



REGION 3

PHILADELPHIA, PA 19103

May 16, 2024

Mr. D. Lee Currey, Director
Water and Science Administration
Maryland Department of the Environment
1800 Washington Blvd., Suite 4502
Baltimore, Maryland 21230-1718

Dear Mr. Currey:

Recently, the Maryland Department of the Environment (MDE) adopted Interim Updates to the State's Water Quality Standards (WQS) in the Code of Maryland Regulations (COMAR) Title 26, Department of the Environment, Subtitle 08, Water Pollution (COMAR 26.08.02). On March 28, 2024, MDE submitted corrections to their water quality criteria for chronic ammonia and a footnote related to PCP criteria for EPA review and approval as required under the Clean Water Act (CWA) Section 303(c)(2)(A), 33 U.S.C. §1313(c)(2)(A), and 40 C.F.R. Part 131.20(c). EPA's review is limited to only those WQS corrections. EPA has completed its review of these corrections and supporting documentation and finds that the revised provisions in Maryland's regulation are consistent with the CWA and EPA's implementation regulations at 40 C.F.R. Part 131.

MDE's Interim Update to WQS, restores the footnote clarifying the influence of pH on PCP toxicity, consistent with EPA's CWA 304(a) recommendation for PCP. Maryland also corrected the table and equation used to calculate the chronic ammonia criteria for when early life stages of freshwater fish and mussels are present, as well as three reference tables of chronic ammonia criteria values. With these corrections, Maryland's ammonia criteria are now wholly consistent with EPA's 2013 recommended criteria for ammonia in freshwater.

Under Section 7 of the Endangered Species Act (ESA), 42 U.S.C. §1536, EPA must ensure that the Agency's approval of these modifications to the State's WQS regulation will not jeopardize the continued existence of Federally listed threatened and endangered species and their critical habitat in Maryland. EPA fulfilled this obligation during consultation for its June 23, 2023, CWA Section 303(c) approval action. The U.S. Fish and Wildlife Service and National Marine Fisheries Service concurred with EPA's determination that the approval of Maryland's revised ammonia criteria, at such time that it is wholly consistent with EPA's CWA Section 304(a) recommendation, are not likely to adversely affect (NLAA) listed species and their critical habitat.

EPA thanks MDE for their efforts to quickly revise the errors from their 2023 submission of its revised WQS regulation and looks forward to working with MDE on their next Triennial Review. Additional details on the WQS corrections can be found in Enclosure 1 to this letter. The specific provisions EPA is approving, both substantive and non-substantive, and a brief rationale for the approval can be found in Enclosure 2 to this letter.

If you have any questions regarding this action, please do not hesitate to contact me or have your staff contact Jessica Martinsen, Chief, Standards and TMDLs Section, 1600 John F. Kennedy Boulevard, Philadelphia, PA 19103, at 215-814-5144 or Martinsen.Jessica@epa.gov. Or your staff may contact Hunter Pates at 215-814-3385 or Pates.Hunter@epa.gov.

Sincerely,

Leslie L. Gillespie-Marthaler, Ph.D., Acting Director
Water Division

Enclosure

1. Maryland's Revised Water Quality Standards – 2023 Interim Update Submission
2. Summary of Maryland's Revised Water Quality Standards – 2023 Interim Update Submission

cc: Matthew Stover, MDE-WSA

Enclosure 1

Maryland's Revised Water Quality Standards – 2023 Interim Update Submission

As discussed below, EPA is not taking action on minor typographic errors, which MDE identified in an email to EPA and has stated will be corrected at a later date.

Several errors were identified in MDE's April 24, 2023 Triennial Review (TR) submission to EPA. MDE is now correcting these errors in the current WQS amendment action, referred to as the 2023 Interim Update, which was published in the *Maryland Register* on November 17, 2023. MDE submitted these corrections to the U.S. Environmental Protection Agency (EPA), Region 3, as required under the Clean Water Act (CWA) Section 303(c)(2)(A), 33 U.S.C. §1313(c)(2)(A), and 40 CFR Part 131.20(c). EPA received this package on March 28, 2024.

In EPA's June 23, 2023 CWA Section 303(c) approval action, EPA did not take action on the errors that were submitted as part of Maryland's TR package. Those errors included Maryland deleting the footnote for Pentachlorophenol (PCP) in Table 6, "Toxic Substances for Ambient Water Quality Criteria --- Pesticides and Chlorinated Compounds" (COMAR 26.08.02.03-2G(6)). That footnote referred to COMAR 26.08.02.03-2D of the regulation, which indicates that the toxicity of certain substances in Tables 1 and 4 of §G of this regulation is increased or decreased by hardness or pH. However, in doing so, MDE inadvertently deleted the indication that PCP is affected by pH.

Another error in the 2023 triennial review submission was MDE's inadvertent deletion of the provisions for Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages May be Present (COMAR 26.08.02.03-2I(5)), both the table (i.e. Table 1) as well as the equation included as a footnote to that table. It had been MDE's intent to revise its ammonia water quality criteria for the protection of aquatic life in freshwater to be wholly consistent with EPA's CWA 304(a) recommendation.

In its June 23, 2023 letter, EPA noted that by not taking an CWA 303(c) approval action on the removal of the footnote to Table 6 at COMAR 26.08.02.03-2G(g), the PCP water quality criteria effective for CWA purposes remained the previously approved criteria that are a function of pH. Likewise, EPA also noted that until such time that Maryland submits the revised table and equation chronic ammonia criteria at COMAR 26.08.02.03-2I(5), the previously approved Table 1 and equation remained effective for CWA purposes.

During the correction of the errors discussed above, MDE identified typographic errors that were discovered after promulgating the 2023 Interim Update but before submitting the WQS revisions to EPA for approval. When amending Table 4 in §H(9) and Table 3 in §I(7), the words "absent" were inadvertently replaced with "present" in the tables' footnotes. For example, Table 4 in §H(9) has a correct title that reads "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 ." However, the table's footnote reads : "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)=..." MDE alerted EPA to this error in an email dated February 28, 2024. EPA is not taking any approval action on these typographic errors, which MDE stated will be corrected in MDE's 2025 Triennial Review. These typographical errors on the footnotes to these tables do not impact the implementation of the tables as approved WQS.

Enclosure 2

Summary of Maryland’s Revised Water Quality Standards – 2023 Interim Update Submission

The Maryland Department of the Environment (MDE) adopted amendments to its Water Quality Standards (WQS) in the Code of Maryland Regulations (COMAR). These amendments were published in *Maryland Register* on November 17, 2023 and submitted to the U.S. Environmental Protection Agency (EPA), Region III, for review on March 28, 2024. Pursuant to Clean Water Act (CWA) Section 303(c) and 40 C.F.R. Part 131, EPA is providing this summary and brief rationale of its approval of the following revisions to Maryland’s WQS regulations:

Table 1

Revisions to MD WQS that EPA is approving pursuant to Section 303(c) of the Clean Water Act

Section Approved	Description of Revision	EPA Rationale
COMAR 26.08.02.03-2I Chronic Numeric Toxic Substance Criteria for Ammonia for the Protection of Fresh Water Aquatic Life	Maryland removed and replaced three tables, one at subsection (5) for “Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life States May Be Present”, another at subsection (6) for “Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages Are Present and Freshwater Mussels Are Absent.”, and another at subsection (7) for “Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life Stages Are Absent and Freshwater Mussels Are Absent.” Based on Maryland’s submittal, EPA is approving the following tables: Table 1. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life States May Be Present	Criteria consistent with EPA’s recommended water quality criteria published in the <i>Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013</i> (EPA 822-R-18-002).

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<tr><td>8.8</td><td>0.49</td><td>0.46</td><td>0.43</td><td>0.40</td><td>0.38</td><td>0.35</td><td>0.33</td><td>0.31</td><td>0.29</td><td>0.27</td><td>0.26</td><td>0.24</td><td>0.23</td><td>0.21</td><td>0.20</td><td>0.19</td><td>0.17</td><td>0.16</td><td>0.15</td><td>0.14</td><td>0.13</td><td>0.13</td><td>0.12</td><td>0.11</td></tr> <tr><td>8.9</td><td>0.42</td><td>0.39</td><td>0.37</td><td>0.34</td><td>0.32</td><td>0.30</td><td>0.28</td><td>0.27</td><td>0.25</td><td>0.23</td><td>0.22</td><td>0.21</td><td>0.19</td><td>0.18</td><td>0.17</td><td>0.16</td><td>0.15</td><td>0.14</td><td>0.13</td><td>0.12</td><td>0.11</td><td>0.11</td><td>0.10</td><td>0.09</td></tr> <tr><td>9</td><td>0.36</td><td>0.34</td><td>0.32</td><td>0.30</td><td>0.28</td><td>0.26</td><td>0.24</td><td>0.23</td><td>0.21</td><td>0.20</td><td>0.19</td><td>0.18</td><td>0.17</td><td>0.16</td><td>0.15</td><td>0.14</td><td>0.13</td><td>0.12</td><td>0.11</td><td>0.11</td><td>0.10</td><td>0.09</td><td>0.09</td><td>0.08</td></tr> 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(°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	4.92	4.61	4.33	4.06	3.80	3.57	3.34	3.13	2.94	2.75	2.58	2.42	2.27	2.13	2.00	1.87	1.75	1.64	1.54	1.45	1.36	1.27	1.19	1.12	6.6	4.85	4.54	4.26	3.99	3.75	3.51	3.29	3.09	2.89	2.71	2.54	2.38	2.24	2.10	1.97	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17	1.10	6.7	4.76	4.46	4.18	3.92	3.68	3.45	3.23	3.03	2.84	2.66	2.50	2.34	2.19	2.06	1.93	1.81	1.70	1.59	1.49	1.40	1.31	1.23	1.15	1.08	6.8	4.65	4.36	4.08	3.83	3.59	3.37	3.16	2.96	2.77	2.60	2.44	2.29	2.14	2.01	1.88	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.05	6.9	4.52	4.23	3.97	3.72	3.49	3.27	3.07	2.88	2.70	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61	1.51	1.42	1.33	1.24	1.17	1.09	1.03	7	4.36	4.09	3.84	3.60	3.37	3.16	2.96	2.78	2.60	2.44	2.29	2.15	2.01	1.89	1.77	1.66	1.56	1.46	1.37	1.28	1.20	1.13	1.06	0.99	7.1	4.18	3.92	3.68	3.45	3.23	3.03	2.84	2.66	2.50	2.34	2.20	2.06	1.93	1.81	1.70	1.59	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.95	7.2	3.98	3.73	3.50	3.28	3.07	2.88	2.70	2.53	2.38	2.23	2.09	1.96	1.84	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90	7.3	3.75	3.51	3.29	3.09	2.90	2.72	2.55	2.39	2.24	2.10	1.97	1.84	1.73	1.62	1.52	1.43	1.34	1.25	1.17	1.10	1.03	0.97	0.91	0.85	7.4	3.49	3.28	3.07	2.88	2.70	2.53	2.37	2.23	2.09	1.96	1.83	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90	0.85	0.79	7.5	3.22	3.02	2.83	2.66	2.49	2.33	2.19	2.05	1.92	1.80	1.69	1.59	1.49	1.39	1.31	1.22	1.15	1.08	1.01	0.95	0.89	0.83	0.78	0.73	7.6	2.94	2.75	2.58	2.42	2.27	2.13	1.99	1.87	1.75	1.64	1.54	1.44	1.35	1.27	1.19	1.12	1.05	0.98	0.92	0.86	0.81	0.76	0.71	0.67	7.7	2.64	2.48	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39	1.30	1.22	1.14	1.07	1.00	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60	7.8	2.35	2.20	2.07	1.94	1.82	1.70	1.60	1.50	1.40	1.32	1.23	1.16	1.08	1.02	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	7.9	2.07	1.94	1.82	1.70	1.60	1.50	1.40	1.32	1.23	1.16	1.08	1.02	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47	8	1.80	1.68	1.58	1.48	1.39	1.30	1.22	1.14	1.07	1.01	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60	0.56	0.53	0.49	0.46	0.43	0.41	8.1	1.55	1.45	1.36	1.28	1.20	1.12	1.05	0.99	0.92	0.87	0.81	0.76	0.71	0.67	0.63	0.59	0.55	0.52	0.49	0.45	0.43	0.40	0.37	0.35	8.2	1.32	1.24	1.16	1.09	1.02	0.96	0.90	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.54	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30	8.3	1.13	1.05	0.99	0.93	0.87	0.82	0.76	0.72	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26	8.4	0.95	0.89	0.84	0.78	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26	0.25	0.23	0.22	8.5	0.80	0.75	0.71	0.66	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0.19	0.18	8.6	0.68	0.64	0.60	0.56	0.52	0.49	0.46	0.43	0.41	0.38	0.36	0.33	0.31	0.29	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.16	0.15	8.7	0.57	0.54	0.50	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	8.8	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.11	8.9	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	9	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.08	
	Temperature (°C)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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6.5	4.92	4.61	4.33	4.06	3.80	3.57	3.34	3.13	2.94	2.75	2.58	2.42	2.27	2.13	2.00	1.87	1.75	1.64	1.54	1.45	1.36	1.27	1.19	1.12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.6	4.85	4.54	4.26	3.99	3.75	3.51	3.29	3.09	2.89	2.71	2.54	2.38	2.24	2.10	1.97	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17	1.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.7	4.76	4.46	4.18	3.92	3.68	3.45	3.23	3.03	2.84	2.66	2.50	2.34	2.19	2.06	1.93	1.81	1.70	1.59	1.49	1.40	1.31	1.23	1.15	1.08																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.8	4.65	4.36	4.08	3.83	3.59	3.37	3.16	2.96	2.77	2.60	2.44	2.29	2.14	2.01	1.88	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.05																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.9	4.52	4.23	3.97	3.72	3.49	3.27	3.07	2.88	2.70	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61	1.51	1.42	1.33	1.24	1.17	1.09	1.03																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7	4.36	4.09	3.84	3.60	3.37	3.16	2.96	2.78	2.60	2.44	2.29	2.15	2.01	1.89	1.77	1.66	1.56	1.46	1.37	1.28	1.20	1.13	1.06	0.99																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.1	4.18	3.92	3.68	3.45	3.23	3.03	2.84	2.66	2.50	2.34	2.20	2.06	1.93	1.81	1.70	1.59	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.95																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.2	3.98	3.73	3.50	3.28	3.07	2.88	2.70	2.53	2.38	2.23	2.09	1.96	1.84	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.3	3.75	3.51	3.29	3.09	2.90	2.72	2.55	2.39	2.24	2.10	1.97	1.84	1.73	1.62	1.52	1.43	1.34	1.25	1.17	1.10	1.03	0.97	0.91	0.85																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.4	3.49	3.28	3.07	2.88	2.70	2.53	2.37	2.23	2.09	1.96	1.83	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90	0.85	0.79																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.5	3.22	3.02	2.83	2.66	2.49	2.33	2.19	2.05	1.92	1.80	1.69	1.59	1.49	1.39	1.31	1.22	1.15	1.08	1.01	0.95	0.89	0.83	0.78	0.73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.6	2.94	2.75	2.58	2.42	2.27	2.13	1.99	1.87	1.75	1.64	1.54	1.44	1.35	1.27	1.19	1.12	1.05	0.98	0.92	0.86	0.81	0.76	0.71	0.67																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.7	2.64	2.48	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39	1.30	1.22	1.14	1.07	1.00	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.8	2.35	2.20	2.07	1.94	1.82	1.70	1.60	1.50	1.40	1.32	1.23	1.16	1.08	1.02	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.9	2.07	1.94	1.82	1.70	1.60	1.50	1.40	1.32	1.23	1.16	1.08	1.02	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8	1.80	1.68	1.58	1.48	1.39	1.30	1.22	1.14	1.07	1.01	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60	0.56	0.53	0.49	0.46	0.43	0.41																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.1	1.55	1.45	1.36	1.28	1.20	1.12	1.05	0.99	0.92	0.87	0.81	0.76	0.71	0.67	0.63	0.59	0.55	0.52	0.49	0.45	0.43	0.40	0.37	0.35																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.2	1.32	1.24	1.16	1.09	1.02	0.96	0.90	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.54	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.3	1.13	1.05	0.99	0.93	0.87	0.82	0.76	0.72	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.4	0.95	0.89	0.84	0.78	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26	0.25	0.23	0.22																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.5	0.80	0.75	0.71	0.66	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0.19	0.18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.6	0.68	0.64	0.60	0.56	0.52	0.49	0.46	0.43	0.41	0.38	0.36	0.33	0.31	0.29	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.16	0.15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.7	0.57	0.54	0.50	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.8	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.9	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
9	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.08																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

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	<p data-bbox="407 297 1440 318">Table 2. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life States Are Present and Freshwater Mussels Are Absent</p> <table border="1" data-bbox="407 334 1549 1097"> <thead> <tr> <th data-bbox="407 334 443 375"></th> <th colspan="30" data-bbox="911 350 1083 375"><i>Temperature (°C)</i></th> </tr> <tr> <th data-bbox="407 375 443 440"><i>pH</i></th> <th data-bbox="443 375 485 440">7</th> <th data-bbox="485 375 527 440">8</th> <th data-bbox="527 375 569 440">9</th> <th data-bbox="569 375 611 440">10</th> <th data-bbox="611 375 653 440">11</th> <th data-bbox="653 375 695 440">12</th> <th data-bbox="695 375 737 440">13</th> <th data-bbox="737 375 779 440">14</th> <th data-bbox="779 375 821 440">15</th> <th data-bbox="821 375 863 440">16</th> <th data-bbox="863 375 905 440">17</th> <th data-bbox="905 375 947 440">18</th> <th data-bbox="947 375 989 440">19</th> <th data-bbox="989 375 1031 440">20</th> <th data-bbox="1031 375 1073 440">21</th> <th data-bbox="1073 375 1115 440">22</th> <th data-bbox="1115 375 1157 440">23</th> <th data-bbox="1157 375 1199 440">24</th> <th data-bbox="1199 375 1241 440">25</th> <th data-bbox="1241 375 1283 440">26</th> <th data-bbox="1283 375 1325 440">27</th> <th data-bbox="1325 375 1367 440">28</th> <th data-bbox="1367 375 1409 440">29</th> <th data-bbox="1409 375 1451 440">30</th> </tr> </thead> <tbody> <tr> <td data-bbox="407 440 443 505">6.5</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td>7.04</td> <td>6.60</td> <td>6.19</td> <td>5.80</td> <td>5.44</td> <td>5.10</td> <td>4.78</td> <td>4.48</td> <td>4.20</td> </tr> <tr> <td data-bbox="407 505 443 570">6.6</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>7.23</td> <td>6.93</td> <td>6.50</td> <td>6.09</td> <td>5.71</td> <td>5.36</td> <td>5.02</td> <td>4.71</td> <td>4.41</td> <td>4.14</td> </tr> <tr> <td data-bbox="407 570 443 634">6.7</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>7.10</td> <td>6.80</td> <td>6.38</td> <td>5.98</td> <td>5.61</td> <td>5.26</td> <td>4.93</td> <td>4.62</td> <td>4.33</td> <td>4.06</td> </tr> <tr> <td data-bbox="407 634 443 699">6.8</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.93</td> <td>6.65</td> <td>6.23</td> <td>5.83</td> <td>5.44</td> <td>5.11</td> <td>4.81</td> <td>4.51</td> <td>4.23</td> <td>3.97</td> </tr> <tr> <td data-bbox="407 699 443 764">6.9</td> <td>6.74</td> <td>6.74</td> 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<td>4.91</td> <td>4.61</td> <td>4.31</td> <td>4.03</td> <td>3.77</td> <td>3.53</td> </tr> <tr> <td data-bbox="407 894 443 959">7.2</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.94</td> <td>5.68</td> <td>5.31</td> <td>5.01</td> <td>4.71</td> <td>4.41</td> <td>4.13</td> <td>3.87</td> <td>3.63</td> <td>3.40</td> </tr> <tr> <td data-bbox="407 959 443 1024">7.3</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.59</td> <td>5.36</td> <td>5.04</td> <td>4.76</td> <td>4.49</td> <td>4.23</td> <td>3.98</td> <td>3.74</td> <td>3.51</td> <td>3.29</td> </tr> <tr> <td data-bbox="407 1024 443 1089">7.4</td> <td>5.21</td> <td>5.21</td> <td>5.21</td> <td>5.21</td> <td>5.21</td> <td>5.21</td> 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(°C)</i>																														<i>pH</i>	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	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.04	6.60	6.19	5.80	5.44	5.10	4.78	4.48	4.20	6.6	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	6.93	6.50	6.09	5.71	5.36	5.02	4.71	4.41	4.14	6.7	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	6.80	6.38	5.98	5.61	5.26	4.93	4.62	4.33	4.06	6.8	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.93	6.65	6.23	5.83	5.44	5.11	4.81	4.51	4.23	3.97	6.9	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.46	6.04	5.64	5.31	4.99	4.68	4.38	4.11	3.86	7	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.51	6.24	5.82	5.44	5.11	4.81	4.51	4.23	3.97	3.73	7.1	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	5.98	5.56	5.21	4.91	4.61	4.31	4.03	3.77	3.53	7.2	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.68	5.31	5.01	4.71	4.41	4.13	3.87	3.63	3.40	7.3	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.59	5.36	5.04	4.76	4.49	4.23	3.98	3.74	3.51	3.29	7.4	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.00	4.69	4.41	4.15	3.91	3.68	3.46	3.25	3.05	
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7.2	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.68	5.31	5.01	4.71	4.41	4.13	3.87	3.63	3.40																																																																																																																																																																																																																																																																																												
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<tr><td>9.9</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.5</td><td>0.4</td><td>0.4</td><td>0.4</td><td>0.4</td><td>0.3</td><td>0.3</td><td>0.3</td><td>0.3</td></tr> <tr><td></td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>1</td><td>8</td><td>5</td><td>2</td><td>0</td><td>7</td><td>5</td><td>3</td><td>1</td></tr> </table>	7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.3	4.0	3.8	3.5	3.3	3.1	2.9	2.7		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	5	0	6	4	3	3	5	7.6	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2	3.9	3.6	3.4	3.2	3.0	2.8	2.6	2.5		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	4	9	6	4	4	5	7	1	7.7	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	8	4	2	1	2	4	7	1	6	7.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.2	2.1	2.0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	5	7	0	3	8	4	1	7.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.7	2.6	2.4	2.2	2.1	2.0	1.8	1.7		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5	7	0	3	8	4	1	8	6	8.8	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	2.6	2.6	2.5	2.4	2.2	2.1	1.9	1.8	1.7	1.6	1.5		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	1	6	2	9	6	5	4	3	8.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	5	2	1	0	0	1	2	8.2	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	9	7	6	6	6	7	9	1	3	8.3	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	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	1.0	0.9		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	1	1	1	3	4	7	9	2	6	8.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9	0.8	0.8		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6	8	0	2	5	9	2	7	1	8.5	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	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	8	1	5	9	3	8	3	9	8.6	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	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	1	5	0	5	0	6	2	8	8.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.4		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	7	2	8	3	0	6	2	9	8.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	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	0.4	0.4	0.4		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	5	1	8	4	1	7	4	2	8.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	6	2	9	6	3	0	8	6	9.9	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	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		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	8	5	2	0	7	5	3	1	
7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.3	4.0	3.8	3.5	3.3	3.1	2.9	2.7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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	<p>Table 3. Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life States Are Absent and Freshwater Mussels Are Absent</p> <table border="1"> <thead> <tr> <th></th> <th colspan="30">Temperature (°C)</th> </tr> <tr> <th>pH</th> <th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th><th>17</th><th>18</th><th>19</th><th>20</th><th>21</th><th>22</th><th>23</th><th>24</th><th>25</th><th>26</th><th>27</th><th>28</th><th>29</th><th>30</th> </tr> </thead> <tbody> <tr><td>6.5</td><td>18.5</td><td>17.4</td><td>16.3</td><td>15.3</td><td>14.3</td><td>13.4</td><td>12.6</td><td>11.8</td><td>11.1</td><td>10.4</td><td>9.72</td><td>9.11</td><td>8.54</td><td>8.01</td><td>7.51</td><td>7.04</td><td>6.60</td><td>6.19</td><td>5.80</td><td>5.44</td><td>5.10</td><td>4.78</td><td>4.48</td><td>4.20</td></tr> <tr><td>6.6</td><td>18.2</td><td>17.1</td><td>16.0</td><td>15.0</td><td>14.1</td><td>13.2</td><td>12.4</td><td>11.6</td><td>10.9</td><td>10.2</td><td>9.57</td><td>8.97</td><td>8.41</td><td>7.89</td><td>7.39</td><td>6.93</td><td>6.50</td><td>6.09</td><td>5.71</td><td>5.36</td><td>5.02</td><td>4.71</td><td>4.41</td><td>4.14</td></tr> <tr><td>6.7</td><td>17.9</td><td>16.8</td><td>15.7</td><td>14.7</td><td>13.8</td><td>13.0</td><td>12.2</td><td>11.4</td><td>10.7</td><td>10.0</td><td>9.39</td><td>8.80</td><td>8.25</td><td>7.74</td><td>7.25</td><td>6.80</td><td>6.38</td><td>5.98</td><td>5.61</td><td>5.26</td><td>4.93</td><td>4.62</td><td>4.33</td><td>4.06</td></tr> 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<tr><td>8.8</td><td>1.84</td><td>1.72</td><td>1.61</td><td>1.51</td><td>1.42</td><td>1.33</td><td>1.25</td><td>1.17</td><td>1.10</td><td>1.03</td><td>0.96</td><td>0.90</td><td>0.85</td><td>0.79</td><td>0.74</td><td>0.70</td><td>0.65</td><td>0.61</td><td>0.58</td><td>0.54</td><td>0.51</td><td>0.47</td><td>0.44</td><td>0.42</td></tr> <tr><td>8.9</td><td>1.57</td><td>1.47</td><td>1.38</td><td>1.29</td><td>1.21</td><td>1.14</td><td>1.07</td><td>1.00</td><td>0.94</td><td>0.88</td><td>0.82</td><td>0.77</td><td>0.72</td><td>0.68</td><td>0.64</td><td>0.60</td><td>0.56</td><td>0.52</td><td>0.49</td><td>0.46</td><td>0.43</td><td>0.40</td><td>0.38</td><td>0.36</td></tr> <tr><td>9</td><td>1.35</td><td>1.27</td><td>1.19</td><td>1.11</td><td>1.04</td><td>0.98</td><td>0.92</td><td>0.86</td><td>0.81</td><td>0.76</td><td>0.71</td><td>0.66</td><td>0.62</td><td>0.58</td><td>0.55</td><td>0.51</td><td>0.48</td><td>0.45</td><td>0.42</td><td>0.40</td><td>0.37</td><td>0.35</td><td>0.33</td><td>0.31</td></tr> </tbody> </table>		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	17.4	16.3	15.3	14.3	13.4	12.6	11.8	11.1	10.4	9.72	9.11	8.54	8.01	7.51	7.04	6.60	6.19	5.80	5.44	5.10	4.78	4.48	4.20	6.6	18.2	17.1	16.0	15.0	14.1	13.2	12.4	11.6	10.9	10.2	9.57	8.97	8.41	7.89	7.39	6.93	6.50	6.09	5.71	5.36	5.02	4.71	4.41	4.14	6.7	17.9	16.8	15.7	14.7	13.8	13.0	12.2	11.4	10.7	10.0	9.39	8.80	8.25	7.74	7.25	6.80	6.38	5.98	5.61	5.26	4.93	4.62	4.33	4.06	6.8	17.5	16.4	15.4	14.4	13.5	12.7	11.9	11.1	10.4	9.78	9.17	8.60	8.06	7.56	7.09	6.65	6.23	5.84	5.48	5.14	4.81	4.51	4.23	3.97	6.9	17.0	15.9	14.9	14.0	13.1	12.3	11.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06	5.68	5.32	4.99	4.68	4.39	4.11	3.86	7	16.4	15.4	14.4	13.5	12.7	11.9	11.1	10.5	9.80	9.19	8.61	8.07	7.57	7.10	6.65	6.24	5.85	5.48	5.14	4.82	4.52	4.24	3.97	3.73	7.1	15.7	14.8	13.8	13.0	12.2	11.4	10.7	10.0	9.40	8.81	8.26	7.74	7.26	6.81	6.38	5.98	5.61	5.26	4.93	4.62	4.33	4.06	3.81	3.57	7.2	15.0	14.0	13.2	12.3	11.6	10.8	10.2	9.53	8.94	8.38	7.85	7.36	6.90	6.47	6.07	5.69	5.33	5.00	4.69	4.40	4.12	3.86	3.62	3.40	7.3	14.1	13.2	12.4	11.6	10.9	10.2	9.58	8.98	8.42	7.89	7.40	6.94	6.50	6.10	5.72	5.36	5.03	4.71	4.42	4.14	3.88	3.64	3.41	3.20	7.4	13.1	12.3	11.6	10.8	10.2	9.52	8.93	8.37	7.85	7.36	6.90	6.47	6.06	5.69	5.33	5.00	4.69	4.39	4.12	3.86	3.62	3.39	3.18	2.98	7.5	12.1	11.4	10.7	9.99	9.36	8.78	8.23	7.72	7.24	6.78	6.36	5.96	5.59	5.24	4.91	4.61	4.32	4.05	3.80	3.56	3.34	3.13	2.93	2.75	7.6	11.0	10.4	9.70	9.10	8.53	8.00	7.50	7.03	6.59	6.18	5.79	5.43	5.09	4.78	4.48	4.20	3.94	3.69	3.46	3.24	3.04	2.85	2.67	2.51	7.7	9.94	9.32	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56	5.21	4.89	4.58	4.30	4.03	3.78	3.54	3.32	3.11	2.92	2.74	2.57	2.41	2.26	7.8	8.84	8.29	7.77	7.28	6.83	6.40	6.00	5.63	5.28	4.95	4.64	4.35	4.08	3.82	3.58	3.36	3.15	2.95	2.77	2.60	2.43	2.28	2.14	2.01	7.9	7.77	7.28	6.83	6.40	6.00	5.63	5.28	4.95	4.64	4.35	4.08	3.82	3.58	3.36	3.15	2.95	2.77	2.60	2.43	2.28	2.14	2.01	1.88	1.76	8	6.76	6.34	5.94	5.57	5.22	4.90	4.59	4.30	4.03	3.78	3.55	3.33	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.99	1.86	1.75	1.64	1.53	8.1	5.82	5.46	5.12	4.80	4.50	4.22	3.96	3.71	3.48	3.26	3.06	2.87	2.69	2.52	2.36	2.21	2.08	1.95	1.82	1.71	1.60	1.50	1.41	1.32	8.2	4.98	4.67	4.38	4.10	3.85	3.61	3.38	3.17	2.97	2.79	2.61	2.45	2.30	2.15	2.02	1.89	1.77	1.66	1.56	1.46	1.37	1.29	1.21	1.13	8.3	4.23	3.97	3.72	3.49	3.27	3.07	2.87	2.69	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61	1.51	1.41	1.33	1.24	1.17	1.09	1.02	0.96	8.4	3.58	3.36	3.15	2.95	2.77	2.59	2.43	2.28	2.14	2.00	1.88	1.76	1.65	1.55	1.45	1.36	1.28	1.20	1.12	1.05	0.99	0.92	0.87	0.81	8.5	3.02	2.84	2.66	2.49	2.34	2.19	2.05	1.93	1.81	1.69	1.59	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.95	0.89	0.83	0.78	0.73	0.69	8.6	2.55	2.39	2.24	2.10	1.97	1.85	1.73	1.63	1.52	1.43	1.34	1.26	1.18	1.10	1.04	0.97	0.91	0.85	0.80	0.75	0.70	0.66	0.62	0.58	8.7	2.16	2.03	1.90	1.78	1.67	1.57	1.47	1.38	1.29	1.21	1.13	1.06	1.00	0.93	0.88	0.82	0.77	0.72	0.68	0.63	0.60	0.56	0.52	0.49	8.8	1.84	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90	0.85	0.79	0.74	0.70	0.65	0.61	0.58	0.54	0.51	0.47	0.44	0.42	8.9	1.57	1.47	1.38	1.29	1.21	1.14	1.07	1.00	0.94	0.88	0.82	0.77	0.72	0.68	0.64	0.60	0.56	0.52	0.49	0.46	0.43	0.40	0.38	0.36	9	1.35	1.27	1.19	1.11	1.04	0.98	0.92	0.86	0.81	0.76	0.71	0.66	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31	
	Temperature (°C)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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6.5	18.5	17.4	16.3	15.3	14.3	13.4	12.6	11.8	11.1	10.4	9.72	9.11	8.54	8.01	7.51	7.04	6.60	6.19	5.80	5.44	5.10	4.78	4.48	4.20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.6	18.2	17.1	16.0	15.0	14.1	13.2	12.4	11.6	10.9	10.2	9.57	8.97	8.41	7.89	7.39	6.93	6.50	6.09	5.71	5.36	5.02	4.71	4.41	4.14																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.7	17.9	16.8	15.7	14.7	13.8	13.0	12.2	11.4	10.7	10.0	9.39	8.80	8.25	7.74	7.25	6.80	6.38	5.98	5.61	5.26	4.93	4.62	4.33	4.06																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.8	17.5	16.4	15.4	14.4	13.5	12.7	11.9	11.1	10.4	9.78	9.17	8.60	8.06	7.56	7.09	6.65	6.23	5.84	5.48	5.14	4.81	4.51	4.23	3.97																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
6.9	17.0	15.9	14.9	14.0	13.1	12.3	11.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06	5.68	5.32	4.99	4.68	4.39	4.11	3.86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7	16.4	15.4	14.4	13.5	12.7	11.9	11.1	10.5	9.80	9.19	8.61	8.07	7.57	7.10	6.65	6.24	5.85	5.48	5.14	4.82	4.52	4.24	3.97	3.73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.1	15.7	14.8	13.8	13.0	12.2	11.4	10.7	10.0	9.40	8.81	8.26	7.74	7.26	6.81	6.38	5.98	5.61	5.26	4.93	4.62	4.33	4.06	3.81	3.57																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.2	15.0	14.0	13.2	12.3	11.6	10.8	10.2	9.53	8.94	8.38	7.85	7.36	6.90	6.47	6.07	5.69	5.33	5.00	4.69	4.40	4.12	3.86	3.62	3.40																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.3	14.1	13.2	12.4	11.6	10.9	10.2	9.58	8.98	8.42	7.89	7.40	6.94	6.50	6.10	5.72	5.36	5.03	4.71	4.42	4.14	3.88	3.64	3.41	3.20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.4	13.1	12.3	11.6	10.8	10.2	9.52	8.93	8.37	7.85	7.36	6.90	6.47	6.06	5.69	5.33	5.00	4.69	4.39	4.12	3.86	3.62	3.39	3.18	2.98																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.5	12.1	11.4	10.7	9.99	9.36	8.78	8.23	7.72	7.24	6.78	6.36	5.96	5.59	5.24	4.91	4.61	4.32	4.05	3.80	3.56	3.34	3.13	2.93	2.75																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.6	11.0	10.4	9.70	9.10	8.53	8.00	7.50	7.03	6.59	6.18	5.79	5.43	5.09	4.78	4.48	4.20	3.94	3.69	3.46	3.24	3.04	2.85	2.67	2.51																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.7	9.94	9.32	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56	5.21	4.89	4.58	4.30	4.03	3.78	3.54	3.32	3.11	2.92	2.74	2.57	2.41	2.26																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.8	8.84	8.29	7.77	7.28	6.83	6.40	6.00	5.63	5.28	4.95	4.64	4.35	4.08	3.82	3.58	3.36	3.15	2.95	2.77	2.60	2.43	2.28	2.14	2.01																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
7.9	7.77	7.28	6.83	6.40	6.00	5.63	5.28	4.95	4.64	4.35	4.08	3.82	3.58	3.36	3.15	2.95	2.77	2.60	2.43	2.28	2.14	2.01	1.88	1.76																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8	6.76	6.34	5.94	5.57	5.22	4.90	4.59	4.30	4.03	3.78	3.55	3.33	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.99	1.86	1.75	1.64	1.53																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.1	5.82	5.46	5.12	4.80	4.50	4.22	3.96	3.71	3.48	3.26	3.06	2.87	2.69	2.52	2.36	2.21	2.08	1.95	1.82	1.71	1.60	1.50	1.41	1.32																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.2	4.98	4.67	4.38	4.10	3.85	3.61	3.38	3.17	2.97	2.79	2.61	2.45	2.30	2.15	2.02	1.89	1.77	1.66	1.56	1.46	1.37	1.29	1.21	1.13																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.3	4.23	3.97	3.72	3.49	3.27	3.07	2.87	2.69	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61	1.51	1.41	1.33	1.24	1.17	1.09	1.02	0.96																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.4	3.58	3.36	3.15	2.95	2.77	2.59	2.43	2.28	2.14	2.00	1.88	1.76	1.65	1.55	1.45	1.36	1.28	1.20	1.12	1.05	0.99	0.92	0.87	0.81																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.5	3.02	2.84	2.66	2.49	2.34	2.19	2.05	1.93	1.81	1.69	1.59	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.95	0.89	0.83	0.78	0.73	0.69																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.6	2.55	2.39	2.24	2.10	1.97	1.85	1.73	1.63	1.52	1.43	1.34	1.26	1.18	1.10	1.04	0.97	0.91	0.85	0.80	0.75	0.70	0.66	0.62	0.58																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.7	2.16	2.03	1.90	1.78	1.67	1.57	1.47	1.38	1.29	1.21	1.13	1.06	1.00	0.93	0.88	0.82	0.77	0.72	0.68	0.63	0.60	0.56	0.52	0.49																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.8	1.84	1.72	1.61	1.51	1.42	1.33	1.25	1.17	1.10	1.03	0.96	0.90	0.85	0.79	0.74	0.70	0.65	0.61	0.58	0.54	0.51	0.47	0.44	0.42																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
8.9	1.57	1.47	1.38	1.29	1.21	1.14	1.07	1.00	0.94	0.88	0.82	0.77	0.72	0.68	0.64	0.60	0.56	0.52	0.49	0.46	0.43	0.40	0.38	0.36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
9	1.35	1.27	1.19	1.11	1.04	0.98	0.92	0.86	0.81	0.76	0.71	0.66	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

Section Approved	Description of Revision	EPA Rationale
COMAR 26.08.02.03-2I(5) Chronic Numeric Toxic Substance Criteria for Ammonia for the Protection of Fresh Water Aquatic Life	<p>Maryland removed and replaced an equation in subsection (5) for “Chronic Ammonia Criteria for Waters Where Freshwater Fish Early Life States May Be Present.”</p> <p>Maryland removed the following equation:</p> $\left[0.9405 * \left(\frac{0.0278}{1 + 10^{7.688 - pH}} + \frac{1.1994}{1 + 10^{pH - 7.688}} \right) * \text{MIN} \left(6.920, 7.547 * 10^{0.028 * (20 - T)} \right) \right]$ <p>Maryland adopted the following equation and revision to subsequent caption:</p> $CCC = 0.8876 * \left(\frac{0.0278}{1 + 10^{7.688 - pH}} + \frac{1.1994}{1 + 10^{pH - 7.688}} \right) * (2.126 * 10^{0.028 * (20 - \text{MAX}(T, 7))})$ <p>[Where MIN indicates the lesser of the two values separated by a comma.] <i>Where MAX indicates the greater of the two values separated by a comma.</i></p>	<p>Criteria consistent with EPA’s recommended water quality criteria published in the <i>Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013</i> (EPA 822-R-18-002).</p>

Table 2: General Non-Substantive Changes

These revisions (e.g., formatting, minor language adjustments and correction of typographical errors) aid the structure, readability, and interpretation of the state’s WQS. While EPA recognizes that these revisions do not make significant substantive changes, EPA is approving the revisions to ensure public transparency as to which provisions are effective for CWA purposes. EPA notes that its actions on these non-substantive changes to the previously approved WQS do not constitute action on the underlying previously approved WQS.

Renumbering of provisions and tables throughout the submission to accommodate the addition or deletion of regulation are not specifically noted here but are nonsubstantial revisions and considered approved.

Section Approved	Description of Revision																													
COMAR 26.08.02.03-2G Table 6. Toxic Substances for Ambient Water Quality Criteria — Pesticides and Chlorinated Compounds	Revision to footnote clarifies the influence of pH on PCP toxicity: <table border="1" data-bbox="432 407 1570 769"> <thead> <tr> <th rowspan="3">Substance</th> <th rowspan="3">CAS#</th> <th colspan="4">Aquatic Life (µg/L)</th> <th colspan="3">Human Health for Consumption of:</th> </tr> <tr> <th colspan="2">Fresh Water</th> <th colspan="2">Salt Water</th> <th rowspan="2">Drinking Water + Organism (µg/L)</th> <th rowspan="2">Organism Only (µg/L)</th> <th rowspan="2">Drinking Water MCL (mg/L)</th> </tr> <tr> <th>Acute</th> <th>Chronic</th> <th>Acute</th> <th>Chronic</th> </tr> </thead> <tbody> <tr> <td>Pentachlorophenol (PCP)¹</td> <td>87865</td> <td>19</td> <td>15</td> <td>13</td> <td>7.9</td> <td>2.7^a</td> <td>30^a</td> <td>0.001</td> </tr> </tbody> </table> <p data-bbox="464 773 1581 833">¹The freshwater aquatic life criteria for PCP are expressed as a function of pH. Refer to §D of this regulation.</p>	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	Pentachlorophenol (PCP) ¹	87865	19	15	13	7.9	2.7 ^a	30 ^a	0.001
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																									
Pentachlorophenol (PCP) ¹	87865	19	15	13	7.9	2.7 ^a	30 ^a	0.001																						
COMAR 26.08.02.03-2D	Revision to provide the correct table reference: D. The toxicity of certain substances in Tables 1 and [4]6 of §G of this regulation is increased or decreased by hardness or pH. For these toxic substances:																													
COMAR 26.08.02.03-2F	Revision to provide the correct table reference: F. Acute and chronic numeric toxic substance criteria for fresh, estuarine, and salt water aquatic life protection and for human health protection are shown in Tables 1—[4]6 of §G. For the instream application of the acute and chronic criteria for the protection of aquatic life in Tables 1—[4]6 of §G of this regulation:																													