Maryland's 2019 Triennial Review of Water Quality Standards

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Overview of the 2019 Triennial Review of Water Quality Standards

The Clean Water Act (CWA) requires that States review their water quality standards every three years (Triennial Review) and revise the standards as necessary. A water quality standard consists of three separate but related components:

1. Designated Uses that define goals for a water body. Examples of Designated Uses include support of aquatic life, drinking water supply or a coldwater fishery such as trout.
2. Criteria that support the Designated Uses. There are numerous criteria for chemical substances, bacteria, acidity and physical characteristics (e.g., temperature). Examples include dissolved oxygen concentrations sufficient to support aquatic life, metals in sufficiently low concentrations that they will not interfere with aquatic life, or temperature values to support reproducing trout populations.
3. Antidegradation policy. Maryland has a policy in place which is implemented through the Maryland Department of the Environment's permitting authorities.

As part of Maryland's 2019 Triennial Review efforts, the Maryland Department of the Environment (MDE) reviewed more than just those sections of water quality standards that are proposed for revision in regulation. In many cases, existing standards remain valid and as a result, the Department maintains those standards in-force. MDE staff also considered adopting current nationally recommended water quality criteria, re-evaluated the State's restoration variances, and maintains an ongoing list of future work items such as the tasks which relate to Maryland's designated use classification system. These items are discussed in further detail in the sections immediately following. Actual amendments to Maryland's water quality standards are described later in the "Water Quality Standards Amendments" Section.

Maryland's water quality standards are found in the Code of Maryland regulations (COMAR) at 26.08.01 – 26.08.02. Maryland regulations may be accessed online at the Division of State Documents web site: www.dsd.state.md.us. Click on COMAR Online and enter the appropriate regulatory reference.

Nationally Recommended Water Quality Criteria Considered with Maryland's 2019 Triennial Review

2013 National Criteria for Ammonia: MDE proposes to adopt a performance-based version of these criteria with this (2019) Triennial Review of Water Quality Standards. To accompany and inform the implementation of the numeric criteria, MDE is also proposing to have the implementation document "Procedures for Applying the Mussels-Absent Ammonia Criteria to Maryland Surface Waters" incorporated (by reference) into the regulation. This implementation document is provided for public review along with the changes to the numeric ammonia criteria. The changes to Code of Maryland Regulations are shown in the "Water Quality Standards Amendments: Water Quality Criteria" Section.

2015 National Criteria for 94 human health criteria: MDE plans to adopt 69 of the 94 nationally recommended human health criteria during this regulatory revision. The changes to Code of Maryland Regulations are shown in the "Water Quality Standards Amendments: Water Quality Criteria" Section. The remaining 25 criteria will be further evaluated for potential adoption with the next Triennial Review.

2016 National Criteria for Cadmium: MDE proposes to adopt these criteria with this (2019) Triennial Review of Water Quality Standards. The changes to Code of Maryland Regulations are shown in the "Water Quality Standards Amendments: Water Quality Criteria" Section.

2016 National Criteria for Selenium: MDE is currently evaluating the updated national criteria for selenium to determine the appropriateness of these criteria to Maryland's surface waters with the intention of adoption with the next Triennial Review.

National Criteria for Nutrients: MDE has conducted an extensive review of this subject and at this time concludes that confounding factors as well as extensive data gaps preclude the development of scientifically defensible nutrient criteria. Even so, Maryland's current water quality standards include statewide dissolved oxygen criteria as well as chlorophyll *a* criteria for most lakes and reservoirs in Maryland that serve as valuable surrogates for nutrient criteria. MDE will continue to monitor the state of the science and may consider adopting nutrient criteria if methodologies become available that are applicable to Maryland's surface waters.

2018 National Criteria for Aluminum: MDE is currently evaluating the updated national criteria for aluminum to determine the appropriateness of these criteria to Maryland's waters with the intention of adoption with the next Triennial Review.

2019 National Criteria for Microcystin and Cylindrospermopsin: MDE will be evaluating the updated national criteria for these algal toxins to determine the appropriateness of these criteria to Maryland's waters with potential adoption with the next Triennial Review.

Re-evaluation and Revision of Maryland's Restoration Variances

"Restoration Variance", as defined in COMAR 26.08.01.01 "means a temporary exception to the water quality standards allowing nonattainment of designated uses granted in situations where no enforcement action will be taken if the nonattainment is due to the existence of one or more of the justifications in 40 CFR §131.10(g). Restoration variances will be reviewed every 3 years at a minimum as required by the Clean Water Act and EPA regulations."

COMAR 26.08.02.02 C. (8)(h) further explains, "The percentage of allowable exceedance for restoration variances is based on water quality modeling and incorporates the best available data and assumptions. The restoration variances are temporary, and will be reviewed at a minimum every three years, as required by the Clean Water Act and EPA regulations. The variances may be modified based on new data or assumptions incorporated into the water quality model."

A combination of the Chesapeake Bay observed Water Quality data and the Chesapeake Bay Modeling framework was used to support the development of Maryland's Chesapeake Bay water quality standards (i.e. those standards associated with Use II waters) which included the dissolved oxygen (DO) restoration variances for the segments identified below. This information and modeling also informed the development of water quality criteria, the Chesapeake Bay TMDLs, and Watershed Implementation Plans.

More recently, the 2010 Chesapeake Bay TMDL document (USEPA, 2010) called for an assessment in 2017 to review progress toward meeting the nutrient and sediment pollutant load reductions necessary for Bay restoration. The 2017 Midpoint Assessment (MPA) was completed in December 2017 and finalized in July 2018. The 2017 MPA measured the Chesapeake Bay Program (CBP) Partnership's progress towards having all practices and controls in place by 2025 in order to achieve the Bay's dissolved oxygen, water clarity/submerged aquatic vegetation, and chlorophyll-*a* standards. The CBP Partnership includes Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, the District of Columbia and the EPA (representing the Federal Government).

As part of the 2017 MPA, the CBP Partnership reviewed the latest science, data, modeling, and decision support tools used to measure progress in order to strengthen the CBP Partnership's decision support capabilities and to optimize the CBP Partnership's Phase 3 Watershed Implementation Plans (WIP3s).

On July 9, 2018, the CBP Partnership accepted Phase III target allocations of 201.2 million pounds nitrogen and 14.2 million pounds phosphorus (PSC, 2018). As part of the target allocation decision the Principal Staff Committee (PSC), a major governing body of the Partnership, received detailed feedback from its members on required adjustments to Maryland's dissolved oxygen restoration variances to be consistent with the latest science and analysis of the 2017 MPA.

All members of the PSC unanimously supported Maryland's updating of their water quality standard regulations' existing restoration variances as described below (PSC, 2017). The EPA,

the CBP Partnership, and the Maryland Department of Environment believes that the proposed variance changes are consistent with the latest science and analysis of the 2017 MPA and are fully protective of Chesapeake water quality. The proposed variances were approved by the PSC on December 19, 2017 (p94 of PSC Presentation December 19, 2017) and reaffirmed by the PSC on July 9, 2018.

The following changes to Maryland's DO restoration variances are being proposed:

- Change the Chesapeake Bay Mainstem Segment 4 Mesohaline (CB4MH) deep-channel refuge subcategory use restoration variance from 2 percent to 6 percent.
- Change the Chesapeake Bay Mainstem Segment 4 Mesohaline (CB4MH) deep-water fish and shellfish subcategory use restoration variance from 7 percent to 5 percent.
- Remove the lower Chester River Mesohaline (CHSMH) deep-channel refuge subcategory use restoration variance of 16 percent.
- Remove the Patapsco River Mesohaline (PATMH) deep-water fish and shellfish subcategory use restoration variance of 7 percent.

At this time, Maryland is not recommending any change to the Eastern Bay Mesohaline (EASMH) deep-channel refuge subcategory use restoration variance of 2 percent. For additional technical documentation and rationale for these proposed changes please read the document titled "Adjustment to the Main Bay Segment CB4MH Deep-Channel and Deep-Water Dissolved Oxygen Criterion for Persistent Nonattainment and Removal of Chester River Deep-Channel and Patapsco River Deep-Water Restoration Variances" which accompanies this Triennial Review. The specific text revisions to the Code of Maryland Regulations to reflect these changes to the restoration variances are shown along with the other changes to COMAR 26.08.02.03-3 in the Water Quality Criteria section below.

Future Water Quality Standards Work

Cold or Cool Water Streams

The Department and it's partners have made significant progress since the last Triennial Review (2016) in engaging stakeholders, reviewing and collecting additional data, and proposing modifications to the Department's process and regulations to better identify and protect cold/cool water streams in Maryland. This Triennial Review includes a number of proposed changes to regulations as a result of this effort including clarified existing use protections under the State's Antidegradation Policy, incorporating by reference the process wherein existing uses are determined, and several designated use changes and existing use determinations (these are described in the "Designated Uses" subheading of the "Water Quality Amendments" section of this document). All of this work was informed and guided by the efforts of the Cold Water Advisory Committee which met four times throughout 2018. With the promulgation of the regulatory changes in this 2019 Triennial Review that help to clarify protections of cold water existing uses, the first of four main objectives will have been achieved by the Committee. The remaining three objectives, briefly described below will be tackled in the coming year(s) as committee meetings can be held.

- Propose a new "coolwater" use classification based on analyses conducted by DNR and consideration of current stream scenarios.
- Propose changes to Class IV (or IV-P) recreational trout waters based on the different types of waters being stocked and/or trout stocking goals.
- Develop a process for conducting Use Attainability Analyses (UAA) for surface waters that support self-sustaining trout populations but which do not currently attain Class III (or III-P) water quality criteria.

For more information on the work that was completed by the Cold Water Advisory Committee and what work remains please visit the following web page: https://mde.maryland.gov/programs/Water/TMDL/WaterQualityStandards/Pages/MDE-Cold-Water-Advisory-Committee.aspx.

PFAS

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that include PFOA, PFOS, GenX, and many other chemicals. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. These chemicals are persistent in the environment and the human body, meaning they do not break down easily and can accumulate over time. People may be exposed to PFOS and PFOA from the air, indoor dust, water, food and numerous consumer products. According to the Center for Disease Control (CDC) the potential for health effects from PFAS in humans is not well understood. MDE's Water and Science Administration is working in partnership with it's Land and Materials Administration to understand, communicate and manage the risk of Per- and Polyfluoroalkyl substances. Towards this goal, MDE is collecting data to understand PFAS

occurrence and levels in drinking water and fish tissue and to also identify potential sources of PFAS throughout Maryland. MDE is in regular communication with EPA on drinking water maximum contaminant levels, development of criteria for fish consumption and development of acute/chronic aquatic life toxicity criteria. While MDE is not proposing numeric criteria at this time, MDE will continue to use EPA guidance for the protection of public health. MDE will continue to develop a robust PFAS dataset to increase the understanding of the PFAS levels throughout the state and to also take regulatory action to protect public health when and where necessary.

Water Quality Standards Amendments

The following sections describe the changes that the Department proposes to make to the Code of Maryland Regulations (COMAR).

Designated Uses

The 2019 Maryland water quality standards amendments that deal with Designated Uses fall into five categories: 1) correcting internal references to subcategory designated uses, 2) removing confusing placeholder language that does not apply to any waters in Maryland, 3) clarifying the geographical extent of certain use designations, 4) use class re-designation, and 5) describing the protections afforded to existing uses which are detailed on the Department's website. More specifically, two internal references to the Chesapeake Bay and tidal tributary subcategory designated uses, in Section 26.08.02.02-1, pointed to a line in the regulation that did not exist. Placeholder language in 26.08.02.07E. confusingly references additional protections consistent with designated uses but has no waters listed. New text and coordinates were added to Section 26.08.02.08 to clarify the extent of various designated uses within the Susquehanna river system. Several stream segments that demonstrated the presence of a cold water obligate species and water temperatures that met Class III (III-P) criteria are being proposed for re-designation to Class III (or III-P). Regulation 26.08.02.08 will now describe the protections for existing uses that are not protected by the current designated use. In addition, this new language will point the reader to the Department's website, where several existing uses are described both in terms of the use being supported and the water quality necessary to support them. These existing uses consist of stream segments that are currently designated as Class I (or I-P) or Class IV (or IV-P) that contain cold water obligate species but which do not fully meet the Class III (III-P) water temperature criteria. This is the first time this has been done in Maryland and will help to ensure both water quality protection and regulatory certainty.

The specific regulations affected are listed below along with a brief description of the proposed amendments followed by the amended regulatory language. Please note that when reviewing amended text, [text in brackets is deleted] while *text in italics is new*.

REGULATIONS MODIFIED

COMAR 26.08.02.02-1 Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting

Summary of Changes to 26.08.02.02-1: Amendments were made to correct the references made to the applicable designated uses during the October 1 - May 31 time-frame.

Specific Changes to Regulation: 26.08.02.02-1 Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting

26.08.02.02-1

.02-1 Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting.

A.—E. (text unchanged)

F. Seasonal Deep-Water Fish and Shellfish Subcategory. This subcategory includes waters of the Chesapeake Bay and its tidal tributaries that have the potential for or are supporting the survival, growth, and propagation of balanced, indigenous populations of important fish and shellfish species inhabiting deep-water habitats as described as follows:

(1) (text unchanged)

(2) From October 1 to May 31, **[**criteria under §A(5) of this regulation apply**]** *the open water fish and shellfish subcategory designated use applies*.

G.Seasonal Deep-Channel Refuge Use.

(1)—(2) (text unchanged)

(3) From October 1 to May 31, **[**criteria under §A(5) of this regulation apply**]** *the open water fish and shellfish subcategory designated use applies*.

COMAR 26.08.02.07 Surface Water Use Designation

Summary of Changes to 26.08.02.07: The following language was removed since its intent was unclear and no waters were listed under this Section (COMAR 26.08.02.07E.). MDE staff believed it may have originally served as a placeholder for existing use determinations. However, since MDE has decided, consistent with EPA recommendations, to provide existing use determinations on its website this language is not needed.

Specific Changes to Regulation: 26.08.02.07 Surface Water Use Designation

26.08.02.07

.07 Surface Water Use Designation.

A—D (text unchanged)

[E. Stream segments, listed below in tabular form, shall be given the additional protection required for:

(1) Shellfish harvesting waters (Class II waters);
(2) Shallow water submerged aquatic vegetation (Class II waters);
(3) Migratory fish spawning and nursery (Class II waters);
(4) Natural trout waters (Class III and Class III-P waters);
(5) Recreational trout waters (Class IV and Class IV-P waters);
(6) Public water supply (Class I-P, II-P, III-P, and IV-P waters).**]**

COMAR 26.08.02.08 Stream Segment Designations

Summary of Changes to 26.08.02.08: Changes to COMAR 26.08.02.08 were made for three primary reasons which are described below.

1. Text was added to the general portion of this regulation to provide notification to the reader that some water bodies have existing uses that may not be protected by the codified designated use class. However, these existing uses and the water quality necessary to support them must be protected per Maryland's antidegradation policy in COMAR 26.08.02.04-1. These existing uses will be described, maintained, and made available on the MDE website.
2. Amendments were made to clarify the descriptions of the extent of tidal (Class II and II-P) versus non-tidal (Class I-P) waters and the extent to which the public water supply use applies in and around the Susquehanna River.
3. The designated use classes of certain surface waters were changed to Class III or III-P based on updated temperature and biological data which demonstrated that the existing use was consistent with a Class III or III-P designation.
4. In a few cases, minor typos in geographic coordinates were corrected.

Specific Changes to Regulation 26.08.02.08

26.08.02.08

.08 Stream Segment Designations *and Existing Uses*.

A.General

(1) All geographic coordinates provided within this regulation are expressed in decimal degrees latitude and longitude using the North American Datum of 1983. In this regulation, Maryland's waters are organized by sub-basin. For most Class I, I-P, III, III-P, IV, or IV-P waters, the limits indicate the most downstream boundary point or line for the segment. In some cases, an upstream point and a downstream point are provided to describe those uses that may apply only to a limited segment of a water body. In tidal areas, the segments are defined by polygons defined by three or more points as numbered and expressed in narrative format in column four and defined by latitude and longitude point locations in columns two and three. Any waterbody not specifically listed in the table is a Class I water.

(2)—(5) (text unchanged)

(6) Existing Uses. Several of the sub-basins in this regulation contain stream segments that support existing uses that require different water quality than the designated use. These existing uses have been determined in accordance with COMAR 26.08.02.04-1. The existing uses for these stream segments are described both in terms of the existing uses supported (e.g. naturalized reproducing brown trout population) and the water quality currently known to sustain them. For determining effluent limits, closure periods, and other regulatory protection measures, these existing uses and the water quality necessary to maintain them must be protected consistent with COMAR 26.08.02.04-1. These existing uses are maintained and can be accessed on the Department's website.

B. Sub-Basin 02-12-02: Lower Susquehanna River Area.

Designated Use Class and Waterbody	Latitude	Longitude	Limits

(1) Class I-P:			
[(1)**]** *(a)* **[**Class I-P:**]** Susquehanna River **[**and all tributaries except those designated below as Class III-P or Class IV-P**]**	*39.608971* **[**39.664764**]**	*-76.143379* **[**-76.171530**]**	**[**Upstream of Conowingo Dam**]** *From head of tide at Spencer Island upstream* to MD/PA line
	39.608994 **[**39.656485**]**	*-76.121094* **[**-76.176049**]**	
(b) All tributaries to the Susquehanna River except those designated below as Class III-P or Class IV-P			*This includes all tributaries to the Susquehanna River including those that drain to the tidal portion of the Susquehanna River*
(2) Class II:			
(a) Northern Chesapeake Bay (CB1TF2**[**-Class II-P**]**): **[**Susquehanna River mainstem from downstream side of Conowingo Dam on eastern and western shores to confluence with Chesapeake Bay.**]** *Includes the Upper Bay mainstem from the confluence with CB1TF1 and Northeast River (NORTF) to the mouth of the Susquehanna River.*	39.475132	-76.097580	(1) West side of Spesutie Narrows bridge
Designated Uses Present in Segment:	39.476006	-76.094421	(2) East side of Spesutie Narrows bridge
Migratory Spawning and Nursery Use: February 1 to May 31, inclusive	39.475323	-76.072807	(3) Locust Pt. on Spesutie Island
Shallow Water Submerged Aquatic Vegetation Use: April 1 to October 30, inclusive	39.449471	-76.010475	(4) Turkey Pt., 0.1 miles WSW of lighthouse
Application Depth: 2.0 meters, NGZ present	39.529629	-75.979271	(5) Red Pt.
Open Water Fish and Shellfish Use: January 1 to December 31, inclusive	39.540794	-76.002899	(6) East side of Carpenter Pt.
	39.540694	*-76.084635*	*(7) Concord Point*
	39.546806	*-76.065148*	*(8) Perry Point*
	[39.608994	-76.121094	(7) Port Deposit
	39.608959	-76.132683	(8) East side Spencer Island
	39.609001	-76.135147	(9) West side Spencer Island
	39.608971	-76.143379	(10) Just south of Rock Run on western shore**]**
(b) Northern Chesapeake Bay (CB1TF1): Upper Bay mainstem to confluence with CB1TF2 **[**(Susquehanna	39.420143	-76.123344	(1) 1,000 feet SW of Cherry Tree Pt., APG

River)**]**, **[**Northeast River (NORTF),**]** Elk River (ELKOH), and CB2OH.			
Designated Uses Present in Segment:	39.401688	-76.035194	(2) North of Chesapeake Haven, Grove Neck
Migratory Spawning and Nursery Use: February 1 to May 31, inclusive	39.429420	-75.997681	(3) 1,300 feet SW of Wroth Pt.
Shallow Water Submerged Aquatic Vegetation Use: April 1 to October 30, inclusive	39.449200	-76.007698	(4) Turkey Pt.
Application Depth: 1 meters, NGZ present	39.449471	-76.010475	(5) Turkey Pt., 0.1 miles WSW of lighthouse
Open Water Fish and Shellfish Use: January 1 to December 31, inclusive	39.475323	-76.072807	(6) Locust Pt. on Spesutie Island
	39.476006	-76.094421	(7) East side of Spesutie Narrows bridge
	39.475132	-76.097580	(8) West side of Spesutie Narrows bridge
(3) Class II-P: Northern Chesapeake Bay (CB1TF2) - That portion of the Susquehanna River inclusive from the head of tide downstream to the mouth of the Susquehanna River is Class II-P.	*39.608971*	*-76.143379*	*(1) Just south of Rock Run on western shore*
	39.609001	*-76.135147*	*(2) West side Spencer Island*
	39.608959	*-76.132683*	*(3) East side Spencer Island*
	39.608994	*-76.121094*	*(4) Port Deposit*
	39.540694	*-76.084635*	*(5) Concord Point*
	39.546806	*-76.065148*	*(6) Perry Point*
[(3)**]** *(4)* Class III: None			
[(4)**]** *(5)* Class III-P:			
(a)—(r) (text unchanged)			
(s) Unnamed tributary to Deer Creek and all tributaries	*39.643704*	*-76.41237*	*Runs parallel to Rocks Road*
(t) Unnamed tributary to Falling Branch and all tributaries	*39.683601*	*-76.439217*	*Flows through Rocks State Park near Falling Branch Road*

(u) Unnamed tributary to Conowingo Reservoir and all tributaries	*39.717647*	*-76.224782*	*Flows from Eckman Lane to Susquehanna River*
[(5)**]** *(6)* — **[**(6)**]** *(7)* (text unchanged)			

C.—G. (text unchanged)

H. Sub-Basin 02-13-06: Elk River Area

Designated Use Class and Waterbody	Latitude	Longitude	Limits
(1)—(3) (text unchanged)			
(4) Class III-P: **[**None.**]**			
Mill Creek	*39.585249*	*-76.052864*	*Upstream of an unnamed tributary near Reservoir Rd.*
(5)—(6) (text unchanged)			

I.—J. (text unchanged)

K. Sub-Basin 02-13-09: Patapsco River Area.

Designated Use Class and Waterbody	Latitude	Longitude	Limits
(1) Class I-P:			
(a) (text unchanged)			
(b) All tributaries to West Branch Patapsco River except those designated below as Class *III-P or Class* IV-P			
(c) (text unchanged)			

(2)—(3) (text unchanged)			
(4) Class III-P:			
(a)—(o) (text unchanged)			
(p) Unnamed Tributary to North Branch Patapsco River and all tributaries	*39.534575*	*-76.891732*	*Near Wesley Road*
(q) Unnamed tributary to the West Branch North Branch Patapsco River and all tributaries	*39.574623*	*-76.955109*	*Near Tannery Road*
(r) Unnamed tributary to the West Branch North Branch Patapsco River and all tributaries	*39.559758*	*-76.927383*	*Near Dutrow Road*
(s) Unnamed tributary to the West Branch North Branch Patapsco River and all tributaries	*39.553998*	*-76.91500*	*Near Reese Road*
(t) Unnamed tributary to Cranberry Branch and all tributaries	*39.608109*	*-76.958926*	*Near Guadelupe Drive*
(u) Unnamed tributary to Liberty Reservoir and all tributaries	*39.432231*	*-76.940664*	*Flows from area near Woodridge Lane*
(v) Unnamed tributary to Liberty Reservoir and all tributaries	*39.432498*	*-76.940303*	*Flows from area near Sykesville Road*
(5) Class IV:			
(a)—(f) (text unchanged)			
(g) Patapsco River	39.221606	**[-]**-76.713289	Mainstem only. B&O (Thomas) viaduct upstream to confluence of North Branch Patapsco and South Branch Patapsco.

	39.349903	-76.882211	
(h) (text unchanged)			
(6) Class IV-P:			
(a) North Branch Patapsco River	39.493185	**[-]**-76.872810	Mainstem only upstream of Liberty Reservoir
(b)—(c) (text unchanged)			

L—O (text unchanged)

P. Sub-Basin 02-14-03: Middle Potomac River Area.

Designated Use Class and Waterbody	Latitude	Longitude	Limits
(1)—(3) (text unchanged)			
(4) Class III-P:			
(a)—(r) (text unchanged)			
(s) Flickinger Branch and all tributaries	*39.450649*	*-77.135427*	*Near unnamed road off of Black Ankle Road*
(t) Unnamed Tributary to Big Pipe Creek and all tributaries	*39.675983*	*-76.919152*	*Near Dug Hill Drive*
(u) Unnamed Tributary to Big Pipe Creek and all tributaries	*39.657544*	*-76.92231*	*Near Route 27 Manchester Road*
(v) Weldon Creek	*39.478131*	*-77.11824*	*Upstream of tributary near Hoopers Delight Road*
(5) (text unchanged)			

(6) Class IV-P:			
(a) (text unchanged)			
(b) Catoctin Creek	39.309777	**[**-**]**-77.567051	Mainstem only, from mouth upstream to Alternate U.S. Rt. 40
	39.450300	-77.562603	
(c) (text unchanged)			

Q. (text unchanged)

R. Sub-Basin 02-14-10: North Branch Potomac River Area.

Designated Use Class and Waterbody	Latitude	Longitude	Limits
(1)—(3) (text unchanged)			
(4) Class III-P:			
(a) North Branch Potomac River mainstem from below Jennings Randolph Dam downstream to the confluence with **[**Laurel Run near Bloomington**]** *Savage River*	**[**39.4742592**]** *39.480398*	**[**79.1054876**]** *-79.067187*	Mainstem only. **[**From Jennings Randolph Dam downstream to the confluence with Laurel Run near Bloomington**]**
	39.4317897	-79.1167041	
(b) (text unchanged)			
(5) (text unchanged)			

(6) Class IV-P:			
(a) Wills Creek	39.648896	**[**-**]**-78.764400	Mainstem only
(b) (text unchanged)			
(c) Georges Creek	39.645609	**[**-**]**-78.915845	Mainstem only
	39.483470	-79.046265	

S. Sub-Basin 05-02-02: Youghiogheny River Area.

Designated Use Class and Waterbody	Latitude	Longitude	Limits
(1)—(2) (text unchanged)			
(3) Class III:			
(a) North and South Branches of the Casselman River and all tributaries	39.668489	-79.177571	**[**Ups**]**Upstream from the confluence of the North and South Branches Casselman to the headwaters
(b)—(g) (text unchanged)			
(4) Class III-P:			
(a) (text unchanged)			
(b) Piney Creek and all tributaries	**[**39.721323**]** *39.722497*	**[**78.960085**]**-*78.964199*	**[**Upstream from the Frostburg Watershed property (near Jay Road)**]**

(5)—(6) (text unchanged)

T.—U. (text unchanged)

Criteria

With this Triennial Review (2019), Maryland is adopting the nationally recommended ammonia, cadmium, and 69 human health criteria. The specific regulations being revised are listed below along with a brief description of the proposed amendments followed by the amended regulatory language. Please note that when reviewing amended text, [text in brackets is deleted] while *text in italics is new*.

REGULATIONS MODIFIED

COMAR 26.08.02.03-2 Numerical Criteria for Toxic Substances Waters

Summary of Changes: Amendments were made to incorporate the updated national criteria for cadmium, national criteria for ammonia, and 69 human health criteria. Also, tables showing the coefficients and conversion factors used to modify aquatic life criteria by hardness have been codified. Several minor errors were also corrected including a misspelling of "dichlorobromomethane", the indication that arsenic toxicity is affected by hardness (all criteria derivation efforts to date have not indicated that to be the case), and the indication that pentachlorophenol is affected by hardness. Footnotes were also added to emphasize which human health criteria were calculated with a carcinogenic risk factor of 10^{-5}.

Specific changes to regulations: COMAR 26.08.02.03-2 Numerical Criteria for Toxic Substances Waters

26.08.02.03-2

.03-2 Numerical Criteria for Toxic Substances in Surface Waters.

A.—F. (text unchanged)

G. Tables of Ambient Water Quality Criteria.

(1) Table 1. Toxic Substances Criteria for Ambient Surface Waters — Inorganic Substances.

Substance	CAS#	Aquatic Life (µg/L)						Human Health for Consumption of:		
		Fresh Water		Estuarine Water		Salt Water		Drinking Water + Organism (*µg/L)*	Organism Only (*µg/L)*	Drinking Water MCL (mg/L)
		Acute	Chronic	Acute	Chronic	Acute	Chronic			
Antimony	7440360							5.6	640	0.006
Arsenic[1]	7440382	340	150			69	36	0.18[d]	1.4[a,d]	0.010

Asbestos	1332214								7 million fibers/L	7 million fibers/L
Barium	7440393							1,000		2
Beryllium								4		0.004
Cadmium[1]	7440439	[2.0] *1.8*	[0.25] *0.72*			[40] *33.13*	[8.8] *7.9*	5		0.005
Chlorine[2]	7782505	19	11			13	7.5			
Chromium (total)	7440473							100		0.1
Chromium III[1]	16065831	570	74							
Chromium VI	18540299	16	11			1100	50			
Copper[1]	7440508	13	9	6.1		4.8	3.1	1,300[d]		1.3[c]
Cyanide	57125	22	5.2			1	1	140	140	0.2
Lead[1]	7439921	65	2.5			210	8.1			0.015[c]
Mercury	7439976	1.4	0.77			1.8	0.94			0.002
Methylmercury[b]	22967926								0.3 mg/kg in fish tissue	
Nickel[1]	7440020	470	52			74	8.2	610	4,600	
Selenium	7782492	20	5			290	71	170	4,200	0.05
Silver[1]	7440224	3.2				1.9				0.10
Thallium	7440280							0.24	0.47	0.002
Zinc[1]	7440666	120	120			90	81	7,400	26,000	

[1] Refer to §D of this regulation.

[2] The more stringent of these criteria or the discharge requirements in COMAR 26.08.03.06 shall be used as the basis for determining discharge permit limitations.

[a] This criterion will be applied against the actual measurement of inorganic arsenic (As+3) rather than total arsenic.

[b] Per EPA recommendation, total mercury concentrations, as opposed to methylmercury, will be used in MDE fish consumption risk-calculation. This approach is deemed to be most protective of human health and most cost-effective.

[c] Lead and Copper are regulated by a treatment technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. The values listed are technically action levels.

[d] Criterion is based on a carcinogenic risk level of 10^{-5}

* Drinking water MCLs apply to Public Water Supply designated waters only.

(2) Table 2. Coefficients Used to Aadjust Applicable Numerical Toxic Substance Fresh Water Aquatic Life Criteria.[*]

Substance	*CAS#*	*mA*	*bA*	*mC*	*bC*
Cadmium	*7440439*	*0.9789*	*-3.866*	*0.7977*	*-3.909*
Chromium III	*16065831*	*0.8190*	*3.7256*	*0.8190*	*0.6848*
Lead	*7439921*	*1.273*	*-1.460*	*1.273*	*-4.705*
Nickel	*7440020*	*0.8460*	*2.255*	*0.8460*	*0.0584*
Silver	*7440224*	*1.72*	*-6.59*	*-*	*-*
Zinc	*7440666*	*0.8473*	*0.884*	*0.8473*	*0.884*

(3) Table 3. Conversion Factors Used to Adjust Applicable Numerical Toxic Substance Fresh Water Aquatic Life Criteria.

Substance	*CAS#*	*Freshwater Acute Conversion Factor (CF)*	*Freshwater Chronic Conversion Factor (CF)*
Cadmium	*7440439*	*1.136672-LN(Hardness)*0.041838*	*1.101672-LN(Hardness)*0.041838*
Chromium III	*16065831*	*0.316*	*0.86*
Lead	*7439921*	*1.46203-LN(Hardness)*0.145712*	*1.46203-LN(Hardness)*0.145712*
Nickel	*7440020*	*0.998*	*0.997*
Silver	*7440224*	*0.85*	*-*
Zinc	*7440666*	*0.978*	*0.986*

**Hardness-dependent criteria may be calculated from the following:*

$$Acute\ Criteria = e^{mA*LN(hardness)+bA} * CF$$

$$Chronic\ Criteria = e^{mC*LN(hardness)+bC} * CF$$

[(2)**]** *(4)* Table **[**2**]** *4*. Toxic Substances for Ambient Water Quality Criteria — Organic Compounds.

Substance	CAS#	Aquatic Life (µg/L)				Human Health for Consumption of:		
		Fresh Water		Salt Water		Drinking Water + Organism (µg/L)	Organism Only (µg/L)	Drinking Water MCL (mg/L)
		Acute	Chronic	Acute	Chronic			
1,1 Dichloroethylene (DCE)	75354					**[**330**]** *300*	**[**7100**]** *20000*	0.007
1,1,1-Trichloroethane (TCA)	71556					200		0.2
1,1,2,2-Tetrachloroethane	79345					1.7[a]	40[a]	
1,1,2-Trichloroethane	79005					5.9[a]	160[a]	0.005
1,2,4-Trichlorobenzene	120821					35[a]	70[a]	0.07
1,2,4,5-Tetrachlorobenzene	*95943*					*0.03*	*0.03*	
1,2-Dichlorobenzene	95501					**[**420**]** *1000*	**[**1300**]** *3000*	0.6

1,2-Dichloroethane	107062					[3.8] *99*[a]	[370] *6500*[a]	0.005
1,2-Dichloropropane	78875					*5*[a]	150[a]	0.005
1,2-Diphenylhydrazine	122667					[0.36] *0.3*[a]	[2] *2*[a]	
1,2-Trans-Dichloroethylene	156605					[140] *100*	[10000] *4000*	0.1
1,3-Dichlorobenzene	541731					320	960	
1,3-Dichloropropene	542756					3.4[a]	210[a]	
1,4-Dichlorobenzene	106467					[63] *300*	[190] *900*	0.075
2,4,5-Trichlorophenol	*95954*					*300*	*600*	
2,4,6-Trichlorophenol	88062					14[a]	24[a]	
2,4-Dichlorophenol	120832					77	290	
2,4-Dimethylphenol	105679					[380] *100*	[850] *3000*	
[2,4-Dinitrophenol	51285					69	5300]	
2,4-Dinitrotoluene	121142					1.1[a]	34[a]	
2-Chloronapthalene	91587					[1000] *800*	[1600] *1000*	
2-Chlorophenol	95578					81	150	
2-Methyl-4,6-Dinitrophenol	534521					[13] *2*	[280] *30*	
3,3'-Dichlorobenzidine	91941					[0.21] *0.49*[a]	[0.28] *1.5*[a]	
3-Methyl-4-Chlorophenol	*59507*					*500*	*2000*	
Acrolein	107028	3	3			6	9	
Acrylonitrile	107131					[0.51] *0.61*[a]	[2.5] *70*[a]	
Benzene	71432					*22*[a]	510[a]	0.005
Benzidine	92875					[0.00086] *0.0014*[a]	[0.002] *0.11*[a]	
Bis(2-Chloroethyl) Ether	111444					0.3[a]	[5.3] *22*[a]	
Bis2(Chloroisopropyl) Ether	108601					[1400] *200*	[65000] *4000*	
Bis(Chloromethyl) Ether	*542881*					*0.0015*[a]	*0.17*[a]	
Bromoform[1]	75252					See Trihalomethanes	1400[a]	
Carbon tetrachloride	56235					[2.3] *4*[a]	[16] *50*[a]	0.005
Chlorobenzene	108907					130	1600	0.1
Chlorodibromomethane[1]	124481					[See Trihalomethanes] *8*[a]	[130] *210*[a]	
Chloroform[1]	67663					[See Trihalomethanes] *60*	[4700] *2000*	

Chlorophenoxy Herbicide (2,4-D)	*94757*					*1300*	*12000*	
Chlorophenoxy Herbicide (2,4,5-TP)	*93721*					*100*	*400*	
Dichlorobromomethane[1]	75274					See Trihalomethanes	170[a]	
Dinitrophenols	*25550587*					*10*	*1000*	
Ethylbenzene	100414					530	2100	0.7
Hexachlorobenzene	118741					**[**0.0028**]** *0.00079*[a]	**[**0.0029**]** *0.00079*[a]	0.001
Hexachlorobutadiene	87683					4.4[a]	180[a]	
Hexachlorocyclopenta-diene	77474					**[**40**]** *4*	**[**1100**]** *4*	0.05
Hexachloroethane	67721					14[a]	33[a]	
Hexachlorocyclohexane (HCH)-Technical	*608731*					*0.066*[a]	*0.1*[a]	
Isophorone	78591					**[**350**]** *340*[a]	**[**9600**]** *18000*[a]	
Methoxychlor	*72435*					*0.02*	*0.02*	
Methyl bromide	74839					**[**47**]** *100*	**[**1500**]** *10000*	
Methylene chloride	75092					**[**46**]** *200*[a]	**[**5900**]** *10000*[a]	0.005
Nitrobenzene	98953					**[**17**]** *10*	**[**690**]** *600*	
N-Nitrosodimethylamine	62759					0.0069[a]	30[a]	
N-Nitrosodi-n-Propylamine	621647					0.05[a]	5.1[a]	
N-Nitrosodiphenylamine	86306					33[a]	60[a]	
Nonylphenol	84852153	28	6.6	7	1.7			
Phenol	108952					**[**10000**]** *4000*	**[**860000**]** *300000*	
Tetrachloroethylene	127184					**[**6.9**]** *100*[a]	**[**33**]** *290*[a]	0.005
Toluene	108883					1300	15000	1
Trichloroethylene (TCE)	79016					**[**25**]** *6*[a]	**[**300**]** *70*[a]	0.005
Trihalomethanes[1]						80		0.08
Vinyl chloride	75014					**[**0.25**]** *0.22*[a]	**[**24**]** *16*[a]	0.002

[1] Four compounds (bromoform, chlorodibromomethane, chloroform, and **[**dichlorodibromomethane**]** *dichlorobromomethane*) are found in combination and comprise a category of contaminants called "trihalomethanes" formed as a result of drinking water disinfection. The concentration of any of these compounds individually, or all of them in sum, may not exceed 80 micrograms per liter. This criterion is equal to the Safe Drinking Water Act Maximum Contaminant Level.

[a] *Criterion is based on a carcinogenic risk level of* 10^{-5}

* Drinking water MCLs apply to Public Water Supply designated waters only.

[(3)**]** *(5)* Table **[**3**]** *5*. Toxic Substances for Ambient Water Quality Criteria-Polycyclic Aromatic Hydrocarbons and Phthalates.

Substance	CAS#	Aquatic Life (µg/L)				Human Health for Consumption of:		
		Fresh Water		Salt Water		Drinking Water + Organism (µg/L)	Organism Only (µg/L)	Drinking Water MCL (mg/L)
		Acute	Chronic	Acute	Chronic			
Acenaphthene	83329					**[**670**]** *70*	**[**990**]** *90*	
Anthracene	120127					**[**8,300**]** *300*	**[**40,000**]** *400*	
Benzo(a)Anthracene	56553					**[**0.038**]** *0.012*[a]	**[**0.18**]** *0.013*[a]	
Benzo(a)Pyrene	50328					**[**0.038**]** *0.0012*[a]	**[**0.18**]** *0.0013*[a]	0.0002
Benzo(b)Fluoranthene	205992					**[**0.038**]** *0.012*[a]	**[**0.18**]** *0.013*[a]	
Benzo(k)Fluoranthene	207089					**[**0.038**]** *0.12*[a]	**[**0.18**]** *0.13*[a]	
Chrysene	218019					0.038[a]	0.18[a]	
Dibenzo(a,h)Anthracene	53703					**[**0.038**]** *0.0012*[a]	**[**0.18**]** *0.0013*[a]	
Fluoranthene	206440					**[**130**]** *20*	**[**140**]** *20*	
Fluorene	86737					**[**1,100**]** *50*	**[**5,300**]** *70*	
Ideno(1,2,3-cd)Pyrene	193395					**[**0.038**]** *0.012*[a]	**[**0.18**]** *0.013*[a]	
Pyrene	129000					[830] *20*	[4,000] *30*	
Bis(2-Ethylhexyl) Phthalate	117817					**[**12**]** *3.2*[a]	**[**22**]** *3.7*[a]	0.006
Butylbenzyl Phthalate	85687					**[**1,500**]** *1*[a]	**[**1,900**]** *1*[a]	
Diethyl Phthalate	84662					**[**17,000**]** *600*	**[**44,000**]** *600*	
Dimethyl Phthalate	131113					**[**270,000**]** *2000*	**[**1,100,000**]** *2000*	
Di-n-Butyl Phthalate	84742					**[**2,000**]** *20*	**[**4,500**]** *30*	

[a] *Criterion is based on a carcinogenic risk level of* 10^{-5}

* Drinking water MCLs apply to Public Water Supply designated waters only.

[(4)**]** *(6)* Table **[**4**]** *6*. Toxic Substances for Ambient Water Quality Criteria — Pesticides and Chlorinated Compounds.

Substance	CAS#	Aquatic Life (µg/L)				Human Health for Consumption of:		
		Fresh Water		Salt Water		Drinking Water + Organism (µg/L)	Organism Only (µg/L)	Drinking Water MCL (mg/L)
		Acute	Chronic	Acute	Chronic			
2, 3, 7, 8-TCDD (Dioxin)	1746016					0.00000005 *a*	0.00000051 *a*	3 X 10-8
4,4'-DDD	72548					**[**0.0031**]** *0.0012a*	**[**0.0031**]** *0.0012a*	
4,4'-DDE	72559					**[**0.0022**]** *0.00018a*	**[**0.0022**]** *0.00018a*	
4,4'-DDT	50293	1.1	0.001	0.13	0.001	**[**0.0022**]** *0.0003a*	**[**0.0022**]** *0.0003a*	
Aldrin	309002	3		1.3		**[**0.00049**]** *0.0000077a*	**[**0.00050**]** *0.0000077a*	
alpha-BHC	319846					**[**0.026**]** *0.0036a*	**[**0.049**]** *0.0039a*	
alpha-Endosulfan	959988	0.22	0.056	0.034	0.0087	**[**62**]** *20*	**[**89**]** *30*	
Atrazine	**[**319857**]** *1912249*					3		0.003
beta-BHC	319857					**[**0.091**]** *0.08a*	**[**0.17**]** *0.14a*	
beta-Endosulfan	33213659	0.22	0.056	0.034	0.0087	**[**62**]** *20*	**[**89**]** *40*	
Carbaryl	63252	2.1	2.1	1.6				
Chlordane	57749	2.4	0.0043	0.09	0.004	**[**0.0080**]** *0.0031a*	**[**0.0081**]** *0.0032a*	0.002
Chlorpyrifos	2921882	0.083	0.041	0.011	0.0056			
Diazinon	333415	0.17	0.17	0.82	0.82			
Dieldrin	60571	0.24	0.056	0.71	0.0019	**[**0.00052**]** *0.000012a*	**[**0.00054**]** *0.000012a*	
Endosulfan Sulfate	1031078					**[**62**]** *20*	**[**89**]** *40*	
Endrin	72208	0.086	0.036	0.037	0.0023	0.059	0.060	0.002
Endrin Aldehyde	7421934					**[**0.29**]** *1*	**[**0.30**]** *1*	
gamma-BHC (Lindane)	58899	0.95		0.16		**[**0.98**]** *4.2*	**[**1.8**]** *4.4*	0.0002
Heptachlor	76448	0.52	0.0038	0.053	0.0036	**[**0.00079**]** *0.000059a*	**[**0.00079**]** *0.000059a*	0.0004
Heptachlor Epoxide	1024573	0.52	0.0038	0.053	0.0036	**[**0.00039**]** *0.00032a*	**[**0.00039**]** *0.00032a*	0.0002

Polychlorinated Biphenyls PCBs			0.014		0.03	0.00064[a]	0.00064[a]	0.0005
Toxaphene	8001352	0.73	0.002	0.21	0.002	**[**0.0028**]** *0.007*[a]	**[**0.0028**]** *0.0071*[a]	0.003
Tributyltin (TBT)		0.46	0.072	0.42	0.0074			
Pentachlorobenzene	*608935*					*0.1*	*0.1*	
Pentachlorophenol (PCP)**[**1**]**	87865	19	15	13	7.9	2.7[a]	30[a]	0.001

[[1] Refer to §D of this regulation.**]**

[a] *Criterion is based on a carcinogenic risk level of 10^{-5}.*

***** Drinking water MCLs apply to Public Water Supply designated waters only.

H. Acute Numeric Toxic Substance Criteria for Ammonia for the Protection of Fresh Water Aquatic Life [(Table 1)].

(1) The use of Tables 3 and 4 requires documentation acceptable to the Department of the absence of fresh water mussels using the methods outlined in the document, "Procedures for Applying the Mussel-Absent Ammonia Criteria to Maryland Surface Waters", which is incorporated by reference.

[(1)**]** *(2)* Presence of Salmonid Fish. In Class III, III-P, IV, and IV-P waters, the concentration of total ammonia (in milligrams of nitrogen per liter) may not exceed the acute criterion listed [under "Salmonids Present"] in Table 1.

[(2)**]** *(3)* Absence of Salmonid Fish. In Class I and I-P waters, the concentration of total ammonia (in milligrams of nitrogen per liter) may not exceed the acute criterion listed **[**under "Salmonids Absent"**]** in Table [1]*2*.

(4) Presence of Salmonid Fish and Absence of Freshwater Mussels. In Class III, III-P, IV, and IV-P waters, the concentration of total ammonia (in milligrams of nitrogen per liter) may not exceed the acute criterion listed in Table 3.

(5) Absence of Salmonid Fish and Absence of Freshwater Mussels. In Class I and I-P waters, the concentration of total ammonia (in milligrams of nitrogen per liter) may not exceed the acute criterion listed in Table 4.

[(3)**]** *(6)* Table 1. Acute Water Quality Criteria for Freshwater Aquatic Life for Ammonia *Where Salmonids May Be Present* (milligrams of nitrogen per liter)*[1]*.

[

pH	Salmonids Present[1]	Salmonids Absent[2]
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0

6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

[1] The acute water quality criteria for total ammonia where salmonids may be present was calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids present) =

$$\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}}$$

[2] The acute water quality criteria for total ammonia where salmonids are absent were calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids absent) =

$$\frac{0.411}{1+10^{7.204-pH}}+\frac{58.4}{1+10^{pH-7.204}}$$

]

	Temperature (°C)																
pH	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
6.5	32.6	32.6	31.6	29.1	26.8	24.6	22.7	20.9	19.2	17.7	16.3	15.0	13.8	12.7	11.7	10.8	9.9
6.6	31.3	31.3	30.3	27.9	25.7	23.6	21.8	20.0	18.4	17.0	15.6	14.4	13.2	12.2	11.2	10.3	9.5
6.7	29.8	29.8	28.8	26.5	24.4	22.5	20.7	19.0	17.5	16.1	14.9	13.7	12.6	11.6	10.7	9.8	9.0
6.8	28.0	28.0	27.2	25.0	23.0	21.2	19.5	18.0	16.5	15.2	14.0	12.9	11.9	10.9	10.0	9.2	8.5
6.9	26.2	26.2	25.3	23.3	21.5	19.8	18.2	16.7	15.4	14.2	13.1	12.0	11.1	10.2	9.4	8.6	7.9
7.0	24.1	24.1	23.3	21.5	19.8	18.2	16.8	15.4	14.2	13.1	12.0	11.1	10.2	9.4	8.6	7.9	7.3
7.1	21.9	21.9	21.3	19.6	18.0	16.6	15.3	14.0	12.9	11.9	11.0	10.1	9.3	8.5	7.9	7.2	6.7
7.2	19.7	19.7	19.1	17.6	16.2	14.9	13.7	12.6	11.6	10.7	9.8	9.1	8.3	7.7	7.1	6.5	6.0
7.3	17.5	17.5	17.0	15.6	14.4	13.2	12.2	11.2	10.3	9.5	8.7	8.0	7.4	6.8	6.3	5.8	5.3
7.4	15.3	15.3	14.9	13.7	12.6	11.6	10.7	9.8	9.0	8.3	7.7	7.0	6.5	6.0	5.5	5.1	4.7
7.5	13.3	13.3	12.9	11.8	10.9	10.0	9.2	8.5	7.8	7.2	6.6	6.1	5.6	5.2	4.8	4.4	4.0
7.6	11.4	11.4	11.0	10.1	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5
7.7	9.6	9.6	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5	3.2	2.9
7.8	8.1	8.1	7.9	7.2	6.7	6.1	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.2	2.9	2.7	2.5
7.9	6.8	6.8	6.6	6.0	5.6	5.1	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1
8.0	5.6	5.6	5.4	5.0	4.6	4.2	3.9	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.7
8.1	4.6	4.6	4.5	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4
8.2	3.8	3.8	3.7	3.4	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2
8.3	3.1	3.1	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	1.0
8.4	2.6	2.6	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8
8.5	2.1	2.1	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.6
8.6	1.8	1.8	1.7	1.6	1.5	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5
8.7	1.5	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4
8.8	1.2	1.2	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4
8.9	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3
9.0	0.9	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3

[1] The acute water quality criteria for total ammonia where salmonids may be present was calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids present) =

$$CMC = MIN\left[\left(\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}\right),\left(0.7249*\left(\frac{0.0114}{1+10^{7.204-pH}}+\frac{1.6181}{1+10^{pH-7.204}}\right)*\left(23.12*10^{0.036*(20-T)}\right)\right)\right]$$

Where MIN indicates the lesser of the two values separated by a comma.

(7) Table 2. Acute Water Quality Criteria for Freshwater Aquatic Life for Ammonia Where Salmonids Are Absent (milligrams of nitrogen per liter)[1].

	Temperature (°C)																				
pH	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***18***	***19***	***20***	***21***	***22***	***23***	***24***	***25***	***26***	***27***	***28***	***29***	***30***
6.5	*50.9*	*47.8*	*44.0*	*40.5*	*37.3*	*34.3*	*31.6*	*29.1*	*26.8*	*24.6*	*22.7*	*20.9*	*19.2*	*17.7*	*16.3*	*15.0*	*13.8*	*12.7*	*11.7*	*10.8*	*9.9*
6.6	*48.9*	*45.9*	*42.2*	*38.9*	*35.8*	*32.9*	*30.3*	*27.9*	*25.7*	*23.6*	*21.8*	*20.0*	*18.4*	*17.0*	*15.6*	*14.4*	*13.2*	*12.2*	*11.2*	*10.3*	*9.5*
6.7	*46.5*	*43.6*	*40.2*	*37.0*	*34.0*	*31.3*	*28.8*	*26.5*	*24.4*	*22.5*	*20.7*	*19.0*	*17.5*	*16.1*	*14.9*	*13.7*	*12.6*	*11.6*	*10.7*	*9.8*	*9.0*
6.8	*43.8*	*41.1*	*37.9*	*34.8*	*32.1*	*29.5*	*27.2*	*25.0*	*23.0*	*21.2*	*19.5*	*18.0*	*16.5*	*15.2*	*14.0*	*12.9*	*11.9*	*10.9*	*10.0*	*9.2*	*8.5*
6.9	*40.8*	*38.3*	*35.3*	*32.5*	*29.9*	*27.5*	*25.3*	*23.3*	*21.5*	*19.8*	*18.2*	*16.7*	*15.4*	*14.2*	*13.1*	*12.0*	*11.1*	*10.2*	*9.4*	*8.6*	*7.9*
7.0	*37.6*	*35.3*	*32.5*	*29.9*	*27.6*	*25.4*	*23.3*	*21.5*	*19.8*	*18.2*	*16.8*	*15.4*	*14.2*	*13.1*	*12.0*	*11.1*	*10.2*	*9.4*	*8.6*	*7.9*	*7.3*
7.1	*34.3*	*32.2*	*29.6*	*27.3*	*25.1*	*23.1*	*21.3*	*19.6*	*18.0*	*16.6*	*15.3*	*14.0*	*12.9*	*11.9*	*11.0*	*10.1*	*9.3*	*8.5*	*7.9*	*7.2*	*6.7*
7.2	*30.8*	*28.9*	*26.6*	*24.5*	*22.6*	*20.8*	*19.1*	*17.6*	*16.2*	*14.9*	*13.7*	*12.6*	*11.6*	*10.7*	*9.8*	*9.1*	*8.3*	*7.7*	*7.1*	*6.5*	*6.0*
7.3	*27.3*	*25.7*	*23.6*	*21.7*	*20.0*	*18.4*	*17.0*	*15.6*	*14.4*	*13.2*	*12.2*	*11.2*	*10.3*	*9.5*	*8.7*	*8.0*	*7.4*	*6.8*	*6.3*	*5.8*	*5.3*
7.4	*24.0*	*22.5*	*20.7*	*19.1*	*17.5*	*16.1*	*14.9*	*13.7*	*12.6*	*11.6*	*10.7*	*9.8*	*9.0*	*8.3*	*7.7*	*7.0*	*6.5*	*6.0*	*5.5*	*5.1*	*4.7*
7.5	*20.7*	*19.5*	*17.9*	*16.5*	*15.2*	*14.0*	*12.9*	*11.8*	*10.9*	*10.0*	*9.2*	*8.5*	*7.8*	*7.2*	*6.6*	*6.1*	*5.6*	*5.2*	*4.8*	*4.4*	*4.0*
7.6	*17.8*	*16.7*	*15.4*	*14.1*	*13.0*	*12.0*	*11.0*	*10.1*	*9.3*	*8.6*	*7.9*	*7.3*	*6.7*	*6.2*	*5.7*	*5.2*	*4.8*	*4.4*	*4.1*	*3.8*	*3.5*
7.7	*15.1*	*14.1*	*13.0*	*12.0*	*11.0*	*10.1*	*9.3*	*8.6*	*7.9*	*7.3*	*6.7*	*6.2*	*5.7*	*5.2*	*4.8*	*4.4*	*4.1*	*3.8*	*3.5*	*3.2*	*2.9*
7.8	*12.7*	*11.9*	*10.9*	*10.1*	*9.3*	*8.5*	*7.9*	*7.2*	*6.7*	*6.1*	*5.6*	*5.2*	*4.8*	*4.4*	*4.0*	*3.7*	*3.4*	*3.2*	*2.9*	*2.7*	*2.5*
7.9	*10.6*	*9.9*	*9.1*	*8.4*	*7.7*	*7.1*	*6.6*	*6.0*	*5.6*	*5.1*	*4.7*	*4.3*	*4.0*	*3.7*	*3.4*	*3.1*	*2.9*	*2.6*	*2.4*	*2.2*	*2.1*
8.0	*8.8*	*8.2*	*7.6*	*7.0*	*6.4*	*5.9*	*5.4*	*5.0*	*4.6*	*4.2*	*3.9*	*3.6*	*3.3*	*3.0*	*2.8*	*2.6*	*2.4*	*2.2*	*2.0*	*1.9*	*1.7*
8.1	*7.2*	*6.8*	*6.3*	*5.8*	*5.3*	*4.9*	*4.5*	*4.1*	*3.8*	*3.5*	*3.2*	*3.0*	*2.7*	*2.5*	*2.3*	*2.1*	*2.0*	*1.8*	*1.7*	*1.5*	*1.4*
8.2	*6.0*	*5.6*	*5.2*	*4.8*	*4.4*	*4.0*	*3.7*	*3.4*	*3.1*	*2.9*	*2.7*	*2.4*	*2.3*	*2.1*	*1.9*	*1.8*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*
8.3	*4.9*	*4.6*	*4.2*	*3.9*	*3.6*	*3.3*	*3.1*	*2.8*	*2.6*	*2.4*	*2.2*	*2.0*	*1.9*	*1.7*	*1.6*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*1.0*
8.4	*4.1*	*3.8*	*3.5*	*3.2*	*3.0*	*2.7*	*2.5*	*2.3*	*2.1*	*2.0*	*1.8*	*1.7*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*
8.5	*3.3*	*3.1*	*2.9*	*2.7*	*2.4*	*2.3*	*2.1*	*1.9*	*1.8*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.6*
8.6	*2.8*	*2.6*	*2.4*	*2.2*	*2.0*	*1.9*	*1.7*	*1.6*	*1.5*	*1.3*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*

8.7	2.3	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4
8.8	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4
8.9	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3
9.0	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3

[1] The acute water quality criteria for total ammonia where salmonids are absent were calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids absent) =

$$CMC = \left[0.7249 * \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \right) * MIN \begin{pmatrix} 51.93, \\ 23.12 * 10^{0.036 * (20-T)} \end{pmatrix} \right]$$

Where MIN indicates the lesser of the two values separated by a comma.

(8) Table 3. Acute Water Quality Criteria for Freshwater Aquatic Life for Ammonia Where Salmonids May Be Present and Freshwater Mussels Are Absent (milligrams of nitrogen per liter)[1].

	Temperature (°C)																	
pH	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	31.4	28.9	26.6
6.6	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	30.1	27.7	25.5
6.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	28.7	26.4	24.3
6.8	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	27.0	24.9	22.9
6.9	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	25.2	23.2	21.3
7.0	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	23.2	21.4	19.7
7.1	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.1	19.5	17.9
7.2	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.0	17.5	16.1
7.3	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	16.9	15.5	14.3
7.4	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	14.8	13.6	12.5
7.5	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	12.8	11.8	10.8
7.6	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.0	10.1	9.3
7.7	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.3	8.5	7.9
7.8	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	7.8	7.2	6.6
7.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.5	6.0	5.5
8.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.4	5.0	4.6
8.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.1	3.8
8.2	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.4	3.1

8.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.0	2.8	2.6
8.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.3	2.1
8.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.7
8.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.4
8.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.2
8.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0
8.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8
9.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7

[1] The acute water quality criteria for total ammonia where salmonids are present and freshwater mussels are absent were calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids present and freshwater mussels absent) =

$$MIN\left[\left(\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}\right),\left(0.7249*\left(\frac{0.0114}{1+10^{7.204-pH}}+\frac{1.6181}{1+10^{pH-7.204}}\right)*(62.15*10^{0.036*(20-T)})\right)\right]$$

Where MIN indicates the lesser of the two values separated by a comma.

(9) Table 4. Acute Water Quality Criteria for Freshwater Aquatic Life for Ammonia Where Salmonids Are Absent and Freshwater Mussels Are Absent (milligrams of nitrogen per liter)[1].

	Temperature (°C)																
pH	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
6.5	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	47.5	43.8	40.3	37.1	34.1	31.4	28.9	26.6
6.6	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9	45.6	42.0	38.6	35.6	32.7	30.1	27.7	25.5
6.7	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	43.4	39.9	36.8	33.8	31.1	28.7	26.4	24.3
6.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	40.9	37.6	34.6	31.9	29.3	27.0	24.9	22.9
6.9	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	38.1	35.1	32.3	29.7	27.4	25.2	23.2	21.3
7.0	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	35.1	32.3	29.8	27.4	25.2	23.2	21.4	19.7
7.1	34.3	34.3	34.3	34.3	34.3	34.3	34.3	34.3	34.3	32.0	29.4	27.1	24.9	23.0	21.1	19.5	17.9
7.2	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	28.8	26.5	24.4	22.4	20.6	19.0	17.5	16.1
7.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	25.5	23.5	21.6	19.9	18.3	16.9	15.5	14.3
7.4	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	22.4	20.6	18.9	17.4	16.1	14.8	13.6	12.5
7.5	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	19.4	17.8	16.4	15.1	13.9	12.8	11.8	10.8
7.6	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	16.6	15.3	14.0	12.9	11.9	11.0	10.1	9.3

7.7	*15.1*	*15.1*	*15.1*	*15.1*	*15.1*	*15.1*	*15.1*	*15.1*	*15.1*	*14.1*	*12.9*	*11.9*	*11.0*	*10.1*	*9.3*	*8.5*	*7.9*
7.8	*12.7*	*12.7*	*12.7*	*12.7*	*12.7*	*12.7*	*12.7*	*12.7*	*12.7*	*11.8*	*10.9*	*10.0*	*9.2*	*8.5*	*7.8*	*7.2*	*6.6*
7.9	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*9.9*	*9.1*	*8.4*	*7.7*	*7.1*	*6.5*	*6.0*	*5.5*
8.0	*8.8*	*8.8*	*8.8*	*8.8*	*8.8*	*8.8*	*8.8*	*8.8*	*8.8*	*8.2*	*7.5*	*6.9*	*6.4*	*5.9*	*5.4*	*5.0*	*4.6*
8.1	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*6.8*	*6.2*	*5.7*	*5.3*	*4.9*	*4.5*	*4.1*	*3.8*
8.2	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*5.6*	*5.1*	*4.7*	*4.3*	*4.0*	*3.7*	*3.4*	*3.1*
8.3	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.9*	*4.6*	*4.2*	*3.9*	*3.6*	*3.3*	*3.0*	*2.8*	*2.6*
8.4	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*	*3.8*	*3.5*	*3.2*	*2.9*	*2.7*	*2.5*	*2.3*	*2.1*
8.5	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.1*	*2.9*	*2.6*	*2.4*	*2.2*	*2.1*	*1.9*	*1.7*
8.6	*2.8*	*2.8*	*2.8*	*2.8*	*2.8*	*2.8*	*2.8*	*2.8*	*2.8*	*2.6*	*2.4*	*2.2*	*2.0*	*1.9*	*1.7*	*1.6*	*1.4*
8.7	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.1*	*2.0*	*1.8*	*1.7*	*1.5*	*1.4*	*1.3*	*1.2*
8.8	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.8*	*1.7*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*
8.9	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*0.9*	*0.8*
9.0	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*	*0.7*

[1] The acute water quality criteria for total ammonia where salmonids are present and freshwater mussels are absent were calculated using the following equation, which may also be used to calculate unlisted values: Acute water quality criteria for ammonia (salmonids present and freshwater mussels absent) =

$$\left[0.7249 * \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}}\right) * MIN\left(\begin{matrix}51.93,\\ 62.15 * 10^{0.036*(20-T)}\end{matrix}\right)\right]$$

Where MIN indicates the lesser of the two values separated by a comma.

I. Chronic Numeric Toxic Substance Criteria for Ammonia, Expressed as a 30-day Average, for the Protection of Fresh Water Aquatic Life **[**(Tables 1 and 2)**]**.

(1) Averaging Period. The concentration of total ammonia nitrogen (in milligrams of nitrogen per liter) expressed as a 30-day average may not exceed the chronic criterion listed in Tables 1 **[**or**]**, 2, *or 3*.

(2) The use of Table **[**2**]** *3* requires documentation acceptable to the Department of the absence of fish early life stages.

(3) The use of Table 2 or 3 requires documentation acceptable to the Department of the absence of fresh water mussels using the methods outlined in the document Procedures for Applying Mussel-Absent Ammonia Criteria to Maryland Surface Waters.

[(3)**]** *(4)* In addition, the highest 4-day average within the 30-day period may not exceed 2 1/2 times the chronic criterion.

[(4)**]** *(5)* Table 1. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages May Be Present (milligrams of nitrogen per liter).1

[

Temperature (°C)										
pH	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562

8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

[1] The freshwater chronic water quality criteria for total ammonia where fish early life stages may be present were calculated using the following equation, which may also be used to calculate unlisted values:

Freshwater chronic water quality criterion for ammonia (fish early life stages present)

$$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN(2.85,1.45\times10^{0.028\times(25-T)})$$

=

Where MIN indicates the lesser of the two values separated by a comma.**]**

	Temperature (°C)																							
pH	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
6.5	*4.9*	*4.6*	*4.3*	*4.0*	*3.8*	*3.6*	*3.3*	*3.1*	*2.9*	*2.8*	*2.6*	*2.4*	*2.3*	*2.1*	*2.0*	*1.9*	*1.8*	*1.6*	*1.5*	*1.4*	*1.4*	*1.3*	*1.2*	*1.1*
6.6	*4.8*	*4.5*	*4.3*	*4.0*	*3.7*	*3.5*	*3.3*	*3.1*	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*2.0*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*
6.7	*4.7*	*4.4*	*4.2*	*3.9*	*3.7*	*3.4*	*3.2*	*3.0*	*2.8*	*2.7*	*2.5*	*2.3*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*
6.8	*4.6*	*4.3*	*4.1*	*3.8*	*3.6*	*3.4*	*3.1*	*3.0*	*2.8*	*2.6*	*2.4*	*2.3*	*2.1*	*2.0*	*1.9*	*1.8*	*1.7*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*
6.9	*4.5*	*4.2*	*4.0*	*3.7*	*3.5*	*3.3*	*3.1*	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*
7	*4.3*	*4.1*	*3.8*	*3.6*	*3.4*	*3.1*	*2.9*	*2.8*	*2.6*	*2.4*	*2.3*	*2.1*	*2.0*	*1.9*	*1.8*	*1.7*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*
7.1	*4.2*	*3.9*	*3.7*	*3.4*	*3.2*	*3.0*	*2.8*	*2.6*	*2.5*	*2.3*	*2.2*	*2.0*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*
7.2	*3.9*	*3.7*	*3.5*	*3.3*	*3.1*	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*
7.3	*3.7*	*3.5*	*3.3*	*3.1*	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*
7.4	*3.5*	*3.2*	*3.0*	*2.8*	*2.7*	*2.5*	*2.3*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*	*0.8*
7.5	*3.2*	*3.0*	*2.8*	*2.6*	*2.5*	*2.3*	*2.2*	*2.0*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*
7.6	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*2.0*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.7*
7.7	*2.6*	*2.4*	*2.3*	*2.1*	*2.0*	*1.9*	*1.8*	*1.6*	*1.5*	*1.4*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*
7.8	*2.3*	*2.1*	*2.0*	*1.9*	*1.8*	*1.7*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.6*	*0.5*
7.9	*2.0*	*1.9*	*1.7*	*1.6*	*1.5*	*1.4*	*1.4*	*1.3*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.5*
8	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*
8.1	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*

8.2	*1.2*	*1.2*	*1.1*	*1.0*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*
8.3	*1.0*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*
8.4	*0.9*	*0.8*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
8.5	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
8.6	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*
8.7	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
8.8	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
8.9	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
9	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*

[1] The freshwater chronic water quality criteria for total ammonia where fish early life stages may be present were calculated using the following equation, which may also be used to calculate unlisted values:

Freshwater chronic water quality criterion for ammonia (fish early life stages present)=

$$\left[0.9405 * \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) * MIN\left(\begin{matrix}6.920,\\ 7.547 * 10^{0.028*(20-T)}\end{matrix}\right)\right]$$

Where MIN indicates the lesser of the two values separated by a comma.

[(5)**]** *(6)* Table 2. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages Are [Absent] *Present and Freshwater mussels are absent* (milligrams of nitrogen per liter).1

[

Temperature (°C)										
pH	0—7	8	9	10	11	12	13	14	15[2]	16[2]
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36	5.97
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25	5.86
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10	5.72
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73	5.37
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49	5.15
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22	4.90

7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92	4.61
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.990
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471	0.442

[1]The freshwater chronic water quality criteria for total ammonia where fish early life stages are absent were calculated using the following equation, which may also be used to calculate unlisted values:

Freshwater chronic water quality criterion for ammonia (fish early life stages absent) =

$$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times 1.45\times 10^{0.028\times(25-MAX(T,7))}$$

Where MAX indicates the greater of the two values separated by a comma.

[2]At 15°C and above, the criterion for fish early life stage absent is the same as the criterion for fish early life stage present. **]**

Temperature (°C)																	
pH	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
6.5	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.3*	*7.0*	*6.6*	*6.2*	*5.8*	*5.4*	*5.1*	*4.8*	*4.5*	*4.2*
6.6	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*7.2*	*6.9*	*6.5*	*6.1*	*5.7*	*5.3*	*5.0*	*4.7*	*4.4*	*4.1*
6.7	*7.1*	*7.1*	*7.1*	*7.1*	*7.1*	*7.1*	*7.1*	*7.1*	*6.8*	*6.4*	*6.0*	*5.6*	*5.2*	*4.9*	*4.6*	*4.3*	*4.1*
6.8	*6.9*	*6.9*	*6.9*	*6.9*	*6.9*	*6.9*	*6.9*	*6.9*	*6.6*	*6.2*	*5.8*	*5.5*	*5.1*	*4.8*	*4.5*	*4.2*	*4.0*
6.9	*6.7*	*6.7*	*6.7*	*6.7*	*6.7*	*6.7*	*6.7*	*6.7*	*6.4*	*6.0*	*5.7*	*5.3*	*5.0*	*4.7*	*4.4*	*4.1*	*3.8*
7	*6.5*	*6.5*	*6.5*	*6.5*	*6.5*	*6.5*	*6.5*	*6.5*	*6.2*	*5.8*	*5.5*	*5.1*	*4.8*	*4.5*	*4.2*	*4.0*	*3.7*
7.1	*6.2*	*6.2*	*6.2*	*6.2*	*6.2*	*6.2*	*6.2*	*6.2*	*5.9*	*5.6*	*5.2*	*4.9*	*4.6*	*4.3*	*4.0*	*3.8*	*3.6*
7.2	*5.9*	*5.9*	*5.9*	*5.9*	*5.9*	*5.9*	*5.9*	*5.9*	*5.6*	*5.3*	*5.0*	*4.7*	*4.4*	*4.1*	*3.8*	*3.6*	*3.4*
7.3	*5.5*	*5.5*	*5.5*	*5.5*	*5.5*	*5.5*	*5.5*	*5.5*	*5.3*	*5.0*	*4.7*	*4.4*	*4.1*	*3.8*	*3.6*	*3.4*	*3.2*
7.4	*5.2*	*5.2*	*5.2*	*5.2*	*5.2*	*5.2*	*5.2*	*5.2*	*4.9*	*4.6*	*4.3*	*4.1*	*3.8*	*3.6*	*3.4*	*3.1*	*2.9*
7.5	*4.7*	*4.7*	*4.7*	*4.7*	*4.7*	*4.7*	*4.7*	*4.7*	*4.5*	*4.3*	*4.0*	*3.7*	*3.5*	*3.3*	*3.1*	*2.9*	*2.7*
7.6	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.1*	*3.9*	*3.6*	*3.4*	*3.2*	*3.0*	*2.8*	*2.6*	*2.5*
7.7	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*3.7*	*3.5*	*3.2*	*3.0*	*2.9*	*2.7*	*2.5*	*2.3*	*2.2*
7.8	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.3*	*3.1*	*2.9*	*2.7*	*2.5*	*2.4*	*2.2*	*2.1*	*1.9*
7.9	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*2.8*	*2.7*	*2.5*	*2.3*	*2.2*	*2.1*	*1.9*	*1.8*	*1.7*
8	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.5*	*2.3*	*2.2*	*2.0*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*
8.1	*2.2*	*2.2*	*2.2*	*2.2*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.0*	*1.8*	*1.7*	*1.6*	*1.5*	*1.4*	*1.3*	*1.2*
8.2	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.7*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*
8.3	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*	*0.9*
8.4	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.2*	*1.1*	*1.1*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*
8.5	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*
8.6	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.9*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*
8.7	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*
8.8	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*
8.9	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*
9	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*

[1] The freshwater chronic water quality criteria for total ammonia where fish early life stages are present but freshwater mussels are absent were calculated using the following equation, which may also be used to calculate unlisted values:

Freshwater chronic water quality criterion for ammonia (fish early life stages present and freshwater mussels absent)=

$$\left[0.9405*\left(\frac{0.0278}{1+10^{7.688-pH}}+\frac{1.1994}{1+10^{pH-7.688}}\right)*MIN\left(\begin{matrix}6.920,\\ 7.547*10^{0.028*(20-T)}\end{matrix}\right)\right]$$

Where MIN indicates the lesser of the two values separated by a comma.

(7) Table 3. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages Are Absent and Freshwater Mussels Are Absent (milligrams of nitrogen per liter).1

	Temperature (°C)																							
pH	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
6.5	18.5	17.3	16.2	15.2	14.3	13.4	12.6	11.8	11.0	10.3	9.7	9.1	8.5	8.0	7.5	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2
6.6	18.2	17.1	16.0	15.0	14.1	13.2	12.4	11.6	10.9	10.2	9.6	9.0	8.4	7.9	7.4	6.9	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1
6.7	17.8	16.7	15.7	14.7	13.8	12.9	12.1	11.4	10.7	10.0	9.4	8.8	8.2	7.7	7.2	6.8	6.4	6.0	5.6	5.2	4.9	4.6	4.3	4.1
6.8	17.4	16.3	15.3	14.4	13.5	12.6	11.8	11.1	10.4	9.8	9.1	8.6	8.0	7.5	7.1	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0
6.9	16.9	15.9	14.9	13.9	13.1	12.3	11.5	10.8	10.1	9.5	8.9	8.3	7.8	7.3	6.9	6.4	6.0	5.7	5.3	5.0	4.7	4.4	4.1	3.8
7	16.3	15.3	14.4	13.5	12.6	11.8	11.1	10.4	9.8	9.1	8.6	8.0	7.5	7.1	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0	3.7
7.1	15.6	14.7	13.8	12.9	12.1	11.3	10.6	10.0	9.3	8.8	8.2	7.7	7.2	6.8	6.3	5.9	5.6	5.2	4.9	4.6	4.3	4.0	3.8	3.6
7.2	14.9	13.9	13.1	12.2	11.5	10.8	10.1	9.5	8.9	8.3	7.8	7.3	6.9	6.4	6.0	5.6	5.3	5.0	4.7	4.4	4.1	3.8	3.6	3.4
7.3	14.0	13.1	12.3	11.5	10.8	10.1	9.5	8.9	8.3	7.8	7.3	6.9	6.4	6.0	5.7	5.3	5.0	4.7	4.4	4.1	3.8	3.6	3.4	3.2
7.4	13.0	12.2	11.4	10.7	10.0	9.4	8.8	8.3	7.8	7.3	6.8	6.4	6.0	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.6	3.4	3.1	2.9
7.5	11.9	11.2	10.5	9.8	9.2	8.6	8.1	7.6	7.1	6.7	6.3	5.9	5.5	5.2	4.8	4.5	4.3	4.0	3.7	3.5	3.3	3.1	2.9	2.7
7.6	10.8	10.2	9.5	8.9	8.4	7.8	7.4	6.9	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0	2.8	2.6	2.5
7.7	9.7	9.1	8.5	8.0	7.5	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2	3.9	3.7	3.5	3.2	3.0	2.9	2.7	2.5	2.3	2.2
7.8	8.6	8.0	7.5	7.1	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	1.9
7.9	7.5	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2	3.9	3.7	3.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7
8	6.5	6.0	5.7	5.3	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0	2.8	2.6	2.5	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5
8.1	5.5	5.2	4.8	4.5	4.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2
8.2	4.6	4.3	4.1	3.8	3.6	3.4	3.1	2.9	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.5	1.5	1.4	1.3	1.2	1.1	1.1
8.3	3.9	3.6	3.4	3.2	3.0	2.8	2.6	2.5	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.9
8.4	3.2	3.0	2.8	2.6	2.5	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7
8.5	2.6	2.5	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6
8.6	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5
8.7	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4
8.8	1.4	1.3	1.2	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3
8.9	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
9	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2

[1] The freshwater chronic water quality criteria for total ammonia where fish early life stages are present but freshwater mussels are absent were calculated using the following equation, which may also be used to calculate unlisted values:

Freshwater chronic water quality criterion for ammonia (fish early life stages present and freshwater mussels absent)=

$$\left(0.9405*\left(\frac{0.0278}{1+10^{7.688-pH}}+\frac{1.1994}{1+10^{pH-7.688}}\right)*\left(7.547*10^{0.028*(20-MAX(T,7))}\right)\right)$$

Where MAX indicates the greater of the two values separated by a comma.

J—K (text unchanged)

COMAR 26.08.02.03-3 Water Quality Criteria Specific to Designated Uses

Summary of Changes: Revisions to COMAR 26.08.02.03-3 consisted of the following five changes:

1. Clarification as to when the 7-day average dissolved oxygen criterion applies to the Seasonal and Migratory Fish Spawning and Nursery subcategory designated use (i.e., only when salinities are less than or equal to 0.5 parts per thousand).
2. The removal or update of dissolved oxygen restoration variances for several segments of the Chesapeake Bay and its tidal tributaries. The proposed changes include:
   - Increasing the Chesapeake Bay Mainstem Segment 4 Mesohaline (CB4MH) deep-channel refuge subcategory use restoration variance from 2 percent to 6 percent.
   - Decreasing the Chesapeake Bay Mainstem Segment 4 Mesohaline (CB4MH) deep-water fish and shellfish subcategory use restoration variance from 7 percent to 5 percent.
   - Removing the lower Chester River Mesohaline (CHSMH) deep-channel refuge subcategory use restoration variance of 16 percent.
   - Removing the Patapsco River Mesohaline (PATMH) deep-water fish and shellfish subcategory use restoration variance of 7 percent.
3. Incorporating by reference the 2017 Addendum to the "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries" to the paragraph that discusses implementing the dissolved oxygen standard.
4. Correcting an internal table reference for the table that provides the submerged aquatic vegetation (SAV) restoration goal acreages.
5. Correcting a typo in the paragraph that provides the segments that are entirely SAV no grow zones.

Specific Changes to Regulation: 26.08.02.03-3 Water Quality Criteria Specific to Designated Uses.

26.08.02.03-3

.03-3 Water Quality Criteria Specific to Designated Uses

A.— B. (text unchanged)
C. Criteria for Class II Waters — Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting.
(1)— (7) (text unchanged)
(8) Dissolved Oxygen Criteria for Class II Waters.
(a) (text unchanged)
(b) Seasonal and Migratory Fish Spawning and Nursery Subcategory. The dissolved oxygen concentrations in areas designated as migratory spawning and nursery seasonal use shall be:
(i) Greater than or equal to 6 milligrams/liter for a 7-day averaging period from February 1 through May 31 *(salinity less than or equal to 0.5 parts per thousand)*;
(ii) -(iii) (text unchanged)
(c)— (d) (text unchanged)
(e) Seasonal Deep-Water Fish and Shellfish Subcategory. The dissolved oxygen concentrations in areas designated as seasonal deep-water fish and shellfish subcategory shall be:

(i) —(iii) (text unchanged)

(iv) The open-water fish and shellfish subcategory criteria apply from October 1 to May 31; *and*

(v) For the dissolved oxygen criteria restoration variance for Chesapeake Bay Mainstem Segment 4 mesohaline (CB4MH) seasonal deep-water fish and shellfish subcategory, not lower for dissolved oxygen in segment CB4MH than the stated criteria for the seasonal deep-water seasonal fish and shellfish use for more than **[**7**]***5* percent spatially and temporally (in combination), from June 1 to September 30**[**; and

(vi) For dissolved oxygen criteria restoration variance for Patapsco River mesohaline (PATMH) seasonal deep-water fish and shellfish subcategory, not lower for dissolved oxygen in segment PATMH than the stated criteria for the deep-water seasonal fish and shellfish use for more than 7 percent spatially and temporally (in combination), from June 1 to September 30.**]**.

(f) Seasonal Deep-Channel Refuge Subcategory. The dissolved oxygen concentrations in areas designated as deep-channel seasonal refuge use shall be:

(i) (text unchanged)

(ii) For dissolved oxygen criteria restoration variance for Chesapeake Bay Mainstem Segment 4 mesohaline (CB4MH) deep-channel refuge subcategory, not lower for dissolved oxygen in segment CB4MH than the stated criteria for the seasonal deep-channel refuge for more than **[**2**]** *6* percent spatially or temporally (in combination), from June 1 to September 30;

[(iii) For the dissolved oxygen criteria restoration variance for Lower Chester River Mesohaline (CHSMH) seasonal deep-channel refuge subcategory, not lower for dissolved oxygen in segment CHSMH than the stated criteria for the seasonal deep-channel refuge use for more than 16 percent spatially and temporally (in combination), from June 1 to September 30;**]**

[(iv)**]** *(iii)* **-** **[**(v)**]** *(iv)* (text unchanged)

(g) Implementation of the Dissolved Oxygen Water Quality Standard. The attainment of the dissolved oxygen criteria that apply to the Chesapeake Bay and tidally influenced tributary waters shall be determined using the guidelines established in the U.S. Environmental Protection Agency publications "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries (EPA 903-R-03-002), Chapter III"**[**, "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries (EPA 903-R-03-002), Chapter III",**]***;* "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries—2004 Addendum (EPA 903-R-04-005)*,* Chapter V"**[**,**]***;* "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries—2007 Addendum (EPA 903-R-07-003), Chapter IV"**[**,**]***;* "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries — 2008 Technical Support for Criteria Assessment Protocols Addendum (EPA 903-R-08-001), Chapter III"**[**„*;* and**]***;* "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries — 2010 Technical Support for Criteria Assessment Protocols Addendum (EPA 903-R-10-002), Chapters II and III"**[**,**]***; and "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries — 2017 Technical Addendum (EPA 903-R-17-002), Chapters II and III";* which are incorporated by reference.

(h) (text unchanged)

(9) Water Clarity Criteria for Seasonal Shallow-Water Submerged Aquatic Vegetation Subcategory.

(a) Water Clarity Criteria Measurement. A Bay segment has attained the shallow water designated use if:

(i) Submerged aquatic vegetation (SAV) acreage meets or exceeds the SAV acreage restoration goal in Table [2]*3* of this regulation;

(ii) The shallow-water acreage that meets or exceeds the water clarity criterion expressed in Secchi depth equivalence from Table **[**1**]** *2* of this regulation at the segment specific application depth specified in Regulation .08 of this chapter (excluding SAV no

grow zones) is 2.5 times greater than the SAV Acreage Restoration Goal from Table [2]*3* of this regulation; or

(iii) (text unchanged)

(a-1) (text unchanged)

(b) — (c) (text unchanged)

(d) SAV No Grow Zones. Certain Chesapeake Bay segments contain areas designated as shallow water use that are not suitable for growth of submerged aquatic vegetation due to natural conditions and permanent physical alterations. Tables V-1 and Figures V-1 to V-12 in the 2004 U.S. Environmental Protection Agency publication "Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability — 2004 Addendum (EPA 903-R-04-006)", which is incorporated by reference, indicate the SAV No Grow Zones. The segments Upper Choptank River (CHOTF), Upper Nanticoke River **[**(NANTD)**]** *(NANTF)*, Upper Pocomoke River (POCTF), and Middle Pocomoke River Oligohaline (POCOH) are entirely SAV no grow zones, therefore, the shallow-water designated use does not apply to these segments.

(e) (text unchanged)

(10) — (11) (text unchanged)

C-1. — H. (text unchanged)

Antidegradation

Amendments to Maryland's Antidegradation Policy, proposed as part of this 2019 Triennial Review, clarify the department's responsibility to protect existing uses, include a significant reorganization of the Tier II Policy Implementation Procedures, and modify the list of Tier II waters. COMAR 26.08.02.04-1 no longer includes the Tier II Policy Implementation Procedures and instead describes the Tier I level of protection and existing use protections. The Tier II Policy Implementation Procedures were moved to 26.08.02.04-2 and the Tier III level of protection for Outstanding National Resource Waters is now described in the new regulation 26.08.02.04-3.

The specific regulations being revised are listed below along with a brief description of the proposed amendments followed by the amended regulatory language. Please note that when reviewing amended text, [text in brackets is deleted] while *text in italics is new*.

REGULATIONS MODIFIED

COMAR 26.08.02.04 Anti-degradation Policy

Summary of Changes: Minor additions are included in order to clarify the Department's responsibility and authority to protect existing uses. Furthermore, the term "Class" is replaced with "Use Class Designations" to be consistent with the last Triennial Review.

Specific Changes to Regulation: 26.08.02.04 Antidegradation Policy.

26.08.02.04

.04 [Anti-Degradation] ***Antidegradation*** **Policy.**

A. Waters of this State shall be protected and maintained for existing uses and the basic uses of water contact recreation, fishing, protection of aquatic life and wildlife, and agricultural and industrial water supply as identified in **[**Class I**]** *the Use Class designations*.

B. Consistent with the Federal Act, existing uses and the level of water quality necessary to protect existing uses for any water body shall be maintained.

[B**]***C*. - **[**C**]** *D*. (text unchanged)

[D**]** *E*. **[**The Department shall discourage the downgrading of any stream from a designated use with more stringent criteria to one with less stringent criteria. Downgrading may only be considered if:**]** *The Department shall ensure that existing uses are maintained and protected and support changes to designated uses and associated criteria in any circumstances where the designated use and criteria do not reflect and protect uses that are being attained. Changes in designated uses and associated criteria to less stringent uses and criteria may only be undertaken when:*

(1) — (3) (text unchanged)

[E**]** *F*. The Department shall provide public notice and opportunity for a public hearing on the proposed change before:

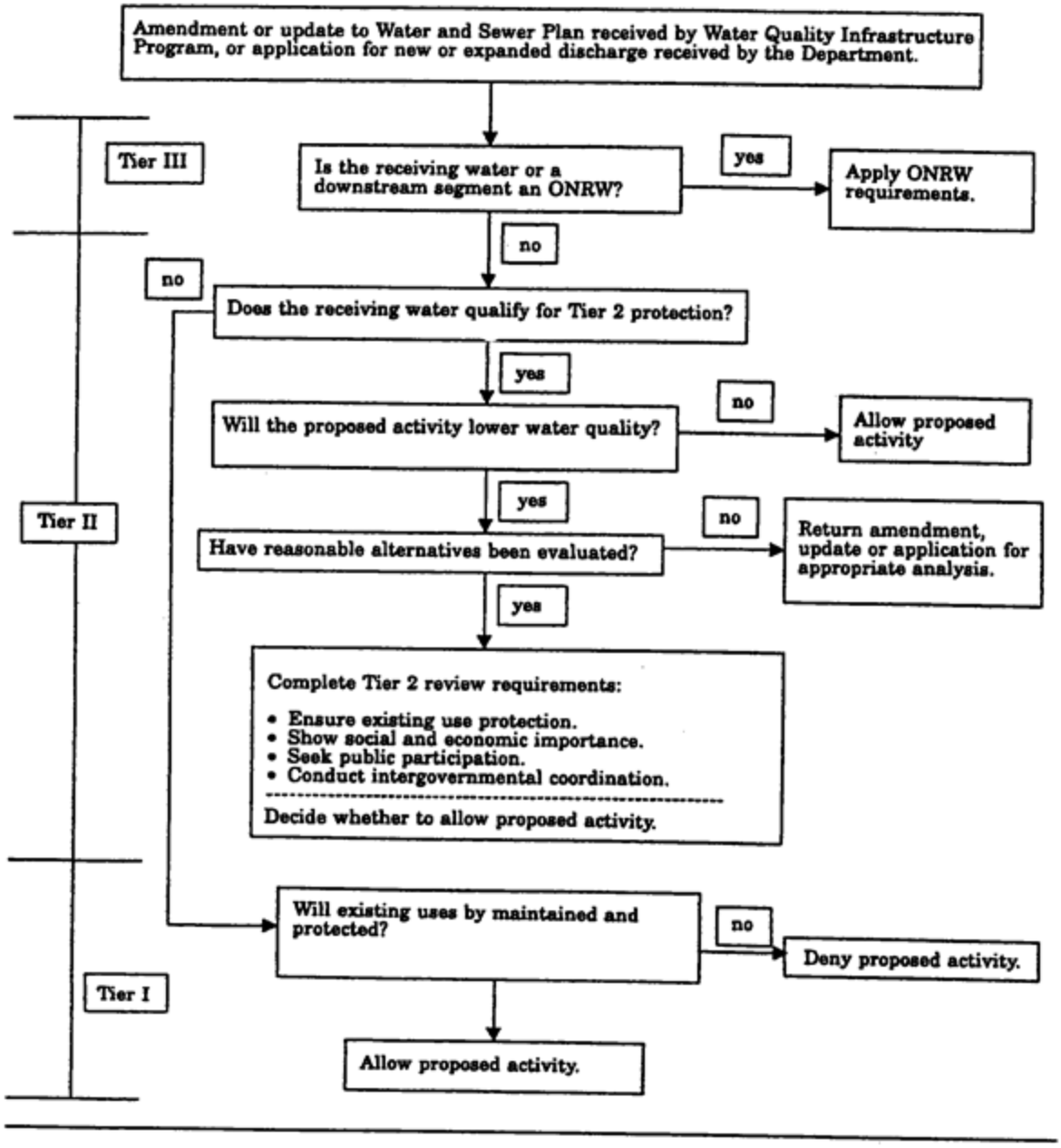
(1) (text unchanged)
(2) **[**Downgrading any**]** *Changing the* stream use designation.

[F**]** *G*. (text unchanged)

H. Maryland's Antidegradation Procedure Flow Chart

Click here to view flow chart

Maryland's Antidegradation Procedure



COMAR 26.08.02.04-1 Antidegradation Policy Implementation Procedures.

Summary of Changes: The repeal of and adoption of new regulation COMAR 26.08.02.04-1 is being proposed. This regulation has previously provided the implementation procedures for the Tier II level of protection. However, the changes proposed below move the implementation procedures for the Tier II level of protection to COMAR 26.08.02.04-2 and, in their place (within 26.08.02.04-1), provide the implementation procedures for the Tier I level of protection. This new text clarifies the Department's obligations, authority and procedures for protecting the existing uses of waters of the state.

Specific Changes to Regulation: COMAR 26.08.02.04-1 Antidegradation Policy Implementation Procedures

26.08.02.04-1

Repeal existing regulation 04.-1

.04-1 Antidegradation Policy Implementation Procedures: Tier I Level of Protection - Existing Uses and Designated Uses.

A. All waters of the State shall receive Tier I protection which requires the protection and maintenance of existing uses and designated uses.

B. Protections. Waters that have demonstrated an existing use that is not protected by the water quality criteria specified for the current designated use for this water body shall be protected so as to maintain the existing use and the water quality necessary to protect the existing use.

C. Implementation of the Tier I level of Protection for Cold Water Existing Uses. The determination and protection of cold water existing uses in Maryland will be implemented according to the "Cold Water Existing Use Determinations: Policy and Procedures (Maryland Department of the Environment, May 12, 2021)", which is incorporated by reference.

D. Compilation and Maintenance of the List of Waters with Existing Uses. The Department shall compile and maintain, on its website, a public list of the waters with an existing use that is not protected by the currently designated use and associated water quality criteria.

COMAR 26.08.02.04-2 Outstanding National Resource Water.

Summary of Changes to 26.08.02.04-2: The repeal of and adoption of new regulation is being proposed. The language that describes Tier II level of protection (including the list of Tier II waters) was moved from COMAR 26.08.02.04-1 to this section of COMAR (i.e., 26.08.02.04-2). Additionally, this language was reorganized for clarity. All regulatory language related to the Outstanding National Resource Waters (Tier III level of protection) was moved to a newly created regulation at COMAR 26.08.02.04-3.

Eleven Tier II segments were added to the list of Tier II waters based on recently assessed data that demonstrated high indices of biotic integrity scores. In addition, one Tier II stream segment was removed from the list of Tier II waters due to a locational error where monitoring stations had incorrect coordinates. The baseline scores of 3 Tier II stream segments were corrected and 2 Tier II stream segments that were erroneously removed during past regulatory changes are being re-included. These changes to the list of Tier II waters are summarized below in tables 1 - 4.

For additional detail on these changes to the Tier II list, please read the document titled "2019 Triennial Review of Water Quality Standards: Documentation of Changes to the List of Tier II High Quality Waters".

Table 1. Stream segment proposed for removal from the list of Tier II waters.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
Bear Creek 1	Garrett	39.65018	-79.28886	39.65046	-79.298011	Location correction	Several sampling events with high scores were incorrectly shown on an adjacent stream segment. Stream should not have been designated as Tier II.

Table 2. Tier II stream segments with baseline score corrections.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary

Bear Creek 4	Garrett	39.56476	-79.32195	39.65018	-79.28886	Baseline Score Correction	A site with high scores was missing from original calculations. When correctly added to the average for Bear Creek 4, the baseline scores changed.
Principio Creek UT 1	Cecil	39.61544	-76.05885	39.60709	-76.03070	Baseline Score Correction	Recalculated baseline score to reflect year of designation in accordance with sampling events used to calculate scores.
Timber Run 1	Baltimore Co.	39.44400	-76.84151	39.43794	-76.86878	Baseline Score Correction	Baseline FIBI corrected to 4.57 instead of the current 4.67 score due to a transcription error.

Table 3. Stream segments erroneously removed from Tier II list in 2018 and now being re-included.

Tier II Stream Name	**County**	**From Lat**	**From Long**	**To Lat**	**To Long**	**Reason for Proposed Adjustment**	**Summary**
North Branch Patapsco River UT 2	Baltimore Co.	39.494629	-76.86357	39.49571	-76.837947	Erroneously removed from the Tier II list in 2018	This Tier II water was erroneously removed from the Tier II list. Re-evaluation confirmed Tier II designation

Saint Clements Creek 2	Saint Mary's	38.358656	-76.727069	38.34856	-76.73058	Erroneously removed from the Tier II list in 2018	This Tier II water was erroneously removed from the Tier II list. Re-evaluation confirmed Tier II designation.

Table 4. New Tier II Stream segments.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
Laurel Run 1	Garrett	39.688371	-79.449636	39.6877	-79.439537	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation.
Sand Spring Run 1	Garrett	39.257794	-79.473281	39.272048	-79.474658	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Bush Cabin Run 1	Baltimore	39.599083	-76.707107	39.61048	-76.681793	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation

Deer Creek 1	Baltimore	39.713068	-76.597628	39.70742	-76.590096	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Deer Creek 9	Baltimore	39.72117	-76.609265	39.713068	-76.597628	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Mill Run 5	Charles	38.52755	-77.078741	38.52029	-77.090089	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Timothy Branch 1	Prince George's	38.710667	-76.854371	38.664667	-76.878959	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Wilson Owens Branch 1	Anne Arundel	38.825626	-76.68624	38.825834	-76.697119	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation

District Branch 1	Prince George's	38.866772	-76.719393	38.854804	-76.691683	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Morgan Creek UT 1	Kent	39.306198	-76.016172	39.289815	-76.020911	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation
Fannels Branch 1	Kent	39.189562	-76.107898	39.187236	-76.113317	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI≥4.00) justifying Tier II designation

Specific Changes to Regulation: COMAR 26.08.02.04-2 Outstanding National Resource Water.

26.08.02.04-2

Repeal existing regulation 04-2

04-2 Antidegradation Policy Implementation Procedures: Tier II Level of Protection - High Quality Waters.

A. In Maryland, the term "Tier II water" is defined as a water body with water quality that measures significantly better than that required by water quality standards to support its designated uses. A Tier II watershed is defined as the area of land that contributes runoff to a Tier II waterbody and any discharges to streams upstream of and including the Tier II waterbody. Significantly better is evaluated statistically to demonstrate at least a 90 percent certainty that the mean of the available data is better than the applicable standard (for example, the criterion is outside the outer bound of the 90 percent confidence interval). Water quality is considered significantly better and waters may be listed as Tier II, if the exclusion under §D of this regulation does not apply and if:

(a) Measured water quality characteristics for which numeric criteria have been promulgated are significantly better than the water quality criteria specified in Regulations .03—.03-3 of this chapter; or

(b) Maryland Biological Stream Survey assessment data indicate that both fish and benthic values of the index of biological integrity are 4.00 or greater.

B. Compilation and Maintenance of the List of High Quality Tier II Waters. The Department shall compile and maintain a public list of the Tier II waters. That list is contained in §N of this regulation. All readily available information may be considered to determine a listing. Tier II listings shall be made only for those specific characteristics for which monitoring data indicates the water body exceeds numeric water quality criteria or thresholds established under the narrative standards for biocriteria. The Department shall consider information available from the categories listed under §§A and D of this regulation.

C. Designation for Specific Water Quality Measures. Where a water body is designated a Tier II water based on a specific water quality measure, potential impacts to only that specific characteristic shall be subject to Tier II review. For example, where a water body is designated Tier II because of high dissolved oxygen, only potential impacts to dissolved oxygen are subject to Tier II review.

D. Waters That May Not Be Listed as Tier II. Water bodies included in the List of Impaired Waters (303(d) List) are not Tier II waters for the impairing substance.

E. Antidegradation Review - General. An antidegradation review of updated, new, or proposed amendments to Water and Sewerage Plans (County Plans), wetlands and waterways permits, water quality certifications, or discharge permits in a Tier II watershed is required to assure consistency with antidegradation requirements. An applicant for proposed amendments to County Plans, a wetlands and waterways permit, water quality certification, or discharge permits in a Tier II watershed that will result in a new, or an increased, permitted annual discharge of pollutants or a potential impact to water quality shall evaluate alternatives to eliminate or reduce discharges or impacts. If impacts are unavoidable (as defined in §H of this regulation), an applicant shall prepare and document a social and economic justification. The Department shall determine, through the public processes for each of these permits or authorizations, whether these activities can be justified.

F. Need for Tier II Antidegradation Review.

(1) Permits and Authorizations. Before submitting an application for a new or major modification of an existing discharge permit or Notice of Intent for authorization under a general permit, wetlands and waterways permit, or water quality certification, the discharger or applicant shall determine whether the receiving water body is in a Tier II watershed by consulting the list of Tier II waters.

(2) County Plans. As part of its continuing planning process, the Department shall review proposed updates or amendments to County Plans for any new or major modifications to discharges to a Tier II watershed. If a proposed update or amendment to a County Plan results in a new discharge or a major modification of an existing discharge to a Tier II watershed, the applicant shall perform a Tier II antidegradation review and:

(a) State final action letters for updated County Plans or proposed amendments to the County Plan, such as changes to water or sewerage service areas shall, at a minimum, include notification that portions of the updated Plan or amendments to service areas may impact Tier II watersheds; and

(b) For updates or amendments to the County Plans that require discharge permits that grant new discharges or an increase or modification to an existing discharge, the County shall be notified that the applicant for the permit will be required to complete an antidegradation review.

(3) Exemptions. The requirement to perform a Tier II antidegradation review does not apply to individual discharges of treated sanitary wastewater of less than 5,000 gallons per day, if all of the existing and designated uses continue to be met.

G. Tier II Antidegradation Review.

(1) If a Tier II antidegradation review is required, the applicant shall provide an analysis of reasonable alternatives that do not require direct discharge or a potential water quality impact to a Tier II watershed. The analysis shall include cost data and estimates to determine the cost effectiveness and feasibility of the alternatives.

(2) If the analysis in §G(1) of this regulation shows that the alternatives are cost effective and feasible, the alternative is required as a condition of the permit, authorization, or amendment to the County Plan.

(3) If the analysis in §G(1) of this regulation shows that the alternatives are not cost effective and feasible, the applicant shall provide the Department with plans to configure or structure the discharge or other regulated activities that may cause a potential water quality impact so as to minimize the use of the assimilative capacity of the water body. The assimilative capacity of the water body is the difference between the water quality at the time the water body was designated as Tier II, the baseline, and the water quality criterion.

(4) An applicant shall update an antidegradation review when applying for a new or major modification to an existing permit or authorization.

H. Potential Determinations Resulting from Antidegradation Reviews.

(1) If there is a cost-effective alternative to direct discharge or water quality impacts, the applicant shall implement the alternative and it shall be a condition of the permit or authorization.

(2) If there is no cost-effective alternative to direct discharge or water quality impacts, but there is potential for further minimization of the use of assimilative capacity, the applicant shall revise the initial application to further minimize the use of assimilative capacity, and it shall be a condition of the permit or authorization. If the minimization of the use of assimilative capacity is adequate, then no social and economic justification (SEJ) is required.

(3) If there is no cost-effective alternative to direct discharge or water quality impacts, minimization of the use of assimilative capacity is not adequate and, the SEJ does not justify the water quality impact, the permit application or authorization shall be denied.

(4) If there is no cost-effective alternative to direct discharge or water quality impacts, all reasonable efforts have been made to minimize the use of assimilative capacity, and the SEJ is adequate and justifies the discharge or water quality impacts, the discharge permit shall be granted subject to other applicable requirements.

I. Social and Economic Justification (SEJ).

(1) An SEJ shall be submitted if:

(a) No cost effective alternative to the discharge or water quality impacts is available; or

(b) The cumulative degradation resulting from nonpoint source pollution and any other permitted discharges would diminish water quality.

(2) To allow for natural variability, water quality shall be considered diminished only if the assimilative capacity as defined in §G(3) of this regulation is cumulatively reduced by more than 25 percent from the baseline water quality of either benthic or fish IBI value used to make the Tier II stream designation identified in §O of this regulation.

J. Demonstrating Social and Economic Justification for an Impact to Tier II Waters.

(1) In order to promote compact development, maintain habitat and open lands, and minimize water impacts in undeveloped areas, the requirement for social and economic justification is met if the following demonstrations are made:

(a) The watershed affecting the Tier II water is located in a priority funding area as defined in State Finance and Procurement Article, §5-7B-02, Annotated Code of Maryland;

(b) The Department determines, in consultation with the Maryland Department of Planning, that the local jurisdiction in which the watershed affecting Tier II waters are located, is using to the extent reasonably practical, innovative development approaches to minimize impacts to water quality from development;

(c) Physical development after the date of the Tier II listing is necessary to accommodate the projected growth within the watershed, and use of innovative development approaches are maximized to the extent reasonably practicable to encourage redevelopment, reuse and infill development; and

(d) If the Department of Planning's growth projections for the watershed affecting the Tier II waters demonstrate that additional physical development of undeveloped land is required to accommodate the projected growth and that development is consistent with the applicable county master plan.

(2) The approaches described in §J(1)(b) of this regulation include, but are not limited to, innovative stormwater management and sediment and erosion control design practices, green building design techniques, nutrient removal technology for septic systems, innovative technologies designed to reduce point source discharges of pollutants, uniform building codes designed to remove impediments to rehabilitation projects, model infill development guidelines designed by the Maryland Department of Planning, and transit-oriented development.

K. Components of the Social and Economic Justification.

(1) Components of the SEJ may vary depending on factors including, but not limited to, the extent and duration of the impact from the proposed discharge or regulated activity and the existing uses of the water body.

(2) The economic analyses shall include impacts that result from treatment beyond the costs to meet technology-based or water quality-based requirements.

(3) The economic analysis shall address the cost of maintaining high water quality in Tier II waters and the economic benefit of maintaining Tier II waters.

(4) The economic analysis shall determine whether the costs of the pollution controls needed to maintain the Tier II water would limit growth or development in the watershed including the Tier II water.

L. Department Responsibilities.

(1) The Department shall determine whether the SEJ is adequate and demonstrates that the costs of water pollution controls are reasonable and would not limit development or growth and, if not, shall determine whether lowering of the water quality is unavoidable for necessary development or growth to take place in the watershed.

(2) The Department shall determine whether the SEJ demonstrates that the impact to water quality is necessary for development or growth to take place in the watershed. Evaluation of the SEJ shall consider the relative magnitude of costs and benefits of development, recognizing the difficulty in quantifying benefits, and the extent to which denial of the amendment, permit, or authorization would substantially impact future development within the watershed.

(3) When the Department proposes to issue a tentative determination to either issue or deny the permit application, the notice of tentative determination shall state that these waters are designated as Tier II and, if applicable, that a social and economic justification is available for review.

(4) Existing in-stream water uses and the level of water quality necessary to protect existing uses shall be maintained and protected.

(5) All required point and nonpoint source controls under State statutes and regulations shall be achieved.

M. Public Participation.

(1) Public participation for a permit to discharge to a Tier II watershed is the same as that required for any permit subject to the Administrative Procedure Act or the requirements of Environment Article, Title 1, Subtitle 6, Annotated Code of Maryland.

(2) If an SEJ is not required, the public notice shall reflect the Tier II status of the waterbody and note that an SEJ is not required and note the justification.

(3) If an SEJ is required, the public notice shall reflect the Tier II status of the waterbody and note that an SEJ is required, and the Department shall make the SEJ available for review.

N. List of Tier II Waters Based on Maryland Biological Stream Survey (fish and benthic macroinvertebrate) Index Scores.

Date	*Stream Name*	*County*	*12-Digit Watershed*	*From Lat*	*From Long*	*To Lat*	*To Long*	*Baseline: Fish IBI*	*Benthic IBI*
2007	*Black Sulphur Run 1*	*Allegany*	*021405110138*	*39.66571*	*-78.49952*	*39.65183*	*-78.47808*	*4.33*	*4.25*
2007	*Elklick Run 1*	*Allegany*	*021410040090*	*39.57690*	*-78.91140*	*39.57095*	*-78.93507*	*4.00*	*4.50*
2007	*Fifteenmile Creek 1*	*Allegany*	*021405110137*	*39.71230*	*-78.44577*	*39.70747*	*-78.45106*	*4.67*	*4.25*
2003	*Fifteenmile Creek 3*	*Allegany*	*021405110135*	*39.64046*	*-78.39719*	*39.63082*	*-78.38600*	*5.00*	*4.25*
2007	*Fifteenmile Creek 4*	*Allegany*	*021405110137*	*39.71921*	*-78.44378*	*39.71230*	*-78.44577*	*4.67*	*4.00*
2007	*Fifteenmile Creek 5*	*Allegany*	*021405110137*	*39.70188*	*-78.44975*	*39.69293*	*-78.45128*	*4.67*	*4.25*
2011	*Fifteenmile Creek 6*	*Allegany*	*021405110135*	*39.65610*	*-78.40009*	*39.65591*	*-78.39701*	*4.67*	*4.00*
2007	*Town Creek 1*	*Allegany*	*021405120122*	*39.54048*	*-78.54280*	*39.52337*	*-78.54404*	*4.67*	*4.25*

2007	*White Sulphur Run 1*	*Allegany*	*02140511013737*	*39.65183*	*-78.47808*	*39.66107*	*-78.45709*	*4.00*	*4.25*
2003	*Sideling Hill Creek 1*	*Allegany, Washington*	*02140510014848*	*39.66097*	*-78.36225*	*39.63948*	*-78.33408*	*4.67*	*4.25*
2021	*Wilson Owens Branch 1*	*Anne Arundel*	*02131102091414*	*38.825626*	*-76.68624*	*38.825834*	*-76.697119*	*4.67*	*4.14*
2003	*Lyons Creek 1*	*Anne Arundel, Calvert*	*02131102091010*	*38.76807*	*-76.62204*	*38.76693*	*-76.63353*	*5.00*	*4.71*
2011	*Lyons Creek 3*	*Anne Arundel, Calvert*	*02131102090909*	*38.76472*	*-76.65905*	*38.75572*	*-76.67206*	*4.33*	*4.00*
2009	*Patuxent River 1*	*Anne Arundel, Prince George's*	*02131104093737*	*39.01110*	*-76.73676*	*39.00709*	*-76.73319*	*4.00*	*4.71*
2007	*Beetree Run 1*	*Baltimore Co.*	*02130805031111*	*39.68323*	*-76.66591*	*39.66633*	*-76.67247*	*4.33*	*5.00*
2007	*Blackrock Run 1*	*Baltimore Co.*	*02130805030303*	*39.54230*	*-76.73384*	*39.52739*	*-76.72217*	*4.67*	*4.00*
2021	*Bush Cabin Run 1*	*Baltimore Co.*	*02130805030606*	*39.599083*	*-76.707107*	*39.61048*	*-76.681793*	*4.00*	*4.84*
2007	*Cooks Branch 1*	*Baltimore Co.*	*02130907104848*	*39.43616*	*-76.84026*	*39.43789*	*-76.86894*	*4.67*	*4.84*
2007	*Cooks Branch 2*	*Baltimore Co.*	*02130907104848*	*39.43792*	*-76.86879*	*39.43825*	*-76.87277*	*4.84*	*5.00*

2021	*Deer Creek 1*	*Baltimore Co.*	*02120202032*	*39.713068*	*-76.597628*	*39.70742*	*-76.590096*	*4.67*	*4.33*
2021	*Deer Creek 9*	*Baltimore Co.*	*02120202032*	*39.72117*	*-76.609265*	*39.713068*	*-76.597628*	*4.67*	*4.67*
2007	*Delaware Run 1*	*Baltimore Co.*	*02130805003*	*39.49910*	*-76.77293*	*39.50196*	*-76.76216*	*4.00*	*4.33*
2011	*Harris Mill Creek 1*	*Baltimore Co.*	*02120202032*	*39.71528*	*-76.62412*	*39.71307*	*-76.59763*	*4.67*	*4.00*
2003	*Keysers Run 1*	*Baltimore Co.*	*02130907104*	*39.46914*	*-76.83976*	*39.47156*	*-76.87929*	*5.00*	*4.00*
2008	*Little Falls 1*	*Baltimore Co.*	*02130805009*	*39.62193*	*-76.63046*	*39.61385*	*-76.62302*	*4.33*	*4.00*
2007	*North Branch Patapsco River UT 1*	*Baltimore Co.*	*02130907104*	*39.48558*	*-76.84373*	*39.49465*	*-76.86359*	*4.67*	*4.67*
2011	*North Branch Patapsco River UT 2*	*Baltimore Co.*	*02130907104*	*39.494629*	*-76.86357*	*39.49571*	*-76.837947*	*4.17*	*4.56*
2007	*Peggys Run 1*	*Baltimore Co.*	*02130806031*	*39.60906*	*-76.79718*	*39.61597*	*-76.79254*	*5.00*	*4.00*
2007	*Peggys Run UT 1*	*Baltimore Co.*	*02130806031*	*39.60402*	*-76.82804*	*39.60906*	*-76.79718*	*5.00*	*4.67*
2007	*Red Run 1*	*Baltimore Co.*	*02130905104*	*39.41111*	*-76.81224*	*39.40074*	*-76.79887*	*4.67*	*4.17*

2005	*Timber Run 1*	*Baltimore Co.*	*02130907104*	*39.44400*	*-76.84151*	*39.43794*	*-76.86878*	*4.48*	*4.57*
2007	*Gunpowder Falls 1*	*Baltimore Co., Carroll*	*02130806031*	*39.69574*	*-76.80339*	*39.68389*	*-76.76963*	*4.00*	*4.50*
2011	*Murphy Run 1*	*Baltimore Co., Carroll*	*02130806031*	*39.62639*	*-76.83087*	*39.62004*	*-76.81855*	*5.00*	*4.00*
2007	*First Mine Branch 1*	*Baltimore Co., Harford*	*02130805030*	*39.62700*	*-76.55549*	*39.62524*	*-76.59857*	*4.33*	*4.33*
2003	*Little Gunpowder Falls 1*	*Baltimore Co., Harford*	*02130804029*	*39.50453*	*-76.42982*	*39.48592*	*-76.42739*	*4.00*	*4.33*
2003	*Little Gunpowder Falls 2*	*Baltimore Co., Harford*	*02130804029*	*39.48150*	*-76.42516*	*39.47306*	*-76.40243*	*4.33*	*4.17*
2008	*Little Gunpowder Falls 3*	*Baltimore Co., Harford*	*02130804029*	*39.52930*	*-76.51334*	*39.52561*	*-76.49405*	*4.00*	*4.00*
2011	*Little Gunpowder Falls 4*	*Baltimore Co., Harford*	*02130804029*	*39.47306*	*-76.40243*	*39.46108*	*-76.39091*	*4.00*	*4.33*
2007	*Choptank River UT 1*	*Caroline*	*02130404049*	*38.89921*	*-75.80250*	*38.90032*	*-75.82887*	*4.33*	*4.43*
2007	*Faulkner Branch 1*	*Caroline*	*02130306061*	*38.71178*	*-75.79381*	*38.71002*	*-75.77321*	*4.00*	*4.71*
2007	*Forge Branch 1*	*Caroline*	*02130404050*	*38.99411*	*-75.81912*	*38.96356*	*-75.82510*	*4.67*	*4.14*

2008	*Herring Run 1 (Caroline Co.)*	*Caroline*	*02130404090*	*38.85163*	*-75.78393*	*38.84814*	*-75.80201*	*5.00*	*4.43*
2008	*Hog Creek 1*	*Caroline*	*02130404084*	*38.75614*	*-75.90846*	*38.78274*	*-75.93954*	*5.00*	*4.71*
2007	*Hunting Creek 1*	*Caroline*	*02130403071*	*38.71848*	*-75.88225*	*38.70389*	*-75.89296*	*4.33*	*4.43*
2009	*Marsh Creek 1*	*Caroline*	*02130404076*	*38.71487*	*-75.93561*	*38.70310*	*-75.94396*	*4.00*	*4.71*
2007	*Robins Creek 1*	*Caroline*	*02130404086*	*38.79651*	*-75.84430*	*38.81482*	*-75.86926*	*4.67*	*4.43*
2008	*Sullivan Branch 1*	*Caroline*	*02130306014*	*38.75398*	*-75.78257*	*38.72927*	*-75.76085*	*4.33*	*4.43*
2008	*Tull Branch 1*	*Caroline*	*02130306013*	*38.74128*	*-75.79902*	*38.71843*	*-75.77007*	*4.33*	*4.14*
2008	*Watts Creek 1*	*Caroline*	*02130404092*	*38.87704*	*-75.78880*	*38.85750*	*-75.81524*	*4.67*	*5.00*
2008	*Tuckahoe River 1*	*Caroline, Queen Anne's*	*02130405031*	*38.99067*	*-75.92972*	*38.98128*	*-75.93486*	*4.67*	*5.00*
2016	*Tuckahoe River 2*	*Caroline, Queen Anne's*	*02130405033*	*38.98128*	*-75.93486*	*38.97278*	*-75.93518*	*4.67*	*5.00*
2007	*Beaver Run 1*	*Carroll*	*02130907105*	*39.52564*	*-76.94339*	*39.51553*	*-76.93306*	*4.67*	*4.00*
2012	*Beaver Run 2*	*Carroll*	*02130907105*	*39.51555*	*-76.93302*	*39.50302*	*-76.91245*	*4.50*	*4.00*

2007	*Gillis Falls 1*	*Carroll*	*02130908103*	*39.41843*	*-77.07169*	*39.41370*	*-77.07350*	*5.00*	*4.33*
2003	*Gillis Falls 2*	*Carroll*	*02130908102*	*39.38573*	*-77.08755*	*39.36202*	*-77.06503*	*4.67*	*4.00*
2007	*Joe Branch 1*	*Carroll*	*02130907105*	*39.49684*	*-76.98763*	*39.47308*	*-76.98504*	*5.00*	*4.67*
2007	*Little Morgan Run 1*	*Carroll*	*02130907104*	*39.44303*	*-77.00405*	*39.43667*	*-76.98714*	*5.00*	*5.00*
2008	*Little Morgan Run 2*	*Carroll*	*02130907104*	*39.43418*	*-76.97782*	*39.42667*	*-76.96086*	*4.00*	*4.33*
2003	*Little Morgan Run UT 1*	*Carroll*	*02130907104*	*39.44732*	*-77.02609*	*39.44303*	*-77.00405*	*5.00*	*5.00*
2007	*Little Morgan Run UT 2*	*Carroll*	*02130907104*	*39.45284*	*-76.99936*	*39.43667*	*-76.98714*	*4.33*	*4.00*
2008	*Middle Run 1*	*Carroll*	*02130907105*	*39.49246*	*-76.94485*	*39.47679*	*-76.92717*	*5.00*	*4.33*
2007	*Morgan Run 1*	*Carroll*	*02130907105*	*39.47892*	*-76.99912*	*39.47308*	*-76.98504*	*4.33*	*4.00*
2007	*Morgan Run UT 1*	*Carroll*	*02130907104*	*39.41909*	*-76.94624*	*39.42504*	*-76.94703*	*4.67*	*4.00*
2007	*North Branch Patapsco River 1*	*Carroll*	*02130907104*	*39.52245*	*-76.87527*	*39.51010*	*-76.88719*	*4.00*	*4.17*
2009	*Piney Branch 2 (Carroll Co.)*	*Carroll*	*02130908102*	*39.37318*	*-77.01189*	*39.35703*	*-76.99621*	*4.67*	*4.00*

2007	*South Branch Gunpowder Falls UT 1*	*Carroll*	*02130806031 7*	*39.66661*	*-76.88386*	*39.70835*	*-76.85661*	*5.00*	*4.00*
2007	*South Branch Patapsco River 1*	*Carroll, Howard*	*02130908102 5*	*39.36322*	*-77.07507*	*39.36202*	*-77.06503*	*5.00*	*4.00*
2007	*Basin Run 1*	*Cecil*	*02120203034 4*	*39.65615*	*-76.08164*	*39.65530*	*-76.11020*	*4.33*	*4.67*
2007	*Big Elk Creek 1*	*Cecil*	*02130606038 6*	*39.66985*	*-75.82816*	*39.66294*	*-75.82655*	*4.00*	*4.33*
2007	*Big Elk Creek 2*	*Cecil*	*02130606038 6*	*39.66297*	*-75.82656*	*39.61737*	*-75.82005*	*4.67*	*4.43*
2007	*Gramies Run 1*	*Cecil*	*02130606038 7*	*39.70360*	*-75.85958*	*39.66983*	*-75.82808*	*4.50*	*4.67*
2003	*Little North East Creek 1*	*Cecil*	*02130608037 7*	*39.72566*	*-75.95853*	*39.66625*	*-75.93462*	*4.67*	*4.67*
2007	*Mill Creek 1*	*Cecil*	*02120201031 9*	*39.58515*	*-76.05275*	*39.56460*	*-76.06549*	*4.00*	*4.33*
2007	*Principio Creek 1*	*Cecil*	*02130609038 0*	*39.64415*	*-76.03558*	*39.61434*	*-76.03344*	*4.67*	*4.00*
2007	*Principio Creek 2*	*Cecil*	*02130609038 0*	*39.59454*	*-76.02519*	*39.58707*	*-76.02894*	*4.00*	*4.67*
2009	*Principio Creek 3*	*Cecil*	*02130609038 0*	*39.58703*	*-76.02897*	*39.57064*	*-76.03058*	*4.33*	*4.00*

2003	*Principio Creek UT 1*	*Cecil*	*02130609038*	*39.61544*	*-76.05885*	*39.60709*	*-76.03070*	*4.22*	*4.89*
2007	*Hill Top Fork UT 1*	*Charles*	*02140110077*	*38.48924*	*-77.16391*	*38.46113*	*-77.15144*	*4.33*	*4.43*
2008	*Hoghole Run 1*	*Charles*	*02140109073*	*38.51805*	*-77.03583*	*38.50957*	*-77.02469*	*4.13*	*4.60*
2009	*Jennie Run 1*	*Charles*	*02140109074*	*38.56786*	*-76.98150*	*38.54646*	*-77.01716*	*4.33*	*4.29*
2016	*Marbury Run 1*	*Charles*	*02140111078*	*3856780*	*-77.14674*	*38.57919*	*-77.15872*	*4.33*	*4.14*
2007	*Mattawoman Creek UT 1*	*Charles*	*02140111078*	*38.53477*	*-77.16806*	*38.54767*	*-77.17246*	*4.00*	*4.43*
2003	*Mattawoman Creek UT 2*	*Charles*	*02140111078*	*38.53761*	*-77.18100*	*38.55605*	*-77.19043*	*4.33*	*4.71*
2008	*Mattawoman Creek UT 3*	*Charles*	*02140111078*	*38.56562*	*-77.13269*	*38.58862*	*-77.12501*	*4.67*	*4.43*
2009	*Mill Dam Run 1*	*Charles*	*02140108076*	*38.56503*	*-76.83737*	*38.56415*	*-76.84207*	*4.67*	*4.71*
2008	*Mill Run 3 (Charles Co.)*	*Charles*	*02140110077*	*38.49943*	*-77.08434*	*38.47626*	*-77.08420*	*4.11*	*4.62*
2011	*Mill Run 5*	*Charles*	*02140110077*	*38.52755*	*-77.078741*	*38.52029*	*-77.090089*	*4.00*	*4.43*

2007	*Mill Run UT 1 (Charles Co.)*	*Charles*	*02140110079*	*38.51104*	*-77.10720*	*38.50039*	*-77.08561*	*4.50*	*4.29*
2008	*Nanjemoy Creek 1*	*Charles*	*02140110077*	*38.42378*	*-77.21466*	*38.41522*	*-77.20368*	*4.00*	*4.86*
2003	*Old Womans Run 1*	*Charles*	*02140111078*	*38.59669*	*-77.02960*	*38.59612*	*-77.05501*	*4.33*	*4.71*
2007	*Old Womans Run 2*	*Charles*	*02140111078*	*38.59708*	*-77.00973*	*38.59669*	*-77.02960*	*4.67*	*4.43*
2007	*Piney Branch 1 (Charles Co.)*	*Charles*	*02140108076*	*38.56180*	*-76.87701*	*38.55004*	*-76.87041*	*4.33*	*4.43*
2008	*Potomac River UT 1*	*Charles*	*02140102078*	*38.46814*	*-77.24377*	*38.47086*	*-77.26168*	*4.67*	*4.14*
2011	*Potomac River UT 2*	*Charles*	*02140102078*	*38.48546*	*-77.23682*	*38.47495*	*-77.25927*	*4.00*	*4.43*
2007	*Reeder Run 1*	*Charles*	*02140102078*	*38.50839*	*-77.18502*	*38.51782*	*-77.20231*	*4.84*	*4.29*
2003	*Reeder Run 2*	*Charles*	*02140102078*	*38.51592*	*-77.21343*	*38.53274*	*-77.22703*	*4.33*	*4.71*
2016	*Reeder Run 3*	*Charles*	*02140102078*	*38.50269*	*-77.18977*	*38.50940*	*-77.20911*	*4.78*	*4.52*
2012	*Swanson Creek 4*	*Charles*	*02131101089*	*38.56522*	*-76.76043*	*38.56323*	*-76.75701*	*4.00*	*4.60*

2007	*Swanson Creek UT 1*	*Charles*	*021311010892*	*38.55236*	*-76.77384*	*38.56324*	*-76.75700*	*4.67*	*4.43*
2003	*Wards Run 1*	*Charles*	*021401100778*	*38.51808*	*-77.13581*	*38.51012*	*-77.14786*	*4.67*	*4.71*
2009	*Wards Run 2*	*Charles*	*021401100778*	*38.50346*	*-77.15071*	*38.48449*	*-77.13184*	*4.00*	*4.71*
2003	*Wolf Den Branch 1*	*Charles*	*021401080769*	*38.63601*	*-76.82109*	*38.62192*	*-76.82043*	*4.33*	*4.71*
2003	*Zekiah Swamp Run 1*	*Charles*	*021401080769*	*38.63464*	*-76.79846*	*38.62196*	*-76.82036*	*4.33*	*4.14*
2007	*Zekiah Swamp Run 2*	*Charles*	*021401080768*	*38.60216*	*-76.83388*	*38.59608*	*-76.83771*	*4.67*	*4.71*
2003	*Zekiah Swamp Run 3*	*Charles*	*021401080765*	*38.58953*	*-76.84107*	*38.56355*	*-76.85086*	*4.50*	*4.57*
2007	*Zekiah Swamp Run 4*	*Charles*	*021401080760*	*38.52679*	*-76.90389*	*38.51257*	*-76.91427*	*4.67*	*4.43*
2007	*Zekiah Swamp Run 5*	*Charles*	*021401080760*	*38.49396*	*-76.92612*	*38.48639*	*-76.92853*	*4.00*	*4.71*
2007	*Zekiah Swamp Run 6*	*Charles*	*021401080768*	*38.61391*	*-76.83263*	*38.60216*	*-76.83388*	*4.00*	*4.43*
2012	*Zekiah Swamp Run 7*	*Charles*	*021401080768*	*38.61910*	*-76.82968*	*38.61393*	*-76.83266*	*4.17*	*4.86*
2003	*Zekiah Swamp Run UT 1*	*Charles*	*021401080762*	*38.52253*	*-76.87598*	*38.52817*	*-76.89208*	*5.00*	*4.43*

2007	*Zekiah Swamp Run UT 2*	*Charles*	*02140108076*	*38.61249*	*-76.86986*	*38.58952*	*-76.84111*	*4.34*	*4.00*
2008	*Zekiah Swamp Run UT 3*	*Charles*	*02140108076*	*38.54068*	*-76.83338*	*38.55595*	*-76.86021*	*4.33*	*4.14*
2008	*Mattawoman Creek 1*	*Charles, Prince George's*	*02140111078*	*38.65497*	*-76.93916*	*38.65767*	*-76.98456*	*5.00*	*4.43*
2012	*Mattawoman Creek 2*	*Charles, Prince George's*	*02140111078*	*38.65234*	*-76.90833*	*38.65252*	*-76.91689*	*4.00*	*4.14*
2003	*Swanson Creek 1*	*Charles, Prince George's*	*02131101089*	*38.60760*	*-76.74634*	*38.58927*	*-76.74244*	*4.67*	*5.00*
2007	*Swanson Creek 2*	*Charles, Prince George's*	*02131101089*	*38.55844*	*-76.74044*	*38.55404*	*-76.72821*	*4.67*	*4.14*
2007	*Swanson Creek 3*	*Charles, Prince George's*	*02131101089*	*38.58927*	*-76.74244*	*38.55844*	*-76.74044*	*4.67*	*4.43*
2016	*Wolf Den Branch 2*	*Charles, Prince George's*	*02140108076*	*38.67283*	*-76.80444*	*38.63902*	*-76.81987*	*4.00*	*4.43*
2007	*Smoots Pond Run 1*	*Charles, Saint Mary's*	*02140107075*	*38.47788*	*-76.79137*	*38.49444*	*-76.80455*	*5.00*	*4.43*
2007	*Blinkhorn Creek 1*	*Dorchester*	*02130403046*	*38.65297*	*-75.90070*	*38.65195*	*-75.93188*	*4.33*	*4.71*

2003	*Davis Millpond Branch 1*	*Dorchester*	*021303060607*	*38.66525*	*-75.75797*	*38.67465*	*-75.77339*	*4.67*	*5.00*
2008	*Skinners Run 1*	*Dorchester*	*021303060608*	*38.67503*	*-75.82252*	*38.66851*	*-75.81497*	*4.00*	*4.29*
2003	*Big Hunting Creek 1*	*Frederick*	*021403030251*	*39.62634*	*-77.45965*	*39.60990*	*-77.41044*	*4.33*	*4.25*
2008	*High Run 1*	*Frederick*	*021403030251*	*39.60468*	*-77.46215*	*39.60823*	*-77.41093*	*4.00*	*4.50*
2007	*Talbot Branch UT 1*	*Frederick*	*021403020238*	*39.46420*	*-77.13548*	*39.45535*	*-77.16043*	*4.33*	*4.25*
2007	*Weldon Creek 1*	*Frederick*	*021403020238*	*39.47694*	*-77.15018*	*39.47488*	*-77.16046*	*4.00*	*4.00*
2007	*Bear Creek 2*	*Garrett*	*050202010018*	*39.65484*	*-79.36376*	*39.65316*	*-79.38472*	*4.67*	*4.00*
2008	*Bear Creek 3*	*Garrett*	*050202010018*	*39.66006*	*-79.32011*	*39.65441*	*-79.33055*	*4.67*	*4.25*
2008	*Bear Creek 4*	*Garrett*	*050202010016*	*39.56476*	*-79.32195*	*39.65018*	*-79.28886*	*4.22*	*4.39*
2007	*Bear Creek 5*	*Garrett*	*050202010018*	*39.65593*	*-79.33884*	*39.65482*	*-79.36370*	*4.67*	*4.00*
2003	*Bear Creek UT 1*	*Garrett*	*050202010018*	*39.64821*	*-79.34058*	*39.65559*	*-79.33808*	*5.00*	*4.50*
2007	*Bear Pen Run 1*	*Garrett*	*021410060077*	*39.59163*	*-79.14355*	*39.57341*	*-79.12028*	*4.75*	*4.25*

2016	*Big Run 1*	*Garrett*	*02141006007 8*	*39.58348*	*-79.17124*	*39.55629*	*-79.15005*	*4.88*	*4.13*
2007	*Big Run UT 1*	*Garrett*	*02141006007 8*	*39.57835*	*-79.19349*	*39.58348*	*-79.17124*	*4.00*	*4.75*
2007	*Blacklick Run 1*	*Garrett*	*02141006008 0*	*39.63910*	*-79.09647*	*39.61727*	*-79.08702*	*4.00*	*4.25*
2007	*Buffalo Run 1*	*Garrett*	*05020201001 9*	*39.68685*	*-79.40998*	*39.69053*	*-79.40417*	*4.67*	*4.00*
2008	*Buffalo Run 2*	*Garrett*	*05020201001 9*	*39.69264*	*-79.43757*	*39.68915*	*-79.42334*	*4.00*	*4.25*
2012	*Buffalo Run 3*	*Garrett*	*05020201001 9*	*39.68781*	*-79.41738*	*39.68685*	*-79.41002*	*4.00*	*4.25*
2010	*Casselman River 1*	*Garrett*	*05020204003 4*	*39.66851*	*-79.17745*	*39.67513*	*-79.17104*	*4.67*	*4.00*
2003	*Crabtree Creek 1*	*Garrett*	*02141006007 4*	*39.47779*	*-79.19210*	*39.50564*	*-79.15474*	*4.47*	*4.30*
2003	*Double Lick Run 1*	*Garrett*	*02141006007 6*	*39.54257*	*-79.21921*	*39.53356*	*-79.20082*	*4.92*	*4.38*
2007	*Dry Run 1*	*Garrett*	*02141006007 7*	*39.54299*	*-79.17013*	*39.52313*	*-79.14385*	*4.00*	*4.50*
2007	*Hoyes Run 1*	*Garrett*	*05020201001 2*	*39.53193*	*-79.40384*	*39.52879*	*-79.41254*	*5.00*	*4.25*
2021	*Laurel Run 1*	*Garrett*	*05020201001 9*	*39.688371*	*-79.449636*	*39.6877*	*-79.439537*	*4.00*	*4.25*

2011	*Laurel Run UT 1*	*Garrett*	*02141005005*	*39.47897*	*-79.15120*	*39.47772*	*-79.11977*	*4.00*	*4.25*
2003	*Little Bear Creek 1*	*Garrett*	*05020201001*	*39.65775*	*-79.26858*	*39.65019*	*-79.28882*	*4.50*	*4.25*
2008	*Little Savage River 1*	*Garrett*	*02141006008*	*39.65111*	*-78.99097*	*39.59315*	*-79.04834*	*4.00*	*4.00*
2003	*Middle Fork Crabtree Creek 1*	*Garrett*	*02141006007*	*39.51193*	*-79.16195*	*39.51261*	*-79.15403*	*4.67*	*4.50*
2009	*Middle Fork Crabtree Creek 2*	*Garrett*	*02141006007*	*39.53353*	*-79.20087*	*39.53507*	*-79.18800*	*5.00*	*4.25*
2011	*Middle Fork Crabtree Creek 3*	*Garrett*	*02141006007*	*39.53507*	*-79.18800*	*39.51565*	*-79.16892*	*4.00*	*4.50*
2003	*Mill Run 1 (Garrett Co.)*	*Garrett*	*05020201002*	*39.71553*	*-79.34541*	*39.70909*	*-79.34891*	*4.21*	*4.56*
2003	*Mill Run 2 (Garrett Co.)*	*Garrett*	*05020201002*	*39.70907*	*-79.36308*	*39.71472*	*-79.38469*	*4.67*	*4.00*
2003	*Mill Run 4 (Garrett Co.)*	*Garrett*	*05020201002*	*39.71883*	*-79.30088*	*39.71553*	*-79.34541*	*5.00*	*4.58*
2011	*Mill Run UT 2 (Garrett Co.)*	*Garrett*	*05020201002*	*39.71594*	*-79.27141*	*39.71849*	*-79.30071*	*4.50*	*4.50*
2003	*Monroe Run 1*	*Garrett*	*02141006007*	*39.54471*	*-79.22830*	*39.54944*	*-79.14434*	*4.00*	*4.25*

2003	*Poplar Lick Run 1*	*Garrett*	*02141006007 9*	*39.59098*	*-79.10319*	*39.58389*	*-79.09140*	*4.50*	*4.38*
2003	*Puzzley Run 1*	*Garrett*	*50202010022*	*39.69028*	*-79.22870*	*39.72189*	*-79.23219*	*4.00*	*4.75*
2011	*Sand Spring Run 1*	*Garrett*	*05020201000 1*	*39.257794*	*-79.473281*	*39.272048*	*-79.474658*	*4.00*	*4.25*
2007	*Savage River 1*	*Garrett*	*02141006007 7*	*39.57974*	*-79.08983*	*39.56218*	*-79.11099*	*4.34*	*4.25*
2003	*Savage River 2*	*Garrett*	*02141006007 7*	*39.56219*	*-79.11102*	*39.54306*	*-79.13744*	*4.72*	*4.29*
2009	*Savage River 4*	*Garrett*	*02141006008 1*	*39.59811*	*-79.05554*	*39.60227*	*-79.07229*	*5.00*	*4.50*
2007	*South Branch Bear Creek 1*	*Garrett*	*05020201001 5*	*39.62367*	*-79.37594*	*39.65316*	*-79.38472*	*4.33*	*4.50*
2007	*South Branch Casselman River 1*	*Garrett*	*05020204003 3*	*39.62616*	*-79.19151*	*39.64653*	*-79.18124*	*4.67*	*4.00*
2007	*South Branch Casselman River 2*	*Garrett*	*05020204003 3*	*39.64814*	*-79.18152*	*39.66851*	*-79.17745*	*4.00*	*4.25*
2011	*Spring Lick Run 1*	*Garrett*	*02141006007 4*	*39.50365*	*-79.20005*	*39.49073*	*-79.17532*	*4.00*	*4.25*
2011	*Toms Spring Run 1*	*Garrett*	*02141006007 6*	*39.51704*	*-79.20115*	*39.51565*	*-79.16893*	*4.50*	*4.75*

2016	*Wolf Den Run 1*	*Garrett*	*02141005004 7*	*39.39655*	*-79.21193*	*39.38905*	*-79.19443*	*4.00*	*4.00*
2016	*Wolf Den Run UT 1*	*Garrett*	*02121005004 7*	*39.41259*	*-79.22063*	*39.39655*	*-79.21193*	*4.00*	*4.00*
2007	*Youghiogheny River UT 1*	*Garrett*	*05020201002 0*	*39.67943*	*-79.35317*	*39.68632*	*-79.38164*	*4.00*	*4.00*
2007	*Broad Creek 1*	*Harford*	*02120205033 9*	*39.67899*	*-76.35243*	*39.66468*	*-76.32487*	*4.00*	*4.17*
2008	*Bynum Run UT 1*	*Harford*	*02130704113 1*	*39.50923*	*-76.27523*	*39.50505*	*-76.28355*	*4.33*	*4.00*
2012	*Cattail Branch UT 1*	*Harford*	*02120202032 8*	*39.62017*	*-76.49403*	*39.63521*	*-76.49927*	*5.00*	*4.33*
2007	*Deer Creek 2*	*Harford*	*02120202032 9*	*39.67564*	*-76.45429*	*39.67445*	*-76.44291*	*4.00*	*4.67*
2003	*Deer Creek 3*	*Harford*	*02120202032 4*	*39.63225*	*-76.41051*	*39.61776*	*-76.39938*	*4.33*	*5.00*
2003	*Deer Creek 4*	*Harford*	*02120202032 2*	*39.59924*	*-76.26823*	*39.60333*	*-76.24910*	*4.33*	*4.33*
2008	*Deer Creek 5*	*Harford*	*02120202033 0*	*39.68097*	*-76.51724*	*39.67993*	*-76.50004*	*4.00*	*4.00*
2008	*Deer Creek 6*	*Harford*	*02120202032 7*	*39.65641*	*-76.43661*	*39.65238*	*-76.43784*	*4.00*	*5.00*
2008	*Deer Creek 7*	*Harford*	*02120202032 2*	*39.61660*	*-76.23174*	*39.62119*	*-76.21763*	*4.33*	*4.00*

2009	*Deer Creek 8*	*Harford*	*021202020327*	*39.64722*	*-76.43147*	*39.63217*	*-76.41041*	*4.00*	*4.33*
2007	*Deer Creek UT 1*	*Harford*	*021202020330*	*39.64980*	*-76.55578*	*39.67578*	*-76.54223*	*4.33*	*4.00*
2007	*Deer Creek UT 2*	*Harford*	*021202020321*	*39.58866*	*-76.20168*	*39.61740*	*-76.19373*	*4.33*	*5.00*
2007	*Deer Creek UT 3*	*Harford*	*021202020324*	*39.65935*	*-76.39446*	*39.64010*	*-76.35041*	*4.67*	*4.00*
2007	*Falling Branch 1*	*Harford*	*021202020329*	*39.72913*	*-76.46723*	*39.67453*	*-76.44299*	*4.00*	*4.33*
2007	*Hollands Branch 1*	*Harford*	*021202020322*	*39.64115*	*-76.24400*	*39.62126*	*-76.21756*	*4.00*	*4.67*
2007	*Little Deer Creek 1*	*Harford*	*021202020328*	*39.64640*	*-76.50645*	*39.65453*	*-76.49075*	*4.67*	*4.33*
2008	*Little Deer Creek 2*	*Harford*	*021202020328*	*39.65455*	*-76.49075*	*39.66009*	*-76.48109*	*4.00*	*4.00*
2011	*Little Deer Creek UT 1*	*Harford*	*021202020328*	*39.62878*	*-76.48475*	*39.66009*	*-76.48109*	*4.67*	*4.33*
2008	*Otter Point Creek 1*	*Harford*	*021307021130*	*39.43296*	*-76.29982*	*39.43281*	*-76.28558*	*4.33*	*4.14*
2003	*Wet Stone Branch 1*	*Harford*	*021202020327*	*39.63021*	*-76.45688*	*39.64721*	*-76.43147*	*4.67*	*4.33*
2007	*Carrolls Branch 1*	*Howard*	*021331060960*	*39.19818*	*-76.95531*	*39.19474*	*-76.93510*	*4.00*	*4.67*

2007	*Dorsey Branch 1*	*Howard*	*02131108096*	*39.28402*	*-77.00921*	*39.26105*	*-77.04475*	*4.00*	*5.00*
2007	*Patuxent River UT 2*	*Howard*	*02131107094*	*39.18842*	*-76.97725*	*39.16340*	*-76.97520*	*4.06*	*4.44*
2007	*Rocky Gorge Reservoir UT 1*	*Howard*	*02131107094*	*39.17385*	*-76.96164*	*39.15066*	*-76.96862*	*4.67*	*4.00*
2007	*South Branch Patapsco River UT 1*	*Howard*	*02130908102*	*39.34471*	*-76.96235*	*39.34836*	*-76.95941*	*4.33*	*5.00*
2007	*Cypress Branch 1*	*Kent*	*02130510042*	*39.30475*	*-75.74799*	*39.28812*	*-75.78414*	*4.00*	*4.14*
2009	*Cypress Branch 2*	*Kent*	*02130510042*	*39.28429*	*-75.79552*	*39.27214*	*-75.81757*	*4.67*	*4.14*
2003	*East Fork Langford Creek UT 1*	*Kent*	*02130506040*	*39.21050*	*-76.13505*	*39.19893*	*-76.11633*	*4.67*	*4.14*
2021	*Fannels Branch 1*	*Kent*	*02130506040*	*39.189562*	*-76.107898*	*39.187236*	*-76.113317*	*4.17*	*4.00*
2021	*Morgan Creek UT 1*	*Kent*	*02130509041*	*39.306198*	*-76.016172*	*39.289815*	*-76.020911*	*4.27*	*4.00*
2010	*Goshen Run UT 1*	*Montgomery*	*02140208086*	*39.21470*	*-77.17439*	*39.21709*	*-77.14649*	*4.00*	*4.75*
2003	*Patuxent River UT 1*	*Montgomery*	*02131108096*	*39.28851*	*-77.19257*	*39.28496*	*-77.13996*	*4.17*	*5.00*

2007	*Bald Hill Branch 1*	*Prince George's*	*021311030925*	*38.99228*	*-76.84371*	*38.92241*	*-76.82020*	*4.00*	*4.14*
2007	*Beaverdam Creek 1*	*Prince George's*	*021402050823*	*39.02370*	*-76.85045*	*39.02190*	*-76.85974*	*4.33*	*4.43*
2007	*Beaverdam Creek 2*	*Prince George's*	*021402050823*	*39.02287*	*-76.86218*	*39.01585*	*-76.89775*	*4.33*	*4.71*
2021	*District Branch 1*	*Prince George's*	*021311020917*	*38.866772*	*-76.719393*	*38.854804*	*-76.691683*	*4.34*	*4.00*
2007	*Mataponi Creek UT 1*	*Prince George's*	*021311020905*	*38.72979*	*-76.82511*	*38.71989*	*-76.79437*	*4.00*	*4.43*
2003	*Piscataway Creek 1*	*Prince George's*	*021402030803*	*38.73428*	*-76.86811*	*38.73258*	*-76.87590*	*4.67*	*4.43*
2007	*Piscataway Creek 2*	*Prince George's*	*021402030799*	*38.70638*	*-76.97208*	*38.69906*	*-76.98589*	*4.33*	*4.14*
2007	*Rock Creek 1*	*Prince George's*	*021311010904*	*38.69443*	*-76.75155*	*38.69093*	*-76.72613*	*4.67*	*4.71*
2021	*Timothy Branch 1*	*Prince George's*	*021401110787*	*38.710667*	*-76.854371*	*38.664667*	*-76.878959*	*4.50*	*4.14*
2009	*Turkey Branch 1*	*Prince George's*	*021311030921*	*38.84980*	*-76.84000*	*38.85763*	*-76.78847*	*4.67*	*4.14*
2008	*Alder Branch 1*	*Queen Anne's*	*021305070395*	*39.07879*	*-76.06344*	*39.07197*	*-76.07868*	*4.67*	*4.71*
2003	*Andover Branch 1*	*Queen Anne's*	*021305100425*	*39.22355*	*-75.76977*	*39.23043*	*-75.78289*	*4.17*	*4.57*

2009	*Andover Branch 2*	*Queen Anne's*	*02130510042 5*	*39.23044*	*-75.78285*	*39.24174*	*-75.79593*	*4.33*	*5.00*
2007	*Andover Branch UT 1*	*Queen Anne's*	*02130510042 5*	*39.21407*	*-75.80767*	*39.24699*	*-75.82277*	*4.67*	*4.71*
2007	*Blockston Branch UT 1*	*Queen Anne's*	*02130405052 9*	*38.98971*	*-75.99870*	*38.98086*	*-75.97180*	*4.00*	*4.14*
2003	*Browns Branch 3*	*Queen Anne's*	*02130508040 3*	*39.15968*	*-75.92076*	*39.16360*	*-75.95177*	*4.33*	*5.00*
2007	*Granny Finley Branch 1*	*Queen Anne's*	*02130508039 9*	*39.08786*	*-75.95688*	*39.11766*	*-76.04025*	*4.00*	*4.00*
2011	*Gravel Run 1*	*Queen Anne's*	*02130507039 7*	*39.03535*	*-76.03710*	*39.05027*	*-76.06391*	*4.00*	*4.02*
2011	*Island Creek 1*	*Queen Anne's*	*02130508039 8*	*39.08896*	*-76.05355*	*39.11732*	*-76.06863*	*4.33*	*4.14*
2008	*Mill Stream Branch 1*	*Queen Anne's*	*02130507039 6*	*39.01998*	*-76.03938*	*39.02288*	*-76.06394*	*4.67*	*4.43*
2007	*Norwich Creek 1*	*Queen Anne's*	*02130405052 2*	*38.97574*	*-76.01146*	*38.95164*	*-75.99614*	*4.67*	*4.71*
2011	*Norwich Creek 3*	*Queen Anne's*	*02130405052 2*	*38.94203*	*-75.99741*	*38.92547*	*-75.97541*	*4.00*	*4.14*
2003	*Red Lion Branch 1*	*Queen Anne's*	*02130510041 9*	*39.22756*	*-75.90160*	*39.23418*	*-75.90438*	*4.22*	*4.43*
2003	*Red Lion Branch 2*	*Queen Anne's*	*02130510041 9*	*39.18442*	*-75.89387*	*39.20305*	*-75.89646*	*4.27*	*4.43*

2007	*Red Lion Branch 3*	*Queen Anne's*	*02130510041 9*	*39.20657*	*-75.89344*	*39.22756*	*-75.90160*	*4.50*	*4.57*
2007	*Red Lion Branch UT 1*	*Queen Anne's*	*02130510042 0*	*39.17411*	*-75.86903*	*39.18442*	*-75.89387*	*4.33*	*4.14*
2007	*Southeast Creek 1*	*Queen Anne's*	*02130506040 1*	*39.13192*	*-75.97889*	*39.13975*	*-75.98786*	*4.67*	*4.43*
2008	*Southeast Creek 2*	*Queen Anne's*	*02130508040 1*	*39.13989*	*-75.98794*	*39.14592*	*-75.98986*	*4.17*	*4.29*
2008	*Southeast Creek UT 2*	*Queen Anne's*	*02130508040 1*	*39.11759*	*-75.95646*	*39.11650*	*-75.96562*	*4.33*	*4.71*
2008	*Southeast Creek UT 3*	*Queen Anne's*	*01230508040 1*	*39.11651*	*-75.96563*	*39.13035*	*-75.97788*	*4.44*	*4.71*
2007	*Three Bridges Branch 1*	*Queen Anne's*	*02130507030 97*	*39.05323*	*-76.03293*	*39.05027*	*-76.06391*	*4.17*	*4.43*
2007	*Wye East River UT 1*	*Queen Anne's*	*02130503040 36*	*38.98305*	*-76.08860*	*38.94966*	*-76.10908*	*4.67*	*4.71*
2008	*Wye East River UT2*	*Queen Anne's*	*02130503040 36*	*38.99155*	*-76.03511*	*38.99231*	*-76.07751*	*4.00*	*4.14*
2011	*Norwich Creek 2*	*Queen Anne's/Talbot*	*02130405050 22*	*38.92547*	*-75.97541*	*38.91998*	*-75.96930*	*4.33*	*4.71*
2007	*Burnt Mill Creek 1*	*Saint Mary's*	*02140104070 24*	*38.36375*	*-76.65992*	*38.34639*	*-76.64235*	*4.00*	*4.43*
2007	*Burnt Mill Creek UT 1*	*Saint Mary's*	*02140104070 24*	*38.38129*	*-76.66945*	*38.37031*	*-76.65860*	*4.00*	*4.71*

2007	*Chaptico Run 1*	*Saint Mary's*	*02140106073600*	*38.37100*	*-76.75610*	*38.36489*	*-76.78197*	*4.67*	*4.43*
2012	*Fisherman Creek 1*	*Saint Mary's*	*02140103071200*	*38.21065*	*-76.40307*	*38.19762*	*-76.41925*	*4.67*	*4.00*
2008	*Forrest Hall Branch 1*	*Saint Mary's*	*02140106074200*	*38.42298*	*-76.72010*	*38.38460*	*-76.74243*	*5.00*	*4.14*
2007	*Hayden Run 1*	*Saint Mary's*	*02140106074200*	*38.43916*	*-76.73770*	*38.41884*	*-76.74437*	*4.33*	*4.43*
2009	*Hillton Run 1*	*Saint Mary's*	*02140103071500*	*38.24596*	*-76.46944*	*38.22383*	*-76.46161*	*4.00*	*4.43*
2007	*Johns Creek 1*	*Saint Mary's*	*02140103071400*	*38.23144*	*-76.52353*	*38.23587*	*-76.49717*	*4.34*	*4.43*
2008	*McIntosh Run 1*	*Saint Mary's*	*02140104072100*	*38.32959*	*-76.63552*	*38.32555*	*-76.64338*	*4.00*	*4.86*
2008	*McIntosh Run 2*	*Saint Mary's*	*02140104072100*	*38.32555*	*-76.64337*	*38.31354*	*-76.65517*	*4.00*	*4.43*
2007	*Saint Clements Bay UT 1*	*Saint Mary's*	*02140105072600*	*38.32481*	*-76.69673*	*38.29953*	*-76.71233*	*4.33*	*4.71*
2007	*Saint Clements Creek 1*	*Saint Mary's*	*02140105072800*	*38.34856*	*-76.73058*	*38.33257*	*-76.72384*	*4.17*	*4.43*
2011	*Saint Clements Creek 2*	*Saint Mary's*	*02140105073000*	*38.358656*	*-76.727069*	*38.348588*	*-76.730607*	*4.33*	*4.71*

2007	*Saint Mary's River 1*	*Saint Mary's*	*021401030717*	*38.27485*	*-76.51438*	*38.25265*	*-76.50721*	*4.00*	*4.71*
2010	*Saint Mary's River UT 3*	*Saint Mary's*	*021401030719*	*38.27771*	*-76.51543*	*38.30595*	*-76.52726*	*4.00*	*4.43*
2003	*Warehouse Run 1*	*Saint Mary's*	*021401030714*	*38.20522*	*-76.49843*	*38.22150*	*-76.48619*	*4.67*	*4.43*
2007	*Dividing Creek 1*	*Somerset, Worcester*	*021302040064*	*38.21149*	*-75.57593*	*38.18183*	*-75.54768*	*4.33*	*5.00*
2007	*Highfield Creek 1*	*Talbot*	*021304050517*	*38.89321*	*-75.97110*	*38.89050*	*-75.96166*	*4.17*	*4.72*
2007	*Jadwins Creek 1*	*Talbot*	*021304050516*	*38.84859*	*-75.97328*	*38.83436*	*-75.93300*	*4.00*	*4.43*
2007	*Kings Creek 1*	*Talbot*	*021304040473*	*38.79141*	*-76.02193*	*38.79367*	*-75.99319*	*4.67*	*4.71*
2007	*Skipton Creek UT 1*	*Talbot*	*021305030434*	*38.88226*	*-76.04616*	*38.87955*	*-76.05344*	*4.00*	*4.43*
2003	*Adkins Race 1*	*Wicomico*	*021302030648*	*38.33427*	*-75.37668*	*38.31965*	*-75.35493*	*4.67*	*4.15*
2008	*Little Burnt Branch 1*	*Wicomico*	*021303040567*	*38.43934*	*-75.62701*	*38.41103*	*-75.59458*	*4.00*	*5.00*
2007	*Nassawango Creek 1*	*Wicomico*	*021302050668*	*38.31299*	*-75.46914*	*38.30312*	*-75.46400*	*4.17*	*4.57*
2007	*Plum Creek 1*	*Wicomico*	*021303050584*	*38.51243*	*-75.70759*	*38.53541*	*-75.74588*	*4.00*	*4.43*

2010	*Little Mill Creek 1*	*Worcester*	*021301060672*	*38.02677*	*-75.46306*	*38.04621*	*-75.42736*	*4.00*	*4.71*
2007	*Nassawango Creek 2*	*Worcester*	*021302050668*	*38.28361*	*-75.45386*	*38.25998*	*-75.46283*	*4.67*	*4.21*
2008	*Nassawango Creek 3*	*Worcester*	*021302050667*	*38.26000*	*-75.46286*	*38.23505*	*-75.47196*	*4.56*	*4.62*

COMAR 26.08.02.04-3 Antidegradation Policy Implementation Procedures: Tier III Level of Protection.

Summary of New Regulation 26.08.02.04-3: The Department is proposing to move the regulation that discusses antidegradation implementation for Outstanding National Resource Waters from COMAR 26.08.02.04-2 to a new regulation at COMAR 26.08.02.04-3. Besides changing the title of this regulation to be consistent with the rest of the antidegradation regulations, no other changes are being proposed to this language.

Specific Regulation Additions: COMAR 26.08.02.04-3 Antidegradation Policy Implementation Procedures: Tier III Level of Protection.

26.08.02.04-3

.04-3 Antidegradation Policy Implementation Procedures: Tier III Level of Protection - Outstanding National Resource Waters.

A. Scope. There are many tools available to protect special resources including the Smart Growth Initiative, Rural Legacy Program, local comprehensive plans, Program Open Space, and others that work through the private sector and nongovernment organizations. This regulation applies the Tier III Outstanding National Resource Water (ONRW) designation only where the most stringent protection is necessary and appropriate to protect and maintain existing exceptional resources. Where high quality waters constitute an outstanding national resource, such as waters of national and State parks and wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

B. Definitions.

(1) Exceptional Biological Resources.

(a) "Exceptional biological resources" means ecologically significant aquatic or wetland habitat that is:

(i) Distinctive because of its unique or very rare combination of natural species and communities; and

(ii) Dependent on maintaining high or pristine water quality or special conditions of existing water quality, such as a bog, which can best be assured protection by no new or increased discharge.

(b) "Exceptional biological resources" includes, if appropriate:

(i) Wholly aquatic threatened or endangered species as defined in Natural Resources Article, §10-2A-01, Annotated Code of Maryland;

(ii) Wholly aquatic species in need of conservation identified in COMAR 08.03.08.09; or

(iii) Wetlands of special concern as defined in COMAR 26.23.06.

(2) "Protected Area" means a permanently protected area such as:

(a) Wildlife refuges or similar habitat protection areas which include but are not limited to wildlife management areas, national parks, State parks, and management areas;

(b) Areas under permanent conservation easement or rural legacy status as determined in consultation with the Rural Legacy Board, Natural Resources Article, §5-9A-03, Annotated Code of Maryland, or easement holder to assure that the location meets the intent and needs of the ONRW designation as determined by the Department of the Environment; or

(c) Areas under some other demonstrated protection, by which the Department may be assured that there will be no changes in land use which could result in nonpoint source runoff posing a direct or indirect threat to the biological values proposed in the nomination.

C. Eligible Nominations.

(1) Required Components. The nominating group or individual shall provide:

(a) Evidence of the presence of exceptional biological resources or exceptional recreational resources dependent on such biological resources;

(b) Scientific information and analysis concerning existing water quality in the body of water, including a demonstration that the water quality is typical of the nominated body of water;

(c) Specific boundaries of the nominated waters and upstream watershed, and a statement whether the nominated body of water and upstream watershed are fully within a protected area except as provided in §F of this regulation; and

(d) Demonstration that an attempt has been made to notify all impacted riparian landowners of the nomination by delivering or mailing notice of proposed nomination to the riparian landowner.

(2) A mailed notice shall request "Restricted Delivery" and show to whom it was delivered and the date and address of delivery.

(3) Additional Information That May Be Required. The Department may require the nominee to submit an economic analysis to address community economic and social concerns.

(4) Assessment. Before proposing the ONRW designation for a body of water, the Department will analyze the information in the nomination package for completeness and confirmation that the body of water achieves and meets the conditions of the ONRW designation.

D. Requirements for an ONRW.

(1) The area nominated for ONRW designation shall be an exceptional biological resource or exceptional recreational resource dependent on exceptional biological resources.

(2) The exceptional biological resource shall be dependent on maintaining high or pristine water quality or special conditions of existing water quality, such as a bog, which can best be assured protection by no new or increased discharge.

(3) To be designated an Outstanding National Resource Water, the area shall be wholly within a permanently protected area.

(4) If the area nominated for ONRW designation has high water quality but does not have exceptional biological resources, it will be protected against degradation under Regulation .04 of this chapter.

E. Protection for Upstream Areas that Feed the ONRW Water Body. In determining whether to designate a body of water as ONRW, the Department may consider whether the watershed upstream of the proposed ONRW area has protections in place that are consistent with the maintenance and protection of biological resources in the ONRW segment. These protections can include, but are not limited to:

(1) A county comprehensive plan or other plan that designates the upstream watershed as a "no growth area"; or

(2) An easement or other legal instrument that protects and maintains the existing land use.

F. Endangered Species. If a nomination is based on a federally threatened or endangered wholly aquatic species, the Department may, but is not required to, designate a water body as an ONRW without requiring protected status. Although the presence of an endangered species may be an indication of a special biological resource, the primary protection for endangered species is provided by the Maryland Nongame and Endangered Species Conservation Act, Natural Resources Article, Title 10, Subtitle 2A, Annotated Code of Maryland, and the Federal Endangered Species Act. If an ONRW is approved for a body of water that is not in a protected status, any regulated activities in the watershed which would adversely impact the aquatic threatened or endangered species population, or impair the habitat required by the species, will require the maximum practical application of best management practices and implementation of antidegradation policies by the Department. The implementation requirements set forth in §I of this regulation also apply.

G. Designation of an Area as an ONRW.

(1) The Department may designate an area as an ONRW if:

(a) All provisions of the Administrative Procedure Act, State Government Article, Title 10, Subtitle 1, Annotated Code of Maryland, have been met;

(b) The application is complete and all requirements have been met; and

(c) Written permission for the designation has been received from the landowner or landowners within the proposed area for ONRW.

(2) Notice to property owners shall be based on property and tax records in the affected jurisdictions.

H. Public Involvement. The Department shall provide public notice and opportunity for a public informational hearing on the proposed designation of an ONRW before that designation is made. Local jurisdictions shall have 60 days after notification of the nomination to comment on the consistency of the nomination with the locality's comprehensive plan.

I. Implementation.

(1) A wastewater or industrial discharge NPDES permit that would allow a new discharge or an increase in an individual discharge may be issued within an ONRW only if there is mitigation or offsets elsewhere in the ONRW segment that result in no net increase in any substance which might impact or impair the ONRW values for which the body of water was nominated.

(2) A water quality certification may permit an impact only if:

(a) The water quality necessary to maintain and protect the exceptional biological resource is maintained; and

(b) There is mitigation or restoration elsewhere in the ONRW water segment.

(3) Sources of pollution may be allowed by the Department for temporary degradation if, after a minimal period of time (weeks to months), the waters are returned or restored to conditions equal to or better than those existing just before the temporary source of pollution.

(4) After a public informational hearing, the Secretary may make exceptions to §I(1), (2), and (3) of this regulation to protect critical public health and safety concerns.