District of Columbia Surface Water Assessment and Listing Methodology

Prepared for District Department of Energy and the Environment

DRAFT

November 4, 2021

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DISTRICT OF COLUMBIA SURFACE WATER ASSESSMENT AND LISTING METHODOLOGY

BACKGROUND AND PURPOSE

The Clean Water Act (CWA) requires states including the District of Columbia (the District) to report on the quality of the Nation's waters. Section 305(b) requires a comprehensive biennial water quality assessment report and Section 303(d) requires a list of waters for which effluent limitations are not sufficient to meet water quality standards (WQS). As part of WQS, waters are assigned designated uses, which define the types of uses that the waters are expected to support (i.e., primary contact recreation, secondary contact recreation etc.). Criteria and indicators for determining if these uses are attained are established for each designated use by waterbody or waterbody segment (e.g., bacteria concentrations to determine if a water is safe for swimming; chemical pollutant concentrations to determine if water can support aquatic life, etc.). Waters undergo a regular assessment process every other year to determine if criteria are met and individual designated uses are attained. Waters that meet the criteria for a given use "support" that designated use. Waters that do not meet the criteria for a given use do not support that designated use, and they placed on the 303(d) list of impaired waters. Results are then reported through the Integrated Report (IR).

This document summarizes the District's methods for assessing attainment of designated uses, listing and delisting waterbodies from the 303(d) list, and reporting results through the IR. The District implements these methods to make impairment determinations and listing/delisting decisions, and to prepare the IR.

INTRODUCTION

Beginning in 2004, EPA recommended a single water quality monitoring and assessment report (the IR) every even-numbered year that combines the Section 305(b) report and the Section 303(d) list of impaired waters (U.S. EPA, 2002). The District began to produce Section 305(b) reports in 1992 and Integrated Reports in 2004. The assessment of waterbody segments in the District is undertaken with a combination of physical/chemical water quality data, physical habitat data, bioassessment data, and observations related to narrative criteria[1].

EPA provides comprehensive information and guidance on WQS, water quality compliance, and water quality assessment and reporting. According to EPA,

> ***Water quality assessment*** *begins with water quality standards. After setting standards, states assess their waters to determine the degree to which these standards are being met. To do so, states may take biological, chemical, and physical measures of their waters; sample fish tissue and sediments; and evaluate land use data, predictive models, and surveys (U.S. EPA, 2021a).*

In general terms,

[1] Note that this assessment methodology establishes an approach for assessment that includes narrative criteria. Prior to the implementation of this assessment methodology, the District did not explicitly integrate narrative criteria into assessment.

Assessment of an individual waterbody (e.g., a stream segment) means analyzing biological, habitat, physical/chemical, and/or toxicity data and other information to determine designated use support.

Designated use is the use (or uses) specified for a waterbody whether it is attained or not

Impaired waters are those waterbodies that do not meet WQS.

A **303(d) list** is a compilation and categorization of impaired waterbodies.

Listing is the process of placing an impaired waterbody on the 303(d) list.

Delisting is the process of removing an impaired waterbody from the 303(d) list where the assessment methods and decision rules indicate that the condition causing the impairment is no longer present or not present.

EPA recognizes that states may use different methods to determine whether a waterbody meets WQS as long as they use "all existing and readily available information" in developing their 303(d) lists (40 C.F.R. §130.7(b) (5)). Accordingly, EPA's regulations require states to submit a summary description of the methodology used to develop the list and to make a copy of the entire methodology available for review. These methodologies are essential for EPA's review of state 303(d) lists. In general, an assessment methodology constitutes the "decision rules" that will be used when assessing water quality to determine the impairment status and categorization for a particular waterbody (U.S. EPA, 2003).

Regarding content (U.S. EPA, 2005), EPA suggests that:

> *The assessment methodology should be consistent with the state's WQSs and include a description of the following as part of their section 303(d) list submissions:*
>
> - *What data and information were used to make attainment determinations (e.g., results from site-specific and probabilistic monitoring and other predictive tools).*
> - *How the data and information were used to make attainment determinations and place surface water segments in the five reporting categories.*
> - *Rationales for any decision to not use any existing and readily available data and information.*
> - *Changes in the assessment methodology since the last reporting cycle.*

On balance, EPA guidance provides the District and other states with considerable latitude in designing and implementing methods to assess, list, and delist waterbodies.

DATA

The District considers all existing and readily available data to assess attainment of designated uses.

In general, the main sources of data used for assessment purposes are:

- District ambient water quality monitoring data
- Ambient monitoring data from other agencies (EPA, USGS, Corps of Engineers, DC Water, etc.)
- Monitoring data from other sources (universities, non-governmental organizations, citizen scientists, etc.)

- District phytoplankton, zooplankton, and benthic macroinvertebrate data
- District fish tissue data
- District physical habitat data
- District special monitoring studies
- Compliance monitoring
- Observations from District staff related to narrative criteria (see footnote #1 regarding the use of narrative criteria)

To maintain data quality, the District ensures that the data utilized for assessment is unbiased and based on scientifically sound data collection and analytical methods. The District's Water Quality Monitoring Regulations (District of Columbia Municipal Regulations [DCMR] Title 21, Chapter 19) were developed to ensure accurate, consistent, and reproducible water quality monitoring data for decision making purposes. These regulations include Quality Assurance Project Plan (QAPP) requirements and specific quality assurance procedures. Any data – including data collected by the District or data collected by others – that do not satisfy quality requirements are not utilized for assessment purposes.

The specific data utilized for assessment might vary from one reporting cycle to the next because of the implementation of special studies, the implementation of projects that include relevant data collection, or other reasons. The data used for assessment is documented in the individual IRs.

ASSESSMENT METHODOLOGY

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 biological and physical habitat indicators to determine if a given use is supported. If a waterbody meets criteria for a given use, that use is supported in that waterbody. 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.

Water Quality Standards

As described in the District's WQS (DCMR Title 21, Chapter 11), the categories of designated uses for the surface waters of the District of Columbia are:

- 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 absent of man-made objects that impede free movement)

Assessment Criteria

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 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, bioassessment, physical habitat assessment, and numeric criteria for dissolved oxygen, temperature, pH, turbidity, secchi depth, total dissolved gases, hydrogen sulfide, oil & grease, Chlorophyll-*a*, inorganic compounds (mostly metals but including ammonia), and organic chemicals that apply to Class C waters for the protection of aquatic life. Operationally, attainment of the Class C use is evaluated using bioassessment, physical habitat assessment, and numeric criteria for dissolved oxygen, temperature, pH, turbidity, secchi depth, and inorganic compounds.
- 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. Operationally, the presence or absence of a fish consumption advisory is used to evaluate attainment of the Class D use.
- Class E: District WQS include narrative criteria that apply to Class E waters for the protection of navigation.

Assessment and Reporting Period

The District uses data from the most recent five-year period for assessment (the assessment period). Reporting (and 303(d) listing and delisting) is completed every other year in a biennial IR.

Assessment Units

Surface waters in the District are divided into waterbody segments (sometimes referred to as waterbodies or segments) that are used as assessment units (Table 1). Each waterbody segment is assessed independently. A waterbody segment that does not support a designated use is considered impaired for that use.

Table 1. Waterbody Segments Used as Assessment Units

Waterbody Name	Waterbody ID	Watershed
Anacostia DC Seg 01 (Lower Anacostia)	DCANA00E SEG1	Anacostia
Anacostia DC Seg 02 (Upper Anacostia)	DCANA00E SEG2	Anacostia
Fort Chaplin Run	DCTFC01R	Anacostia
Fort Davis Tributary	DCTFD01R	Anacostia
Fort Dupont	DCTDU01R	Anacostia
Fort Stanton Tributary	DCTFS01R	Anacostia
Hickey Run	DCTHR01R	Anacostia
Nash Run	DCTNA01R	Anacostia
Pope Branch (Hawes Run)	DCTPB01R	Anacostia
Texas Avenue Tributary	DCTTX27R	Anacostia

Table 1. Waterbody Segments Used as Assessment Units		
Waterbody Name	Waterbody ID	Watershed
Watts Branch DC Seg 01 (Lower Watts Branch)	DCTWB00R SEG1	Anacostia
Watts Branch DC Seg 02 (Upper Watts Branch)	DCTWB00R SEG2	Anacostia
Kingman Lake	DCAKL00L	Anacostia
Washington Ship Channel	DCPWC04E	Anacostia
Potomac DC Seg 01 (Lower Potomac)	DCPMS00E SEG1	Potomac
Potomac DC Seg 02 (Middle Potomac)	DCPMS00E SEG2	Potomac
Potomac DC Seg 03 (Upper Potomac)	DCPMS00E SEG3	Potomac
Battery Kemble Creek	DCTBK01R	Potomac
Dalecarlia Tributary	DCTDA01R	Potomac
Foundry Branch	DCTFB02R	Potomac
Oxon Run	DCTOR01R	Potomac
Chesapeake & Ohio Canal	DCTCO01L	Potomac
Tidal Basin	DCPTB01L	Potomac
Rock Creek DC Seg 01 (Lower Rock Creek)	DCRCR00R SEG1	Rock Creek
Rock Creek DC Seg 02 (Upper Rock Creek)	DCRCR00R SEG2	Rock Creek
Broad Branch	DCTBR01R	Rock Creek
Dumbarton Oaks	DCTDO01R	Rock Creek
Fenwick Branch	DCTFE01R	Rock Creek
Klingle Valley	DCTKV01R	Rock Creek
Luzon Branch	DCTLU01R	Rock Creek
Melvin Hazen Valley Branch	DCTMH01R	Rock Creek
Normanstone Creek	DCTNS01R	Rock Creek
Pinehurst Branch	DCTPI01R	Rock Creek
Piney Branch	DCTPY01R	Rock Creek
Portal Branch	DCTPO01R	Rock Creek
Soapstone Creek	DCTSO01R	Rock Creek

Water Quality Assessment

Water Quality Data

The District models its assessment methods for water quality data and its decision rules for designated use attainment on recommendations made by EPA in its Consolidated Assessment and Listing Methodology (CALM) guidance (U.S. EPA, 2002). Specific assessment methods for individual constituents and the associated numeric criteria for constituents as found in the District's WQS (Title 21, Chapter 11 - District of Columbia Municipal Regulations) are described in Table 2 for constituents that are routinely monitored. Waters that do not attain WQS and meet water quality criteria over the assessment period are considered to be impaired.

The assessment of conventional constituents generally follows the "ten percent" rule. That is, waters are impaired for 303(d) when:

More than 10% of the samples exceed the criterion (U.S.EPA 2002)

Exceptions are the assessment of secchi depth and chlorophyll-*a* where seasonal segment averages instead of the ten percent rule are used for assessment. Consideration is given to criteria that are expressed to describe weekly, monthly, and seasonal averaging periods (e.g., weekly dissolved oxygen means, monthly *E. coli* geomeans seasonal segment average chlorophyll a measurements).

The assessment of toxic constituents (ammonia, metals, and organic chemicals) is based on the "no more than once every three years" rule (U.S.EPA, 1997). This rule is used for the assessment of Class C aquatic life and Class D human health/fish consumption uses. Under this rule, non-attainment occurs where there is more than one exceedance of the water quality criteria within a three-year period based on grab or composite samples. Operationally, a single sample exceedance of Class C aquatic life or Class D human health/fish consumption criteria within a three-year period is assessed as insufficient information to make a use support decision. Two or more exceedances of the same criteria within a three-year period using grab or composite samples indicates an impaired condition where the use is not supported.

Given that the District uses data from the most recent five-year period for biennial assessment and reporting, the three-year requirement of the no more than once every three years rule requires special treatment. This is accomplished by applying the one-in-three rule separately to data from years one through three, years two through four, and years three through five. Two or more exceedances within any of the three-year periods indicates an impaired condition where the use is not supported.

Table 2. Assessment Methods for Numeric Water Quality Criteria[1]

Constituent	DU Class	Water Quality Criterion (WQC)	Assessment Metric	Non-Attainment of Water Quality Criteria
E. coli 30-day Geomean[2] (126)	A	126 MPN/100 mL	Calendar month geomeans	Any monthly geomean exceedance of the WQC.
E. coli SSV (410)	A	410 MPN/100mL	All individual samples	>10% of the individual samples exceed the WQC.
Dissolved oxygen in non-tidal waters: Instantaneous Minimum year-round in non-tidal waters.	C	5 mg/L	All individual samples	>10% of the individual samples exceed the WQC.
Dissolved oxygen in tidal waters Feb 1 through May 31:	C	6 mg/L	7-day means. Use successive weeks beginning Feb 1, Feb 8, etc.	>10% of assessment metric (7-day means) exceed the WQC.

Table 2. Assessment Methods for Numeric Water Quality Criteria[1]				
Constituent	**DU Class**	**Water Quality Criterion (WQC)**	**Assessment Metric**	**Non-Attainment of Water Quality Criteria**
7-day mean[3].				
Dissolved oxygen in tidal waters Feb 1 through May 31: Instantaneous minimum.	C	5 mg/L	All individual samples	>10% of the individual samples (instantaneous minimums) exceed the WQC.
Dissolved oxygen in tidal waters June 1 through Jan 31: 30-day mean[4].	C	5.5 mg/L	Calendar month means	>10% of assessment metric (calendar month means) exceed the WQC.
Dissolved oxygen in tidal waters June 1 through Jan 31: 7-day mean.	C	4 mg/L	7-day means. Use successive weeks beginning June 1, June 8, etc.	>10% of assessment metric (7-day means) exceed the WQC.
Dissolved oxygen in tidal waters June 1 through Jan 31: Instantaneous minimum.	C	3.2 mg/L Use 4.3 mg/l if water temperature is ≥ 29 degrees C	All individual samples. Adjust criteria where temperature is ≥ 29 degrees C	>10% of the individual samples exceed the WQC.
Temperature: maximum	C	32.2 degrees C	All individual samples	>10% of the individual samples exceed the WQC.
Temperature: Maximum change above ambient.	C	2.8 degrees C	All individual samples	>10% of the individual samples exceed the WQC.
pH	A, B, C	> 6.0 and < 8.5	Individual samples	>10% of the individual samples exceed the WQC
Turbidity Increase above ambient	A, B, C	20 NTUs	Individual samples	>10% of the individual samples exceed the WQC
Secchi depth: seasonal segment average in tidal waters April 1 through October 31	C	0.8 m	Seasonal segment averages (April 1 through October 31) over the five-year assessment period.	Mean of seasonal segment averages exceeds the WQC

Table 2. Assessment Methods for Numeric Water Quality Criteria[1]				
Constituent	**DU Class**	**Water Quality Criterion (WQC)**	**Assessment Metric**	**Non-Attainment of Water Quality Criteria**
Chlorophyll-*a:* Seasonal average in tidal waters from July 1 to September 30	C	25 ug/L	Seasonal segment averages (July 1 through Sept 30) over the five-year assessment period.	Mean of seasonal segment averages exceeds the WQC
Ammonia	C	Specific chronic (CCC) 4-day avg concentration depending upon pH, temperature and season	All calculated CCC Values. For CCC, the highest 4-day avg concentration within a calendar month shall not exceed 2.5 time the CCC.	Two or more exceedances of the CCC aquatic life criterion within a three-year period[5]
	C	Specific acute (CMC) 1-hour avg concentration depending upon pH and temperature	All calculated CMC values	Two or more exceedances of the CMC aquatic life criterion within a three-year period[5]
Metals	C	Specific chronic (CCC) 4-day avg concentration for each metal	All calculated CCC concentrations (converted to appropriate dissolved or total fraction as needed for comparison to criteria)	Two or more exceedances of a CCC aquatic life criterion within a three-year period[5]
	C	Specific acute (CMC) 1-hour avg concentration for each metal	All calculated CMC concentrations (converted to appropriate dissolved or total fraction as needed for comparison to criteria)	Two or more exceedances of a CMC aquatic life criterion within a three-year period[5]
	D	Specific 30-day human health concentration for each metal	Calendar month 30-day average concentrations	Two or more exceedances of a human health criterion within a three-year period[5]
Organics	C	Specific chronic (CCC) 4-day avg concentration for each metal	All calculated CCC concentrations (converted to appropriate dissolved or total fraction as needed for comparison to criteria)	Two or more exceedances of a CCC aquatic life criterion within a three-year period[5]
	C	Specific acute (CMC) 1-hour avg concentration for each metal	All calculated CMC concentrations (converted to appropriate dissolved or total fraction as needed for comparison to criteria)	Two or more exceedances of a CMC aquatic life criterion within a three-year period[5]

Table 2. Assessment Methods for Numeric Water Quality Criteria[1]

Constituent	DU Class	Water Quality Criterion (WQC)	Assessment Metric	Non-Attainment of Water Quality Criteria
	D	Specific 30-day human health concentration for each metal	Calendar month 30-day average concentrations	Two or more exceedances of a human health criterion within a three-year period[5].

[1] Use support decisions for most constituents are based on a five-year statistical evaluation of ambient water quality data. Assessment occurs at the segment level. Consideration can be given to the recentness of data, extreme weather conditions, and other factors in assessing non-attainment.

[2] 30-day Geomean: The 30-day geometric mean is a calendar month geomean.

[3] 7-day mean: The 7-day mean refers to a calendar date mean for successive seven-day periods (e.g., February 1-7, February 8-14, etc.).

[4] The 30-day mean is a calendar month mean.

[5]Best professional judgment and potential use of the ten percent rule are considered if ten or more samples are collected in a three-year reporting period.

Treatment of Non-detect (ND) Values

ND values occur when a water quality sample is analyzed but the pollutant of interest is not found (not detected) above the detection limit. Detection limits represent the lowest concentrations of the constituent that can be measured reliably. For the purposes of water quality assessment, ND values are treated as follows:

- In cases where the number of samples is considered in the analysis (e.g., for parameters assessed using the "the ten percent rule"- see Table 2), NDs are used as part of the sample count if the detection limit is below the criterion, but they are not interpreted as exceedances.
- In cases where a calculated value is required for comparison with a criterion that is a measure of central tendency (e.g., a mean, geomean, or average) NDs are not included in the calculation.
- NDs are not replaced or substituted with estimates such as the Method Detection limit [MDL] or one-half the MDL in assessment.

Bioassessment

The District uses guidance provided in EPA's Rapid Bioassessment Protocols (U.S.EPA, 1989) and the Maryland Biological Stream Survey (MD DNR, 2007) to collect and interpret benthic macroinvertebrate data to assess attainment of Class C aquatic life use. Benthic macroinvertebrate samples are collected every other year from assessed waterbodies and are sorted and quantified by a contract laboratory. Because the benthic macroinvertebrate communities differ between the Coastal Plain and the Piedmont physiographic province ecoregions, the waterbodies in each of these physiographic provinces are assessed differently. Table 3 provides a summary of the assessed waterbodies according to watershed and physiographic province.

Table 3. Waterbodies for Benthic Macroinvertebrate Assessment		
Assessed Waterbody Name	Watershed	Physiographic Province
Fort Chaplin Run	Anacostia	Coastal Plain
Fort Davis Tributary	Anacostia	Coastal Plain
Fort Dupont	Anacostia	Coastal Plain
Fort Stanton Tributary	Anacostia	Coastal Plain
Hickey Run	Anacostia	Coastal Plain
Nash Run	Anacostia	Coastal Plain
Pope Branch (Hawes Run)	Anacostia	Coastal Plain
Texas Avenue Tributary	Anacostia	Coastal Plain
Watts Branch DC Seg 01 (Lower Watts Branch)	Anacostia	Coastal Plain
Watts Branch DC Seg 02 (Upper Watts Branch)	Anacostia	Coastal Plain
Battery Kemble Creek	Potomac	Piedmont
Dalecarlia Tributary	Potomac	Piedmont
Foundry Branch	Potomac	Piedmont
Oxon Run	Potomac	Coastal Plain
Rock Creek DC Seg 01 (Lower Rock Creek)	Potomac	Piedmont
Rock Creek DC Seg 02 (Upper Rock Creek)	Rock Creek	Piedmont
Broad Branch	Rock Creek	Piedmont
Dumbarton Oaks	Rock Creek	Piedmont
Fenwick Branch	Rock Creek	Piedmont
Klingle Valley	Rock Creek	Piedmont
Luzon Branch	Rock Creek	Piedmont
Melvin Hazen Valley Branch	Rock Creek	Piedmont
Normanstone Creek	Rock Creek	Piedmont
Pinehurst Branch	Rock Creek	Piedmont
Piney Branch	Rock Creek	Piedmont
Portal Branch	Rock Creek	Piedmont
Soapstone Creek	Rock Creek	Piedmont

Seven benthic macroinvertebrate metrics are calculated for each waterbody. The different metrics for Coastal Plain and Piedmont sites are presented in Table 4.

Table 4. Benthic Macroinvertebrate Assessment Metrics for Coastal Plain and Piedmont Sites	
Coastal Plain Site Macroinvertebrate Metrics	Piedmont Site Macroinvertebrate Metrics
Total Taxa (Families)	Total Taxa (Families)

Table 4. Benthic Macroinvertebrate Assessment Metrics for Coastal Plain and Piedmont Sites	
Coastal Plain Site Macroinvertebrate Metrics	Piedmont Site Macroinvertebrate Metrics
# of Ephemeroptera, Plecoptera, and Trichoptera (EPT) Taxa (Families)	# of EPT Taxa (Families)
% EPT Taxa (Families)	% EPT Taxa (Families)
% Gathers/Collectors (Individuals)	% Dominant (Individuals)
% Chironomidae (Individuals)	% Scrapers (Individuals)
# of Diptera (Families)	# of Trichoptera (Families)
Hilsenhoff Biotic Index (HBI)	Hilsenhoff Biotic Index (HBI)

Each individual assessment metric is scored either as a one (1), a three (3) or a five (5), with a score of one indicative of poor water quality, three indicative of fair water quality, and five indicative of good water quality. The scores for each individual metric are added together to get an overall score for that waterbody. Scoring ranges are the same for Coastal Plain and Piedmont sites. As shown in Table 5, the overall score for a waterbody is assigned a water quality rating of "good," 'fair" or "poor" based on the assessment. Use support determination is associated with the water quality rating, where a rating of good and fair is interpreted to be fully supporting, and poor as not supporting.

Table 5. Overall Water Quality Rating Based on Benthic Macroinvertebrate Assessment Metrics		
Overall Score	Water Quality Rating	Support Determination
>20	Good	Fully supporting
11-20	Fair	Fully supporting[1]
0-10	Poor	Not supporting

[1]The macroinvertebrate assessment metrics are based on the comparison of District data with data from relatively unimpaired regional reference sites in Maryland. Given the urban nature of the District, it was determined that 1) both the Good and Fair water quality ratings reflect fully supporting conditions in the District, and 2) the gradation between Good/Fair and Poor provides ample information to target restoration.

A compendium of the individual benthic macroinvertebrate metrics that the District uses for this assessment is provided in Appendix A.

Physical Habitat Assessment

The District also uses guidance provided in EPA's Rapid Bioassessment Protocols (U.S.EPA, 1989) and the Maryland Biological Stream Survey (MD DNR, 2007) to collect and interpret physical habitat data to assess attainment of Class C aquatic life use. Physical habitat observations are made every other year in assessed waterbodies by District staff, with measurements and scores recorded in the field. Because the habitat conditions differ between the Coastal Plain and the Piedmont physiographic province ecoregions, the waterbodies in each of these physiographic provinces are assessed differently. Table 4 provides a summary of the assessed waterbodies according to watershed and physiographic province. As shown in Table 6, six physical habitat assessment metrics are calculated for Coastal Plain sites, and eight metrics are used for Piedmont sites.

Table 6. Physical Habitat Assessment Metrics for Coastal Plain and Piedmont Sites

Coastal Plain Site Physical Habitat Assessment Metrics	Piedmont Site Physical Habitat Assessment Metrics
Remoteness	Remoteness
Shading	Shading
Epifaunal Substrate (EPI)	EPI
Instream habitat	Instream habitat
Numbers of Woody Debris and Root Wads ("Wood')	Numbers of Woody Debris and Root Wads ("Wood')
Bank Stability	Bank Stability
	Riffle Quality
	Embeddedness

Field observations for each metric are converted to scores from 0-100. The scores for each individual metric are averaged together to calculate an overall physical habitat index (PHI) score. Scoring ranges are the same for Coastal Plain and Piedmont sites. As shown in Table 7, the overall PHI score for a waterbody is assigned a water quality rating of "good," 'fair" or "poor" based on the assessment. In addition, use support determination is associated with the water quality rating, with a ratings of good and fair interpreted to be fully supporting, and poor as not supporting.

Table 7. Overall Water Quality Rating Based on Physical Habitat Assessment Metrics

Overall PHI Score	Water Quality Rating	Support Determination
>72	Good	Fully supporting
>56 - 72	Fair	Fully supporting[1]
0-56	Poor	Not supporting

[1]The physical habitat assessment metrics are based on the comparison of District data with data from relatively unimpaired regional reference sites in Maryland. Given the urban nature of the District, it was determined that 1) both the Good and Fair water quality ratings reflect fully supporting conditions in the District, and 2) the gradation between Good/Fair and Poor provides ample information to target restoration.

A compendium of the individual physical habitat metrics that the District uses for this assessment is provided in Appendix B.

Fish Consumption Assessment

The District assesses the safety of eating the fish caught in District waters and issues fish consumption advisories based on periodic studies of fish tissue. These advisories serve as public health alerts that provide recommendations on safe fish consumption when chemical contaminants are detected in tissue from these fish. Fish consumption advisories are based on a comparison of the concentration of chemical contaminants in fish with U.S. EPA screening levels, which are concentrations above which fish tissue contaminants may pose risks to human consumers, and U.S. FDA levels to protect human health (see USFWS, 2014). The specific chemical contaminants that limit consumption of fish are typically included in fish consumption advisories.

As shown in Table 8, fish consumption advisories are used to assess attainment of Class D human health uses. If a fish consumption advisory is issued and is in effect for a given waterbody, that waterbody is

considered to not support its Class D use and is considered impaired for Class D. If there is no fish consumption advisory in effect for a given waterbody, then that waterbody is considered to support its Class D use and is not considered impaired for Class D.

Table 8. Threshold for Fish Consumption Use Support Classification in a Waterbody	
Support of Designated Use	Threshold
Fully Supporting	No fish consumption advisories are in effect.
Not Supporting	A fish consumption advisory is in effect for the general population or a subpopulation that could be at risk for one or more fish species
Insufficient Information	Data to determine if the designated use is fully supporting or not supporting is unavailable.
Not Assessed	"Not assessed" is used when fish consumption is not a designated use for the waterbody.

Currently, the fish tissue data upon which the fish consumption advisories are based are collected at mainstem stations located on the Anacostia and Potomac rivers. However, because some individual waterbodies are not hydrologically connected to the mainstem Anacostia and/or Potomac rivers, the existing fish consumption advisories that are based on fish tissue data from the mainstems do not apply to these waters. For waters that are not hydrologically connected to the mainstems, only fish consumption advisories based on fish tissue collected in that waterbody would apply.

While fish consumption advisories are used to determine whether or not the Class D fish consumption use is attained, they do not provide any information on the presence or absence of chemical contaminants in the water column in any of the District's waterbodies. Therefore, while the existence of a fish consumption advisory affects use attainment, the specific chemical contaminants associated with a fish consumption advisory are not recorded as a pollutant of concern (Category 3) or a cause of impairment (Categories 4 and 5) in the 303(d) list of impaired waterbodies unless there is waterbody-specific water quality data that indicates the presence of a pollutant of concern or impairment.

Narrative Criteria

In addition to numeric WQS, bioassessment, physical habitat, and fish consumption advisories, the District has narrative criteria that must also be assessed to determine attainment of designated uses. The narrative criteria are statements that describe the desired water quality goal, such as waters being "free from" pollutants like oil and scum, color and odor, and other substances that can harm people and fish. The principal narrative criteria in the District found in the District's WQS Standards (DCMR Title 21, Chapter 11) that inform assessment are summarized in Table 9.

Table 9. Narrative Criteria	
1104.1	The surface waters of the District shall be free from substances in amounts or combinations that do any one of the following: (a) Settle to form objectionable deposits; (b) Float as debris, scum, oil, or other matter to create a nuisance; (c) Produce objectionable odor, color, taste, or turbidity; (d) Cause injury to, are toxic to, or produce adverse physiological or behavioral changes in humans, plants, or animals; (e) Produce undesirable or nuisance aquatic life or result in the dominance of nuisance species; or (f)

Table 9. Narrative Criteria	
	Impair the biological community that naturally occurs in the waters or depends upon the waters for its survival and propagation.
1104.3	Class A waters shall be free of discharges of untreated sewage, litter and unmarked submerged or partially submerged man-made structures that would constitute a hazard to the users of Class A waters.
1104.4	The aesthetic qualities of Class B waters shall be maintained. Construction, placement or mooring of facilities not primarily and directly water oriented is prohibited in, on, or over Class B waters unless: (a) The facility is for the general public benefit and service, and (b) Land based alternatives are not available.
1104.5	Class C streams shall be maintained to support aquatic life and shall not be placed in pipes.
1104.6	Within tidally influenced Class C waters, concentrations of chlorophyll a in free floating microscopic aquatic plants (algae) shall not exceed levels that result in ecologically undesirable consequences such as reduced water clarity, low dissolved oxygen, food supply imbalances, proliferation of species deemed potentially harmful to aquatic life or humans or aesthetically objectionable conditions or otherwise render tidal waters unsuitable for designated uses.
1104.7	Class E waters shall be free of unmarked submerged or partially submerged man-made objects that pose a hazard to users of these waters.

Narrative criteria provide blanket protection for all waters. They can also protect waterbodies from pollutants for which numeric criteria are difficult to specify. The attainment of narrative criteria is typically evaluated through field observation and best professional judgment of monitoring and assessment staff. Field observation performed by the monitoring and assessment staff provide Information on narrative criteria. Reported conditions that might affect support of a designated use related to narrative criteria (the “free from”) are documented over the assessment and reporting period and evaluated as a component of the Assessment Methodology. Use support based on the narrative criteria are assessed with the questions provided in Table 10.

Table 10. Assessment Using Narrative Criteria			
Name of affected waterbody/segment:			
What is the reported condition?			
What uses are potentially impacted by the reported condition?			
	Yes	No	Comment
Is the reported condition substantial? (e.g., Is it significant and sizeable?)			
Is the reported condition widespread? (e.g., Does it widely impact the waterbody/segment?)			
Are any visual impacts seen? (e.g., Nuisance conditions, biological impairment, etc.)			
Is the rereported condition persistent? (e.g., Has it occurred over a long period of time or continuously?)			
Has the reported condition been remediated?			
Does the available water quality data meet the numeric criteria and support the designated use?			
Does the reported condition preclude the waterbody from supporting a designated use?			
Use support Determination: Fully Supporting _____ Not Supporting _____			

Completion of Table 10 with a use support determination based on narrative criteria is conducted by the assessment staff based on experience, knowledge of the local waterbodies, and best professional judgment.

Decision Rules for Attaining Designated Uses

The District's Assessment Methodology is governed by a set of decision rules that are used for use support determination, listing, and delisting. These rules incorporate EPA's Independent Application Policy on the use of multiple types of data to assess attainment (U.S.EPA, 2005).

For Purposes of WQS Attainment/Nonattainment Determinations

Policy of independent applicability says:

- When evaluating multiple types of data (e.g., biological, chemical) and any one type of data indicates an element of a WQS is not attained, the segment should most likely be identified as impaired.

- If there is reason to doubt the nonattainment finding, re-evaluate all of the data sets to resolve discrepancies. In some cases this may lead to modification of applicable WQS to account for site-specific information.

Policy of independent applicability does not say:

- Always assume that a single sample result showing impairment outweighs all other data showing attainment.
- Accept all differences in data finings at face value.

The decision rules for attaining designated uses in a waterbody are presented in Table 11.

Table 11. Decision Rules for Attaining Designated Uses

Use Class	Decision	Criterion	Decision Rule
A	Fully Supporting	E. coli	No exceedance of monthly geomean during assessment period. **AND**
			≤10% of samples exceed SSV **AND**
		Conventional pollutants (pH, turbidity)	≤10% of the individual samples exceed the WQC **AND**
		Narrative criteria	Water meets all relevant narrative criteria, including DC WQS §1104.3
	Not supporting	E. coli	Any exceedances of monthly geomean during assessment period **OR**
			>10% of samples exceed SSV **OR**
		Conventional pollutants (pH, turbidity)	>10% of the individual samples exceed the WQC **OR**
		Narrative criteria	Water does not meet all relevant narrative criteria, including DC WQS §1104.3
B	Fully Supporting	Conventional pollutants (pH, turbidity)	≤10% of the individual samples exceed the WQC **AND**

Table 11. Decision Rules for Attaining Designated Uses			
Use Class	Decision	Criterion	Decision Rule
		Narrative criteria	Water meets all relevant narrative criteria, including DC WQS §1104.4
	Not supporting	Conventional pollutants (pH, turbidity)	>10% of the individual samples exceed the WQC **OR**
		Narrative criteria	Water does not meet all relevant narrative criteria, including DC WQS §1104.3
C	Fully Supporting	Conventional pollutants (other than secchi depth and chlorophyll a)	≤10% of the individual samples exceed the WQC **AND**
		Secchi depth	Mean of seasonal segment averages does not exceed the WQC **AND**
		Chlorophyll a	Mean of seasonal segment averages does not exceed the WQC **AND**
		Ammonia	No more than one exceedance of the CCC WQC every three years. **AND**
			No more than one exceedance of the CMC WQC every three years **AND**
		Toxic pollutants (e.g., metals, organics, pesticides)	No more than one exceedance of the CCC every three years. **AND**
			No more than one exceedance of the CMC every three years. **AND**
		Bioassessment Protocol	Macroinvertebrate results indicate “Fair” to “Good” water quality **AND**
		Physical habitat assessment Protocol	Physical habitat assessment results indicate “Fair” to “Good” water quality

Table 11. Decision Rules for Attaining Designated Uses			
Use Class	Decision	Criterion	Decision Rule
			AND
		Narrative criteria	Water meets all relevant narrative criteria, including DC WQS §1104.6
C	Not Supporting	Conventional pollutants (e.g., pH, turbidity, DO, temperature, etc.)	>10% of the individual samples exceed the WQC **OR**
		Secchi depth	Mean of seasonal segment averages (n≤5) exceeds the WQC **OR**
		Chlorophyll a	Mean of seasonal segment averages (n≤5) exceeds the WQC **OR**
		Ammonia	More than one exceedance of the CCC WQC every three years. **OR**
			More than one exceedance of the CMC WQC every three years. **OR**
		Toxic pollutants (e.g., metals, organics, pesticides)	More than one exceedance of the CCC WQC every three years. **OR**
		Toxic pollutants (e.g., metals, organics, pesticides)	More than one exceedance of the CMC WQC every three years. **OR**
		Bioassessment Protocol	Macroinvertebrate results indicate “Poor” water quality **OR**
		Physical habitat assessment Protocol	Physical habitat assessment results indicate “Poor” water quality **OR**
		Narrative criteria	Water does not meet all relevant narrative criteria, including DC WQS §1104.6

Table 11. Decision Rules for Attaining Designated Uses			
Use Class	Decision	Criterion	Decision Rule
D	Fully Supporting	Fish consumption advisory	No applicable fish consumption advisory[1] is in effect **AND**
		Toxic pollutants (e.g., metals, organics, pesticides)	No more than one exceedance of the human health WQC every three years **AND**
		Narrative	Water meets all relevant narrative criteria
	Not Supporting	Fish consumption advisory	Applicable fish consumption advisory[1] is in effect. **OR**
		Toxic pollutants (e.g., metals, organics, pesticides)	More than one exceedance of the human health WQC every three years **OR**
		Narrative	Water does not meet all relevant narrative criteria
E	Fully Supporting	Narrative	Water meets all relevant narrative criteria, including DC WQS §1104.7
	Not Supporting	Narrative	Water does not meet all relevant narrative criteria, including DC WQS §1104.7

[1]Fish consumption advisories are applicable to certain waters based on where the fish tissue that informs the fish consumption advisory was collected. For waters that are hydrologically connected to mainstems, fish consumption advisories based on fish tissue collected in the mainstems are applicable. For waters that are not hydrologically connected to mainstems, only fish consumption advisories based on fish tissue collected from that waterbody are applicable.

303(d) LISTING AND DELISTING

This section describes the procedures and decision rules used in the District to list and delist waterbodies and pollutants from the 303(d) list.

Categorization

The District follows the five-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 or waterbody/pollutant combination into one or more of the five IR categories based on the attainment of each designated use for that waterbody as shown in Table 12 below:

Table 12. Categorization of Waterbodies	
Category	Definition
1	All designated uses are supported, and no use is threatened.
2	Available data and/or information indicate that some but not all of the designated uses are supported.
3	There is insufficient available data and/or information to make a use support determination.
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 for specified, acceptable reasons. Category 4 and its subcategories may include 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. The subcategories are:
4a	A State developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination.
4b	Other required control measures are expected to result in the attainment of an applicable WQS in a reasonable period of time.
4c	The non-attainment of any applicable WQS for the segment is the result of pollution and is not caused by a pollutant.
5	Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

Categorization allows the District to track progress as waterbodies incrementally or entirely attain WQS; demonstrate advancement in the development and implementation of TMDLs and other required control measures; and target monitoring for those waterbodies where additional data and information is needed to assess WQS attainment. In general,

- Waterbodies are placed in Category 1 when the assessment process indicates that all WQS are attained, and all designated uses are supported.
- Waterbodies are placed in Category 2 when the assessment process indicates that one or more designated use is supported but the data and information available is insufficient to determine that other designated uses are supported.
- Waterbodies are placed in Category 3 where insufficient data and information are available to make a use support determination. This insufficiency can be due to not having enough data or to not having the right quality of data to rigorously evaluate a waterbody's attainment status. Pollutants are not identified for this category because the impairment is uncertain.
- Waterbodies are placed in Category 4 when the impairment is recognized and either a TMDL or another control program aimed at attainment of WQS is in place, or where non-attainment is not causally linked to a pollutant.

- Waterbodies are placed in Category 5 when the impairment is recognized and a TMDL is needed. Category 5 is governed by 40 CFR 130.7(b)(1) where it is stated that:

  > *Segments must be placed in Category 5 when, based on existing and readily available data and/or information, technology-based effluent limitations required by the Act, more stringent effluent limitations, and other pollution control requirements are not sufficient to implement an applicable water quality standard and a TMDL is needed.*

  Category 5 listings contain a priority ranking for TMDLs (low, medium, high) and a targeted date for TMDL development.

303(d) Listing

The 303(d) list is developed following assessment for water quality criteria, macroinvertebrate assemblages, physical habitat, fish consumption advisories, and narrative criteria described above. The term "303(d) list" is short for the list of impaired and threatened waters (e.g., stream/river segments) that have been identified and reported to EPA (EPA, 2021b). “Listing” is the process of placing an impaired waterbody on the 303(d) list. Waters on the 303(d) list require development of a TMDL. This distinguishes them from Category 4a water where TMDLs have already been developed. Listing is undertaken every other year using data from the most recent five-year assessment period so that information on the status of District waterbodies and use support is current.

The listing process addresses key questions on waterbody status, including:

- Are the existing listings from the previous reporting cycle still valid?
- Are there any new impairment listings based on assessment of available data in the current reporting cycle and/or changes in WQS that affect current listings since the last reporting cycle?
- Are the pollutant and non-pollutant causes of impairment known and clearly documented?
- Are the waterbodies categorized correctly?

Causes of Impairment

Using the decision rules for attaining designated uses in Table 12, the District identifies and records the cause for each designated use impairment in Categories 4 and 5 of the IR. The identification of cause is based on the type of data and metrics used to make the assessment. In most cases, the cause is a specific pollutant (e.g., *E. coli,* nutrients). In other cases, a non-pollutant cause is responsible for the impairment. In these circumstances, where impairment is not attributed to a specific pollutant, it is sufficient for the purposes of 305(b) reporting to list the non-pollutant observed deficiency as the cause. For non-pollutant causes, the District identifies causes such as “flow alterations” and “habitat alterations” consistent with guidance provided for EPA’s ATTAINS program (U.S.EPA, 2021c).

As shown in Table 13, the methods for identifying the causes of impairment are specific to the criteria type exceeded or transgressed.

Table 13. Methods for Identifying Cause of Impairment		
Designated use class	Criterion Type	Method for Identifying Cause
Class A Primary contact recreation	Numeric criteria for individual pollutants (e.g., E. coli, pH, turbidity)	Cause is the specific pollutant or pollutants that exceed numeric criteria.
	Narrative criteria	Cause of impairment is identified by best professional judgment of assessment staff.
Class B Secondary contact recreation and aesthetic uses	Numeric criteria for individual pollutants (e.g., pH, turbidity)	Cause is the specific pollutant or pollutants that exceed numeric criteria
	Narrative criteria	Cause of impairment is identified by best professional judgment of assessment staff.
Class C Aquatic Life	Numeric criteria (e.g., pH, turbidity, DO, trace metals, organic compounds, etc.)	Cause is the specific pollutant or pollutants that exceed numeric criteria.
	Benthic macroinvertebrate and physical habitat assessment protocols	Cause is identified through assessment protocols or a stressor analysis. The cause may be a pollutant or a non-pollutant.
	Narrative criteria	Cause of impairment is identified by best professional judgment of assessment staff.
Class D Fish consumption	Numeric criteria for individual pollutants (e.g., trace metals and organic compounds)	Cause is the specific pollutant or pollutants that exceed numeric criteria.
	Existence and applicability of a fish consumption advisory	Cause is identified by best professional judgment of assessment staff.
Class E Navigation	Narrative criteria	Cause of impairment is due to unmarked submerged or partially submerged man-made objects that pose a hazard to users of these waters as determined by best professional judgment of assessment staff

In general, the identification of the pollutant or pollutants causing impairment is straightforward when a specific numeric criterion for a given designated use is exceeded. However, the identification of cause is less straightforward when narrative criteria are not met, or when other indicators of impairment (e.g., biological or habitat assessment protocols) are exceeded. In these cases, further investigation of the specific pollutant causes of impairment with a stressor analysis may be warranted to identify specific pollutants that need to be remediated or reduced to allow the waterbody to attain a designated use or uses. The District is currently developing a full stressor analysis procedure that will be used to identify specific causes of impairment for aquatic life use impairments identified through macroinvertebrate or physical habitat assessment protocols and for other situations where specific causes are not identified through the assessment process.

303(d) Delisting

Delisting is the process of removing a waterbody from the existing 303(d) list. This process is used when evidence, in the form of available data and information, indicates that the waterbody is not impaired or no longer impaired for a given designated use.

Delisting a waterbody has implications for other water quality programs, including the TMDL program. If assessment shows that waterbodies listed in Category 4a and Category 5 are no longer impaired, the TMDLs for specific pollutants may no longer be needed and can be withdrawn where appropriate. Note that withdrawing TMDLs requires EPA approval.

Authority for Delisting

States (including the District) are legally allowed to delist waterbodies or pollutants from their 303(d) list if the original listings are no longer supported. Specifically, 40 CFR §130.7 (b)(6)(iv)) states that

> *Upon request by the Regional Administrator, each State must demonstrate good cause for not including a water or waters on the list. Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed in the categories in § 130.7(b)(5); or changes in conditions, e.g., new control equipment, or elimination of discharges.*

EPA's *Assessment Guidance on the 2002 Integrated Report* (U.S. EPA 2001) further clarifies this and states that:

> *The existing regulation requires states, territories, and authorized tribes, at the request of the Regional Administrator, to demonstrate good cause for not including waterbodies on the 303(d) list that were included on previous 303(d) lists (pursuant to 40 CFR 130.7(b)(6)(iv))…Where a waterbody was previously listed based on certain data or information, and the state removes the waterbody without developing or obtaining any new information, EPA will carefully evaluate the state's or territory's re-evaluation of the available information, and will not approve such approvals unless the state's or territory's submission describes why it is appropriate under the current regulations to remove each affected waterbody.*

This statement emphasizes the fact that waterbodies and specific pollutants can be removed from the 303(d) list through analysis of "more recent and accurate data" or if there are "flaws in the original analysis that led to the waterbody being listed."

The District recognizes that it has authority to delist waterbody/pollutant combinations where justified and documented.

Reasons for Delisting and WQS Attainment

Guidance on the ATTAINS online system (the Assessment, Total Maximum Daily Load Tracking and Implementation System) for accessing information about the conditions in the Nation's surface waters (U.S. EPA, 2013) explains acceptable reasons for delisting in the context of waterbody changes from the prior reporting cycle.

> ***Reasons for delisting*** *waters include: TMDL approved or established by EPA (Category 4a), other pollution control requirements (Category 4b), Not caused by a pollutant (Category 4c), or data and/or information lacking to determine water quality status; original basis for listing was incorrect (Category 3).*

Reasons for WQS attainment *include:*

- *Applicable WQS attained, original basis for listing was incorrect*
- *Applicable WQS attained due to restoration activities*
- *Applicable WQS attained due to change in WQS*
- *Applicable WQS attained according to new assessment method*
- *Applicable WQS attained threatened water no longer threatened*
- *Applicable WQS attained, reason for recovery unspecified*

Removal of Specific Pollutant Causes

The District has a process to remove a pollutant that has been identified as a cause of impairment for a given waterbody when new evidence indicates that the pollutant is not causing impairment for a given designated use in a waterbody. In this case, the process is used to remove an individual pollutant that is reported as a cause of impairment in various tables in the IR (including in the Appendix 3.1 2020 Use Support and Cause by Pollutant table and in the Appendix 3.4 District of Columbia 303(d) List table in the "Pollutant(s) or Pollutant Categories Causing Impairment" column). This is important because it allows the District to better characterize the actual causes of impairment as better information is obtained. It also allows the waterbody to remain on the 303(d) list if other pollutant or non-pollutant causes continue to impair a designated use.

Weight of Evidence Approach

The District uses a "weight of evidence" approach to identify waterbodies for delisting or pollutants for removal as causes of impairment. A weight of evidence approach does not rely on just one piece of data to determine if a waterbody should be delisted or pollutant should be removed as a cause of impairment. Instead, it relies on evaluating multiple pieces of evidence simultaneously to come to a conclusion or recommendation. This approach provides the assessment staff with the flexibility to evaluate the evidence and assign more or less weight to individual pieces of evidence, as appropriate, to come to conclusions about whether waterbodies should be delisted or impairment causes should be removed.

The weight of evidence approach is conducted according to the following steps:

- Identify all available relevant evidence
- Review/analyze evidence against WQS or other decision-making criteria
- Make recommendations for delisting or pollutant removal based on the evidence
- Develop a written "good cause justification" rationale for delisting that includes a summary of the evidence and a recommendation

The types of evidence considered during the weight of evidence approach are summarized in Table 14.

Table 14. Types of Data used in the Weight of Evidence Approach

Data Type	Discussion
Water Quality Data	Water quality data is used to determine whether or not recent data continue to support the earlier listing and conclusion that a waterbody is impaired and/or impaired by a specific pollutant. This type of analysis aligns with 40 CFR §130.7 (b)(6)(iv)) statement that evaluation

Table 14. Types of Data used in the Weight of Evidence Approach	
Data Type	**Discussion**
	of "more recent or accurate data" is one way to delist a waterbody or from the 303(d) list. A similar understanding is used to remove individual pollutants as causes of impairment.
Non-Water Quality Data	Non-water quality data is used to determine whether or not recent findings support previous listings. For example, recent macroinvertebrate or physical habitat assessments or the presence or absence of a fish consumption advisory can be used to determine if existing listings remain applicable.
Historical Data	Examination of the original water quality data or non-water quality data that identified impairment and led specific pollutants to be listed as causing designated use impairment is used to identify data gaps, unsubstantiated assumptions, inconsistencies, or other errors in the original listings. This type of analysis provides evidence to support findings of "flaws in the original analysis that led to the water being listed," one of the "good cause justifications" endorsed in 40 CFR to support delisting a 303(d) listing or removal of individual pollutants as causes of impairment.
IRs	Examination of IRs is used to review what was understood about designated use support and pollutant causes across the decades. The IRs summarize data, describe water quality assessment, and document use support decisions.
TMDL Data	Examination of the water quality and non-water quality data referenced in TMDL documents is used to review the causes of impairment, the historical data used to assess impairment, and the historical data used to develop TMDL models and model inputs. In addition, review of the applicable WQS at the time of TMDL development can link impairment to specific violations of those WQS. In some cases, TMDL write-ups provide more information on the impairment than what is provided in the IR.

A weight of evidence analysis is developed for each delisting recommendation and/or recommendation for removal of a pollutant as a cause of impairment. This analysis uses the evidence available in the data categories described above in the aggregate to draw conclusions regarding whether entire waterbodies and/or individual pollutants merit delisting/removal. Unlike with listing pollutants as causing an impairment in the first place, there is often no immediate or simple solution available to determine whether a waterbody should be delisted and/or a pollutant should be removed. Rather, the overall accumulation of evidence backed up by best professional judgment leads to the decision to delist/remove a pollutant.

While "delisting" can only be applied to Category 5, this weight of evidence process can also be used to remove pollutant causes and/or move waterbodies to different categories based on the evidence. Waterbodies recommended for delisting from Category 5 will be documented in the IR and will be supported by a discussion or summary of the results of the weight of evidence analysis and a good cause

justification (see next subsection). Similarly, pollutants removed as causes of impairment and waterbodies that change categories will be similarly documented in the IR, along with good cause justification for the changes.

Good Cause Justification

Good cause justification is developed to support weight of evidence analysis that demonstrates the merit for delisting a waterbody or removing a pollutant as a cause of impairment. The good cause justification summarizes the data and the decisions leading to the recommendations to delist and/or remove a pollutant cause and includes one or more of the "good cause justifications" outlined in 40 CFR §130.7 (b)(6)(iv)) to support the regulatory requirements of the delisting recommendation. Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed/pollutant being identified as a cause of impairment in the categories in § 130.7(b)(5); or changes in conditions, e.g., new control equipment, or elimination of discharges.

REPORTING

The assessment results for all waterbodies are reported in the biennial Integrated Report. Tabular summaries are utilized to list waterbodies placed in Categories 1 and 2 with basic information on waterbody name, waterbody ID, the designated uses supported, and, in the case of Category 2, the designated use where the data and information available is insufficient to determine use support. Tabular summaries are also utilized for Category 3, 4, and 5 listings that include the 303(d) listing year, waterbody name, waterbody ID, and pollutants or non-pollutants causing impairment (Categories 4 and 5). Other information such as the TMDL establishment date, priority rankings, and targeted TMDL development date are included where needed on a category-by-category basis. A "good cause" justification rationale is provided for each delisting and/or removal of a pollutant as a cause of impairment.

The District follows EPA guidance on reporting outlined in *Information Concerning 2022 Clean Water Act Section 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions* (EPA, 2021c). The information reported on the District's assessment methodology and assessment results are prepared in a format that allows uploading to ATTAINS. The specific information uploaded to ATTAINS is:

Assessment Methodology

- Description of data and information used to make attainment determinations (40 CFR 130.7(b)(6)(ii))
- Description of how data and information was used to make attainment determinations (40 CFR 130.7(b)(6)(i))
- A rationale for any decision to not use any existing and readily available data and information (40 CFR 130.7(b)(6)(iii))
- Description of changes in assessment methodology since the last reporting cycle

Assessment Results

- Five-part categorization of waters

- Description of water quality of all waters of the US and the extent to which the quality of waters provides for protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water (e.g., results of probability-based/statistical surveys) (40 CFR 130.8 (b)(1))
- Changes from previous CWA 303(d) list (e.g., the waterbodies/pollutants that have been added and the waterbodies/pollutants that have been delisted and the reason for their delisting)
- A list of water quality-limited waters (impaired and threatened) still requiring a TMDL, pollutants causing the impairment, priority ranking for TMDL development (including waters targeted for TMDL development within the next two years) (40 CFR 130.7(b))
- Status of TMDL development
- Summaries of designated use support
- Any other reasonable information requested by the EPA Regional Administrator (40 CFR 130.7(b)(6)(iv))

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