, 2023;
- TMDL documents for District waterbodies; and
- Background Study for Inorganic Chemicals in Soil, Surface Water, and Groundwater, 2022

No data received was disqualified and all data received was used in making use support determinations.

3.2 Use Support Determination

During the assessment process, data are used to determine if a waterbody supports each of its designated uses. In general, data are compared against numeric water quality criteria, narrative criteria, and other benthic macroinvertebrate, fish tissue, and physical habitat metrics to determine if a given use is supported. If a waterbody meets criteria for a given use, that use is supported in that waterbody segment. If some or all criteria are not met, the waterbody does not support that designated use and it is considered impaired for that designated use. Appendix 3.1 Use Support and Cause by Pollutant lists each waterbody segment along with the data used to make a use support determination for each WQS use class.

Designated Uses

The following are designated uses for the surface waters of the District of Columbia:

Class A -Primary contact recreation (swimmable).

Class B - Secondary contact recreation and aesthetic enjoyment (wadeable).

Class C - Protection and propagation of fish, shellfish, and wildlife (aquatic life).

Class D - Protection of human health related to consumption of fish and shellfish (fish consumption).

Class E - Navigation (ability to travel freely up and down the river using assorted watercraft, and absence of man-made objects that impede free movement).

Assessment Criteria

As described in the *Assessment and Listing Methodology, 2022*, the criteria used for assessment include numeric water quality criteria, narrative criteria, and other methods and protocols, including bioassessment, physical habitat assessment, and fish tissue analysis. The DOEE used the assessment protocols found in the 2022 Assessment and Listing Methodology, the assessment criteria are summarized as follows:

Class A: District WQS include narrative criteria and numeric criteria for *E. coli*, pH, and turbidity that apply to Class A waters for the protection of primary contact recreation.

Class B: District WQS include narrative criteria and numeric criteria for pH and turbidity that apply to Class B waters for the protection of secondary contact recreation and aesthetic enjoyment.

Class C: District WQS include narrative criteria and numeric for dissolved oxygen, temperature, pH, turbidity, secchi depth, total dissolved gases, hydrogen sulfide, oil and grease, Chlorophyll-a, inorganic compounds (mostly metals but including ammonia), and organic constituents that apply to Class C waters for the protection of aquatic life. Protocols for macroinvertebrate based bioassessment and physical habitat assessment are normally applied for surface water assessment but are undergoing review and revision and are unavailable for the 2024 IR.

Class D: District WQS include narrative criteria and numeric criteria for inorganic compounds (mostly metals) and organic chemicals that apply to Class D waters for the protection of human health. EPA’s recommended fish tissue screening levels are also used to assess metals and organic constituents found in fish tissue. If the median contaminant concentration exceeds the EPA screening value, the contaminant is listed as a cause of impairment for Class D fish tissue analysis.

Class E: District WQS include narrative criteria that apply to Class E waters for the protection of navigation.

Categorization

The District applies the five (5)-category approach for classifying WQS attainment using the guidelines for category placement established by EPA (U.S. EPA, 2005). Following assessment, the District places every waterbody into one or more of the five (5) IR categories shown below based on use support or non-support of individual uses for that waterbody.

Category 1 - All designated uses are supported; no use is threatened.

Category 2 - Available data and/or information indicate that some, but not all, designated uses are supported.

Category 3 - There is insufficient available data and/or information to make a use support determination.

Category 4 - Available data and/or information indicate that at least one (1) designated use is not supported or is threatened. The subcategories in Category 4 indicate how the non-support of, or threat to, the designated use (i.e., the impairment) is being addressed.

> Category 4a - A State developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination. This subcategory may include waterbodies with TMDLs that may or may not need to be revised for one reason or another, including court orders, consent decrees, and availability of new information.
>
> Category 4b - Other required control measures are expected to result in the attainment of an applicable WQS in a reasonable period of time.
>
> Category 4c - The non-attainment of any applicable WQS for the segment is the result of pollution and is not caused by a pollutant.

Category 5 - Available data and/or information indicate that at least one designated use is not supported or is threatened, and a TMDL is needed.

Priority and Ranking of TMDL Development Based on 303(d) List

Waterbody/pollutant combinations listed in Category 5 (the 303(d) list) require the development of TMDLs. The process summarized below describes how DOEE prioritizes and ranks the TMDLs that need to be developed based on the 303(d) list.

Revisions to TMDLs required by a consent decree or court order will supersede all other TMDLs scheduled for development.

Waterbodies placed on the draft 303(d) list for toxics substances, such as metals and organic constituents, are ranked as high priority for TMDL development based on their risk to human health. Based on previous experience with the TMDL development process, which includes data gathering, model development, and public participation, the District anticipates the development of TMDLs for waterbodies ranked as high priority in the next six (6) years.

Waterbodies placed on the draft 303(d) list for trash are ranked as high priority for TMDL development.

Waterbodies placed on the draft 303(d) list for bacteria (*E. coli)* associated with primary contact recreation use are ranked as a high priority for TMDL development. Bacterial impairment poses human health risk, though the observed effects are usually not as severe as toxic substances' effects. TMDL development for primary contact recreation use is given preference over TMDL development for secondary contact recreation (also a high priority).

Waterbodies placed on the draft 303(d) list for pH are also ranked as medium priority as it is an aquatic life use criterion.

The medium priority waterbodies will be scheduled for TMDL preparation within nine (9) years.

Waterbodies placed on the draft 303(d) list not previously mentioned are ranked low priority. Low priority waterbodies will be scheduled for TMDL preparation within twelve (12) years.

Georeferencing

The geographic location codes included in the 2024 303(d) list were taken from the National Hydrography Dataset. The District uses HUC-10 codes: 0207001003 for the Cameron Run-Potomac River watershed, 0207000810 for the Difficult Run-Potomac River, 0207001002 for Anacostia River watershed, and 0207001001 for the Rock Creek-Potomac River watershed. Only one District waterbody, Dalecarlia Tributary, is in the Difficult Run-Potomac River watershed. The EPA ATTAINS database is used to compile the data for the Integrated Report.

Public Participation

The draft 2024 Integrated Report was available for a thirty (30)-day public comment period, July 12 through August 11,2024. A Notice of Availability of the report, for a thirty (30)-day comment period was published on the DC Register, provided on the DOEE website, and emailed to stakeholders. DOEE received comments. Responses to the comments were prepared in a separate document and appropriate updates were made to the report. The IR and the response to comments document will be submitted to EPA Region 3 for approval.

Categorization of District of Columbia Waters

See Appendix 3.4 Draft District of Columbia 303(d).

3.3 Waterbody Segments Water Quality Assessment

Designated Use Support

Designated use support for this 2024 Integrated Report (IR) was determined through application of the Assessment Methodology and the results produced through the *Reevaluation of Toxics* document. A District-wide summary of fully supporting and impaired waterbody segments is presented in Table 3.2. As shown, all thirty-six (36) District waterbodies were assessed, and all thirty-six (36) waterbodies were found to be impaired for one (1) or more of their designated uses.

Table 3.2 Summary of Fully Supporting and Impaired Waterbody Segments

Degree of Use Support	Number of Waterbody Segments	Number of Waterbody Segments Assessed
Number fully supporting all assessed uses	0	36
Number impaired for one or more uses	36	0

A District-wide summary of use support by waterbodies is presented in Table 3.3.

Table 3.3 Individual Use Support Summary of Waterbody Segments

Use	Total Number	Number Assessed	Number Fully Supporting	Number Not Supporting	Number Not Assessed	Number with Insufficient Info
Class A: Primary Contact Recreation	36	36	1	35	0	0
Class B: Secondary Contact Recreation and Aesthetic Enjoyment	36	36	18	18	0	0
Class C: Protection and Propagation of Fish, Shellfish and Wildlife	36	36	1	23	0	12
Class D: Protection of Human Health related to Consumption of Fish and Shellfish	36	36	2	32	0	2
Class E: Navigation	22	22	22	0	0	0

Use support by use class as presented in Table 3.3 is summarized as follows:

Class A:

- One (1) waterbody supported the primary contact use.
- Thirty-five (35) waterbodies did not support the primary contact use due to pH, turbidity, and/or *E. coli* exceedances.

Class B:

- Eighteen (18) waterbodies supported the secondary contact recreation use.
- Eighteen (18) waterbodies did not support the secondary contact use because of violations of pH and/or turbidity/water clarity.

Class C:

- One (1) waterbody supported the aquatic life designated use.

- Twenty-three (23) waterbodies did not support the aquatic life designated use because of violations of Class C criteria, such as water clarity, dissolved oxygen, toxics, or other criteria.
- Twelve (12) waterbodies had insufficient information available to determine if they supported aquatic life use. This was due to a combination of the lack of the benthic macro-invertebrate and physical habitat metrics being available for use in 2024.

Class D:

- Two (2) waterbodies supported the human health use.
- Two (2) had insufficient information available to determine if they supported human health use. This was due to uncertainties in several of the toxic reevaluation results.
- Thirty-two (32) waterbodies did not support human health use based on violations of metals, pesticides, polychlorinated biphenyls (PCBs), or other criteria.

Class E:

- All twenty-two (22) of the waterbodies with a Class E navigation designated use supported that use.

The Category 5 303(d) List of Impaired Waterbodies

The Category 5 303(d) List of Impaired Waterbodies is central to IR reporting. This list changes from one IR reporting cycle to the next as new impairments are found and TMDLs are completed. In addition, new data may show that previous impairments are no longer impaired. The summary of Category 5 causes for impairments are presented in Table 3.4.

3.4 Relative Assessment of Causes/Stressors

Table 3.4 summarizes the stressors/causes of impairment identified in the 2024 IR.

Table 3.4 Total Number of Waterbody Segments Impaired by Various Causes

Impairment Causes	Number of Waterbodies Impacted
Arsenic	19
Benzo[a]Anthracene	10
Benzo[a]Pyrene	4
Benzo[b]Fluoranthene	9
Benzo[k]Fluoranthene	7
Biochemical Oxygen Demand (BOD)	3
Chlordane	5
Chlordane In Fish Tissue	8
Chlorine, Residual (Chlorine Demand)	1

Impairment Causes	**Number of Waterbodies Impacted**
Chlorophyll-a	5
Chrysene	2
Copper	1
DDD (Dichlorodiphenyldichloroethane)	6
DDE (Dichlorodiphenyldichloroethylene)	5
DDT (Dichlorodiphenyltrichloroethane)	8
Dibenz[a,h]Anthracene	7
Dieldrin	23
Dieldrin In Fish Tissue	8
Dissolved Oxygen	3
Escherichia coli (E. Coli)	35
Heptachlor Epoxide	18
Heptachor Epoxide In Fish Tissue	8
Indeno[1,2,3-cd]Pyrene	7
Mercury	1
Nitrogen, Total	8
Oil And Grease	2
PCBs In Fish Tissue	8
Phosphorus, Total	8
Polychlorinated Biphenyls (PCBs)	28
Total Suspended Solids (TSS)	8
Trash	2
Turbidity	17

3.5 Relative Assessment of Sources

Table 3.5 summarized sources of impairment identified in the 2024 IR.

Table 3.5 Total Number of Waterbody Segments Impaired by Various Sources

Impairment Source	Number of Waterbodies Impacted
Unspecified urban stormwater	32
Discharges from municipal separate storm sewer systems (MS4)	26
Residential districts	15
Source unknown	10
Impacts from hydrostructure flow regulation/modification	10
Upstream source	7
Illegal dumps or other inappropriate waste disposal	8
Combined sewer overflows	9
Municipal (urbanized high-density area)	5
Wet weather discharges (point source and combination of stormwater, SSO or CSO)	5
Channelization	4
Wet weather discharges (nonpoint source)	4
Municipal point source discharges	3
Contaminated sediments	6
Atmospheric deposition - toxics	3
Waterfowl	1
Highway/road/bridge runoff (non-construction related)	1
Urban runoff/storm sewers	1

3.6 Special Topics

Chesapeake Bay TMDL

Pursuant to Section 303(d) of the Clean Water Act (CWA), EPA established the Chesapeake Bay TMDL for nutrients and sediment for all impaired segments in the tidal portion of the Chesapeake Bay watershed on December 29, 2010. As a signatory to the EPA Chesapeake Bay Agreement, the District has been actively working with EPA and the other partner jurisdictions (Maryland, Virginia, Pennsylvania, West Virginia, New York, and Delaware) to develop and implement the Chesapeake Bay TMDL.

During this reporting cycle, DOEE WQD regularly participated in monthly meetings of the Bay Water Quality Goal Implementation Team (WQGIT) and technical workgroup (e.g., Land Use, Modeling, Wastewater, Water Quality Trading, etc.). The WQD also co-chaired the WQGIT and helped lead the multi-jurisdiction agreement on decisions related to land use, Bay modeling, and climate change impacts to planning targets. In addition, WQD and other DOEE Divisions which participate in Bay meetings ensure that issues specific to the District are identified and addressed.

Bacteria TMDLs Revision

Between 2003 and 2004, DOEE developed, and EPA approved, bacteria TMDLs for District waters based on fecal coliform. These TMDLs needed to be revised to express the load allocations in "daily" terms due to a court order in *Friends of the Earth v. EPA*, 446 F.3d 140 (D.C. Cir. 2006). In addition, fecal coliform needed to be translated to *E. coli* after the District adopted *E. coli* for purposes of the bacteria water quality criteria in 2008.

In 2014, EPA approved bacteria TMDLs for the Potomac River, the Anacostia River, Kingman Lake, Oxon Run, Rock Creek, C&O Canal, the Tidal Basin, and Washington Ship Channel.

In 2015, DC Water filed a lawsuit in the United States District Court for the District of Columbia against EPA challenging the TMDLs. In the lawsuit, which has since been withdrawn, DC Water sought to correct what it perceived as technical mistakes, arguing the TMDLs set the waste load allocations for Blue Plains too low. In response, EPA issued a revised decision rationale supporting the approval of DOEE's TMDL that was approved in 2017.

In 2016, the Anacostia RiverKeeper, Kingman Park Civic Association, and Potomac RiverKeeper Network (plaintiffs) jointly filed a lawsuit in the United States District Court for the District of Columbia against EPA, challenging its approval of the TMDLs. In the lawsuit, the plaintiffs argued that the TMDLs failed to appropriately set a maximum daily load as required by the *Friends of the Earth* decision and failed to achieve the narrative criteria designed to protect human health. *Anacostia Riverkeeper, Inc. et al v. McCarthy et al*, Case No. 1:16-cv-01651-CRC (D.D.C.).

In 2019, the Court issued a Memorandum Opinion holding that EPA violated the CWA "when it approved 'total maximum daily load' that did not establish daily maximum discharge limits". The Court also held that EPA's reasoning that the numeric criteria established for *E. coli* also met the District's narrative WQS criteria was flawed. As a result, the Court vacated EPA's approval of the District's bacteria TMDLs but stayed vacatur for one year to allow the District and EPA to develop new TMDLs. Vacatur has since been stayed until December 15, 2024, by the Court.

Since the Court decision in 2019, the District has worked, with EPA's assistance, to revise the bacteria TMDLs. Efforts for this Integrated Report cycle include: developing options to revise the TMDLs; engaging stakeholders and plaintiffs on those options; estimating a timeline to revise TMDLs; exploring TMDL datasets (e.g., past modeling files and analyses) to investigate past evidence to address the Court's decision; and collating data for future TMDL modeling. In addition, EPA has allocated funding and developed a work plan to help identify data gaps that need filling to revise the TMDLs. Data collection is on-going.

Anacostia River Trash TMDL Revision

On March 30, 2018, in *Natural Resources Defense Council, Inc. v. EPA*, 301 F. Supp. 3d 133 (D.D.C. 2018), the Court vacated the EPA's approval of the TMDL for trash in the Anacostia River, but stayed vacatur until such time as EPA approves a replacement TMDL. The Court further directed EPA to submit regular status reports informing the Court of the actions that the agency has taken to comply with the Order. Since July 2019, EPA has provided the Court with regular status updates on EPA, DOEE, and Maryland Department of Environment (MDE) activities to revise the trash TMDLs.

Activities during this reporting cycle include working with Morgan State University to review Anacostia trash literature and other trash TMDLs, review scientific literature on public use surveys, and develop a public survey to identify quantitative and qualitative trash thresholds for the recreational use of the Anacostia River. These thresholds will be important for developing a TMDL endpoint. As part of the contracted work described above, EPA, MDE, and DOEE meet regularly with the University to provide technical expertise and help move the study forward. It is estimated that a final study report with recommendations on trash TMDL endpoint will be ready by May-June of 2024.

Anacostia River Metals and Toxics TMDLs Revision

In 1988, the District listed waterbodies impaired by toxics on its 303(d) list, and subsequently developed TMDLs. In 2006, Friends of the Earth successfully challenged the District's TMDLs because they did not express daily loads (*Friends of the Earth vs. EPA*, 446 F.3d 140,144 (D.C. Cir. 2006)). Then in 2009, Anacostia Riverkeeper, Friends of the Earth, and Potomac Riverkeepers filed a complaint that other District TMDLs were also not expressed as daily loads. The Court ordered that the TMDLs be vacated but stayed the vacatur until January 2017. Due to additional data needs identified by DOEE and EPA, the Court extended the current vacatur through March 2022. The vacatur deadline has since been extended again to April 1, 2024.

- With EPA's assistance, a contractor helped draft a TMDL modeling report that supported the draft metals and toxics TMDLs. DOEE's WQD provided expertise and guidance on the modeling report.
- The Draft TMDLs were public-noticed in the DC Register for a-30-day public comment period from July 9 to August 7, 2021.
- A key comment received following this public notice was the need to incorporate climate change consideration as part of the TMDLs revision. To make this change and other updates, EPA sought and was granted an extension ending April 1, 2024, by the court.
- The updated *Draft* revised TMDL documents with all the changes included were published for public comment in the DC Register on September 8, 2023, and the comment period was to end on October 8, 2023. However, DOEE received and granted a request (from Earthjustice on behalf of Anacostia Riverkeeper, Potomac Riverkeeper Network, and Friends of the Earth) to extend the written comment period for additional 14 days (i.e., until October 23, 2023).
- The revised toxics TMDL document has been finalized and submitted to EPA. A chapter on climate change has been added and facilities permitted under the Multi-sector General Permit (MSGP) have been assigned their individual wasteload allocations (WLAs) to

further improve these TMDLs. EPA approved the revised Toxics TMDL on March 29, 2024.

Bacteria Source Tracking Studies

All District waters are impaired by bacteria. DOEE is using new tools and techniques to identify bacteria sources that will facilitate source control and mitigating practices to reduce bacteria impairment of District waters.

Anacostia River

WQD partnered with EPA's Office of Research and Development and EPA Region 3 to both source and track microbial pollution in headwater streams of the Anacostia River. Seven (7) headwater streams were monitored for water quality and hydrology for twelve (12) months. In addition, water samples were collected from headwater streams and MS4 pipe outfalls for quantitative polymerase chain reaction analysis. A total of two hundred thirty-one (231) water samples were collected across thirty (33) sampling events over fifty-seven (57) weeks (from November 2019 to December 2020). Paired measurements of *E. coli*, precipitation, and host-associated genetic markers indicative of human, ruminant, dog, and avian fecal sources were assessed in all the two hundred thirty-one (231) samples.

The results indicated that:

- Forty-four and six-tenths percent (44.6%) of receiving water samples exceeded the single sample maximum value of four hundred ten (410) most probable number (MPN)/one hundred (100) milliliters (ml) demonstrating that these urban streams frequently harbor fecal pollution levels that compromise water quality.
- *E. coli* levels were considerably higher across sites after rain events indicating that fecal pollution from urban landscape run-off and stormwater outfalls contribute substantially to water impairment.
- Human fecal pollution was detected at all sites, but occurrence was highly variable between different sites.
- Human fecal pollution average concentrations were significantly higher in samples where *E. coli* levels exceeded the four hundred ten (410) MPN/one hundred (100) ml benchmark or after rain events indicating a close link between human waste, precipitation, and reduced water quality.
- Dog, avian and ruminant sources were always higher after rain or when *E. coli* levels exceeded the local water quality assessment benchmark (410 MPN/100 ml).
- Ruminant waste was often not detected in the absence of rainfall. Avian fecal scores exhibited a different trend where waste was detected regardless of sample groupings.

Conclusions:

- Findings suggest that the elimination of human waste sources alone may not reduce *E. coli* to an acceptable level due to the presence of dog, ruminant, and avian sources.

- Prioritizing sites with the highest average concentration of human waste may be an effective strategy to minimize potential exposure to human pathogens reducing public health risks.

Monitoring and Predictive Modeling of Bacteria in the Lower Anacostia River

DOEE collaborated with the USGS to undertake additional monitoring of bacteria and to create a model to enhance our understanding of bacteria dynamics in the Lower Anacostia River. USGS received funding 2020 through 2023 the Urban Waters Federal Partnership and DOEE contributed matching funding for the study.

This multiyear collaborative study has concluded. Activities included evaluating and statistically summarizing bacteria, water quality, water flow, and other parameters during a twenty-year (20) period; exploring statistical relationships between bacteria and other parameters; installing a new USGS gage station (that measures flow and real-time bacteria concentrations) in lower Anacostia; and testing new tools, which use fluorometry to quantify bacteria in real-time.

USGS is working on a conceptual model to enhance our understanding of bacteria dynamics in Anacostia River. Ultimately this model will be used to predict the likelihood that bacteria concentrations falling above or below Recreational Water Quality Criteria for bacteria in the Lower Anacostia River. This model will be used as one (1) line of evidence to help local decision-making related to swimming in the Anacostia River.

Volunteer Water Quality Monitoring in District Waters

The Volunteer Water Quality Monitoring project is a citizen science project that started in 2018. DOEE awarded a grant to Alliance for the Chesapeake Bay in 2021 to continue implementation of the District's volunteer-based program previously managed by Anacostia Riverkeeper (ARK). Volunteers monitored water quality for *E. coli,* pH, turbidity, and water temperature at twenty-four (24) locations in District rivers and tributaries where high recreation activities occurred. In 2022, two monitoring locations in Watts Branch (WB1 and WB2) were added to the Anacostia River sampling locations. Monitoring took place weekly from May to September every year. Additionally, a Recreational Use Survey of on-water recreation in District waters was completed. Volunteers observed types of recreation activities witnessed, and the number of participants engaged in each activity.

Alliance for the Chesapeake Bay partnered with ARK, Nature Forward and Rock Creek Conservancy to train volunteers and execute the project. Volunteers engaged from all eight (8) District wards have worked together with the Alliance and partners and completed the first five (5) years of the project. All data generated were published (via water reporter, social media, and the Chesapeake Monitoring Cooperative database) and accessible to the public. During the 2022 and 2023 monitoring period, the following trends were observed throughout the District's surface waters:

<u>Watershed Trends from 2022-2023</u>

While bacteria levels ranged across the three (3) watersheds and often violated the geometric mean standard, other measures of water quality including pH (6.5-8), water temperature (less than 32.3°F), and turbidity (less than 20 Nephelometric Turbidity Unit (NTU) above ambient) were generally within the acceptable range.

Anacostia River Trends

The Anacostia River sites are located on the main stem from the National Arboretum to the Washington Channel, with one (1) tributary site located on Hickey Run and two (2) at Watts Branch. Bacteria levels were generally lower downstream than upstream except at Yards Marina, which recorded one hundred percent (100%) of the samples in violation of the *E. coli* geometric mean threshold (126 MPN/100 ml) for both years. The geometric mean trends showed a lesser percentage of violations at the downstream sites than at upstream sites (Table 3.9). At the Washington Channel and Buzzard Point sites, six percent (6%) violations of geometric mean were recorded in 2022 and no violations were recorded in 2023. All geometric means recorded in 2023 were below the *E. coli* geometric mean threshold for both sites. The Anacostia Park site percent violation of the geometric mean threshold decreased from one hundred percent (100%) to seventy-five percent (75%). The National Arboretum, Hickey Run and Watts Branch sites exceeded the threshold ninety-four (94%) to one hundred percent (100%) of the time. In the Anacostia River, turbidity tended to decrease downstream. The turbidity for all Anacostia sites recorded fewer percent violations in 2023 than in 2022 and these ranged from zero (0%) to five percent (5%) in 2023 at all sites except the National Arboretum site. Violations for low pH occurred more frequently for sites along the Anacostia River during this period than in previous years. The highest percent pH violations were recorded in the Anacostia Park and National Arboretum sites. These sites had low pH values sixty percent (60%) and thirty-five percent (35%) of the time in 2022 and 2023, respectively. This was a very different trend from 2019 to 2021 period when most samples violated the pH standard zero (0%) to five percent (5%) of the time, respectively. More detail is provided below in Table 3.6.

Table 3.6 Percent Violations for *E. coli* (geometric mean)), pH and Turbidity

Monitoring Site	**% violation *E. coli* geometric mean**		**% violation pH (<6 and >8.5)**		**% violation turbidity**	
	2022	2023	2022	2023	2022	2023
RC-1 (Rock Creek at Juniper Street NW)	100	100	20	5	20	5
RC-2 (Pinehurst Branch)	93	75	5	10	0	0
RC-3 (Broad Branch)	100	69	0	5	40	5
RC-4a (Soapstone Creek)	100	100	5	0	10	0
RC-5 (Reservation 630 Melvin Hazen Run)	100	81	15	0	5	0
RC-6 (Rock Creek below Piney Branch)	100	100	25	0	15	5
RC-7 (Normanstone Run)	100	100	45	16	5	0
RC-8 (P Street Beach)	100	100	30	15	15	5
PR-1 (Battery Kemble Park)	93	100	30	0	0	0

Monitoring Site	**% violation *E. coli* geometric mean**		**% violation pH (<6 and >8.5)**		**% violation turbidity**	
	2022	2023	2022	2023	2022	2023
PR-2 (Fletcher's Cove)	80	75	10	0	25	0
PR-3 (Foundry Branch)	100	100	5	0	0	0
PR-4 (Washington Canoe Club)	100	100	5	0	15	0
PR-5 (Thompson Boat Center)	47	94	0	0	15	0
PR-6 (Tidal Basin)	0	0	0	5	10	0
PR-7 (Columbia Island)	33	6	5	5	15	0
AR-1 (National Arboretum)	94	100	10	35	55	15
AR-2 (Hickey Run)	100	100	10	20	20	0
AR-3 (Kingman Lake)	63	50	25	5	55	5
AR-4 (Anacostia Park)	100	75	60	21	45	5
AR-5 (Yards Marina)	100	100	25	0	15	0
AR-6 (Buzzard Point)	6	0	25	5	10	0
AR-7 (Washington Channel)	6	0	30	0	10	0
WB-1 (Watts Branch, Marvin Gay	100	100	0	5	10	5
WB-2 (Watts Branch at Kenilworth	100	100	5	11	15	0

Potomac River Trends

The Potomac River sites include five (5) on the mainstem from Fletcher's Cove to Columbia Island. The two (2) Potomac tributaries sampled were Battery Kemble Park and Foundry Branch. The Tidal Basin and Columbia Island sites on mainstem sites reported consistently low bacteria levels throughout the two (2) years of monitoring. The Tidal Basin site met water quality standards for recreation ninety (90%)to ninety-seven percent (97%) of the time and no *E. coli* violations of the geometric mean standard were recorded. Bacteria levels at the Washington Canoe Club and Thompson Boat Center sites increased over time, with one hundred percent (100%) of samples from the Washington Canoe Club site failing to meet *E. coli* standards in 2021. The Battery Kemble Park and Foundry Branch sites frequently exhibited very high bacteria loads and recorded the highest percentages of violations, including in dry weather. The Potomac River sites showed generally good water quality for pH and turbidity. Low pH violations were not frequent for sites in the Potomac. The highest percent pH violation of thirty percent (30%) was recorded at Fletcher's Cove in 2022. Most sites had no pH violations in 2023.

Turbidity levels were very low at all locations and no violations were recorded in 2023. The Battery Kemble and Foundry Branch sites had the lowest turbidity level; no violations were recorded at these sites in both years. The turbidity at the Fletcher's Cove site was the highest on average for the Potomac River sites, the result of river flow patterns and sedimentation issues in that section of the Potomac River.

Rock Creek Trends

Rock Creek exhibited very high levels of bacteria, oftentimes more than the Anacostia and Potomac Rivers. Based on the geometric mean standard, the percentage of violations recorded in Rock Creek was equal to or greater than sixty-nine percent (69%) for all sites, reflecting the significant bacteria impairment of Rock Creek and its tributaries. Every site except for Pinehurst Branch exceeded the *E. coli* threshold with one hundred percent (100%) violations recorded for at least one (1) year during the two-year period. Normanstone Run exhibited the highest average bacteria levels in Rock Creek for both years and levels increased from 2022-2023. The consistently unsafe levels of bacteria across nearly every Rock Creek site show that the creek remains significantly impaired throughout the section of it that runs through the District. The average pH, turbidity, and water temperature at Rock Creek sites fell within the acceptable ranges for each category. Normanstone Run had the lowest average pH value at 6.2 and forty-five percent (45%) violation was recorded in 2022, and Broad Branch had the highest pH average at 7.0. Turbidity levels at Pinehurst Branch were low and did not exceed the turbidity threshold of twenty NTU (<20 NTU). The highest percent violation of forty percent (40%) for turbidity was recorded at Broad Branch in 2022. The Melvin Hazen Run site was renamed to Reservation 630.

Recreational Use Trends

All three District waterways experienced a decline in weekday recreational use. Potomac River had the highest number of participants recreating on the water and Rock Creek had the lowest (Figure 3.1). Rock Creek and the Anacostia River saw more decline in the amount of recreation occurring from 2022 to 2023. The Potomac River did not experience the same fluctuations as Rock Creek and the Anacostia River as nearly the same number of recreational use participants were recorded each year. The most common activities were rowing/sculling with sixty-seven (67%), primarily observed at sites near docks and at boat launches on the Anacostia and Potomac Rivers. Many power boats were also observed, especially at downstream sites. Water-based recreation in Rock Creek has declined by more than fifty percent (50%) since 2020 when the #RecreateResponsibly campaign was implemented by Rock Creek Conservancy and the National Park Service. Signage near stream entry points warns visitors to "Stay Dry, Stay Safe'. Dogs were still observed in the water in Rock Creek. Overall, the total recreation activities observed in the Anacostia and Potomac Rivers, and Rock Creek declined by forty-nine percent (49%), seven percent (7%), and thirty-three percent (33%) respectively from 2022 to 2023.

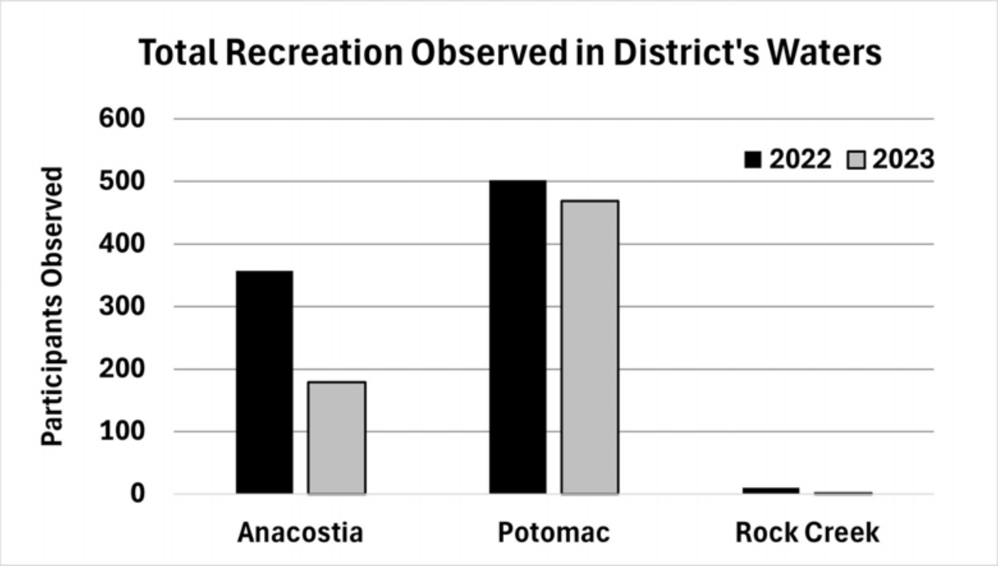


Figure 3.1 Total Recreation Participants Observed in District's Waters

TMDL Implementation Plan

DOEE submitted an updated draft of its Consolidated TMDL Implementation Plan (TMDL IP) in September of 2022. The 2022 Consolidated TMDL IP, which builds on – and primarily continues – strategies identified and implemented during the development of the 2016 plan, describes how and when the District's MS4 WLAs will be attained and focuses on achieving load reductions simultaneously in all the District's watersheds with TMDLs. This plan uses a consolidated modeling approach to track and report on these load reductions in a consistent manner.

The TMDL IP includes a series of programmatic milestones the District has committed to in the interest of accelerating the pace of stormwater management implementation. Significant programmatic milestones identified in the 2022 TMDL IP include the following:

- Identifying suitable locations for potential stormwater retrofit projects that can be implemented to help meet WLA targets. This "BMP retrofit inventory" can be found here.
- Completing microbial source tracking studies that will inform targeted bacteria source reduction actions. One study will be in the Rock Creek watershed with another in the Anacostia River watershed.
- A review of potential revisions to the stormwater regulations yielded two potential changes that the District is pursuing: updating the peak discharge requirements and lowering the area threshold for regulated projects.

- Using the list of targeted watersheds to drive BMP implementation in those watersheds.
- Developing and providing internal “best practices” guidance on BMP selection and design to promote higher pollutant removal efficiencies.
- Continue with regular updates to the Implementation Plan Modeling Tool and the TMDL IP.
- Working to revise and update District TMDLs (ongoing):
    - Identifying priority TMDLs in need of revisions.
    - Developing a monitoring work plan to support TMDL revisions.
    - Conducting intensive monitoring to support TMDL revisions.
    - Completing the first round of priority TMDL revisions.

TMDL IP Modeling

The District’s TMDL Implementation Plan Modeling Tool (IPMT) was developed in 2014 to model the stormwater runoff volumes, pollutant loads generated, and load reductions achieved through stormwater management. By generating a pollutant load “gap” between current conditions and the wasteload allocation (WLA), it is possible to determine how much load reduction is required to meet an individual WLA. It can also be used to forecast pollutant reductions associated with implementation of the District’s 2013 Stormwater Regulations. The IPMT also includes a comprehensive TMDL inventory that provides users with access to details for each waterbody, pollutant, TMDL document, decision rationale document, and numeric WLA.

Application of the IPMT provides a method to track the achievement of TMDLs in a consistent manner for all pollutants. DOEE updates the IPMT at the end of each annual reporting cycle with the specifications of Best Management Practices (BMPs) that have been implemented in that time frame. These data are then used to model pollution reductions made toward implementation milestones and, if necessary, guide adaptive management strategies.

DOEE applies the IPMT model to calculate the runoff and pollutant load reductions from BMP implementation for each MS4 Permit reporting year. Tables 3.7, 3.8, and 3.9 show the IPMT outputs for reporting year 2023.

Table 3.7 Pollutant Load Reductions, 2022-2023

Watershed	Runoff Retained (gallons)	Total Nitrogen (lbs)	Total Phosphorus (lbs)	Total Suspended Solids (lbs)	Fecal Coliform (billion MPN)	Copper (lbs)	Lead (lbs)	Cadmi-um (lbs)	Zinc (lbs)
Anacostia	35,054,723	1,051	121	23,759	7,900	16.61	5.11	5.59	38.37

Watershed	**Runoff Retained (gallons)**	**Total Nitrogen (lbs)**	**Total Phosphorus (lbs)**	**Total Suspended Solids (lbs)**	**Fecal Coliform (billion MPN)**	**Copper (lbs)**	**Lead (lbs)**	**Cadmi -um (lbs)**	**Zinc (lbs)**
Rock Creek	16,535,441	474	54	7,646	3,488	7.39	2.24	2.45	14.22
Potomac River	21,099,185	642	75	9,023	4,907	10.24	3.20	3.51	19.90
Total	**72,689,350**	**2,167**	**250**	**40,429**	**16,294**	**34.2**	**10.6**	**11.6**	**72.49**

Table Key

The following tables are color-coded as follows:

Green cells indicate that the WLA has already been achieved for that waterbody and pollutant combination.
Blue cells indicate that the benchmark load reduction was achieved or exceeded for that waterbody and pollutant combination.
Orange cells indicate that the benchmark load reduction was not achieved for that waterbody and pollutant combination.
Grey cells indicate that there is no MS4 WLA for that waterbody and pollutant combination, and therefore no benchmark has been established. Load reductions are provided for informational purposes only.

Table 3.8 Overall Summary of WLA Benchmark Achievements, 2022-2023

WLA Achieved	26
Benchmark Achieved	31
Benchmark Not Achieved	105
No WLA or benchmark	894

Table 3.9 Pollutant Load Reductions from BMP Implementation with WLA Benchmarks, 2022-2023

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium^1 (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
Anacostia	16,581,405	518.33	59.92	11,792.9	9,682	5,021	598.6	2.3E-01	8.1E+00	2.5E+00	2.8E+00	2.9E-02	1.9E+01	1.4E-03	4.6E-04	2.1E-03	5.3E-03	4.0E-05	1.3E-04	9.1E-02	6.1E-01	4.3E-01	1.2E-02	3,885.7	-
Anacostia Lower	3,808,725	109.77	12.57	2,449.0	2,051	1,142	116.1	5.0E-02	1.7E+00	5.3E-01	5.8E-01	6.2E-03	4.0E+00	3.2E-04	9.9E-05	4.4E-04	1.1E-03	9.2E-06	3.0E-05	2.1E-02	1.3E-01	8.9E-02	2.6E-03	823.3	-

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium[1] (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
Anacostia Upper	12,772,680	408.57	47.35	9,343.9	7,631	3,879	482.5	1.8E-01	6.4E+00	2.0E+00	2.2E+00	2.3E-02	1.5E+01	1.1E-03	3.6E-04	1.6E-03	4.2E-03	3.1E-05	1.0E-04	7.1E-02	4.8E-01	3.4E-01	9.6E-03	3,062.4	-
ANATF_DC	13,540,478	310.60	37.45	6,930.7	5,981	2,622	463.3	1.4E-01	4.9E+00	1.6E+00	1.7E+00	1.7E-02	1.1E+01	7.7E-04	2.8E-04	1.3E-03	3.3E-03	2.1E-05	7.0E-05	4.9E-02	3.4E-01	2.8E-01	7.3E-03	2,400.4	-
ANATF_MD	4,630,847	87.42	9.80	1,845.7	1,527	811	86.5	3.7E-02	1.3E+00	4.0E-01	4.3E-01	4.6E-03	3.0E+00	2.3E-04	7.3E-05	3.3E-04	8.4E-04	6.5E-06	2.2E-05	1.5E-02	9.8E-02	6.7E-02	2.0E-03	612.8	-
Battery Kemble Creek	972,226	26.94	3.08	341.3	503	228	27.2	1.2E-02	4.3E-01	1.3E-01	1.4E-01	1.5E-03	8.2E-01	8.0E-05	2.4E-05	1.1E-04	2.8E-04	2.4E-06	7.8E-06	5.3E-03	3.4E-02	2.2E-02	6.5E-04	202.0	-
Broad Branch	1,314,047	37.85	4.27	652.6	680	260	45.5	1.7E-02	5.8E-01	1.7E-01	1.9E-01	2.1E-03	1.1E+00	1.1E-04	3.3E-05	1.5E-04	3.8E-04	3.2E-06	1.0E-05	7.2E-03	4.6E-02	2.9E-02	8.8E-04	273.1	-
C&O Canal	1,350,762	37.67	4.30	474.2	699	317	37.8	1.7E-02	6.0E-01	1.8E-01	2.0E-01	2.1E-03	1.1E+00	1.1E-04	3.4E-05	1.5E-04	3.9E-04	3.3E-06	1.1E-05	7.4E-03	4.7E-02	3.0E-02	9.1E-04	280.7	-
Dalecarlia Tributary	1,818,113	52.69	6.02	682.7	986	444	50.8	2.4E-02	8.3E-01	2.6E-01	2.8E-01	3.0E-03	1.6E+00	1.5E-04	4.7E-05	2.1E-04	5.4E-04	4.4E-06	1.5E-05	1.0E-02	6.4E-02	4.3E-02	1.3E-03	395.7	-
Dumbarton Oaks	19,030	0.53	0.06	9.5	10	4	0.7	2.4E-04	8.4E-03	2.5E-03	2.8E-03	3.0E-05	1.6E-02	1.6E-06	4.8E-07	2.1E-06	5.4E-06	4.6E-08	1.5E-07	1.0E-04	6.6E-04	4.3E-04	1.3E-05	4.0	-
Fenwick Branch	113,578	3.44	0.38	56.4	59	22	3.9	1.5E-03	5.0E-02	1.5E-02	1.7E-02	1.8E-04	9.6E-02	9.3E-06	2.8E-06	1.3E-05	3.2E-05	2.7E-07	9.1E-07	6.2E-04	3.9E-03	2.5E-03	7.6E-05	23.6	-

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium[1] (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
Fort Chaplin Tributary	39,536	1.27	0.14	24.2	20	12	1.2	5.1E-04	1.7E-02	5.3E-03	5.8E-03	6.3E-05	4.0E-02	3.2E-06	9.9E-07	4.4E-06	1.1E-05	9.6E-08	3.2E-07	2.2E-04	1.4E-03	8.9E-04	2.7E-05	8.2	-
Fort Davis Tributary	38,035	1.17	0.13	23.3	20	11	1.2	4.9E-04	1.7E-02	5.1E-03	5.5E-03	6.0E-05	3.8E-02	3.1E-06	9.5E-07	4.2E-06	1.1E-05	9.2E-08	3.0E-07	2.1E-04	1.3E-03	8.5E-04	2.6E-05	7.9	-
Fort Dupont Tributary	17,419	0.48	0.06	10.7	9	5	0.5	2.2E-04	7.7E-03	2.3E-03	2.5E-03	2.8E-05	1.8E-02	1.4E-06	4.4E-07	1.9E-06	5.0E-06	4.2E-08	1.4E-07	9.6E-05	6.0E-04	3.9E-04	1.2E-05	3.6	-
Fort Stanton Tributary	40,687	1.13	0.13	24.9	21	12	1.2	5.2E-04	1.8E-02	5.4E-03	5.9E-03	6.5E-05	4.1E-02	3.3E-06	1.0E-06	4.5E-06	1.2E-05	9.8E-08	3.3E-07	2.2E-04	1.4E-03	9.1E-04	2.7E-05	8.5	-
Foundry Branch	187,294	17.70	2.31	509.4	546	272	5.2	9.8E-03	4.0E-01	1.6E-01	1.7E-01	1.2E-03	8.9E-01	3.0E-05	2.3E-05	1.2E-04	2.9E-04	4.5E-07	1.5E-06	1.0E-03	1.7E-02	3.0E-02	5.4E-04	219.0	-
Hickey Run	900,971	33.13	4.47	872.1	683	279	110.3	1.6E-02	5.6E-01	1.8E-01	2.0E-01	1.9E-03	1.3E+00	8.3E-05	3.2E-05	1.5E-04	3.8E-04	2.2E-06	7.2E-06	5.0E-03	3.8E-02	3.2E-02	8.2E-04	274.1	-
Kingman Lake	460,107	13.98	1.61	322.5	265	138	14.0	6.4E-03	2.2E-01	6.9E-02	7.6E-02	7.9E-04	5.2E-01	3.9E-05	1.3E-05	5.7E-05	1.5E-04	1.1E-06	3.7E-06	2.5E-03	1.7E-02	1.2E-02	3.4E-04	106.5	-
Klingle Valley Run	737,182	20.93	2.39	376.6	390	146	25.5	9.6E-03	3.3E-01	1.0E-01	1.1E-01	1.2E-03	6.4E-01	6.1E-05	1.9E-05	8.4E-05	2.1E-04	1.8E-06	5.9E-06	4.1E-03	2.6E-02	1.7E-02	5.0E-04	156.4	-
Lower Beaverdam Creek	507,912	17.35	2.07	453.8	358	188	21.9	8.3E-03	3.0E-01	9.5E-02	1.0E-01	1.0E-03	7.0E-01	4.6E-05	1.7E-05	7.8E-05	2.0E-04	1.2E-06	4.1E-06	2.8E-03	2.1E-02	1.6E-02	4.4E-04	143.6	-
Luzon Branch	1,577,092	44.38	5.05	784.2	817	312	54.6	2.0E-02	7.0E-01	2.1E-01	2.3E-01	2.5E-03	1.3E+00	1.3E-04	4.0E-05	1.8E-04	4.5E-04	3.8E-06	1.3E-05	8.7E-03	5.5E-02	3.5E-02	1.1E-03	328.0	-

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium[1] (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
Melvin Hazen Valley Branch	99,496	2.76	0.32	49.4	52	20	3.4	1.3E-03	4.4E-02	1.3E-02	1.4E-02	1.6E-04	8.4E-02	8.2E-06	2.5E-06	1.1E-05	2.8E-05	2.4E-07	7.9E-07	5.5E-04	3.5E-03	2.2E-03	6.7E-05	20.7	-
Nash Run	170,941	5.56	0.61	109.4	92	51	5.2	2.3E-03	7.8E-02	2.4E-02	2.6E-02	2.8E-04	1.8E-01	1.4E-05	4.4E-06	2.0E-05	5.0E-05	4.1E-07	1.4E-06	9.4E-04	6.0E-03	4.0E-03	1.2E-04	36.8	-
Normanstone Creek	51,788	1.44	0.16	25.7	27	10	1.8	6.7E-04	2.3E-02	6.9E-03	7.5E-03	8.2E-05	4.4E-02	4.2E-06	1.3E-06	5.7E-06	1.5E-05	1.3E-07	4.1E-07	2.8E-04	1.8E-03	1.2E-03	3.5E-05	10.8	-
Northwest Branch	4,076,545	123.93	14.03	2,675.4	2,231	1,223	128.3	5.5E-02	1.9E+00	5.8E-01	6.3E-01	6.7E-03	4.3E+00	3.4E-04	1.1E-04	4.8E-04	1.2E-03	9.9E-06	3.3E-05	2.2E-02	1.5E-01	9.8E-02	2.9E-03	895.2	-
Oxon Run	7,573,225	225.53	25.85	2,920.9	4,181	1,775	211.8	1.0E-01	3.5E+00	1.1E+00	1.2E+00	1.3E-02	6.8E+00	6.3E-04	2.0E-04	9.0E-04	2.3E-03	1.8E-05	6.0E-05	4.2E-02	2.7E-01	1.9E-01	5.3E-03	1,677.8	-
Pinehurst Branch	196,622	6.14	0.67	97.7	102	39	6.8	2.5E-03	8.7E-02	2.6E-02	2.9E-02	3.1E-04	1.7E-01	1.6E-05	4.9E-06	2.2E-05	5.6E-05	4.8E-07	1.6E-06	1.1E-03	6.8E-03	4.4E-03	1.3E-04	40.9	-
Piney Branch	7,929	0.22	0.03	3.9	4	2	0.3	1.0E-04	3.5E-03	1.1E-03	1.2E-03	1.3E-05	6.7E-03	6.5E-07	2.0E-07	8.8E-07	2.3E-06	1.9E-08	6.3E-08	4.4E-05	2.8E-04	1.8E-04	5.3E-06	1.6	-
Pope Branch	42,273	1.46	0.17	33.1	27	13	1.3	6.3E-04	2.2E-02	7.0E-03	7.7E-03	7.8E-05	5.2E-02	3.7E-06	1.3E-06	5.8E-06	1.5E-05	1.0E-07	3.4E-07	2.3E-04	1.6E-03	1.2E-03	3.3E-05	10.7	-
Portal Branch	13,207	0.37	0.04	6.6	7	3	0.5	1.7E-04	5.8E-03	1.8E-03	1.9E-03	2.1E-05	1.1E-02	1.1E-06	3.3E-07	1.5E-06	3.8E-06	3.2E-08	1.1E-07	7.3E-05	4.6E-04	3.0E-04	8.9E-06	2.7	-
Potomac Lower	11,555,566	33	38.49	4,3	6,243	2,709	323.1	1.5E-01	5.3E+00	1.6E+00	1.8E+00	1.9E-02	1.0E+01	9.6E-04	3.0E-04	1.3E-03	3.4E-03	2.8E-05	9.2E-05	6.4E-02	4.1E-01	2.7E-01	8.0E-03	2,505.4	-

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium[1] (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
		6.02		19.1																					
Potomac Middle	1,589,920	67.50	8.83	1,066.0	1,335	405	154.8	2.9E-02	1.1E+00	3.7E-01	4.0E-01	3.6E-03	2.2E+00	1.4E-04	6.1E-05	2.9E-04	7.1E-04	3.8E-06	1.3E-05	8.8E-03	6.6E-02	6.5E-02	1.5E-03	536.0	-
Potomac Upper	5,789,172	177.38	20.56	2,545.5	3,516	1,604	161.9	8.3E-02	2.9E+00	9.3E-01	1.0E+00	1.0E-02	5.7E+00	4.9E-04	1.7E-04	7.6E-04	1.9E-03	1.4E-05	4.6E-05	3.2E-02	2.1E-01	1.6E-01	4.4E-03	1,410.9	-
POTTF_DC	27,037,087	529.28	60.69	7,725.3	9,972	4,228	532.0	2.4E-01	8.4E+00	2.6E+00	2.8E+00	3.0E-02	1.6E+01	1.5E-03	4.8E-04	2.1E-03	5.5E-03	4.3E-05	1.4E-04	9.8E-02	6.4E-01	4.4E-01	1.3E-02	4,002.3	-
POTTF_MD	2,063,604	46.94	5.38	618.1	879	385	43.7	2.1E-02	7.4E-01	2.3E-01	2.5E-01	2.6E-03	1.4E+00	1.3E-04	4.2E-05	1.9E-04	4.8E-04	3.8E-06	1.2E-05	8.6E-03	5.6E-02	3.9E-02	1.1E-03	352.7	-
Rock Creek Lower	1,969,114	55.66	6.36	994.7	1,033	389	68.2	2.6E-02	8.8E-01	2.7E-01	2.9E-01	3.2E-03	1.7E+00	1.6E-04	5.0E-05	2.2E-04	5.7E-04	4.8E-06	1.6E-05	1.1E-02	6.9E-02	4.5E-02	1.3E-03	414.4	-
Rock Creek Upper	9,786,840	275.90	31.42	4,879.1	5,081	1,934	339.0	1.3E-01	4.3E+00	1.3E+00	1.4E+00	1.6E-02	8.3E+00	8.0E-04	2.5E-04	1.1E-03	2.8E-03	2.4E-05	7.8E-05	5.4E-02	3.4E-01	2.2E-01	6.6E-03	2,039.4	-
Soapstone Creek	6,020,782	167.45	19.15	2,995.1	3,121	1,190	208.6	7.7E-02	2.7E+00	8.0E-01	8.8E-01	9.6E-03	5.1E+00	4.9E-04	1.5E-04	6.7E-04	1.7E-03	1.5E-05	4.8E-05	3.3E-02	2.1E-01	1.3E-01	4.1E-03	1,252.6	-
Texas Avenue Tributary	38,061	1.28	0.14	23.3	20	11	1.2	4.9E-04	1.7E-02	5.1E-03	5.5E-03	6.0E-05	3.8E-02	3.1E-06	9.5E-07	4.2E-06	1.1E-05	9.2E-08	3.0E-07	2.1E-04	1.3E-03	8.5E-04	2.6E-05	7.9	-

Watershed	Runoff Retained (gallons)	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Cadmium^1 (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	*E. coli* (Billion MPN)	Trash (lbs)
Tidal Basin	1,265,728	40.37	4.69	547.8	758	303	38.8	1.8E-02	6.3E-01	2.0E-01	2.2E-01	2.2E-03	1.2E+00	1.1E-04	3.6E-05	1.6E-04	4.2E-04	3.1E-06	1.0E-05	7.0E-03	4.6E-02	3.4E-02	9.5E-04	304.2	-
Washington Ship Channel	324,192	27.13	4.14	518.2	577	102	116.1	1.1E-02	4.4E-01	1.7E-01	1.8E-01	1.4E-03	9.4E-01	3.7E-05	2.5E-05	1.3E-04	3.0E-04	7.8E-07	2.6E-06	1.8E-03	2.0E-02	3.1E-02	6.0E-04	231.7	-
Watts Branch	2,046,650	68.68	7.89	1,605.5	1,294	614	62.4	3.1E-02	1.1E+00	3.4E-01	3.7E-01	3.8E-03	2.5E+00	1.8E-04	6.1E-05	2.8E-04	7.1E-04	5.0E-06	1.6E-05	1.1E-02	7.8E-02	5.8E-02	1.6E-03	519.4	-
Watts Branch - Lower	1,005,540	38.58	4.50	968.2	755	302	30.6	1.7E-02	6.2E-01	2.0E-01	2.2E-01	2.1E-03	1.5E+00	9.3E-05	3.5E-05	1.6E-04	4.1E-04	2.4E-06	8.0E-06	5.6E-03	4.2E-02	3.5E-02	9.2E-04	303.0	-
Watts Branch - Upper	1,041,110	30.10	3.39	637.3	539	312	31.7	1.3E-02	4.6E-01	1.4E-01	1.5E-01	1.7E-03	1.1E+00	8.5E-05	2.6E-05	1.2E-04	3.0E-04	2.5E-06	8.3E-06	5.7E-03	3.6E-02	2.3E-02	7.0E-04	216.3	-
CSS - Anacostia	18,473,318	533.05	61.20	11,966.4	10,001	5,616	588.5	2.5E-01	8.5E+00	2.6E+00	2.8E+00	3.0E-02	1.9E+01	1.5E-03	4.8E-04	2.1E-03	5.5E-03	4.5E-05	1.5E-04	1.0E-01	6.5E-01	4.4E-01	1.3E-02	4,013.8	-
CSS - Potomac	2,164,527	60.80	6.96	1,092.6	1,133	428	75.0	2.8E-02	9.6E-01	2.9E-01	3.2E-01	3.5E-03	1.9E+00	1.8E-04	5.5E-05	2.4E-04	6.2E-04	5.2E-06	1.7E-05	1.2E-02	7.5E-02	4.9E-02	1.5E-03	454.7	-
CSS - Rock Creek	4,779,488	142.52	16.14	1,772.2	2,576	1,120	133.7	6.3E-02	2.2E+00	6.7E-01	7.3E-01	7.8E-03	4.2E+00	4.0E-04	1.2E-04	5.5E-04	1.4E-03	1.2E-05	3.8E-05	2.6E-02	1.7E-01	1.1E-01	3.3E-03	1,033.8	-

Submerged Aquatic Vegetation

DOEE's Fisheries Management Branch (FMB) has monitored submerged aquatic vegetation (SAV) since 1993. In this time, the FMB compiled an extensive data that reflects the growth and decline of SAV species within the District. Not only does SAV provide an important habitat for juvenile and adult aquatic life, but it also provides sediment stabilization and improves water quality. Considered suitable areas for refuge, feeding, and reproduction, SAV beds are of utmost ecological importance in a watershed system (Kraus, Jones 2012). However, SAV is vulnerable to nutrient and sediment pollution caused by runoff. Because the District's highly urbanized area causes substantial runoff to enter the environment, monitoring the health of SAV is vital when considering the health of the aquatic ecosystem.

2023 observations revealed three different species of SAV including: *Hydrilla verticillata*, *Najas minor* and *Vallisneria americana* (only found in restoration exclosures). A total of fifty-two and three-tenths (52.3) acres of SAV were recorded in 2023, all the SAV mapped was found in the Anacostia River, not including the Oxon cove restoration site. Acreage of SAV District was recorded at an all-time high of one thousand one hundred seventy-six and fifteen hundreds (1176.15) acres in 2017. Starting in 2018 SAV abundance and species diversity has decreased District wide (Figure 3.2). The major factor in the decrease of SAV in 2018 was the record-breaking precipitation the region experienced; the National Weather Service recorded Reagan Washington National Airport received more than sixty-one (61) inches of rain. With increased discharge, turbidity, and flow, SAV District-wide was not able to obtain the nutrients needed (sunlight, etc.) to grow and flourish. Continued effects of the rain deluge were seen during the 2019 SAV ground-truthing survey. All SAV found within in District since 2019 has been within the Anacostia River, not including SAV found at the Oxon Cove restoration site; 2019 (ninety-two and six-tenth) (92.6) acres,) 2020 (sixty-seven and two-tenths (67.2) acres), 2021 (six and nine-tenths (6.9) acres), 2022 (three and two-tenths (3.2) acres), and 2023 (fifty-two and three-tenths (52.3) acres).

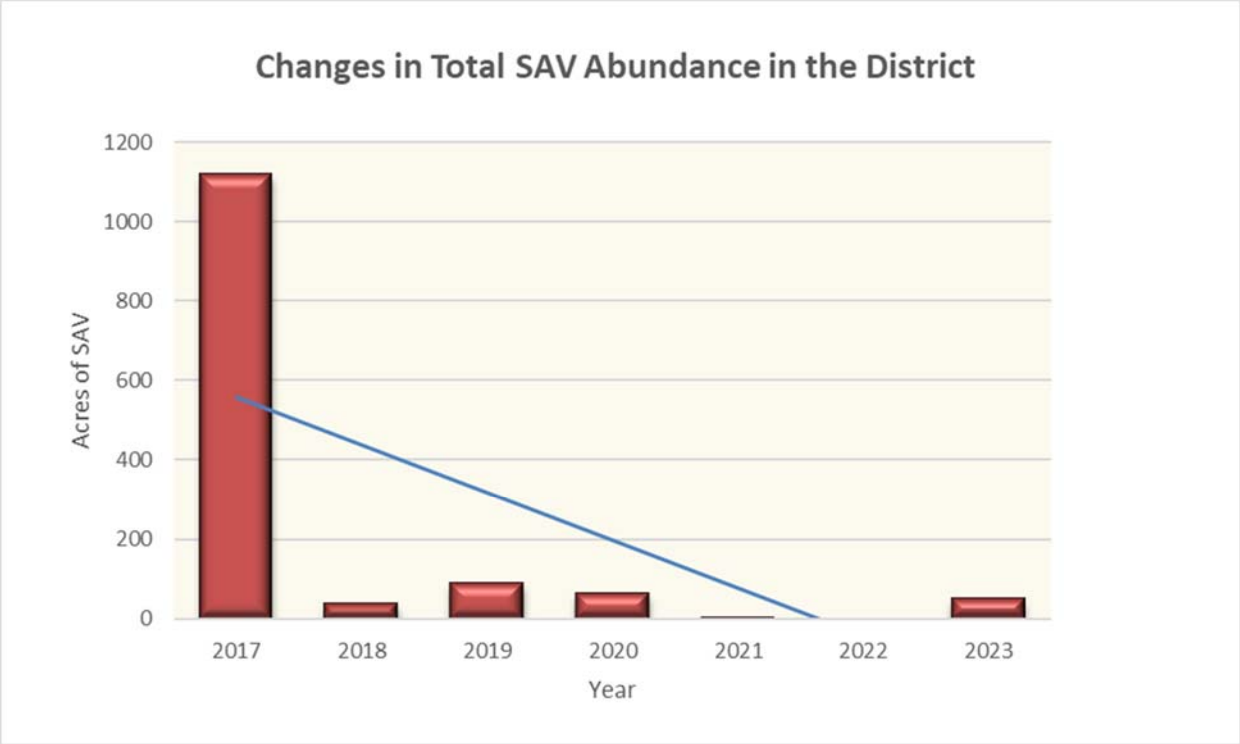


Figure 3.2 SAV Abundance by Year

Aquatic Habitat Restoration

SAV provides vital ecosystem functions in river systems. These include water quality improvement, sediment stabilization, and habitat and forage for fish and wildlife species. District of Columbia waters have historically supported large SAV beds in shallow areas of the Potomac and Anacostia Rivers, but because of development in the watershed, and resulting water quality degradation, these beds have been compromised or even lost. To combat these losses, DOEE has begun a restoration program in the Anacostia and Potomac Rivers. Because of its historical dominance within freshwater and brackish water systems of the Chesapeake Bay *Vallinsneria americana* (wild celery), was designated the most suitable native SAV for the restoration efforts (Davis, 1985). Three sites were selected based on historical maps, water quality, and the guidelines set forth in the "*Second Technical Synthesis for SAV Restoration",* (Batiuk, 2000). To accomplish this DOEE biologists are using wild harvested plants and seeds from the Potomac River in Maryland to establish new beds in designated planting areas. Once sites are planted, biologists will monitor the sites for percent crown cover of plants as well as fish community data to determine if SAV plantings are influencing the fish community. Initial planting in 2012 and 2013 yielded a zero percent (0%) crown cover with no surviving plants observed at the Buzzards Point/James Creek site. Further improvements on the enclosure structure at the same site resulted in a crown cover score of three (3) (forty percent (40%) to seventy percent (70%)) for the 2014 sampling season. *V. americana* returned and flourished, for the third year, at the restoration site in the Anacostia River in 2016. Flower stalks and seed pods were present in a majority of plants at the Buzzards Point/James Creek restoration site. Ground-truthing at this site in September 2016 revealed a cover density of four (4) (seventy-one percent (71%) to one hundred percent

(100%)). We continued to see healthy growth of SAV at the Buzzards Point/James Creek site in 2019. Cover density was scored again at four (4).

The lack of actively replanting adult *V. americana* every year was determined to contribute to the site's success. It is important to note in 2019 the Anacostia River was the only waterbody in the District where SAV grew. In fact, it was the highest amount of SAV ever recorded in the Anacostia River at ninety-two and six-tenths (92.6) acres. In 2020, there was a cover density score of zero (0) at the Buzzard Point/James Creek restoration site. Only six and nine-tenths (6.9) acres of SAV was recorded District-wide in 2021. No SAV was found outside of the Anacostia River. Although the District experienced the lowest amount of SAV in over a decade the restoration site at Buzzards Point/James Creek scored a cover density of three (3), comprised one hundred percent (100%) of *V. americana*. Cover density in 2022 and 2023 scored a zero (0) (no SAV present) at the Buzzards Point/James Creek restoration site.

Initial plantings of V. americana at the Oxon Cove site began in 2016. Two (2) exclosures were installed at the Oxon Cove site for the 2017 planting season. These exclosures were indispensable to the survivability of the *V. americana* plants at this site, as with other sites. For the second year no adult *V. americana* were installed at the Oxon Cove site. Although no adult plants were installed at the Oxon Cove site in 2018, a healthy bed was observed during the 2019 ground-truthing survey with a cover density score of four (4). However, this bed was comprised of forty percent (40%) *H. verticillata*, fifty percent (50%) *N. minor*, and ten percent (10%) *V. americana*. This is the first year in which other species of SAV have been found inside the exclosure at this site. Flower stalks were not observed at the Oxon Cove site in the late summer of 2019. Similar to the Buzzards Point/James Creek site, the lack of yearly adult plantings of *V. americana* for the past two (years directly related to the success of SAV inside the exclosures. Mirroring the Buzzards Point/James Creek restoration site there was no SAV found within the exclosure in 2020. During the 2021 ground truthing survey, the Oxon Cove restoration site received a cover density score of three (3) and was completely comprised of *V. americana*. In 2022, biologists expanded the SAV restoration work under a grant received by National Park Service (NPS)/US Army Corps of Engineers (USACE) and installed thirty (30) exclosures in July 2022. Again, in 2022, this site received a cover density of three (3) with one hundred percent (100%) of the plants being *V. americana*. In 2023, half of the thirty (30) exclosures installed by biologists in 2022 received a cover density score of four (4) and one hundred percent (100%) *V. americana*, the remaining half received a cover density score of zero (0) (no SAV present). Oxon Cove's seclusion from the main stem of the river may add additional protection and serve as a "bank" of SAV in years where SAV is sparse in the District, even in years that receive record breaking precipitation. For this reason, biologists believe this site to be significant to the overall success of SAV in the lower portion of District waters. Continued monitoring and planting will continue at this site in 2024.

Fish data collection at the Buzzards Point/James Creek restoration site began in March 2023 and ended in November 2023. This is the nineth year DOEE fisheries staff have collected fish data at this site. A total of two hundred fifteen (215) fish were caught representing twenty (20) different species between May and November 2023, this month series represents a period in which SAV may be present. Biomass grams per repetition (g/rep) had steadily increased at the Buzzards Point/James Creek site until 2019 which experienced a drastic decline in biomass (Figure 3.3). Biomass continued to decrease in 2020 in the absence of SAV. The decrease may be due in part to sampling only occurring between September-November due to the pandemic. Staff recorded a slight increase in biomass during the 2021 sampling season. Since 2020 the biomass for this site has increased every year; 2022 to nine thousand five hundred eighteen and forty-three hundredths (9,518.43) g/rep and in 2023 to eleven thousand six hundred fifty and seventy-one hundredths (11,650.71) g/rep (Figure 3.2). For biomass we used data only collected during periods where SAV may be present (May-November). This is the same method used when calculating biomass in our District SAV report. No sample was taken in November of 2023 for the biomass data.

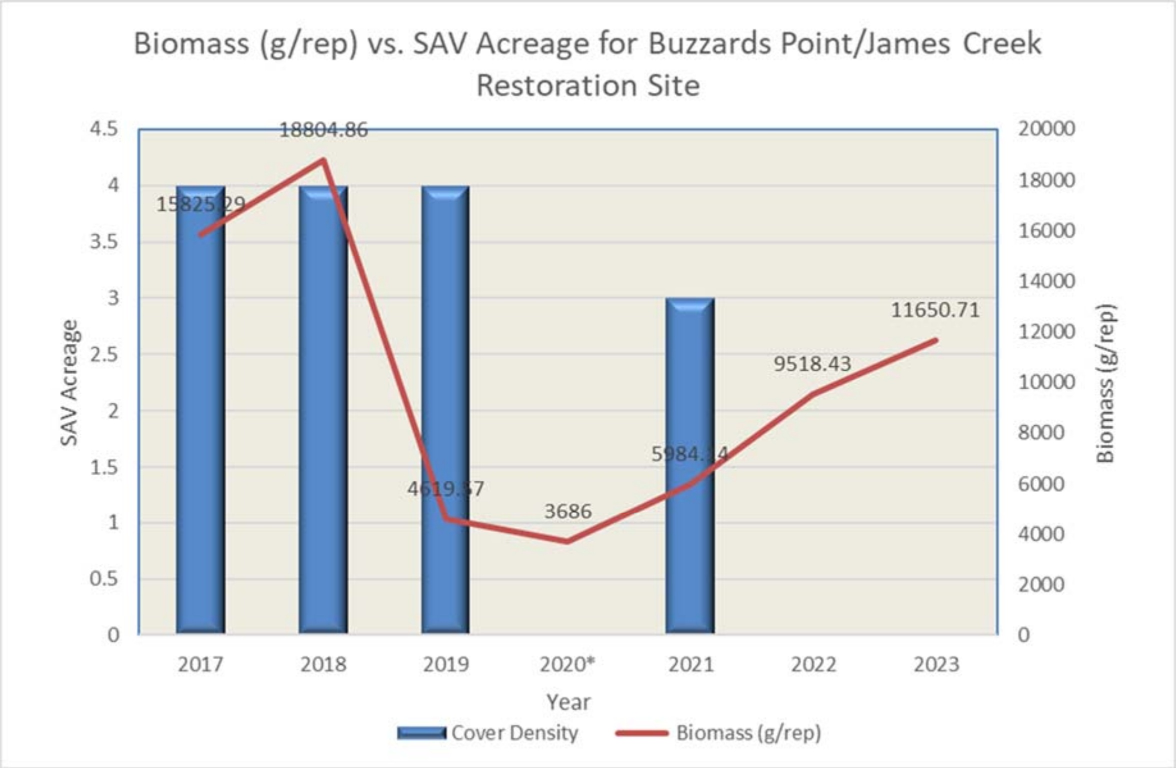


Figure 3.3 Biomass vs SAV Acreage for Buzzard Point/James Creek Restoration Site

Using biomass as indicator of fish community monitoring is helpful in visualizing the overall impact SAV has on the area. Since 2013, when monitoring began at Buzzards Point/ James Creek, there has been a substantial increase in fish biomass every year. There was a large decrease in biomass at the Buzzards Point/James Creek site in 2019, four thousand six hundred nineteen and fifty-seven hundredths (4,619.57) g/rep, which continued into 2020 with three thousand six hundred eighty-six (3,686) g/rep. Biomass increased to five thousand nine hundred eighty-one and fourteen hundredths (5,981.14) g/rep in 2021. Fish biomass continued to increase in 2022 (nine thousand five hundred eighteen and forty-three hundredths (9,518.43) g/rep) and in

2023 (eleven thousand six hundred fifty and seventy-one hundredths (11,650.71) g/rep), 2023 was the highest recorded fish biomass since 2019.

Fish data is also collected for the Oxon cove restoration site. Data is analyzed every year but will not be presented for the purpose of this report, due to the variable results that do not illustrate a consistent trend.

Although the District SAV has not fully recovered from the heavy rains of 2018, we hope to see re-growth in the years to come. While grazing is still a problem at all restoration sites, we hope that the growth of *V. americana* will soon outpace the destruction due to grazing. With this theory enclosures can eventually be removed, and sites could be self-sustaining. Restoration efforts will continue to be a priority for fisheries staff in 2024.

Monitoring Heavy Metals and Organic Compounds in the Air

Air toxics, or hazardous air pollutants (HAPs), are pollutants known or suspected to cause cancer, other serious health impacts, and adverse environmental effects. The federal Clean Air Act (CAA) currently regulates one hundred eighty-eight (188) HAPs. EPA's Government Performance Results Act set a goal of reducing HAP emissions by seventy-five percent (75%) nationwide between 1993 and 2010 to significantly reduce the risks to human health from air pollution. EPA is working to further refine this goal to protect human health and the environment by reducing the risks from air toxic emissions, and particularly focusing on populations and areas disproportionately impacted by air pollution, which include, for example, urban areas, children at risk, and populations whose water and food are affected by persistent, bio-accumulating toxics. Assessing progress in reducing cumulative risk from HAPs will require EPA to move away from a focus on assessing reductions from tons per year emitted toward a focus on estimating reductions in cancer and non-cancer risks associated with lower emissions.

The National Air Toxics Trends Station (NATTS) Network was developed to fulfill the need for long-term HAP monitoring data of consistent quality. The goal of ambient air toxics monitoring is to support the reduction of public exposure to HAPs. Ambient data play a critical role by characterizing HAPs concentrations to support three (3) objectives – assessing trends, exposure assessments, and air quality model evaluation. The NATTS Network was initiated in 2003 and the current network configuration includes twenty-six (26) sites (twenty-one (21) urban, and five (5) rural) across the United States. There are typically over one hundred (>100) pollutants monitored at each NATTS. Target HAPs include volatile organic compounds, carbonyls, heavy metals, and polycyclic aromatic hydrocarbons (PAHs).

Since 2004, DOEE's Air Quality Division has been operating a special purpose NATTS site for ambient measurement of air toxics of primary concern, including heavy metals in the District's air. The NATTS monitoring site is located on the grounds of the McMillan Reservoir.

Table 3.10 DOEE NATTS Monitoring Site

Site Name Air Quality System ID	Street Address	City, State, ZIP	Latitude, Longitude
McMillan 11-001-0043	2500 First Street, NW	Washington, DC 20001	38.921847 deg N, 77.013178 deg W

Daily (twenty-four (24)-hour) air samples are collected on a one (1)-in-six (6)-day schedule throughout the year. The collected samples are sent for laboratory analysis. The District's NATTS site also includes an Aethalometer for continuous sampling of black carbon and diesel particulate matter in the ambient air.

DOEE reports the quality-assured air monitoring data from its NATTS site to EPA's national air database: https://www.epa.gov/outdoor-air-quality-data. Additionally, EPA coordinates the development of a detailed annual report for NATTS and other special-purpose monitoring programs. The National Monitoring Program Annual Reports are made available on EPA's public website at https://www.epa.gov/amtic/air-toxics-monitoring-national-program-reports. These reports provide data summaries and air toxics trends measured in recent years at the national network including the District's NATTS air monitoring site.

Road Salt Reduction Pilot

The District's MS4 permit requires the District to pilot road salt alternatives and incorporate its findings into the District's snow removal strategy. This project, developed in collaboration with the Department of Public Works (DPW), is ready to be implemented during the FY 2023 Snow Season, provided favorable weather conditions occur. Specifically, the project will compare the effectiveness of alternative de-icing practices, including the use of a salt alternative, Calcium Magnesium Acetate, and brine with the existing deicing practice of dry road salt application (control scenario). To best target the effectiveness of each deicing treatment scenario, the pilot will be deployed during events for which plowing is not needed. Qualifying weather events will include ice, freezing rain, slush, and snow accumulations of less than two (2) inches.

Pre- and Post-restoration Stream Water Quality Monitoring

In 2017, DOEE first awarded funds to MWCOG to conduct water quality monitoring at several streams to assess conditions both before and after stream restorations were executed. Since that time, MWCOG has monitored a variety of parameters to assist DOEE in evaluating stream restoration projects, including water quality (flow, temperature, dissolved oxygen, and pH), macroinvertebrates, fish, geomorphology, and vegetation. Monitoring conducted for this program has occurred for projects at Nash Run, Pope Branch, Watts Branch, Fort Dupont, Fort Davis (near Park Drive), Stickfoot Branch, Springhouse Run, Broad Branch, Linnean Park, Milkhouse Ford, Bingham Run, Texas Avenue Tributary (at Alger Park and near Park Drive), and Spring Valley. In FY 2022 and FY 2023 new sites were added to the monitoring program at the completed Branch Avenue (Oxon Run Trib) restoration site and upcoming restoration sites at Pinehurst Branch, Reservation 630, Hickey Run, Grant Rd Stream, and Linnean Gully.

Monitoring is expected to continue at each site for five (5) years after restoration is complete. New monitoring sites will be added when new restoration projects are selected.

In addition, design contractors hired for the Kingman Lake and Oxon Run restoration projects have conducted pre-restoration monitoring for those project sites.

Hickey Run Trash BMP Monitoring

Utilizing federal funds provided under the American Recovery and Reinvestment Act (ARRA), DOEE installed a BMP at an outfall to Hickey Run to capture trash and sediment. In mid-FY 2017, DOEE contracted to maintain the BMP and monitor the pollutant loads captured. There was a gap in service from October 1, 2022, through August 31, 2023, due to a contract lapse. During the removal process, plastic and glass bottles and cans were set aside and bagged separately. Figure 3.4 demonstrates how the trash captured has changed over time.

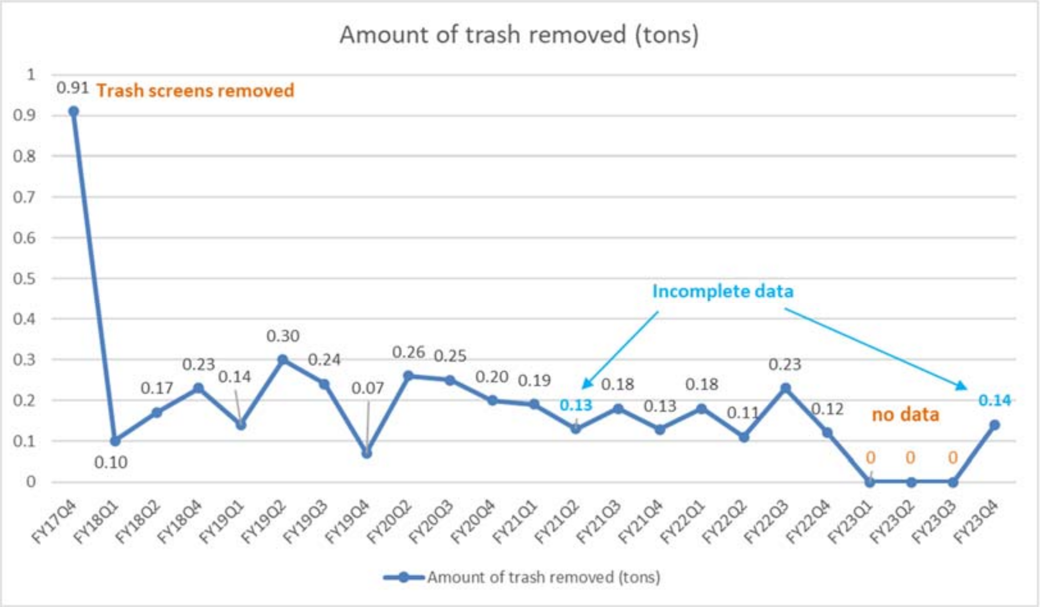


Figure 3.4 Trash Captured by the Hickey Run BMP, 2017-2023

The BMP was originally outfitted with screens at the downstream discharge location, presumably to enhance trash removal performance. However, the screens clogged rapidly, which raised the water surface elevation within the BMP structure, forcing flows through the trash box openings, and thereby negating the sediment capture achieved by the BMP. Screens from the trash BMP were removed in April 2017 to correct the bypass issue, this adjustment reduced the quantity of trash that the BMP captures.

DOEE is actively considering a retrofit solution for this BMP that will maximize both sediment and trash capture.

The contractor removed a total of five hundred eighty-five and thirty-eight hundredths (585.38) tons of sediment that had accumulated in the BMP between April 2017 and September 2023. Initially, the sediment removal was occurring on a quarterly basis but has moved to a yearly basis; hence, the increased volume of sediment, see Figure 3.5. However, the levels of monthly accumulation have not increased, see Figure 3.6.

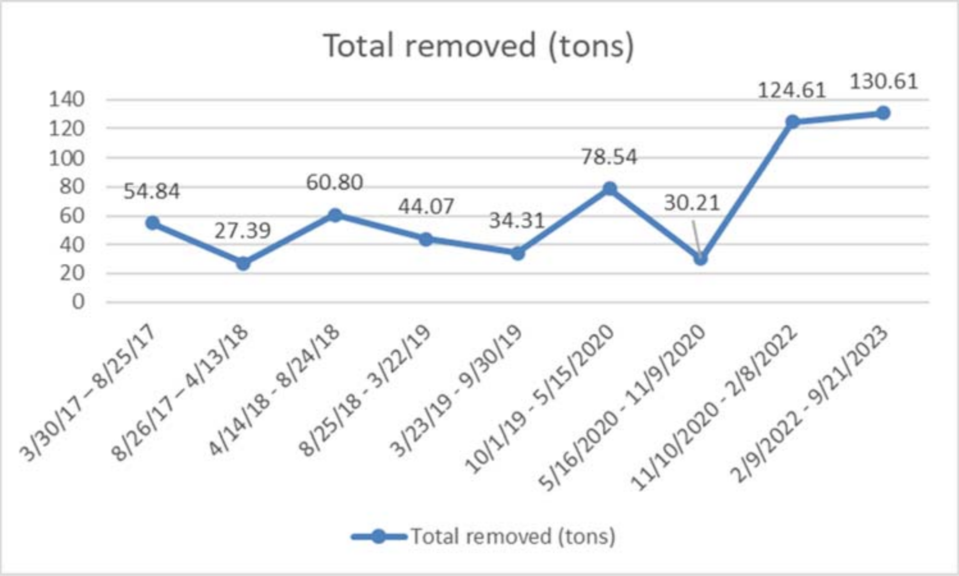


Figure 3.5 Sediment Removal from Hickey Run, 2017-2023

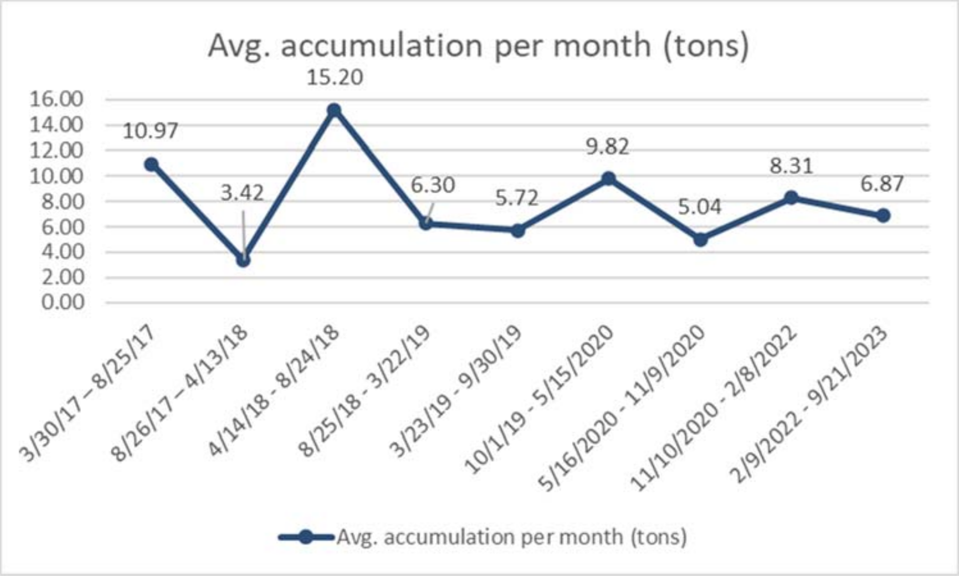


Figure 3.6 Sediment Accumulation at Hickey Run, 2017-2023

Wetland Mapping and Assessment Activities

Wetlands, vital to healthy watersheds, offer numerous benefits to humans, water quality, and wildlife. They store floodwater, protect shorelines, recharge groundwater, mitigate urban heat island effect, and manage nutrients and pollutants. Wetlands are crucial for food webs, serving as nursery habitat for breeding fish, amphibians, and birds, while acting as buffers against pollution.

Wetlands are the primary habitat used by most species selected for vulnerability consideration in the District's 2015 Wildlife Action Plan. Protection and restoration of the District's wetlands is also vital to the health of the Chesapeake Bay ecosystem.

A mapping effort associated with the 2020 Wetland Conservation Plan identified two hundred and ninety-one (291) wetlands within District boundaries, with seventy-six percent (76%) less than half (0.5)-acre in size and sixty0six percent (66%) less than a quarter-acre (0.25). Tidal wetlands cover one hundred and sixty-nine (169) acres, and non-tidal wetlands cover one hundred twenty (120) acres, with seventy-four percent (74%) located on National Park Service land. The District's Aquatic Resources Registry is a publicly available, interactive map of the baseline data containing wetland, streamlines, and SAV survey results for the last five (5) years.

Over ninety-two (92%) of wetlands in the District are located within five hundred (500) feet of urban development, facing challenges like habitat loss and degraded water quality.

DOEE received an EPA Regional Wetland Program Development Grant in October 2020, leading to the development of the District's Wetland Program Plan (WPP) and a Wetland Monitoring Program. The WPP was approved by the EPA in December 2021 and guides DOEE in strengthening and improving its Wetland Program over the next five years. The Wetland Monitoring Program, launched in 2022, aims to complete functional and condition assessments for every mapped wetland on a rotating five (5)-year basis. Since the implementation of the Monitoring Program, an additional fourteen (14) acres of wetlands have been identified and mapped in the field, contributing to the Aquatic Resources Registry.

Wetlands Protection Activities

On May 14, 2021, DOEE published a final rulemaking to add new Chapters 25 (Critical Area – General Rules) and 26 (Critical Area – Wetlands and Streams) to Title 21 of the District of Columbia Municipal Regulations (DCMR). These regulations ensure that the District's wetlands and streams are protected following the reduction in federal protection resulting from the Sackett v. EPA, 598 U.S. 651 (2023), Supreme Court ruling.

Chapters 25 and 26 create a clear process for permitting projects that propose to impact wetlands and streams in the District. These regulations describe the permit application and review process for regulated activities that require either a District wetland and stream permit or a Clean Water Act Section 401 (33 U.S.C. § 1341) water quality certification. They provide the criteria to determine if a proposed project is water-dependent, or if the proposed project is not water-dependent and has no practicable alternative. They also detail the planning process to avoid and minimize wetland and stream impacts to the maximum extent practicable. Finally, the regulations describe the mitigation requirements for impacts to wetlands and streams that are necessary to ensure lost wetland and stream functions are replaced. DOEE implements these regulations to ensure no net loss of wetland and stream acreage occurs.

3.7 2022 303(d) Program Vision and Prioritization Strategy

Introduction

In September 2022, EPA finalized the *2022-2032 Vision for the Clean Water Act Section 303(d) Program.* The purpose of the updated Vision document is to articulate a renewal of the initial 2013 long-term vision and associated goals, as well as to introduce new focus areas for the CWA 303(d) Program. The goals outline aspirations and highlight opportunities to implement CWA 303(d) program activities in the following categories – Planning and Prioritization, Restoration, Protection, Data and Analysis, and Partnership. Focus areas provide four (4) cross-cutting themes of national, regional, and local importance, consistent with EPA priorities, to consider in CWA Section 303(d) program implementation – Environmental Justice, Climate Change, Tribal Water Quality and Program Development, and Program Capacity Building.

Accordingly, DOEE is updating its *303(d) Program New Vision Prioritization Strategy* document, which was first incorporated in the District's 2016 Integrated Report. These updates are intended to 1) reaffirm the District's previously identified priorities and 2) highlight program activities that align with the 2022-2032 vision's identified goals and focus areas.

Prioritization

The District's first prioritization strategy identified updating TMDLs as required by Court Orders and/or Consent Decrees as the highest priority. In doing so, DOEE cited the Court Order in the case *Anacostia River Keeper et al v. Jackson*, 798 F. Supp. 2d 210 (D.D.C. 2011), which held that the TMDLs established by the District were not expressed as daily loads as required by the CWA. This remains the District's highest priority for the 2022-2032 Prioritization Framework.

Currently, revisions and updates to one group of TMDLs subject to this Court Order are still underway: the District's bacteria TMDLs. In addition, subsequent to the development of the first prioritization strategy, a separate Court Order determined the Anacostia Trash TMDL also lacked a daily load expression and therefore needed to be revised. *Natural Resources Defense Council, Inc. v. EPA*, 301 F. Supp. 3d 133 (D.D.C. 2018).Completing these TMDL revisions to comply with Court Orders will remain the highest priority for the District's 303(d) and TMDL program.

2022-2032 Vision Goals and Related Program Activities

The 2022-2032 EPA Vision goals are 1) Planning and Prioritization, 2) Restoration, 3) Protection, 4) Data and Analysis, and 5) Partnership. This document is intended to identify and summarize DOEE program activities that align with those Vision goals. More detail on these program activities can be found in DOEE's Integrated Reports (https://doee.dc.gov/publication/integrated-report-epa-and-us-congress-regarding-dcs-water-quality) and/or MS4 Annual Reports (https://doee.dc.gov/publication/ms4-reporting-library).

Planning and Prioritization: The biennial Integrated Reporting process is the primary approach DOEE employs to identify and prioritize water quality impairments for further action. In the

2022 IR cycle, this work also included a comprehensive effort to reevaluate the data supporting toxic impairments identified on the District's 303(d) list. This resulted in identifying a significant number of water body/pollutant combinations previously placed in Category 3 that were shown not to be impaired, allowing DOEE to better focus and prioritize resources for future water quality investigations.

Restoration: The District invests heavily in stormwater management to address water quality impacts associated with urbanization. Much of this work is directed by the requirements of the District's NPDES MS4 Permit. The latest MS4 Permit was issued by EPA on Nov. 20, 2023. This permit requires the District to manage one thousand one hundred seventy-five (1,175) acres of its MS4 service area with green infrastructure or other stormwater best management practices. DOEE anticipates that a significant portion of these acres will be managed via installation of GI practices through regulated development/redevelopment projects or voluntary retrofits. In addition, DOEE aims to restore streams that are impacted by stormwater runoff and urbanization. Currently, DOEE has stream restoration projects in the planning/design or construction phase for Stickfoot Branch, Ft. Dupont, Oxon Run, and a portion of Rock Creek.

Protection: The Protection goal is the one aspect of the 2022-2032 Vision that is not immediately applicable to the District's programs. The entirety of the District's waters are listed as impaired for at least one designated use or pollutant. As a result, there are not presently unimpaired or healthy waters within the District that require protection planning approaches.

Data and Analysis: Data collection and analysis are the foundation of the District's 303(d) program. DOEE's ability to assess the condition of the District's waters, identify potential causes of impairment, and develop TMDLs to guide implementation and restoration activities rely on having access to high-quality water quality data. The core of these efforts is DOEE's ambient water quality monitoring program, which samples water quality in the Anacostia and Potomac Rivers, Rock Creek, and their tributaries throughout the year. DOEE also supports other projects that supplement this "core" sampling effort including the development of EQuIS, which is a software application for environmental data management, analysis, and visualization. DOEE's volunteer water quality monitoring program works with nonprofit environmental organizations to engage volunteers in collecting data on bacteria and other parameters between May and September. DOEE has similarly partnered with EPA to leverage their contractor resources to collect additional bacteria data to support ongoing revisions of bacteria TMDLs. Finally, DOEE also conducts projects to develop and evaluate new sampling and analytical capabilities. These include multiple microbial source tracking projects in recent years to explore the utility of genetic markers and molecular techniques in identifying underlying causes of bacterial impairments. DOEE is also partnering with the U.S. Geological Survey (USGS) to evaluate novel instrumentation like the Fluidion ALERT system, which could provide a rapid, in-situ method for collecting data to inform decisions about contact recreation.

Partnership: DOEE partners with many organizations to further advance District and regional water quality goals. DOEE and Maryland Department of the Environment (MDE) collaborate in support of revising the Anacostia Trash TMDL, including on a project with researchers at Morgan State University that will help inform a numeric endpoint for TMDL development. DOEE staff are active in supporting the Chesapeake Bay Program, particularly through the Water Quality Goal Implementation Team and its associated workgroups. Similarly, DOEE staff support regional communication and collaboration through organizations coordinated by the Metropolitan Washington Council of Governments (MWCOG,) including the Anacostia Watershed Restoration Partnership (AWRP), Water Resources Technical Committee (WRTC), and Chesapeake Bay Policy Committee (CBPC).

2022-2032 Vision Focus Areas

The 2022-2032 Vision Focus Areas are 1) Environmental Justice, 2) Climate Change, 3) Tribal Water Quality and Program Development, and 4) Program Capacity Building. This document is intended to identify DOEE program activities that align with select Vision Focus Areas.

Environmental Justice: DOEE prioritizes incorporating environmental justice concerns into its programs. DOEE's Water Quality Division previously conducted a GIS analysis of the distribution of stormwater BMPs throughout the District through the lens of EPA's Environmental Justice Screening Tool. The results of this effort will help inform future efforts to focus BMP implementation in more equitable ways to serve all District residents. DOEE is building on this effort by leveraging EPA Section 604(b) grant funding to support development of a Diversity, Equity, Inclusion, and Justice (DEIJ) strategy for the District's Stormwater Management program.

Climate Change: DOEE's work to update the Anacostia Toxics TMDL has included evaluating potential impacts of climate change on the updated TMDL's loading and allocation scenarios. These considerations were incorporated into the TMDL development process to address stakeholder comments provided in response to the first draft of the updated TMDL. DOEE will continue to evaluate if and how to incorporate climate change considerations in future TMDL development projects, as appropriate.

Chapter 4 Public Health-Related Assessments

Drinking Water Program Monitoring and Assessments

Drinking water for the District is treated by the Washington Aqueduct, which is federally-owned and operated by the USACE. The Aqueduct is responsible for compliance with all the regulations that pertain to water treatment such as filtration, disinfection and chemical contaminant removal, and corrosion control. DC Water purchases the treated water and distributes it to District residents. Drinking water quality is regulated by EPA Region 3. DC Water collaborates with the USACE Washington Aqueduct to control corrosion of pipes and plumbing throughout the District to minimize the release of lead into water. DC Water monitors for lead at the tap and helps customers identify lead sources on their property by testing for lead in drinking water samples.

Lead Pipe Replacement

The Lead Service Line Priority Replacement and Disclosure Amendment Act of 2018, D.C. Law 22-241 (Lead Service Line Act), prohibits DC Water from replacing the public portion of a lead service line without replacing the portion on private property, unless DC Water requests and is unable to obtain consent of the owner. The cost of replacement is paid by DC Water using appropriated funds. If funding to replace the private portion is not available, DC Water may only replace the public portion if necessary to repair a damaged line or to comply with federal regulations after exceedance of a lead action level. If the property owner decides to pay to replace the private portion of a lead water line, DC Water may replace the public portion at the same time.

The Lead Service Line Act also creates a payment assistance program for property owners who seek to replace the private portion of a lead service line when the public portion is not lead. Payment assistance is awarded on a sliding scale as a percentage of the replacement cost depending on the owner's income. DOEE created a payment assistance application form and notifies an applicant of approval or denial of each application. DOEE transfers funding for replacements to DC Water.

DOEE and DC Water have partnered to implement two (2) new programs to ensure that the entire lead service pipe is replaced in full:

1) Full Lead Water Service Line Replacement Program - District funds cover the cost of the lead water service pipe replacement on private property when DC Water replaces the portion of the pipe in public space; and

2) Lead Pipe Replacement Assistance Program – District funds are provided to assist with the cost to replace the lead service lines on private property when the service pipe in public space is not lead. Under this program, fifty percent (50%) of the replacement costs will be paid from District funds up to two thousand five hundred dollars ($2,500), regardless of income. Residents

who meet specific income requirement can qualify for up to one hundred percent (100%) of the replacement cost to be covered by them.

Lead in Water in Multiple Dwellings

The Multiple Dwelling Residence Water Lead Level Test Act of 2004, D.C. Law 15-303, requires owners of multi-family buildings and unit owner's associations for condominiums to request lead test kits from DC Water and provide them to tenants or owner-occupants upon request.

DC Water provides the test kit, and the owner or association must, within fifteen (15) days of receipt of the test kit, provide the test kit to the tenant or occupant. The tenant or occupant collects the sample and sends it to DC Water to be tested. DC Water tests the lead level and mails the results to the owner or association and the tenant or occupant who requested the test. The owner or association is required, within fifteen (15) days of receipt of the results, to provide a copy of the result to any tenant who requests the result, post a copy in a conspicuous place, and send a certification to the Mayor that the owner has complied with the tenant notification requirements.

Lead in Drinking Water in Schools and Daycare Centers

DOEE addresses lead in drinking water in all licensed child development facilities. To that end, the District's City Council passed the Childhood Lead Exposure Prevention Amendment Act of 2017, D.C. Law 22-21, which requires public schools and public charter schools to, among other things:

- Locate all drinking water sources and install and maintain filters for reducing lead at all drinking water sources.
- Post conspicuous signs on water sources that are not drinking water sources that communicate that the water should not be used for cooking or consuming.
- Test all drinking water sources for lead annually and, if a test result shows that a drinking water source's lead concentration exceeds five (5) parts per billion (ppb):
    - shut off the drinking water source within twenty-four (24) hours after receiving the test result;
    - determine in writing remediation steps;
    - publicize the test results and remediation steps by sending an email or written correspondence to parent within five (5) days and posting information about the test results and remediation efforts online the DC Public Schools website; and
    - publish a list of drinking water sources with information about filters, testing, and maintenance on the DGS website.

DOEE conducts quarterly Quality Assurance and Primary Prevention Webinars for all Childcare Centers to ensure compliance and standard operating procedures are followed. The Act defines drinking water sources as "a source of water from which a person can reasonably be expected to consume or cook with the water originating from the source".

The District's sampling protocol includes kitchen sinks, water fountains/bubblers, and sinks within the classrooms and bathrooms because those sinks are often used to wash food, to wash bottles used for nursing infants, and to teach children to brush their teeth.

There is no documented safe level of lead in children. The current lead activation level in the District is five (5) ppb of lead in water. However, the goal of the District is for all drinking water sources to contain less than one (1) ppb of lead.

Fish Consumption Advisory

In June 2023, United States Fish and Wildlife Service (US FWS) completed a study of fish tissue for contaminants of concern for DOEE on fish caught in District waters. The results of the study revealed per- and polyfluoroalkyl substances (PFAS) were present in all fish species analyzed. DOEE is reviewing data and risk assessments from Maryland and New Jersey to determine risks in the District. Based on the District's determinations, the 2016 fish consumption advisory may be updated. To view the current fish consumption advisory, visit the DOEE website (https://doee.dc.gov/node/9582).

Chapter 5 Groundwater Assessment

5.1 Groundwater Protection

Introduction

This section updates the District's groundwater protection efforts for July 1, 2021 to June 30, 2024. DOEE's Water Quality Division continues to be responsible for groundwater policy, planning, research, and some regulatory oversight. Through a Joint Funding Agreement with USGS, DOEE collects data from the District's groundwater monitoring network and conducts investigations to assess groundwater quantity and quality, evaluate groundwater/surface water interactions and inform groundwater protection strategies. Data from these studies are available at the USGS website: https://waterdata.usgs.gov/dc/nwis/gw.

As part of an ongoing groundwater background study, DOEE had groundwater samples analyzed for inorganic constituents at two wells individually screened in the Lower Patapsco Aquifer and the Patuxent Aquifer. The analytical results show that the groundwater generally meets the District's Groundwater Quality Standards. However, there were low exceedances of the iron and manganese standards in some samples.

Ground water levels in the shallow aquifers are consistent with previous years. Seasonal variations also appear to follow normal trends. The deeper Patuxent Aquifer continues to slowly recover (Figure 5.1) from the extensive dewatering events linked to the construction of tunnels and drop shafts for the DC Long Term Control Plan.

Summary of Groundwater Quality

DOEE maintains groundwater monitoring networks in the Anacostia River and Rock Creek watersheds. All existing wells are listed in Appendix 5.1 Groundwater Monitoring Wells, and their mapped locations are presented in Appendix 5.2. Many of the wells are relatively shallow and intercept groundwater flowing to streams while several are in the recharge area for the Patuxent Aquifer (Appendix 5.2). A few deep wells extend into the Patuxent Aquifer. Well construction details are listed in Appendix 5.3.

USGS is committed to releasing the new data through their National Water Information System website once it is reviewed. Historic data can be found in the USGS Annual Water Data Reports and were referred to by DOEE in previous Integrated Reports submitted to EPA and Congress.

DOEE is conducting a study to determine the naturally-occurring groundwater concentrations for the Cretaceous-aged Aquifers of the Potomac Group and for the shallow alluvial aquifer. The Cretaceous-aged Aquifers are comprised of the Upper and Lower Patapsco Aquifers and the Patuxent Aquifer. Data will be collected during the groundwater seasonal high and low periods over two years. Several new monitoring wells have been installed to augment the existing monitoring network as all the wells in the existing network are not suitable for inclusion in the study. A preliminary assessment at two wells screened in the Lower Patapsco Aquifer and the Patuxent Aquifer showed only low exceedances of the District's Groundwater Standards for iron and manganese.

In FY23, DOEE sampled wells screened in the shallow alluvial aquifer and the Patuxent Aquifer to determine the presence or absence of 29 per- and polyfluoroalkyl (PFAS) at those locations. The results will be presented in the next reporting period, Groundwater Quantity Issues.

Through a cooperative agreement with USGS, DOEE collects discrete and continuous groundwater elevation data from the groundwater monitoring network. The latest discrete data are presented with measurements collected from previous years in Appendix 5.4, Manual Water Level Measurements for Monitoring Wells.

Groundwater levels in several deep wells, such as WE Cb 8 and WW Cc 38 continue to slowly recover from the massive dewatering activities that were needed to construct the tunnels and drop shafts for the District's LTCP. The deep wells are screened in the Patuxent Aquifer. Several factors may influence the slow recovery in this Aquifer including the reduction of pervious surfaces in the Aquifer's recharge area, other dewatering activities, slow groundwater flow through the Aquifer, and strong compression from the overlying Arundel Clay Confining Unit. However, the District encourages stormwater infiltration, and this may promote a faster recovery of hydraulic pressure in the Aquifer.

Groundwater Quantity Issues

Through a cooperative agreement with USGS, DOEE collects discrete and continuous groundwater elevation data from the groundwater monitoring network. The latest discrete data are presented with measurements collected from previous years in Appendix 5.4 Manual Water Level Measurements for Monitoring Wells.

Groundwater levels in several deep wells, such as WE Cb 8 and WW Cc 38 continue to slowly recover from the massive dewatering needed to construct the tunnels and drop shafts for the District's LTCP. These deep wells are screened in the Patuxent Aquifer. Several factors may influence the slow recovery in this Aquifer including the reduction of pervious surfaces in the Aquifer's recharge area, other dewatering activities, slow groundwater flow through the Aquifer, and strong compression from the overlying Arundel Clay Confining Unit. However, the District encourages stormwater infiltration, and this may promote a faster recovery of hydraulic pressure in the Aquifer.

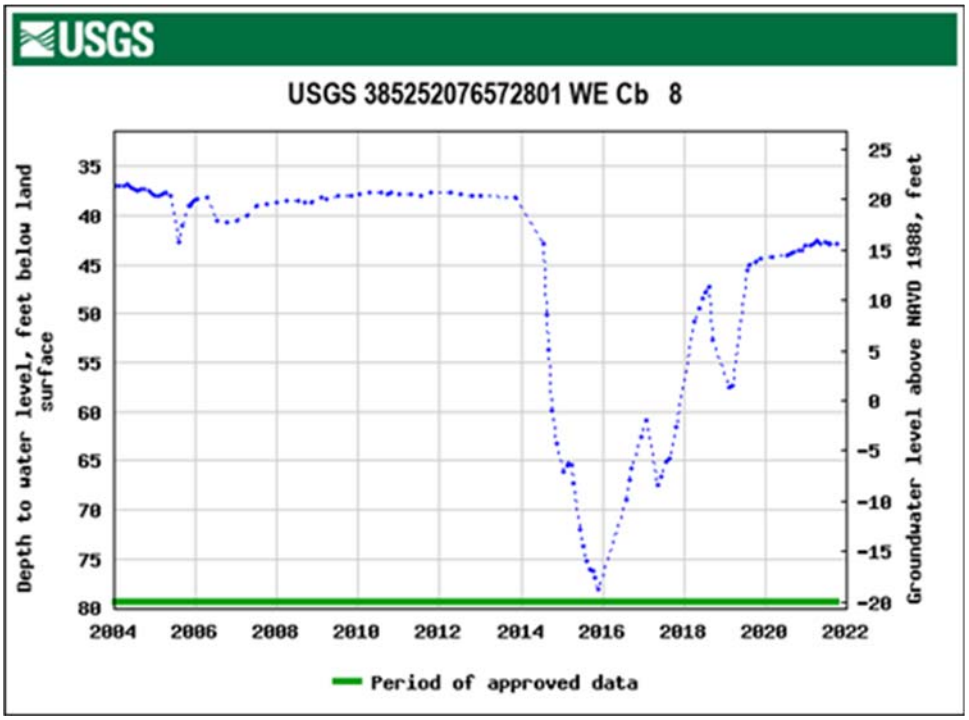


Figure 5.1 Groundwater Recovery at Deep Well Cb 8

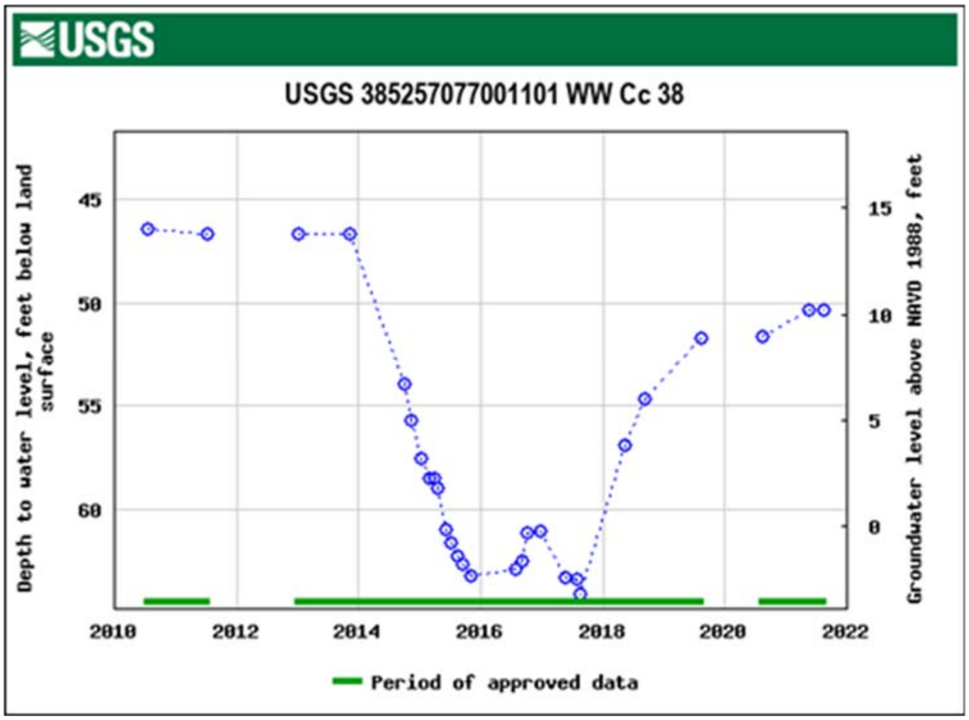


Figure 5.2 Groundwater Depth to Water Level at Deep Well Cc 38

Overview of Groundwater Contamination Sources

Appendix 5.5 summarizes contaminant sources to the shallow groundwater aquifer and identifies programs with regulatory oversight over groundwater pollution and the number of open cases with shallow groundwater contamination under each program. No new major sources have been identified since the last Integrated Report.

Overview of Programs Related to Groundwater Protection

WQD is charged with administration of the District's Water Pollution Control Act, which defines the District's waters as including both groundwater and surface water. In 1993, the District promulgated groundwater regulations. These regulations established numerical criteria and enforcement standards for forty-seven (47) chemical constituents. Subsequently, the District also developed water quality monitoring regulations that set standards for groundwater monitoring supporting preventive as well as remedial activities. Well regulations were enacted in September 2016. DOEE is preparing a guidebook to supplement the well regulations. DOEE processes hundreds of well permit applications each year.

An updated list of DOEE groundwater-related programs or branches that can impact groundwater and their functions follows:

- Construction Grants Program: Pursuant to the federal Clean Water and Safe Drinking Water Acts and various appropriations acts, EPA funds the District for the construction and/or improvement of wastewater facilities, drinking water distribution and storage facilities, and other water related structures that will protect water quality. The projects identified for use of the funds meet a variety of needs, such as those related to the LTCP, the Municipal Sanitary Storm Sewer Monitoring Network, and the implementation of pollution control measures.

- Construction and Maintenance Branch: Performs compliance inspection and enforcement for sediment erosion controls and stormwater management at construction sites. The Branch also inspects permitted stormwater management devices to ensure that they are being properly maintained.

- Federal Facilities Program: Oversees the cleanup of Formerly Used Defense Sites and active defense facilities that are contaminated.

- Groundwater Protection Program: Coordinates and implements groundwater protection in the District including developing groundwater strategies, policies, and regulations to protect groundwater; engaging in groundwater quality planning and research; collecting, analyzing, storing, and sharing groundwater monitoring data; collaborating on regulatory oversight at contaminated sites; reviewing applications for withdrawal and injection of substances into groundwater for remediation or well maintenance; providing technical expertise on groundwater-related permits; and promoting groundwater protection with internal and external stakeholders engaged in groundwater- related activities.

- Hazardous Waste Management Program: Regulates hazardous waste from small and large quantity generators.

- Integrated Pest Management Program: Conducts public education for pesticide use.

- IED's Illicit Discharge and NPDES Branch: Conducts inspections and enforcement related to well construction, use, maintenance, and abandonment. The Branch also performs the same functions for pollutant spills, releases, or other discharge violations that lead to the degradation of groundwater resources.

- Nonpoint Source Program: Plans and implements BMPs to address nonpoint source pollution, restore aquatic habitat, and provide oversight of nonpoint source studies.

- Pesticide Certification and Enforcement Program: Processes registration of pesticide products for use in the District, certifies applicators, and performs application inspections.

- Remediation and Site Response Program (RSRP): Investigates and remediates sites where historic contaminant releases have occurred. The program exercises state CERCLA-like authority and focuses on historic hazardous releases to soil and water.

- Total Maximum Daily Load (TMDL) Program: Develops point and nonpoint source load allocations to meet WQS in impaired waterbodies.

- Underground Storage Tank Management Program: Provides oversight for installation and removal of underground storage tanks as well as remediation activities for leaking tanks.

- Voluntary Cleanup Program (VCP): Oversees owner or developer initiated voluntary remediation of contaminated lands and buildings. The goal is to return actual or potentially contaminated properties to productive uses.

- The Regulatory Review Division: Processes well construction and abandonment permits in private and public space. The Branch also collects and maintains records of all permitted wells in the District.

Appendix 5.6 lists the various groundwater protection activities in the District, their implementation status, and the District agencies responsible for implementation.

Aquifer Vulnerability Assessment

The DC Water Resources Research Center (WRRC) assessed the District's groundwater vulnerability to contamination in 1992 in a report entitled *Urban Land Use Activities and The Ground Water: A Background Survey of the District of Columbia* (WRRC, 1992). The report mapped the probability of groundwater contamination and ranked areas accordingly. The District recognizes that this report is old and when funds become available, it will be revised. See Appendix 5.5 for an updated list of groundwater contamination sources primarily under EPA oversight.

Aquifer Mapping

Several years ago, the District, in conjunction with the USGS, developed a steady-state, three-dimensional, groundwater flow model of the shallow aquifers in the Anacostia River watershed. The model contains layers to represent the aquifers in the District. However, the model did not distinguish between the Upper and Lower Patapsco Aquifers and the confining Arundel Clay, all of which overlay the Patuxent Aquifer on the eastern side of the Anacostia River. Therefore, flow values do not truly accurately represent groundwater flux in any of the individual units.

This issue highlights the need for sound aquifer mapping in the area. The Upper and Lower Patapsco Aquifers also are vulnerable to urban activities as they appear to outcrop in mixed use areas, maybe relatively thin, and underlie areas slated for urban development. Additional field work will help to resolve the boundaries of the relevant geologic units and ultimately, these shallow aquifers.

Although the Patuxent Aquifer is the most significant regional aquifer, very little field data are available to reliably map it in the District. Well boring logs (Appendix 5.8) from a hole extending five hundred and ninety-eight (598) feet below ground surface through Cretaceous-aged sediments into bedrock reveal that the Patuxent Aquifer is less than one hundred (100) feet thick at this location. Conversely, the overlying Arundel Clay Confining Unit is about four hundred (400) feet thick. Groundwater trapped under the Arundel Clay is under such extreme hydraulic pressure that it advances high up within the well casing and typically is measured at approximately seventy-six (76) feet below ground surface. Based on the USGS topographic map for this location, the ground surface elevation is about sixty-five (65) feet above mean sea level, so the well does not exhibit artesian conditions. Dewatering for the Blue Plains Wastewater

Treatment Plant's tunnels and shafts quite possibly had a significant negative impact on the groundwater's hydraulic pressure, but the potentiometric surface may be recovering as noted at other impacted wells in the District.

Comprehensive Data Management System

The USGS maintains and manages all data collected during joint District-USGS projects since 2002. This data is readily available on the USGS website (www.usgs.gov) and the date entered will continue to grow as funding for more projects becomes available. This data includes chemical, locational, and geological information. USGS includes monitoring well data in the regional groundwater database maintained for the District and other states. The data will be available in GIS format soon. Monitoring well location data for boring/well locations for all District-permitted wells in both private and public space can be found at http://atlasplus.dcgis.dc.gov/ in the Environmental Layer.

Groundwater/Surface Water Interaction

DOEE began exploring the use of groundwater age-dating techniques to look for indicators of possible surface water intrusion into aquifers. Powars (2016) noted paleochannel downcutting or erosion through the Arundel Clay, the Cretaceous-aged confining unit overlying the Patuxent Aquifer, in several parts of the District (Figure 5.2 and 5.3), suggesting that a stream, such as the Anacostia River, may be in direct hydraulic communication with the Patuxent Aquifer thereby causing pollutants in the surface water column to reach and negatively impact the groundwater resource.

When two waterbodies are in hydraulic communication, the differences in hydraulic pressure between them will dictate the direction of flow. With surface water/groundwater interactions, if the surface waterbody has a higher hydraulic pressure than the groundwater in the aquifer, the surface water will intrude into the aquifer and change the groundwater quality. In the District, the opposite usually occurs, and groundwater discharge provides the baseflow for perennial streams. Except for arid areas or where an aquifer is depleted, surface water intrusion into an aquifer is less desirable than groundwater discharge into a river since surface water contains pathogens and other micro-organisms that are not present in natural groundwater.

Surface water also has another distinctive signature that can be used for groundwater age-dating. It contains higher concentrations of certain dissolved manmade gases, such as chlorofluorocarbons (CFC) (CFC-11, CFC-12, and CFC-113), and sulfur hexafluoride (SF_6) that have been widely distributed in the atmosphere for many years. However, as groundwater from a deep well in a confined aquifer typically takes many years to travel slowly through the subsurface, it is not expected to contain modern manmade gases unless it was exposed to the atmosphere or surface water since those gases were released. Therefore, the residence time or age of a groundwater sample from an aquifer can be determined based on the concentration of those gases in the groundwater after adjusting for certain assumptions.

The presence of CFCs in ground water indicates recharge after 1940 or mixing of older waters with post-1940 water (Busenberg et al., 1993). A relatively young or modern groundwater age typically indicates that there may be a problem with the well's structural integrity, or that the confining unit is leaking, thereby allowing the atmosphere or surface water to mix with the groundwater. Excessive pumping also can increase the groundwater flow rate through the aquifer so that relatively young groundwater can reach the monitoring well faster than normally would occur.

To investigate whether the Patuxent Aquifer is in direct hydraulic communication with the Anacostia River, a groundwater sample was collected for age-dating purposes from a monitoring well. The analytical suite covered CFCs, SF_6, dissolved carbon dioxide, nitrogen, arsenic, and Hydrogen/Helium isotopes. The monitoring well is located at the District's AREC and is three hundred and eighty-eight feet (388 feet) deep, screened in the Patuxent Aquifer, and located approximately two hundred feet (200 feet) away from the river on its eastern bank (Appendix 5.2). The well's recharge area is approximately three (3) miles to the northwest. The well also is across the river from the location of DC CSO 019, a large, combined sewer outfall, where millions of gallons of groundwater were removed to construct the tunnel, shaft, and diversion structures as part of the LTCP. Dewatering started at CSO 019 in 2013, and the age-dating sample was collected in 2021.

Due to delays caused by the pandemic, DOEE only received results from the CFC and SF_6 analyses. According to preliminary interpretations, CFC data show that the water is older than the CFC method can reliably date while SF_6 data indicate that the groundwater is more than fifty-five (55) years old. Results of the other laboratory analyses are expected to provide a more definitive age for the samples. Complete results and analyses are pending.

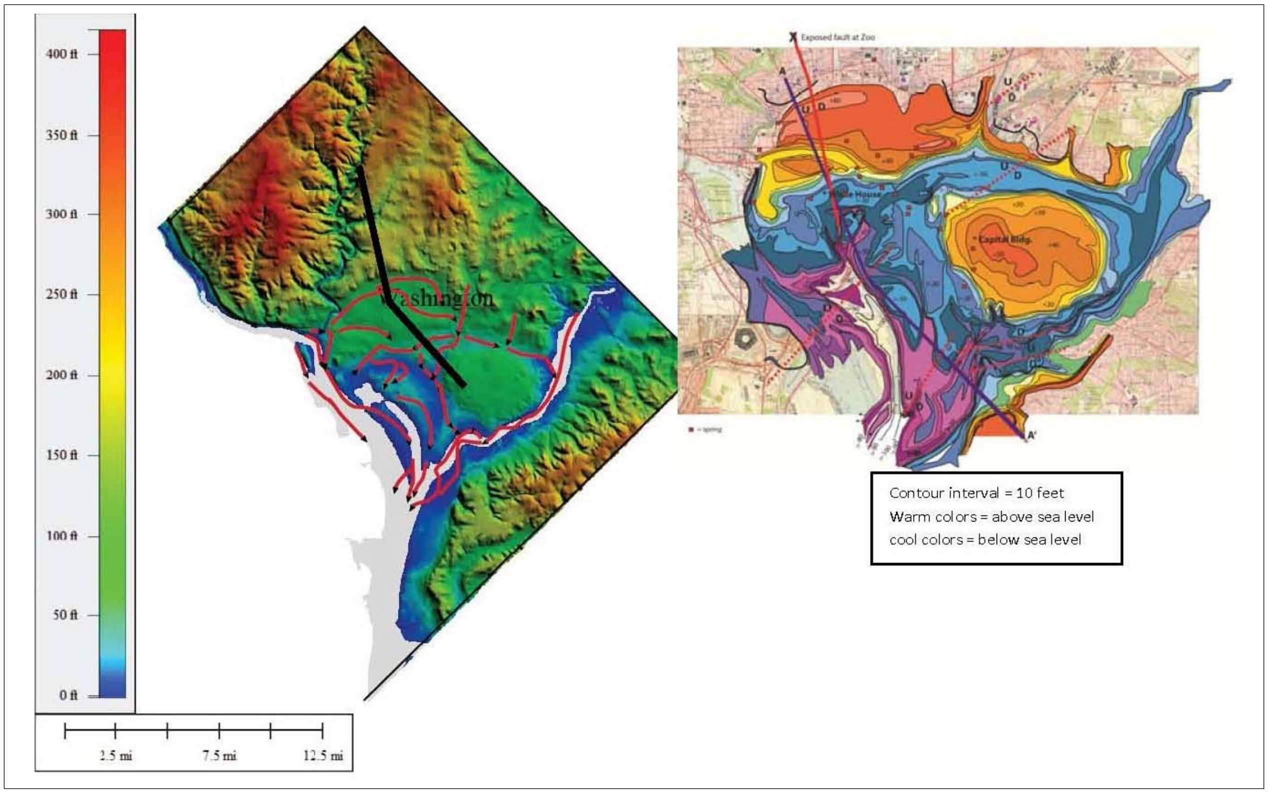


Figure 5.3 LiDAR elevation map of the District and the paleochannels and structure contour map of base quaternary sediments showing paleochannels and locations of proposed faults(red dashed line) and documented (solid red line)

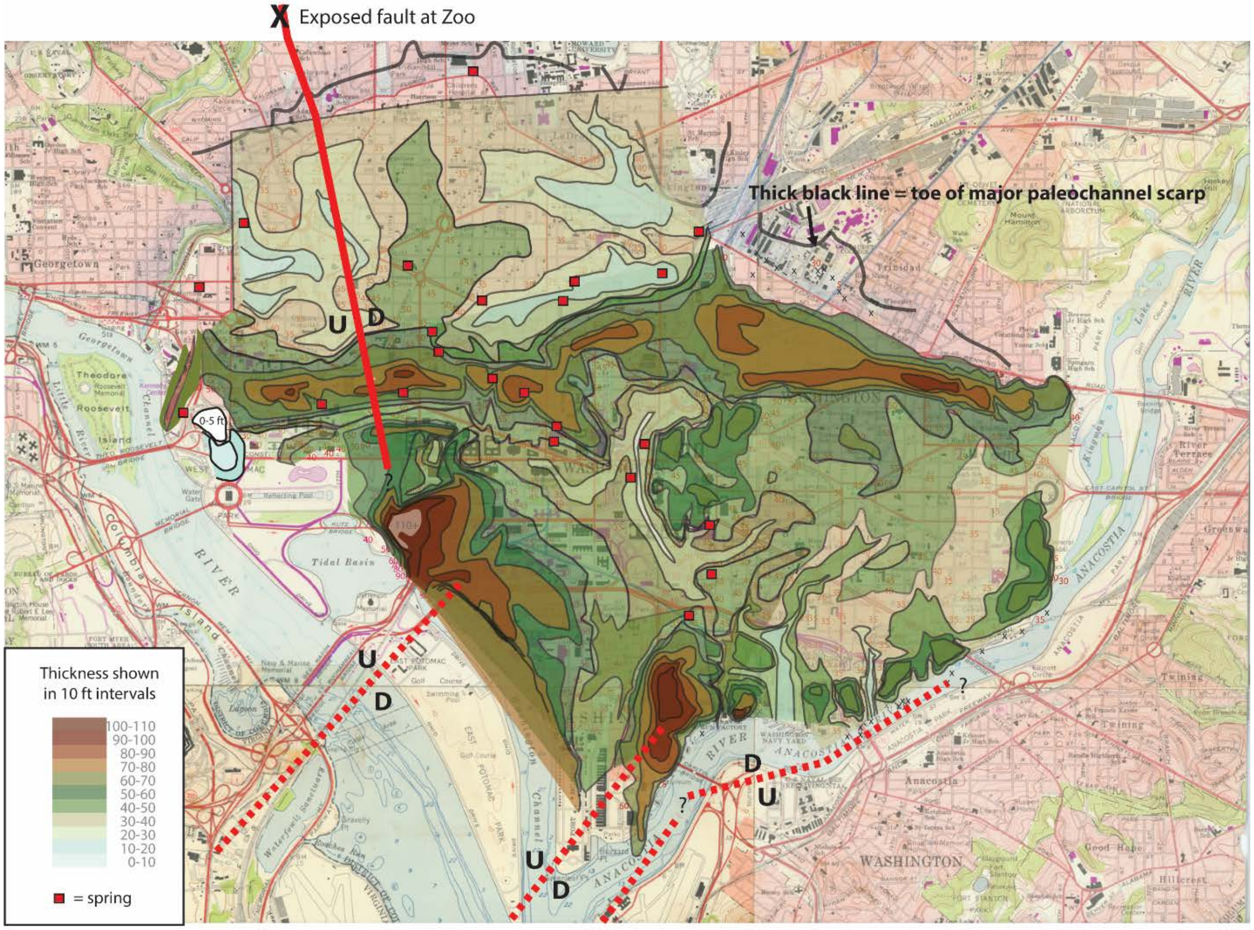


Figure 5.4 Map of the thickness of the quaternary deposits beneath downtown Washington DC

5.2 Groundwater Evaluation

The progress of the work to determine the quantity and quality of groundwater discharging to the surface water, remains focused on quantifying the flow and pollutants transport, distribution, recharge, and discharge of groundwater resources within The District which results in mapping the groundwater flow and hydrochemistry in the aquifers. The objective is to provide detailed and quantitative knowledge of the groundwater resources to understand the contribution of groundwater to the baseflow and to address the seepage of nonpoint source pollution. Some examples of the tools used to support these goals include: the use of existing groundwater models, 3-D visualization of the DC Aquifer Units, GIS layers of the hydrogeologic units' distribution, analysis of all the existing subsurface information, construction of 3-D geologic visualizations, as well as the characterization and definition of the conceptual model of the multiple aquifer units in the District. Information and results from the quantification of groundwater resources has been made available to other DOEE programs within the Agency.

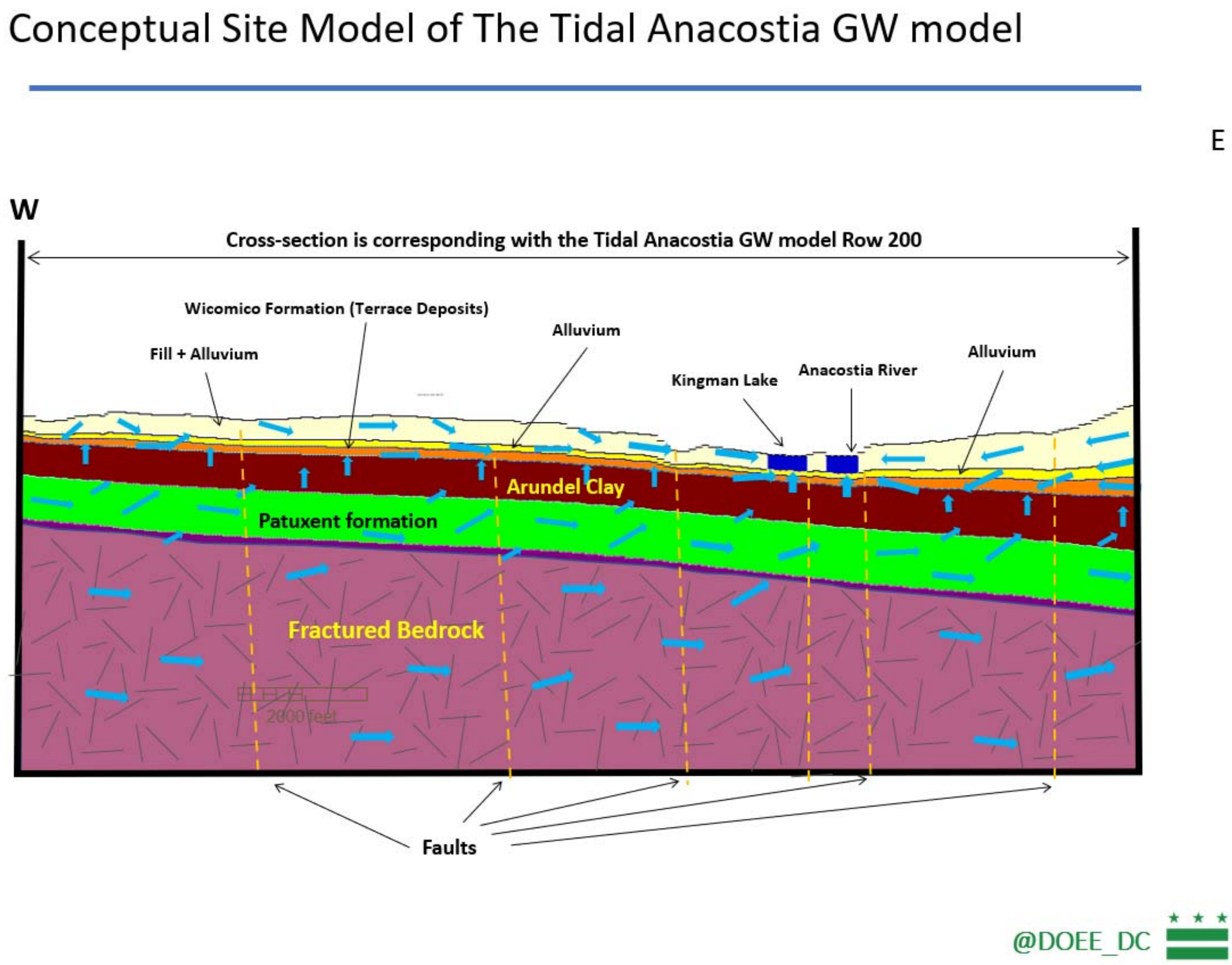
A second part of the work is the hydrogeologic information for the Tidal Anacostia River area, which is now complete, therefore has been used to support the Tidal Anacostia Groundwater Model (Figures 5.4 and 5.5). Detailed hydrogeologic cross-sections and 3-D visualizations for specific sites along the Anacostia River have been developed.

During this reporting period, the groundwater evaluation team continued the integration of all the new and more detailed and site-specific information becoming available. This means newly geological and hydrogeological information available to DOEE and other entities is being integrated into the digital geodatabase of the surface and subsurface geology of DC. The digital data is being used in specialized software to construct geologic cross sections and 3-D geological visualizations to define the distribution of aquifers and their interactions.

The existing groundwater model and other analytical tools have been used for the assessment of the possible impacts that depressurization occurring in the District for construction purposes may cause to the quantity and quality of groundwater in the aquifers. This analysis is now focused on analyzing the depressurization effect on the main aquifer in the Anacostia River Watershed by the operation of two simultaneous construction dewatering systems. The hydraulic conductivity data obtained from the extensive construction dewatering monitoring is also being assessed.

The DC Groundwater Model was updated to the most recent version of MODFLOW-USG in 2023, and the surface water tributaries are now considered in the model. After doing so, the calibration remained in the same order of magnitude (Figure 5.6).

An updated GIS layer based on the MODFOW-USG groundwater model results was constructed (Figure 5.7).



Conceptual Site Model of The Tidal Anacostia GW model

Figure 5.5 Tidal Anacostia River Groundwater Model Conceptual Site Model

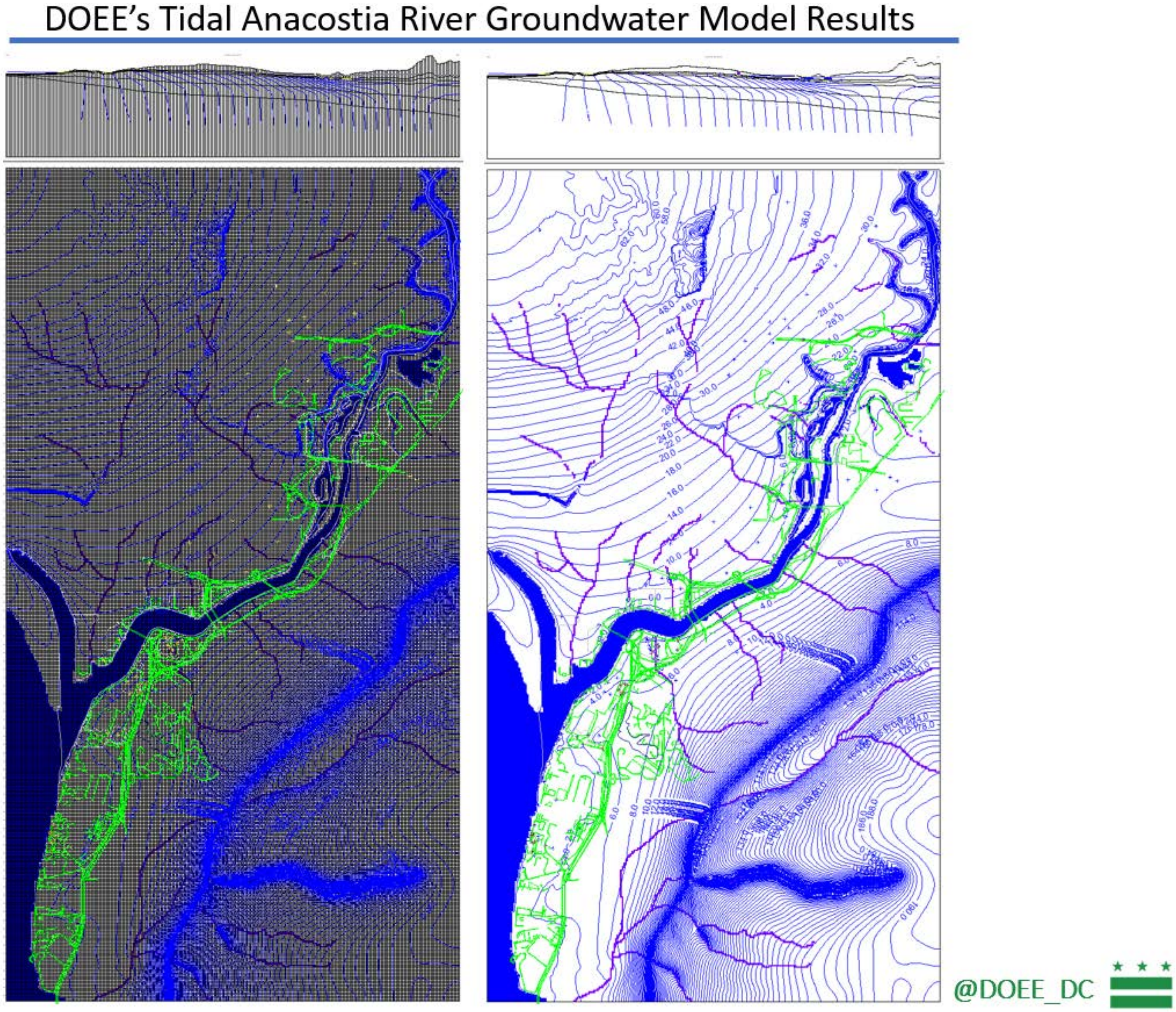


Figure 5.6 Tidal Anacostia River Model Results

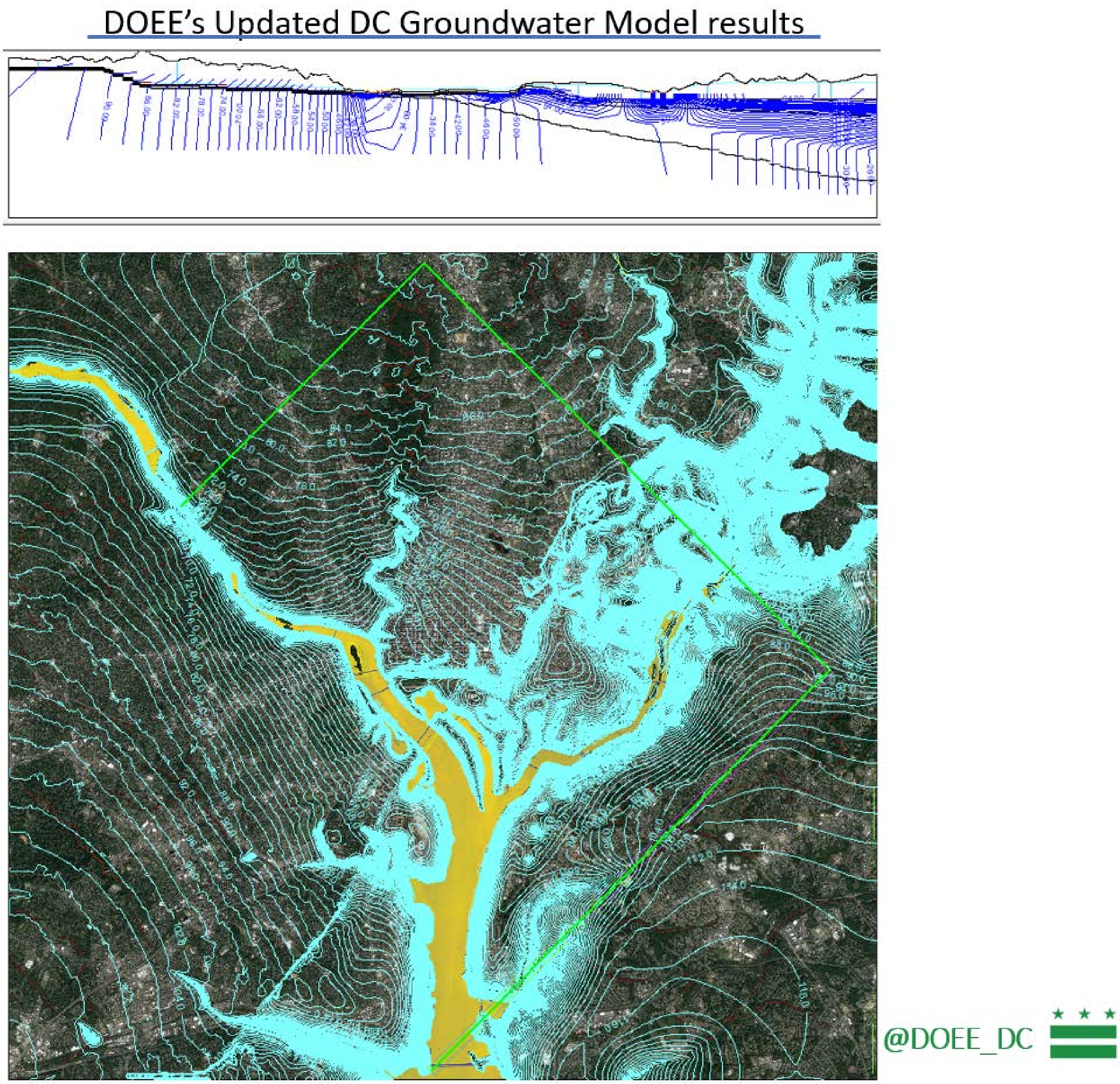


Figure 5.7 Updated DC Groundwater Model Results

Definitions

AASHTO - American Association of State Highway & Transportation Officials

Anti-seep collar - An impermeable diaphragm usually of sheet metal or concrete constructed at intervals within the zone of saturation along the conduit of a principal spillway to increase the seepage length along the conduit and thereby prevent piping or seepage along the conduit.

Anti-vortex device - A device designed and placed on the top of a riser or at the entrance of a pipe to prevent the formation of a vortex in the water at the entrance.

Apron - A floor or lining to protect a surface from erosion, for example, the pavement below chutes, spillways, or at the toes of dams.

Base flow - The stream discharge from groundwater accretion.

Best management practice (BMP) - Structural or non-structural practice that minimizes the impact of stormwater runoff on receiving waterbodies and other environmental resources, especially by reducing runoff volume and the pollutant loads carried in that runoff.

Building permit - Authorization for construction activity issued by the District of Columbia Department of Consumer and Regulatory Affairs.

Clearing - The removal of trees and brush from the land excluding the ordinary mowing of grass, pruning of trees, or other forms of long-term landscape maintenance.

Common plan of development - Multiple, separate, and distinct land-disturbing, substantial improvement, or other construction activities taking place under, or to further, a single, larger plan, although they may be taking place at different times on different schedules.

Construction - Activity conducted for the:

(a) Building, renovating, modifying, or razing of a structure; or

(b) Movement or shaping of earth, sediment, or a natural or built feature

   a. **Construction general permit (CGP)** - An NPDES general permit that regulates stormwater discharges from construction activities that disturb one or more acres, or smaller sites that are part of larger common plan of development or sale that disturb one or more acres.

   b. **Cut** - An act by which soil or rock is dug into, quarried, uncovered, removed, displaced, or relocated and the conditions resulting from those actions.

Demolition - The removal of part or all of a building, structure, or built land cover.

Department - The District of Columbia Department of Energy and Environment or its agent.

Dewatering - Removing water from an area or the environment using an approved technology or method, such as pumping.

DCMR - The District of Columbia Municipal Regulations.

DDOT - The District Department of Transportation.

Director - The Director of the Department of Energy and Environment.

District - The District of Columbia.

Disturbed area - An area in which the natural vegetative soil cover has been removed or altered and is susceptible to erosion.

DOEE - The Department of Energy and Environment.

EPA - The United States Environmental Protection Agency.

Erosion - The process by which the ground surface, including soil and deposited material, is worn away by the action of wind, water, ice, or gravity.

Erosion and sediment control (ESC) - Devices and conservation measures used to reduce or eliminate soil particles from leaving a land area.

Excavation - An act by which soil or rock is cut into, dug, quarried, uncovered, removed, displaced, or relocated and the conditions resulting from those actions.

Exposed area - Land that has been disturbed or land over which unstabilized soil or other erodible material is placed.

Grading - Causing disturbance of the earth, including excavating, filling, stockpiling of earth materials, grubbing, root mat or topsoil disturbance, or any combination of them.

Limits of disturbance (LOD) - The boundary within which all land grading, construction, landscaping, and related activities occur.

National Pollutant Discharge Elimination System (NPDES) - The NPDES permit program addresses water pollution by regulating point sources that discharge pollutants to the waters of the United States.

Notice of intent (NOI) - A form required for authorization of coverage under the Construction General Permit.

Peak discharge - The maximum rate of flow of water at a given point and time resulting from a storm event.

Public right-of-way (PROW) - The surface, the air space above the surface (including air space immediately adjacent to a private structure located on public space or in a public right-of-way), and the area below the surface of any public street, bridge, tunnel, highway, lane, path, alley, sidewalk, or boulevard.

Raze - The complete removal of a building or other structure down to the ground.

Responsible person - Construction personnel knowledgeable in the principles and practices of soil erosion and sediment control and certified by a Department-approved soil erosion and sedimentation control training program to assess conditions at the construction site that would impact the effectiveness of a soil-erosion or sediment-control measure on the site.

Runoff - That portion of precipitation (including snow-melt) which travels over the land surface, and from rooftops, either as sheetflow or as channel flow, in small trickles and streams, into the main water courses.

Safety and Data Sheet (SDS) - A document providing guidance on handling a hazardous substance, along with its composition and physical and chemical properties.

Sediment - Soil, including soil transported or deposited by human activity or the action of wind, water, ice, or gravity.

Sedimentation - The deposition or transportation of soil or other surface materials from one place to another because of an erosion process.

Soil - All earth material of whatever origin that overlies bedrock and may include the decomposed zone of bedrock which can be readily excavated by mechanical equipment.

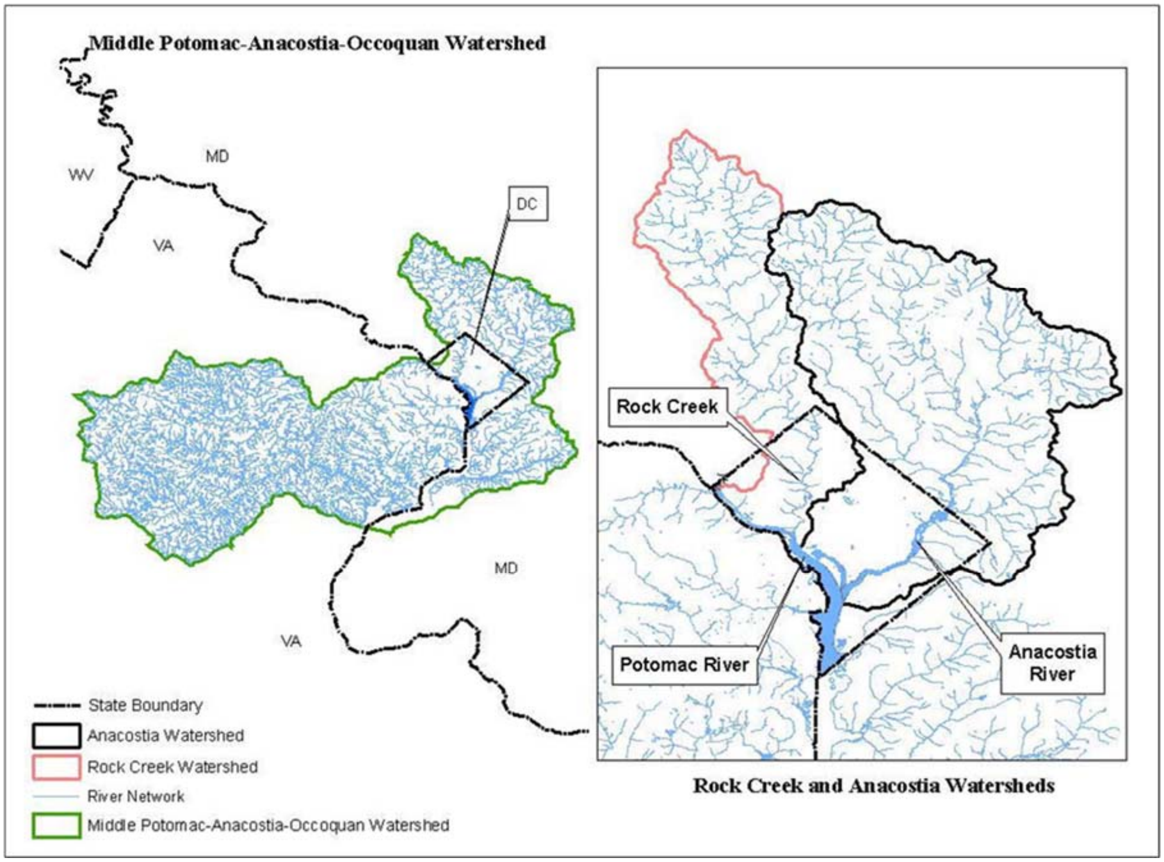
Soil erosion and sediment control plan - A set of drawings, calculations, specifications, details, and supporting documents related to minimizing or eliminating erosion and off-site sedimentation caused by stormwater on a construction site. It includes information on construction, installation, operation, and maintenance.

Soils report - A geotechnical report addressing all soil erosion and sediment control-related soil attributes, including but not limited to site soil drainage and stability.

Stormwater management plan - A set of drawings, calculations, specifications, details, and supporting documents related to the management of stormwater for a site, which includes information on construction, installation, operation, and maintenance.

Stormwater pollution prevention plan (SWPPP) - A document that identifies potential sources of stormwater pollution at a construction site, describes practices to reduce pollutants in stormwater discharge from the site, and may identify procedures to achieve compliance.

Appendix 2.1 Major District of Columbia Watersheds



Appendix 3.1 2024 Use Support and Cause by Pollutant

Waterbody Name	**Waterbody ID**	**Class A Swimming Use**	**Class B Secondary Contact Rec Use**	**Class C Aquatic life Use***	**Class D Fish Consumption Use**	**Class E Navigation Use**
Kingman Lake	DCAKL00L	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality DO TSS[2,3] Turbidity Oil & Grease DDT Phosphorus (Total)[2] Nitrogen (Total)[2] BOD[4]	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs Water Quality Arsenic DDD DDT Chlordane Dieldrin Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	Fully Supporting
Anacostia DC (Lower) Segment 01	DCANA00E SEG1	Not Supporting Causes: Water Quality *E. coli*	Not Supporting Causes: Water Quality Trash	Not Supporting Causes: Water Quality DDD DDT TSS[2,3] Phosphorus (Total)[2] Nitrogen (Total)[2] DO BOD[4] Chlorophyll-a	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs Water Quality Arsenic DDD DDT Chlordane Dieldrin Heptachlor	Fully Supporting

					Epoxide Benzo_a_anthracene (PAH2) Chrysene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	
Anacostia DC (Upper) Segment 02	DCANA00E SEG2	Not Supporting Causes: <u>Water Quality</u> *E. coli* Turbidity	Not Supporting Causes: <u>Water Quality</u> Trash Turbidity	Not Supporting Causes: <u>Water Quality</u> DO TSS[2,3] Turbidity Oil & Grease Phosphorus (Total)[2] Nitrogen (Total)[2] BOD[4] Chlorophyll a DDD DDE DDT Heptachlor epoxide Total PCBs	Not Supporting Causes: <u>Fish Tissue</u> Chlordane Dieldrin Heptachlor epoxide Total PCBs <u>Water Quality</u> Arsenic DDD DDE DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	Fully Supporting
Potomac DC (Lower) Segment 01	DCPMS00E SEG1	Not Supporting Causes: <u>Water Quality</u> *E. coli* Turbidity	Not Supporting Causes: <u>Water Quality</u> Turbidity	Not Supporting Causes: <u>Water Quality</u> Turbidity Phosphorus (Total)[2] Nitrogen (Total)[2] TSS[2] Chlorophyll-a	Not Supporting Causes: <u>Fish Tissue</u> Chlordane Dieldrin Heptachlor epoxide Total PCBs <u>Water Quality</u>	Fully Supporting

				DDD	Arsenic DDD Total PCBs	
Potomac DC (Middle) Segment 02	DCPMS00E SEG2	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Chlorophyll a TSS[2] Turbidity Phosphorus (Total)[2] Nitrogen (Total)[2]	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs Water Quality Arsenic Dieldrin Total PCBs	Fully Supporting
Potomac DC (Upper) Segment 03	DCPMS00E SEG3	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality TSS[2] Turbidity Phosphorus (Total)[2] Nitrogen (Total)[2] Chlorophyll a	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs Water Quality Arsenic Total PCBs	Fully Supporting
Tidal Basin	DCPTB01L	Fully Supporting	Fully Supporting	Not Supporting Causes: Water Quality Phosphorus (Total)[2] Nitrogen (Total)[2] TSS[2]	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Washington Ship Channel	DCPWC04E	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Not Supporting Causes: Water Quality Phosphorus (Total)[2] Nitrogen (Total)[2] TSS[2]	Not Supporting Causes: Fish Tissue Chlordane Dieldrin Heptachlor epoxide Total PCBs Water Quality Arsenic Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3)	Fully Supporting

					Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	
Rock Creek (Lower) Segment 01	DCRCR00R SEG1	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity DDD DDE	Not Supporting Causes: Water Quality Arsenic DDD DDE Dieldrin Heptachlor Epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Chrysene (PAH2) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	Fully Supporting
Rock Creek (Upper) Segment 02	DCRCR00R SEG2	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity	Insufficient evidence to determine use support	Fully Supporting
Battery Kemble Creek	DCTBK01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support*	Fully Supporting	NDU
Broad Branch	DCTBR01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity DDT Heptachlor epoxide	Not Supporting Causes: Water Quality Arsenic DDT Dieldrin Heptachlor Epoxide Total PCBs	Fully Supporting
C&O Canal	DCTCO01L	Not Supporting Causes:	Fully Supporting	Insufficient evidence to determine use support	Insufficient evidence to determine use support#	Fully Supporting

		Water Quality *E. coli*				
Dalecarlia Tributary	DCTDA01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Dieldrin Heptachlor epoxide Total PCBs	NDU
Dumbarton Oaks Tributary	DCTDO01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Not Supporting Causes: Water Quality Chlordane DDT Heptachlor Epoxide	Not Supporting Causes: Water Quality Arsenic Chlordane DDT Dieldrin Heptachlor Epoxide Mercury Total PCBs	Fully Supporting
Fenwick Branch	DCTFE01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality DDT Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Fort Chaplin Run	DCTFC01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Arsenic	NDU
Fort Davis Tributary	DCTFD01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Arsenic	NDU
Fort Dupont Tributary	DCTDU01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Arsenic Total PCBs	NDU
Fort Stanton Tributary	DCTFS01R	Not Supporting Causes:	Not Supporting Causes:	Not Supporting Causes:	Not Supporting Causes:	NDU

		Water Quality *E. coli* Turbidity	Water Quality Turbidity	Water Quality Turbidity	Water Quality Arsenic Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Total PCBs	
Foundry Branch	DCTFB02R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Fully Supporting	NDU
Hickey Run	DCTHR01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity Copper Total residual chlorine	Not Supporting Causes: Water Quality DDE Benzo_a_anthracene (PAH2) Total PCBs	NDU
Klingle Valley Creek	DCTKV01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Luzon Branch	DCTLU01	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Melvin Hazen Valley Branch	DCTMH01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Not Supporting Causes: Water Quality DDT	Not Supporting Causes: Water Quality Arsenic DDT Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Nash Run	DCTNA01R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Arsenic Dieldrin Heptachlor epoxide Benzo_a_anthra	NDU

					cene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	
Normanstone Creek	DCTNS01R	Not Supporting Causes: <u>Water Quality</u> *E. coli*	Fully Supporting	Insufficient evidence to determine use	Not Supporting Causes: <u>Water Quality</u> Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Oxon Run	DCTOR01R	Not Supporting Causes: <u>Water Quality</u> *E. coli* Turbidity	Not Supporting Causes: <u>Water Quality</u> Turbidity	Not Supporting Causes: <u>Water Quality</u> Turbidity	Not Supporting Causes: <u>Water Quality</u> Dieldrin	NDU
Pinehurst Branch	DCTPI01R	Not Supporting Causes: <u>Water Quality</u> *E. coli*	Fully Supporting	Insufficient evidence to determine use	Not Supporting Causes: <u>Water Quality</u> Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Piney Branch	DCTPY01R	Not Supporting Causes: <u>Water Quality</u> *E. coli*	Fully Supporting	Insufficient evidence to determine use	Not Supporting Causes: <u>Water Quality</u> Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Pope Branch	DCTPB01R	Not Supporting Causes: <u>Water Quality</u> *E. coli*	Fully Supporting	Not Supporting Causes: <u>Water Quality</u> Chlordane	Not Supporting Causes: <u>Water Quality</u> Chlordane DDE Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3)	NDU

					Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	
Portal Branch	DCTPO01R	Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Soapstone Creek		Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Dieldrin Heptachlor epoxide Total PCBs	Fully Supporting
Texas Avenue Tributary	DCTTX27R	Not Supporting Causes: Water Quality *E. coli* Turbidity	Not Supporting Causes: Water Quality Turbidity	Not Supporting Causes: Water Quality Turbidity Chlordane DDD	Not Supporting Causes: Water Quality Arsenic Chlordane DDD DDE DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Total PCBs	NDU
Watts Branch (Lower) Segment 01		Not Supporting Causes: Water Quality *E. coli*	Fully Supporting	Insufficient evidence to determine use support	Not Supporting Causes: Water Quality Arsenic Dieldrin Total PCBs	NDU
Watts Branch		Not	Not	Not	Not Supporting	NDU

(Upper) Segment 02		Supporting Causes: Water Quality *E. coli* Turbidity	Supporting Causes: Water Quality Turbidity	Supporting Causes: Water Quality Turbidity	Causes: Water Quality Arsenic Dieldrin Total PCBs	

* Note that there is currently no approved methodology for benthic and macroinvertebrate evaluations for the 2024 IR. In the vast majority of cases, evaluation of use attainment for Class C was able to be made based on other pollutants/metrics. For example, in some cases, other pollutants/metrics showed that the Class C use was not supported. However, in cases where findings from other pollutant evaluations showed that there was insufficient evidence to determine use support, the Class C use was classified as "insufficient evidence to determine use support" based on the lack of current benthic and macroinvertebrate evaluations and the lack of definitive evaluation of impairment from other pollutant evaluations.

#Whiole there were no pollutants identified as causing impairment for this waterbody, there were other pollutants for which there was insufficient evidence to make a use determination.

[1] All findings based on DOEE data collection unless otherwise noted.

[2] Based on Chesapeake Bay Program analysis.

[3] Based on Anacostia watershed TSS TMDL.

[4] Based on Anacostia watershed BOD TMDL.

Appendix 3.2 2018-2023 Statistical Summary Reports

Total Statistical Summary Report

Waterbody Name	Waterbody ID	Temperature % Violation	pH % Violation	DO % Violation	Turbidity % Violation	E. coli SSV % Violation	E. coli monthly geomean % Violation
Kingman Lake	DCAKL00L	0.00	1.04	37.00	37.50	27.89	66.67
Lower Anacostia	DCANA00E_SEG1	0.00	1.80	13.56	7.74	30.51	84.00
Upper Anacostia	DCANA00E_SEG2	0.00	4.68	38.62	22.28	34.67	92.00
Lower Potomac	DCPMS00E_SEG1	0.00	0.38	1.12	11.19	8.75	15.00
Middle Potomac	DCPMS00E_SEG2	0.63	3.35	0.00	10.61	16.25	16.00
Upper Potomac	DCPMS00E_SEG3	0.00	1.30	0.00	12.15	25.19	72.73
Tidal Basin	DCPTB01L	0.00	4.26	0.00	1.34	6.60	5.26
Washington Ship Channel	DCPWC04E	0.00	1.51	3.60	1.44	4.59	14.29
Lower Rock Creek	DCRCR00R_SEG1	0.34	4.71	0.00	10.78	54.52	100.00
Upper Rock Creek	DCRCR00R_SEG2	0.00	3.07	0.00	32.24	60.80	100.00
Battery Kemble Creek	DCTBK01R	0.00	6.82	0.00	0.00	47.92	93.33
Broad Branch	DCTBR01R	0.00	3.73	2.38	12.59	46.94	88.24
C&O Canal	DCTCO01L	0.00	3.41	1.15	1.14	4.35	11.11
Dalecarlia Tributary	DCTDA01R	0.00	0.00	0.00	0.00	66.67	#N/A
Dumbarton Oaks	DCTDO01R	0.00	0.00	0.00	0.00	25.00	#N/A
Fort Dupont	DCTDU01R	0.00	0.00	0.00	19.51	46.94	#N/A
Foundry Branch	DCTFB02R	0.00	3.05	0.00	5.67	35.86	93.33
Fort Chaplin	DCTFC01R	0.00	0.00	0.00	18.18	54.00	#N/A
Fort Davis	DCTFD01R	0.00	0.00	7.32	47.50	39.13	#N/A
Fenwick Branch	DCTFE01R	0.00	0.00	0.00	4.76	24.44	#N/A
Fort Stanton	DCTFS01R	0.00	0.00	0.00	21.74	37.50	#N/A
Hickey Run	DCTHR01R	0.00	3.97	2.17	31.98	91.18	100.00
Klingle Valley	DCTKV01R	0.00	0.00	0.00	2.38	13.33	#N/A
Luzon Branch	DCTLU01	0.00	0.00	0.00	9.52	73.33	#N/A
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	0.00	3.70	0.00	5.00	40.97	93.75
Nash Run	DCTNA01R	0.00	0.00	4.88	17.07	68.89	#N/A
Normanstone Creek	DCTNS01R	0.00	4.51	0.00	0.73	75.52	100.00

Waterbody Name	Waterbody ID	Temperature % Violation	pH % Violation	DO % Violation	Turbidity % Violation	E. coli SSV % Violation	E. coli monthly geomean % Violation
Oxon Run	DCTOR01R	0.00	0.00	2.17	13.04	52.73	#N/A
Pope Branch	DCTPB01R	0.00	0.00	0.00	4.65	38.00	#N/A
Pinehurst Branch	DCTPI01R	0.00	3.03	0.00	0.72	48.61	88.24
Portal Branch	DCTPO01R	0.00	0.00	0.00	2.38	44.44	#N/A
Piney Branch	DCTPY01R	0.00	0.00	0.00	0.00	35.56	#N/A
Soapstone Creek	DCTSO01R	0.00	5.30	0.00	2.13	44.83	100.00
Texas Avenue Tributary	DCTTX27R	0.00	0.00	2.50	15.00	62.22	#N/A
Lower Watts Branch	DCTWB00R_SEG1	0.00	2.70	0.00	9.33	85.37	100.00
Upper Watts Branch	DCTWB00R_SEG2	0.00	4.76	0.00	26.09	78.99	100.00

E. coli Geometric Mean (a minimum of 5 samples in 30 days (calendar month))

Waterbody Name	Waterbody ID	# of samples	monthly geomean % violation
Kingman Lake	DCAKL00L	21	66.67
Lower Anacostia	DCANA00E_SEG1	25	84.00
Upper Anacostia	DCANA00E_SEG2	25	92.00
Lower Potomac	DCPMS00E_SEG1	20	15.00
Middle Potomac	DCPMS00E_SEG2	25	16.00
Upper Potomac	DCPMS00E_SEG3	22	72.73
Tidal Basin	DCPTB01L	19	5.26
Washington Ship Channel	DCPWC04E	21	14.29
Lower Rock Creek	DCRCR00R_SEG1	25	100.00
Upper Rock Creek	DCRCR00R_SEG2	25	100.00
Battery Kemble Creek	DCTBK01R	15	93.33
Broad Branch	DCTBR01R	17	88.24
C&O Canal	DCTCO01L	9	11.11
Dalecarlia Tributary	DCTDA01R	0	NA
Dumbarton Oaks	DCTDO01R	0	NA
Fort Dupont	DCTDU01R	0	NA
Foundry Branch	DCTFB02R	15	93.33
Fort Chaplin	DCTFC01R	0	NA
Fort Davis	DCTFD01R	0	NA
Fenwick Branch	DCTFE01R	0	NA
Fort Stanton	DCTFS01R	0	NA
Hickey Run	DCTHR01R	19	100.00

Waterbody Name	Waterbody ID	# of samples	monthly geomean % violation
Klingle Valley	DCTKV01R	0	NA
Luzon Branch	DCTLU01	0	NA
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	16	93.75
Nash Run	DCTNA01R	0	NA
Normanstone Creek	DCTNS01R	17	100.00
Oxon Run	DCTOR01R	0	NA
Pope Branch	DCTPB01R	0	NA
Pinehurst Branch	DCTPI01R	17	88.24
Portal Branch	DCTPO01R	0	NA
Piney Branch	DCTPY01R	0	NA
Soapstone Creek	DCTSO01R	17	100.00
Texas Avenue Tributary	DCTTX27R	0	NA
Lower Watts Branch	DCTWB00R_SEG1	6	100.00
Upper Watts Branch	DCTWB00R_SEG2	9	100.00

NA-not assessed, minimum number of samples requirement not met.

E. coli Statistical Summary Report (MPN/100mL)

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	SSV (410) % violation
Kingman Lake	DCAKL00L	15	2,420	420	563	173	27.89
Lower Anacostia	DCANA00E_SEG1	2	2,420	491	712	162	30.51
Upper Anacostia	DCANA00E_SEG2	1	2,420	605	809	210	34.67
Lower Potomac	DCPMS00E_SEG1	1	2,420	176	461	24	8.75
Middle Potomac	DCPMS00E_SEG2	1	2,420	266	538	54	16.25
Upper Potomac	DCPMS00E_SEG3	2	4,840	360	584	141	25.19
Tidal Basin	DCPTB01L	1	2,420	132	312	46	6.60
Washington Ship Channel	DCPWC04E	1	2,420	129	306	41	4.59
Lower Rock Creek	DCRCR00R_SEG1	41	4,840	939	929	435	54.52

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	SSV (410) % violation
Upper Rock Creek	DCRCR00R_SEG2	30	160,000	4,738	9,653	520	60.80
Battery Kemble Creek	DCTBK01R	20	2,420	594	630	365	47.92
Broad Branch	DCTBR01R	6	2,420	756	842	345	46.94
C&O Canal	DCTCO01, DCTCO01L	1	2,420	138	277	62	4.35
Dalecarlia Tributary	DCTDA01R	38	2,420	963	848	770	66.67
Dumbarton Oaks	DCTDO01R	7	1,986	326	460	138	25.00
Fort Dupont	DCTDU01R	52	4,839	709	945	345	46.94
Foundry Branch	DCTFB02R	3	2,420	527	708	192	35.86
Fort Chaplin	DCTFC01R	1	2,420	854	921	450	54.00
Fort Davis	DCTFD01R	4	4,839	726	975	255	39.13
Fenwick Branch	DCTFE01R	24	2,420	341	484	161	24.44
Fort Stanton	DCTFS01R	2	24,196	1,014	3,251	186	37.50
Hickey Run	DCTHR01R	99	240,000	9,559	23,857	2,420	91.18
Klingle Valley	DCTKV01R	1	1,733	219	383	58	13.33
Luzon Branch	DCTLU01	96	2,420	1,308	930	1,120	73.33
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	9	2,420	661	810	319	40.97
Nash Run	DCTNA01R	24	2,420	1,077	921	579	68.89
Normanstone Creek	DCTNS01R	40	2,420	1,311	935	1,046	75.52
Oxon Run	DCTOR01R	88	2,420	853	858	488	52.73
Pope Branch	DCTPB01R	4	2,420	604	822	164	38.00
Pinehurst Branch	DCTPI01R	2	2,420	666	739	355	48.61

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	SSV (410) % violation
Portal Branch	DCTPO01R	23	2,420	679	831	365	44.44
Piney Branch	DCTPY01R	21	2,420	474	639	214	35.56
Soapstone Creek	DCTSO01R	3	2,420	633	667	345	44.83
Texas Avenue Tributary	DCTTX27R	8	24,200	1,452	3,581	613	62.22
Lower Watts Branch	DCTWB00R_SEG1	42	24,196	1,764	2,644	1,559	85.37
Upper Watts Branch	DCTWB00R_SEG2	1	240,000	6,956	22,028	1,300	78.99

Dissolved Oxygen Statistical Summary Report (mg/L)

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Kingman Lake	DCAKL00L	2.0	26.0	7.1	3.7	6.9	37.0%
Lower Anacostia	DCANA00E_SEG1	2.2	14.7	8.1	2.9	7.7	13.6%
Upper Anacostia	DCANA00E_SEG2	0.5	14.1	6.6	3.0	5.9	38.6%
Lower Potomac	DCPMS00E_SEG1	4.5	16.2	9.5	2.5	8.8	1.1%
Middle Potomac	DCPMS00E_SEG2	5.3	15.7	9.6	2.2	8.9	0.0%
Upper Potomac	DCPMS00E_SEG3	6.9	15.3	10.7	2.5	10.2	0.0%
Tidal Basin	DCPTB01L	6.0	16.1	10.5	2.4	9.9	0.0%
Washington Ship Channel	DCPWC04E	4.0	15.1	8.8	2.2	8.7	3.6%
Lower Rock Creek	DCRCR00R_SEG1	7.2	15.8	9.4	1.8	8.8	0.0%
Upper Rock Creek	DCRCR00R_SEG2	4.5	15.3	8.9	2.1	8.2	0.0%
Battery Kemble Creek	DCTBK01R	7.9	15.0	10.8	1.9	10.6	0.0%
Broad Branch	DCTBR01R	4.3	18.8	11.1	3.0	10.0	2.4%

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
C&O Canal	DCTCO01L	4.2	12.7	7.9	1.9	7.5	1.1%
Dalecarlia Tributary	DCTDA01R	6.6	15.6	9.8	2.2	9.2	0.0%
Dumbarton Oaks	DCTDO01R	7.4	13.9	10.2	1.8	10.1	0.0%
Fort Dupont	DCTDU01R	7.2	15.1	10.3	1.9	10.1	0.0%
Foundry Branch	DCTFB02R	7.1	15.6	10.8	2.6	10.3	0.0%
Fort Chaplin	DCTFC01R	4.3	13.5	8.9	2.5	8.5	0.0%
Fort Davis	DCTFD01R	1.8	13.9	8.1	2.8	8.1	7.3%
Fenwick Branch	DCTFE01R	6.5	15.4	9.9	2.4	8.9	0.0%
Fort Stanton	DCTFS01R	6.9	15.1	10.2	2.0	10.1	0.0%
Hickey Run	DCTHR01R	1.0	16.2	7.7	2.9	7.2	2.2%
Klingle Valley	DCTKV01R	7.2	15.9	10.4	2.1	10.0	0.0%
Luzon Branch	DCTLU01	7.0	14.6	10.0	2.0	9.3	0.0%
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	7.6	16.0	10.6	2.0	10.2	0.0%
Nash Run	DCTNA01R	3.0	14.8	8.4	2.8	8.6	4.9%
Normanstone Creek	DCTNS01R	6.7	14.0	10.1	2.2	9.9	0.0%
Oxon Run	DCTOR01R	4.5	14.6	10.1	2.3	10.1	2.2%
Pope Branch	DCTPB01R	4.6	13.6	8.4	2.6	8.0	0.0%
Pinehurst Branch	DCTPI01R	7.6	17.6	11.2	2.8	10.6	0.0%
Portal Branch	DCTPO01R	4.5	15.0	9.4	2.4	8.7	0.0%
Piney Branch	DCTPY01R	6.4	15.8	9.7	2.5	9.2	0.0%
Soapstone Creek	DCTSO01R	7.1	17.2	10.7	2.4	10.0	0.0%

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Texas Avenue Tributary	DCTTX27R	0.7	13.9	9.4	2.3	9.5	2.5%
Lower Watts Branch	DCTWB00R_SEG1	4.7	17.5	9.4	2.9	9.3	0.0%
Upper Watts Branch	DCTWB00R_SEG2	6.1	14.8	9.9	2.2	10.0	0.0%

pH Statistical Summary Report

Waterbody Segment	Watershed Code	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Kingman Lake	DCAKL00L	5.0	8.0	7.1	0.5	7.0	1.04
Lower Anacostia	DCANA00E_SEG1	4.0	10.0	7.2	0.6	7.3	1.80
Upper Anacostia	DCANA00E_SEG2	4.0	8.2	7.0	0.6	7.1	4.68
Lower Potomac	DCPMS00E_SEG1	6.4	8.6	7.8	0.3	7.8	0.38
Middle Potomac	DCPMS00E_SEG2	5.0	8.9	7.7	0.6	7.8	3.35
Upper Potomac	DCPMS00E_SEG3	5.0	8.8	7.2	0.6	7.0	1.30
Tidal Basin	DCPTB01L	5.0	8.9	7.4	0.7	7.0	4.26
Washington Ship Channel	DCPWC04E	5.0	8.9	7.5	0.6	7.5	1.51
Lower Rock Creek	DCRCR00R_SEG1	4.0	8.7	7.2	0.7	7.0	4.71
Upper Rock Creek	DCRCR00R_SEG2	4.0	8.1	7.2	0.6	7.4	3.07
Battery Kemble Creek	DCTBK01R	4.0	8.2	7.0	0.9	7.0	6.82
Broad Branch	DCTBR01R	5.0	12.2	7.5	0.7	7.5	3.73
C&O Canal	DCTCO01L	7.1	8.8	7.9	0.3	7.9	3.41
Dalecarlia Tributary	DCTDA01R	6.9	8.2	7.6	0.3	7.6	0.00
Dumbarton Oaks	DCTDO01R	7.0	8.4	7.6	0.2	7.6	0.00
Fort Dupont	DCTDU01R	6.7	7.8	7.4	0.3	7.5	0.00
Foundry Branch	DCTFB02R	5.0	8.3	7.0	0.7	7.0	3.05
Fort Chaplin	DCTFC01R	6.8	7.8	7.5	0.2	7.5	0.00
Fort Davis	DCTFD01R	6.5	7.7	7.1	0.2	7.2	0.00
Fenwick Branch	DCTFE01R	7.2	7.9	7.4	0.2	7.4	0.00
Fort Stanton	DCTFS01R	6.9	8.2	7.4	0.3	7.5	0.00
Hickey Run	DCTHR01R	4.0	8.0	7.1	0.7	7.0	3.97

Waterbody Segment	Watershed Code	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Klingle Valley	DCTKV01R	7.2	8.4	7.5	0.2	7.5	0.00
Luzon Branch	DCTLU01	7.2	8.4	7.6	0.2	7.6	0.00
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	5.0	10.6	7.3	0.7	7.5	3.70
Nash Run	DCTNA01R	7.0	8.0	7.5	0.3	7.5	0.00
Normanstone Creek	DCTNS01R	3.0	8.5	6.9	0.8	7.0	4.51
Oxon Run	DCTOR01R	7.0	8.0	7.6	0.3	7.6	0.00
Pope Branch	DCTPB01R	6.6	7.8	7.2	0.2	7.2	0.00
Pinehurst Branch	DCTPI01R	5.0	8.6	7.2	0.6	7.0	3.03
Portal Branch	DCTPO01R	6.9	7.7	7.5	0.2	7.5	0.00
Piney Branch	DCTPY01R	6.8	8.0	7.4	0.2	7.4	0.00
Soapstone Creek	DCTSO01R	5.0	8.8	7.2	0.8	7.0	5.30
Texas Avenue Tributary	DCTTX27R	6.7	7.9	7.3	0.2	7.3	0.00
Lower Watts Branch	DCTWB00R_SEG1	4.0	8.5	7.4	0.6	7.5	2.70
Upper Watts Branch	DCTWB00R_SEG2	5.0	9.3	7.6	0.6	7.6	4.76

Temperature Statistical Summary Report (°C)

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Kingman Lake	DCAKL00L	1.0	30.0	19.4	7.9	23.0	0.00
Lower Anacostia	DCANA00E_SEG1	1.8	31.8	20.3	8.2	23.2	0.00
Upper Anacostia	DCANA00E_SEG2	2.3	31.9	20.4	7.6	23.0	0.00
Lower Potomac	DCPMS00E_SEG1	1.6	31.5	18.0	8.6	19.5	0.00
Middle Potomac	DCPMS00E_SEG2	1.6	37.2	21.5	7.8	24.5	0.63
Upper Potomac	DCPMS00E_SEG3	1.6	31.0	22.0	6.6	24.0	0.00
Tidal Basin	DCPTB01L	1.1	31.0	21.5	7.7	24.3	0.00
Washington Ship Channel	DCPWC04E	2.7	31.7	23.1	6.7	25.1	0.00
Lower Rock Creek	DCRCR00R_SEG1	1.2	40.0	20.1	5.3	21.7	0.34
Upper Rock Creek	DCRCR00R_SEG2	2.4	27.6	17.7	6.7	19.8	0.00
Battery Kemble Creek	DCTBK01R	1.5	22.2	15.9	4.9	17.4	0.00
Broad Branch	DCTBR01R	2.1	27.0	17.3	5.5	19.2	0.00
C&O Canal	DCTCO01L	6.3	31.8	22.9	6.3	25.2	0.00

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Dalecarlia Tributary	DCTDA01R	4.6	23.1	14.2	5.7	14.0	0.00
Dumbarton Oaks	DCTDO01R	4.5	23.1	14.0	5.7	13.9	0.00
Fort Dupont	DCTDU01R	1.5	25.7	13.8	7.4	13.1	0.00
Foundry Branch	DCTFB02R	2.8	26.0	17.0	5.3	19.1	0.00
Fort Chaplin	DCTFC01R	4.8	24.3	14.1	6.2	14.2	0.00
Fort Davis	DCTFD01R	1.7	23.4	13.3	6.9	12.9	0.00
Fenwick Branch	DCTFE01R	3.8	23.8	14.2	6.6	14.4	0.00
Fort Stanton	DCTFS01R	2.3	23.5	12.7	6.8	11.7	0.00
Hickey Run	DCTHR01R	4.6	27.1	17.5	5.6	18.3	0.00
Klingle Valley	DCTKV01R	1.6	24.5	12.9	6.5	12.4	0.00
Luzon Branch	DCTLU01	5.8	21.6	14.2	5.0	14.1	0.00
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	1.8	24.5	16.9	5.2	18.9	0.00
Nash Run	DCTNA01R	4.0	26.2	15.7	6.8	15.3	0.00
Normanstone Creek	DCTNS01R	2.8	22.8	16.4	4.7	18.1	0.00
Oxon Run	DCTOR01R	2.4	25.9	13.2	7.6	10.2	0.00
Pope Branch	DCTPB01R	2.5	25.1	13.6	7.4	13.3	0.00
Pinehurst Branch	DCTPI01R	2.1	23.5	16.9	5.3	18.7	0.00
Portal Branch	DCTPO01R	2.3	23.9	13.8	6.6	13.8	0.00
Piney Branch	DCTPY01R	1.2	24.5	13.3	7.3	13.0	0.00
Soapstone Creek	DCTSO01R	1.4	24.0	17.2	5.3	19.3	0.00
Texas Avenue Tributary	DCTTX27R	3.7	22.4	13.5	5.9	13.3	0.00
Lower Watts Branch	DCTWB00R_SEG1	3.1	24.8	16.5	6.4	18.0	0.00
Upper Watts Branch	DCTWB00R_SEG2	2.8	25.9	15.6	6.6	16.0	0.00

Turbidity Statistical Summary Report (NTU)

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Kingman Lake	DCAKL00L	3.7	87.1	21.1	13.2	17.0	37.50
Lower Anacostia	DCANA00E_SEG1	0.4	158.0	10.0	11.7	7.4	7.74
Upper Anacostia	DCANA00E_SEG2	1.1	217.0	18.4	22.3	12.7	22.28
Lower Potomac	DCPMS00E_SEG1	1.0	96.0	10.9	12.0	7.3	11.19

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Middle Potomac	DCPMS00E_SEG2	0.0	164.0	8.9	16.5	4.2	10.61
Upper Potomac	DCPMS00E_SEG3	0.1	214.0	10.8	19.9	6.0	12.15
Tidal Basin	DCPTB01L	1.1	23.2	5.8	3.2	5.1	1.34
Washington Ship Channel	DCPWC04E	0.2	24.0	4.0	3.2	3.2	1.44
Lower Rock Creek	DCRCR00R_SEG1	0.0	331.2	11.2	30.2	3.2	10.78
Upper Rock Creek	DCRCR00R_SEG2	0.0	440.0	35.4	63.4	7.1	32.24
Battery Kemble Creek	DCTBK01R	0.0	13.4	1.6	1.8	1.2	0.00
Broad Branch	DCTBR01R	0.0	86.3	9.4	11.8	6.0	12.59
C&O Canal	DCTCO01L	0.5	28.8	6.0	4.1	5.0	1.14
Dalecarlia Tributary	DCTDA01R	0.0	19.1	1.0	2.9	0.4	0.00
Dumbarton Oaks	DCTDO01R	0.0	4.3	1.3	1.2	1.0	0.00
Fort Dupont	DCTDU01R	0.5	893.0	33.0	138.6	5.5	19.51
Foundry Branch	DCTFB02R	0.0	1250.0	11.9	106.1	0.7	5.67
Fort Chaplin	DCTFC01R	1.8	93.0	13.0	17.2	7.0	18.18
Fort Davis	DCTFD01R	1.3	307.0	40.3	60.4	17.7	47.50
Fenwick Branch	DCTFE01R	0.0	49.3	2.4	8.3	0.4	4.76
Fort Stanton	DCTFS01R	0.3	1885.0	78.2	323.2	4.9	21.74
Hickey Run	DCTHR01R	0.7	220.0	21.7	31.5	8.8	31.98
Klingle Valley	DCTKV01R	0.0	32.1	1.3	5.0	0.2	2.38
Luzon Branch	DCTLU01	0.0	116.9	8.1	24.2	0.7	9.52
Melvin Hazen Valley Branch (Reservation 360)	DCTMH01R	0.0	146.0	5.8	16.1	1.9	5.00
Nash Run	DCTNA01R	0.0	47.1	9.4	11.1	5.0	17.07
Normanstone Creek	DCTNS01R	0.0	24.9	1.8	3.1	0.8	0.73
Oxon Run	DCTOR01R	0.0	45.9	6.4	11.4	2.0	13.04
Pope Branch	DCTPB01R	0.6	264.0	15.6	39.1	8.6	4.65
Pinehurst Branch	DCTPI01R	0.0	36.5	1.7	3.9	0.5	0.72
Portal Branch	DCTPO01R	0.0	84.3	3.4	13.2	0.5	2.38
Piney Branch	DCTPY01R	0.0	11.6	1.2	2.5	0.2	0.00
Soapstone Creek	DCTSO01R	0.0	68.3	2.7	7.7	0.7	2.13
Texas Avenue Tributary	DCTTX27R	1.3	42.0	12.6	9.9	9.5	15.00

Waterbody Name	Waterbody ID	Min. Value	Max Value	Avg. Value	Std. Dev.	Median Value	% WQS Violation
Lower Watts Branch	DCTWB00R_SEG1	0.1	433.0	16.0	56.1	4.6	9.33
Upper Watts Branch	DCTWB00R_SEG2	0.0	459.7	25.7	54.4	6.2	26.09

Appendix 3.3 District of Columbia 303(d) List

Categorization of District of Columbia Waters

Category 1- All designated uses are supported, no use is threatened.

No DC waters fit this category.

Category 2- Available data and/or information indicate that some, but not all, designated uses are supported.

No DC waters fit this category.

Category 3- There is insufficient available data and/or information to make a use support determination.

Category 4- Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

See subcategories below:

> Category 4A- TMDLs needed to result in a designated use attainment have been approved or established by EPA.
>
> Category 4B- TMDL not required. Other pollution control requirements (such as permits, strategies) are expected to address waterbody/pollutant combinations and result in attainment of the water quality standards in a reasonable period of time.
>
> Category 4C- Impaired or threatened waters for one or more designated uses. TMDL is not required as impairment is not caused by a pollutant.

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

Geographic Location: 0207001003 - Cameron Run-Potomac River 0207000810 - Difficult Run-Potomac River 0207001002 - Anacostia River 0207001001 - Rock Creek-Potomac River.

DISTRICT OF COLUMBIA

LIST OF IMPAIRED WATERBODIES

Category 3 - There is insufficient available data and/or information to make a use support determination

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutants for which there is insufficient information to make use determination
2024	0207001001	DCTBK01R	Battery Kemble Creek	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTCO01L	Chesapeake and Ohio Canal	C	Total PCBs
2024	0207001001	DCTCO01L	Chesapeake and Ohio Canal	D	Total PCBs
2024	0207000810	DCTDA01R	Dalecarlia Tributary	C	Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTDO01R	Dumbarton Oaks	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTFE01R	Fenwick Branch	C	DDT Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTKV01R	Klingle Valley Creek	C	Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment

Category 3 - There is insufficient available data and/or information to make a use support determination					
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutants for which there is insufficient information to make use determination
2024	0207001001	DCTNS01R	Normanstone Creek	C	Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTPI01R	Pinehurst Branch	C	Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTPY01R	Piney Branch	C	Chlordane Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTPO01R	Portal Branch	C	Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTSO01R	Soapstone Creek	C	Chlordane Dieldrin Heptachlor epoxide Total PCBs Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTWB00R	Lower Watts Branch	C	Physical habitat assessment

Category 3 - There is insufficient available data and/or information to make a use support determination					
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutants for which there is insufficient information to make use determination
					Benthic macroinvertebrate assessment
2024	0207001002	DCTFD01R	Fort Davis Tributary	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001003	DCTOR01R	Oxon Run	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTNA01R	Nash Run	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTBR01R	Broad Branch	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCRCR00R	Upper Rock Creek	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCRCR00R	Upper Rock Creek	D	Chlordane Dieldrin Heptachlor epoxide Total PCBs
2024	0207001001	DCTFB02R	Foundry Branch	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTPB01R	Popes Branch	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTDU01R	Fort Dupont Creek	C	Physical habitat assessment Benthic macroinvertebrate assessment

Category 3 - There is insufficient available data and/or information to make a use support determination

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutants for which there is insufficient information to make use determination
2024	0207001002	DCTHR01R	Hickey Run	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTTX27R	Texas Avenue Tributary	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTDO01R	Dumbarton Oaks	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTFC01R	Fort Chaplin Run	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTWB00R	Upper Watts Branch	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCTLU01R	Luzon Branch	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001002	DCTFS01R	Fort Stanton Tributary	C	Physical habitat assessment Benthic macroinvertebrate assessment
2024	0207001001	DCRCR00R	Lower Rock Creek	C	Physical habitat assessment Benthic macroinvertebrate assessment

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
2024	0207001002	DCANA00E	Upper Anacostia River- segment 2	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCANA00E	Upper Anacostia River- segment 2	B	Trash Turbidity	Trash TSS
2024	0207001002	DCANA00E	Upper Anacostia River- segment 2	C	DDD DDE DDT Heptachlor epoxide Total PCBs TSS Phosphorus (Total) Nitrogen (Total) Chlorophyll-a DO BOD Turbidity Oil & Grease	DDD DDE DDT Heptachlor epoxide Total PCBs TSS Phosphorus (Total) Nitrogen (Total) Oil & Grease BOD
2024	0207001002	DCANA00E	Upper Anacostia River- segment 2	D	Arsenic DDD DDE DDT Dieldrin Heptachlor Epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3)	Arsenic DDD DDE DDT Dieldrin Heptachlor Epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3)

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs Total PCBs (fish tissue)	Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs
2024	0207001002	DCANA00E	Upper Anacostia River- segment 2	D	Chlordane (fish tissue) Dieldrin (fish tissue) Heptachlor epoxide (fish tissue)	Chlordane Dieldrin Heptachlor epoxide
2024	0207001002	DCANA00E	Lower Anacostia River- segment 1	A	*E. coli*	*E. coli*
2024	0207001002	DCANA00E	Lower Anacostia River- segment 1	B	Trash	Trash
2024	0207001002	DCANA00E	Lower Anacostia River- segment 1	C	DDD DDT TSS Phosphorus (Total) Nitrogen (Total) BOD Chlorophyll-a DO	DDD DDT TSS Phosphorus (Total) Nitrogen (Total) BOD DO
2024	0207001002	DCANA00E	Lower Anacostia River-segment 1	D	Arsenic Chlordane	Arsenic Chlordane

Category 4a - TMDL has been approved to address identified impairment causes

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					DDD DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Chrysene (PAH2) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs Total PCBs (fish tissue) Chlordane (fish tissue) Dieldrin (fish tissue) Heptachlor epoxide (fish tissue)	DDD DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Chrysene (PAH2) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs Chlordane Dieldrin Heptachlor epoxide
2024	0207001003	DCPMS00E	Lower Potomac	A	*E. coli*	*E. coli*

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
			River- segment 1		Turbidity	TSS
2024	0207001003	DCPMS00E	Lower Potomac River-segment 1	B	Turbidity	TSS
2024	0207001003	DCPMS00E	Lower Potomac River- segment 1	C	TSS Turbidity Phosphorus (Total) Nitrogen (Total) Chlorophyll-a	TSS TSS Phosphorus (Total) Nitrogen (Total)
2024	0207001003	DCPMS00E	Lower Potomac River- segment 1	D	Total PCBs Total PCBs (fish tissue)	Total PCBs
2024	0207001001	DCPMS00E	Middle Potomac River- segment 2	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001001	DCPMS00E	Middle Potomac River- segment 2	B	Turbidity	TSS
2024	0207001001	DCPMS00E	Middle Potomac River- segment 2	C	TSS Phosphorus (Total) Nitrogen (Total) Turbidity Chlorophyll-a	TSS Phosphorus (Total) Nitrogen (Total)
2024	0207001001	DCPMS00E	Middle Potomac River- segment 2	D	Total PCBs Total PCBs (fish tissue)	Total PCBs
2024	0207001001	DCPMS00E	Upper Potomac River- segment 3	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001001	DCPMS00E	Upper Potomac River- segment 3	B	Turbidity	TSS
2024	0207001001	DCPMS00E	Upper Potomac	C	TSS	TSS

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
			River- segment 3		Phosphorus (Total) Nitrogen (Total) Turbidity Chlorophyll-a	Phosphorus (Total) Nitrogen (Total)
2024	0207001001	DCPMS00E	Upper Potomac River- segment 3	D	Total PCBs Total PCBs (fish tissue)	Total PCBs
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	A	*E. coli*	*E. coli*
2024	0207001001	DCRCR00R	Upper Rock Creek- segment 2	A	*E. coli*	*E. coli*
2024	0207001001	DCTBK01R	Battery Kemble Creek	A	*E. coli*	*E. coli*
2024	0207001001	DCTBR01R	Broad Branch	C	Heptachlor Epoxide	Heptachlor Epoxide
2024	0207001001	DCTBR01R	Broad Branch	D	Dieldrin Heptachlor Epoxide Total PCBs	Dieldrin Heptachlor Epoxide Total PCBs
1998	0202001001	DCTCO01L	Chesapeake and Ohio Canal	A	*E. coli*	*E. coli*
2024	0207000810	DCTDA01R	Dalecarlia Tributary	A	*E. coli*	*E. coli*
2022	02070008	DCTDA01R	Dalecarlia Tributary	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
20222024	0207001001	DCTDO01R	Dumbarton Oaks	C	Chlordane Heptachlor Epoxide	Chlordane Heptachlor Epoxide

Category 4a - TMDL has been approved to address identified impairment causes

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
2024	0207001001	DCTDO01R	Dumbarton Oaks	D	Chlordane Dieldrin Heptachlor Epoxide Total PCBs	Chlordane Dieldrin Heptachlor Epoxide Total PCBs
2022	02070010	DCTFE01R	Fenwick Branch	D	DDT Dieldrin Heptachlor epoxide Total PCBs	DDT Dieldrin Heptachlor epoxide Total PCBs
20222024	0207001002	DCTFC01R	Fort Chaplin	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTFC01R	Fort Chaplin	B	Turbidity	TSS
2024	0207001002	DCTFC01R	Fort Chaplin	C	Turbidity	TSS
2024	0207001002	DCTFC01R	Fort Chaplin	D	Arsenic	Arsenic
2024	0207001002	DCTFD01R	Fort Davis	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTFD01R	Fort Davis	B	Turbidity	TSS
2024	0207001002	DCTFD01R	Fort Davis	C	Turbidity	TSS
2024	0207001002	DCTFD01R	Fort Davis	D	Arsenic	Arsenic
2024	0207001002	DCTDU01R	Fort Dupont	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTDU01R	Fort Dupont	B	Turbidity	TSS
2024	0207001002	DCTDU01R	Fort Dupont	C	Turbidity	TSS
2024	0207001002	DCTDU01R	Fort Dupont	D	Arsenic Total PCBs	Arsenic Total PCBs
2024	0207001002	DCTFS01R	Fort Stanton	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTFS01R	Fort Stanton	B	Turbidity	TSS
2024	0207001002	DCTFS01R	Fort Stanton	C	Turbidity	TSS
2024	0207001002	DCTFS01R	Fort Stanton	D	Arsenic Benzo_a_anthracene (PAH2)	Arsenic Benzo_a_anthracene (PAH2)

Category 4a - TMDL has been approved to address identified impairment causes

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Benzo_b_fluroanthene (PAH3) Total PCBs	Benzo_b_fluroanthene (PAH3) Total PCBs
2024	0207001001	DCTFB02R	Foundry Branch	A	*E. coli*	*E. coli*
2024	0207001002	DCTHR01R	Hickey Run	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTHR01R	Hickey Run	B	Turbidity	TSS
2024	0207001002	DCTHR01R	Hickey Run	C	Turbidity	TSS
2024	0207001002	DCTHR01R	Hickey Run	D	DDE Benzo_a_anthracene (PAH2) Total PCBs	DDE Benzo_a_anthracene (PAH2) Total PCBs
2024	0207001002	DCAKL00L	Kingman Lake	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCAKL00L	Kingman Lake	B	Turbidity	TSS
2024	0207001002	DCAKL00L	Kingman Lake	C	DO BOD Oil & Grease DDT Turbidity Phosphorus (Total) Nitrogen (Total) TSS	Oil & Grease DDT TSS Phosphorus (Total) Nitrogen (Total) BOD
2024	0207001002	DCAKL00L	Kingman Lake	D	Arsenic DDD DDT Dieldrin Chlordane Benzo_a_anth	Arsenic DDD DDT Dieldrin Chlordane

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					racene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs
2024	0207001002	DCAKL00L	Kingman Lake	D	Chlordane (fish tissue) Dieldrin (fish tissue) Heptachlor epoxide (fish tissue) Total PCBs (fish tissue)	Chlordane Dieldrin Heptachlor epoxide
2022	02070010	DCTKV01R	Klingle Valley Creek	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
2024	0207001001	DCTLU01	Luzon Branch	D	Dieldrin	Dieldrin

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Heptachlor epoxide Total PCBs	Heptachlor epoxide Total PCBs
2024	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	D	Dieldrin Total PCBs	Dieldrin Total PCBs
2024	0207001002	DCTNA01R	Nash Run	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTNA01R	Nash Run	B	Turbidity	TSS
2024	0207001002	DCTNA01R	Nash Run	C	Turbidity	TSS
2024	0207001002	DCTNA01R	Nash Run	D	Arsenic Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	Arsenic Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_a_pyrene (PAH3) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs
2022	02070010	DCTNS01R	Normanstone Creek	D	Dieldrin	Dieldrin Heptachlor epoxide

Category 4a - TMDL has been approved to address identified impairment causes

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Heptachlor epoxide Total PCBs	Total PCBs
20222024	0207001003	DCTOR01R	Oxon Run	A	*E. coli*	*E. coli*
2024	0207001003	DCTOR01R	Oxon Run	D	Dieldrin	Dieldrin
2022	02070010	DCTPI01R	Pinehurst Branch	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
20222024	0207001001	DCTPY01R	Piney Branch	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
2024	0207001002	DCTPB01R	Pope Branch (Hawes Run)	A	*E. coli*	*E. coli*
2024	0207001002	DCTPB01R	Pope Branch (Hawes Run)	C	Chlordane	Chlordane
2024	0207001002	DCTPB01R	Pope Branch (Hawes Run)	D	Chlordane DDE Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3)	Chlordane DDE Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Dibenzo_a_h_anthracene (PAH3) Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs

Category 4a - TMDL has been approved to address identified impairment causes						
Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Indeno_1_2_3_cd_pyrene (PAH3) Total PCBs	
2022	02070010	DCTPO01R	Portal Branch	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
2022	02070010	DCTSO01R	Soapstone Creek	D	Dieldrin Heptachlor epoxide Total PCBs	Dieldrin Heptachlor epoxide Total PCBs
202220 24	0207001002	DCTTX27R	Texas Avenue Tributary	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTTX27R	Texas Avenue Tributary	B	Turbidity	TSS
2024	0207001002	DCTTX27R	Texas Avenue Tributary	C	Turbidity DDD Chlordane	TSS DDD Chlordane
2024	0207001002	DCTTX27R	Texas Avenue Tributary	D	Arsenic Chlordane DDD DDE DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3)	Arsenic Chlordane DDD DDE DDT Dieldrin Heptachlor epoxide Benzo_a_anthracene (PAH2) Benzo_b_fluroanthene (PAH3) Benzo_k_fluroanthene (PAH3) Total PCBs

Category 4a - TMDL has been approved to address identified impairment causes

Assessment Year	Geo location	WB ID	WB Name	Use Class	Pollutant(s) or Indicator(s) Causing Impairment	Pollutants for which TMDLs have been developed to address impairment causes
					Benzo_k_fluroanthene (PAH3) Total PCBs	
2024	0207001001	DCPTB01L	Tidal Basin	C	Phosphorus (Total) Nitrogen (Total) TSS	Phosphorus (Total) Nitrogen (Total) TSS
1998	0207001001	DCPTB01L	Tidal Basin	D	PCBs (fish tissue)	Total PCBs
2024	0207001001	DCPWC04E	Washington Ship Channel	A	*E. coli*	*E. coli*
2024	0207001001	DCPWC04E	Washington Ship Channel	C	Phosphorus (Total) Nitrogen (Total) TSS	Phosphorus (Total) Nitrogen (Total) TSS
2024	0207001001	DCPWC04E	Washington Ship Channel	D	Total PCBs Total PCBs (fish tissue)	Total PCBs
2024	0207001002	DCTWB00R	Watts Branch DC (Upper) Seg 02	A	*E. coli* Turbidity	*E. coli* TSS
2024	0207001002	DCTWB00R	Watts Branch DC (Upper) Seg 02	B	Turbidity	TSS
2024	0207001002	DCTWB00R	Watts Branch DC (Upper) Seg 02	C	Turbidity	TSS
2024	0207001002	DCTWB00R	Watts Branch DC (Upper) Seg 02	D	Dieldrin Total PCBs	Dieldrin Total PCBs
2024	0207001002	DCTWB00R	Watts Branch DC (Lower) Seg 01	A	*E. coli*	*E. coli*
2024	0207001002	DCTWB00R	Watts Branch DC (Lower) Seg 01	D	Dieldrin Total PCBs	Dieldrin Total PCBs

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2024	0207001003	DCPMS00E	Lower Potomac River- segment 1	Chlordane (fish tissue)	Chlordane (fish tissue)	High		
2024	0207001003	DCPMS00E	Lower Potomac River- segment 1	Heptachlor epoxide (fish tissue)	Heptachlor epoxide (fish tissue)	High		
2022	0207001003	DCPMS00E	Lower Potomac River- segment 1	Arsenic	Arsenic	High		
2024	0507001003	DCPMS00E	Lower Potomac River – segment 1	DDD	DDD	High		
2022	0207001003	DCPMS00E	Lower Potomac River- segment 1	Dieldrin (fish tissue)	Dieldrin (fish tissue)	High		
2024	0207001001	DCPMS00E	Middle Potomac River – segment 2	Chlordane (fish tissue)	Chlordane (fish tissue)	High		
2024	0207001001	DCPMS00E	Middle Potomac River – segment 2	Heptachlor epoxide (fish tissue)	Heptachlor epoxide (fish tissue)	High		
2022	0207001001	DCPMS00E	Middle Potomac River – segment 2	Arsenic	Arsenic	High		
2022	0207001002	DCPMS00E	Middle Potomac River – segment 2	Dieldrin	Dieldrin	High		

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2022	0207001001	DCPMS00E	Middle Potomac River – segment 2	Dieldrin (fish tissue)	Dieldrin	High		
2024	0207001001	DCPMS00E	Upper Potomac River – segment 3	Chlordane (fish tissue)	Chlordane (fish tissue)	High		
2024	0207001001	DCPMS00E	Upper Potomac River – segment 3	Heptachlor epoxide (fish tissue)	Heptachlor epoxide (fish tissue)	High		
2022	0207001001	DCPMS00E	Upper Potomac River – segment 3	Arsenic	Arsenic	High		
2022	0207001001	DCPMS00E	Upper Potomac River – segment 3	Dieldrin (fish tissue)	Dieldrin	High		
2014	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Turbidity	Total suspended solids (TSS)	Low		2022
2022	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Arsenic	Arsenic	High		
2024	0207001001	DCRCR00R	Lower Rock Creek – segment 1	DDD	DDD	High		
2022	0207001001	DCRCR00R	Lower Rock Creek- segment 1	DDE	DDE	High		

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2022	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Dieldrin	Dieldrin	High		
2022	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Heptachlor epoxide	Heptachlor epoxide	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Benzo(a)anthracene	Benzo(a)anthracene	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Benzo(b)fluoranthene	Benzo(b)fluoranthene	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Benzo(k)fluoranthene	Benzo(k)fluoranthene	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Chrysene	Chrysene	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Dibenzo(a,h)anthracene	Dibenzo(a,h)anthracene	High		
2024	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	High		
2022	0207001001	DCRCR00R	Lower Rock Creek- segment 1	Total PCBs	Total PCBs	High		

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2018	0207001001	DCRCR00R	Upper Rock Creek- segment 2	Turbidity	Total suspended solids (TSS)	Low		2024
2014	0207001001	DCTBR01R	Broad Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2022	0207001001	DCTBR01R	Broad Branch	Arsenic	Arsenic	High		
2022	0207001001	DCTBR01R`	Broad Branch	DDT	DDT	High		
2024	0207001001	DCTBR01R	Broad Branch	Turbidity	Total suspended solids (TSS)	Low		
2014	0207001001	DCTDO01R	Dumbarton Oaks	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2022	0207001001	DCTDO01R	Dumbarton Oaks	Arsenic	Arsenic	High		
2022	0207001001	DCTDO01R	Dumbarton Oaks	DDT	DDT	High		
2024	0207001001	DCTDO01R	Dumbarton Oaks	Mercury	Mercury	High		
2014	0207001001	DCTFE01R	Fenwick Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
1998	0207001001	DCTHR01R	Hickey Run	Total residual chlorine	Total residual chlorine	Low		
2024	0207001001	DCTHR01R	Hickey Run	Copper	Copper	High		
2014	0207001001	DCTKV01R	Klingle Valley	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2014	0207001001	DCTLU01R	Luzon Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.								
303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2014	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2022	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	Arsenic	Arsenic	High		
2022	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	DDT	DDT	High		
2022	0207001001	DCTMH01R	Reservation 630 (Melvin Hazen Valley Branch)	Heptachlor epoxide	Heptachlor epoxide	High		
2014	0207001001	DCTNS01R	Normanstone Creek	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2018	0207001003	DCTOR01R	Oxon Run	Turbidity	Total suspended solids (TSS)	Low		2026
2014	0207001001	DCTPI01R	Pinehurst Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2014	0207001001	DCTPY01R	Piney Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2014	0207001001	DCTPO01R	Portal Branch	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2014	0207001001	DCTSO01R	Soapstone Creek	Escherichia coli (E. coli)	Escherichia coli (E. coli)	High		2022
2024	0207001001	DCPTB01L	Tidal Basin	Chlordane (fish tissue)	Chlordane (fish tissue)	High		

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.

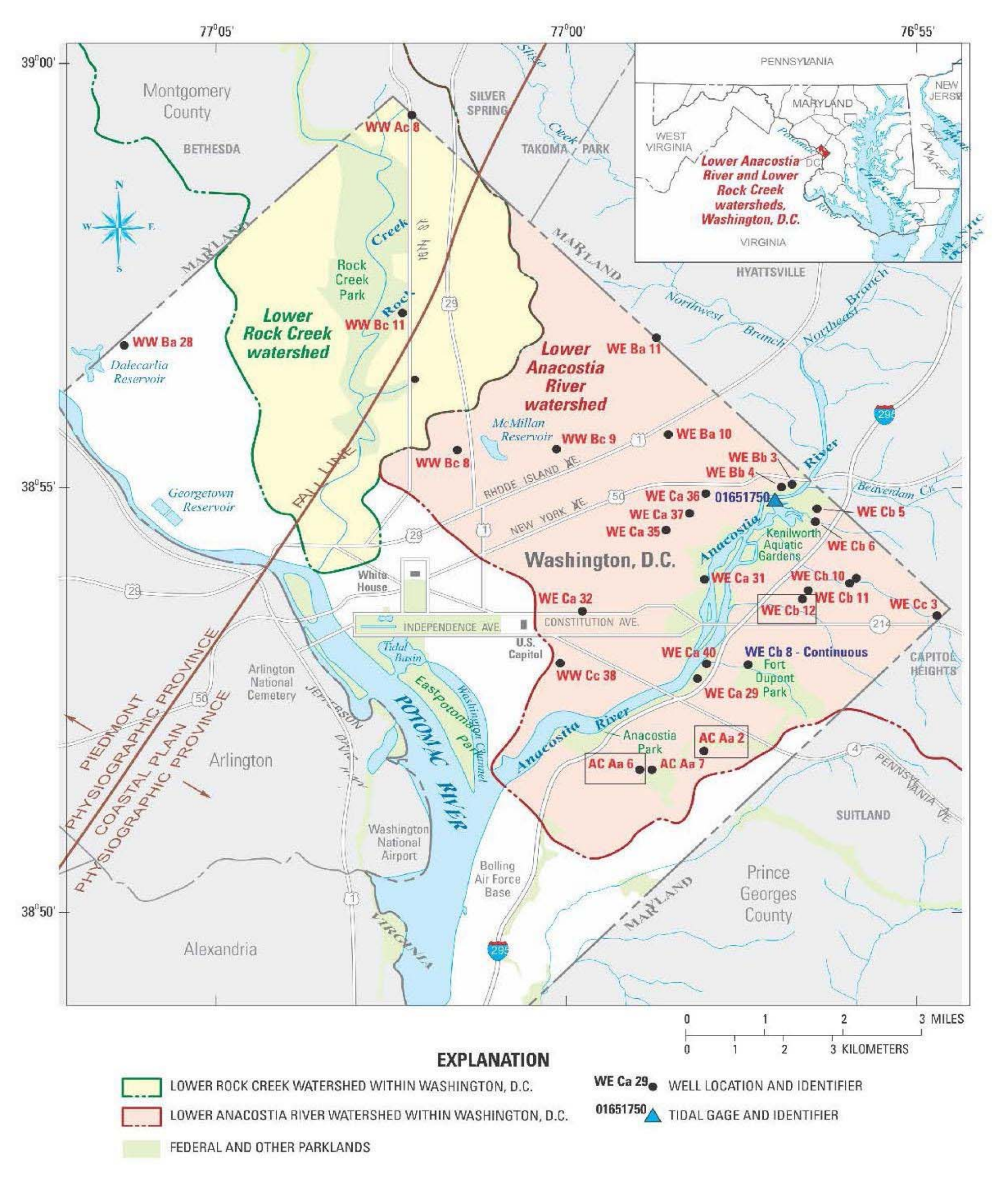
303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Development	Targeted for TMDL within 2 years	TMDL Establishment Date
2024	0207001001	DCPTB01L	Tidal Basin	Heptachlor epoxide (fish tissue)	Heptachlor epoxide (fish tissue)	High		
2022	0207001001	DCPTB01L	Tidal Basin	Dieldrin (fish tissue)	Dieldrin (fish tissue)	High		
2024	0207001001	DCPWC04E	Washington Ship Channel	Chlordane (fish tissue)	Chlordane (fish tissue)	High		
2024	0207001001	DCPWC04E	Washington Ship Channel	Heptachlor epoxide (fish tissue)	Heptachlor epoxide (fish tissue)	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Arsenic	Arsenic	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Dieldrin (fish tissue)	Dieldrin	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Benzo_a_anthracene	Benzo_a_anthracene	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Benzo_b_fluoranthene	Benzo_b_fluoranthene	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Benzo_k_fluoranthene	Benzo_k_fluoranthene	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Dibenzo_a_h_anthracene	Dibenzo_a_h_anthracene	High		
2022	0207001001	DCPWC04E	Washington Ship Channel	Indeno_1_2_3_cd_pyrene	Indeno_1_2_3_cd_pyrene	High		
2022	0207001002	DCTWB00R	Lower Watts Branch – segment 1	Arsenic	Arsenic	High		

Category 5- Available data and/or information indicate that a designated use is not being supported or is threatened, and a TMDL is needed.								
303d Listing Year	Geographic Location	WBID[1]	WB Name	Pollutant(s) or Indicator(s) Causing Impairment	Pollutant for which TMDL Will Be Done	Priority Ranking for TMDL Developm ent	Targeted for TMDL within 2 years	TMDL Establishment Date
2022	0207001002	DCTWB00R	Upper Watts Branch – segment 2	Arsenic	Arsenic	High		

Appendix 5.1 Groundwater Monitoring Wells

USGS Site Name	USGS Site Number	DOEE Well Number	Site Location
AC Aa 1**	385225076590101	DCMW001-03	Anacostia Park Recreation Center
AC Aa 2	385157076580301	DCMW010-05	28th Street SE (near Hillcrest and Park Drives)
AC Aa 6	385138076585901	DCMW001-08	Fort Stanton Park (shallow)
AC Aa 7	385138076585902	DCMW002-08	Fort Stanton Park (deep)
AX Ac 1**	385219077002201	DCMW006-04	Earth Conservation Corps
WE Ba 9	385606076584101	DCMW012-05	Taft Recreation Center
WE Ba 10	385534076582101	DCMW007-05	Langdon Park
WE Ba 11*	385649076584201	DCMW003-08	Ft. Totten
WE Bb 3	385504076563801	DCMW001-02	New York Avenue (shallow)
WE Bb 4	385504076563802	DCMW004-02	New York Avenue (deep)
WE Ca 29	385238076581501	DCMW005-02	Anacostia Park
WE Ca 31	385355076575901	DCMW002-03	Langston Golf Course
WE Ca 32	385332076594701	DCMW001-04	Massachusetts Avenue and 7th Street
WE Ca 33	385349076592801	DCMW006-05	Reservation 210 (Maryland and F Streets)
WE Ca 34**	385245076583501	DCMW005-05	RFK near Barney Circle
WE Ca 35	385429076583601	DCMW004-04	U.S. National Arboretum Azalea Hill
WE Ca 36	385460076574801	DCMW003-04	U.S. National Arboretum Weather Station
WE Ca 37	385446076581001	DCMW005-04	U.S. National Arboretum Administration Building
WE Ca 39	385241076580901	DCMW001-14	DOEE Aquatic Education Center
WE Cb 5	385443076562801	DCMW002-02	Kenilworth Aquatic Gardens (shallow)
WE Cb 6	385443076562802	DCMW003-02	Kenilworth Aquatic Gardens (deep)
WE Cb 8	385252076572801	DCMW002-04	Fort DuPont Park
WE Cb 9**	385355076555501	DCMW001-05	Lederer Gardens #1
WE Cb 10	385354076555901	DCMW002-05	Lederer Gardens #2
WE Cb 11	385332076564101	DCMW003-05	Clay and Flint (shallow)
WE Cb 12	385332076564102	DCMW004-05	Clay and Flint (deep)
WE Cc 3	385327076544801	DCMW008-05	Watts Branch Park
WW Ac 8*	385929077020901	DCMW004-08	16th Street NW and Eastern Avenue

Appendix 5.2 Map of Groundwater Monitoring Network



Location of study area, including lower portions of the Anacostia River and Rock Creek watersheds, and Federal and other parklands in Washington, D.C. Wells enclosed with a rectangle designate locations where water quality samples were collected in 2017. Well WE Cb 8 which is screened in the Patuxent Aquifer and is continuously monitored is shown in blue text.

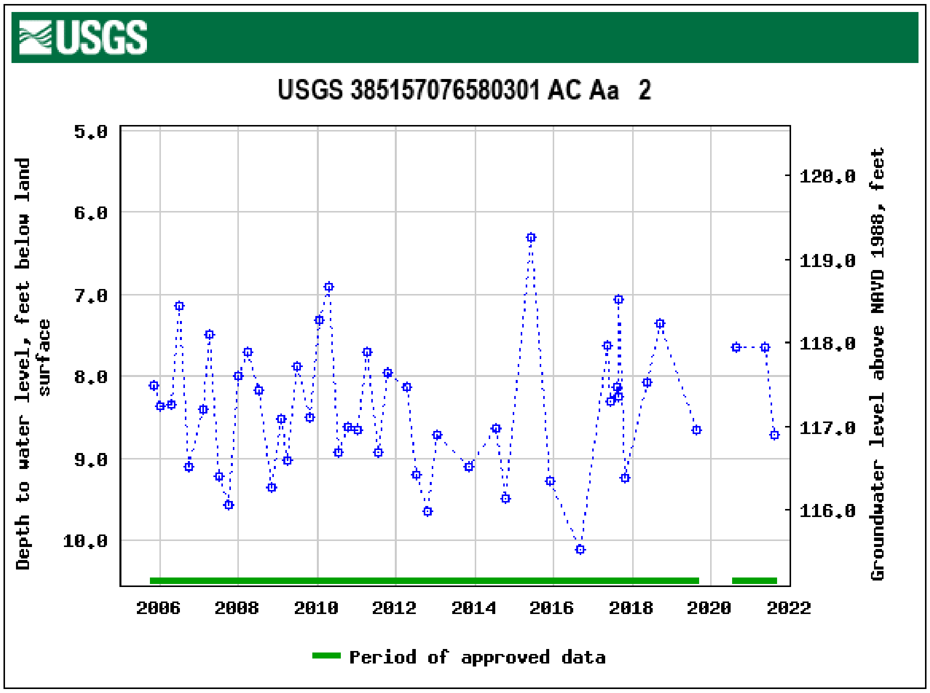
Appendix 5.3 Well Identification, Location, and Construction Details

	Well Name		Latitude	Longitude	Altitude of land surface (feet)	Well depth (feet)	Hole depth (feet)
1	AC Aa 2		38°51'57.4 "	76°58'03.3"	125.59	17	24
2	AC Aa 6		38°51'38.4"	76°58'59.3"	142.55	18.5	19.5
3	AC Aa 7		38°51'38.4"	76°58'59.3	142.55	60	61.5
4	WE Ba 10		38°55'34.4"	76°58'21.4"	74.43	17	20
5	WE Ba 11		38°56'48.8"	76°58'42.4"	87.43	28.5	28.5
6	WE Bb 3		38°55'03.6"	76°56'37.7"	12.30	25	32
7	WE Bb 4		38°55'03.6"	76°56'37.7"	12.37	32	62
8	WE Ca 29		38°52'38.4"	76°58'15.3"	13.38	48.5	57
9	WE Ca 31		38°53'55.4"	76°57'59.4"	9.07	14.7	16.5
10	WE Ca 32		38°53'31.8"	76°59'47.1"	79.98	29	30
11	WE Ca 35		38°54'29.2"	76°58'36.0"	150.05	250	265
12	WE Ca 36		38°54'59.9"	76°57'47.5"	42.71	232	242
13	WE Ca 37		38°54'46.3"	76°58'09.7	51.59	25.2	25.2
14	WE Ca 39		38°52'41.8"	76°58'09.9"	15.55*	388	398
15	WE Ca 40		38°52'42.7"	76°58'09.1”	15.00	60	60
16	WE Cb 5		38°54'43.5"	76°56'28.4"	18.53	22.6	31.3
17	WE Cb 6		38°54'43.5"	76°56'28.4"	18.79	46.3	57
18	WE Cb 8		38°52'52.3"	76°57'28.0"	58.79	265	277

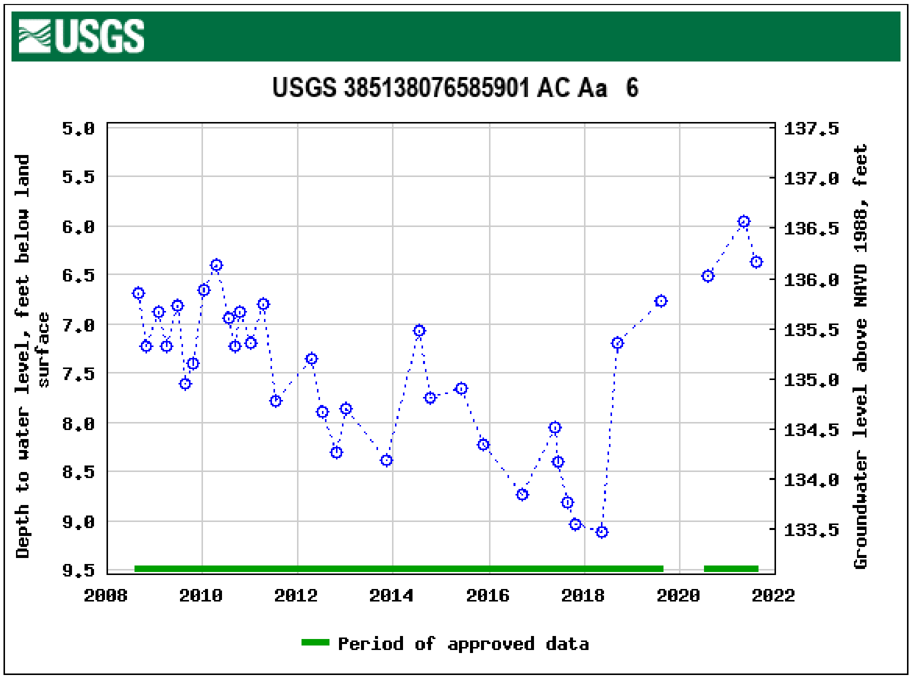
	Well Name		Latitude	Longitude	Altitude of land surface (feet)	Well depth (feet)	Hole depth (feet)
19	WE Cb 10		38°53'54"	76°55'59"	42.44	18	18
20	WE Cb 11		38°53'32.1"	76°56'41.2"	59.99	21	23
21	WE Cb 12		38°53'32.1"	76°56'41.2"	60.59	39	39
22	WE Cc 3		38°53'27.0"	76°54'48.5"	88.70	23	23
23	WE Cc 38		38°52'56.9"	77°00'11.2	60.61	290	290
24	WW Ac 8		38°59'29.3"	77°02'08.6"	261.51	33.6	33.6
25	WW Ba 28		38°56'44"	77°06'11"	202.93	100	101
26	WW Bc 8		38°55'19.3"	77°01'26.9"	123.39	32	32
27	WW Bc 9		38°55'27.8"	77°00'07.7"	133.60	36	36

Note *: The TOC of well Ca-39 was raised in September 2020 to 17.55ft ASL, which is 2.00 ft above the ground elevation 15.55 ft ASL

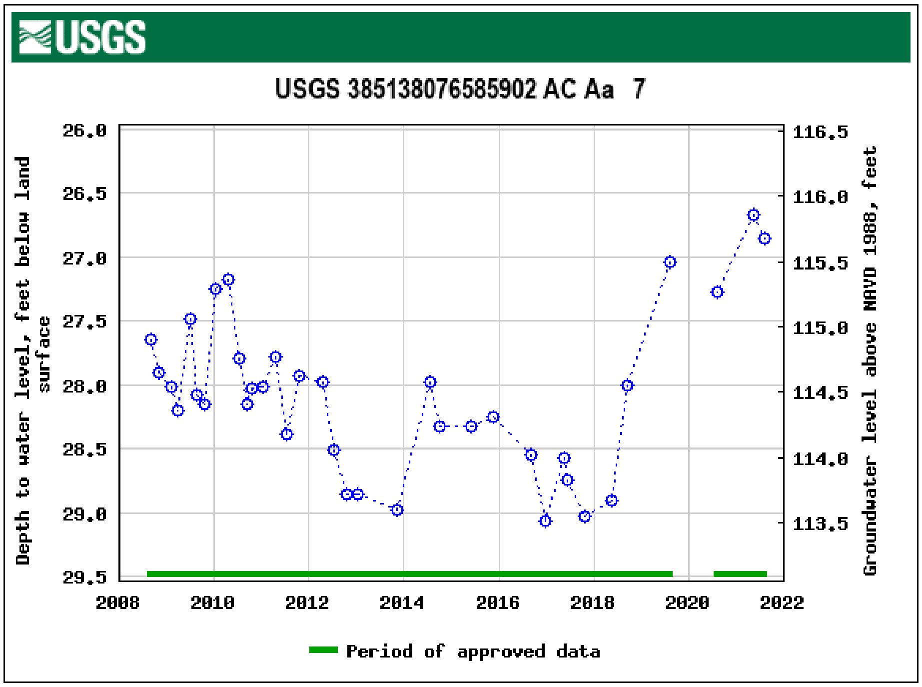
Appendix 5.4 Water Level Measurements for Monitoring Wells



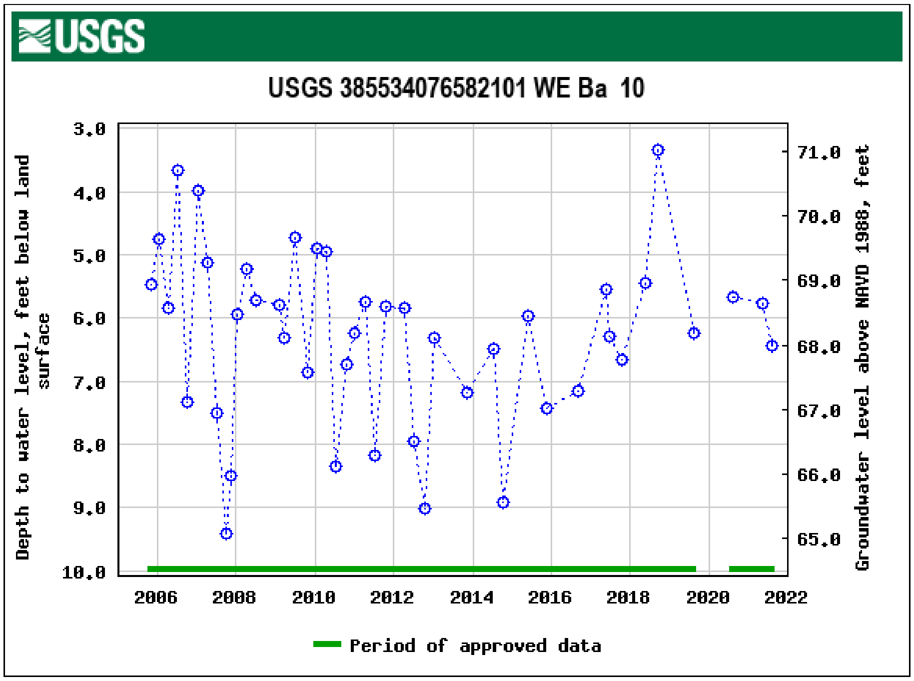
Graph of manual water-level measurements for well DCMW010 (AC Aa2)



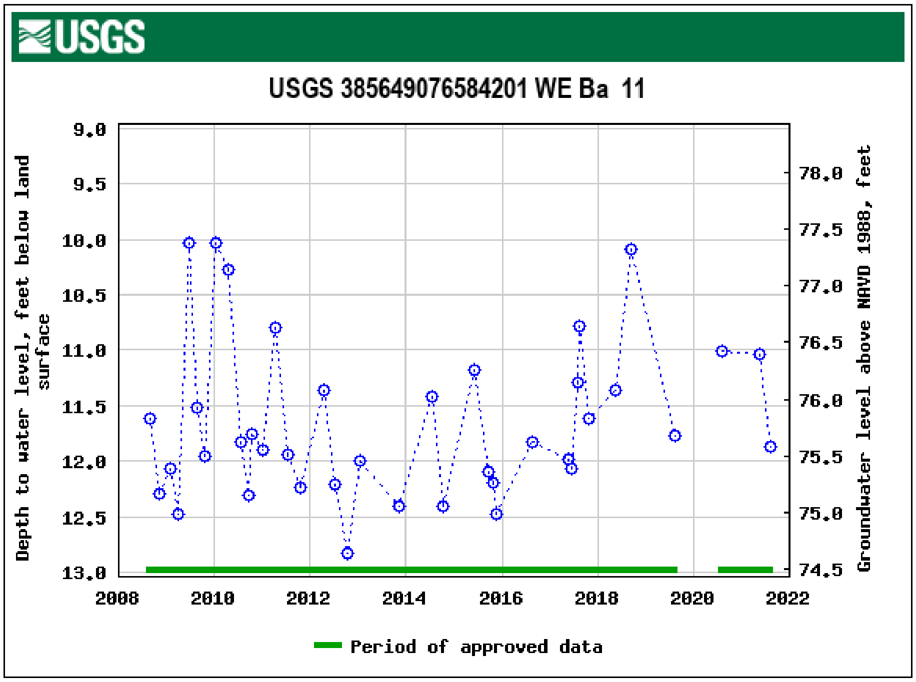
Graph of manual water-level measurements for well DCMW001-08 (AC Aa6)



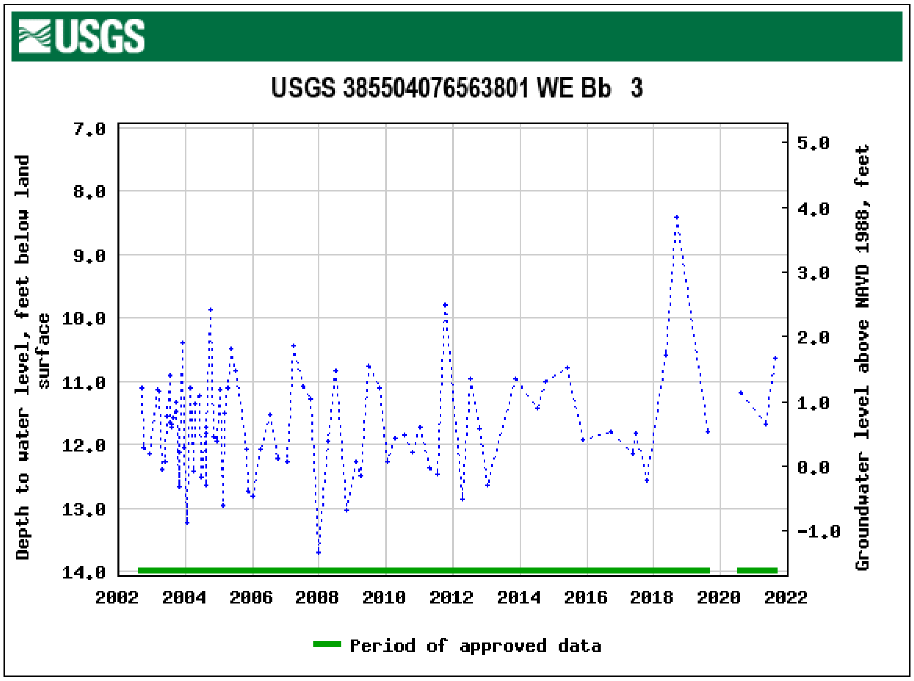
Graph of manual water-level measurements for well DCMW002-08 (AC Aa7)



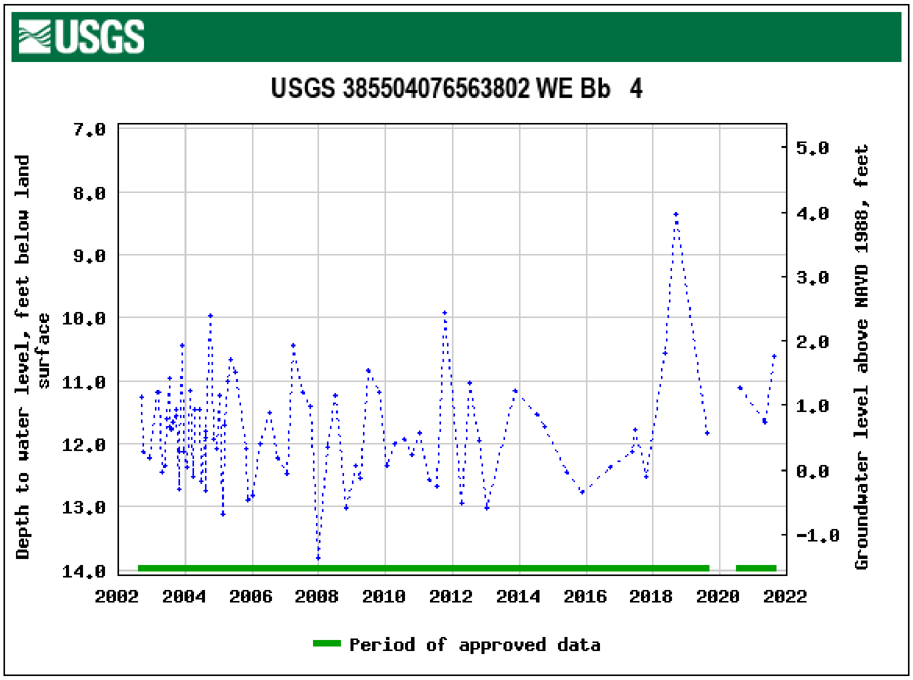
Graph of Manual Water Level Measurements for DCMW007-05 (WE Ba 10)



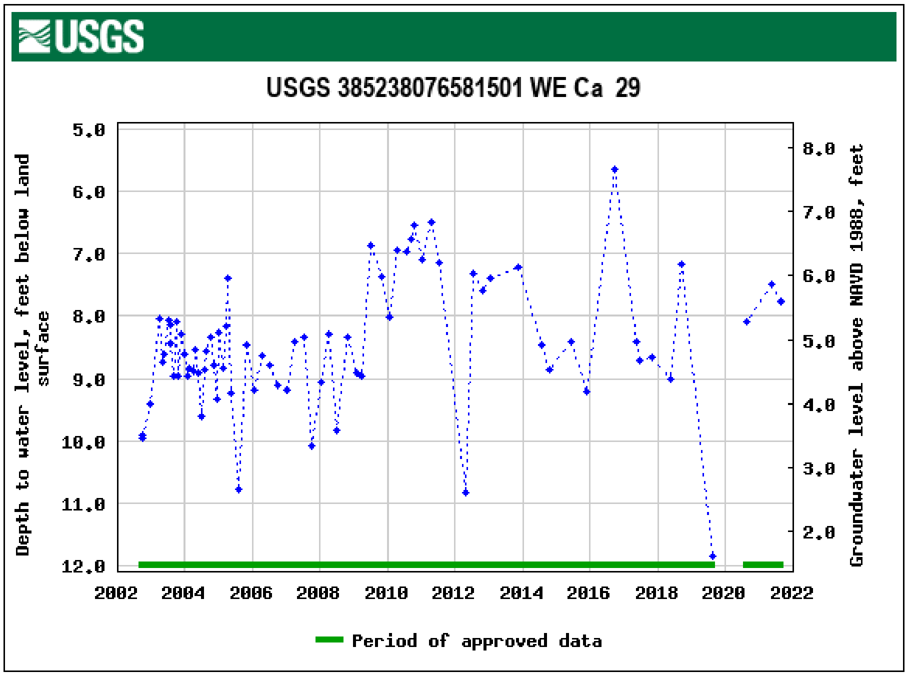
Graph of Manual Water-Level Measurements for DCMW003-8 (WE Ba 11)



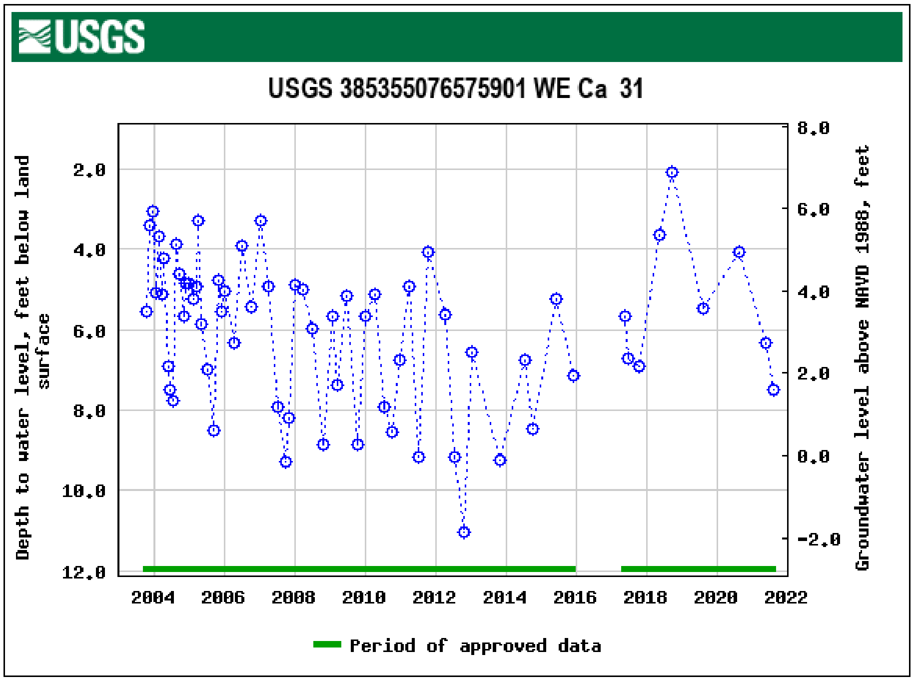
Graph of Manual Water-Level Measurements for well DCMW001-02 (WE Bb3)



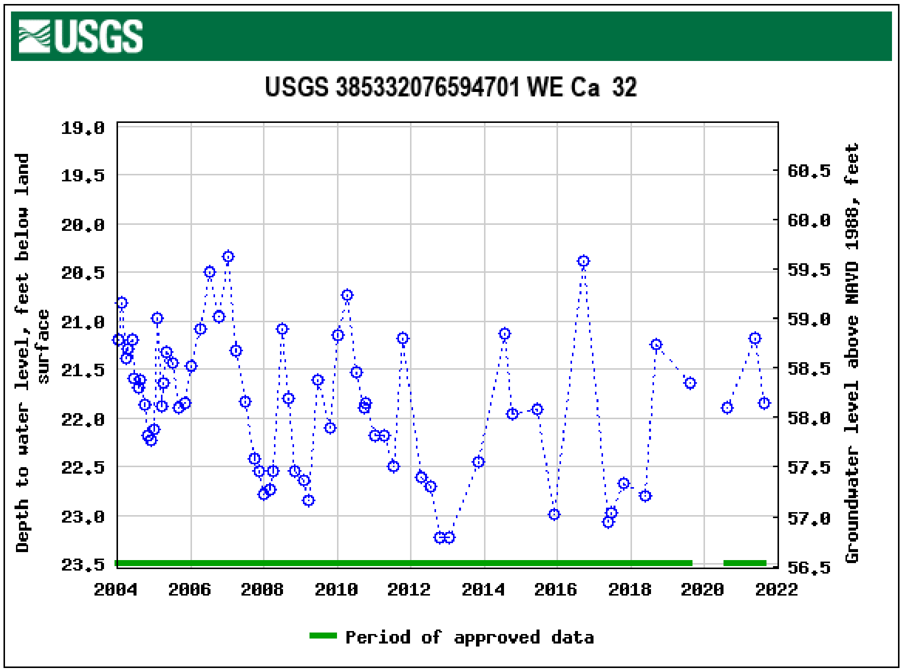
Graph of Manual Water-Level Measurements for well DCMW004-02 (WE Bb4)



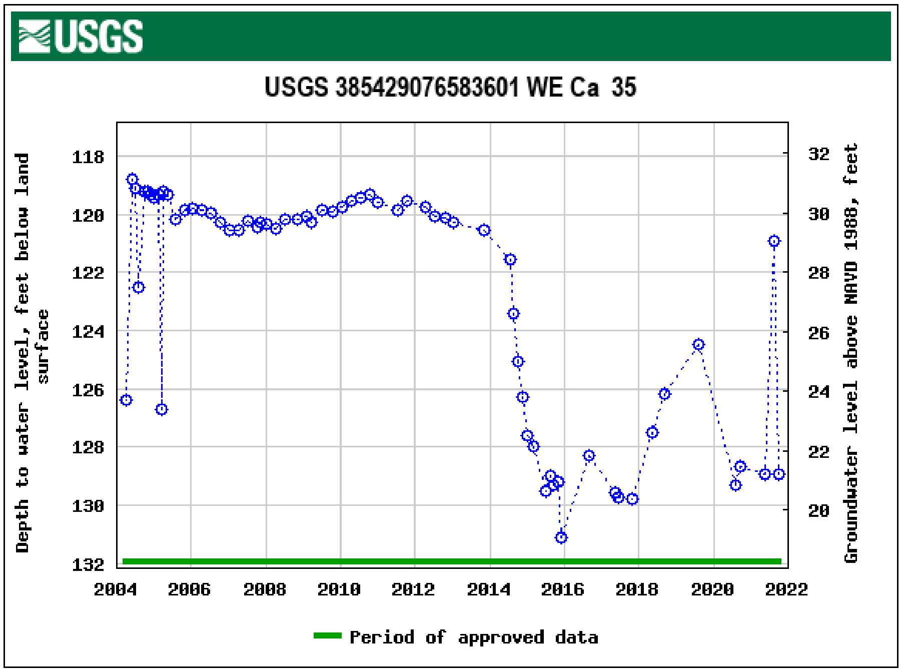
Graph of Manual Water-Level Measurements for well DCMW005-02 (WE Ca29)



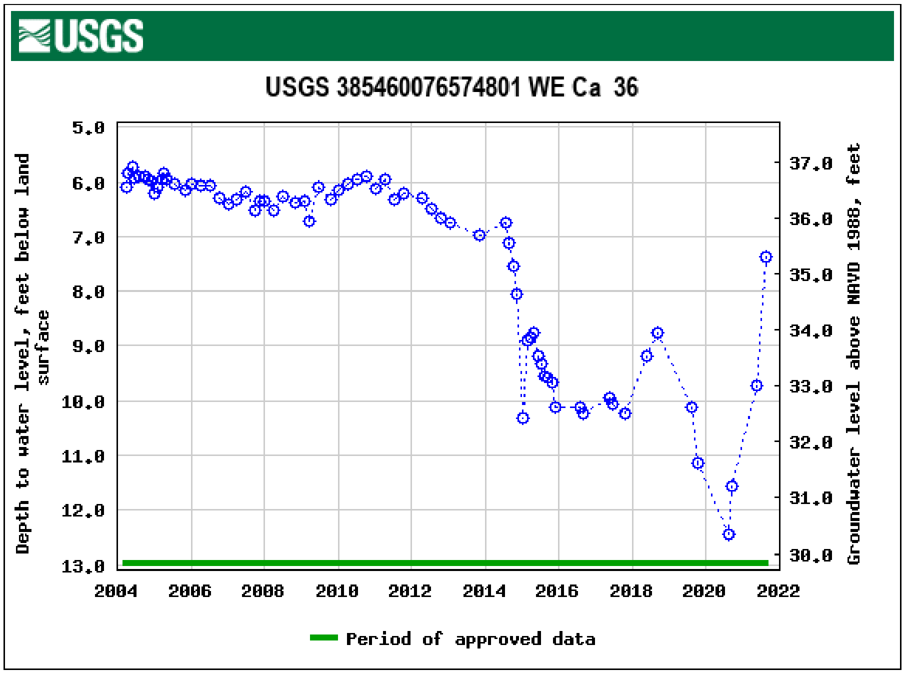
Graph of Manual Water-Level Measurement for well DCMW002-03 (WE Ca 31)



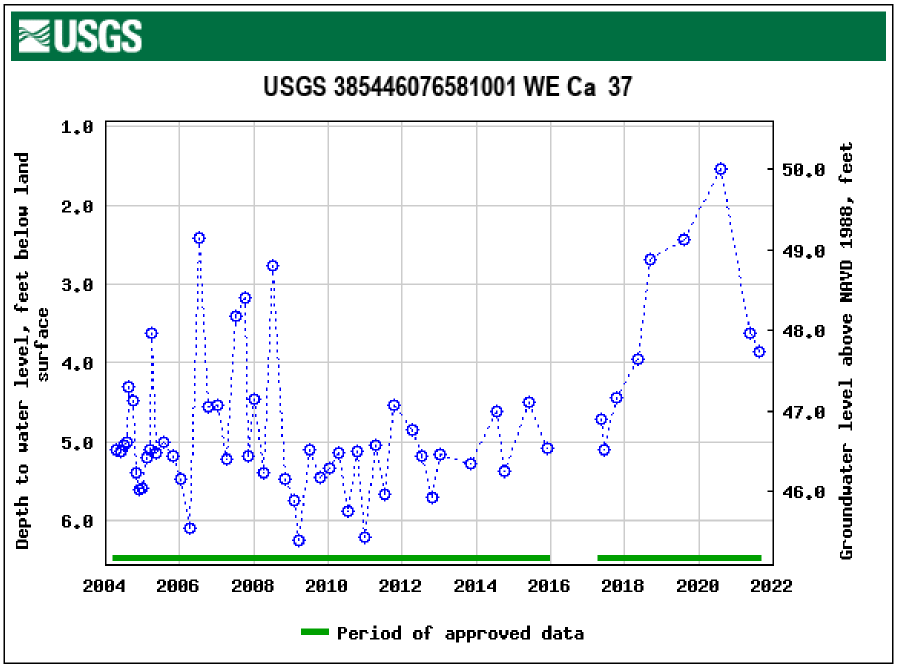
Graph of Manual Water-Level Measurements for well DCMW001-04 (WE Ca 32)



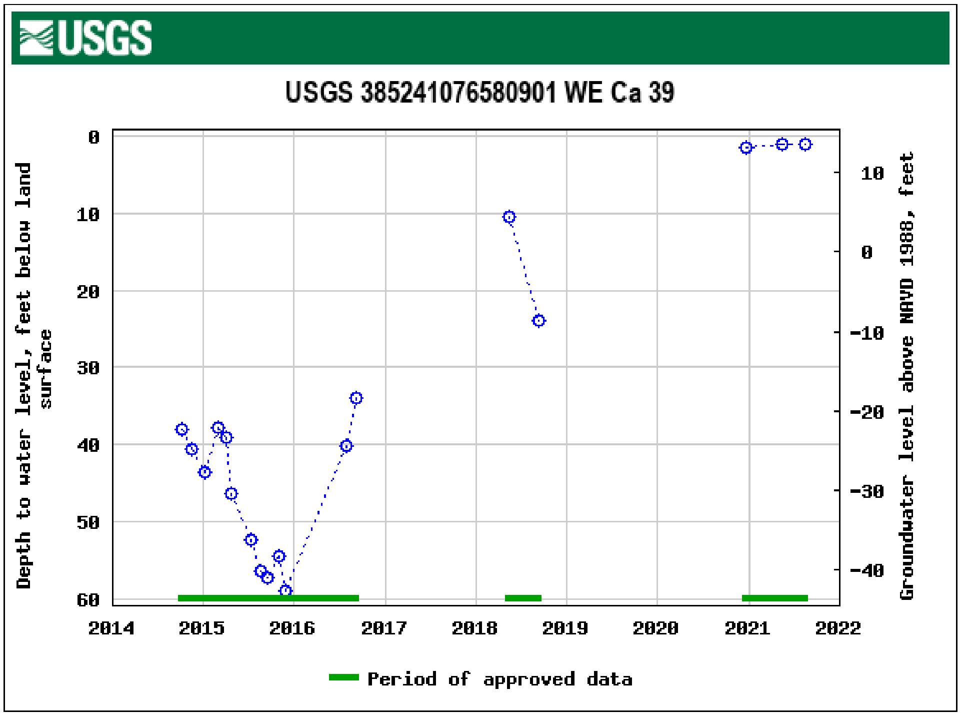
Graph of Manual Water-Level Measurements for well DCMW004-04 (WE Ca 35)



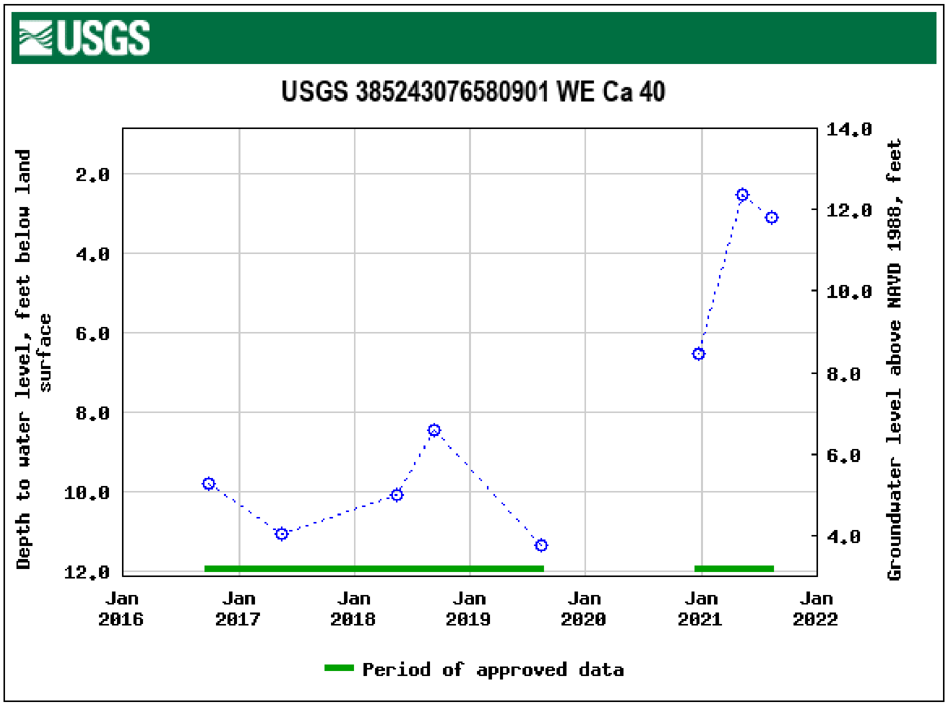
Graph of Manual Water-Level Measurements for well DCMW003-04 (WE Ca 36)



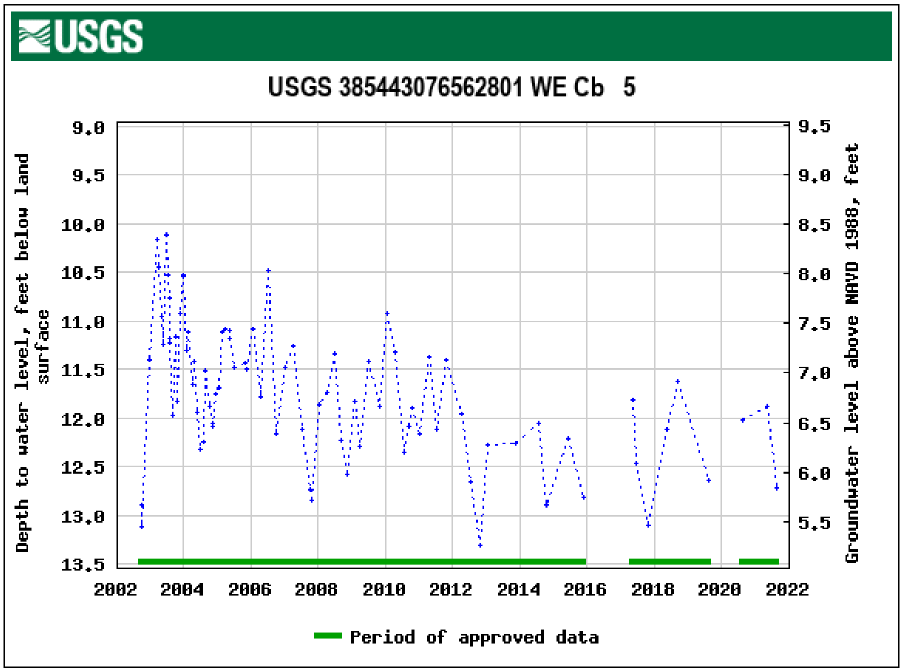
Graph of Manual Water-Level Measurements for well DCMW0005-04 (WE Ca 37)



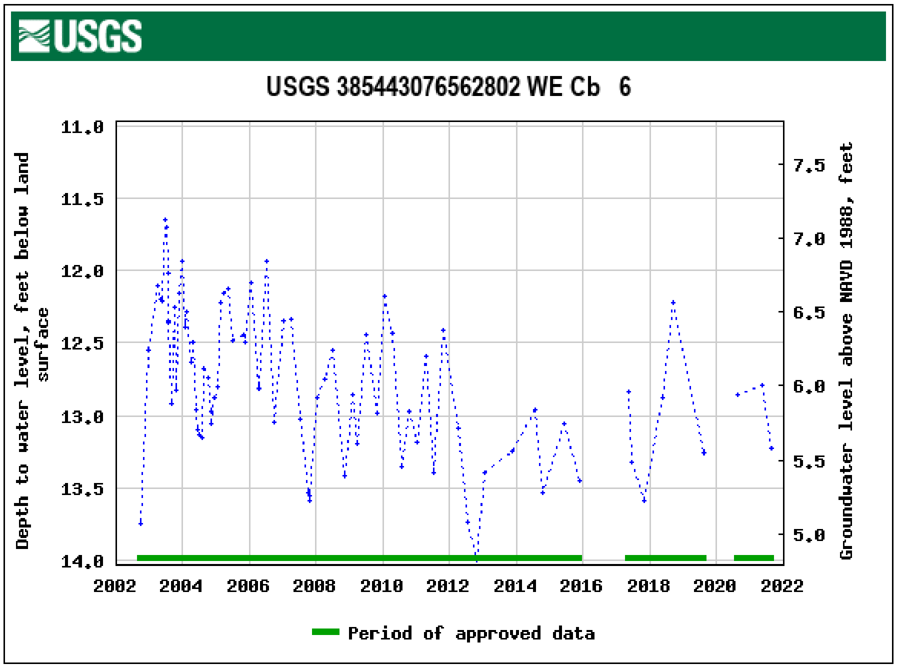
Graph of Manual Water-Level Measurements for well DCMW001-14 (WE Ca 39)



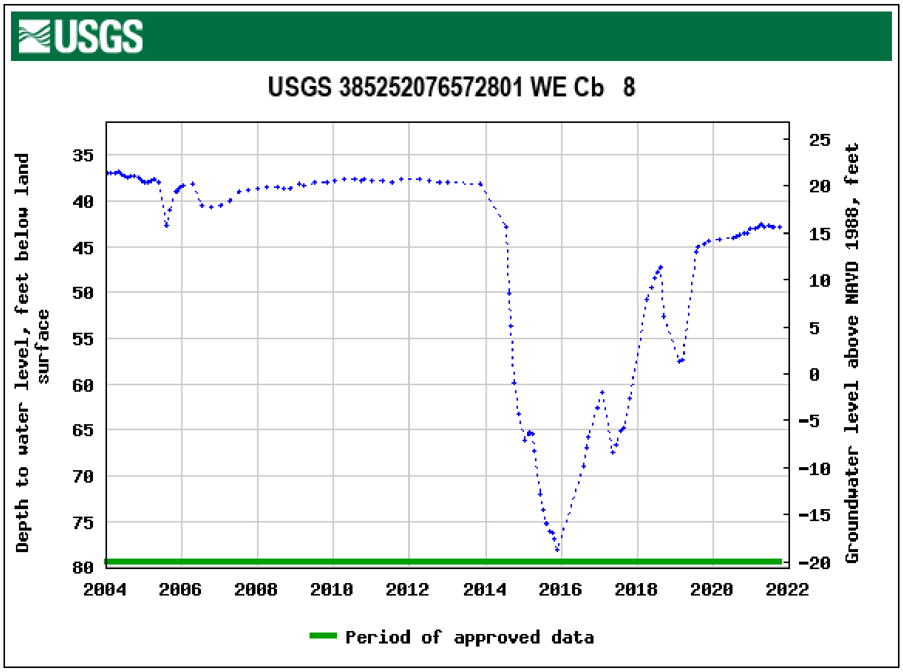
Graph of Manual Water-Level Measurements for well DCMW016-01 (WE Ca 40)



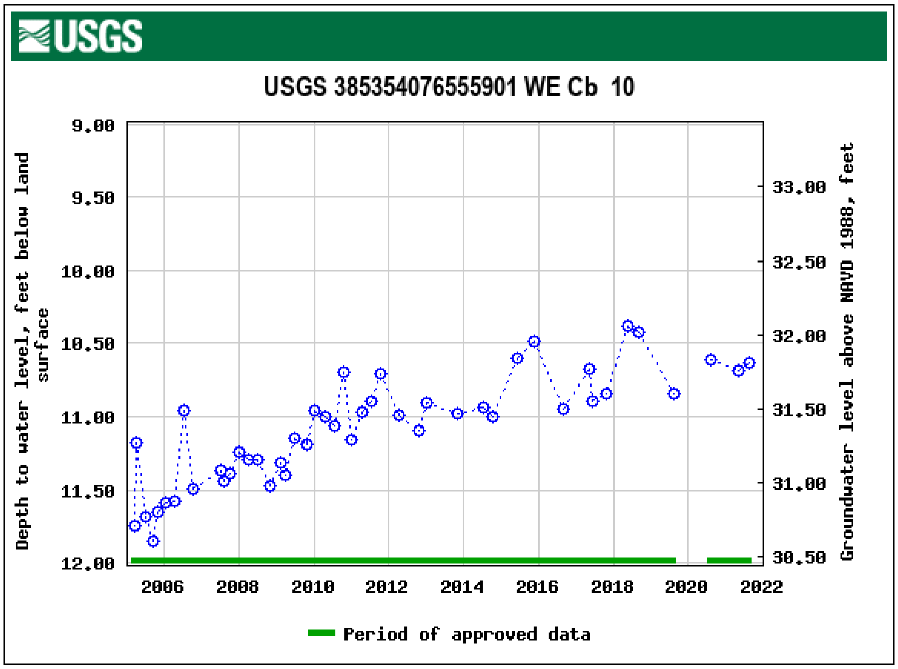
Graph of Manual Water-Level Measurements for well DCMW002-02 (WE Cb 5)



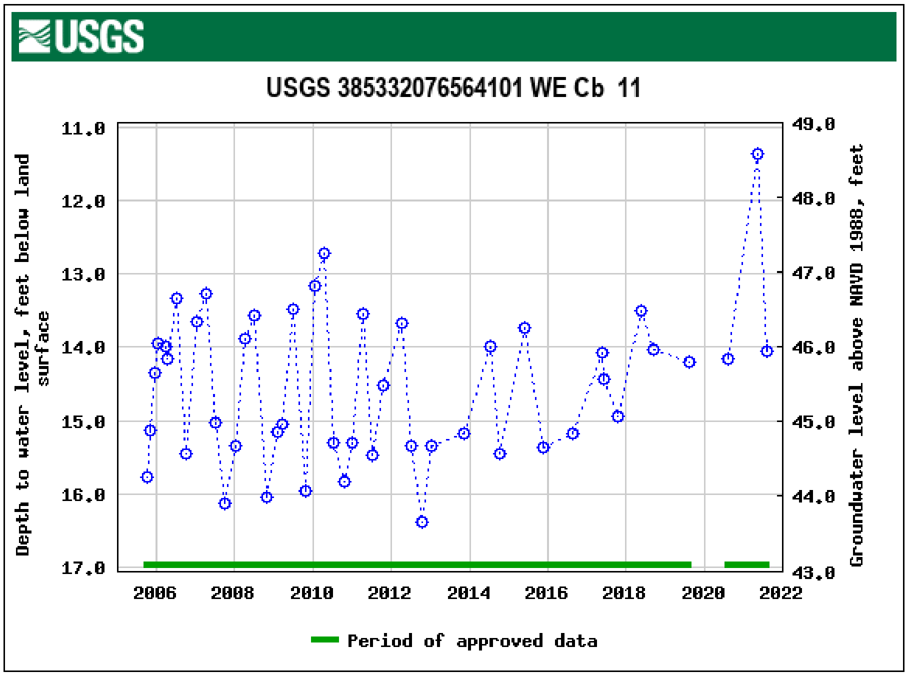
Graph of Manual Water-Level Measurements for well DCMW003-02 (WE Cb 6)



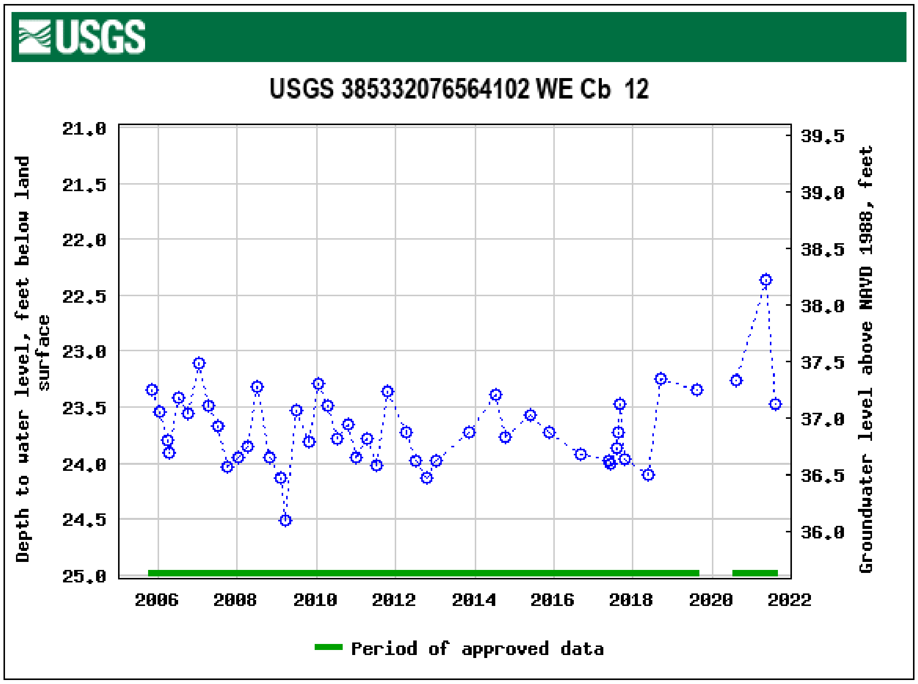
Graph of Water-Level Measurements for well DCMW002-04 (WE Cb 8)



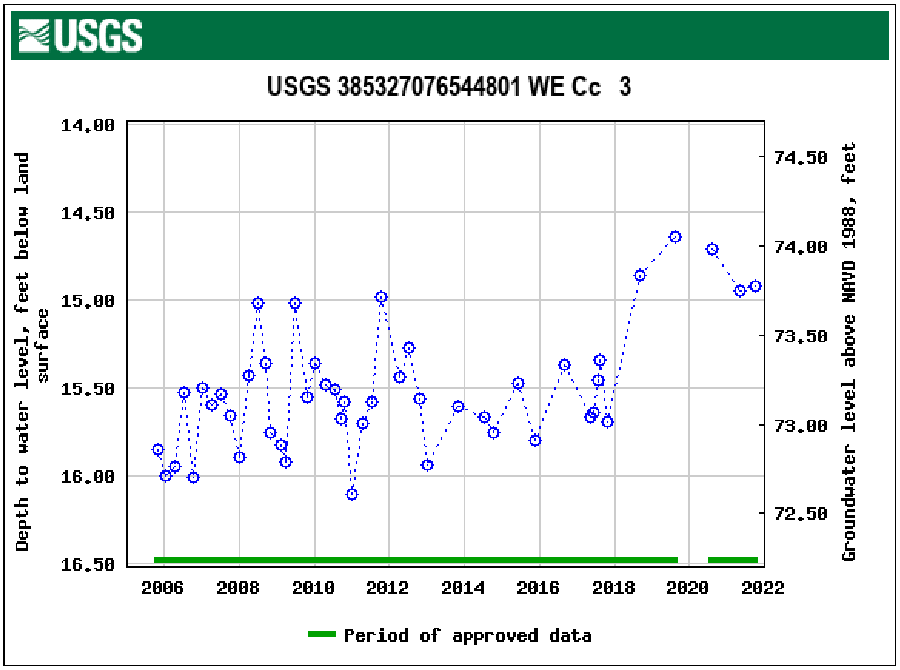
Graph of Manual Water-Level Measurements for well DCMW002-05 (WE Cb10)



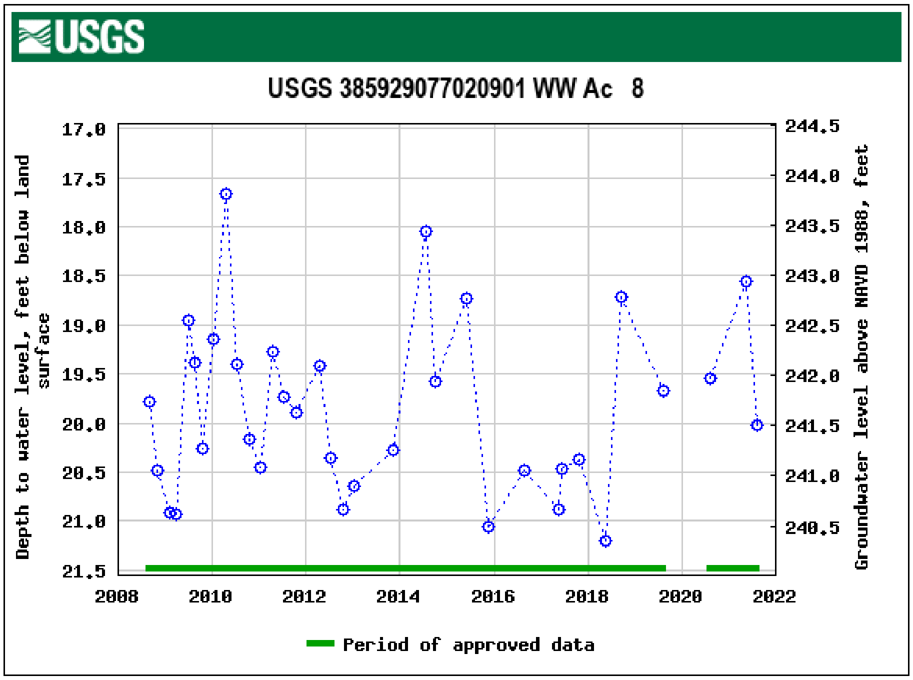
Graph of Manual Water-Level Measurements of well DCMW003-05 (WE Cb 11)



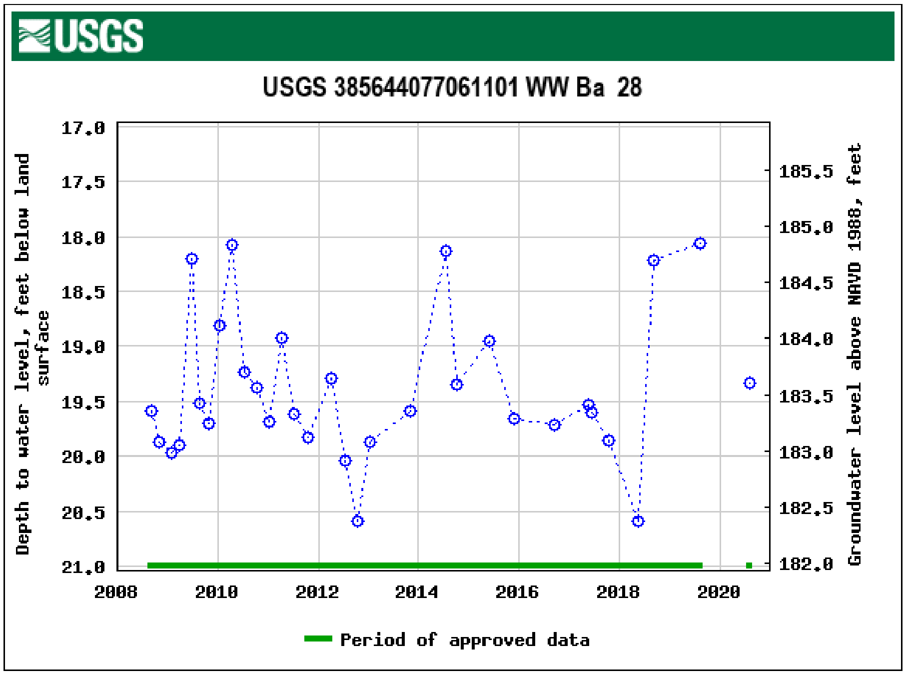
Graph of Manual Water-Level Measurements for well DCMW004-05 (WE Cb 12)



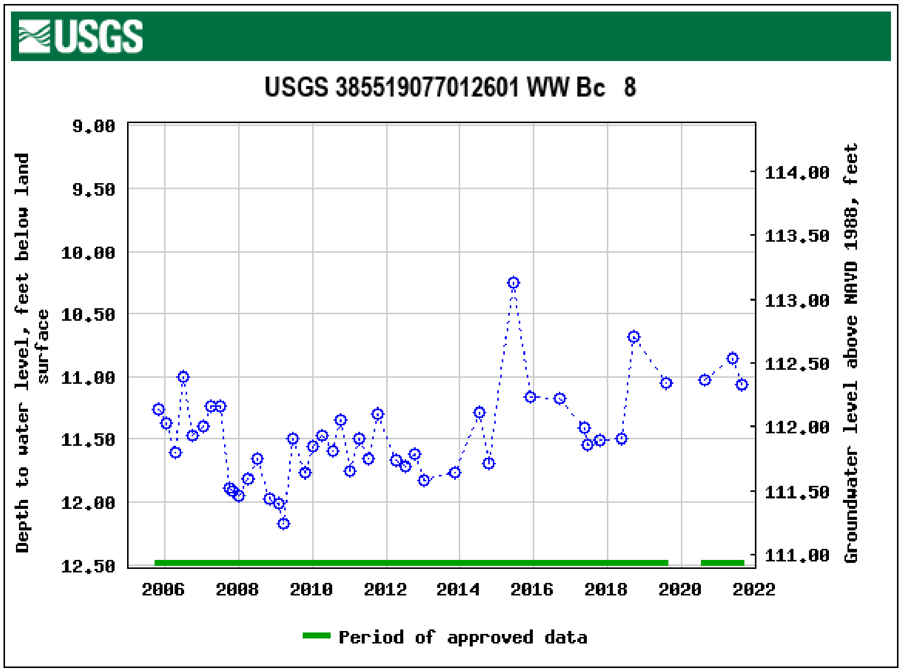
Graph of Manual Water-Level Measurements for well DCMW008-05 (WE Cc 3)



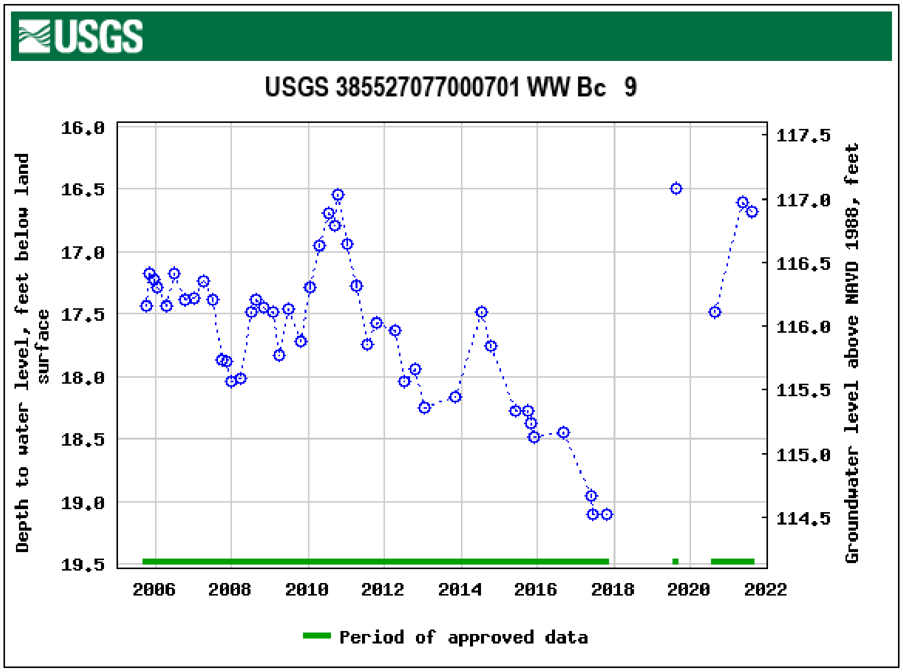
Graph of Manual Water-Level Measurements for well DCMW004-08 (WW Ac 8)



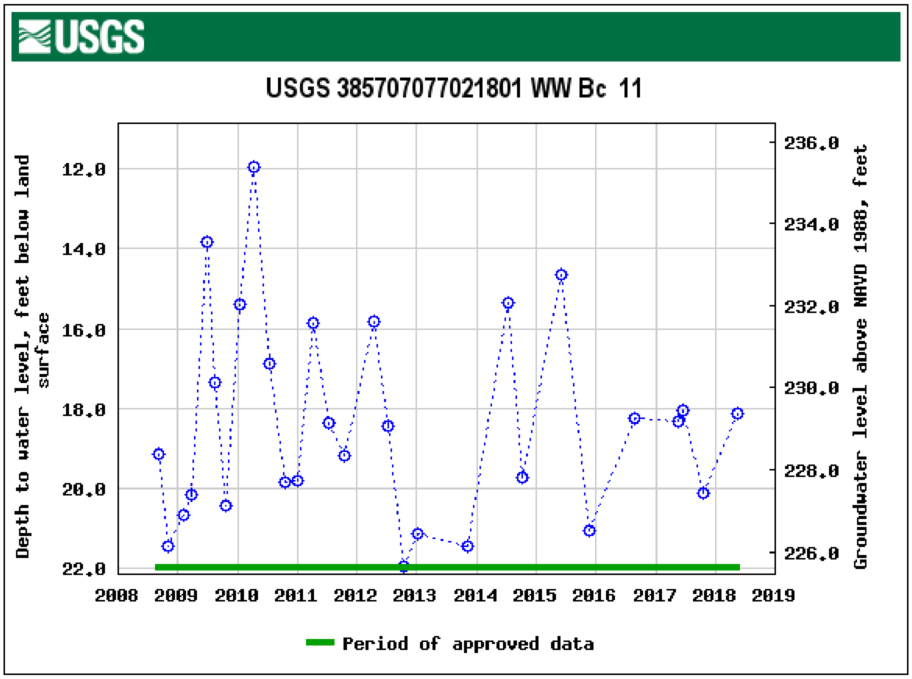
Graph of Manual Water-Level Measurements for well DCMW007-08 (WW Ba 28)



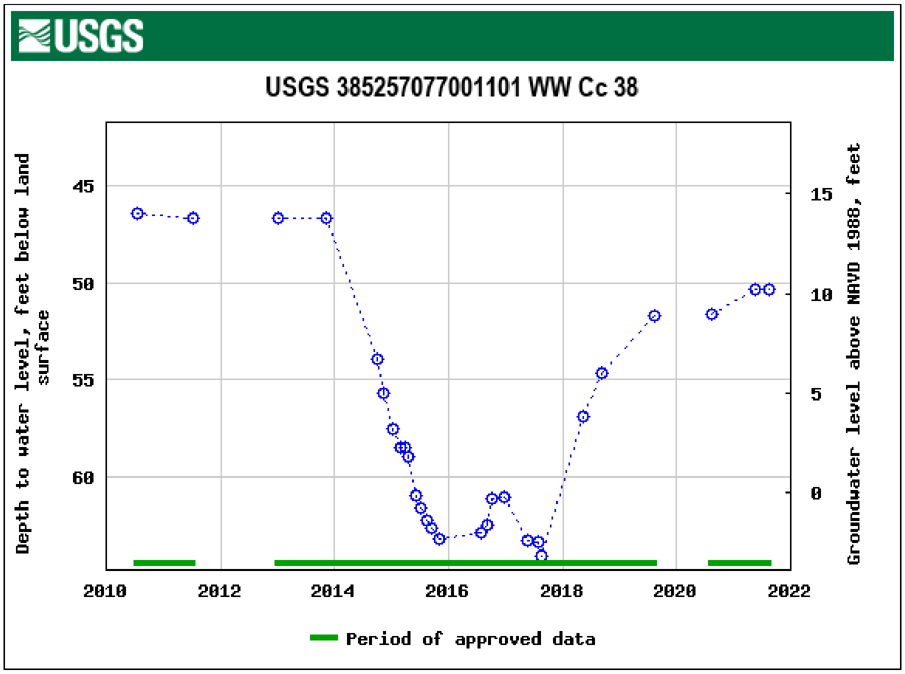
Graph of Manual Water-Level Measurements for well MW009-05 (WW Bc 8)



Graph of Manual Water-Level Measurements for well DCMW0011-05 (WW Bc 9)



Graph for Manual Water-Level Measurements for well DCMW006-08 (WW Bc 11)



Graph of Manual Water-Level Measurements for well DCMW001-13 (WW Cc 38)

Appendix 5.5 Major Sources of Groundwater Contamination

Sources	**10 Highest-Priority Sources (✓)**	**Relative Priority**	**Factors**[a]
Animal Feedlots	NA	—	—
Containers		Low	A, B, D, E
CERCLIS Sites	✓	High	A, B, D, E, F, G, H
De-icing Applications		Medium	A, D, F, G, H
Federal Superfund (NPL)	✓	High	A, B, D, E, F, G, H
Fill	✓	High	A, D, E, F, G, H
Graveyards		Medium	—
Landfills (permitted)	✓	Medium	A, B, D, E, F, G, H
Landfills (unpermitted)[a]	✓	Medium	A, B, D, E, F, G, H
Material Transfer Operations		Medium	A, B, D, E, F, H
Material Stockpiles		Low	A, B
Mining and Mine Drainage	NA	—	—
Pesticide Applications	✓	Medium	A, B, C, F, G, H
Pipeline and Sewer Lines	✓	Medium	F, H
Radioactive Disposal Sites	NA	—	—
RCRA Sites	✓	Medium	A, B, D, E, F, G, H
Septic Tanks		—	—
Shallow Injection Wells		Medium	A, F, G
Storage Tanks (above ground)		Medium	A, B, D, F, G, H
Storage Tanks (underground)	✓	High	A, B, D, E, F, G, H
Storm Water Drainage Wells		Medium	E, F, I
Surface Impoundments		Low	A, B
Transportation of Materials	✓	Medium	A, B, C, D, E, G, H
Urban Runoff		Medium	F, H
Waste Tailings	NA	—	—
Waste Piles		Medium	A, D, E

A = Human health and/or environmental risk (toxicity) B
= Size of the population at risk
C = Location of the sources relative to drinking water sources

D = Number and/or size of contaminant sources E
= Hydrogeologic sensitivity
F = State findings, other findings
G = Documented from mandatory reporting H
= Geographic distribution/occurrence
I = Assigned for pipelines and sewer lines and is a combination of the age and construction material of the lines (in D.C., there still are brick lines at least 100 years old).
NA = Not Applicable
— = Not a Priority

[a] Unknown. The locations and nature of the materials disposed in unpermitted landfills are not yet known.

Appendix 5.6 Groundwater Protection Programs

Programs or Activities	Check	Implementation Status	Responsible State Agency
Ambient groundwater monitoring system	✓	Partly established	DOEE
Aquifer vulnerability assessment (1)	✓	Fully established	DOEE
Aquifer mapping (2)	✓	Under development	DOEE
Aquifer characterization	✓	Partly developed	DOEE
Comprehensive data management system (3)	✓	Partly developed	DOEE
Emergency Response	✓	Fully established	*HSEMA
EPA-endorsed Core Comprehensive State Ground Water Protection Program (CSGWPP)	✓	Under development	DOEE
Ground water discharge permits	✓	Under development	DOEE
Groundwater Best Management Practices	✓	Under development	DOEE
Ground water legislation	✓	Fully established	DOEE
Ground water classification	✓	Fully established	DOEE
Ground water quality standards	✓	Fully established	DOEE
Interagency coordination for ground water protection initiatives	✓	Under development	DOEE
Land Remediation and Development (Brownfields Revitalization Program)	✓	Fully established	DOEE
Nonpoint Source Controls	✓	Partly developed	DOEE
Pesticide State Management Plan	✓	Fully established	DOEE
Pollution Prevention Program	✓	Under development	DOEE
State RCRA Program incorporating more stringent requirements than RCRA Primacy (except for corrective action)	✓	Fully established	DOEE
State septic system regulations			
Underground storage tank installation requirements	✓	Fully established	DOEE
Underground Storage Tank Remediation Fund	✓	Fully established	DOEE
Underground Storage Tank Permit Program	✓	Fully established	DOEE
Underground Injection Control Program		Joint oversight	DOEE & EPA
Vulnerability assessment for drinking water/wellhead protection	✓	Fully established	DOEE
Well abandonment regulations	✓	Fully established	DOEE
Wellhead Protection Program (U.S. EPA-approved)	✓		
Well installation regulations	✓	Fully established	DOEE

*HSEMA-Homeland Security Emergency Management Agency

Appendix 5.7 Shallow Aquifer Contamination

Aquifer: Shallow Aquifer				
Source Type	**Present in Reporting Area**	**Number of Sites in Area**	**Number of Sites that are Listed and/or Have Confirmed Releases**	**Number with Confirmed Groundwater Contamination**
NPL	Yes	1	1	1
SEMS (formerly CERCLIS)	Yes	118(h)	2	2
DOD/DOE	Yes (a)	13	13	1(c)
UST Total Opened/Closed	Yes	3,257 (b)(c)	1,520 (c)(g)	527 (c)(g)
UST Active/Opened	Yes	421 (b)(e)	139 (c)	99 (c)(f)
RCRA Corrective Action	Yes	2(i)	2	2
Underground Injection	Yes (d)	58(j)	—	54
State Sites (Voluntary Clean Lands Program)	Yes (e)	22	22	22
Nonpoint Sources	(k)	—	—	—
Other	Yes	6	6	6
Totals		3,898	1,705	714

NPL - National Priority List
SEMS - (Superfund Enterprise Management System (formerly CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System)
DOE - Department of Energy
DOD - Department of Defense
UST - Underground Storage Tanks
RCRA - Resource Conservation and Recovery Act

(a) Only DOD facilities. The number represents the number of facilities. Within a facility, there are several areas of concern resulting from distinct sources (e.g., LUST, landfill, maintenance shops, etc.). Groundwater contamination assessment is ongoing for many of the sites. Numbers were provided by the Land Remediation and Development Branch.

(b) Data represents the number of UST facilities known to DC from previous and current annual registration. This value includes sites with heating oil and hazardous materials tanks. Numbers were provided by the Underground Storage Tank Branch, DOEE.

(c) Most of these sites (facilities) are not closed, either the USTs were removed or abandoned in place or the soil and/or groundwater contamination was remediated, and the LUST case closed. There are 3,257 facilities and 1,920 LUST cases in the District. Facilities with more than one LUST case are counted more than once. There are 139 open LUST cases and 75 have groundwater contamination.

(d) Each facility is counted only once independent of the number of LUST cases.

(e) This value applies to active and temporarily closed tanks.

(f) There is on-going groundwater contamination assessment/remediation and monitoring by responsible parties for many of the open LUST cases pending closure. These cases include heating oil contaminated sites.

(g) Source type data make no distinction between State and non-State sites.

(h) Data taken from EPA SEMS website January 2024.

(i) Southeast Federal Center and Naval Research Laboratory

(j) There are a total of 147 inventoried active wells in the District of Columbia. The majority (131 wells) are part of aquifer remediation systems at 54 active remediation sites. There are 14 storm water drainage wells at two facilities, basically roof-top drainage systems, and two septic systems at two facilities. (Data provided by the USEPA Region 3 Underground Injection Program).

(k) See Nonpoint Source Section

Appendix 5.8 Oxon Run Deep Well Log

TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

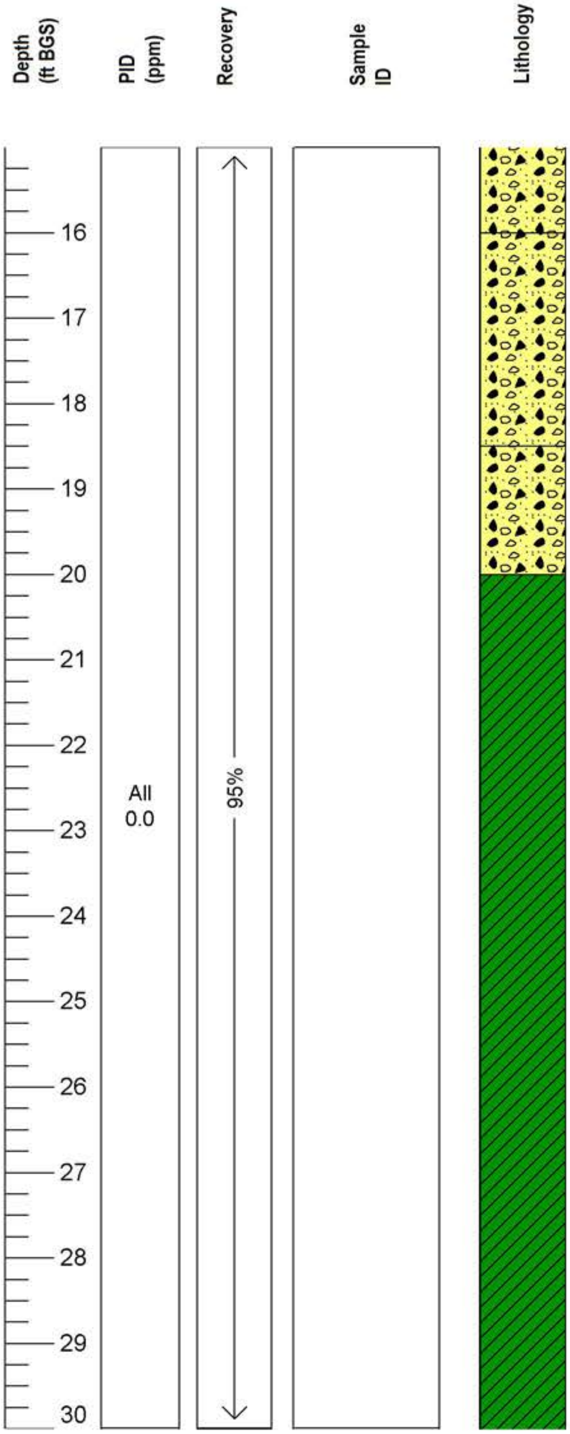
Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
0 1	All 0.0	95%		▨	***Clay:*** CLAY (CL), grayish brown, 10YR 5/2, little sand, little subrounded gravel, soft, medium plasticity, moist, no odor.
2 3				▤	***Silt:*** SILT (ML), dark brown, 7.5YR 5/6, with clay and small to large rounded gravel, contains roots, soft, moist, no odor.
4 5				▤	***Silt:*** SILT (ML), dark brown, 7.5YR 5/6, some mottiling (red 10YR 5/8 and light yellowish brown) with clay, some subrounded gravel, contains roots, stiff, moist, no odor.
6 7 8				▤	***Silt:*** SILT (ML), dark brown, 7.5YR 5/6, some mottiling (red 10YR 5/8 and light yellowish brown) with clay, some subrounded gravel, contains roots, very stiff, moist, no odor.
9 10				▨	***Clay:*** CLAY (CL), gray, 10YR 3/1, some fine sand, little silt, soft, medium plasticity, moist, no odor.
11 12 13				▩	***Gravel:*** Well graded subrounded GRAVEL (GW), grayish brown, 10YR 5/2, some fine to medium well graded sand, little silt, soft, wet, no odor.
				▨	***Clay:*** CLAY (CL), light brownish clay, 10YR 6/2, some fine sand, little silt, moist, no odor.
14 15				▩	***Gravel:*** Well graded subrounded GRAVEL (GW), gray, 10YR 5/11, some well graded fine to medium sand, little silt, soft, wet, no odor.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Gravel: Well graded subrounded GRAVEL (GW), gray, 10YR 5/11, some well graded fine to medium sand, little silt, soft, very wet, no odor.

Gravel: Well graded subrounded to rounded GRAVEL (GW), grayish brown, 10YR 5/1, some clay (reddish brown, 2.5YR 5/4), little sand, soft, wet, no odor.

Clay: CLAY (CL), reddish brown, 2.5YR 5/4 and light gray, 2.5YR 7/1, very stiff, moist, no odor.

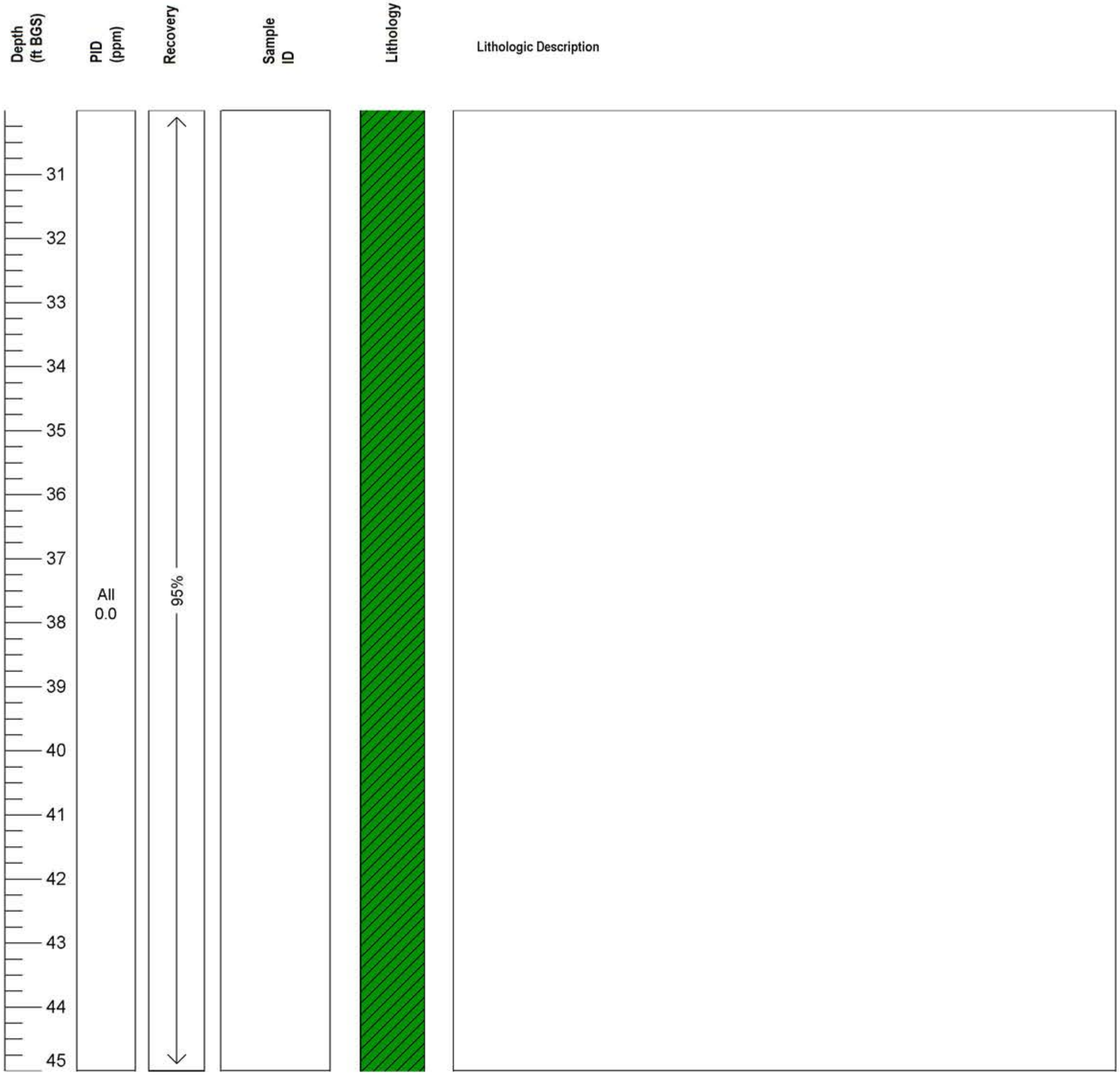
TETRA TECH

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Date: 02/14/23-03/02/23

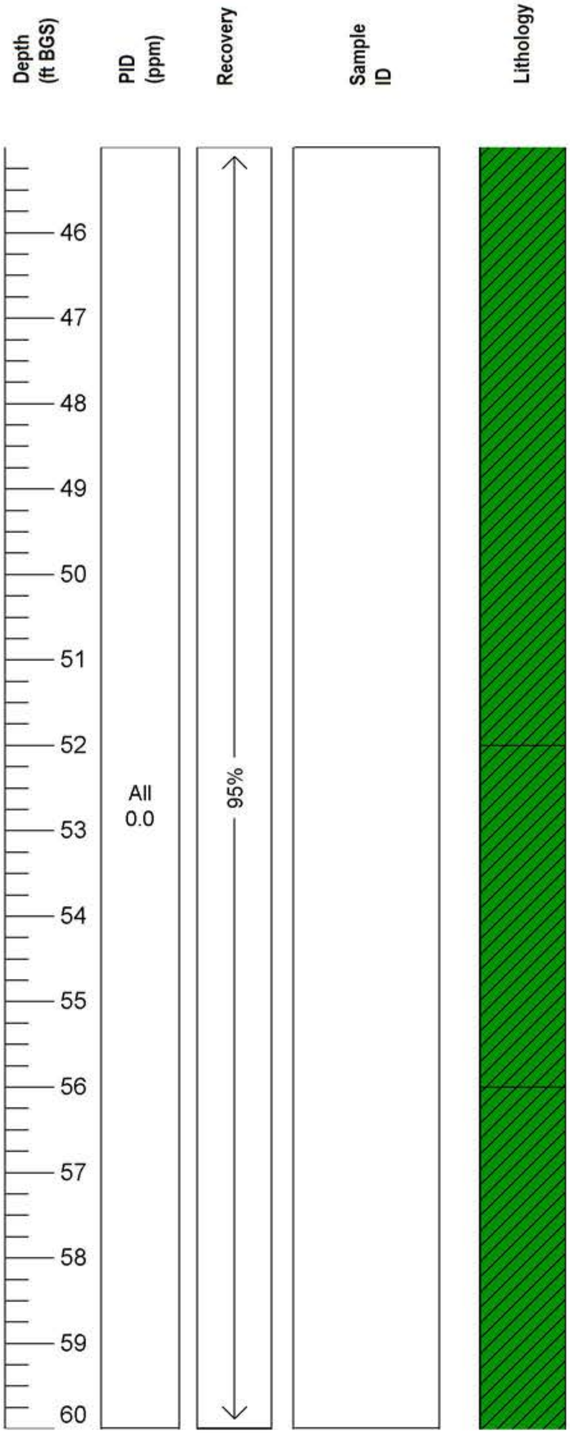
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

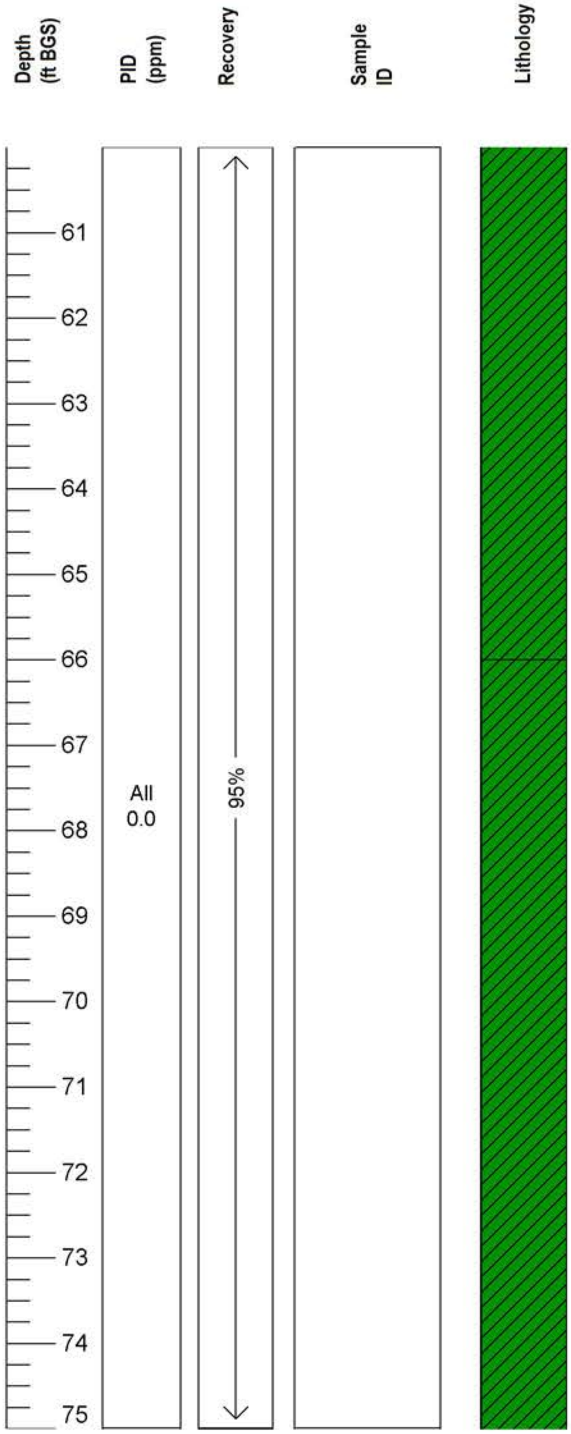
Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), light reddish brown, 10YR 6/4, very stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), bluish gray, GLEY 2 10BG 6/1, stiff, high plasticity, moist, no odor.



Lithologic Description

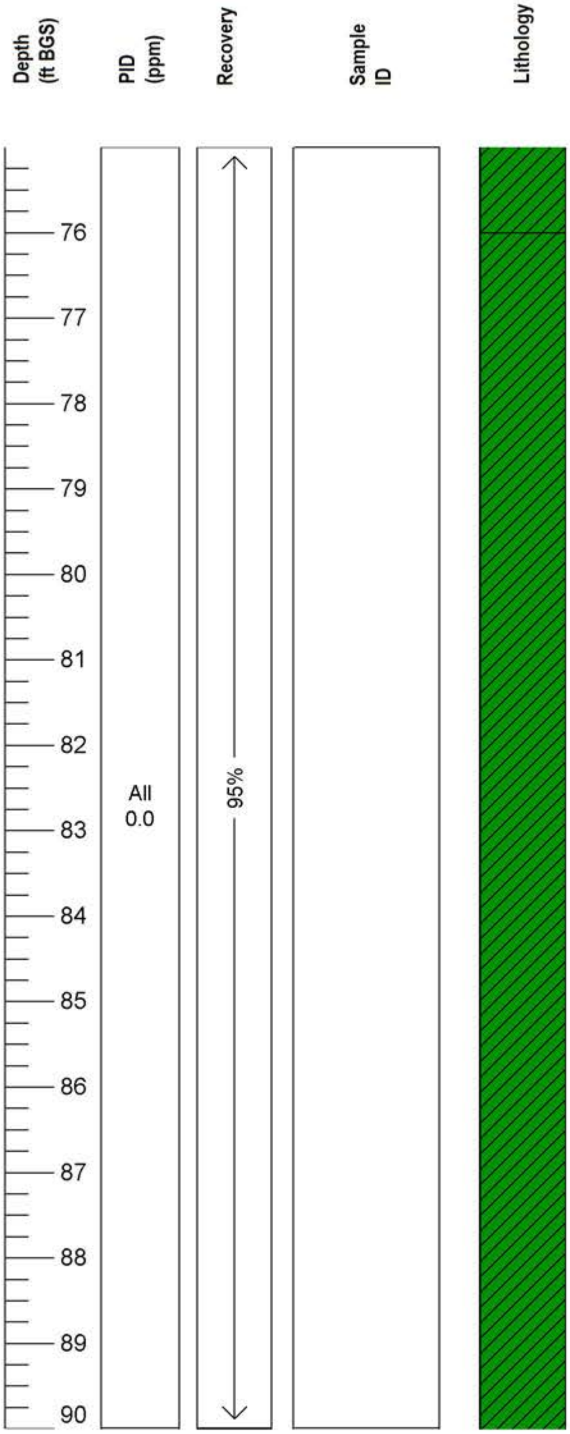
Clay: CLAY (CL-CH), yellowish brown, 10YR 5/4, changes to light brown, 10YR 6/5 with depth, very stiff, medium plasticity, moist, no odor.

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), reddish brown, 5YR 5/3, very stiff, high plasticity, moist, no odor.

Date: 02/14/23-03/02/23

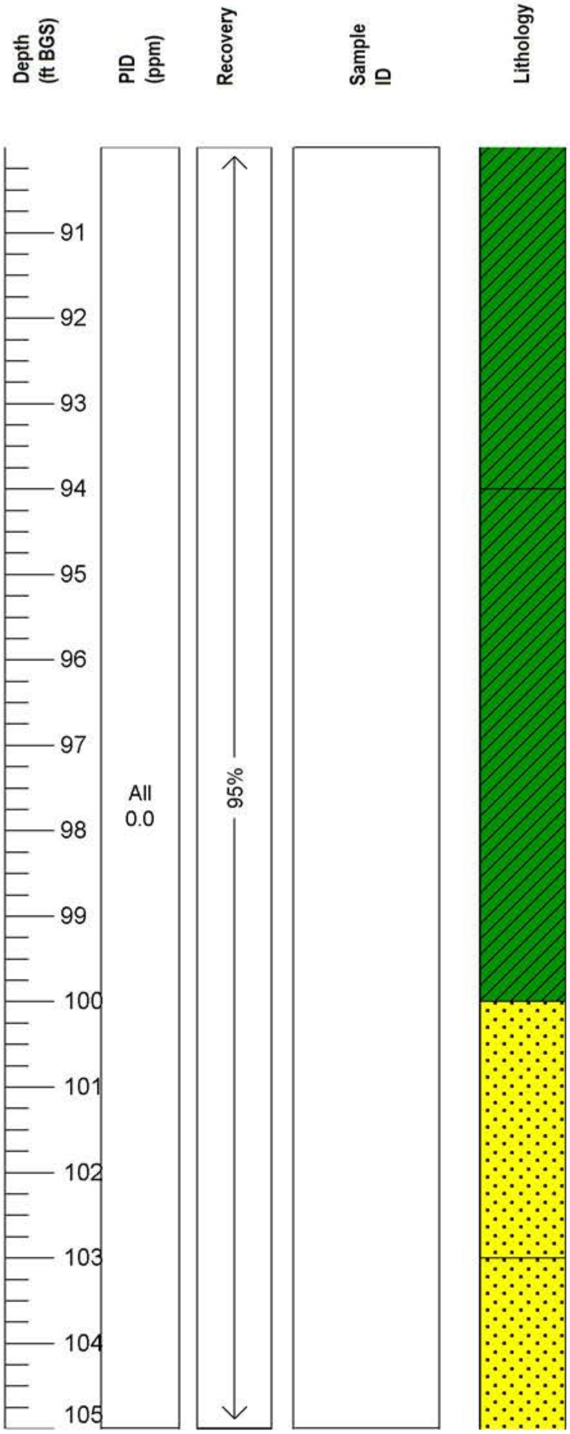
Boring ID:
GW-3-MW-10B

TETRA TECH

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), bluish gray, GLEY 2 10BG 6/1, very stiff, high plasticity, moist, no odor.

Sand: Poorly graded fine SAND (SP), greenish gray, GLEY 1, 10GY 6/1, some silt, loose, moist, no odor.

Sand: Poorly graded fine to medium SND (SP), greenish gray, GLEY 1, 10GY 6/1, some silt, loose, moist, no odor.

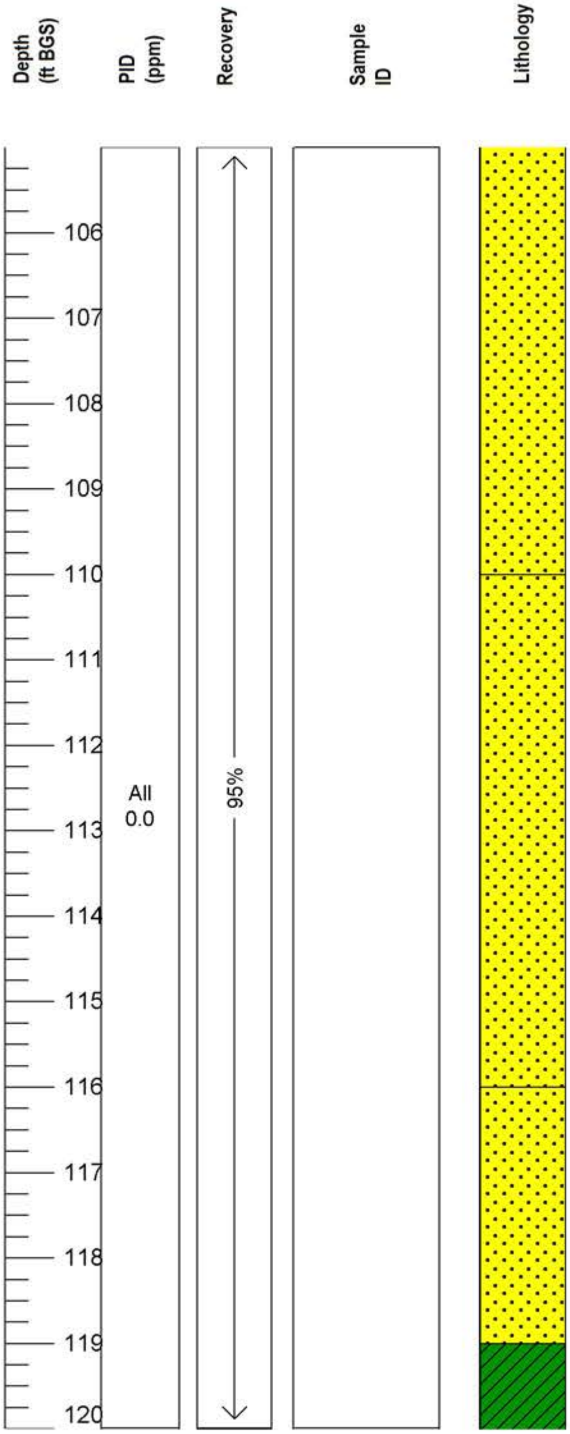
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Sand: Poorly graded fine to medium SAND (SP), greenish gray, GLEY 1, 10GY 5/1, little silt, loose, moist, no odor.

Sand: Well graded medium to coarse SAND (SW), greenish gray, 10 GLEY 5/1, some silt, loose, moist, no odor.

Clay: CLAY (CL-CH), greenish gray, 10 GLEY 5/1, some fine sand, little silt, very stiff, medium plasticity, moist, no odor.

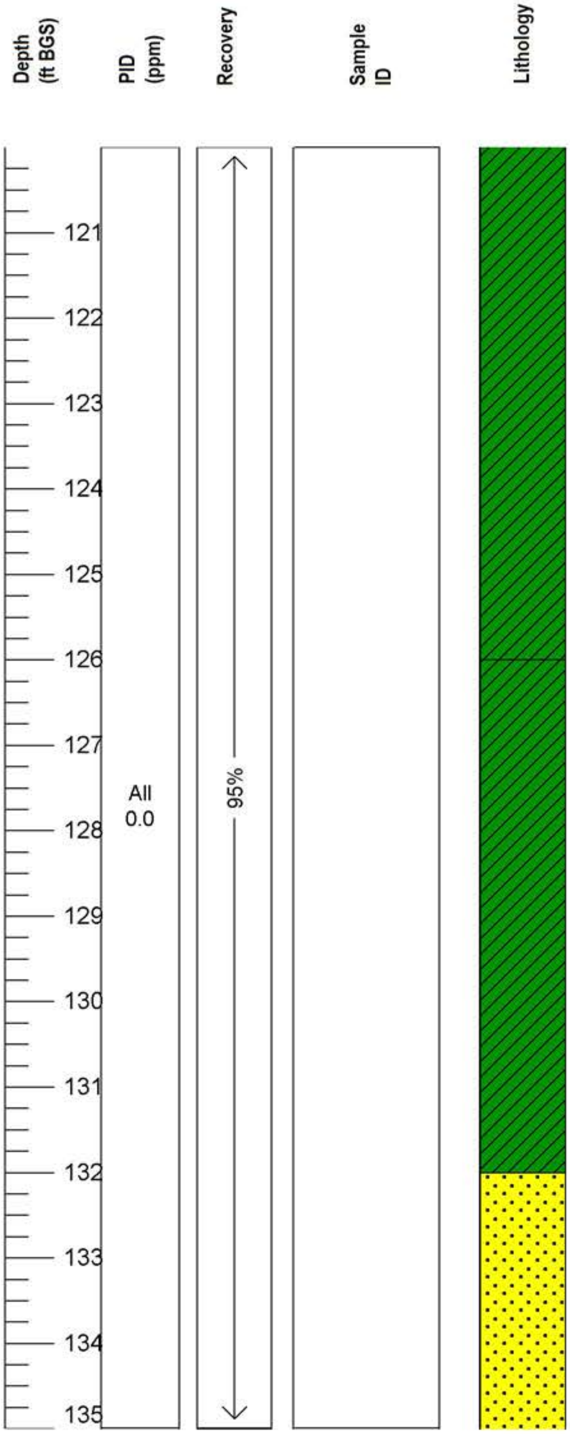
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CL-CH), greenish gray, 10 GLEY 5/1, with small lenses of sand and sandy clay (SC) increasing with depth, little silt, very stiff, medium plasticity, moist, no odor.

Sand: Poorly graded SAND (SP-SC), greenish gray, 10 GLEy 5G 6/1, some clay, loose, moist, no odor.

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
	All 0.0	95%		🟨	
136				🟩	***Clay:*** CLAY (CL), greenish gray, GLEY 1, 5G 6/1, some medium sand, stiff, medium plasticity, moist, no odor.
138				🟨	***Sand:*** Poorly graded SAND (SP-SC), greenish gray, 10 GLEy 5G 6/1, some clay, loose, moist, no odor.
139				🟩	***Clay:*** CLAY (CL), greenish gray, GLEY 1, 5G 6/1, some medium sand, stiff, medium plasticity, moist, no odor.
141				🟩	***Clay:*** CLAY (CL-CH), greenish gray, GLEY, little sand, very stiff, medium plasticity, moist, no odor.
145				🟩	***Clay:*** CLAY (CL-CH), greenish gray, GLEY 5G/1, 6/1, some medium sand, medium stiff, medium plasticity, moist, no odor.
146				🟩	***Clay:*** CLAY (CH), gray, 10YR 5/1, secondary color reddish brown, 2.5YR 5/4, very stiff, high plasticity, moist, no odor.
147				🟩	
148				🟩	
149				🟩	
150					

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
151				▨	
152				▨	***Clay:*** CLAY (CL), greenish gray, GLEY 1, 5G/1, 6/1, mottiling (reddish brown, 2.5YR 5/4), very stiff, medium plasticity, moist, no odor.
153				▨	
154				▨	***Clay:*** CLAY (CH), greenish gray, GLEY 1, 5G/1, 6/1, mottiling (light yellowish brown) 10YR 6/4), very stiff, high plasticity, moist, no odor.
155				▨	
156				▨	
157	All 0.0	95%		▨	
158				▨	
159				▨	
160				▨	
161				▨	***Clay:*** CLAY (CL), light reddish gray, 10YR 7/1, very stiff, medium plasticity, moist, no odor.
162				▨	
163				▨	
164				▨	***Clay:*** CLAY (CL-CH), gray, 10YR 6/1, very stiff, medium to high plasticity, moist, no odor.
165				▨	

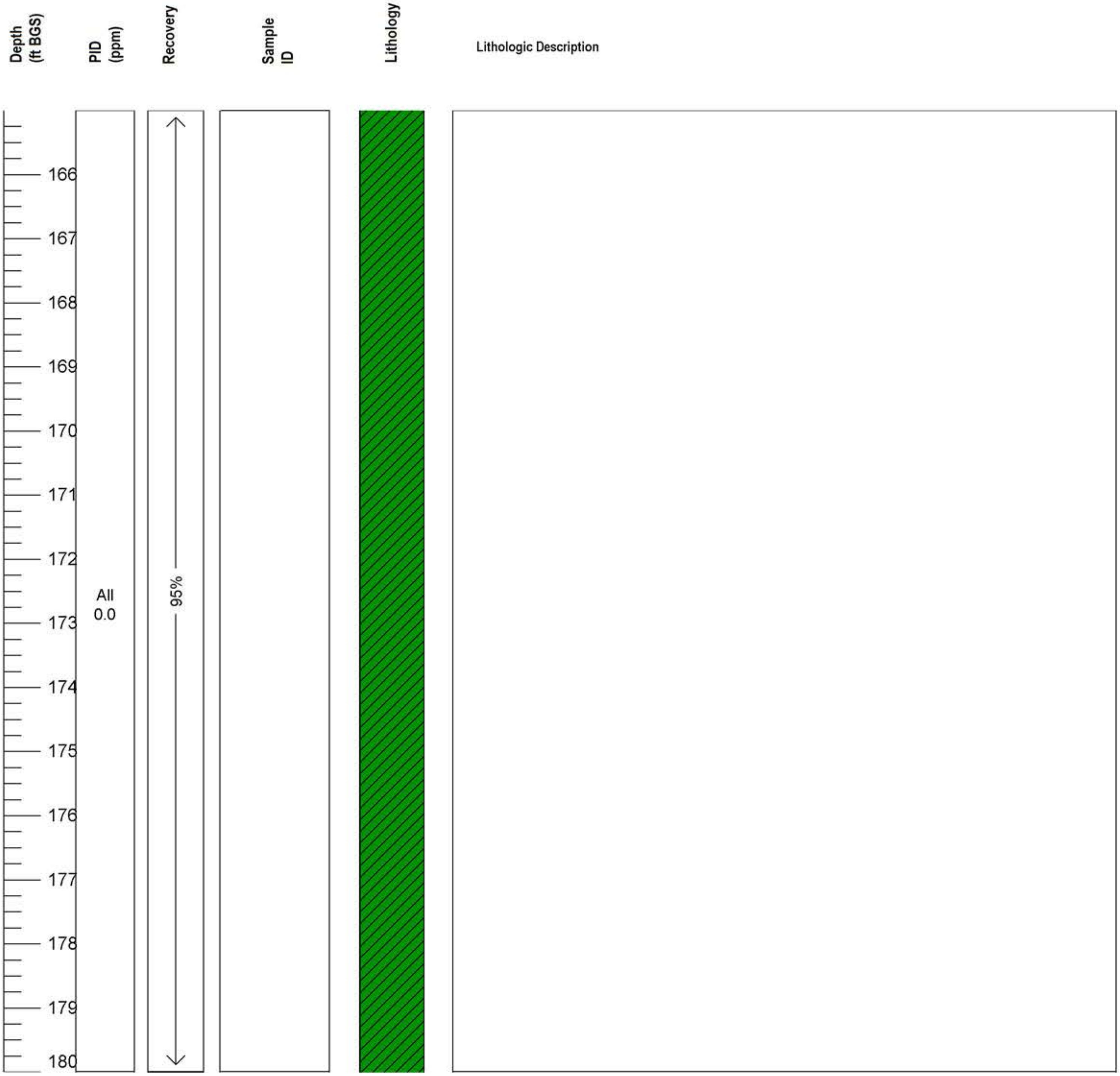
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

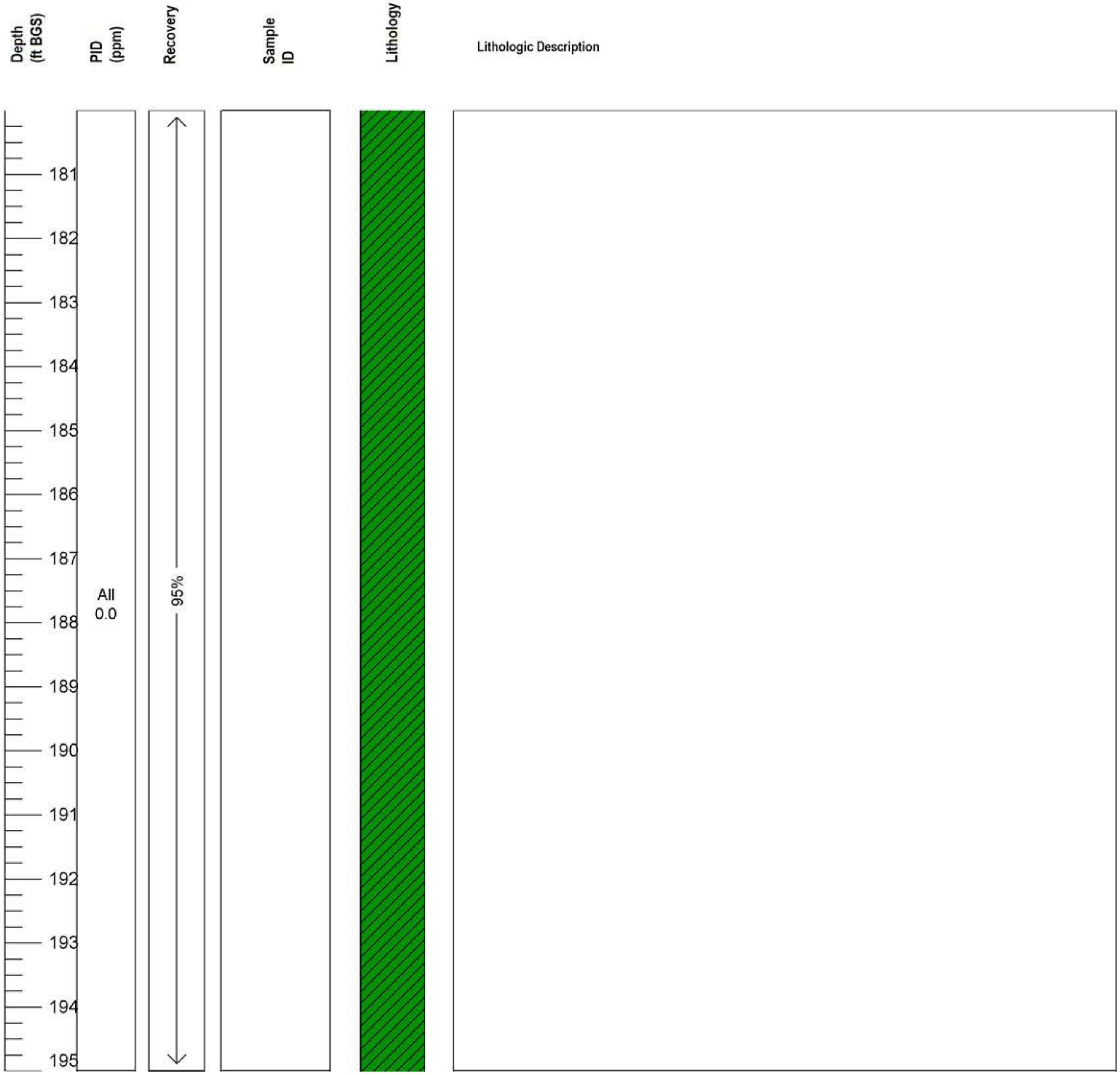


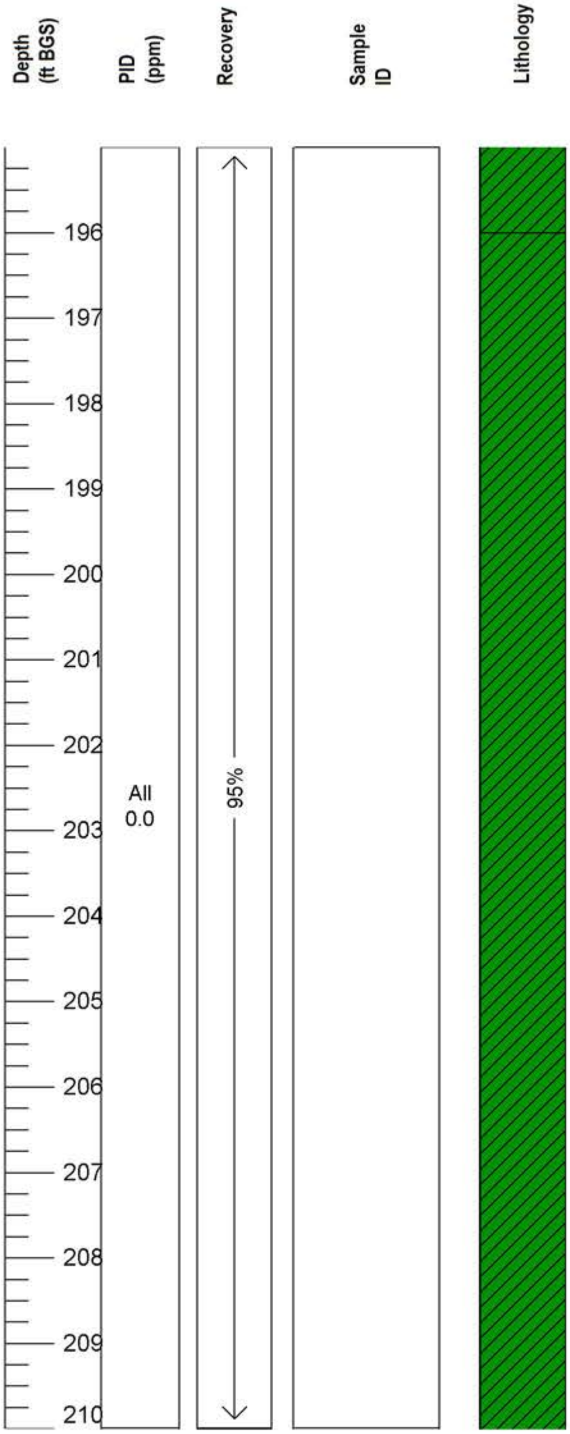
Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8





Lithologic Description

Clay: CLAY (CL-CH), light reddish brown, 10YR 6/3 and light yellowish gray, 10YR 7/1, very stiff, medium plasticity, moist, no odor.

TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

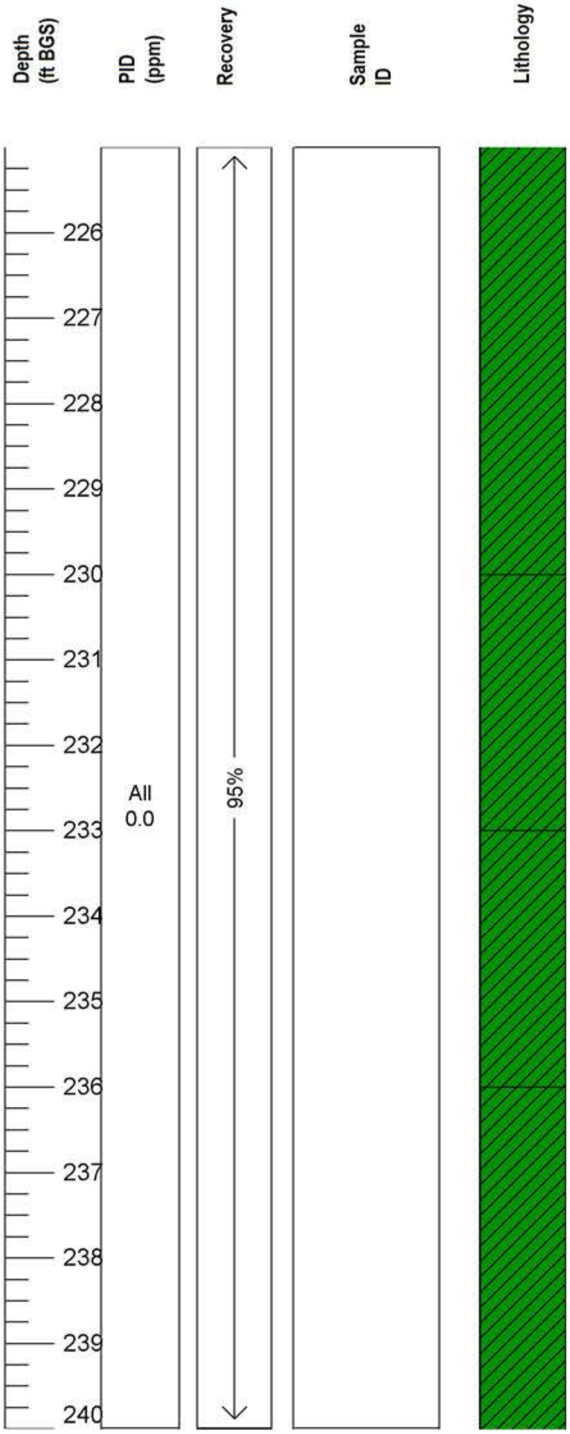
Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
211 212 213 214 215 216 217 218 219 220 221 222 223 224 225	All 0.0	95%	GW-3-MW-10B-210.0-211.0	▨	

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CL-CH), greenish gray, GLEY 1 6/1, very stiff, medium plasticity, moist, no odor.

Clay: CLAY (CH), light reddish brown, 10YR 6/3 and light yellowish gray, 10YR 7/1, very stiff, medium plasticity, moist, no odor.

Clay: CLAY (CH), light reddish brown, 10YR 6/3 and light reddish gray, 10YR 7/1, contains bands of lignite and light reddish brown 2.5YR 7/3 mottiling, stiff to soft, high plasticity, moist, no odor.

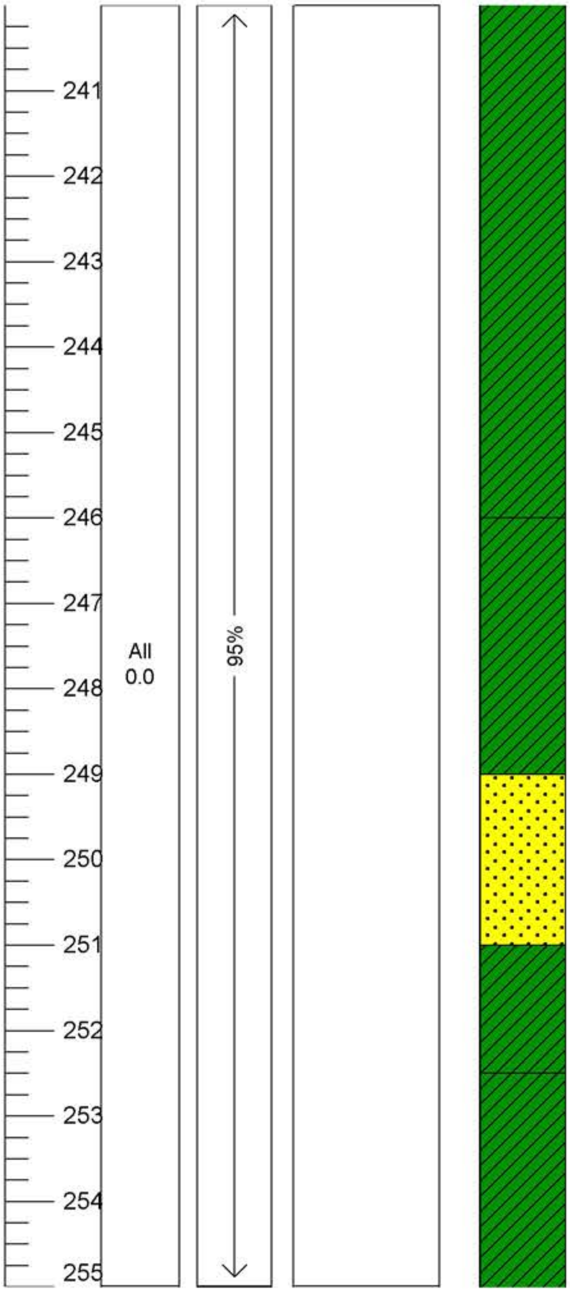
Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS) | PID (ppm) | Recovery | Sample ID | Lithology | Lithologic Description



Clay: CLAY (CL), light brownish gray, 10YR 6/2, some fine sand, stiff, medium plasticity, moist, no odor.

Sand: Poorly graded medium SAND (SP-SC), light brownish gray, 10YR 6/2, loose, moist, no odor.

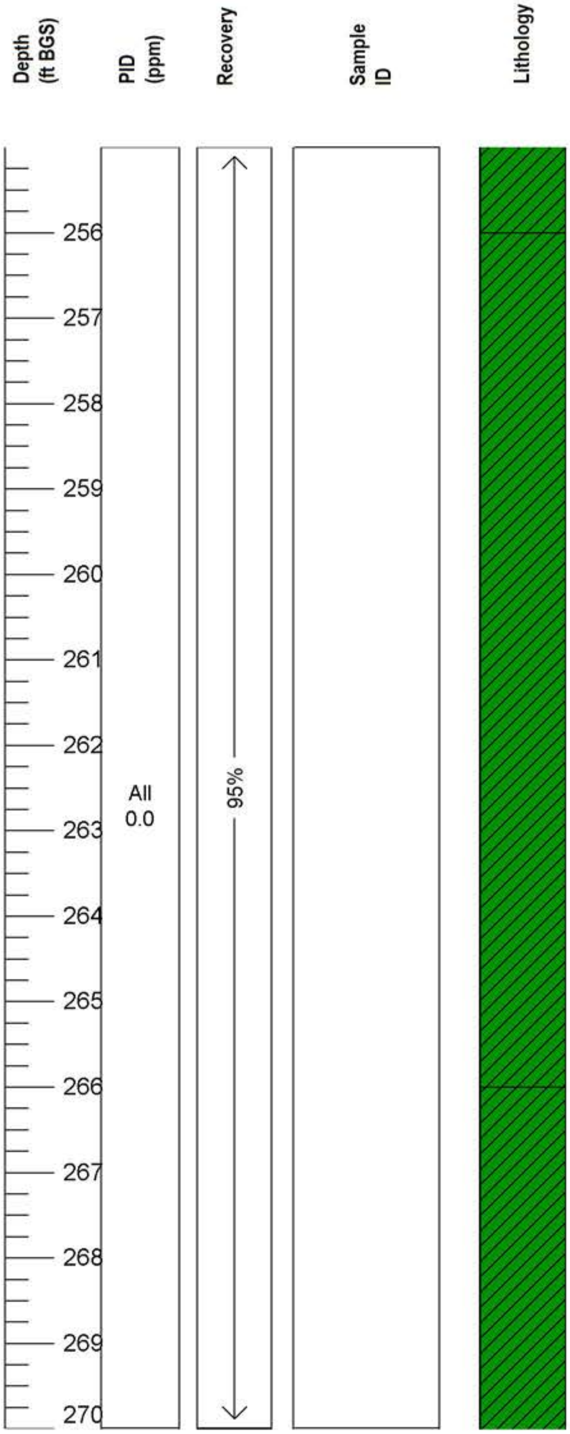
Clay: CLAY (CL), grayish brown, 10YR 5/2, stiff, medium plasticity, moist, no odor.

Clay: CLAY (CL-CH), gray, 10YR 5/1, very stiff, medium to high plasticity, moist, no odor.

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CL-CH), gray, 10YR 5/1, contains significant amount of lignite, very stiff, medium to high plasticity, moist, no odor.

Clay: CLAY (CL-CH), gray, 10YR 5/1, very stiff, medium to high plasticity, moist, no odor.

TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
271				▨	
272					
273					
274					
275					
276					
277		95%			
278	All 0.0				
279					
280					
281				▨	***Clay:*** CLAY (CH), gray, 10YR 5/1, some sand, contains small lense of clayey sand, stiff, high plasticity, moist, no odor.
282					
283					
284					
285					

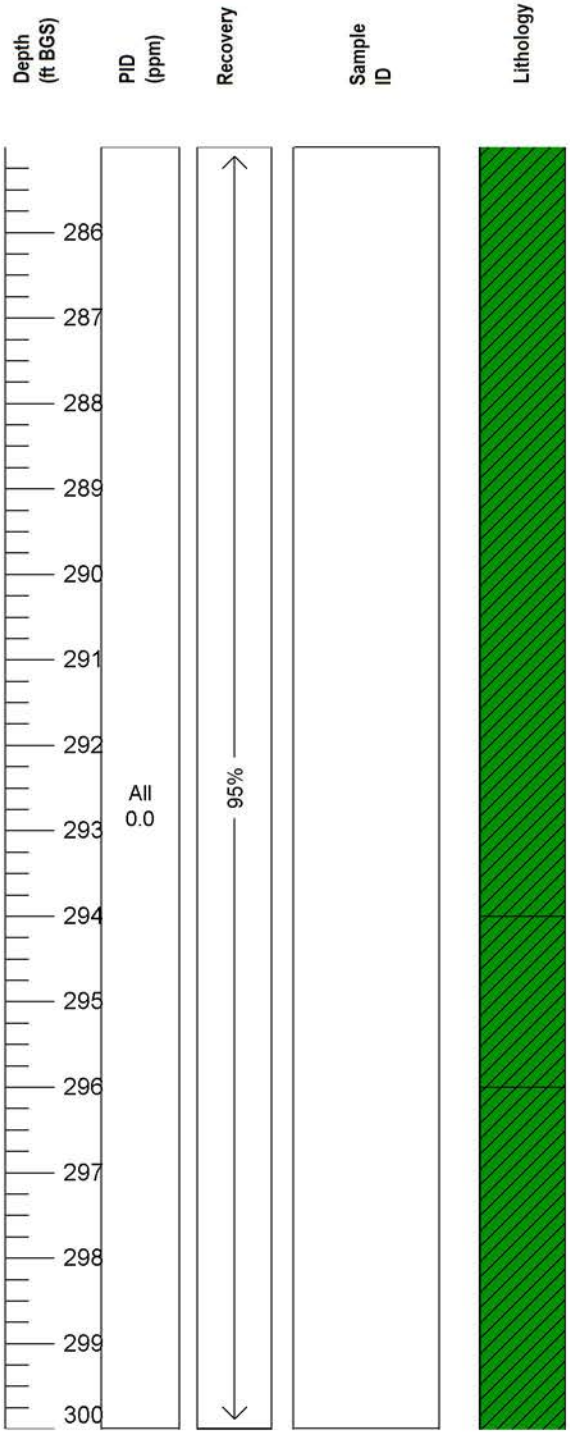
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CL-CH), reddish brown, 2.5YR 4/3, some sand and silt, very stiff, medium plasticity, moist, no odor.

Clay: CLAY (CH), light greenish gray, GLEY 1 5GY 7/1, very stiff, high plasticity, moist, no odor.

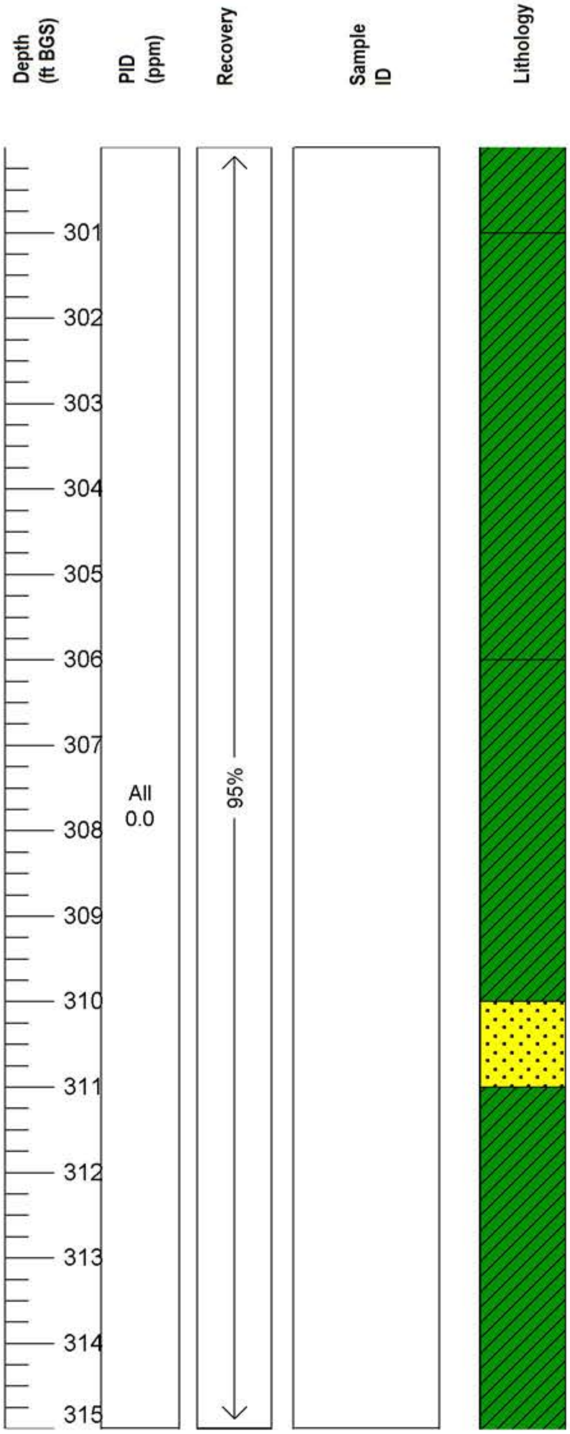
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), greenish gray, GLEY 1 5GY 6/1, very stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), greenish gray, GLEY 1 5GY 6/1, some fine sand, very stiff, high plasticity, moist, no odor.

Sand: Poorly graded fine SAND (SP-SC), greenish gray, GLEY 1 5GY 6/1, loose, moist, no odor.

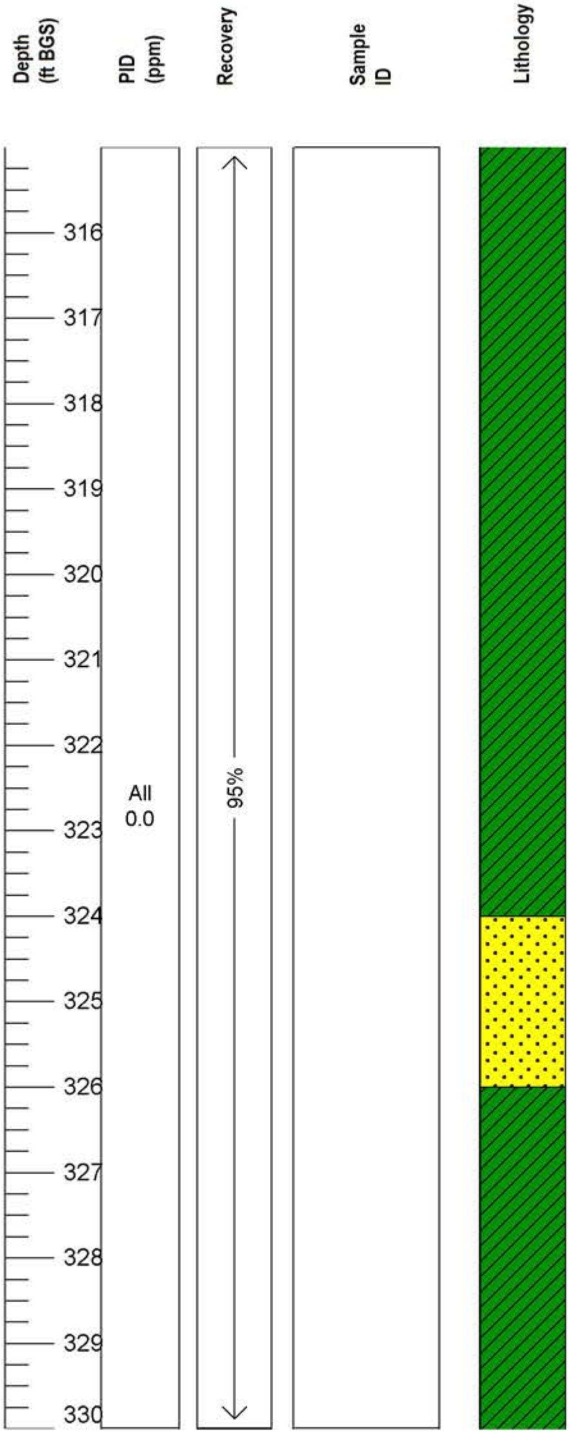
Clay: CLAY (CL), greenish gray, GLEY 1 5GY 6/1, some meidum sand, very stiff, medium plasticity, moist, no odor. Lenses of sand throughout interval and more clay from 318.0-322.0 ft. bgs.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Sand: Poorly graded medium SAND (SP-SC), greenish gray, loose, moist, no odor.

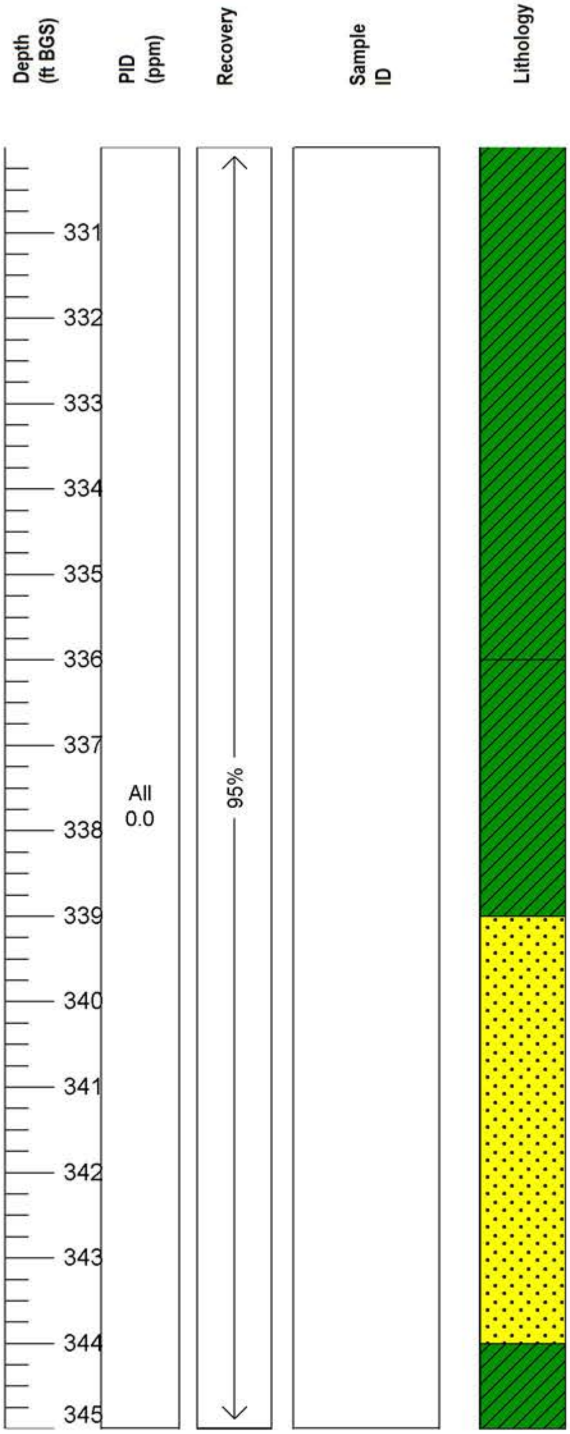
Clay: CLAY (CH), greenish gray, GLEY 1 5GY 6/1, some fine to medium sand, very stiff, high plasticity, moist, no odor.

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), greenish gray, GLEY 1 5GY 6/1, and fine to medium sand, very stiff, high plasticity, moist, no odor. (Sandy clay)

Sand: Poorly graded medium SAND (SP-SC), greenish gray, loose, moist, no odor.

Clay: CLAY (CL), greenish gray, GLEY 1 5G/1 6/1, light yellowish brown mottiling, stiff, moist, no odor.

TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
	All 0.0	95%		▨	***Clay:*** CLAY (CL), greenish gray, GLEY 1 5G/1 6/1, some subrounded gravel, very stiff, moist, no odor.
346				▨	***Clay:*** Organic CLAY (CL-OL), gray, 10YR 6/1, some fine sand, medium stiff to soft, loose, moist, no odor. Organic rich towards bottom. Lignite and wood chunks towards bottom.
347					
348					
349					
350					
351					
352					
353					
354					
355				▨	***Clay:*** Organic CLAY (CL-OL), dark gray, 10YR 3/1, 10YR 2/1 and 10YR 2/2, dark brown as secondary colors, very micaceous, contains lignite and wood, stiff, moist, no odor.
356					
357					
358					
359					
360					

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

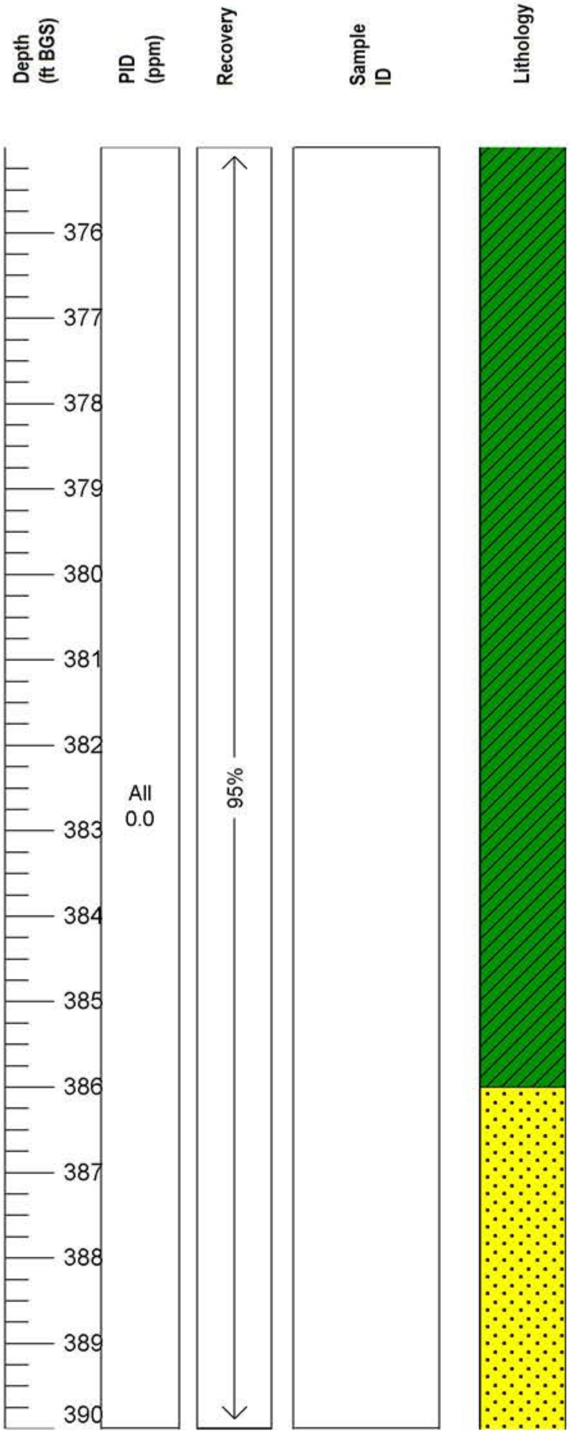
Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
	All 0.0	95%		▨	
361				▨	***Clay:*** CLAY (CH), greenish gray, GLEY 10GY 6/1, contains lignite, very stiff, high plasticity, moist, no odor.
362				▨	***Clay:*** CLAY (CH), greenish gray, GLEY 10 6/1, very stiff, high plasticity, moist, no odor.
363				▨	
364				▨	
365				▨	
366				▨	***Clay:*** CLAY (CL-CH), light gray, 10YR 7/1, very stiff, moist, medium plasticity, no odor.
367				▨	
368				▨	
369				▨	
370				▨	
371				▨	
372				▨	
373				▨	
374				▨	
375				▨	

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Sand: Poorly graded medium SAND (SP), light gray, 10YR 7/1, some clay, loose, moist to slightly wet to touch, no odor.

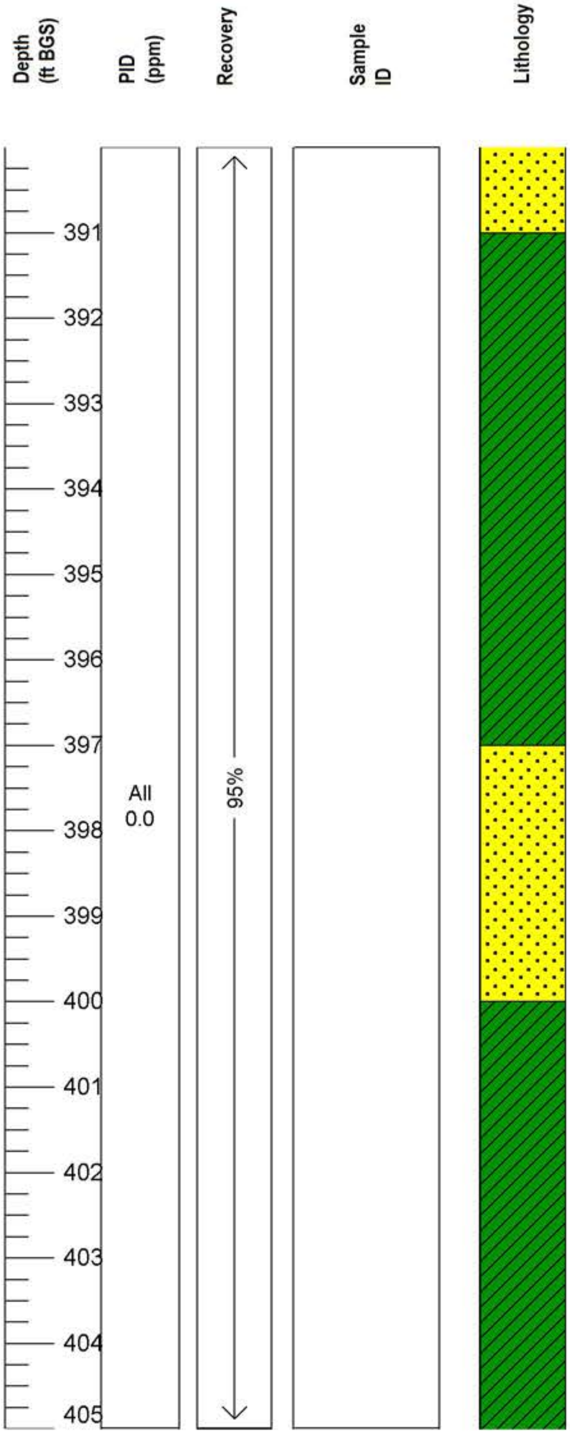
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CL-CH), light gray, 10YR 7/1, very stiff, moist, medium plasticity, no odor.

Sand: Poorly graded fine to medium SAND (SP-SC), light gray, 10YR 7/1, some clay, loose, moist, no odor.

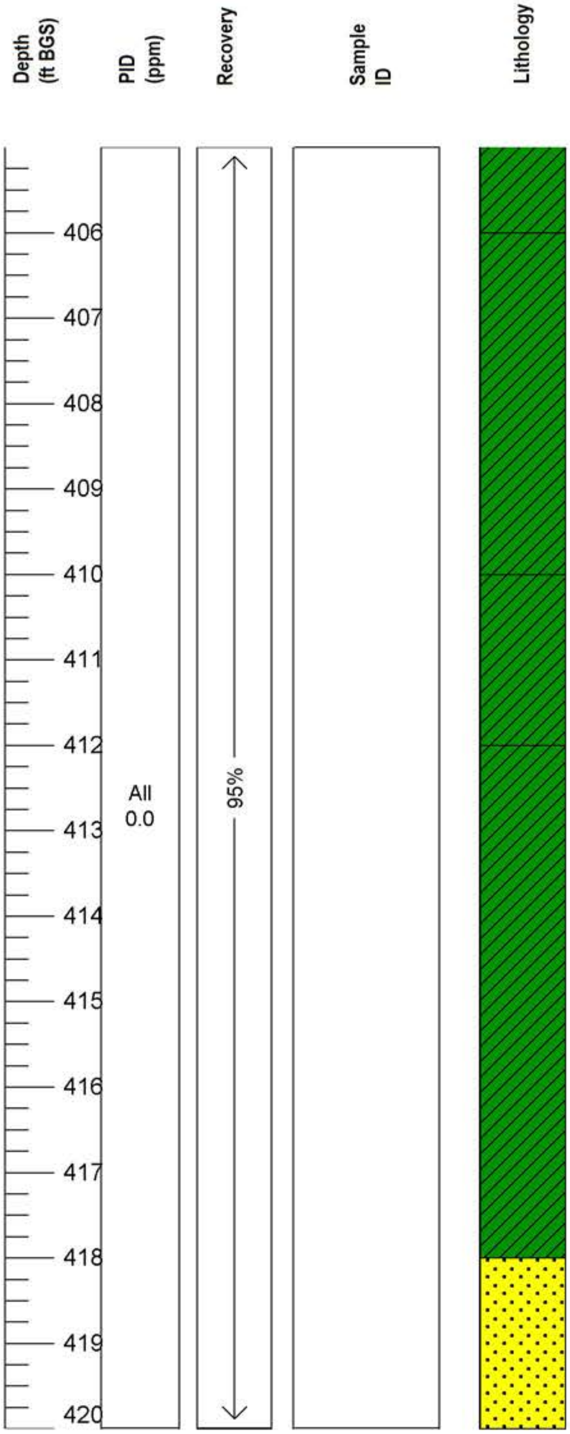
Clay: CLAY (CH), light gray, 10YR 7/1, some sand, stiff, moist, no odor.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), light greenish gray, GLEY 1 10GY 8/1, pale yellowish 5Y 8/3 mottiling, very stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), light greenish gray, GLEY 1 10GY 8/1, reddish brown 2.5YR 6/4 mottiling, very stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), reddish brown, 5YR 5/4, little silt, very stiff, some sand (more sand towards bottom of interval), high plastivity, moist, no odor.

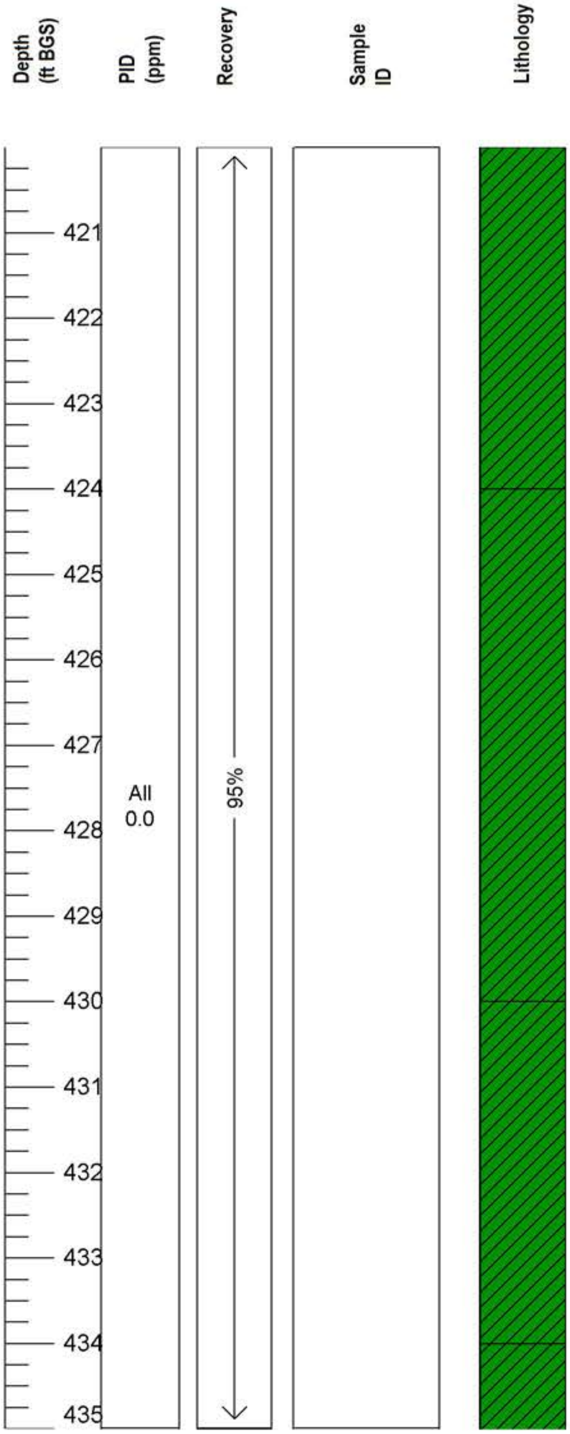
Sand: Poorly graded medium to coarse SAND (SP-SC), gray, 10YR 5/1, and brown 10YR 4/3, some clay, loose, moist, no odor.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), light greenish gray, GLEY 1 10GY 8/1, reddish brown 2.5YR 6/4 mottiling, very stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), reddish brown, 5YR 5/4, stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), dark yellowish brown, 10YR 4/4, and light brownish gray 10YR 5/2, very micaceous, stiff, high plasticity, moist, no odor.

Clay: CLAY (CL), light gray, 2.5YR 7/1, some very fine to coarse sand (more coarse with depth), very micaceous, stiff, medium plasticity, moist, no odor.

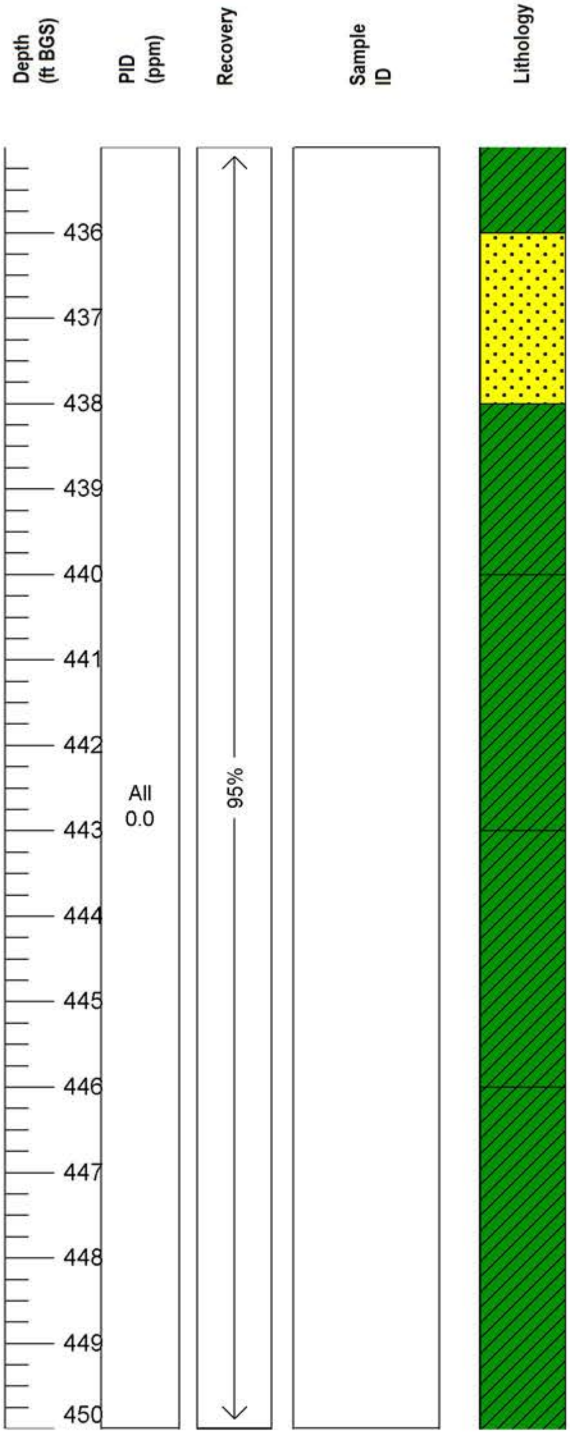
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Sand: Poorly graded fine SAND (SP-SC), gray, 2.5Y 7/1, some clay, micaceous, loose, moist, no odor. (Clayey sand lense)

Clay: CLAY (CL), light gray, 10YR 7/1, some poorly graded fine sand, micaceous, stiff, medium plasticity, moist, no odor.

Clay: CLAY (CH), dark gray, 2.5Y 4/1, stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), light gray, 10YR 7/1, micaceous, stiff, high plasticity, moist, no odor.

Clay: CLAY (CH), intermixed light gray, 10YR 7/1, and dark gray, 10YR 4/1, stiff, high plasticity, moist, no odor.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
451				▨	
452				▨	***Clay:*** CLAY (CH), dark gray, 2.5YR 4/1, stiff, high plasticity, moist, no odor.
453				▨	
454				▨	***Clay:*** CLAY (CH), light greenish gray, GLEY 10Y 8/1, red 2.5YR 5/6 mottiling, contains wood fragments and lignite, stiff, high plasticity, moist, no odor.
455				▨	
456				▨	
457				▨	
458	All 0.0	95%		▨	
459				▨	
460				▨	***Clay:*** CLAY (CH), greenish gray, GLEY 1 5G/1, 5/1, little fine sand, medium stiff to soft, high plasticity, moist, no odor.
461				▨	
462				▨	
463				▨	
464				▨	***Clay:*** CLAY (CH), very dark gray, GLEY 10YR 3/1, very stiff, high plasticity, moist, no odor.
465				▨	

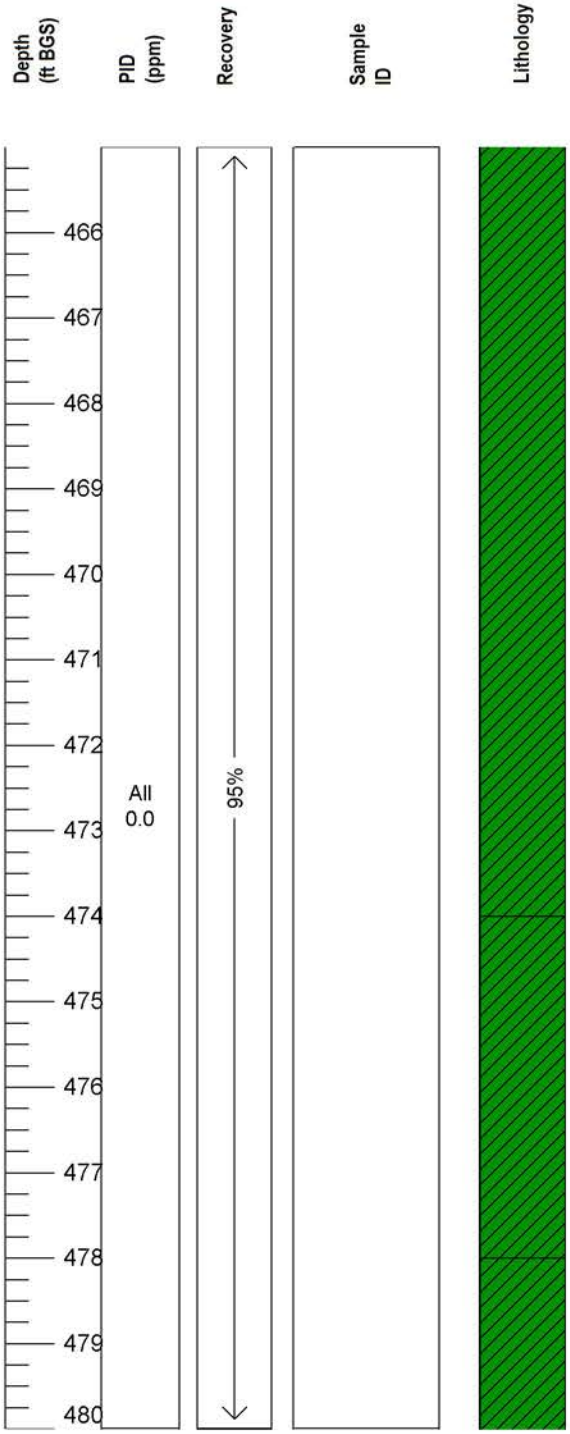
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), greenish gray, GLEY 1 5G/1 5/1, some fine sand, stiff, high plasticity, moist, no odor.

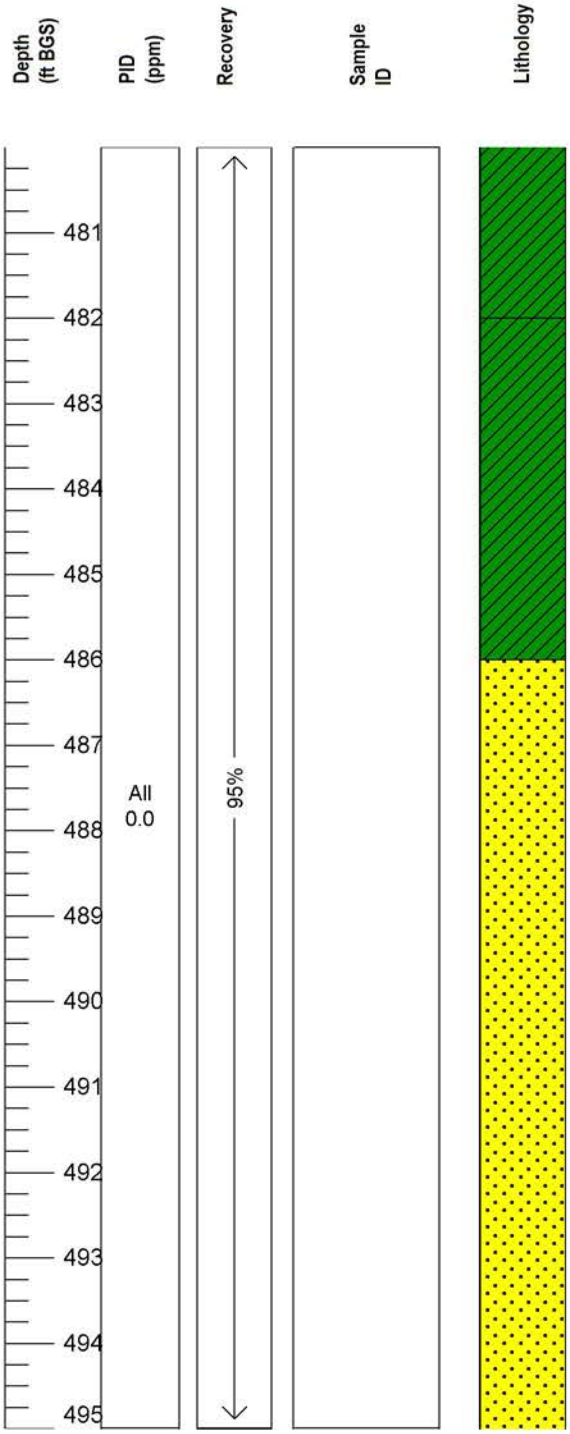
Clay: CLAY (CL), light gray, GLEY 1 N 3/1, some poorly graded fine sand (coarser with depth), stiff, medium plasticity, moist, no odor.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), light gray, GLEY 1 N 3/1, some medium sand, medium stiff, high plasticity, moist, no odor.

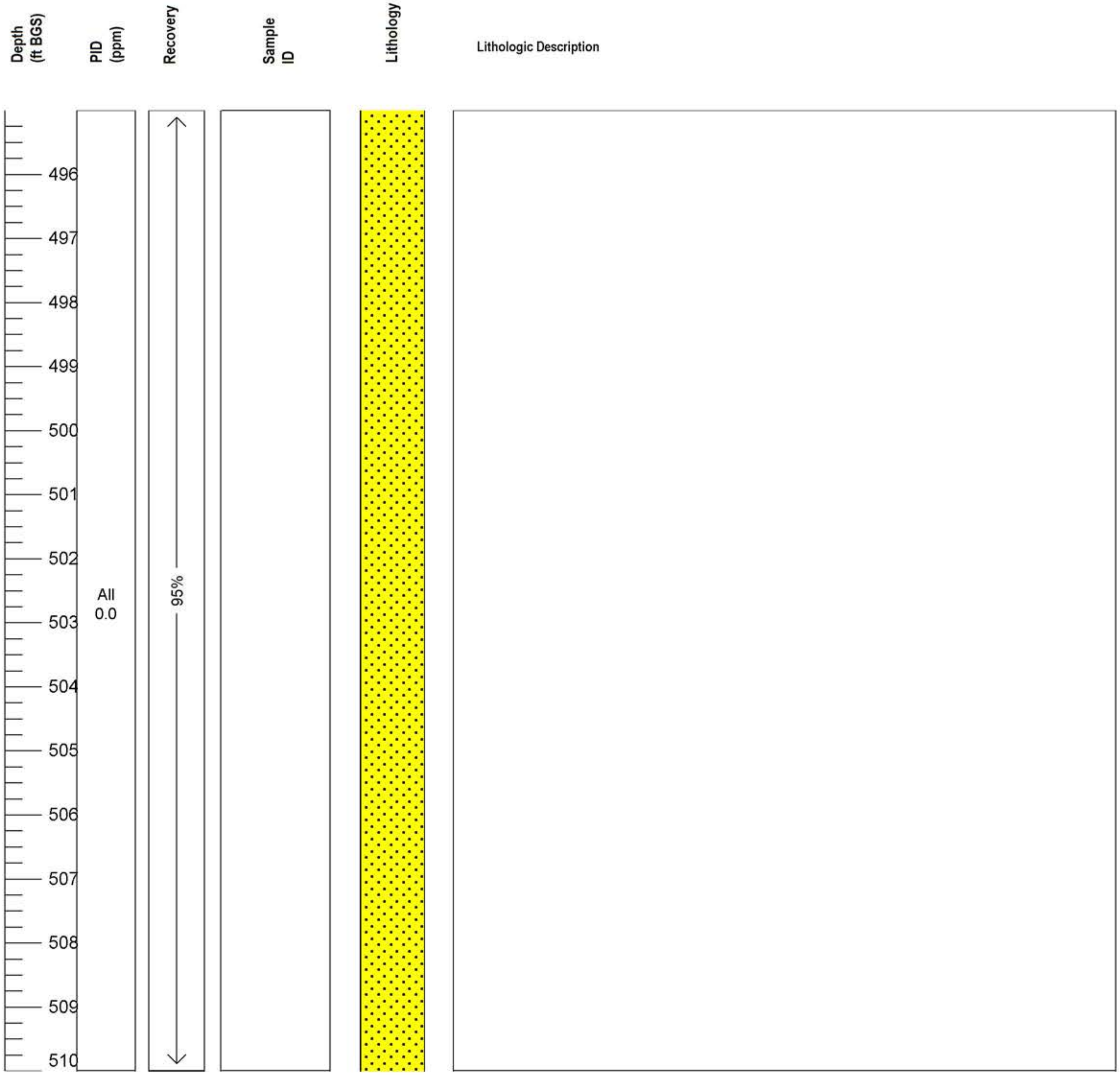
Sand: Poorly graded fine to medium SAND (SP-SC), light gray, GLEY N 3/1, some clay, little subrounded to rounded gravel, lignite from 486.0-488.0 ft bgs, medium dense to dense, damp from 490.0-494.0 ft bgs., moist to verging on damp most of interval.

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

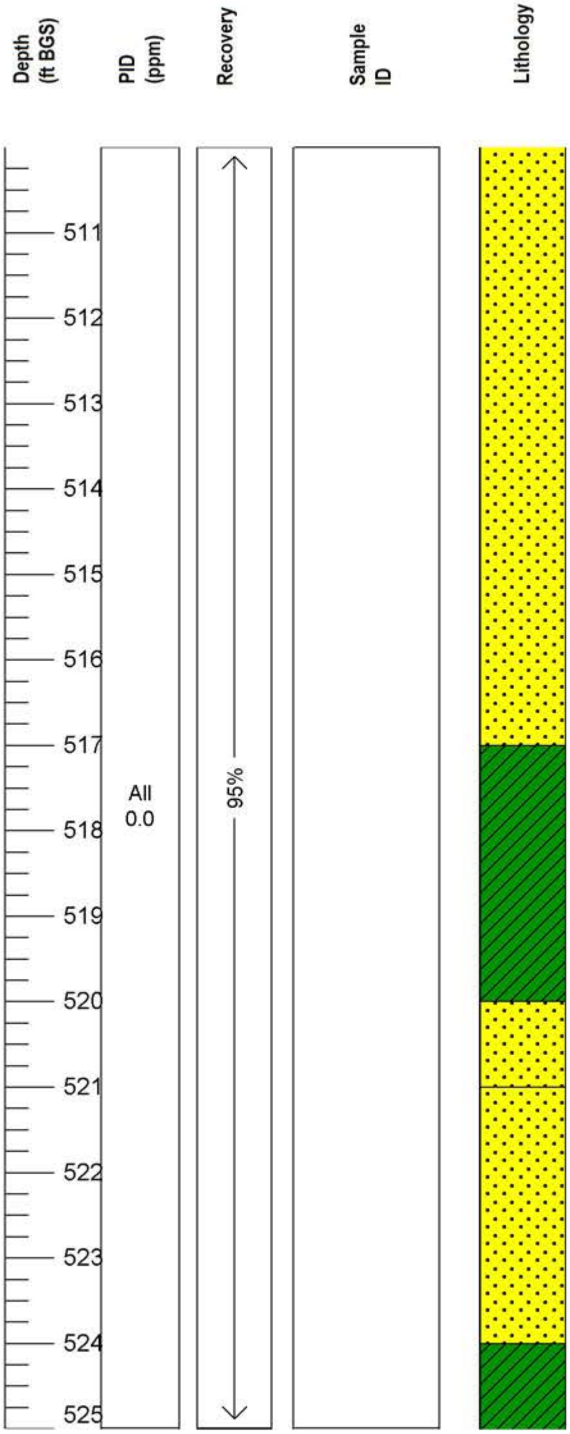


Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), dark gray, 10YR 3/1, little sand, very stiff, high plasticity, moist, no odor.

Sand: Poorly graded fine SAND (SP), light gray, GLEY 1 N 3/1, dense, moist to wet, no odor.

Sand: Poorly graded fine SAND (SP), GLEY 1 N 3/1, dense, very wet, no odor. (Wettest soil encountered since top of aquifier)

Clay: CLAY (CH), light gray, GLEY 1 N 3/1, some fine sand, soft to medium stiff, high plasticity, moist, no odor. (Become drier at this depth, sandy clay)

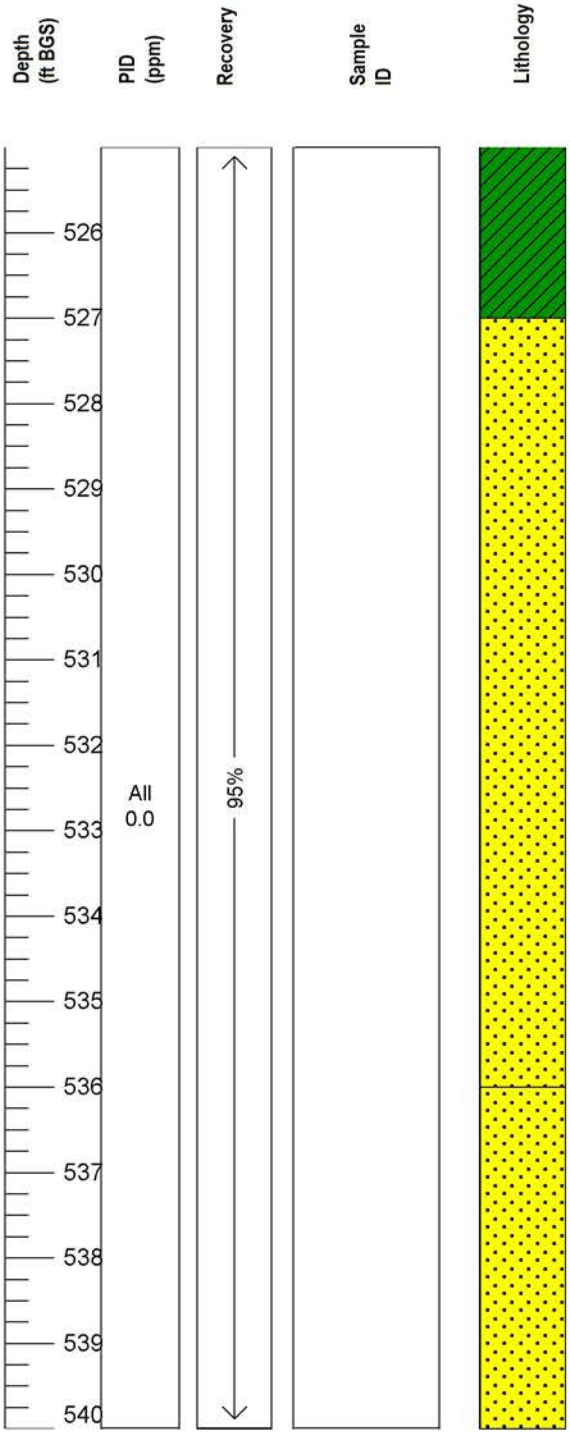
TETRA TECH

Boring ID: GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Sand: Poorly graded medium SAND (SP), light gray, GLEY 1 N 3/1, some subrounded to rounded gravel, dense, moist to wet (damp at 533.0-536.0 ft. bgs.), no odor.

Sand: Poorly graded medium SAND (SP), light gray, GLEY 1 N 3/1, some subrounded gravel, dense, wet, no odor.

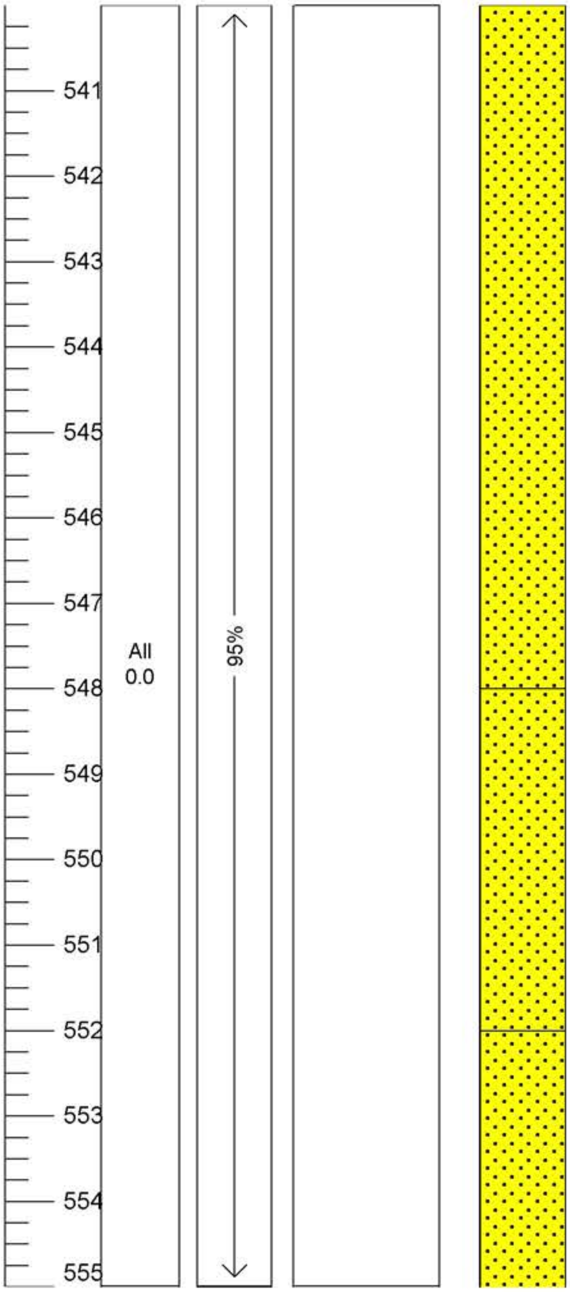
Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description



Sand: Poorly graded SAND (SP), light gray, some subrounded gravel to cobble size pieces, some white sand, moist but drier than above interval, dense, no odor.

Sand: Poorly graded fine to medium SAND (SP), some rounded gravel and clay, dense, moist, no odor. (Clayey sand)

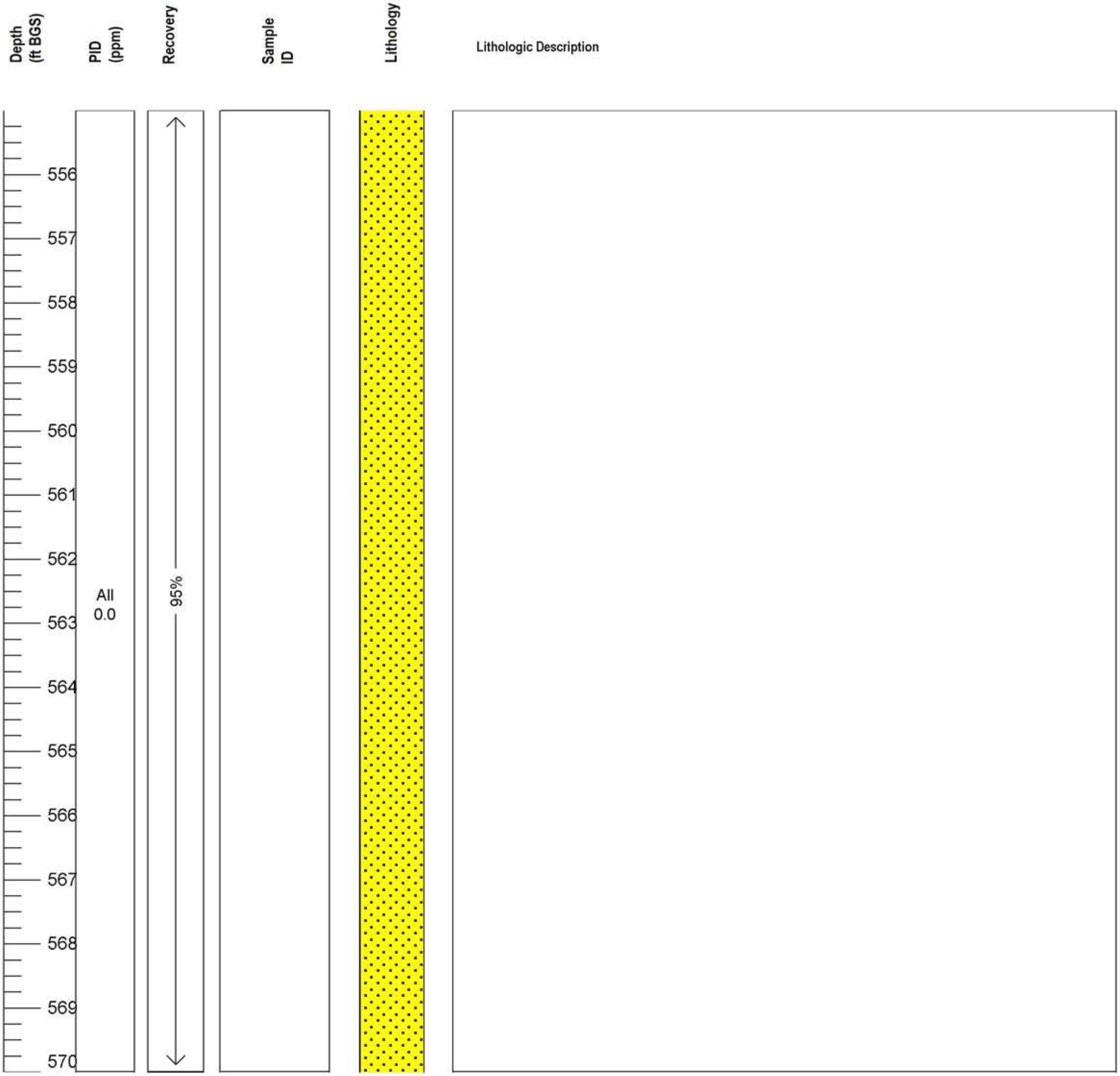
Sand: Poorly graded fine to medium SAND (SP), contains pockets of gravelly material up to cobble size, dense, moist, no odor. (Clayey sand)

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

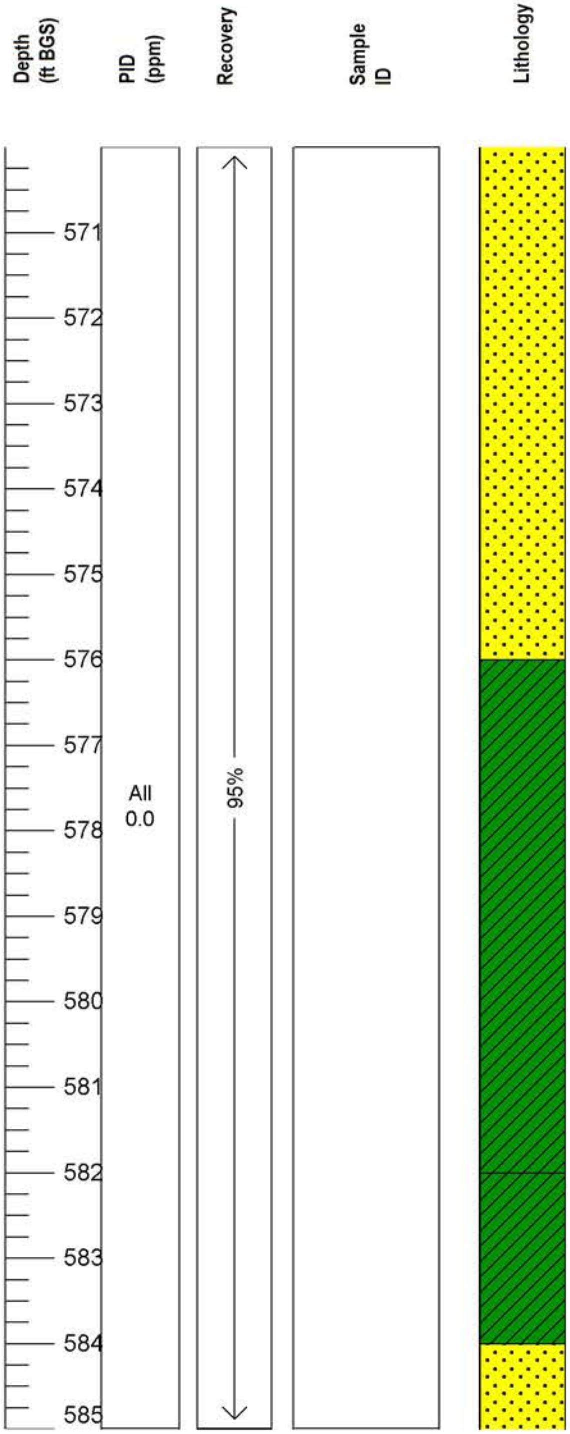


Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8



Lithologic Description

Clay: CLAY (CH), greenish gray, GLEY 1 5G/1 6/1, some sand and rounded gravel, medium stiff, high plasticity, moist to wet, no odor. (Sandy clay lense)

Clay: CLAY (CL), greenish gray, GLEY 1 5G/1 6/1, some subrounded to rounded well graded gravel, medium stiff, high plasticity, moist, no odor.

Sand: Mixture of poorly graded SAND and well graded GRAVEL (GW), contains small chunks of rock (regolith) start to appear, some silt, loose, dry (moisture starved), no odor.

TETRA TECH

Boring ID:
GW-3-MW-10B

Site: DOEE Inorganics Groundwater Deep Wells
Address: 501 Mississippi Avenue SE, Wasington DC
Project Number: 103S6394.015.07
Logged By: Ali Fahim

Drilling Company: Cascade
Driller: Joseph Lary
Drilling Method: Sonic
Sample Hammer: Auto
Bit Size: 7 inch
Core Barrel Size: 4 inch

Sampling Method: Continuous
Drilling Equipment: Boart Longyear LS609
Start Date & Time: 2/14/2023 0700
Completion Date & Time: 03/02/2023 1600
Completion Depth (ft BGS): 598
Depth to Groundwater (with isolation casing installed) (ft BGS): 69.8

Depth (ft BGS)	PID (ppm)	Recovery	Sample ID	Lithology	Lithologic Description
586	All 0.0	95%			***Gravel:*** Mixture of poorly graded SAND and well graded GRAVEL (GW), regolith becomes more common, slightly clayey at bottom, some silt, loose, dry (moisture starved), no odor. Rock chunks at 598.0 ft. bgs. are greenish gray color, dense, and surface can be scratched with penny and knife.
587					
588					
589					
590					
591					
592					
593					
594					
595					
596					
597					
598					

Bibliography

Batiuk, R.A., Bergstrom, P., Kemp, M., Carter, V., Gallegos, C., Karrh, L., Wilcox, D., Teichberg, M. 2000. Chesapeake Bay Submerged Aquatic Vegetation Water Quality and Habitat-Based Requirements and Restoration Targets: A Second Technical Synthesis. Chesapeake Bay Program, Annapolis, MD. 217pp.

Chadwick, D. Bart, et al, 2001. Anacostia River Seepage & Porewater Survey Report - Draft. February 27, 2001.

CH2MHILL, 2002. FFA Draft, Interim Groundwater Summary, Washington Navy Yard, Washington, D.C. Prepared for the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command, Norfolk, VA. July 2002.

Cooke, C.W., 1952. Sedimentary Deposits of Prince Georges County and the District of Columbia, in Cooke, C.W., Martin, R.O.R., and Meyer, Gerald, Geology and Water Resources of Prince Georges County: Baltimore, Maryland, Maryland Department of Geology, Mines, and Water Resources Bulletin 10.

Davis, A.M., Southworth, C.S., Schindler, J.S., and Reddy, J.E., 2001. Geologic Map database of Washington, D.C. area featuring Data from Three 30 X 60 Minute Quadrangles - Fredrick, Washington West, and Fredericksburg: US Geological Survey Open - File Report 01-277.

Davis, F.W., 1985. Historical Changes in Submerged Macrophyte Communities of Upper Chesapeake Bay. Ecology 66:981–993.

Darton, N.H., 1950. Configuration of the Bedrock Surface of the District of Columbia and Vicinity: US Geological Survey Professional Paper 217.

DC Department of Sanitary Engineering, 1955, Summary of the Sewerage System of the District of Columbia, March 1955.

DC Municipal Separate Storm Sewer System, NPDES Permit DC 0000221 Annual Report, August 19, 2011.

DC Municipal Separate Storm Sewer System, NPDES Permit DC 0000221 Fiscal Year 2010 Implementation Plan, August 19, 2009.

DC Municipal Separate Storm Sewer System, NPDES Permit DC 0000221 Fiscal Year 2011 Implementation Plan, August 19, 2010.

DC Water and Sewer Authority (DC Water), 2011, Volume 4: Geotechnical Data Report; Conformed Documents; Project: CSO Long Term Control Plan; Division A - Blue Plains Tunnel; Location: Blue Plains Advanced Wastewater Treatment. January 10, 2011

DiTomaso, J. M., & Healy, E. A., Aquatic and Riparian Weeds of the West, vol 3421, 2003.

District of Columbia Government, Department of Consumer and Regulatory Affairs, Housing and Environmental Regulation Administration, Water Hygiene Branch. The District of Columbia Nonpoint Source Management Plan. December 1989.

DC Water and Sewer Authority, 2009, Sewer System Facilities Plan. Prepared by Engineering Program Management Consultant -3A Greeley and Hansen, June 2009.

DC Water Resources Research Center (WRRC), 1992. Urban Land Use Activities and the Ground Water: A Background Survey of the District of Columbia. Prepared for United States Geological Survey, Water Resources Division, National Center, Reston, VA., August 1992.

D.C. Water and Sewer Authority (WASA). 2003. Revised FY 2004 and Proposed FY 2005 Operating Budgets Report. www.dcwasa.com PDF file, Washington, D.C.

D.C. Water and Sewer Authority (WASA) and the D.C. Department of Health (DOH). 2001. The 2000 District of Columbia Clean Water Needs Survey, Washington, D.C.

District of Columbia, Department of Consumer and Regulatory Affairs, Tributary Nutrient Reduction Strategy for the Restoration of the Chesapeake Bay, November 1995.

Environmental Health Administration - Fisheries and Wildlife Division, 1998 Submerged Aquatic Vegetation Surveys of the Potomac and Anacostia Rivers within the District of Columbia, 1999.

Environmental Health Administration - Fisheries and Wildlife Division, 1999 Submerged Aquatic Vegetation Surveys of the Potomac and Anacostia Rivers within the District of Columbia, March 2000.

Environmental Health Administration, Hickey Run total maximum daily load (TMDL) to Control Oil and Grease. D.C. Department of Health, 1998.

Environmental Health Administration-Water Quality Division, The District of Columbia Unified Watershed Assessment and Watershed Priorities, September 1998.

Fleming, A.H., Drake, A.A., Jr., and McCartan, Lucy, 1994. Geologic Map of the Washington West Quadrangle, District of Columbia, Montgomery and Prince Georges Counties, Maryland, and Arlington and Fairfax Counties, Virginia: US Geological Survey Geologic Quadrangle 1748, 1 Sheet, Scale 1:24,000.

Froelich, A.H., and Hack, J.T., 1976. Physiology, Drainage, and Geology, in Smith Horace, Soil Survey of the District of Columbia: Washington, D.C., US Department of Agriculture, Soil Conservation Service.

Gordon, Martin K., 1984. The Army Corps of Engineers and the Origins of the Anacostia River Improvement Project. Presentation to the 11th Annual Conference on the D.C. Historical Studies, February 25, 1984.

Greely and Hansen. 2001. Combined Sewer System Long Term Control Plan, Report prepared for the DC Water and Sewer Authority, Washington, D.C.

Griggs, A. & Cummins, J., Filamentous Algae Monitoring Program: Potomac River Basin, 2014.

HIS GeoTrans, 1998. Deep Production Well Report, Aquatic Resources Education Center, Anacostia Park, Washington, D.C. Prepared for US National Park Service, North Capital Street, Washington, D.C. August 5, 1998.

Johnston, P.M., 1964. Geology and Ground-Water Resources of Washington, D.C., and Vicinity. USGS Water Supply Paper 1776. Reston, Virginia.

Johnston, P.M., 1961. Geology and Ground-Water Resources of Washington, D.C., and Vicinity [incl. well and foundation borings, tables, and logs]: US Geol. Survey open file report. Reston, Virginia.

Killgore, K.J, Morgan II, R.P., Rybicki, N.B. 1989. Abundance of Fishes Associated with Submersed Aquatic Plants in the Potomac River. North American Journal of Fisheries Management 9:101–111.

Klohe, C.A, and Debrewer, L.M., 2007, Summary of Ground-Water-Quality Data in the Anacostia River Watershed, Washington, D.C., September–December 2005: US Geological Survey Open-File Report 2006-1392, 64 p.

Koterba, M.T., Dieter, C.A., and Miller, C.V., 2010, Pesticides in groundwater in the Anacostia River and Rock Creek watersheds in Washington, D.C., 2005 and 2008: US Geological Survey Scientific Investigations Report 2010-5130, 90p.

Kraus, R.T., Jones, R.C. 2012. Fish Abundances in Shoreline Habitats and Submerged Aquatic Vegetation in Tidal Freshwater Embayment of the Potomac River. Environ Monit Assess 184:3341–3357.

Layne Geoscience, Inc., 1998. Ground Water Development Report, DC Aquatic Resource Education Center, Well PW-1, Anacostia Park, Washington DC. Prepared for National Parks Service. May 4, 1998.

Logan, W.S., 1999a, Role of Ground Water in the Hydrology of the Fort Lincoln Wetland Complex, Anacostia River, Washington, D.C. (Phase II). Report for D.C. Department of Health, 1999a.

Logan, W.S., Estimation of Shallow Groundwater Flux to the Anacostia River. Draft Report for D.C. Department of Health, 1999b.

Macalaster, E. G., Barker, D. A., & Kasper, M., Chesapeake Bay Program Technical Studies: A Synthesis, 1982.

MACTEC, 2005, Preliminary Geotechnical Services South Capitol Street Bridge Washington, D.C. Prepared for HNTB, Inc. Arlington, Virginia MACTEC Project Number 3551-05-0587, May 25, 2005.

Matrix Environmental and Geotechnical Services (Matrix), 2003. Quantifying Specific Discharge Across the Sediment – Water Interface Within A Test Area of the Anacostia River, Washington, D.C., A Pre-Capping Evaluation. Data Report. Prepared for Yuewei Zhu, PhD., PE, Senior Environmental Engineer, Horne Engineering Services, Inc., 2750 Prosperity Ave, Suite 450 Fairfax, VA and Danny D. Reible, PhD, PE, Chevron Professor of Chemical Engineering, Director, Hazardous Substance Research Center/South & Southwest, 3221 CEBA, Louisiana State University, Baton Rouge, LA. October 6, 2003.

Metropolitan Washington Council of Governments, An Existing Source Assessment of Pollutants to the Anacostia Watershed. Final Draft. Prepared for the Environmental Regulation Administration, Department of Consumer and Regulatory Affairs, District of Columbia, 1996.

Metropolitan Washington Council of Governments, Estimation of Nonpoint Source Loads to the Anacostia River in the District of Columbia for the Total Maximum Daily Load Process, prepared for the Department of Health, March 2000.

Miller, C.V., and Klohe, C. A., 2003. Summary of Water- and Sediment-Quality Data for Anacostia River Well Sites Sampled in July–August 2002: US Geological Survey Open-File Report 03-73.

Moore, K. A., Submerged Aquatic Vegetation of the York River, 2009.

Morris, V., et. al., September 2007, Evaluation of Seasonal Wet and Dry Deposition of Heavy Metals and Organics in Washington, DC, Howard University, Washington, D.C. 20059.

Powars, D.S., Edwards, L.E., Johnson, G.H., and Berquist, C.R., 2016, Geology of the Virginia Coastal Plain: New insights from continuous cores and geophysical surveys, in Bailey, C.M., Sherwood, W.C., Eaton, L.S., and Powars, D.S., eds., The Geology of Virginia: Virginia Museum of Natural History Special Publication 18, p. 193–240.

Quality Environmental Solutions, Inc. (QES), 2003. Deep Aquifer Exploration and Testing Report, Arena Stage, Washington D.C. Prepared for Mr. Doug Pegg, Earth Energy Utility Co. June 20, 2003.

Rhithron Associates, Inc., 2010. Analysis of Biological Samples: District of Columbia Phytoplankton, Zooplankton and Benthic Macroinvertebrate Samples: 2005–2009. Prepared for the DOEE Water Quality Division, October 2010.

Stribling, J. B., C.G. Gerardi, and B.D. Snyder. Biological Assessment of the Mattaponi Creek and Brier Ditch Watersheds. Winter 1996 Index Period. Prepared by Tetra Tech, Inc., Owings Mills, MD for Prince George's County, Department of Environmental Resources, Largo, MD. PGDER 96-4, 1996.

Summers, J., Assessment of Filamentous Algae in the Greenbrier River, and the Other West Virginia Streams, 2008.

Tenbus, Frederick J., 2003. Lithologic Coring in the Lower Anacostia Tidal Watershed, Washington, D.C., July 2002. US Geological Survey Open-File Report 03-318.

The DC Water Resources Research Center (WRRC), 1992. Urban Land Use Activities and the Ground Water: A Background Survey of the District of Columbia. Prepared for United States Geological Survey, Water Resources Division, National Center, Reston, VA. August 1992.

EPA, Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity, and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries, 2003.

EPA, Clean Water Action Plan: Restoring and Protecting America’s Waters, EPA-840-R-98-001, February 1998.

EPA, Consolidated Assessment and Listing Methodology, July 2002.

EPA, Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, 2005.

EPA, Information Concerning 2010 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, 2009.

EPA, "Rapid Bioassessment Protocols for Use in Streams and Rivers - Benthic Macroinvertebrates and Fish." May 1989.

US FWS, Analysis of Contaminant Concentrations in Fish Tissue Collected from the Waters of the District of Columbia, 2014.

Van Ness, K., K. Brown, M.S. Haddaway, D. Marshall, D. Jordahl. Montgomery County Water Quality Monitoring Program Stream Monitoring Protocols. Montgomery County Department of Environmental Protection, Watershed Management Division. Rockville, MD, 1997.

Williams, Garnett P., 1977. Washington D.C.’s Vanishing Springs and Waterways, Geological Survey Circular 752.