



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

COMMENT AND RESPONSE DOCUMENT

TRIENNIAL REVIEW OF WATER QUALITY STANDARDS

25 Pa. Code Chapter 93
47 Pa. B. 7852 (October 21, 2017)
Environmental Quality Board Rulemaking #7-534
(Independent Regulatory Review Commission #3182)

The proposed regulation that constitutes the Commonwealth of Pennsylvania's Triennial Review of Water Quality Standards was adopted by the Environmental Quality Board (Board) at its April 18, 2017 meeting. Public notices for the proposed rulemaking (Board – Chapter 93) and proposed statement of policy (Department - Chapter 16) were published in the *Pennsylvania Bulletin* on October 21, 2017 (47 Pa.B. 6609 and 6703, respectively) with provisions for 70-day concurrent public comment periods on each proposal, which were set to end on December 29, 2017. Supplemental corrections were published in the *Pennsylvania Bulletin* on October 28, 2017 (47 Pa.B. 6727 and 6730, respectively) to correct printer errors that were published in the October 21 *Bulletin* notices for the date and location for the public hearings to be held at the Northeast Regional Office on December 6, 2017.

The Board and Department held public hearings, for the purpose of accepting comments on the proposed rulemaking and statement of policy on December 6, 8, and 14, at the Department's Northeast Regional Office in Wilkes-Barre, the Southcentral Regional Office in Harrisburg, and the Southwest Regional Office in Pittsburgh, respectively.

In response to requests for an extension of the public comment period and to add a public hearing in the southeast region of Pennsylvania, public notices were also published in the *Pennsylvania Bulletin* on December 30, 2017. (47 Pa.B. 7852 and 7861) Additional public hearings were held on January 30, 2018, at the Department's Southeast Regional Office in Norristown, for both the Proposed Regulation and Proposed Statement of Policy. The extended public comment periods for these proposals closed on February 16, 2018.

As a result of the public hearings and extended public comment period, the Board received comments on the proposed rulemaking from 776 commenters, including from the Independent Regulatory Review Commission (IRRC). The following is a summary of the comments received on the proposed amendments to 25 Pa. Code Chapter 93, and the Department's responses to those comments.

GENERAL COMMENTS

Comment 1:

Requests were received for an extension to the DEP's triennial review process to allow for more time for the public to participate in this important process that comes about once every 3 years or more. Since many of the issues being taken up in the Triennial review greatly impact the Delaware River watershed, they also request that a hearing be held in the watershed well after the new year to allow for more participation by the public in the southeast corner of the state. By providing at least 30 more days beyond the Dec 29, 2017 deadline, after the holiday season and new year, and providing a venue for an additional public hearing within the southeast region, they strongly believe public participation will be greatly improved and ensure the meaningful time needed to fully and fairly review and comment on the proposed standards or standards that may be missing, but that are needed in this triennial. (13, 29)

Response: The Department appreciates the comments. In response to these requests, the public comment period was extended and additional public hearings were held for the Chapter 16

proposed Statement of Policy and Chapter 93 proposed Regulation at the Department's Southeast Regional Office in Norristown, on January 30, 2018. The extended public comment period ended on February 16, 2018.

Comment 2:

I appreciate the PADEP providing an extension to the public comment period, as called for by Delaware Riverkeeper Network and allies, to avoid the holiday season and original deadline of 12/31. Having a longer open comment period now until Feb 16, 2018 helps residents like me have more information to truly be part of this process and to share this important process with my neighbors and other watershed groups and land conservancies. (29A, 32-73)

Response: The Department appreciates the comments.

Comment 3:

The Pennsylvania Dept. of Environmental Protection (PADEP) must set strong numeric water quality standards as part of your triennial review process to better protect the tributaries and water that flows through the Delaware River Basin and the greater Commonwealth. As a resident of the Delaware River watershed who values clean streams and healthy drinking water, I appreciate the PADEP considering my comments. (1)

I am writing to support and encourage the Pennsylvania Dept. of Environmental Protection (PADEP) to set strong numeric water quality standards as part of your triennial review process to better protect the tributaries and water that flows through the Delaware River Basin and the greater Commonwealth. As someone who enjoys recreating, paddling, and fishing in the Delaware River and other Pennsylvania streams and as someone who values clean drinking water and healthy streams that are diverse and high quality, please consider my comments, and consider setting more standards than what is currently being proposed in this triennial review. I understand that these standards set an important foundation for so many of the water quality programs, permits, and impacts that are being considered. (9, 32-73)

I strongly urge you to strengthen the current water quality standards in Pennsylvania. (74-775)

I would like to see water quality standards as high as possible in Pennsylvania, since I'm concerned about polluted water caused by dangerous chemicals that the state hasn't considered "toxic" in the past. Please enact the strictest protections possible. (19)

As a resident of the Delaware River watershed and I value clean streams and healthy drinking water. Please consider and address my comments in this year's triennial review or the next. Healthy streams only improve our quality of life and our economy, so strengthening standards is a critical step to ensuring the 19,000 miles of impaired waterways are cleaned up and remain healthy and diverse streams deserving of High Quality and Exceptional Value are given these protections and not disqualified because the bar is set too high or the work of private land trusts are not included in watershed protection when they should be. Thank you for your time. (9, 32-73)

Response: The Department appreciates the comments.

Comment 4:

The evaluation of these standards is critical to the mission of the PFBC to not only protect water quality for state jurisdictional species but to also protect the recreational value of the Commonwealth's resources for generations of anglers and boaters. (8)

Response:

The Department recognizes that evaluation of these standards is critical to our common mission to protect water quality for aquatic species and the recreational value of the Commonwealth's water resources, for current and future generations of all citizens, visitors, anglers, and boaters.

Comment 5:

Our members appreciate the efforts of the Department of Environmental Protection (PADEP) to set strong numeric water quality standards in the triennial review process to better protect the waters of the Commonwealth and improve our quality of life and our health. Most of our members grew up enjoying our many exceptional area creeks and streams, and at times, the West Branch of the Susquehanna River, for all kinds of warm weather activities such as swimming, floating, kayaking, canoeing, and fishing. We would like to one day see all waters of the Commonwealth support these healthy and restorative activities. We believe the benefits of setting even higher standards than what is currently in effect and what is being proposed, will more than pay for the costs of implementing them by improving the value of living, working, and vacationing in Pennsylvania. (14)

Response: The Department appreciates the comments.

Comment 6:

As Pennsylvanians, we all have a constitutional right to clean water. With 19,000 miles of impaired waterways in the Commonwealth, there is still a long way to go. (14)

Water quality standards are a critical component to ensuring the spirit of the Clean Water Act is implemented. In addition, the standards and designated and existing uses are critical to ensure that the PA Constitution, Article 1 Section 27 is fulfilled. The Pennsylvania Supreme Court Act 13 natural gas challenge brought by Delaware Riverkeeper Network issued an important decision on December 19, 2013. In that decision the Court ruled that Act 13 violates the Pennsylvania Constitution on the grounds that it violates the Environmental Rights Amendment. In doing so, the Court held that the right to pure water, clean air and a healthy environment are fundamental rights that must be given high-priority consideration and protection by every level of Pennsylvania's government. Since that ruling by Chief Justice Castille, multiple examples of case law have been reinforcing this protection and the responsibility of the PADEP to work and operate within this strong environmental rights construct — this reinvigoration of PA environmental rights is critical as we face many challenges in the decades to come. (29A)

Response: The Department appreciates the comments.

Comment 7:

The U.S. Fish and Wildlife Service provided comments pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of federally listed, threatened and endangered species, and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) to ensure protection of fish and wildlife resources. (20)

We recommend ensuring that all WQS for toxic substances, metals, and all other pollutants offer the highest level of protection for NMFS-listed [National Marine Fisheries Service] sturgeon species, and that all standards are at least as protective as the national standards promulgated by EPA. Setting appropriate thresholds for pollutants is necessary to minimize the potential for adverse effects, and we encourage you to use the best available science to justify your thresholds and to help facilitate EPA's triennial review and their subsequent ESA [Endangered Species Act] Section 7 consultation with us. (26)

Response: The Department does and will continue to set appropriate thresholds for pollutants when necessary, to minimize the potential for adverse effects. The best available science is used to justify the thresholds and to help facilitate EPA's approval process of this triennial review and subsequent Endangered Species Act (ESA) Section 7 consultation with the United States Fish and Wildlife Service and National Marine Fisheries Service (the Services).

Comment 8:

With nearly 10,000 member companies involved in all industrial categories and of all sizes, we have been actively and positively involved throughout the past 15 years or more in working with other stakeholders in helping to frame workable approaches to addressing the water quality challenges of the state. As expressed in our previous comments on various legislation regarding water policy, DEP and EPA proposed rulemakings, and proposals from interstate water basin commissions for the Delaware and Susquehanna rivers, we and our members recognize that development, use and stewardship of the state's water resources is vital to the health and success of the communities, industries and enterprises throughout the state. That stewardship of our water resources requires a thoughtful balancing of environmental and economic considerations. (25)

Response: The Department acknowledges the comment.

Comment 9:

Please note that the comments and recommendations presented by EPA Region 3 are strictly for the Environmental Quality Board's (EQB) consideration and do not constitute approval or disapproval decisions under CWA 303(c). Neither are these comments a determination by the EPA Administrator under CWA Section 303(c)(4)(B) that revised or new standards are necessary to meet the requirements of the Act. (4)

Response: The Department understands that these are EPA's comments and recommendations and do not constitute an approval, disapproval, or an Administrator's Determination under Clean Water Act (CWA) Section 303(c) to meet the requirements of the CWA. The final approval action (CWA Section 303(c)) for this rulemaking will be conducted by EPA after such time as

this rulemaking is published in the Pennsylvania Bulletin as a final-form rulemaking, and the complete Administrative Record of Rulemaking is presented to EPA with a specific request for such review and approval.

Comment 10:

We are fully supportive of Pennsylvania's proposed revisions, subject to the specific comments provided on individual topics or items. Under CWA Section 303(c) it is the responsibility of the Pennsylvania Department of Environmental Protection (PADEP) to protect the existing and designated uses of the surface waters of the Commonwealth by establishing water quality standards. The specific water quality criteria being proposed will help PADEP determine if any particular parameter has the potential to negatively impact water quality and, therefore, uses. Having scientifically defensible numeric criteria also benefits the public: dischargers know what specific standards they will be required to meet, and the general public understands what standards are needed to protect water resources. (4)

In accordance with federal regulation at 40 CFR 131.11, states must adopt water quality criteria based on sound scientific rationale and these criteria must contain sufficient parameters or constituents to protect the designated use. States can adopt numerical criteria based on EPA's national CWA 304(a) recommendations, EPA's national recommendations modified to reflect site-specific conditions, or other scientifically defensible methods. Pennsylvania is proposing to adopt several criteria that are based on EPA's national recommendations, as well as several criteria that are not consistent with EPA's national recommendations or for which there are no national recommendations. We remind PADEP that in order to support a CWA 303(c) approval, EPA will need to document that Pennsylvania has met the requirements of the 40 CFR 131.11. (4)

Response: The Department appreciates the comments. The Department understands that the Commonwealth has a responsibility under the CWA to protect the existing and designated uses of the surface waters of this Commonwealth by establishing appropriate water quality standards.

Comment 11:

I would request that in the future, I be added to a mailing list or email list so that I am alerted when the next triennial review occurs. Public notice is critical since this process only comes along every three years. (32-73)

Response: The Department encourages all that are interested to sign up for the *eNotice* service on the Department's website, so they can stay informed of these opportunities for public participation, and to review and comment on the various regulatory and permitting activities being undertaken by the Department or the Environmental Quality Board. The *eNotice* service can be customized to certain preferences on notification.

SPECIFIC COMMENTS BY SECTION OR TOPIC

Comments on Specific water quality criteria – Table 3 (§93.7)

Ammonia criteria

Note:

The Department was made aware in November 2018 that a typesetting error was identified and corrected in the EPA Aquatic Life Ambient Water Quality Criteria for Ammonia (EPA 2013a) document. The equation to calculate the ammonia criterion maximum concentration (CMC) where *Oncorhynchus* species are absent was missing two parentheses which are needed to correctly calculate the criterion (see page 42 of EPA's 2013 document). The error did not affect the results for the criterion values presented in Figure 5a (p. 43) and Table 5b (p. 45), and the equation is correct in Appendix N: Site-Specific Criteria for Ammonia (p. 227). The new publication number is EPA-822-R-18-002.

Comment 12:

We support the proposed amendments to the ammonia criteria. (2, 4, 6, 15)

The Board proposes to amend the ammonia criteria to conform to EPA's final recommendations for Aquatic Life Ambient Water Quality Criteria for Ammonia-Freshwater 2013. These recommendations consider the most recent scientific research regarding the effects of ammonia on aquatic life and incorporate the latest toxicity information. (2)

We support the new federally-recommended criteria for ammonia and the statewide application of these federally-recommended criteria that are protective of aquatic life. (8)

We agree with the comment of the PA Fish and Boat Commission (PFBC) supporting the new federally recommended criteria for ammonia. We note that even water resulting from the careful distillation of toxic gas industry waste fluids still retains some ammonia when no traces of other toxins are reported. (14)

We appreciate the Department of Environmental Protection's (Department) proposal to adopt the Environmental Protection Agency's (EPA) 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia. As the agency responsible for the protection and recovery of federally listed endangered and threatened mussels, we concur that these criteria are warranted to protect listed species, as well as to prevent the need for listing additional mussel species. We support the application of criteria that are protective of freshwater mussels throughout Pennsylvania. (20)

We support DEP's proposal to adopt the Environmental Protection Agency's (EPA) 2013 Aquatic life ambient water quality criteria for ammonia (EPA 822-R-13-001). (27)

Response: The Department appreciates the comments.

Comment 13:

I am interested in how the department tracks pH and temperature since it is relevant to the application of this (ammonia) criterion. (15)

Response: The Department gathers pH and temperature data according to approved data collection protocols. These sampling protocols are contained within the 2018 Version of the Water Quality Monitoring Protocols for Streams and Rivers, found at http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf (refer to Chapter 4. Chemical Data Collection Protocols). The results are recorded and stored so that the data can later be used and analyzed appropriately.

Comment 14:

We are pleased that Pennsylvania is proposing to adopt ammonia nitrogen criteria based on EPA's recommendations found in "Aquatic Life Ambient Water Quality Criteria for Ammonia — Freshwater. 2013", (EPA-822-R-13-001). However, there appear to be some inconsistencies. In order to be wholly consistent with EPA recommendations, we recommend PADEP revise "30-day average Criteria Continuous Concentration (CCC) chronic criterion equation" to "30-day rolling average Criteria Continuous Concentration (CCC) chronic criterion equation." (4)

Similarly, we recommend that "Chronic concentration is not to exceed 2.5 times the CCC as a 4-day average within 30 days..." be revised to "Chronic concentration is not to exceed 2.5 times the CCC as a 4-day average within the 30 day averaging period...". As written it appears that Pennsylvania's chronic criteria would be based on any chosen 30-day period, for example, a given month, rather than each possible 30-day period that a rolling average would achieve, regardless of any artificial or implied bracketing such as the set 30-day periods of a given month. (4)

For clarity, we also recommend rewording "Chronic concentration is not to exceed 2.5 times the CCC as a 4-day average within 30 days (e.g. 2.5 x 1.9 mg TAN/L at pH 7 and 20°C or 4.8mg TAN/L) more than once in 3 years on average." to "The highest four-day average within the 30-day averaging period should not be more than 2.5 times the CCC (e.g., 2.5 x 1.9 mg TAN/L at pH 7 and 20°C or 4.8 mg TAN/L) more than once in three years on average." (4)

Response: The Department appreciates the comments and suggested revisions. It is the Department's intent for these ammonia criteria statements to be consistent with EPA's recommended criteria. In response to the comments, the Department has adjusted its description to "30-day rolling average Criteria Continuous Concentration (CCC) chronic criterion equation" and has revised the language to include "The highest four-day average within the 30-day averaging period should not be more than 2.5 times the CCC (e.g., 2.5 x 0.2 mg TAN/L at pH 9 and 20°C or 0.5 mg TAN/L) more than once in three years on average." (Please also note the change in the example given.)

Comment 15:

In addition, the previous regulation stated that: “The pH and temperature used to derive the appropriate ammonia criteria shall be determined by one of the following methods:

- 1) instream measurements, representative of median pH and temperature – July through September.
- 2) Estimates of median pH and temperature – July through September – based upon available data or values determined by the Department. For purposes of calculating effluent limitations based on this value the accepted design stream flow shall be the actual or estimated lowest 30-consecutive-day average flow that occurs once in 10 years.” (4)

In the proposed revision some of the above descriptive language has been removed. PADEP should clarify what is meant in the proposed revision by “...best estimates, representative of the median pH and temperature of the receiving stream for the applicable time period and design conditions.” How will “best estimates” be determined and what will they be based on? How will ‘-design conditions’ be considered? Why has the language on calculating effluent limitations been removed? Implementation and assessment is not a reviewable element of a water quality standards submission as determined by 40 CFR §131.21(c), but it could be considered in EPA’s review as it relates to the criteria’s scientific defensibility and protectiveness of the use. (4, 776)

Response: The Department appreciates the comments and suggested revisions. The Department provides further clarification to the temperature and pH implementation language as published at proposed rulemaking October 21, 2017 at 17 Pa.B. 6609. The Board is revising the language as follows: “The pH and temperature used to derive the appropriate ammonia criteria shall be determined by instream measurements or best estimates based on reference waters that are representative of the median pH and temperature of the receiving water. Instream measurements for pH and temperature will be gathered using Department data collection protocols.”. These current Department protocols are contained within the 2018 Version of the Water Quality Monitoring Protocols for Streams and Rivers, found at http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf (refer to Chapter 4; Chemical Data Collection Protocols).

With regard to the seasonal component (July through September), the Department recommends the implementation language not be restored in this clarification, because current temperature and pH data suggests that ammonia toxicity to aquatic life may reach high levels outside of that seasonal timeframe.

The Department appreciates the recognition that implementation and assessment is not a reviewable element of a water quality standards submission under the Clean Water Act, and the Department agrees that this may be useful to inform the review and scientific defensibility of the criteria. Therefore, when calculating the effluent limitations for ammonia, the accepted design stream flow shall continue to be the actual or estimated lowest 30 consecutive-day average flow that occurs once in 10 years (Q₃₀₋₁₀), as referenced elsewhere – in Table 1 at 25 Pa. Code §96.4

(relating to TMDLs and WQBELs) – and in §93.7(a) which incorporates Chapter 96 (relating to water quality standards implementation).

Comment 16:

We support DEP’s proposal to adopt the Environmental Protection Agency’s (EPA) 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia (EPA 822-R-13-001). This (ammonia) criterion is especially important in Pennsylvania where sensitive mussel species are present or where plans are underway to restore mussel populations to their historic ranges. However, according to EPA comments (dated Dec 20, 2017) some technical revisions may need to be reviewed and made for this ammonia criteria to be more protective. We would also note that it is unclear why the pH and temperature language pertaining to effluent limitations was removed from the proposed language. (27)

Response: The Department appreciates the comments. The Department intends for these ammonia criteria statements to be consistent with EPA’s recommended criteria. As such, the Department has adjusted the criteria language to be wholly consistent with EPA’s comments and EPA’s recommended criteria statements.

The Department provides further clarification to the temperature and pH implementation language as published at proposed rulemaking October 21, 2017 at 17 Pa.B. 6609. The Department added a provision that Department-approved data collection protocols should be used to determine the pH and temperature values that are then used to derive the appropriate ammonia criteria and effluent limitations. For more details see the previous response to Comment 15.

Comment 17:

In response to a letter from US EPA dated January 21, 2013, the Department proposes to add chronic and acute criteria for Total Ammonia Nitrogen (TAN) to the water quality criteria. The new criteria are based on the protection of sensitive freshwater mussels on a statewide basis. The justification given is the protection of sensitive mussel populations for both chronic and acute exposures, and the protection of salmonid species for acute exposures. (17)

Response: The newly developed Federal recommendations (i.e., the 2013 EPA criteria) expand the freshwater toxicity database for ammonia and result in national criteria recommendations that are protective of the aquatic community as a whole, which includes sensitive freshwater mollusk species and salmonids. The criteria are intended to be protective of the aquatic community, as a whole, which includes sensitive freshwater mollusk species (e.g., freshwater mussels in the Order Unionoida) which are ubiquitous throughout Pennsylvania. Aquatic life criteria are developed according to the 1985 *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (EPA 1985), which establishes that a reasonable level of protection will be provided if all except a small fraction of the taxa are protected, unless a commercially or recreationally important species is very sensitive. The small fraction is set at 0.05. Therefore, criteria developed following the 1985 Guidelines – as were the 2013 ammonia criteria – are designed to be protective of 95% of the taxa.

Comment 18:

The *2015-2025 Pennsylvania Wildlife Action Plan*, published by the Pennsylvania Fish and Boat Commission, provides county record information for each of the endangered freshwater mussel species identified from Pennsylvania. Endangered mussels have been identified in 15 of Pennsylvania's 67 counties. We do not operate in any of the 15 identified counties. Therefore, implementation of the TAN criteria to protect mussel species on a statewide basis is excessive since there are many watersheds where these standards will provide no net ecological benefit compared to the existing protections. (17)

We ask EQB to explain the need to impose the more stringent (ammonia) Federal standard on a statewide basis. Has EQB considered a more site-specific approach to regulating ammonia? (776)

Response: The objective of replacing Pennsylvania's current ammonia criteria with the EPA's 2013 national ammonia criteria recommendations (EPA 2013a) is not to guarantee that it provides sufficient protection for every threatened or endangered mussel in the Commonwealth. The proposed criteria are intended to be protective of the aquatic community, as a whole, which includes sensitive freshwater mollusk species (e.g., freshwater mussels in the Order Unionoida) which are ubiquitous throughout Pennsylvania. Pennsylvania can be divided into six drainage basins: Ohio, Erie, Genesee, Susquehanna, Potomac, and Delaware, and there are unionid mussels in every basin (PFBC 2018). Criteria developed following the 1985 Guidelines (EPA 1985) – as were the 2013 ammonia criteria (EPA 2013a) – are designed to be protective of 95% of the taxa. It is, however, a completely different matter when threatened or endangered species are present. The Endangered Species Act (ESA) protects species that are listed as endangered and threatened, and their habitat, by prohibiting the “take” of listed animals. “Take” is defined in the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct”. It may be determined that some or all threatened or endangered species are not afforded adequate protection by the criteria; and then the Department will be obligated to increase its protection on a site-specific basis wherever threatened or endangered species or their critical habitat is found to be lacking sufficient protection. Pennsylvania is obligated to protect threatened and endangered species as required by the ESA, and pursuant to 93.4c(a)(2) (relating to implementation of antidegradation requirements, endangered or threatened species). Please also see the response to Comment 20 (below) for additional information.

Comment 19:

In the event the Department continues to consider the proposed TAN criteria, it is recommended that the Department create a “Sensitive Mussel” aquatic life use designation under which the proposed TAN criteria would apply, rather than apply the criteria statewide. Under this scenario, the Commonwealth could adopt guidance and standards for listing surface waters under this use, thereby providing protections where such actions are necessary to protect beneficial functions and to support sensitive mussel and salmonid populations. (17)

Response: The final-form rulemaking includes the 2013 EPA ammonia criteria. EPA recommends a single national acute criterion and a single national chronic criterion that will be

protective of sensitive mollusks due to every state having at least one freshwater unionid mussel or bivalve mollusk, or non-pulmonate snail species, native or present in at least some of their waters (EPA 2013a). It is appropriate for Pennsylvania to adopt these national criteria on a statewide basis because there are approximately 65 species of unionid mussels found throughout Pennsylvania. Additionally, Pennsylvania is host to at least 18 species of non-pulmonate (or prosobranch) snails. The criteria are intended to be protective of the aquatic community, as a whole, which includes sensitive freshwater mollusk species (e.g., freshwater mussels in the Order Unionoida) which are ubiquitous throughout Pennsylvania. Freshwater mussels are among the most sensitive genera in the dataset and many of these sensitive mussels reside throughout Pennsylvania. Aquatic communities that include naturally reproducing cold water fish species in the family Salmonidae are also very common throughout the Commonwealth.

If a listed species is demonstrated to inhabit a specific location and it can be determined that the listed species is not receiving adequate protection, then more stringent site-specific criteria will be necessary to prevent “take” of the listed species. And conversely, if it is demonstrated that sensitive species are not inhabiting a specific location then it is possible to derive site-specific water quality criteria that better reflect the organisms that occur at a specific site using the *Revised Deletion Process for the Site Specific Recalculation Procedure for Aquatic Life Criteria* (EPA 2013b). An additional resource entitled *Technical Support Document for Conducting and Reviewing Freshwater Mussel Occurrence Surveys for the Development of Site-Specific Water Quality Criteria for Ammonia* (EPA 2013c) has been prepared to provide information to help states and tribes determine whether freshwater mussels in the Order Unionoida are present or absent at a particular site.

Comment 20:

If these revisions to water quality criteria for TAN are adopted on a state-wide basis, permittees who are not located on sensitive streams are provided the opportunity to request site-specific criteria under 25 Pa. Code Section 93.8d. These criteria are appropriate when site-specific biological or chemical conditions exist in the receiving waters which differ from conditions upon which the water quality criteria were based. Requests for site-specific criteria include all information collected during extensive scientific studies conducted by permittees requesting the site-specific criteria.

Upon receipt of any requests for site-specific criteria, the Department is required to review all data to verify that each request is appropriate. If the Department determines that site-specific criteria are appropriate, the Department is required to publish the site-specific criterion in the *Pennsylvania Bulletin* and take additional actions relating to public notice of permit applications and draft permits. In addition, the Department will be required to:

- i. Maintain publicly available lists of site-specific criteria,
- ii. Submit to the EPA’s Regional Administrator for review and approval, the methodologies used for site-specific criteria development within 30 days of Department’s final action, and
- iii. Prepare a recommendation to the Environmental Quality Board in the form of proposed rulemaking.

Sensitive mussel species have been documented in 15 counties of the Commonwealth, leaving 52 counties where sensitive species have not been identified. Multiple permittees in those 52 counties could potentially request site specific criteria for TAN, placing a significant burden on the Department's resources. Developing the recommended "Sensitive Mussel" aquatic life use designation under which the proposed TAN criteria would apply to specific stream segments or watersheds where sensitive species are identified would eliminate the potentially significant burden for permittees and Commonwealth resources. (17, 776)

Response: The Department does not believe a "Sensitive Mussel" aquatic life use is warranted, as requested. The Department believes the commenter is confusing the concept of "sensitive" mussels with "listed" mussels. As described in the rationale document for the ammonia criterion, EPA updated the ammonia criteria that are applicable nationally, considering the latest toxicity information for freshwater species, including unionid mussels and gill-breathing (non-pulmonate) snails. These are sensitive species, but not necessarily listed as endangered or threatened, although some are. The criteria are intended to be protective of the aquatic community as a whole, which includes sensitive freshwater mollusk species (e.g., freshwater mussels in the Order Unionoida) which are ubiquitous throughout Pennsylvania. The Department summarized this condition in its document "*RATIONALE FOR THE DEVELOPMENT OF AMBIENT WATER QUALITY CRITERIA FOR AMMONIA - PROTECTION OF AQUATIC LIFE USE.*" (DEP. Updated July 2019).

Comment 21:

With respect to the proposed chronic TAN criterion, the Regulatory Analysis Form filed with the Independent Regulatory Review Commission claims positive impacts associated with reduced toxics in the Pennsylvania's waterways in general. ArcelorMittal agrees with the effort to improve the quality of life for those who recreate or otherwise depend on a healthy aquatic ecosystem for income. However, there are costs imposed on the regulated community related to increased treatment requirements associated with the proposed chronic TAN criterion in this rulemaking. To address the question of additional cost for treatment mandated by these regulations and attendant benefits, Section 19 of the Regulatory Analysis Form contains the following general statement:

"Specific estimates of costs and savings cannot be determined because each activity that will result in pollution to waters in this Commonwealth must be reviewed based on site-specific considerations. These site-specific considerations include, but are not limited to the size, flow volume, and the chemical, biological and physical properties of both the receiving water and the effluent discharge. These unique parameters result in site-specific requirements. National Pollutant Discharge Elimination System (NPDES) permits and other approvals will be required for discharges to waters of this Commonwealth using the water quality uses and criteria identified in the proposed regulations."

In addition, Section 23 of the Regulatory Analysis Form includes a table that is intended to provide an estimate of the fiscal savings and costs for the regulated community associated with implementation of the propose criteria. The table generally states that the costs and savings are, "Not Measurable".

These statements and other similar general statements made in the Regulatory Analysis Form seem to address the benefit of environmental regulations in general and do not provide information necessary for the public to evaluate the economic impact of this proposed rulemaking. The statements do not appear to be substantiated by any analysis of estimated or actual costs and impacts to the operation of regulated wastewater treatment facilities, nor do they provide a cost-benefit analysis regarding the implementation of the new standards. The ability of individual treatment plants to meet more stringent criteria will be a function of the existing capacity and engineering design of the facilities, and it cannot be assumed that all facilities will be able to meet the criteria without substantial upgrades to the plants. The economic costs on a case-by-case basis could be significant because of redesign and construction efforts needed to meet more stringent criteria. (17)

It is recommended that the Department conduct a cost analysis to identify the actual costs for additional treatment. At a minimum, information such as the cost per pound of reductions in TAN should be developed and be made available to interested parties for review and comment prior to finalizing the proposed rule changes. In addition, interested parties should be consulted as part of the cost analysis to provide general and site-specific information that should be considered prior to finalizing the proposed revisions to water quality standards. (17, 776)

Response: The Department does not consider economic impacts or achievability in the development of the numeric water quality criteria. The criteria are instream goals based on the best available scientific information and research. These instream goals are designed to protect designated water uses and, as such, are used to calculate allowable effluent limitations in NPDES permits. States are required to develop standards and the corresponding water quality criteria, based on Section 303(c)(2)(A) of the federal CWA. The federal CWA requires the following factors to be taken into consideration:

“Such standards shall be such as to protect the public health or welfare, enhance the quality of the water and serve the purposes of this Chapter. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value in navigation.” 33 U.S.C. §1313(c)(2)(A).

Based on the language above, the federal CWA does not discuss economic considerations when describing the factors to be evaluated in the development of water quality criteria. In other federal statutes, economic feasibility is explicitly noted as a factor that must be considered. As a contrasting example, Congress specifically called for consideration of economic and technical feasibility in the development of primary drinking water standards under the federal Safe Drinking Water Act. For example, if a primary drinking water regulation is expressed as a maximum contaminant level (MCL), “economic and technical feasibility must be considered to ascertain the level of such contaminant in water in public water systems.” 42 U.S.C.A. § 300f(1)(C).

Additionally, treatment costs are site-specific and depend upon the size of the discharge in relation to the size of the stream and many other factors. Therefore, it is not possible to predict the actual change in costs generally for wastewater treatment facilities.

Economics in terms of feasibility occurs when the Department issues a NPDES permit. NPDES permits include effluent limits that are commonly set as technology-based limits. Technology-based effluent limits are the minimum level of control that must be imposed in an NPDES permit. See 40 CFR § 125.3. These limits are established as being achievable by using available technology. If the limits achievable using the available technology are not sufficient to prevent impacts from discharges into receiving waters, water quality-based effluent limits are imposed which are based on the water quality standards.

To the extent that a water quality-based effluent limit cannot be implemented immediately upon permit issuance, schedules of compliance, which are considered an element of “effluent limitations,” may be used to phase in the new technology or remedial measures. See 33 U.S.C. § 1362(11).

Bacteria criteria - General

Comment 22:

In general, we support the Department’s proposal in its Triennial Review of Water Quality Standards (WQS) to update the *E. coli* bacteria criteria for freshwater recreational water quality. (6)

We commend the Board on the proposed amendments to the Pennsylvania Water Quality Standards bacteria criteria for recreational waters. (12)

Response: The Department appreciates the comments.

Comment 23:

DRN [Delaware Riverkeeper Network] will provide more detail in writing related to *E. coli* and fecal coliform proposals. EPA also provided important feedback. (29A)

Response: The Department did receive supplemental information from DRN pertaining to the bacteria criteria and the Department addressed these concerns in its response to Comment 30. The Department addressed EPA’s concerns pertaining to the bacteria criteria in its responses to Comment 26 and Comment 30.

Comment 24:

The Clean Water Act requires waters to be fishable and swimmable. See 33 U.S.C. § 1251(a)(2). Activities are classified as “primary contact recreation” if they involve a high degree of bodily contact with the water; and if immersion and ingestion are likely, such as swimming, wading, and bathing. Activities classified as “secondary contact recreation” are those water-related activities that present less risk of water ingestion, such as boating or shore-based fishing. These activities can expose participants to bacteria in our waterways, and exposure to these bacteria can

make people sick. The water quality criteria for bacteria should be set at a level to appropriately protect the waters and the people who use them. (2)

Response: The commenter's definition of primary and secondary contact recreation appears to align with primary and secondary contact recreation as defined by the Clean Water Act. Exposure to pathogens associated with fecal contamination through activities involving water contact can make people sick and therefore the Department realizes the importance of establishing appropriate criteria for protection from fecal contamination during recreation involving water contact. The Department has determined that these federally recommended recreational use criteria are appropriate for the Commonwealth and these criteria are part of the final-form rulemaking.

Bacteria criteria – Indicator Selection

Comment 25:

The transition to a new fecal indicator bacterium is supported by EPA's Recreational Water Quality Criteria (RWQC) Report published in 2012. This document provides EPA's recommended Clean Water Act §304(a) RWQC for states, lays out the science related to the 2012 RWQC, describes how these scientific findings were used during the development of the 2012 RWQC, and describes the water quality methods associated with the 2012 RWQC. This Report recommends using the fecal indicator bacteria enterococci and *Escherichia coli* (*E. coli*) as indicators of fecal contamination for fresh water, citing scientific advancements in microbiological, statistical, and epidemiological methods have demonstrated that culturable enterococci and *E. coli* are better indicators of fecal contamination than the previously used general indicators, total coliforms and fecal coliforms, which Pennsylvania currently utilizes. The commenter agrees with the Board's selection of *E. coli* as the indicator bacterium. (2)

We support the amendments the Board is proposing to the bacteria criteria, in changing the primary contact recreational water bacterial indicator from fecal coliform to *E. coli*, applied statewide. The fecal coliform is commonly identified as being thermotolerant bacteria (able to grow at 44.5°C) [Warden, Paul; DeSarno, Monique; Volk, Sarah; and Eldred, Bradley. *Analytical Services. Evaluation of Colilert-18 for Detection and Enumeration of Fecal Coliform Bacteria in Wastewater Using the U.S. Environmental Protection Agency Alternative Test Procedure Protocol. Microbiological Methods, Journal of AOAC International. Volume 94, Number 5:2011*]. Thermotolerant bacteria consists of *E. coli*, Klebsiella, Enterobacter, and Citrobacter species [Warden, et al], [Doyle, Michael. Erickson, Mary. *Closing the Door on the Fecal Coliform Assay. Microbe, Volume 1, Number 4, page 162: 2006*]. When testing for fecal coliforms, the population of the bacteria present can affect the fecal coliform results, for example: Klebsiella, Enterobacter, & Citrobacter species are false-positive indicators of fecal contamination as they are from nonfecal origin [Doyle, et al.]. It has been found that up to 15% of Klebsiella (nonfecal origin) are thermotolerant and up to 10% of *E. coli* are not thermotolerant, thus potentially causing an error rate of 25% when testing for fecal coliforms [Allen, Martin; Edberg, Stephen; Clancy, Jennifer; Hruday, Steve. *Drinking water microbial myths. Critical Reviews in Microbiology; ISSN: 1040-841X (print), 1549-7828 (electronic):2013: <http://informahealthcare.com/mby>*]. *E. coli* is the only bacteria of the coliform bacteria group that comes from the intestinal tract and being found to be much more specific to the detection of fecal contamination, so much so, that *E. coli* is the

definitive indicator of fecal contamination in drinking water [Allen, et al.], [Cummings, Dennis. *The Fecal Coliform Test Method Compared to Specific Tests for Escherichia coli*. IDEXX: <https://www.idexx.com/resource-library/water/water-reg-article9B.pdf>]. We strongly encourage the Board to amend the bacterial indicator for the State's Water Quality Standards for recreational water from fecal coliforms to *E. coli*. Hopefully this comment strengthens the rationale behind the bacterial change for primary contact recreational waters. (12)

The Board is proposing to switch from a criterion using fecal coliform as the indicator of fecal contamination to one using *E. coli* for the swimming season of May 1 to September 30, when people are most likely to engage in primary contact recreation. We support the switch to *E. coli* as the indicator parameter. (30)

Response: The Department appreciates the comments regarding the proposed amendments to the bacteria criteria, especially the decision to use *Escherichia coli* (*E. coli*) as the indicator of fecal contamination, rather than fecal coliforms.

Bacteria Criteria – Magnitude, Duration, Frequency

Comment 26:

We are pleased that Pennsylvania is proposing to adopt *E. coli* criteria to protect recreational waters. However, the proposed *E. coli* criteria is not fully consistent with EPA's recommendations found in "Recreational Water Quality Criteria" (EPA-820-F-12-058). The EPA criteria is comprised of a magnitude, duration, and frequency of excursion for both the geometric mean (GM) and the statistical threshold value (STV). It is important for states to adopt the magnitude, duration, and frequency components of the criteria in order to be consistent with EPA's recommendations and to be fully protective of the primary contact recreation designated use. The magnitudes of Pennsylvania's proposed criteria, and the 30-day duration for the GM and STV are for the most part consistent with EPA's recommendations. For the criteria to be wholly consistent, EPA has the following recommended revisions:

PADEP should revise the proposed criteria from "*E. coli* level shall be a geometric mean of 126 per 100 milliliters (ml) ..." to "*E. coli* level shall be a geometric mean of 126 colony forming units (cfu) per 100 milliliters (ml)" to clarify the units of the criterion. Similarly, "410 per 100 ml" should be revised to "410 colony forming units (cfu) per 100 ml". (4)

PADEP should remove the provision that the criterion applies "based on consecutive samples, each sample collected on different days during a 30-day period." Data sufficiency (e.g., sampling frequency) is not a reviewable element of a water quality standards submission as determined by 40 CFR §131.21(c). but it could be considered in EPA's review as it relates to the criteria's scientific defensibility and protectiveness of the use. Data sufficiency is more appropriately addressed in the development of the State's assessment methodologies. Further, PADEP should specify that the duration of the criteria is a 30-day interval. (4)

PADEP should revise the language used to describe the frequency of the criteria. In the EPA recommended criteria, the frequency of the criteria, that is the maximum number of times the

pollutant may be present above the magnitude over the specified duration, is expressed differently for the GM and the STV. The GM is a never-to-be-exceeded value, and the STV should be exceeded no more than 10% of the time. Specifically, the EPA recommended criteria states that “The waterbody geometric mean should not be greater than the selected geometric mean magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day interval,” PADEP’s proposed criteria states that “No more than 10% of the total samples taken during a 30-day period may exceed 410 per 100 ml.” PADEP’s proposed frequency is expressed as a percentage of samples in the 30-day duration period that can exceed the STV, whereas EPA’s language is that the STV should be exceeded no more than 10% of the time. EPA recommends PADEP revise the frequency component of its proposed criteria to be consistent with EPA’s recommendation that there should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day duration interval. (4)

EPA provided more detail in their Dec 20, 2017 comment letter where it also suggested DEP adopt magnitude, duration and frequency components of the criteria in order to be consistent with EPA and to be fully protective of primary contact designated use. (9, 24, 32-73)

Response: It was the intent of the Department to propose recreational criteria to be wholly consistent with EPA’s 2012 Recreational Water Quality Criteria (RWQC). The intent of the Department has not deviated since presenting the proposed rule to the Board. Based upon the recommendations within these comments, the Department made changes to the proposed criteria to be wholly consistent with EPA’s 2012 RWQC, especially regarding magnitude, duration, and frequency.

Bacteria – Natural Sources of *E. coli* in the environment

Feasibility analysis of the criteria based on water quality studies conducted in stream segments known to have no sources of *E. coli* associated with human activities

Comment 27:

It appears that the proposed bacteria criteria for *E. coli* are similar to those adopted by other states based upon federal recommendations. Though the criteria are backed by sound science with regards to human health, it has been difficult to consistently achieve the criteria in other states because of natural sources of *E. coli* in the environment. Implementation of these criteria has therefore resulted in expansion of the listing of impaired waters through the 303(d) processes and necessitated the development of Total Maximum Daily Loads for bacteria for affected waters with limited success. It is recommended that before the criteria for *E. coli* are adopted, the Department conduct a feasibility analysis of the criteria based on water quality studies conducted in stream segments known to have no sources of *E. coli* associated with human activities. The results of any feasibility analysis should be provided for public review and comments prior to finalizing the revisions to water quality standards for bacteria. (17)

Response: The Department understands that the commenter is concerned that *E. coli* naturally present in the environment may have a combined effect with the *E. coli* associated with events of

fecal contamination and the result would be that the total measured *E. coli* levels would exceed the criteria. The commenter suggests that the Department should conduct a study to demonstrate that naturally occurring levels of *E. coli* in a watershed with little to no anthropogenic influence would not exceed the proposed criteria. The Department collected such data in 2017.

The Department collected bacteriological samples on the White Deer Creek basin in Centre and Union Counties. The basin is mostly forested (Bald Eagle State Forest) and therefore has minimal impact from humans upstream of the point where Interstate 80 crosses the main stem of White Deer Creek. One hundred fifty samples collected in this area between August 29 and September 21, 2017 were analyzed for both *E. coli* and fecal coliforms. None of the fecal coliform results were greater than the current criteria of 200 cfu per 100 ml, and there were only two times when the *E. coli* counts were greater than 126 cfu per 100 milliliters (both of these samples were found to contain 130 cfu *E. coli* per 100 ml). Neither of these two samples would have caused an impairment because the proposed criteria magnitude is calculated as the geometric mean of all the samples within a 30-day duration interval and the other samples at these two sites were lower in value. This data refutes the claim that *E. coli* counts will be uncharacteristically high and therefore not representative of the conditions in watersheds that have minimal human impact, with an overall result of too many impairments.

Comment 28:

Commenters noted concern that natural sources of bacteria could make it difficult for dischargers to meet the more stringent standard being proposed. Commenters suggested that the Department should conduct an additional feasibility study. (776)

Response: See Response to Comment 27.

Adding a provision to allow a discharger to demonstrate that they are not the cause

Comment 29:

We would also like to offer comment regarding the proposed bacterial standards for recreational waters. If PDEP adopts EPA's RWQC for *Escherichia coli* (*E. coli*) in fresh water, some industrial sectors may not be able to meet the criteria due to the presence of bacteria originating from natural environmental sources. This concern has become more widely known in recent years as states and the regulated community has engaged in more robust testing of ambient waters and effluents using new bacterial assays. NCASI has published two recent reports on this topic (NCASI 2016, 2017).

Some states have addressed this matter by incorporating provisions in their standards so a discharger can provide scientifically defensible data demonstrating that the sources responsible for elevated levels of these indicator bacteria are not associated with connections to sanitary sources. For example, Oregon's Department of Environmental Quality (ODEQ) recently issued its RWQC, and an accompanying issue paper (Borok 2016) discusses its position regarding industrial discharges with non-fecal sources. The paper contains the following passage:

This change acknowledges that certain non-fecal containing discharges, such as pulp and paper effluent, may contain bacteria that are detected as *E. coli* or enterococcus, but are not pathogenic

and do not indicate the presence of fecal contamination. (Gauthier and Archibald 2001; Degnan 2007; Croteau, et al. 2007). Due to the potential interference of plant-based bacteria in enterococcus tests, it may be difficult for pulp and paper mills to achieve compliance with enterococcus criteria even if the discharge poses little risk to public health due to the lack of pathogenic bacteria in the discharge. ...

The proposed provision will allow flexibility to entities that can demonstrate to DEQ that their discharge does not come from fecal sources. DEQ would require such entities to demonstrate through biochemical species identification techniques that the effluent contains non-fecal based bacteria species. Once the demonstration is made, DEQ would include appropriate effluent limits in the permit to ensure that public health is protected.

In a similar action, the Florida Department of Environmental Protection included a memorandum as part of the record in its revision of RWQC that recognizes this same concern and affords dischargers the opportunity to demonstrate that bacterial assay results are not indicative of the presence of bacteria linked to sanitary wastewater (FDEP 2015).

For these reasons, PDEP may wish to consider acknowledging the potential for false positive bacteria results as part of the triennial review record and provide some guidance regarding approaches that might be taken to avoid unwarranted effluent limits.

References offered by commenter:

- Borok, A. 2016. Issue Paper: Revisions to the Water Quality Standard for Bacteria. State of Oregon Department of Environmental Quality, Portland, OR, February 2016. <http://www.oregon.gov/deq/FilterDocs/BacteriaIssuePaper.pdf.pdf>.
- National Council for Air and Stream Improvement, Inc. (NCASI). 2016. Implications of USEPA's 2012 recreational water quality criteria to the pulp and paper industry, with mill case studies characterizing indicator bacteria in effluents. Technical Bulletin No. 1041. Cary, NC: National Council for Air and Stream Improvement, Inc.
- National Council for Air and Stream Improvement, Inc. (NCASI). 2017. Evaluation of Escherichia coli (*E. coli*) measurement methods when applied to woodyard runoff. Technical Bulletin No. 1044. Cary, NC: National Council for Air and Stream Improvement, Inc. (28)

Other commenters stated concern that natural sources of bacteria could make it difficult for dischargers to meet the more stringent standard being proposed. Commenters offered scientific material to the Department for review. Commenters also suggested adding a provision to the rulemaking to allow a discharger to provide scientific data to show they are not the cause of elevated levels of bacteria. IRRC asks EQB to work with these commenters to gain a better understanding of their concerns and, if appropriate, amend the rulemaking accordingly. (776)

Response: The Department is aware that there may be situations where *E. coli* is present in the surface water and it may not be of either human or fecal origin. The Department will rely on published guidance from EPA when dealing with these unique situations. EPA guidance establishes the requirements and protocols for establishing site-specific recreational water quality

criteria. In December 2014, EPA published a guidance document entitled, *An Overview of Technical Support Materials: A Guide to the Site-Specific Alternative Recreational Criteria TSM Documents*, located at: <https://www.epa.gov/sites/production/files/2015-11/documents/guide-site-specific-alternative-recreational-criteria-documents.pdf>. This 2014 document cross-references the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act promulgation of 2004 and states that if “sanitary surveys and epidemiological studies show the sources of the indicator bacteria to be non-human and the indicator densities do not indicate a human health risk, then it is reasonable for the State or Territory not to consider those sources of fecal contamination in determining whether the standard is being attained”. The 2014 Guidance Document also cross-references an EPA review of studies that was published in 2009 and states that “there are scenarios of contamination from non-human sources and non-fecal sources of fecal indicator bacteria that potentially present markedly different probability of illness relative to human sources. Quantitative microbial risk assessment (QMRA) can be used as a basis to develop site-specific alternative criteria, where sources are characterized predominantly as non-human or non-fecal.”

Bacteria – Difficulty associated with having different fecal indicators for the swimming and non-swimming seasons

Comment 30:

Other Considerations in Proposed Adoption of E. coli Criteria for the Protection of Waters Designated for Water Contact Recreation, EPA recommends PADEP consider whether having recreational criteria that relies on an *E. coli* indicator that would apply only during the swimming season (May 1 through September 30). Additionally, EPA recommends PA DEP adopt a second fecal coliform indicator that would apply” for the remainder of the year.” However, EPA acknowledged it would be difficult for the public to understand. EPA also notes that the data from the different time periods would be difficult to compare. (4, 776)

We would like to recommend testing for *E. coli* year-round and as the bacterial indicator for secondary contact recreational waters. We strongly recommend using the same indicator year-round and for primary and secondary contact recreational waters, not only due to the *E. coli* being a better fecal indicator, but using the same indicator will help maintain a laboratory’s testing work flow and will provide consistent data year-round. If testing with two different bacterial indicators year-round the results may not correlate as the population of bacteria present could affect the testing results, for example: if the water sample has a high number of thermotolerant coliforms along with thermotolerant *E. coli*, then the fecal coliform results could be higher when compared to *E. coli* or vice versa. Hopefully this comment helps the Board consider year-round testing of *E. coli* and help proactively change the State’s Water Quality Standards for secondary contact recreational water to *E. coli* as well, prior to the finalization of the EPA’s recommendations on secondary contact recreational criteria. (12)

For the non-swimming season of October 1 through April 30, when secondary contact recreation is the norm, the Board is proposing to retain the current, fecal coliform-based criterion. We recommend that the Board retain the current fecal coliform-based criterion only if it lacks sufficient data to derive an *E. coli*-based criterion that provides a corresponding level of

protection. If this is the case, the Board should commit to establishing an *E. coli*-based criteria for secondary contact recreation during the next Triennial Review Process. (30)

The Board defined the non-swimming season as October 1 through April 30, when secondary contact recreation is the norm, and is proposing to retain the current, fecal coliform-based criterion. The commenter supports maintaining a bacteria criterion for the non-swimming season, but recommends that the Board retain the current, fecal coliform-based criterion only if it lacks sufficient data to derive an *E. coli*-based criterion that provides a corresponding level of protection. If the data allows, the Board should replace the current fecal coliform criterion for the non-swimming season with a comparable *E. coli* criterion. To simplify matters for all concerned, the commenter also suggests the Board switch to *E. coli* as the fecal indicator bacteria throughout the year, and to do so immediately, if possible. (2)

I am concerned about the adoption of a different method for measuring bacteria during the summer months and the winter months. I believe this will cause confusion, particularly for communities where there are waterbodies with bacteria impairments. (15)

Bacteria standards should be made to be consistent throughout the year and DEP should consider adopting EPA's recommended standards. (32-73, 9)

To assist with consistency and data comparison throughout the year, the commenter recommends the Board adopt *E. coli* standards consistently throughout the year. Other commenters (EPA and PennFuture) raise other considerations for these criteria that should be considered to protect public health. There should be ample time before mid-April to adopt *E. coli* standards for this triennial review that are protective of public health. (27)

Indicator Selection for Non-swimming season - Bacteria standards should be consistent throughout the year and protective of water users. DEP should consider adopting EPA's recommended standards. (1, 2, 9, 24, 74-775) If the data allow, the Board should replace the current fecal coliform criterion for the non-swimming season with a comparable *E. coli* criterion. (74-775)

The Board's proposed amendments only change the fecal indicator bacteria to *E. coli* between the months of May and September. For the remainder of the year, when primary contact with the water is less likely, the Board proposes to continue to use fecal coliform as the indicator. (2)

The preamble to the proposed rule states that "[t]he Department conducted field studies making side-by-side sample comparisons between the current [swimming season] fecal coliform and proposed *E. coli* criteria." 47 Pa. Bull. at 6611. If that side-by-side sampling data establishes a statistically significant relationship between fecal coliform and *E. coli* levels, the Department may be able to derive an *E. coli* criterion that corresponds to the current fecal coliform criterion of 2000 cfu/100 mL. If so, the Board should replace that fecal coliform criterion with the corresponding *E. coli* criterion as part of its final rule in the current rulemaking proceeding. This *E. coli*-based criterion for October through April, which would be subject to revision upon EPA's finalization of its recommended secondary contact recreational criteria, cf. 47 Pa. Bull.

6611, would immediately make monitoring and reporting, and understanding the reported data, easier by using a single indicator parameter throughout the year. (2)

Alternatively, we request the Department and Board commit to begin considering EPA's recommended secondary contact recreational criteria as soon as those criteria are finalized, even if that occurs before Pennsylvania's next triennial review. (2)

Response: The Department acknowledges that collecting data using either one indicator or the other (fecal coliform or *E. coli*) depending upon the time of the year, does not allow for consistency of data comparison throughout the year. However, this can be overcome by having the collected sample analyzed for both *E. coli* and fecal coliforms. The Department acknowledges that relying on two different indicators for fecal contamination depending upon the time of the year carries an inherent risk of potential confusion. However, the Department of Health regulations (28 Pa. Code §18.28) for the state's bathing beaches currently rely on *E. coli* as the indicator of fecal contamination. Additionally, those areas of the state (swimming beaches in Lake Erie and Presque Isle) that fall under the auspices of the federal BEACH Act promulgation (November 16, 2004) also rely on *E. coli*. Currently, both fecal coliforms and *E. coli* are being used as indicators of fecal contamination during the swimming season. Therefore, this rulemaking will not increase the risk of potential confusion by using two different indicators as the criteria for those situations which already rely on two different indicators. As such, there is not a net foreseeable increase in the risk of potential confusion associated with the implementation of the new standard. The existing regulations have different standards for swimming and non-swimming seasons and there are no implementation problems.

The Department does not have sufficient data or information to be able to design criteria using *E. coli* as the indicator for fecal contamination for water contact sports during the non-swimming season (October 1 to April 30) when secondary contact recreation is the norm. EPA is currently conducting research to help in designing criteria that will be protective of secondary contact recreation. When EPA finalizes and recommends these new federal secondary contact recreational criteria, the Department will evaluate these recommendations and propose to adopt them if they are appropriate for Pennsylvania. In the interim, the regulations retain the current non-swimming season (when only secondary contact recreation occurs) fecal coliform-based numerical criterion, which is a geometric mean maximum value of 2,000 cfu/100 ml (found at 25 Pa. Code §93.3, Table 3), which continue to be applied statewide in all surface waters from October 1 to April 30.

Comment 31:

A commenter inquired regarding the Board's proposal to amend its existing bacteria criteria by replacing the current fecal coliform based criteria for water contact sports during the swimming season (May 1 to September 30) with 2012 EPA Recreational Water Quality Criteria recommendations. IRRC notes that the existing regulations currently recognize a swimming season and a non-swimming season, and there are different standards for both. Some commenters have suggested that having different standards for each season could be confusing to the regulated community. IRRC asks EQB to explain how it currently implements this standard

and if it has had any problems with implementation of it. Will the new criteria require a different implementation strategy? If so, what will be required? (776)

Response: The existing water contact sports (WC) criteria consist of components for both a swimming season and a non-swimming season. Both the swimming and the non-swimming season components currently rely on fecal coliform as the indicator of fecal contamination. The risk of exposure to pathogens associated with fecal contamination is greater during the swimming season as this is when full body immersion, ingestion, and inhalation are more likely to occur, and as such, the criteria are designed to be more protective during the swimming season. The recommended *E. coli* criteria will only apply to the swimming season. EPA is currently developing secondary contact criteria and when EPA recommends these criteria, the Board will evaluate this recommendation for its appropriateness for use in Pennsylvania waters during the non-swimming season. The Department's current non-swimming season criteria that relies on fecal coliform will remain in place during the interim. The implementation of the current water quality criteria (based on fecal coliform) is straightforward and will not change appreciably. The Department's current implementation guidance for bacterial criteria is located at:

<http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2015%20Methodology/BacteriaAssessmentMethodology.pdf>.

Water samples are collected, and the results are used in assessments, permitting, and TMDL development. The number of samples collected and the span of time over which they are collected may change as per EPA guidance associated with the recommended criteria. The Department's Bureau of Laboratories would analyze the samples for *E. coli* rather than fecal coliform. To date, the Department has not had any problems implementing the current criteria.

The Department acknowledges that relying on two different indicators for fecal contamination depending upon the time of the year could be considered confusing. However, the Department of Health regulations (28 Pa. Code §18.28) for the state's bathing beaches currently rely on *E. coli* as the indicator of fecal contamination. Additionally, those areas of the state (swimming beaches in Lake Erie and Presque Isle) that fall under the auspices of the federal BEACH Act promulgation (November 16, 2004) also rely on *E. coli*. Currently, both fecal coliforms and *E. coli* are being used as indicators of fecal contamination during the swimming season. Therefore, this rulemaking will not increase the risk of potential confusion that may accompany having two different indicators, as the criteria already rely on these two different indicators.

Bacteria – Global Warming will extend the swimming season

Comment 32:

In the Triennial Review, the Board is proposing to switch from a criterion using fecal coliform as the indicator of fecal contamination to one using *Escherichia coli* (*E. coli*) for the swimming season of May 1 to September 30, when people are most likely to engage in primary contact recreation. The commenter notes that the five-month duration of the swimming season when "primary contact" is more likely to take place is an assumption that may no longer be valid. With the current trend of warmer weather and warmer water temperatures as a result of climate change, the times of year during which primary contact recreation occurs is increasing.

Therefore, as part of the next triennial review, the Pennsylvania Department of Environmental Protection (Department or DEP) and the Board should reconsider the appropriate timeframe for which primary contact standards are applicable. (2)

Response: The Department is aware that climate change will impact outdoor recreation (refer to Pennsylvania's 2018 Climate Action Plan, located at: <http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5342&DocName=2015%20CLIMATE%20CHANGE%20ACTION%20PLAN%20UPDATE.PDF%20>). Higher spring and fall temperatures will lengthen the season for recreation involving water contact. The Department will need to monitor how outdoor recreation in Pennsylvania's surface waters will be affected by climate change. The Department recognizes that it is important to maintain an appropriate timeframe defining the season during which water contact recreation involving full body immersion is likely.

Bacteria - Risk Paradigm - 32 vs 36 illnesses per 1000 swimmers

Comment 33:

For the swimming season of May 1 to September 30, the Board should adopt *E. coli* criteria based on a more protective risk paradigm. (74-775)

Further, the Board selected the less protective *E. coli* standard of two presented by the Environmental Protection Agency (EPA)—36 versus 32 illnesses per 1,000 swimmers, without conducting a risk assessment to determine the appropriate level of risk to Pennsylvanians and visitors who recreate in and on the Commonwealth's waters should be exposed. The commenter supports the switch to *E. coli* as the indicator parameter, but recommends that the Board conduct a risk management assessment to determine the appropriate level of risk to which those who recreate in and on the Commonwealth's waters should be exposed. A more stringent *E. coli* criterion also better pursues the Clean Water Act goal of making Pennsylvania's waters swimmable. Therefore, for the swimming season of May 1 to September 30, the Board should adopt *E. coli* criteria based on a more protective risk paradigm. (2)

From May 1 through September 30, the Board proposes adopting a risk paradigm that allows for 36 illnesses per 1,000 swimmers. This proposal is one of two scenarios presented in EPA's RWQC Report—36 illnesses per 1,000 swimmers and 32 illnesses per 1,000 swimmers. RWQC Report, p. 6. To select a scenario, EPA recommends that states make a risk management decision regarding acceptable illness rates. *Id.* In undertaking this risk assessment, however, states are not limited to the two risk scenarios and associated water quality criteria for bacteria recommended by EPA. Pennsylvania is free to determine that neither of the scenarios proposed by EPA is sufficiently protective of Pennsylvania's waters, and therefore may adopt a risk management scenario and criteria for *E. coli* that is more protective than those recommended by EPA. (2)

Without engaging in a risk management decision-making process, the Board proposes to implement the less protective of EPA's scenarios—36 illnesses per 1,000 swimmers. This puts swimmers and others engaging in primary contact activities at greater risk. Pennsylvanians and

visitors who recreate in and on the Commonwealth's waters deserve protections from exposure to harmful bacteria. (2)

The Board proposes to implement the lesser protective scenario articulated in the RWQC Report noting that:

[t]he *E. coli* levels associated with this risk paradigm are . . . most closely akin to the current Department of Health (DOH) standards in 28 Pa. Code § 18.28 (relating to bathing beach contamination) and the criteria that were promulgated for Lake Erie and Presque Isle under the 2004 Bacteria Rule (40 CFR § 131.41 (relating to bacteriological criteria for those states not complying with Clean Water Act Section 303(i)(1)(A)))]. 47 Pa. Bull. 6611. Both the DOH regulations and the 2004 Bacteria Rule setting bacteriological criteria are based on the bacteria criteria recommended by EPA in 1986. (See DEP, Rationale for the Development of Ambient Water Quality Criteria for Bacteria, p. 3 Jan. 2017 (noting that the DOH regulations are based on the previous nationally recommended 1986 bacteria criteria) available at http://files.dep.state.pa.us/PublicParticipation/Public%20Participation%20Center/PubPartCenterPortalFiles/Environmental%20Quality%20Board/2017/April%2018/7-534%20Proposed%20Triennial%20Review/06_7-534_Triennial%202017_Bacteria_Rationale.pdf; and see Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule, 69 Fed. Reg. 67218 (Nov. 16, 2004) (Promulgating the same bacteria criteria for coastal and Great Lakes waters as presented in EPA's Ambient Water Quality Criteria for Bacteria published in 1986). EPA's 1986 Ambient Water Quality Criteria for Bacteria set a geometric mean value of 126 and a single sample maximum value of 235 *E. coli* per 100 mL. EPA, Ambient Water Quality Criteria for Bacteria 1986, Table 4 – Criteria for Indicator for Bacteriological Densities (Jan. 1986). Deferring to a standard selected in 2004 and itself implementing a criteria developed in 1986 does not appropriately consider the risks presented today. Advances in technologies and understanding of microbiology may influence decisionmakers' assessment of acceptable levels of bacteria present in a given waterbody. Taking into account these advances, the Board must determine what the appropriate risk paradigm is for today.

Further, the Board's proposed less-protective risk scenario does not advance the Clean Water Act's objective of restoring and maintaining the chemical, physical, and biological integrity of Pennsylvania's waters. A risk assessment should be undertaken to determine the appropriate risk management scenario. A more protective risk scenario would better safeguard those recreating on and in Pennsylvania's waters and facilitate improvements in water quality, and therefore should be implemented by the Board. (2)

Further, in selecting an acceptable Level of risk of sickness. the Board is proposing a criteria reflecting a less protective standard—36 illnesses per 1.000. We recommend that the Board adopt the more protective risk paradigm. (30)

Response: The 2012 RWQC put forth two sets of recommendations based on two different risk paradigms (32 illnesses per 1000 swimmers and 36 illnesses per 1000 swimmers). EPA states that the designated use of primary contact recreation would be protected if either set of criteria

(including a geometric mean and a statistical threshold value) is adopted into state water quality standards and approved by EPA.

The Department recommends adopting the *E. coli* freshwater levels associated with the 36 per 1,000 illness rate (i.e., Recommendation 1 in the 2012 RWQC). The *E. coli* levels associated with this risk paradigm (geometric mean = 126 cfu/100 ml & statistical threshold value = 410 cfu/100ml) are most closely akin to the current Pennsylvania Department of Health (DOH) standards at 28 Pa. Code §18.28 (relating to bathing beach contamination). The criteria values for the current DOH standards and the criteria values that were promulgated under the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act for Lake Erie beaches including Presque Isle Bay are a geometric mean value of 126 cfu/100 ml and a single sample maximum value of 235 cfu/100 ml. In order to achieve the most consistent approach and because EPA considers both risk paradigms to be adequately protective, the Department favors the criteria based on Recommendation 1. The Department believes that will result in a more seamless transition.

Comment 34:

Commenter offered additional Permitting Considerations for Industrial Operations with Onsite Sanitary Wastewater Disposal in an Attachment 3:

Large industrial operations may generate domestic (sanitary) wastewater in addition to industrial wastewater. In such situations, the sanitary and industrial wastewaters may be treated and disposed separately or together, either onsite or offsite.

Wastewater permits issued and renewed by DEP are based on the statutes and rules in effect at the time of permit issuance or renewal (Rule 62-620.620(1), F.A.C.). The permit applicant needs to provide reasonable assurance that discharge from the facility to waters of the state will meet applicable water quality standards. Effluent limitations are established, as needed, for parameters that have the potential to cause or contribute to exceedances of water quality standards in receiving waters. (Rules 62-620.620(1) and 62-650.300(1), F.A.C.)

Separate Treatment and Disposal of Sanitary and Industrial Wastewater

In some situations, industrial and sanitary wastewater are treated and disposed separately. For example, industrial wastewater may be discharged under an NPDES permit, while sanitary wastewater from the same facility is piped to a domestic treatment facility offsite, or treated either onsite or offsite and disposed in accordance with applicable domestic wastewater regulations. In this example, the industrial facility should not have the potential to cause or contribute to exceedances by pollutants that are exclusively associated with sanitary wastewater (indicators of human pathogens, for example). Therefore, the industrial wastewater NPDES permit would not include effluent limitations for sanitary wastewater parameters, because the NPDES permit would not authorize a discharge of domestic wastewater to the waters of the State.

Combined Disposal of Sanitary and Industrial Wastewater

In other industrial operations, sanitary wastewater is treated and discharged along with the industrial wastewater. In cases where the sanitary wastewater is treated and disinfected before it is mixed with the main industrial wastewater stream, the sanitary wastewater can be monitored before mixing to ensure compliance with applicable disinfection requirements in Subsections 62-600.440(3)-(6), F.A.C. This scenario would include cases where the sanitary wastewater is disinfected using typical measures for domestic wastewater (e.g. chlorination) and cases where disinfection is provided by mixing with a substream of the industrial wastewater capable of sufficient disinfection. In either case, effluent monitoring and limits may be established at internal outfalls prior to being combined with the main industrial wastewater stream, consistent with Subsection 62-620.320(1), F.A.C. This offers the advantage that smaller internal waste streams may be treated more economically, and often monitored more easily, than larger direct discharges.

At a few large industrial operations, the sanitary and industrial wastewater may be commingled within the facility in a configuration that makes separate treatment and disinfection infeasible. For example, sanitary wastewater from individual manufacturing and office buildings may be routed to onsite industrial process wastewater sewers. In such situations, a permittee would need to provide reasonable assurance that treatment of the combined wastewater is capable of sufficient disinfection to meet applicable sanitary wastewater requirements. Demonstration of reasonable assurance would be site-specific based on the unique configuration of treatment processes at the facility, and the NPDES permit may include effluent limitations for both industrial and sanitary parameters in the combined discharge. Demonstrations could include monitoring for *E. coli* at internal locations that meet the freshwater definition, or a combination of other methods to characterize identified bacteria sources as predominantly of non-human origin. (28)

Response: The Department appreciates the comments. These comments will be shared with the Department's NPDES permitting program as they would pertain to implementation of the criteria through permitting. The final regulations do not identify an implementation strategy, which is addressed at the time of permitting.

Chloride criteria

Comment 35:

A criterion for chloride to protect Pennsylvania streams from impacts like brine gas drilling wastewater and road salt applications in the winter is a missing critical standard by the state that is overdue and needed. (1)

We have supported the Department during previous discussions to establish chloride criteria for water quality standards in the Commonwealth. After a lengthy discussion and literature review, the PFBC suggested that the Department consider the implementation of the Iowa Equation-Based Aquatic Life Chloride Criteria. During that analysis, the PFBC had some concerns with the chronic (CCC) criterion. At that time, we had concerns that this criterion would be less protective to aquatic life than the EPA 1988 National Aquatic Life Criteria for chloride. The

Department subsequently followed that effort up with toxicology testing on a variety of mayfly species and it was determined that a suitable suite of tests did not adequately define mayfly response. (8)

The Department is now reviewing the EPA Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity to determine how it may apply to Pennsylvania. This approach would use field-based specific conductivity as a surrogate for a broad range of ion concentrations. It also removes the need for the adjustments for hardness and sulfate concentrations in a formulaic determination. The EPA is currently evaluating this method and is reviewing public comments. (8)

The U.S. Fish and Wildlife Service (USFWS) has recently published a study assessing the effects of high salinity wastewater discharges on Unionid mussels in Pennsylvania. The USFWS suggests that a chronic criterion of 78 µg/l chloride or 247 pS/cm will prevent the take of federally endangered and threatened mussels. This information should be considered during the evaluation of the EPA Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity. (8)

The Department has been evaluating chloride standards for several triennial review cycles. We have supported the Department's effort to implement water quality standards for chloride criteria to minimize impacts to aquatic life. We strongly support and suggest that the Department implement water quality standards for chloride during the evaluation of the current methodology. (8)

A criterion for chloride to protect Pennsylvania streams from impacts like brine gas drilling wastewater and road salt applications in the winter is a missing critical standard by the state that is overdue and needed; the science conducted by the state and academic institutions in the past supports establishment of this chloride criterion at this critical time, especially in light of the grave aquatic life impacts that occur with high chlorides entering our freshwater tributaries and the increasing chloride trends being documented by scientists. (9)

The Board should expeditiously adopt aquatic life criteria for chloride or specific conductivity. (2)

For far too long, aquatic life in Pennsylvania's waters has gone largely without protection from discharges of chloride. EPA originally established national aquatic life criteria for chloride in 1988 (EPA, Ambient Water Quality Criteria for Chloride – 1988, Feb. 1988). It took until 2010—over 20 years—for the Board to propose a rulemaking to adopt these criteria. Even then, however, the Board did not finally adopt a standard. In 2012, the Board proposed a different set of equation-based criteria for chloride that would account for the effect of the hardness and sulfate concentration on chloride toxicity, but later withdrew that proposal to allow the Department to conduct further studies. Despite the completion of additional toxicity studies and refinement of the Pennsylvania-specific equations during the development of the current Triennial Review regulatory package, “the Department is not recommending a specific chloride

criterion with this proposed rulemaking.” 47 Pa. Bull. at 6612. According to that recommendation, the Board continues to defer proposing aquatic life criteria for chloride. (2)

One reason given for the further delay is EPA’s publication in December 2016 of a new draft field-based method for developing aquatic life criteria for specific conductivity. EPA, Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity, EPA-HQ-OW2016-0353, 81 Fed. Reg. 94370 (Dec. 2016). The preamble to the Board’s proposed rule explains that “[s]ince conductivity is a surrogate measure for all ions present in the water, this EPA study determines that conductivity better accounts for interactions between all ions and toxicity than simply defining a relationship between only hardness and toxicity.” 47 Pa. Bull. at 6612. The EPA study, however, has not been finalized, and “[t]he Department is currently reviewing this new field-based method to determine how it applies to Pennsylvania.” Id. (2)

“[E]levated levels of chloride are toxic to aquatic life in freshwater environments,” 47 Pa. Bull. at 6611, and chloride can negatively affect the fish and insect community structure, diversity, and productivity, even at lower levels. Steven R. Corsi, et. al, A Fresh Look at Road Salt: Aquatic Toxicity and Water Quality Impacts on Local, Regional, and National Scales, 44 Environ. & Sci. Technol. 7376, 7381 (2010). Inevitably, studies will be necessary to determine relationships and impacts more precisely. While those studies are being undertaken, chlorides from gas production wastewater, mine drainage, industrial facilities, road salts, and water softeners continue to impact the aquatic biological communities in Pennsylvania’s waters. (2)

Pennsylvania’s adoption of aquatic life water quality criteria for chloride is long overdue. We appreciate the efforts of the Department and the Board to develop and refine such criteria. At some point, however, a decision has to be made, subject to further revision as the science inevitably evolves. (2)

The Department and the Board should take action earlier if possible, but should commit to adopt, no later than the next triennial review, aquatic life criteria for chloride, or, as an alternative, aquatic life criteria for specific conductivity or a methodology for deriving such criteria. One way or another, however, another triennial review should not pass without Pennsylvania having criteria in place to protect the aquatic life of Pennsylvania waters from the toxic effects of chloride. (2)

Supports the call for chloride standards to protect Pennsylvania streams from impacts like approved brines and road salt applications in the winter. Over the past ten years, we have seen a number of “spills” of highly saline gas drilling waste fluids into our streams. Exacerbating our concern is the fact that these gas drilling waste fluids are also spread, from accidents and occasionally deliberate releases, onto our roads and lands. Studies showing increasing chloride trends support the establishment of a chloride criterion. (14)

I am particularly concerned about the lack of action on a chloride criterion to protect aquatic life. As reported through sampling by the USGS (United States Geological Survey), chloride levels throughout the Brandywine Christina watershed are increasing at an alarming rate over the past several years. The PA DEP needs to take action now so that communities and stakeholders can

begin to address the concerns raised by this troubling trend line. This proposed rulemaking not only fails to adopt a new criterion, but it does not lay out a course of action or a timeline for adoption. If the department is not going to adopt a new criterion, it should adopt a timeline for action. (15)

The Department has not proposed chloride criteria for the protection of aquatic life on the grounds that insufficient information is available to derive values. Since the Department last proposed chloride criteria, two additional comparative studies have been published (Struewing *et al.* 2015; Wang *et al.* 2017) which demonstrate that organisms native to Pennsylvania are more sensitive to chloride than the laboratory organisms used to derive the current EPA chronic criteria for freshwater aquatic life. These results further demonstrate that chloride toxicity is highly likely to be affecting sensitive aquatic species in Pennsylvania watersheds. For this reason, the Service has and will continue to insist that a chronic criterion of either 78 µg/L chloride or 247 µS/cm (Patnode *et al.* 2015) is warranted to prevent take of federally endangered and threatened mussels at relevant National Pollutant Discharge Elimination System (NPDES) discharges. (20)

Under the Clean Water Act (33 U.S.C. § 1251 *et seq.*), the process for developing water quality standards takes into account that our understanding of toxicity advances with new studies. Numerous standards have been proposed by EPA and promulgated by the states only to be revised in subsequent triennial reviews. Since the last triennial review, the number of species tested for chloride sensitivity has continued to expand. Chloride criteria should be advanced in this triennial review following EPA methods and including sensitive native species such as mayflies, aquatic snails, and native freshwater mussels to protect existing uses. While the complex relationship to hardness needs to be further defined, the differences in the influence of hardness between cladocera and mayflies noted by the Department demonstrate that a hardness adjustment based on a single species is inappropriate. Further testing could demonstrate that hardness does not ameliorate chloride toxicity equally or at all for some species. Existing uses could be severely impaired and species extirpated in the time that it will take to develop a defensible model. In light of known toxicity, the Service contends that it is prudent to implement chloride criteria in this triennial review, regardless of the need for future modifications, to afford immediate protection of aquatic resources. (20)

The commenter supports the Department's consideration of field-based data in deriving water quality criteria to protect aquatic life from chloride toxicity. Thus, we encourage the Department to develop a conductivity standard using existing biological survey data. We also concur that conductivity is an easily-measured surrogate for complex ionic mixtures and the local water chemistry interactions. Using conductivity is likely the most expedient means of accounting for differential toxicity due to variable water chemistry. We advocate that the Department derive eco-region specific conductivity criteria following the EPA method (EPA 2011) for watersheds in Pennsylvania for this triennial review using existing data on water chemistry and biota. EPA's draft evaluation for eco-region 70 identifies a chronic exposure criterion of 340 340 µS/cm (95% CI of 272-365 µS/cm) as being applicable in PA, WV, KY and OH. (20)

The commenter recognizes that a third approach to implement protection in this triennial review is to revise the current ineffective criterion for osmotic pressure to protect aquatic life from chloride toxicity. The criterion for osmotic pressure allows a maximum of 50 milliosmoles per kilogram (mOs/kg) in surface waters, which is equivalent to conductivity of 3817 ($\mu\text{S}/\text{cm}$) based on the modified equation from Cravotta and Brady (2015). Existing studies clearly document toxic effects to native aquatic biota at conductivity values an order of magnitude lower (EPA 2011; Cormier et al. 2013a; Cormier et al. 2013b; Pond et al. 2008). As noted above, the draft eco-region 70 evaluation found aquatic life use impairment and macroinvertebrate extirpation at conductivity values above 340 $\mu\text{S}/\text{cm}$ (4.5 mOsm/kg; 95% CI of 3.6-4.8) (EPA 2016). At more than 10 times greater, the current osmotic pressure standard is allowing existing uses to be impaired. Highly sensitive organisms such as some mayflies and stoneflies (Stroud Water Research Center 2015; EPA 2016) and mussels (Patnode et al. 2015) are likely to be extirpated under chronic exposure. In the light of the current science, the Service recommends that the Department conduct an analysis of osmotic pressure and benthic macroinvertebrate survey data to generate an osmotic pressure criterion that protects aquatic life uses for this triennial review. (20)

Chloride aquatic life use standard are absent once again from this triennial review. DRN believes the DEP needs to adopt chloride standards this triennial review to protect aquatic life. The existing PWS criterion at point of intake of 250 mg/l maximum is not protective to the sensitive macroinvertebrates and endangered species that reside in Pennsylvania. A criterion for chloride to begin protecting Pennsylvania streams from brine wastewater from gas drilling and road salt applications would be a critical step by the state that is overdue and needed now for this triennial review; and the science conducted by the state and academic institutions supports establishment of this chloride criterion at this critical time in history. The USFWS notes the same sentiment in its comments to DEP (dated 2/15/18) – FWS states there is a “need to insist on a chronic criterion for chloride to protect and prevent take of federally endangered and threatened mussels”. The USFWS goes onto note that even with there being some interactions with hardness, it is prudent that DEP implements a chloride criterion in this triennial review, regardless of the need for future modifications, to afford protection of aquatic resources. The USFWS points out EPA in 2011 developed ecoregion standards for chronic exposure (eco-region 70). USFWS also provides science from Patnode et al. 2015 that warrants a chronic criterion of either 78 $\mu\text{g}/\text{l}$ chloride or 247 $\mu\text{S}/\text{cm}$ to prevent take of federally endangered and threatened mussels at relevant NPDES discharges. (27)

We are concerned that DEP continues to not establish chloride standards, a very real threat in the Delaware Watershed especially in our sensitive headwaters tributaries and the main stem, Delaware River. An interim criterion for chloride to begin protecting Pennsylvania streams from brine wastewater from gas drilling and road salt applications is a critical step by the state that is overdue and needed and the science conducted by the state would support establishment of this chloride criterion at this critical time. (29, 29A)

We are concerned about the Board’s decision to postpone indefinitely adopting an aquatic life criteria for chloride or specific conductivity. The discharge of chloride to Pennsylvania’s waters has gone largely unchecked for far too long. Elevated levels of chloride are toxic to aquatic life

in freshwater environments, and chloride can negatively affect the fish and insect community structure, diversity, and productivity, even at lower levels. We appreciate the efforts of the Department and the Board to develop and refine a chloride criteria. At some point, however, a decision has to be made, subject to further revision as the science inevitably evolves. The Department and the Board should take action earlier if possible. but should commit to adopt, no later than the next triennial review, aquatic life criteria for chloride. (30)

A criterion for chloride to protect Pennsylvania streams from impacts like brine gas drilling wastewater and road salt applications in the winter is a missing critical standard by the state that is overdue and needed; the science conducted by the state and academic institutions in the past supports establishment of this chloride criterion at this critical time, especially in light of the grave aquatic life impacts that occur with high chlorides entering our freshwater tributaries and the increasing chloride trends being documented by scientists. (32-73)

The Board should also expeditiously adopt aquatic life criteria for chloride or specific conductivity. For far too long, aquatic life in Pennsylvania's waters has gone largely without protection from discharges of chloride. (74 – 775)

A decision regarding TDS or conductivity has been deferred by The Pennsylvania Department of Environmental Protection (The Department) at this time. In past rulemaking sessions, The Department considered the single ion approach to controlling TDS and conductivity by proposing a criterion for chloride beyond the currently protected areas in the proximity of Public Water Supplies. However, multiple attempts in the past to develop a chloride water quality criterion for the protection of aquatic life in freshwater systems were withdrawn due to the complex nature of aquatic systems and the chemical interactions that effect chloride toxicity in freshwater aquatic organisms. (17)

As an alternative, The Department considered using specific conductivity to control ion toxicity in freshwater aquatic systems. The rulemaking indicated that the US EPA document, *Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity*, was being reviewed to determine its applicability to Pennsylvania streams. However, that document has not been finalized by US EPA, and The Department chose to delay consideration of the recommendations during this triennial review. As a result of the questions regarding ion toxicity and the US EPA findings, The Department also chose to defer a chloride criterion at this time but indicated that given the evidence of ion toxicity on freshwater aquatic organisms, they continue to review all available sources of research with a goal of developing appropriate criteria for the protection of aquatic life. They also indicated that their goal is to eventually develop criteria that are applicable to all freshwaters of the Commonwealth. (17)

We support the Department's decision not to rely on draft conductivity guidance issued by US EPA. Unless and until such guidance is final, US EPA Headquarters' position is that states should not rely on it because US EPA is conducting further tests in response to comments (Per discussion between AISI members and U.S. EPA Office of Water, Washington D.C. 10/30/17). ArcelorMittal requests to be included in any subsequent review of technical data specific to

criteria associated with individual ions and conductivity in order to assist with any future review process. (17)

Response: Due to the complex nature of the chemical interactions that determine the toxicological responses of aquatic organisms to chloride, and the release for comment of the field-based specific conductivity draft that addresses these concerns through specific conductance rather than the individual ions, the Department is not recommending a specific chloride criterion with this rulemaking. The Department continues to review all available science, including the EPA document, *Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity* (USEPA, 2016a), and any new data acquired through additional studies, in efforts to develop appropriate criteria. The Department will proceed in its efforts to develop aquatic life criteria for chloride to be applied in all freshwaters of the Commonwealth for the protection of aquatic life. Until a specific chloride criterion is established, the Department will continue to protect aquatic life by developing appropriate site-specific standards.

Several commenters stated that the United States Fish and Wildlife Service has and will continue to insist that a chronic criterion of either 78 µg/L [*sic*] chloride or 247 µS/cm (Patnode *et al.* 2015) is warranted to prevent take of federally endangered and threatened mussels at relevant NPDES discharges. The Department notes the correct units for the chronic criterion in the source referenced is milligrams per liter (mg/L).

Other Criteria Not being Considered in this Triennial Review

Comment 36:

§ 93.7 Osmotic Pressure (OP) – We recommend that PADEP take the opportunity of this triennial review of its water quality standards regulations to review its Osmotic Pressure (OP) criterion and consider replacing it with a parameter or parameters more appropriately protective of the aquatic life uses in Pennsylvania. (4)

Pennsylvania’s in-stream criterion for osmotic pressure in 25 Pa. Code §93.7 allows for a maximum of 50 milliosmoles per kilogram (mOs/kg) for the protection of aquatic life. Pennsylvania’s maximum 50 mOs/kg osmotic pressure criterion is equivalent to a specific conductivity (SC) of 3816.8 (µS/cm) based on the equation from Cravotta and Brady, 2015. (“Priority pollutants and associated constituents in untreated and treated discharges from coal mining or processing facilities in Pennsylvania, USA”. Applied Geochemistry, 62. pp. 108-130) modified under the direction of Cravotta USGS 2017:

$$\text{Osmotic pressure (mOsm/kg)} = 0.0131 * \text{SC (}\mu\text{S/cm)}$$

Pennsylvania’s OP criterion appears to come from the 1968 Report of the Committee on Water Quality Criteria for the Federal Water Pollution Control Administration (aka “The Green Book”). That report states that “(d)issolved materials that are relatively innocuous; i.e. their harmful effect is due to osmotic effects at high concentrations, should not be increased by more than one-third of the concentration that is characteristic of the natural condition of the subject

water. In no instance should the concentration of total dissolved materials exceed 50 milliosmoles (the equivalent of 1500 mg/l NaCl).” The science for determining the levels of dissolved materials in surface waters as well as what levels are safe for aquatic species has advanced since 1968. (4)

A growing body of science has elucidated that there are low effect-levels on resident aquatic organisms due to mixtures of salts (represented as specific conductance, or ionic compounds) (see examples in citation list in Enclosure 1). For example, a peer-reviewed study in ecoregions that include Pennsylvania found aquatic life use impairment and macroinvertebrate extirpation can occur at levels of specific conductance above 300 to 500 $\mu\text{S}/\text{cm}$ (~4 to 6.5 mOsm/kg) (e.g., PADEP unpublished data; Cormier et al. 2012b, Cormier et al. in press). A 50 mOsm/kg level can result in extirpation of more than 50% of a stream’s macroinvertebrate fauna (EPA unpublished data based on Cormier et al. 2012b and Cormier et al. in press). Recent toxicity studies also reveal aquatic effects at much lower levels of osmotic pressure than Pennsylvania’s current maximum 50 mOsm/kg osmotic pressure criterion. For example, in the Allegheny River in Pennsylvania, Patnode et al. (2015) observed toxicity with a no adverse effect concentration for specific conductance of 247 $\mu\text{S}/\text{cm}$ (~3.2 mOsm/kg) on a federally endangered freshwater mussel (*Epioblasma rangiana*). In the light of this new science, EPA would recommend that PADEP consider the development of individual ionic parameters, or perhaps adopt specific conductivity criteria for the various ecoregions in Pennsylvania. EPA recommends that PADEP conduct an analysis of Pennsylvania’s osmotic pressure and instream aquatic life use (181 scores) to confirm whether the current osmotic pressure criterion is protecting the narrative aquatic life use standard. (4)

Response: The Department is planning to include review of the Osmotic Pressure (OP) criterion as part of the Department’s ongoing review of the ion-constituent (e.g. chloride and sulfate) and total dissolved solids (TDS) / specific conductance-based criteria.

Comment 37:

Pennsylvania’s streams continue to suffer from nutrient pollution, both Nitrogen and Phosphorus, and the failure of PADEP to more rapidly adopt numeric nutrient criteria for aquatic life use exacerbates the damage that these streams suffer. (1)

Pennsylvania’s streams continue to suffer from nutrient pollution, both Nitrogen and Phosphorus, and the failure of PADEP to more rapidly adopt numeric nutrient criteria for aquatic life use exacerbates the damage that these streams suffer, and extends the time they will be part of the long list of “impaired” waters. In July 2000, the EPA provided technical guidance for states to develop regional nutrient criteria to begin addressing this pollution. (9)

Nutrient standards are absent from this triennial review. Pennsylvania’s streams continue to suffer from nutrient pollution, both Nitrogen and Phosphorus, and the failure of PADEP to more rapidly adopt numeric nutrient criteria for aquatic life use exacerbates the damage that these streams suffer, and just extends the time that these streams will be part of the long list of “impaired” waters of the Commonwealth. In July 2000, the EPA provided technical guidance for states to develop regional nutrient criteria to begin mitigating this important need yet PA

continues to kick this can down the road over 17 years later. It is encouraging to see this round DEP is proposing an ammonia standard. DRN would highlight review and consideration of EPA's recommendations outlined in their Dec. letter for ammonia pertaining to 30-day averages. (27)

Pennsylvania's streams continue to suffer from nutrient pollution, both Nitrogen and Phosphorus, and the failure of PADEP to more rapidly adopt numeric nutrient criteria for aquatic life use exacerbates the damage that these streams suffer, and extends the time they will be part of the long list of "impaired" waters. In July 2000, the EPA provided technical guidance for states to develop regional nutrient criteria to begin addressing this pollution. (32-73)

Pennsylvania will need to provide an explanation where new or revised criteria are not adopted for parameters where EPA has published new or updated CWA Section 304(a) criteria recommendations since May 30, 2000, including Nutrient criteria for the protection of aquatic life. See EPA's Ecoregional criteria for Total Phosphorus, Total Nitrogen, Chlorophyll *a*, and Water Clarity (Secchi depth for lakes; turbidity for streams and rivers) (& Level III Ecoregional criteria) (2003). (4)

Response: The Department continues to work towards the development of meaningful nutrient criteria for rivers and streams. The Department finalized a Eutrophication Cause Determination Protocol that provides thresholds and methods for identifying effects-based, nutrient-related causes of aquatic life use impairment in streams and wadeable rivers.

Additional work is currently being conducted to analyze decades worth of Pennsylvania lake water quality data for use in evaluation of lake thresholds for both aquatic life and recreational use impairment.

Comment 38:

The Board should adopt other criteria for which EPA has published new or updated Section 304(a) recommendations since May 30, 2000. As revised in 2015, EPA's regulations governing water quality standards provide that "if a State does not adopt new or revised criteria for parameters for which EPA has published new or updated CWA Section 304(a) criteria, then the State shall provide an explanation [for why it did not] when it submits the results of its triennial review to the Regional Administrator[.]" 40 C.F.R. § 131.20(a). See also 80 Fed. Reg. 51020, 51028 (Aug. 21, 2015) (explaining that this requirement applies to "new or revised criteria for parameters for which EPA has published new or update CWA Section 304(a) criteria recommendations since May 30, 2000"). (2, 4)

This change was made to foster meaningful and transparent involvement of the public and intergovernmental coordination with local, state, and federal entities in light of recent science provided by EPA through its criteria recommendations. EPA will not approve or disapprove this explanation. For Pennsylvania's triennial review, the state will need to provide explanations where new or revised criteria are not adopted for parameters where EPA has published new or updated CWA Section 304(a) criteria recommendations since May 30, 2000. PADEP can link to

additional information on all of these parameters through EPA's Water Quality Criteria website at: <https://www.epa.gov/wqc>. (4)

There appears to be missing toxics from those being proposed. EPA states in its comment that the state will need to provide explanations where new or revised criteria are not adopted for parameters where EPA has published new or updated CWA Section 304(a) criteria recommendations since May 30, 2000 and consistent with EPA's 2015 Updated Ambient Water Quality Criteria for the Protection of Human Health. (27)

The Board's proposed rule would not adopt a number of criteria for which EPA has published new or updated Section 304(a) recommendations since May 30, 2000. Specifically, the Board's proposed rule would not adopt EPA's: (2, 4)

- Human health criteria for 1,2-Diphenylhydrazine if the state does not adopt criteria according to "Updates Consistent with EPA's 2015 Updated Ambient Water Quality Criteria for the Protection of Human Health"
- Human health criteria for methylmercury for consumption of organism only
- Human health criteria for selenium
- Human health criteria for zinc
- 2016 recommended aquatic life criteria for selenium (freshwater), see 81 Fed. Reg. 45285 (July 13, 2016);
- 2016 recommended aquatic life criteria for cadmium, see 81 Fed. Reg. 19176 (Apr. 4, 2016);
- 2012 recommended aquatic life criteria for carbaryl, see 77 Fed. Reg. 30280 (May 22, 2012);
- 2004 recommended aquatic life criteria for tributyltin (TBT), see 69 Fed. Reg. 342 (Jan. 5, 2004); or
- 2002 recommended human health criteria for selenium, N-nitrosodibutylamine (CAS No. 924163), N-nitrosodiethylamine (CAS No. 55185), and N-nitrosopyrrolidine (CAS No. 930552).
- Application, statewide, of the Aquatic Life Ambient Freshwater Quality Criteria – Copper (EPA-822-R-07-001, February 2007)
- Nutrient criteria for the protection of aquatic life. See EPA's Ecoregional criteria for Total Phosphorus, Total Nitrogen, Chlorophyll a, and Water Clarity (Secchi depth for lakes; turbidity for streams and rivers) (& Level III Ecoregional criteria) (2003)

See EPA, "National Recommended Water Quality Criteria - Human Health Criteria Table" for the Section 304(a) recommended water quality criteria; available at <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table>.

The Proposed Rulemaking also lacks a proposal for the adoption of tissue-based selenium criteria for the protection of aquatic life (Aquatic Life Ambient Water Quality Criteria for Selenium - Freshwater, EPA-822-R-16-006, June 2016). Given the high bioaccumulation potential of selenium, the USFWS advocates that this tissue sampling approach should be included in this triennial review to augment water concentration standards. (20)

Response: Given that the criteria were not included for public review and comment in the proposed regulation, the criteria cannot be included in the final-form regulation. The Board must provide additional opportunity for public review and comment on any new recommended criteria prior to adopting Section 304(a) recommendations as part of the final rulemaking. The Department will evaluate these referenced recommended criteria in its review, during the next triennial to determine appropriate recommendations for Pennsylvania waters.

Comment 39:

Even with respect to the most recent of these Section 304(a) recommendations, it would seem that Pennsylvania had sufficient opportunity to evaluate EPA's recommended criteria before the Board's adoption of its proposed rule on April 18, 2017. We recommend that the Board include all of these post-2000 EPA recommended criteria in its final rule as amendments to 25 Pa. Code § 93.8c, Table 5. If the Board does not do so, in accordance with 40 C.F.R. § 131.20(a), (c), the Department must explain in the Triennial Review submission to the Regional Administrator why Pennsylvania has chosen not to adopt these Section 304(a) recommended criteria. (2)

Response: The Board must provide additional opportunity for public review and comment on any new recommended criteria prior to adopting Section 304(a) recommendations as part of the final rulemaking. Since this would substantially expand the original proposed rulemaking, the Department will include these referenced recommended criteria during the next triennial review to determine appropriate recommendations for Pennsylvania waters, and to allow for adequate opportunity for public review and participation on these recommendations.

Comment 40:

We also note that it would appear that human health and not aquatic life toxic standards are being proposed – as an organization with concerns for aquatic life impacts, we would suggest that stream life is also considered where appropriate and protective standards set. In general, where DEP is proposing more stringent protections than EPA, we support such protective measures to better fulfill the spirit of the CWA. (27)

Response: When the Department initiated this triennial review of water quality standards, EPA had only issued Section 304(a) recommended water quality criteria for the referenced human health criteria. To date, EPA has not provided similar Section 304(a) recommended criteria for the protection of aquatic life, for inclusion in the current triennial review. Such aquatic life criteria will be evaluated when they are available.

Comment 41:

The preamble to the Board's proposed rule incorrectly uses kilograms (kg) as the unit for the fish consumption rate. See 47 Pa. Bull. at 6613. (2)

Where insufficient information is available to calculate criteria based on the updated exposure assumptions, Table 5 would be amended by including a symbol (“†”) indicating that a particular criterion is based on exposure inputs of 70 kg for body weight and the consumption of 2 liters per day of drinking water and 17.5 grams per day of fish. See 47 Pa. Bull. at 6631 (acronyms and

footnotes to Table 5). The preamble incorrectly states the fish consumption rate as the updated rate of 22 grams per day. See 47 Pa. Bull. at 6613. (2)

Response: The Department appreciates the comments and identified these same typographical errors in the Preamble. The referenced units or values were correct in the proposed Annex A for this rulemaking and are correct for the final rulemaking.

Comment 42:

While the department includes a number of new compounds to its list of toxic criteria, it does not propose to include PFAs and/or PFOAs. We are concerned that the Department is not proposing to add PFA standards (Perfluoroalkyl and Polyfluoroalkyl substances), since these toxins have been found in drinking water supplies in parts of the Delaware River Basin. (1, 9, 14, 27, 29, 32-73)

New Jersey is currently advancing a science panel’s recommendation to adopt a standard of 14 parts per trillion — the most protective PFA standard in the nation. PADEP adopting the same protective standard would greatly protect and not undermine the strides New Jersey is making on the other side of the Delaware River Watershed, while also ensuring that Pennsylvania communities are given the higher level of protection warranted by the science. (15, 27, 29)

Pennsylvania should be addressing PFAs. If the Department does not take action in this rulemaking, it should set a timeline for action on PFAs. (15)

Response: The Department is currently reviewing the available published scientific literature and data concerning PFAS. EPA published a human health advisory limit (HAL) for PFOA and PFOS of 70 ng/L in 2016. While HALs can serve as guidance to state regulators, they are not enforceable standards. The New Jersey panel referenced above, the New Jersey Drinking Water Quality Institute (NJDWQI), has developed and recommended maximum contaminant levels (MCLs) for PFOA and PFNA that were recently adopted by the New Jersey Department of Environmental Protection (NJDEP) under their Safe Drinking Water program. NJDWQI was created in 1984 with an amendment to New Jersey’s Safe Drinking Water Act. NJDWQI is comprised of a panel of scientists appointed by the governor of New Jersey whose purpose is to develop and recommend safe drinking water MCLs and implementation policies to NJDEP. Pennsylvania does not have an equivalent to NJDWQI. Further, the policies and regulations directing the development of water quality criteria are not the same as those used to establish safe drinking water MCLs. At this time, EPA has not established a recommended reference dose (RfD) in EPA’s Integrated Risk Information System (IRIS) for PFOS or PFOA. The Department will continue to follow and review the state of the science regarding PFAS and will develop criteria when sufficient scientific data and information is available. If EPA develops Maximum Contaminant Level Goals (MCLGs) for any of the PFAS compounds, the Department could use those MCLGs in relevant risk assessment values for protection for threshold level toxic effects to human health, according to 25 Pa. Code § 16.32(d).

Comments on Toxic substances and Human health and aquatic life criteria – (§93.8c)

Comment 43:

Table 5 also includes a number of criteria for toxic substances that have no EPA recommended criteria. Where possible, the Department applied EPA's updated exposure factors and other information to update a number of Department-developed criteria in Table 5. The proposed rule includes these updated criteria, some of which would be relaxed from their current values in Table 5, and some of which would become more stringent. (2)

We support all of the Board's proposed updates to the human health and aquatic life criteria for toxic substances in 25 Pa. Code § 93.8c, Table 5. (1, 2)

We commend PADEP for updating or revising most of its criteria consistent with EPA's 2015 ambient water quality criteria for the protection of human health for 94 chemical pollutants including updated scientific recommendations for exposure factors, including body weight, drinking water consumption rate, and fish consumption rate, bioaccumulation factors, and toxicity factors. (4)

We also agree with the PFBC's support for the statewide application of the federally recommended criteria for the 11 toxic substances listed in Section 93.8.c Human Health and Aquatic Life Criteria for Toxic Substances. (14)

Response: The Department appreciates the comments.

Comment 44:

EPA commends PADEP for updating or revising most of its criteria consistent with EPA's 2015 ambient water quality criteria for the protection of human health for 94 chemical pollutants including updated scientific recommendations for exposure factors, including body weight, drinking water consumption rate, and fish consumption rate, bioaccumulation factors, and toxicity factors. EPA notes that most of the proposed revisions in Table 5 adopt rounding of the EPA recommended criteria. PADEP should state this in the final rulemaking.

PADEP's proposed revisions to human health criteria listed in Table 5 of the state's water quality standards regulations include 78 criteria revisions (of which 75 are consistent with the 2015 EPA update while three (3) appear to be inconsistent). 13 criteria additions, two (2) criteria that show no change (as they are already consistent with the 2015 EPA update), and one (1) criterion that shows a small change in numerical criterion as result of recalculation but should be revised to be consistent with EPA updated criteria.

The three criteria revisions that are inconsistent with EPA's 2015 updated criteria recommendations are: chloroform: chlorophenoxy herbicide (2,4-D): and 1,1-dichloroethylene. For chloroform EPA recommends a criterion of 60 µg/L, while PADEP proposes to revise the current criterion (5.7 µg/L) to 6.5 µg/L. For chlorophenoxy herbicide (2,4-D) EPA recommends 1300 µg/L while PADEP proposes to add a criterion of 1000 µg/L. For 1,1-dichloroethylene EPA recommends a criterion of 300 µg/L while PADEP proposes to revise the existing criterion

(33 µg/L) to 30 µg/L. EPA requests that PADEP explain that these differences are intentional and describe their basis. (4)

Response: The Department appreciates that EPA identified that the proposed 1000 µg/L criterion for chlorophenoxy herbicide (2,4-D) was an error. However, due to the lack of data in fish and shellfish for 2,4-D, EPA has not established bioaccumulation factors (BAFs) according to trophic levels. 2,4-D is calculated with a total BAF of 13 L/kg. EPA's recommended criterion is rounded from 1371 µg/L to 1300 µg/L. The Department disagrees with the rounding of the criterion for 2,4-D from 1371 µg/L to 1300 µg/L and recommends rounding the criterion to 1400 µg/L.

Under the 1986 EPA *Guidelines for Carcinogen Risk Assessment* (USEPA 1986), 1,1-dichloroethylene is classified as Group C, "possible human carcinogen" (USEPA, 2000). EPA has not identified a cancer slope factor for this compound. Therefore, a factor of 10 has been applied to the current human health criterion for the protection of carcinogenic effects. The current criterion is 33 µg/L. The recalculated criterion using the new inputs for body weight, drinking water, and fish consumption along with the application of the safety factor is 30 µg/L. Therefore, the Department is recommending no change to the existing criterion.

The 6.5 µg/L value for chloroform contained in the draft Annex A was not intentional and is suspected to be a typographical error. Given the significance of the difference between the proposed value and EPA's recommendation, the Department will reevaluate chloroform in the next triennial review. This proposed amendment is not included in the final-form rulemaking.

Comment 45:

EPA notes that in addition to the proposed new criteria for 11 chemical pollutants listed in the Pennsylvania Bulletin, Table 5 also includes adoption of new proposed criteria for Bis(chloromethyl)ether and Endosulfon Sulfate, which are consistent with EPA recommended criteria. EPA is pleased that PADEP is proposing the addition of criteria for these 13 pollutants.

The 1,2-Diphenylhydrazine criterion does change slightly under recalculation from 0.036 to 0.03 µg/L and should be revised to be consistent with EPA recommendations (0.03 µg/L). If PADEP does not propose to revise this criterion, EPA recommends that PADEP provide justification for the higher value of 0.036 µg/L.

PADEP has proposed revised criteria values for the following pollutants which differ from EPA's 304(a) recommendations: cyanide; 2 methyl-4,6-dinitrophenol; Acrolein; 1,3-dichlorobenzene; Hexachlorocyclopentadiene; Endrin Aldehyde. The criteria for each of these pollutants is proposed with 2 significant digits, while the EPA recommended criteria for each of these pollutants includes only 1 significant digit. For example, for cyanide PADEP has proposed a revised criterion of 4.0 µg/L while EPA has recommended a criterion value of 4 µg/L. PADEP may want to consider revising these criteria to be consistent with EPA recommendations (e.g. to include 1 significant digit instead of 2). This would be consistent with PADEP's proposed revisions of other human health criteria which have been rounded to one significant digit, and would allow the State some flexibility since PADEP's proposed revisions

for the listed pollutants are more precise than EPA’s recommendations, for example for cyanide. 4.0 µg/L is more precise than 4 µg/L.

EPA also notes 2 typographical errors in the proposed Table 5. The chemical pollutant “methoxychlor” is spelled “metoxychlor” though the CAS number and criterion are consistent with EPA updates. The chemical pollutant “1,3-dichloropropene” is spelled “1,3-dichloropropylene” though the CAS number and criterion are consistent with EPA updates. (4)

The list of national recommended water quality criteria for human health for 94 chemical pollutants needs to be compared and cross checked with the Department’s proposed changes to ensure that all EPA toxic standards adopted in 2015 are reflected in PA. (27)

Response: The Department appreciates the comments. The final regulations update the listed pollutants to be consistent with EPA recommendations and correct the typographical errors in the final publication.

Comment 46:

Under the Clean Water Act (CWA), states have the primary responsibility for developing water quality standards. States typically begin that process with EPA’s national recommended water quality criteria required by Section 304(a) of the CWA. EPA issued a national update of its HHWQC in 2015 that included updates to 94 human health criteria. Importantly, under existing regulations, states are not obligated to adopt those criteria exactly as EPA has issued them before submitting them to EPA for approval. Nor are states required to implement the exact same values in the equation that is used to develop the criteria. The regulations also allow states to modify the national criteria to reflect site-specific conditions or develop other “scientifically defensible” criteria before sending them to EPA for approval.

The CWA is built on a foundation of cooperative federalism, and the EPA has emphasized that cooperative federalism is the touchstone of the environmental statutes it administers. The EPA Administrator has stated that the agency will give states greater flexibility to implement their environmental programs in ways that makes sense for the states.

This flexibility in the regulations and EPA’s emphasis on cooperative federalism, give States the ability to take two important steps. First, a state can consider the science underlying EPA’s methodology and the extent to which the default values in the national criteria are applicable to the waters of the slate. Second, the state can consider the economic impacts of the new criteria — especially in a case where the criteria are more stringent and therefore could impose significantly higher compliance costs.

We have been working with a number of states as they begin their triennial reviews, urging them to take these two important steps, before simply adopting EPA’s national criteria. Several states have agreed to look much more closely at these issues before adopting the EPA criteria, and no state has yet adopted the national criteria in their entirety.

The Commonwealth's proposal to amend the rule, with some exceptions, is proposing to adopt the human health criteria EPA issued in 2015. By our count, of the 94 EPA updated criteria, 55 are more stringent than the current standard—sometimes many times more stringent. As others will testify and comment, EPA's national criteria use extremely conservative assumptions in their derivation of criteria, many of which strain credulity. This results in “compounded conservatism” and unnecessarily stringent criteria that will result in very stringent permit limits and higher compliance costs. Yet, the incremental human health protection provided by these criteria may be negligible at best. In light of this compounded conservatism and the scientific issues, states that adjust the criteria to reflect the water quality characteristics of their state or that use more realistic assumptions in the development of their criteria should easily meet the “scientifically defensible” regulatory standard for EPA approval.

Based on the scientific issues, we believe the Commonwealth should use the health protection target of one in a million (1×10^{-6}), but this should specifically target certain segments of the population. Targeted protection would more accurately mitigate the actual risk associated with calculated HHWQC. Second, the state should maintain the Fish Consumption Rate of 17.5 g/day. Third, the state should use a value of 1 for the Relative Source Contribution (RSC) unless sufficient pollutant specific data is available to calculate a different RSC. Fourth, while the transition from bioaccumulation to bioconcentration factors is a reasonable change, we urge the state to reconsider the methodology used by EPA, which heavily relies on models from the unique Great Lakes region. We also believe that the Commonwealth should consider the detrimental economic impact to industry of simply adopting the 2015 updated EPA criteria in their entirety. The recommendations put forth ensure that the environment and public health are protected, while also ensuring the industry's competitiveness and protecting jobs and livelihood of the local community. (5A)

Response: EPA did not update the human health protection target (1×10^{-6}). The target of one in a million has been applied in accordance with EPA's *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health 2000*. The 2015 recommended updates do not reflect a different health protection target than has been used previously.

EPA and the Department are also not updating the methodology regarding the appropriate Relative Source Contribution (RSC) value. EPA's 2000 Human Health Criteria methodology allows flexibility in applying the RSC (i.e., 0.2 to 0.8), but the guidance sets a maximum of 80%. In many cases, it would be difficult, if not impossible, to unequivocally state that there were no other possible sources of a pollutant such that the RSC should be equal to 100%. The 80% maximum threshold acknowledges the probability of an unknown source or unknown sources of a pollutant. When developing criteria, the Department will select the most appropriate RSC based on the best available information. When insufficient RSC information is available, a conservative value of 20% will be used in the calculation, but the maximum contribution will not exceed 80% in accordance with the 2000 Human Health Criteria methodology. Many of the 2015 updated criteria were previously updated in 2002 following this methodology.

National recommended water quality standards and criteria are intended to be adequately protective of a human population over a lifetime. The exposure factors for the 2015 update, as well as previous updates in 2002 and 2003, were chosen for the general adult population. If the

Department identifies a specific sensitive subpopulation (e.g., women, children, infants) then criteria will be developed based on that sensitive subpopulation if sufficient scientific data is available.

As stated in the EPA 2000 Human Health Criteria methodology, the EPA 1980 methodology emphasized the measurement of bioconcentration. Bioconcentration refers to the uptake and retention of a chemical by an aquatic organism from water only. Bioaccumulation refers to the uptake and retention of a chemical by an aquatic organism from all surrounding media (i.e., food, water, sediment). For some chemicals (especially those that are highly persistent and hydrophobic), the magnitude of bioaccumulation by aquatic organisms can be substantially greater than the magnitude of bioconcentration. EPA's 2000 methodology reflects this important scientific advancement and emphasizes the measurement of chemical bioaccumulation.

It should also be recognized that Pennsylvania is a Great Lakes state. Bioaccumulation factors (BAFs) that utilize Great Lakes models or data are expected to be generally representative of Pennsylvania waters.

The 2015 updated human health criteria reflect advances in our understanding of the toxicity of pollutants and the exposure factors used to develop criteria. Many of the recalculated criteria are based on updated toxicity data and use of BAFs instead of bioconcentration factors (BCFs), which resulted in a dramatic change for some pollutants. The significant change in the value of the criterion was primarily due to the updated reference dose and BAFs not the updated inputs for body weight, drinking water consumption and fish consumption rates. Note that EPA's recommended body weight input increased from 70 kg to 80 kg. Use of this value in the calculation of human health criteria results in a less conservative criterion. The drinking water intake and fish consumption values did slightly increase, but when combined with the increased body weight should not dramatically affect the overall value of the criterion.

Under the Federal Clean Water Act, states may not consider economics in the development of water quality standards and criteria. However, dischargers may be afforded some limited flexibility in achieving new water quality standards when the criteria are implemented through NPDES permits.

Comment 47:

We have been an active participant at the state and federal levels in technical and scientific aspects of water quality criteria development for decades and appreciates this opportunity to offer technical information that can improve the scientific foundation of water quality management decisions in Pennsylvania.

In June 2015 USEPA revised its recommendations for human health water quality criteria (HHWQC) for 94 substances. In doing so, USEPA changed most of the exposure-related assumptions used to derive the criteria, including the fish consumption rate, relative source contribution (RSC), bioaccumulation factors (BAFs), body weight, and drinking water consumption rate. Some of these changes do not reflect the best science, and since that time, all

States that have thoughtfully considered USEPA's revised criteria recommendations have chosen to depart from them in favor of better science and more appropriate assumptions for their States.

Working with Arcadis, we have developed materials to help States contemplate the criteria derivation process and thoughtfully consider designing criteria that provide a reasoned and transparent balance between theoretical risk, risk realities, and the implementation costs associated with potentially excessive conservatism in EPA's criteria recommendations. Today I will highlight just a few of the areas where State-specific science choices may be preferred. The remarks I make today will be supported with considerable technical documentation to be provided during the comment period.

- **Health Protection Targets.** USEPA recommends a health protection target to protect the general population at between a one in million (1×10^{-6}) and one in one hundred thousand (1×10^{-5}) increased lifetime cancer risk and that highly exposed sub-populations not exceed a one in ten thousand (1×10^{-4}) increased lifetime cancer risk. We encourage States to be specific about their health protection targets for at least the mean of the general population and higher-end exposure segment(s). Doing so recognizes the reality of the link between risk and exposure and allows more transparency and greater appreciation of actual risk associated with calculated HHQWC relative to other risks.
- **Fish Consumption Rate.** USEPA's 2015 HHWQC are based on a fish consumption rate of 22.0 grams per day (g/day). USEPA's prior recommendations were based on a fish consumption rate of 17.5 g/day. The difference in consumption rate is based primarily on two changes, neither of which suggests people are eating more fish in 2015 than they were in 2000. The first change results from an improved statistical method developed by the Centers for Disease Control that more accurately estimates lifetime fish consumption rates obtained from relatively short-term (several day) consumption surveys. The more accurate estimates of the fish consumption rate are lower than USEPA's prior estimates. The second change involves adding marine fish and a portion of salmon consumption to the fish consumption rate. The basis for this addition is tenuous, at best, particularly for states with little or no marine coastline. Importantly, the derivation of EPA's fish consumption rate value is not transparent. It cannot be validated because USEPA will not release the data used to derive the value.
- **Relative Source Contribution.** USEPA's recommended criteria for non-carcinogenic compounds include a relative source contribution (RSC) of 20 percent for nearly all substances. The value used for nearly all criteria before 2015 was 100 percent. The RSC acts to make HHWUC more restrictive to account for exposures from other sources such that total exposure does not exceed toxicity thresholds. For nearly all substances, the effect of EPA's new choice is to make HHWQC more restrictive by a factor of 5 times compared to pre-2015 HHWQC. While ensuring that toxicity thresholds are not exceeded is important, USEPA's approach may be extreme and unwarranted in light of the numerous other conservative assumptions used to derive

the criteria and especially when substance-specific exposure data show little reasonable likelihood of other significant exposure pathways.

- **Bioaccumulation Factor.** USEPA’s revised criteria are derived using substance-specific bioaccumulation factors (BAFs) whereas the pre-2015 criteria were based on bioconcentration factors (BCFs). While a transition from BCFs to BAFs is consistent with accepted scientific consensus, the methodology USEPA used is not applicable to the waters of many States because it relies too heavily on models based on accumulation of PCBs in the Great Lakes. PCBs are not representative of most of the substances for which criteria were revised, and USEPA has consistently stated that the Great Lakes are unique in their size, food web, temperature, historical pollutant loading and many other factors. Pennsylvania DEP should consider whether USEPA’s BAFs are appropriate for Pennsylvania waters.
- **Drinking Water Ingestion.** USEPA’s revised criteria used an updated drinking water ingestion rate of 2.4 L/person/day. Thus, USEPA assumes that people drink this amount of water every day from untreated surface waters, or that treated drinking water contains substances at the criteria concentrations 100% of the time over a lifetime. PA DEP might consider whether this assumption is rational and appropriate for purposes of ambient water criteria.

The 2015 revised criteria also include several ‘implicit assumptions;’ that is, assumptions that affect the calculated criteria but are not parameterized in the criteria derivation equation used by USEPA. Examples include assuming that: all waters have a constant chemical concentration equal to the HHWQC; chemical concentrations are not reduced during cooking; people drink untreated surface water; and people consume fish and water with the maximum allowed contamination level continuously over their lifetime. Use of these implicit assumptions act to make the criteria more stringent and make exposure and risk communications less meaningful.

Combining the conservative explicit and implicit assumptions described above leads to a phenomenon referred to as “compounded conservatism;” wherein the level of protection afforded by HHWQC is far greater than stated health protection targets. Recognizing this phenomenon is important and it should be thoughtfully considered in light of the implementation costs and potential for misallocation of public and private resources that may result from applying excessive conservatism when deriving criteria.

- **Probabilistic Risk Assessment.** The 2015 National HHWQC use a decades-old risk assessment approach for which alternatives both exist and are preferred by the modern risk assessment community. The preferred approach, now adopted by at least one State in deriving HHWQC, uses probability models. Among the advantages of this approach is that it applies more of the available data and that it creates a rational and transparent link between the criteria and specific health protection targets. Put simply, probability models allow States to confirm that they have achieved their stated health protection goals.

The level of effort required to address many of the most critical of the above issues is not large. For example:

- long-term fish consumption rates for different regions of the country are available;
- Florida has reviewed exposure data for 26 compounds and developed RSCs and other researchers have published RSCs;
- BAFs are a critical input only for bioaccumulative compounds and information is available for several inputs to refine USEPA's procedure to make it more applicable to State waters, and, where BAF data are unreliable, BCFs still offer a reasonable and transparent alternative to BAFs; and
- Software tools are available that enable the use of probability models to derive HHWQC. (28A)

We will be submitting a considerable volume of technical work covering all of the points made in today's public hearing. We hope that PA DEP will thoughtfully consider this information and the flexibility provided to states under the CWA and, as other states have, make independent judgements about the best choices for protecting Pennsylvania's waters and those who rely on them. (28A)

IRRC also commented for EQB to explain why it believes the standards developed by EPA are appropriate for the protection of Pennsylvania waters instead of more site-specific standards or other scientifically defensible criteria. (776)

Response: EPA did not update the human health protection target (1×10^{-6}). The target of one in a million has been applied in accordance with EPA's 2000 *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health*. The 2015 recommended updates do not reflect a different health protection target than has been used previously.

EPA and the Department are also not updating the methodology regarding the appropriate Relative Source Contribution (RSC) value. The 2000 methodology allows flexibility in applying the RSC (i.e., 0.2 to 0.8), but the guidance sets a maximum of 80%. In many cases, it would be difficult, if not impossible, to unequivocally state that there were no other possible sources of a pollutant such that the RSC should be equal to 100%. The 80% maximum threshold acknowledges the probability of an unknown source(s) of a pollutant. When developing criteria, the Department will select the most appropriate RSC based on the best available information. When insufficient RSC information is available, a conservative value of 20% will be used in the calculation, but the maximum contribution will not exceed 80% in accordance with the 2000 methodology. Many of the 2015 updated criteria were previously updated in 2002 following this methodology.

EPA updated the fish consumption rate (FCR) to 22 grams per day based on National Health and Nutrition Examination Survey (NHANES) data collected from 2003 to 2010 and a modification of the National Cancer Institute (NCI) model. The previous FCR of 17.5 g/day was based on

Continuing Survey of Food Intakes by Individuals (CSFII) data collected from 1994 to 1996 and ratio estimation methods. Development of both FCRs (17.5 g/day and 22 g/day) followed EPA's 2000 methodology, which recommends using a 90th percentile FCR to derive ambient water quality criteria.

National recommended water quality standards and criteria are intended to be adequately protective of a human population over a lifetime. The exposure factors for the 2015 update, as well as previous updates in 2002 and 2003, were chosen for the general adult population. If the Department identifies a specific sensitive subpopulation (e.g., women, children, infants) then criteria will be developed based on that sensitive subpopulation if sufficient scientific data is available.

As stated in the EPA 2000 methodology, the EPA 1980 methodology emphasized the measurement of bioconcentration. Bioconcentration refers to the uptake and retention of a chemical by an aquatic organism from water only. Bioaccumulation refers to the uptake and retention of a chemical by an aquatic organism from all surrounding media (i.e., food, water, sediment). For some chemicals (especially those that are highly persistent and hydrophobic), the magnitude of bioaccumulation by aquatic organisms can be substantially greater than the magnitude of bioconcentration. EPA's 2000 methodology reflects this important scientific advancement and emphasizes the measurement of chemical bioaccumulation.

It should also be recognized that Pennsylvania is a Great Lakes state. Bioaccumulation factors (BAFs) that utilize Great Lakes models or data are expected to be generally representative of Pennsylvania waters.

The updated drinking water values are representative of the general adult population, which includes pregnant and nursing females. For this sensitive subpopulation, of pregnant and nursing females, the drinking water consumption rate of 2.4 liters per day may actually be too low. Also, some pollutants, particularly with respect to emerging contaminants (e.g., hormones, antibiotics, pesticides, etc.), should not be expected to be removed through conventional treatment plants. It cannot be assumed that all pollutants in the raw water will decrease as the water is processed through the treatment plant. In some instances, pollutants may become concentrated in the finished water. Pollutants can also become concentrated through cooking processes.

The regulations are designed for statewide protections using statewide criteria. Site-specific standards may be appropriate on a case-by-case basis. DEP has evaluated EPA's recommendations and determined that they are appropriate for Pennsylvania.

Comment 48:

The EPA Recommendations that Inform the Proposed Triennial WQS are Overly Conservative. PA should, like Florida, consider a Risk-Based Strategy. Pennsylvania is not obligated to incorporate the 2015 EPA guidance on human health water quality criteria (HHWQC). The revised HHWQC made significant changes to exposure-related assumptions, including those related to body weight, drinking water consumption rate, bioaccumulation factors, relative source contribution and fish consumption rate. It is our understanding that since the publication of this

guidance, several other states have not adopted this guidance in their water quality standards and have instead, as Pennsylvania is allowed to do, developed a regulatory framework that is more reflective of their own state. Should Pennsylvania incorporate the revised federal HHWQC, it is likely that municipalities and industry will both be required to expend considerably more resources to comply when there is minimal additional net health benefit to be secured.

The federal HHWQC are overly conservative or are not based on the best available data. For example, the fish consumption rate assumes the average person is eating 22 g/day of fish, up from 17.5 g/day in the previous HHWQC. It is our understanding that EPA has not released the underlying data supporting this significant increase in fish consumption. We understand through our members other data has shown the average person is eating less than 22 g/day of fish. With respect to bioaccumulation factors, the methodology EPA relied on is informed by models built upon data regarding accumulation of PCBs from the Great Lakes. We question why the characteristics of the Great Lakes should inform water quality criteria for all of Pennsylvania. Regarding water consumption, the revised HHWQC assumes the average person consumes 2.4 liters a day of untreated surface water. We ask if DEP believes this to be representative of Pennsylvanians' water consumption. Finally, the combination of extremely conservative assumptions in the revised HHWQC yields a combined level of protection far, far beyond what is necessary to protect the public health.

Instead, the PA Chamber urges that the Department review of its own in-stream water quality data and actual fish and water consumption in Pennsylvania and use that information to develop a probabilistic risk assessment approach, which would result in a transparent and rational regulatory framework that links real-world data with water quality criteria. The Clean Water Act gives states the flexibility to reconsider the assumptions EPA uses; and Pennsylvania, given the breadth of its various water assets and considerable information base, should take advantage of that flexibility. (25)

Response: EPA updated the fish consumption rate (FCR) to 22 grams per day based on National Health and Nutrition Examination Survey (NHANES) data collected from 2003 to 2010 and a modification of the National Cancer Institute (NCI) model. The previous FCR of 17.5 g/day was based on Continuing Survey of Food Intakes by Individuals (CSFII) data collected from 1994 to 1996 and ratio estimation methods. Development of both FCRs (17.5 g/day and 22 g/day) followed EPA's 2000 Human Health Criteria methodology, which recommends using a 90th percentile FCR to derive ambient water quality criteria.

National recommended water quality standards and criteria are intended to be adequately protective of a human population over a lifetime. The exposure factors for the 2015 update, as well as previous updates in 2002 and 2003, were chosen for the general adult population. If the Department identifies a specific sensitive subpopulation (e.g., women, children, infants) then criteria will be developed based on that sensitive subpopulation if sufficient scientific data is available. As stated in the EPA 2000 Human Health Criteria methodology, the EPA 1980 methodology emphasized the measurement of bioconcentration. Bioconcentration refers to the uptake and retention of a chemical by an aquatic organism from water only. Bioaccumulation refers to the uptake and retention of a chemical by an aquatic organism from all surrounding

media (i.e., food, water, sediment). For some chemicals (especially those that are highly persistent and hydrophobic), the magnitude of bioaccumulation by aquatic organisms can be substantially greater than the magnitude of bioconcentration. EPA's 2000 methodology reflects this important scientific advancement and emphasizes the measurement of chemical bioaccumulation. EPA used field-measured bioaccumulation factors (BAFs) and laboratory-measured bioconcentration factors (BCFs) available from peer-reviewed, publicly available journal articles and databases to develop baseline BAFs (USEPA, 2016b). EPA also evaluated additional peer-reviewed sources. It should also be recognized that Pennsylvania is a Great Lakes state. BAFs that utilize Great Lakes models or data are expected to be generally representative of Pennsylvania waters.

The updated drinking water values are representative of the general adult population, which includes pregnant and nursing females. For this sensitive subpopulation, the drinking water consumption rate of 2.4 liters (L) may actually be too low. Some pollutants, particularly with respect to emerging contaminants (e.g., hormones, antibiotics, pesticides, etc.), should not be expected to be removed through conventional treatment plants. It cannot be assumed that all pollutants in the raw water will decrease as the water is processed through the treatment plant. In some instances, pollutants may become concentrated in the finished water. Pollutants can also become concentrated through cooking processes.

The Department has evaluated EPA's recommendations and determined that they are appropriate for Pennsylvania.

Comment 49:

We ask EQB to provide a comparison of its approach to adopting the 2015 EPA guidance on human health water quality criteria to other states surrounding Pennsylvania. Have those states adopted the EPA guidance or taken another approach allowed by 40 C.F.R. § 131.11(b)? (776)

Response: The Department has included an updated Table - TR17 RAF #12 – in the Final Regulatory Analysis Form, which includes a summary of the 2015 EPA-recommended human health water quality criteria and the status of Pennsylvania's neighboring states.

Specific water quality criteria for toxic substances – Table 5 (§93.8c)

Comment 50:

It is encouraging to see DEP is proposing to add 11 new toxics to its list (93.8c and Table 5 Water Quality Criteria for Toxic Substances) including: trichloroethane, 1,2 Dichloropropane, 1,2,4,5-Tetrachlorobenzene, 2,4,5-Trichlorophenol, 3-Methyl-4-Chlorophenol, Methoxychlor, Chlorophenoxy herbicide (2,4-D), Chlorophenoxy herbicide (2,4,5-TP), Dinitrophenols, Hexachlorocyclohexane (HCH), and Pentachlorobenzene). (27)

Response: The Department appreciates the comments.

Comment 51:

We recognize that human health criteria are important aspects of water quality criteria that help protect anglers and boaters as well as the general public. The Board is proposing additions and amendments to the human health and aquatic life criteria in Table 5 which is proposed to be updated to reflect the latest scientific information and implementation of exiting EPA policies in the methods for deriving ambient water quality criteria for the protection of human health. We defer to DEP staff and the coordination with the U.S. EPA to evaluate human health risks and establish human health criteria for these constituents. (8)

Response: The Department appreciates the comments.

Comment 52:

A commentator has concerns with the following language that is being added to subsection 93.8c(a): “instream measurements or best estimates, representative of the median concentrations or conditions of the receiving stream for the applicable time period and design conditions.” They question how it will be implemented. IRRC agrees that the new language, as written, would be difficult to implement. In the final-form regulation, we ask EQB to amend the regulation to clarify implementation of this requirement. (776)

Response: The Department appreciates the comments and suggested revisions. In response to the comments, the regulatory language was revised to include “The values used for the local water quality condition to derive the appropriate water quality criteria shall be determined by instream measurements or best estimates based on reference waters that are representative of the median concentrations or conditions of the receiving water for the applicable time period and design conditions. Instream measurements for the water quality condition will be gathered using Department data collection protocols.” These current Department protocols are contained within the 2018 Version of the Water Quality Monitoring Protocols for Streams and Rivers, found at http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf (refer to Chapter 4. Chemical Data Collection Protocols).

Comment 53:

We ask PADEP to clarify why the human health criterion for nickel is proposed to be revised from 610 to 600 µg/L, and the scientific basis for revision. 610 µg/L is the EPA recommended value. (4)

Response: The nickel criterion was inadvertently rounded to 600 µg/L during the proposed rulemaking. The Department is not recommending a change to the nickel criterion. The final regulation maintains the existing value of 610 µg/L.

Comment 54:

PADEP is proposing revisions to human health criteria for several chemical pollutants in Table 5 for which there currently are no EPA recommended criteria. These chemical pollutants include: 1,2 cis dichloroethylene; acetone; boron; formaldehyde; methyl ethyl ketone; metolachlor; resorcinol; 1,2,3-trichloropropane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene. All

revisions result in more stringent criteria. EPA requests PADEP clarify why these criteria are being revised and the scientific basis for revision. (4)

Response: The Department noted discrepancies between the preamble and the proposed Annex A and determined that there is insufficient rationale to support the proposed updates to several criteria as they were proposed. Therefore, the Department is recommending that the proposed changes not be included in this rulemaking and to be reevaluated in the next triennial review. The final Annex A will show no changes to the following criteria: 1,2 cis dichloroethylene; acetone; boron; formaldehyde; methyl ethyl ketone; metolachlor; resorcinol; 1,2,3-trichloropropane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and xylene.

Comment 55:

DEP should amend the proposed Chloroform Human Health Criteria. In §93.8c, Table 5, the Department changed the Human Health Criteria for chloroform from 5.7 µg/L to 6.5 µg/L, and the basis from Cancer risk level (CRL) to Threshold effect human health criterion (H). These proposed changes to the Human Health criterion for chloroform are not specifically discussed in the preamble to the proposed regulation. With this change in Human Health criterion for chloroform, the Department is not consistent with, nor following the basis for their human health criteria changes as stated in the proposed rule preamble. If the Department is going to rely heavily on the HHWQC, it should do so consistently.

In the preamble's discussion of §93.8c, the Department states that it reviewed the 2015 U.S. EPA National recommendations, published in 80 FR 36986 (June 29, 2015) and determined that they are scientifically sound and applicable to for the protection of Pennsylvania waters. We note that the 2015 update to the U.S. EPA Human Health Ambient Water Quality Criteria increased the criteria for chloroform from 5.7 µg/l (water+organism) and 470 µg/L (organism only) to 60 µg/L (water+organism) and 2,000 µg/L (organism only). Thus, the Department's proposed change in Human Health Criterion for chloroform does not reflect the 2015 EPA update, and is in fact only 10.8% of the 2015 National recommended criterion for chloroform.

In addition, the proposed change from CRL to H further significantly reduces the allowable in-stream concentration for chloroform. Allowable in-stream concentrations for Human Health criteria that is CRL-based uses the Harmonic Mean Flow of the stream to calculate the in-stream concentration, whereas the allowable in-stream concentration for Human Health criteria that is H-based is required to use the 7Q10 low flow value of the stream to calculate the in-stream toxicity concentration. This difference in stream flows for calculating allowable in-stream concentrations can be very significant. In fact for lower order streams, calculating the allowable in-stream Human Health concentration for chloroform based on 6.5 µg/L and the 7Q10 low flow of the receiving stream can result in allowable in-stream human health concentrations for chloroform that are equal to the disinfectant byproduct trihalomethane levels in well-run, properly disinfected drinking water supplies. Hence, the Department's proposed Human Health criterion for chloroform (6.5 µg/L (H)) is inconsistent with the 2015 National Human Health Ambient Water Quality Criteria, and is indirectly regulating drinking water disinfection standards and practices. This improperly developed proposed Human Health criterion will

jeopardize safe drinking water supplies by forcing well-run drinking water facilities into modifying their drinking water disinfection practices to meet this proposed chloroform limit.

We are requesting that the Department adjust the proposed Human Health criterion for chloroform to 60 µg/L to be consistent with the 2015 U.S. EPA Human Health Ambient Water Quality Criteria, which the Department states in the proposed rule's preamble was the purported basis for Human Health criteria changes. In addition, we request that the Department clearly and specifically address in an amendment to the proposed regulation, published in the PA bulletin, the basis for changing the Human Health criterion for chloroform from Cancer risk level (CRL) to Threshold effect human health criterion (H). (25)

Response: The 6.5 µg/L value for chloroform contained in the proposed rulemaking was not intentional and is suspected to be a typographical error. Given the significance of the difference between the proposed value and EPA's recommendation, the Department will reevaluate chloroform in the next triennial review.

Comments on Development of site-specific water quality criteria – (§93.8d)

Comment 56:

The information provided in the Proposed Rulemaking does not include an explanation for limiting the application of the Biotic Ligand Model for Copper to site-specific criteria development. We support statewide application of this model. (20)

We commend PADEP on the proposal to include the Biotic Ligand Model (BLM) as an option for developing site-specific copper criteria. However, we note that while use of the model for the development of site-specific criteria is a step forward, PADEP should consider adopting statewide freshwater copper criteria based on the biotic ligand model. (4)

PADEP should indicate in the final regulations the circumstances when the use of the BLM will be required, explain whether other scientifically defensible methods were considered and explain why the BLM is appropriate. (776)

Response: The Department is reviewing the use and implementation of the Biotic Ligand Model (BLM) for copper on a statewide basis. The Department has been collecting and compiling water quality data at select Water Quality Network monitoring stations for use in the model. The Department will continue to review the statewide applicability of the BLM and will consider a recommendation for updated criteria in a future water quality standards rulemaking. The Department acknowledges the BLM is the most current science for development of the criteria for copper, as opposed to the Water-Effect Ratio (WER) methodology. Although the Department is not adopting statewide criteria based on the BLM in this rulemaking, this final rulemaking adds clarification that the BLM will be required for development of site-specific water quality criteria for copper in freshwater systems.

Comment 57:

We also believe that PADEP needs to formalize the establishment of site-specific criteria as revisions to its water quality standards regulations. PADEP should clarify Pennsylvania regulation at 93.8d(f)(3) to indicate that the submission of site-specific criteria to EPA for review and approval is to obtain EPA approval under CWA Section 303(c). (4)

Response: The Department is currently reviewing its site-specific criteria development process, including clarification how the Department submits the methodologies used for a site-specific criterion to EPA for review and approval under federal Clean Water Act Section 303(c).

Comment 58:

In order for EPA to take a CWA 303(c) action on site-specific criteria, those criteria must be in state law or regulation. See 40 C.F.R. Section 131.4(i). We recommend that PADEP maintains Table 1A, §16 Appendix A, Site-Specific Water Quality Criteria for Toxic Substances (that PADEP is proposing to delete in this triennial review; refer to Department of Environmental Protection (PA DEP) Notice: Chapter 16 Water Quality Toxics Management Strategy — Statement of Policy at 47 Pa.B. 6703, located at: <https://www.pabulletin.com/secure/data/vol47/47-42/1767.html>) for this purpose. We also recommend that PADEP continue to maintain the publicly available online table of site-specific criteria. (4)

Response: The Department is currently conducting a comprehensive review to clarify its site-specific criteria review and development process. The Department appreciates the recommendation to retain Table 1A, §16 Appendix A, Site-Specific Water Quality Criteria for Toxic Substances in addition to maintaining a publicly available online table of approved site-specific criteria, but Chapter 16 is a codification of the Department's Water Quality Toxics Management Strategy Statement of Policy, not state law or regulation. Also, the Department believes having this duplication of two separate tables, Table 1A and the online table could create undue confusion and greater potential for the introduction of errors and inconsistency in determining the applicable criteria. Therefore, the Board is deleting Table 1A from 25 Pa. Code Chapter 16, Appendix A, along with the corresponding cross-references in 25 Pa. Code §§ 93.8a(b) and 93.8c(a), to be replaced by the current online table for site-specific criteria, as proposed. This table will represent those site-specific criteria approved by EPA.

The Department will continue to work closely with EPA in revising the site-specific criteria review, development, and approval process. Further clarification and updates to the Department's site-specific criteria process will be included in appropriate implementation guidance, and, if it is found to be warranted, will address any necessary regulatory updates in a future water quality standards rulemaking, following this comprehensive review and further coordination with EPA.

Exceptions for Fishable / Swimmable Waters

Delaware Estuary Existing Use

Comment 59:

The federally endangered Atlantic sturgeon and other reproducing fish in the tidal Delaware River (Zones 3,4, and 5) deserve stronger elevated dissolved oxygen standards and immediate listing of these zones as fish propagation is needed. (1)

The federally endangered Atlantic sturgeon and other reproducing fish that currently live and breed in the tidal Delaware River (Zones 3, 4, and 5) deserve stronger elevated dissolved oxygen [DO] standards and immediate listing of these zones as fish propagation is needed. Two decades of studies clearly show propagation is occurring and DO has improved, but DO standards for the estuary are very low and need to be upgraded — to fulfill existing use requirements. Delaware Riverkeeper Network petitioned the DRBC in 2015 for this change and EPA is also weighing in for fish propagation for this triennial review. (9)

The Board should adopt a designated use of fish propagation for Zones 3 and 4 and the upper portion of Zone 5 of the Delaware Estuary for fish propagation. (2)

The Clean Water Act states that “it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983.” 33 U.S.C. § 1251(a)(2). The current designated uses of the Delaware Estuary from river mile marker 108.4 (near Philadelphia) to the Pennsylvania-Delaware border, known as zones 3 and 4, do not include fish propagation and only protects fish maintenance and passage. But recent data and observations show that, for all species evaluated (Atlantic Sturgeon, American Shad, Striped Bass, White Perch, Bay Anchovy, Atlantic Silverside, Alewife, Blueback Herring, and Atlantic Menhaden), successful reproduction was clearly demonstrated in one or more of the compromised estuary zones. The “Existing Use” based on data collected since 2000 indicates that at least some “propagation” (i.e., spawning and/or rearing of early stage larvae and juveniles) has been achieved in these portions of the Delaware River. Delaware River Basin Commission, Existing Use Evaluation for Zones 3, 4, & 5 of the Delaware Estuary Based on Spawning and Rearing of Resident and Anadromous Fish, p. 30 (Sept. 30, 2015). (2)

EPA’s regulations implementing the Clean Water Act provide that “[w]here existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained.” 40 C.F.R. § 131.10(h)(2)(ii). See also *id.* § 131.6(a) (mandating that state water quality standards include use designations consistent with the provisions of Sections 101(a)(2) and 303(c)(2) of the Clean Water Act). Because these portions of the Delaware Estuary have an existing use of fish propagation, the designated use must be upgraded to reflect that documented existing use. (2)

The commenter is aware of the Delaware River Basin Commission’s (DRBC) adoption of a resolution committing DRBC and the member states to: conduct further study on the inclusion of

propagation as a designated use in Zones 3 and 4 and the upper portion of Zone 5 of the Delaware Estuary; prepare a schedule for completing a full draft analysis of attainability within three and one-half years; and issue a final rule and an implementation strategy within six years of the adoption of the resolution. (DRBC Resolution No. 2017-4 (Sept. 13, 2017), located at: http://www.state.nj.us/drbc/library/documents/Res2017-04_%20EstuaryExistingUse.pdf.) We likewise are aware of the Delaware Riverkeeper Network's petition to this Board to upgrade Zones 3 and 4 of the Delaware Estuary to include resident and migratory fish populations. (Delaware Riverkeeper Network, Petition to Upgrade Zones 3 & 4 of the Delaware River to Include Resident and Migratory Fish Populations, filed Feb. 28, 2017, located at http://www.delawariverkeeper.org/sites/default/files/EOB.DO_Petition.Final%20-2817%20w%20attachments.pdf.) However, neither of these processes should deter the Board from fulfilling its obligation under 40 C.F.R. § 131.10(h)(2)(ii) to update the applicable designated uses during the current Triennial Review. The available data are sufficient to establish an existing use of fish propagation in Zones 3 and 4 and the upper portion of Zone 5 of the Delaware Estuary. Thus, in issuing its final rule, the Board should change the designated use of these portions of the Delaware Estuary to match their existing use. (2)

Response: The Department recognizes that propagation and water quality have improved in these Zones of the Delaware Estuary. The Board stated in the Preamble to the proposed rulemaking that the demonstrated recovery in propagation for these Zones has occurred under the long-term implementation of the current criteria, and that, in the short term, the existing dissolved oxygen (DO) criteria should provide adequate protection until more appropriate criteria are determined. Since that time, the Department has also become aware of improvements in water quality and propagation of key species through data presented from other programs, and from a report submitted to the Delaware River Basin Commission (DRBC) by the Academy of Natural Sciences of Drexel University (ANSDU), *A Review of Dissolved Oxygen Requirements of Key Sensitive Species in the Delaware Estuary* (ANSDU 2018), which describes the occurrence and DO requirements of select key species, including that of Atlantic sturgeon (*Ancipenser oxyrinchus*), an endangered species. This report also shows that Atlantic sturgeon are present and reproducing in these Zones of the Delaware Estuary, further reinforcing the need to reevaluate these designated uses.

Furthermore, the National Marine Fisheries Service (NMFS) has recently (82 FR 39160) designated the Delaware Estuary as critical habitat, after having listed the Atlantic sturgeon (*Ancipenser oxyrinchus*) as federally endangered in 2012 under the Endangered Species Act. Designating the Delaware Estuary as critical habitat confirms the presence, critical habitat, or critical dependence of endangered or threatened federal or Pennsylvania species, in or on a surface water. As such, the protection under 25 Pa. Code § 93.4c(a)(2) becomes relevant for the Delaware Estuary and will be provided on a case-by-case basis, as NPDES permits or other final approvals are issued, or final actions are taken.

As indicated in the DRBC Resolution of September 2017 (DRBC Res. No. 2017-4), the Department will continue to work with the DRBC and other signatory states in determining the appropriate DO criteria that should apply to this section of the Estuary. An updated recommendation regarding the existing use and designated use, along with the appropriate DO

criteria, will be considered in the next triennial review of water quality standards, following the conclusion and outcome of this collaboration with DRBC and the other member states.

Comment 60:

In April 2017, the commenter testified at a Delaware River Basin Commission Special Public Hearing on the Draft Resolution for the Review of Aquatic Life Uses in the Delaware River Estuary in Trenton, NJ. The purpose of this testimony was to provide the DRBC with the most current physical and biological data available for consideration in support of future rulemaking for designated water quality protected uses in Zone 3, Zone 4, and the upper portion of Zone 5 of the estuary. The commenter previously presented this testimony at the DRBC Hearing Board and included that testimony as part of public comments in this triennial. (8)

Response: As indicated in the responses to Comments 59 through Comment 67, the Department recognizes that propagation and water quality have improved in these Zones of the Delaware Estuary, and that the current designated uses need to be reevaluated.

The Department will continue to work with the Delaware River Basin Commission (DRBC) and other signatory states in determining the appropriate dissolved oxygen (DO) criteria that should apply to this section of the Estuary. An updated recommendation regarding the existing use and designated use, along with the appropriate DO criteria, will be considered in the next triennial review of water quality standards, following the conclusion and outcome of this collaboration with DRBC and the other member states.

Comment 61:

With a membership that includes fishing enthusiasts, our Alliance agrees with the PFBC's comment regarding Delaware River Aquatic Life Uses in the Delaware River Estuary. Anglers from our home area and other regions of the Commonwealth, as well as neighboring states, travel to the Delaware to enjoy the historical diversity of species not available in rivers that no longer free flow to the ocean. The Delaware is a special treasure to all Pennsylvanians, as it allows us a glimpse into the past, and what could one day be the future of aquatic biological diversity in our own region's river. (14)

Response: The Department appreciates the comments. As indicated in the responses to Comment 59 through Comment 67, the Department recognizes that propagation and water quality have improved in these Zones of the Delaware Estuary. The Department also recognizes the Delaware River as an important and special resource to all Pennsylvanians and visitors, both current and future generations.

Comment 62:

As part of this triennial review, PADEP reexamines water body segments that do not meet the fishable and/or swimmable goals specified in Clean Water Act Section 101(a)(2). In the Delaware River in Zones 3, 4, and upper Zone 5 of the Delaware Estuary basin uses are limited to WWF (Maintenance Only) and ME (Passage Only) for tidal portions of the basin from river mile 108.4 to the PA-DE State Border and do not include propagation. In the public notice of the triennial review, PADEP notes that recent Delaware River Basin Commission (DRBC) review has found

successful reproduction demonstrated in the compromised estuary zones. EPA understands that PADEP continues to work with DRBC and other stakeholders in determining the appropriate criteria that should apply in the lower Delaware River and Delaware Estuary. However, EPA also notes that this public notice recognizes that propagation is occurring and is therefore an existing use. Per Pennsylvania's antidegradation regulation at 93.4c(a)(1)(i) existing use protection shall be provided when the Department's evaluation of information indicates that a surface water attains or has attained an existing use. In addition, the public notice acknowledges the presence of the Federally-listed endangered species Atlantic sturgeon. Pennsylvania regulation at 93.4c(a)(2) states that the confirmed presence of such a species requires that PADEP ensure the protection of the species. Based upon these Pennsylvania regulations, EPA believes PADEP should be implementing water quality standards to protect for the existing use. For example, NPDES permits could be written using dissolved oxygen criteria that protects Atlantic sturgeon, rather than the current criteria, which is widely acknowledged to be under protective of that species. (4)

Response: As indicated in the responses to Comment 59 through Comment 67, the Department recognizes that propagation and water quality have improved in these Zones of the Delaware Estuary, and that the current designated uses need to be reevaluated.

The Department will continue to work with the Delaware River Basin Commission (DRBC) and other signatory states in determining the appropriate dissolved oxygen (DO) criteria that should apply to this section of the Estuary. An updated recommendation regarding the existing use and designated use, along with the appropriate DO criteria, will be considered in the next triennial review of water quality standards, following the conclusion and outcome of this collaboration with DRBC and the other member states.

In the interim of the pending collaboration with DRBC and the other states, the Department intends to provide protections for surface waters as required under 25 Pa. Code § 93.4c, including protection of the endangered or threatened Federal or Pennsylvania species and its designated critical habitat under 25 Pa. Code § 93.4c(a)(2) whenever issuing NPDES permits or final approval and actions that would be related to these Zones.

Comment 63:

Establishing a higher dissolved oxygen standard (i.e., 5.0 mg/L) in Zones 3, 4 and 5 of the Delaware River is necessary to protect populations of migratory fish species that depend on that portion of the river for spawning and/or nursery habitat. Species of interest include the Atlantic and Shortnose Sturgeon (both federally listed), American Shad, Striped Bass, Alewife, Blueback Herring, and Atlantic Menhaden. An evaluation of species occurrence and use of this portion of the river was conducted by the Delaware River Basin Commission in 2015 (DRBC 2015).

Atlantic sturgeon, (*Acipenser oxyrinchus*) a species that is both state and federally listed as endangered, has recently been shown to have had several years of successful reproduction in the lower river (Zones 4 and 5, Hale et al. 2016). Peak abundances of young-of-the-year captures of Atlantic sturgeon have occurred in years when the summer dissolved oxygen levels have been higher in the estuary (DRBC 2015). Atlantic sturgeon are susceptible to low dissolved oxygen

during their early life stages (Secor & Gunderson 1998). In order to protect and restore this species by ensuring continued successful spawning, it is necessary to have a higher dissolved oxygen standard established for the estuary.

The related shortnose sturgeon (*Acipenser brevirostrum*), which is also state and federally listed as endangered shows evidence that their distribution is restricted in the lower portion of the river by low dissolved oxygen levels during the summer months (Hastings *et al.* 1987). Based on radio telemetry data, it appears that shortnose sturgeon, in part, utilize the river in the vicinity of Philadelphia during the species seasonal migration. Steps should be taken to ensure that suitable dissolved oxygen are available here to protect sturgeon traveling to that area (O'Herron *et al.* 1993).

In addition to the above endangered species, other migratory fish species of interest, including American shad, striped bass, alewife, blueback herring, and Atlantic menhaden, utilize the lower Delaware River and estuary as spawning and/or nursery habitat. All of these species are intensively managed by the Atlantic States Marine Fisheries Commission and support commercial and/or recreational fisheries on the Atlantic Coast and tributaries, including the Delaware River and Bay. All of these species would also benefit from increased dissolved oxygen level in the lower river to support survival of their eggs, larvae, and juveniles. Thus, the Service advocates adoption of 5.0 mg/L for Zones 3, 4 and 5. (20)

Response: Please see responses to Comment 59 through Comment 62.

Comment 64:

A commenter offered technical assistance pertaining to the triennial review of your state Water Quality Standards (WQS) with the Environmental Protection Agency (EPA). As you know, the Atlantic and shortnose sturgeons, both listed by us under the Endangered Species Act (ESA), use freshwater reaches of the Delaware River within your jurisdiction, for spawning and juvenile rearing habitat. As such, sensitive early life stages (ELS) and spawning adults may be present at certain times of the year. Adults, sub-adults, and juveniles of both species may also forage, rest, and migrate in the Delaware River system within Pennsylvania waters. As such, it is important to set water quality standards to minimize the potential for adverse effects to their growth, survival, and recovery, to levels that are undetectable, or to the point that any effects are extremely unlikely to occur.

Additionally, critical habitat for Atlantic sturgeon was designated on August 17, 2017. Four physical and biological factors (PBFs) are included in the critical habitat designation and the water quality of effluent discharged into PA waters has the potential to affect PBF 3 and PBF 4. These PBFs are as follows:

PBF 3:

Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support: (1) unimpeded movements of adults to and from spawning sites; (2) seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate

salinity zones within the river estuary, and; (3) staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (e.g., at least 1.2 m) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river.

PBF 4:

Water, between the river mouth and spawning sites, especially in the bottom meter of the water column, with the temperature, salinity, and oxygen values that, combined, support: (1) spawning; (2) annual and interannual adult, subadult, larval, and juvenile survival; and (3) larval, juvenile, and subadult growth, development, and recruitment (e.g., 13° C to 26° C for spawning habitat and no more than 30° C for juvenile rearing habitat, and 6 mg/L or greater dissolved oxygen for juvenile rearing habitat).

Because adverse effects to Atlantic sturgeon critical habitat PBF's and to Atlantic sturgeon and shortnose sturgeon, themselves, are prohibited under the ESA, it is important that your WQS support the necessary life functions of these species and the PBFs related to critical habitat. In regard to critical habitat specifically, the WQS should prevent the possibility of effluent plumes restricting passage within the Delaware River and its tributaries (PBF 3), and allow for appropriate dissolved oxygen, salinity, and temperature in areas where sturgeon may spawn, rear, migrate, rest, and forage within your jurisdiction (PBF 4). We recommend including language in your regulations, if not already included, that expressly prohibits effluent plumes from occupying more than half the waterway in order to allow listed species passage. Additionally, temperature guidelines and dissolved oxygen levels to support spawning and rearing habitat (13° C to 26° C for spawning habitat and no more than 30° C for juvenile rearing habitat, and at least 6 mg/L or greater for spawning and rearing habitat) should be reflected in your standards.

For more information about designated critical habitat for Atlantic sturgeon, please see the following websites.

For general information:

<https://www.greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/index.html>.

For GIS data:

https://www.greateratlantic.fisheries.noaa.gov/educational_resources/gis/data/index.html.

And for general species biology:

<https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/index.html>. (26)

Response: Please see responses to Comment 59 through Comment 62.

Comment 65:

Fish propagation and dissolved oxygen standards for the estuary do not reflect the current existing uses of the Delaware River – We request that this triennial review the main stem Delaware River receives long overdue fish propagation use and stringent and elevated dissolved oxygen standards. Currently, fish propagation is not a designated use in sections of the Delaware River estuary and the state is required to review the reasons behind rejection of those uses since

clearly its own studies and those of DRBC indicate that propagation of fish species is clearly occurring in Zones 3,4, and 5. The DRBC found that for all nine fish species evaluated and studied, including the federally endangered Atlantic Sturgeon (*Acipenser oxyrinchus*) as well as the related state and federally listed as endangered shortnose sturgeon (*Acipenser brevirostrum*) in addition to American Shad, Striped Bass, White Perch, Bay Anchovy, Atlantic Silverside, Alewife, Blueback Herring, and Atlantic Menhaden successfully reproduce in these zones. In March 2013, the Delaware Riverkeeper Network submitted a petition to DRBC http://www.delawariverkeeper.org/sites/default/files/Documents/DO_Petition_03-05-2013.pdf for dissolved oxygen (DO) criteria to be elevated to meet the existing use of the main stem Delaware River as DO levels far exceed the current standards. The science documented the past two decades show these improvements to fish as well as dissolved oxygen. There is documented and demonstrated propagation. Therefore, a designated use for propagation is fully appropriate and supported and new standards should be set to support propagation this triennial review. It is not appropriate to qualify the propagation level achieved such that a lower designated use will be applied to the estuary in such a fashion as to continue to depress the level of water quality standards and goals that are applied for the various zones of the estuary. EPA's regulations implementing the Clean Water Act provide that "where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained." 40 C.F.R. 131.10(h)(2)(ii)). The PA Fish and Boat Commission comments dated Feb 15, 2017 from testimony provided to the DRBC on April 6, 2017 also reflect science and fish population data to urge the DEP/Board to make these important changes now to reflect the current existing uses. In their comments dated Dec 20, 2017, EPA also encourages the Board to protect these existing uses and the endangered species, like the federally listed Atlantic sturgeon that live in these areas of the tidal Delaware River. (27)

Response: Please see responses to Comment 59 through Comment 62.

Comment 66:

PA DEP is seeking information about fish in the lower Delaware and in the estuary. Fish propagation is not a designated use in this part of the Delaware River and the state is required to review the reasons behind rejection of those uses. The DRBC found that for all nine fish species evaluated (Atlantic Sturgeon, American Shad, Striped Bass, White Perch, Bay Anchovy, Atlantic Silverside, Alewife, Blueback Herring, and Atlantic Menhaden) successful reproduction was clearly demonstrated in one or more of the compromised estuary zones. Furthermore, Delaware Riverkeeper Network submitted a petition to DRBC for dissolved oxygen (DO) criteria to be strengthened to meet the existing use of the main stem Delaware River as DO levels far exceed the current standards. (29)

Response: Please see responses to Comment 59 through Comment 62.

Comment 67:

The federally endangered Atlantic sturgeon and other reproducing fish that currently live and breed in the tidal Delaware River (Zones 3,4, and 5) deserve stronger elevated dissolved oxygen standards and immediate listing of these zones as fish propagation is needed. Two decades of

studies clearly show propagation is occurring and DO has improved so this existing use should be reflected in the regulations. Historically the DO standards for the estuary are very low and they need ratcheting up now to fulfill existing use requirements. Delaware Riverkeeper Network petitioned the DRBC in 2015 for this change and EPA is also weighing in for fish propagation for this triennial review. (32-73)

Response: Please see responses to Comment 59 through Comment 62.

Swimmable / Water Contact Use

Comment 68:

I do not believe the PADEP can remove the water contact/swimming existing use from the Delaware River from RM 108.4 to 81.8 which includes a section of the tidal river from about Riverton wharf (108.4) downstream to Raccoon Island/Chester/Bridgeport Ferry (81.4). (1, 9, 32-73)

In this river stretch, there are multiple instances where DRN have documented water contact and conducted paddling with members on this stretch of the River. The Tidal Delaware River Water trail is a popular trail; water contact is an existing use and should not be removed especially in light of combined sewer overflow (CSO) cleanup plans underway. (9, 27, 32-73)

In this stretch there are multiple instances where we have participated in and documented water contact and conducted paddling and kayaking with members on this stretch of the River. For example, on the PA side of the River in this stretch, Spruce Harbor Park and the Darby Creek and John Heinz National Wildlife water trail provide maps to encourage kayakers and paddlers to explore these urban areas of the watershed. Harbor Park in Philly provides livery services including kayak rentals and paddle boats. Petty's Island – a 500 acre island in Pennsauken Township NJ, with community support and advocacy by Delaware Riverkeeper Network and other conservation partners dating back to 2004, is now being permanently protected as a wild nature preserve and access point for urban populations when resistance developed in 2004 to stop a golf course and hotel development agreement between Cherokee developers and Citgo who owns the island. (<https://philly.curbed.com/2018/1/9/16739672/petty-island-new-jersey-history-park>). There is a Tidal Delaware River Water Trail in this portion of the tidal Delaware River (<http://www.tidaltrail.org/>) which is bringing large population centers closer to the Delaware River – this water trail was funded by the Dept. and DCNR and other partners. The Tidal Delaware Water Trail is 56 miles of accessible river opportunities from Trenton, New Jersey to Marcus Hook, Pennsylvania and is one of 25 designated Pennsylvania Water Trails and a hub of environmental features, historic resources, and recreational activities for Pennsylvania and New Jersey. The Dept sites combined sewer overflows (CSOs) as a reason to undermine these water opportunities that exist but as EPA also notes, EPA's CSO policy was issued in 1994 and incorporated into the CWA in 2000 and long-term control plans are now in development or in place for the CSOs in this portion of the Delaware River. DEP and DRBC should be listing water contact/swimming as a use in this triennial review because it is clearly occurring in this stretch of the River. EPA's regulations implementing the Clean Water Act provide that "where existing water quality standards specify designated uses less than those which are presently being

attained, the State shall revise its standards to reflect the uses actually being attained.” 40C.F.R. 131.10(h)(2)(ii). (27)

PADEP also reexamined the removal of the water contact use from the Delaware River between River Miles 108.4 to 81.8. In the proposed rulemaking, PADEP states that the WC use remains excluded from the designated uses in this portion of the Delaware River because of impacts from combined sewer overflows (CSO) and hazards associated with commercial shipping and navigation. We believe this conclusion needs to be reconsidered since EPA’s Combined Sewer Overflow Policy was issued in 1994 and incorporated into the Clean Water Act in 2000. Long Term Control Plans are now under development or in place for the CSOs in this portion of the river. In addition, recreation which results in contact with the water is occurring in this portion of the river. PADEP should initiate an effort with the Delaware River Basin Commission (DRBC) and the other member states to revise the applicable standards to include designated use protection for water contact/swimming. (4)

Response: The Department appreciates the comments related to the recreational activities taking place in the aforementioned sections of the Delaware River. The Department will initiate, as suggested, an effort with the Delaware River Basin Commission (DRBC) and the other member states to reevaluate the applicable standards to include designated use protection for water contact/swimming, as well as boating if applicable. Please see the response to Comment 24 for additional information. An updated recommendation regarding water contact sports will be considered in the next triennial review of water quality standards, following outcome of this collaboration with DRBC and the other member states.

COMMENTS CONCERNING CORRECTIONS TO DRAINAGE LISTS

Comment 69:

PADEP is making a number of corrections to its Drainage Lists, as well as proposing to consolidate and reformat several Drainage Lists. PADEP must be cautious that in the process of these revisions they do not inadvertently change the designated use of any streams, especially if the change of designated use is to a use that is less protective. We have reviewed the revisions and we have found that several revisions need to be clarified. (4)

Response: The Board has recommended a number of changes to the Drainage Lists in 25 Pa. Code §§ 93.9a to 93.9z. These changes were described in the Preamble, which clarified that these changes did not affect the current designated use of any streams. These changes are being made to improve the current format of the Drainage Lists and to provide corrections and clarifications as necessary.

Comment 70:

If a downgrade is indeed being proposed a use attainability analyses for each would be required rather than a current change this triennial review. A use attainability analysis (UAA) is a structured scientific assessment of the factors affecting the attainment of uses specified in Section 101(a)(2) of the Clean Water Act (the so called "fishable/swimmable" uses). The factors to be considered in such an analysis include the physical, chemical, biological, and economic use

removal criteria described in EPA's water quality standards regulation (40 CFR 131.10(g)(1)-(6)).

A UAA must be conducted for any water body when a state or authorized tribe designates uses that do not include the uses specified in Section 101(a)(2) of the Act or when designating sub-categories of these uses that require less stringent criteria than previously applicable. States and authorized tribes must hold public hearings for the purpose of reviewing the applicable water quality standards at least once every 3 years and when revising water quality standards. States and authorized tribes must also re-examine waters that do not include the uses specified in Section 101(a)(2) of the Act to determine if new information has become available. If new information indicates that the uses specified in CWA Section 101(a)(2) are attainable, then the state must revise its WQS accordingly to designate such uses. The EPA lists only 6 factors for UAA and the bar is set very high to remove a use.

EPA states concerns with many downgrades in their Dec 20, 2017 letter on the triennial review that need to be explained – they list potential downgrades in Drainage Lists G, L, M, O (Trout Run is EV and DEP is proposing HQ-CWF, MF), and Drainage List R. DRN believes that justification is necessary for all deletions or changes at a minimum (27).

Other commenters suggest that there may be many instances of the Department proposing to downgrade streams in the triennial review and cite EPA's comments reflecting other needed reviews (9, 32-73).

Response: The Department's understanding appears to align with the commenter's understanding of the definition of a use attainability analysis (UAA) as described by the federal Clean Water Act. In 25 Pa. Code § 93.4(b), Pennsylvania has incorporated the six conditions given at 40 CFR 131.10(g)(1)-(6) under which a less restrictive use may be adopted into water quality standards. However, the Board is not redesignating any waters to a less restrictive use, and therefore a UAA is not being conducted.

Comment 71:

In addition to the proposed Drainage List revisions for §§93.9a - 93.9z, an index map update would be helpful. The orientation and size of the current index map in §93.9 limit its usefulness. It would be very helpful to rotate the map 90 degrees and enlarge it to fit the width of the page. (11)

Response: The Department appreciates the comments but does not believe that changing the map is necessary. The Department suggests visiting the online pdf version of 25 Pa. Code Chapter 93, located at https://www.pacode.com/secure/data/025/chapter93/025_0093.pdf and viewing the map in question, which is located immediately before the start of the Drainage Lists. While viewing the pdf online, it is possible to rotate the map clockwise so that it can be properly viewed, as well as to enlarge the map and zoom in to a specific location without losing resolution.

Drainage List B – §93.9b

Comment 72:

According to the GNIS_PA Features updated in July 2017, the stream source for Lackawaxen River is the confluence of West Branch Lackawaxen River and Dyberry Creek at 41.57751/-75.253680. The NHD flowline incorrectly identifies the origin of Lackawaxen River at the confluence of West Branch Lackawaxen River and Van Auken Creek. Van Auken Creek is a tributary to West Branch Lackawaxen River and should have a 4 for hydrological order rather than a 3. (8)

Response: The Department appreciates being alerted of this discrepancy. The Department confirmed that the National Hydrography Dataset (NHD) flowline was incorrect in this instance and alerted the United States Geological Survey (USGS) of the issue. The NHD flowline has since been corrected to make it consistent with the information in the Geographic Names Information System (GNIS). The GNIS is the federal and national standard for geographic nomenclature. Corrections to 25 Pa. Code § 93.9b in the Annex A have been made so that the code will be consistent with the GNIS information and the NHD flowline.

The West Branch Lackawaxen River originates upstream of the Prompton State Park and it flows to the confluence with Dyberry Creek. The source of the Lackawaxen River is this confluence of the West Branch Lackawaxen River and Dyberry Creek. The listing of Van Auken Creek has been corrected in the annex of this final rulemaking to show that it is a tributary of the West Branch Lackawaxen River instead of the Lackawaxen River with a hydrological order of 4- instead of 3-.

Comment 73:

We agree with the proposed corrections to the duplicate entries for the Lackawaxen River. Only one entry for the River is necessary. Also, the Lackawaxen River flows through Wayne and Pike Counties and empties into the Delaware River in Pike County that should also be noted in § 93.9b. Drainage List B. (3)

Response: The Department appreciates the comments regarding the proposed elimination of multiple entries for Lackawaxen River. Regarding the county for the main stem, Pike County is listed in 25 Pa. Code § 93.9b for the entire Lackawaxen River in the Annex A of this final rulemaking. 25 Pa. Code § 93.9(a) states that, “the county column... ..indicates the county in which the mouth of the stream or the downstream limit of the zone described for that entry is located.” The Lackawaxen River empties into the Delaware River in Pike County.

Drainage List D – §93.9d

Comment 74:

In Drainage List D. confirm that the GIS coordinates represent the original location of the PA 903 bridge and not the GIS coordinates of the relocated bridge. (4)

Response: Department staff have confirmed that the coordinates are indeed in the middle of where the PA 903 bridge previously crossed the Lehigh River. The new bridge is further upstream of these coordinates, and therefore, the Annex A is written correctly.

Comment 75:

Delaware River tributaries – it is unclear for Drainage List D if the bolded changes for some Monroe/Carbon County streams are reflected accurately. We believe some of these streams may have an existing use of EV and that regulatory change is now warranted at this time for this triennial review. The current listings in other words, in the regulations within Chapter 93, located at: <https://www.pacode.com/secure/data/025/chapter93/s93.9d.html>, do not reflect what may be found on the existing use tables. Some Monroe County streams listed in bold as HQ-CWF, MF in the proposed triennial review document are already that designation in the above link (examples include: UNT to Tobyhanna Creek, Jim Smith Run, Pole Bridge Run, Singer Run, East Branch Dresser Run, Pollys Run, Hummler Run, Kistler Run, Wagner Run, Upper Tunkhannock Creek, Wolfs Spring Run, Deep Run, Davey Run, Red Run, Tunkhannock Creek, and Shingle Mill Run). This list of streams is bolded as HQ-CWF, MF in the triennial review proposed text but also are reflected as HQ-CWF, MF in the regulations at the link above. A thorough review and explanation of this list is needed before adoption especially in light of efforts in some counties to undermine solid science for special protection streams (see prior DRN testimony). (27)

Response: None of the surface waters of the Commonwealth are being redesignated in this triennial review rulemaking package. Streams on the existing use list will be redesignated through a future rulemaking process(es) to match the existing uses with the designated uses. The link provided in the comment leads to the html version of 25 Pa. Code § 93.9d, Drainage List D. Delaware River Basin in Pennsylvania – Lehigh River. The designated uses of the entire Lehigh River basin are available at that link.

The commenter references a “proposed triennial review document”. The Department believes that this is referring to the Annex A that comprises the triennial review proposed rulemaking and found at:

http://files.dep.state.pa.us/PublicParticipation/Public%20Participation%20Center/PubPartCenterPortalFiles/Environmental%20Quality%20Board/2017/April%2018/7-534%20Proposed%20Triennial%20Review/03_7-534_Triennial%202017_Annex_A.pdf.

The commenter provides a list of examples of Monroe County streams that are included in the proposed annex in bold text as HQ-CWF, MF and states that these streams are also currently designated (i.e., they appear in 25 Pa. Code § 93.9d) as HQ-CWF, MF. The commenter is completely correct, but the Department believes that the commenter may be confused by the formatting of the annex. Language in the annex that is proposed to be inserted into the *Pennsylvania Code* as a result of this rulemaking is formatted as bold and underlined, and language to be deleted is formatted as bold and bracketed. All of the streams that are listed as examples in these comments are proposed to be deleted. They will still be designated HQ-CWF, MF under the two entries for the Tobyhanna Creek basin from the source to Cross Keys Run and

from Frame Cabin Run to the mouth. The Department is proposing to reformat this portion of the code in order to consolidate it.

In many parts of the Drainage Lists, the current format consists of a main stem entry for a stream, followed by unnamed tributaries to that stream, and then individually named tributaries within the basin. Often, most of the tributaries, both named and unnamed, have the same designated use. In some cases, an entire basin is the same designated use except for a few streams. Large stream basins may take up several pages within a Drainage List and can be difficult for individuals to navigate and understand. Reformatting such large basins to consolidate portions of the code that have the same designated use enables readers to view that entire basin within a page or two. In addition, a condensed Drainage List reduces the likelihood that errors will occur in transcription of the code during rulemaking and publication procedures. The Department currently has a GIS mapping tool available, eMapPA, to assist staff as well as members of the public and the regulated community in locating streams within Pennsylvania, and it should be used in conjunction with the *Pennsylvania Code* and other available online mapping resources to determine official designated uses.

Drainage List G – §93.9g

Comment 76:

In Drainage List G, PADEP indicates that they are restoring the correct designated use to the Chester Creek/Goose Creek basin from TSF to WWF. PADEP needs to provide additional documentation to support this revision, as it is unclear from the information in the public notice that this is the correct designation. (4)

From the stream listings tables, it would appear that the Department is proposing to downgrade Goose Creek in the Delaware River Basin from TSF (trout stock fishery) to WWF (warmwater fishery). More information and analysis is warranted to the public on how this decision is justified (1, 9, 32-73), and we believe DEP should be considering a use attainability analysis if this is not an oversight or mistake. (9, 32-73)

It would appear that the Department is proposing to downgrade Goose Creek in the Delaware River Basin from TSF (trout stock fishery) to WWF (warmwater fishery). More information and analysis are warranted to the public on how this decision is justified. DRN has documented fisher people on the lower area of Goose Creek within community park boundaries fishing on multiple occasions as part of our several years of monitoring related to phosphorus and a TMDL being challenged by a sewage treatment plant operator. When a downgrade is being considered, a use attainability analysis is required under the CWA. The Dept. must also prove that at no time in the future would trout be able to be stocked/the use restored even with restoration and the likely enforcement of a strong TMDL standard for phosphorus. (27)

Response: The stream designation of “Goose Creek” has caused confusion over time due to a series of errors in prior rulemaking packages. The subject of this description lies almost entirely in Chester County. The “Goose Creek” basin consists of the portion of Chester Creek basin upstream of the confluence with East Branch Chester Creek. “Goose Creek” does not include

any portion of the East Branch Chester Creek basin. “Goose Creek” originates in West Chester Borough and West Goshen Township, both in Chester County and flows southeast. “Goose Creek” flows through Westtown Township, Chester County and the mouth of “Goose Creek” is located in Thornbury Township, Chester County (at -75.542°W; 39.931°N). There is a very tiny portion of the “Goose Creek” basin that lies in Thornbury Township, Delaware County. This description of “Goose Creek” is consistent with: (1) a 2017 Total Maximum Daily Load (https://www.epa.gov/sites/production/files/2017-05/documents/goose_creek_pa_reassessment_reconsideration.pdf); (2) a trail map for Thornbury Township in Chester County (<http://www.thornburytwp.com/wp-content/uploads/2014/10/Trailways-Map-07-01-14.pdf>) which shows Goose Creek and Goose Creek Park; (3) United States Geological Survey (USGS) topographical maps for the West Chester Quadrangle from 1996 and 1997; and (4) the description of the basin in the Preamble of the September 1984 Proposed Rule at 14 PaB 3473 (see Supplement to Report to Environmental Quality Board Comment and Response Document (“Supplement”); Exhibit One).

Much of the confusion associated with “Goose Creek” is because: (1) it is not named in the NHD Flowline; (2) its name does not appear on current USGS topographical quadrangle maps; and (3) it is not included in the *Pennsylvania Gazetteer of Streams*. In the *Pennsylvania Gazetteer of Streams*, the waterbody described above as “Goose Creek” is identified as Chester Creek.

Between 1978 and the present, at least five rulemakings affected 25 Pa. Code § 93.9g in the “Goose Creek” basin. These regulatory packages inadvertently introduced some errors into the *Pennsylvania Code*. These errors were related to either the designated use (e.g., WWF or TSF) or the stream names. Based on an analysis of these historical changes, it has been determined that there is an error in the *Pennsylvania Code* pertaining to the present designated use of TSF, MF for the “Goose Creek” basin. The proper designated use of “Goose Creek” should be WWF, MF. Additionally, the present designated use of WWF, MF is in error for Westtown Run. The proper designated use of Westtown Run should be TSF, MF.

In the Preamble for a March 1978 rulemaking, it was recommended that the designated use for “Goose Creek”, which was then TSF, should be replaced with WWF. This change was recommended because the “stream receives considerable point and nonpoint waste discharges” and “the actual stream conditions do not meet trout stocking criteria of the Pennsylvania Fish Commission.” A second proposed rulemaking was published in December 1978 at 8 PaB 3665, which addressed the extensive comments received on the March 1978 rulemaking. This second proposed rulemaking maintained the recommendation to redesignate “Goose Creek” as WWF. In a July 1979 comments and responses document, a comment was made to retain the TSF designated use because there was potential that the stream could attain the TSF use provided pollution problems in the basin are corrected. The Department agreed with this commenter. The final rulemaking in September 1979, however, inadvertently deleted reference to all of the tributaries to East Branch Chester Creek. As a result, no designated use appeared in the *Pennsylvania Code* for “Goose Creek”, although the intent was for the “basin” of East Branch Chester Creek (including “Goose Creek”) to be designated TSF. According to the *Pennsylvania Code*, following the September 1979 rulemaking, the East Branch Chester Creek extended downstream to the confluence with West Branch Chester Creek at river mile 8.72 and, as such,

“Goose Creek” would have been a tributary to East Branch Chester Creek according to 25 Pa. Code § 93.9g as published in 1979.

In September 1984, the Environmental Quality Board (Board) revisited “Goose Creek” as part of a triennial review of water quality standards. See Supplement to Report to Environmental Quality Board Comment and Response Document (“Supplement”); Exhibit One, pages 14 Pa.B. 3480, 3481, 3499, and 3501). This published text provides a very good physical description of the “Goose Creek” basin and includes the recommendation that the TSF designation, which was inadvertently deleted in 1979, was not attainable due to the instream physical characteristics and should be changed to WWF for the “Goose Creek” basin. The final rule, published at 15 PaB 544 in February 1985, included reference to “Goose Creek” and a redesignation to WWF.

The Board again revisited Goose Creek in a Drainage List corrections package within a proposed rulemaking at August 3, 1996 (26 Pa.B. 3637, <https://www.pabulletin.com/secure/data/vol26/26-31/1253.html>, see Supplement, Exhibit Four at 26 Pa.B. 3638 and 3641) and a final rulemaking on June 28, 1997 (at 27 Pa.B. 3050, <https://www.pabulletin.com/secure/data/vol27/27-26/1024.html>, see Supplement, Exhibit Five). The intention was to delete the reference to the name “Goose Creek” and change it to Unnamed Tributary to East Branch Chester Creek at River Mile 0.4; while retaining the designation as WWF, as it was previously established in February 1985. This change was made because “Goose Creek” was not found in the *Pennsylvania Gazetteer of Streams* and is only a local name. The problem is that the basin described as Unnamed Tributary to East Branch Chester Creek at River Mile 0.4 is not the same “Goose Creek” that was described in the Preamble of the September 1984 proposed rulemaking, which redesignated Goose Creek from TSF to WWF. They are two different streams. The description given in the Preamble of the September 1984 Proposed Rule for Goose Creek makes it very clear that Goose Creek is not the same stream as the unnamed tributary to East Branch Chester Creek (stream code = 00605) that enters East Branch Chester Creek at River Mile 0.4. So, rather than renaming Goose Creek, this rulemaking, which was finalized in 1997, effectively transposed the designation of WWF from the stream that was described as Goose Creek in the September 1984 Proposed Rulemaking to the unnamed tributary which enters East Branch Chester Creek at River Mile 0.4. The stream described as UNT to East Branch Chester Creek at River Mile 0.4 (and currently in the *Pennsylvania Code* as Westtown Run) was inadvertently designated WWF, but should be TSF.

In a June 2009 proposed rule, the Board renamed the listing for “unnamed tributary to East Branch Chester Creek at RM 0.4” by replacing it with the name “Westtown Run,” which came from an electronic topographical GIS map layer and from the USGS 1997 topographical quadrangle map. This proposal was finalized in April 2010 without any changes.

In light of this historical information and based on these comments, in this final-form rulemaking, the intended designated use of WWF, MF is reinstated for the waters formerly known as the Goose Creek basin and described as the Chester Creek basin from the source to the confluence with East Branch Chester Creek. Further, the intended designated use is restored of TSF, MF to what is currently listed in 25 Pa. Code § 93.9g as Westtown Run and is more appropriately identified as UNT 00605 to East Branch Chester Creek. This unnamed tributary to

East Branch Chester Creek was incorrectly listed in 25 Pa. Code § 93.9g as being designated WWF, MF and its designated use should be correctly listed as TSF, MF.

This correction in the Chester Creek basin is not a redesignation to a less restrictive use. In this most recent review, the Department did not rely on one of the six factors at 40 CFR 131.10(g)(1)-(6) and cross-referenced in Pennsylvania's water quality standards at 25 Pa. Code § 93.4(b), nor did the Department complete a UAA because "Goose Creek" is not being recommended for a less restrictive use in this triennial review.

Comment 77:

In Drainage List G, in clarifying the zone descriptions for the tributaries to East Branch Brandywine Creek, it appears that PADEP revised the designated uses as well and resulting in a protected use with lesser protection for unnamed tributary 00322 to Beaver Creek. Provide additional information to confirm if this was an intended revision and if so, provide additional documentation to support this revision. (4)

Response: Unnamed Tributary (UNT) 00322 flows through East Brandywine Township in Chester County and is a tributary to the East Branch Brandywine Creek with its mouth at 40° 1' 29.5" N; 75° 42' 22.6" W. It was not the intent of the Department to revise the designated use of this small tributary. There is a nuance in formatting the drainage lists at 25 Pa. Code §§ 93.9a to 93.9z that when the stream is named as the downstream limit in the zone description for a portion of a basin, then that stream carries the designated use given for that particular entry, if that stream is not specifically named in the code. For example, if the entry states that the basin of Big Run is CWF from Pine Creek to Middle Creek, then Middle Creek is CWF, unless there is a subsequent entry specifying Middle Creek carries a different designated use. UNT 00322 should retain its current designated use of HQ-TSF, MF.

Comment 78:

A potential downgrade (similar to Goose Creek) appears to be proposed for a tributary (00322) of Beaver Creek which flows into the East Branch Brandywine River. As per our comments regarding Goose Creek, a UAA is needed before any of these downgrades are codified. (27)

Response: Unnamed Tributary (UNT) 00322 is not being redesignated as a result of this triennial review. UNT 00322 is a tributary to the East Branch Brandywine Creek, not Beaver Creek. UNT 00322 should retain its current designated use of HQ-TSF, MF. The Board added an entry into Drainage List G for UNT 00322 to alleviate any confusion. See the response to Comment 77 for further details.

Comment 79:

From the stream listings tables, it would appear that the Department is proposing to downgrade Beaver Creek a tributary to the East Branch Brandywine Creek. More information and analysis is warranted to the public on how this decision is justified and we believe DEP should be considering a use attainability analysis if this is not an oversight or mistake. (9, 32-73)

Response: The mouth of Beaver Creek (stream code 00297) enters the East Branch Brandywine Creek in Downingtown Borough in Chester County. The designated use of Beaver Creek is not being changed. The entries in 25 Pa. Code § 93.9g for the tributaries to the East Branch Brandywine Creek immediately upstream and downstream of Beaver Creek indicate that they have a designated use of WWF, MF. The zone description in the entry prior to Beaver Creek describes a designated use of WWF, MF for the tributaries of the East Branch Brandywine Creek between Unnamed Tributary (UNT) 00322 and Beaver Creek. The next entry gives the designated use of CWF, MF for Beaver Creek basin. And the entry following Beaver Creek pertains to tributaries whose mouths lie downstream of Beaver Creek.

Drainage List J – §93.9j

Comment 80:

In Drainage List J, provide documentation that inclusion of the downstream limit of Roaring Brook did not inadvertently result in a protected use with lesser protection being assigned to a portion of the stream. (4)

Response: The current designated uses of all surface waters in the Commonwealth can be found at 25 Pa. Code §§ 93.9a to 93.9z. The zone description of the upstream portion of Roaring Brook basin in Lackawanna County is currently defined at 25 Pa. Code § 93.9j as “Basin, Source to Elmhurst Reservoir”. This upstream portion is designated HQ-CWF, MF. The remainder of Roaring Brook basin is designated CWF, MF and the zone is defined at § 93.9j as “Basin, Elmhurst Reservoir to Mouth”. A clarification to § 93.9j was recommended along with the proposed rulemaking to demarcate the downstream endpoint of the HQ upstream portion of the basin. The Elmhurst Reservoir is not designated HQ. Roaring Brook was redesignated to HQ-CWF at 15 Pa.B. 544 (Feb. 16, 1985). The Preamble to the proposed rulemaking found at 14 Pa.B. 3473 (see Supplement; Exhibit One; 14 Pa.B. 3499 and 3500) describes the upper portion of the basin as extending downstream to the slack water of Elmhurst Reservoir.

Drainage List L – §93.9l

Comment 81:

In Drainage List L, in making corrections to Logan Branch, it appears that PADEP revised the designated uses as well and resulting in a protected use with lesser protection for a tributary to Logan Branch. Provide additional information to confirm if this was an intended revision and if so, provide additional documentation to support this revision. (4)

Response: Two small streams come together in southern Benner Township in Centre County at 40° 49' 56.6" N; 77° 45' 18.8" W. The stream that flows toward the west goes under Nittany Mountain Road near its origin and this stream is currently identified by the NHD flowline as Logan Branch. It was formerly recognized as an unnamed tributary to Logan Branch with a stream code of 23007. It is also known by the local name of McBrides Run. Regardless of whatever name is attached to this surface water, it is designated HQ-CWF, MF. The other headwater stream is designated CWF, MF and flows toward the east, representing the boundary between College Township and Harris Township and crossing under Loop Road before flowing

into Benner Township. According to the NHD flowline, the stream flowing toward the east does not currently have a name assigned to it, but it was historically known as Logan Branch. Regardless of the name that is assigned to this surface water, it is designated CWF, MF.

The 1978-1979 rulemaking identified a stream locally known as McBrides Run and designated it as HQ-CWF because of “local concern to protect existing quality of unfiltered public supply.” The Newtown Creek, et al. stream redesignations rulemaking package was published in the *Pennsylvania Bulletin* as a final rule on January 6, 2007 (37 PaB 11), and included a clarification which identified Unnamed Tributary (UNT) 23007 as being known locally as McBrides Run and it was described in the annex as being HQ-CWF. The result of the Newtown Creek package was that the HQ-CWF stream which flows toward the west was known as UNT 23007 to Logan Branch and locally known as McBrides Run in the *Pennsylvania Code* and that the other stream that flows toward the east following the boundary between College Township and Harris Township before entering Benner Township was known as Logan Branch and was designated CWF. Subsequent to the Newtown Creek package, the Department recognized these two stream names were switched by in the NHD flowline. The NHD flowline now recognizes the HQ-CWF stream that flows toward the west as Logan Branch and the CWF stream that flows toward the east is not named in the NHD flowline. In order to correct the *Pennsylvania Code* so it is consistent with the NHD flowline, the Board is switching the names on these two streams in the *Pennsylvania Code*. The Board is not changing the designated use of either stream.

Comment 82:

In Drainage List L. Horse Thief Run is proposed to be deleted, and it is unclear to which basin it has been assigned. Confirm that its designated use of CWF, MF has been maintained. (4)

Response: Horse Thief Run is a tributary to Marsh Creek. Horse Thief Run enters Marsh Creek downstream of the confluence of Charleston Creek and Morris Branch, and upstream of the mouth of Baldwin Run. Horse Thief Run is included in the new entry for tributaries to Marsh Creek which enter Marsh Creek between the confluence of Charleston Creek and Morris Branch and the mouth of Baldwin Run. This entry designates these tributaries, including Horse Thief Run, as CWF, MF.

Comment 83:

In Drainage List L there are a number of streams that are proposed to be deleted, and it appears that they are being assigned to be included in a basin with a designated use with lesser protection. Please confirm that the designated uses have been maintained for the following streams: Bender Run, Mosquito Creek, Lycoming Creek (source to Long Run), unnamed tributaries to Lycoming Creek, Cascade Run, Sugar Works Run, Mill Creek, Roaring Branch, Abbott Run, Red Run, Rock Run, Frozen Run, Heylman Run, Pleasant Stream, Slacks Run, Shoemakers Run, Grays Run, Hagermans Run, Gendenen Run, Trout Run, Wolf Run, Daugherty Run, Hoagland Run, and Long Run. (4)

Response: The basins of Bender Run and Mosquito Creek are designated CWF, MF and they are included in the entry which designates the tributaries to the south bank of the West Branch

Susquehanna River from Pine Creek to Loyalsock Creek except Aughanbaugh Run, Antes Creek, and Big Run.

The remainder of the streams addressed in this comment are all in the Lycoming Creek basin. None of these streams have changed their designated use as a result of this rulemaking. The Lycoming Creek basin is being reformatted and many of the named tributaries will no longer appear individually in 25 Pa. Code § 93.91. This reformatting will consolidate this portion of the *Pennsylvania Code*. Consolidation within Drainage Lists will reduce issues that arise when named streams appear to be missing from the code. Consolidation will also reduce issues for those streams that are not named in accordance with the United States Geological Survey (USGS) and are not represented by the NHD flowline (e.g., streams recognized by unofficial local names).

The main stem of Lycoming Creek from its source to Long Run is CWF, MF. All of the tributaries upstream of Red Run are designated HQ-CWF, MF, including the basins of Cascade Run, Sugar Works Run, Mill Creek, Roaring Branch, and Abbott Run. Red Run is designated CWF, MF. The tributaries between Red Run and Long Run are designated HQ-CWF, MF, including the basins of Rock Run, Frozen Run, Heylmun Run, Pleasant Stream, Slacks Run, Shoemakers Run, Grays Run, Hagermans Run, Gendenen Run, Trout Run, Wolf Run, Daugherty Run, and Hoagland Run. The Long Run basin is designated HQ-CWF, MF.

Drainage List M – §93.9m

Comment 84:

In Drainage List M, PADEP is proposing to add UNT 17823 and UNT 17821, both below Federal Aid Secondary Highway (FAS) 690, as those portions of the streams had been missing from the list. Although upstream of FAS 690 the streams are designated HQ-CWF, MF, downstream has been assumed CWF, MF. PADEP needs to provide additional documentation to support this revision, as it is unclear from the information in the public notice that this is the correct designation. (4)

Response: The names in 25 Pa. Code § 93.9m for Bowersox Run and Erb Run are being amended to Unnamed Tributary (UNT) 17823 (locally known as Bowersox Run) and UNT 17821 (locally known as Erb Run). Additionally, the name for Federal Aid Secondary Highway (FAS) 690 is being updated to T3008 (Paxtonville Road). The commenter is specifically requesting further explanation regarding the origin of the CWF, MF designated use for both of these streams between T3008 (Paxtonville Road) and their mouths. These two streams are both tributaries to Middle Creek and are both located downstream of North Branch Middle Creek. The basins of all of the tributaries to Middle Creek downstream of the mouth of North Branch Middle Creek were designated CWF along with the final rulemaking published at April 28, 1973 (3 Pa.B. 789). Therefore, at the time of this 1973 rulemaking, the entire basin of both UNT 17823 and UNT 17821 were designated CWF. In 1979, the portions of both of these basins above the road which was then known as FAS 690 (and now known as T3008 or Paxtonville Road) were redesignated to HQ-CWF. This 1979 rulemaking did not change the designated use of the lower part of these two basins from CWF, although it inadvertently omitted them from 25

Pa. Code § 93.9m. The Board is now reinserting the downstream portions of UNT 17823 and UNT 17821 into the Drainage List as CWF.

Drainage List O – §93.9o

Comment 85:

In Drainage List O, PADEP is proposing to add the Trout Run basin from the water supply dam to mouth, as it was missing from the list. Above the water supply dam, Trout Run is designated EV, this segment of the stream is being added as HQ-CWF, MF. PADEP needs to provide additional documentation to support this revision, as it is unclear from the information in the public notice that this is the correct designation. (4)

Response: Trout Run originates in Perry County, flows through a small portion of western Cumberland County and eventually enters the Conodoguinet Creek in Franklin County. The entire Trout Run basin was a conservation area prior to the 1978-1979 rulemaking. The portion of the basin that lies upstream of the water supply dam was a wilderness trout stream prior to the 1978-1979 rulemaking. The portion of the basin that lies below the water supply dam (i.e., the portion missing from 25 Pa. Code § 93.9o) was still a conservation area even though it was not a wilderness trout stream. The policy for conservation areas was very similar to the current HQ category of waters (i.e., required maintenance of existing water quality and social or economic justification (SEJ) provisions were available for permitted activities), which is the reason why those streams were generally all converted to HQ in the 1978-1979 rulemaking. Any specific streams lying within conservation areas that were not intended to be automatically converted to HQ were included in the documentation that accompanied the 1978-1979 rulemaking. The Trout Run basin below the water supply dam was not specified as an exception to this general conversion of conservation areas. A correction is made in the final Annex A reinserting the downstream portion of the basin that was omitted during the 1978-1979 rulemaking. The missing downstream portion is reinserted as HQ-CWF, MF. The portion of the basin upstream of the dam was a wilderness trout stream and it was correctly converted to EV as a result of the 1978-1979 rulemaking.

Comment 86:

In Drainage List O, PADEP is proposing to correct the designated use of Reynolds Run from HQ-CWF, MF to HQ-TSF, MF. PADEP needs to provide additional documentation to support this correction as it is unclear from the information in the public notice that this correction is warranted. (4)

Response: Reynolds Run was designated as a conservation area in 1973 and thus received a designated use of HQ-CWF in the final-form rulemaking published at 9 Pa.B. 3051. Several streams in the area including Reynolds Run were subsequently reevaluated in 1989. An October 1989 stream report produced by the Pennsylvania Department of Environmental Resources (see Supplement; Exhibit Two, Octoraro Creek Stream Report) showed that the streams were largely affected by agriculture and were actually supporting warm-water biota. The report recommended that Reynolds Run (and also McCreary Run) be redesignated as HQ-TSF, MF. The streams were approved for redesignation in the Cooks Creek final-form rulemaking published at 21 Pa.B. 5511

(see Supplement; Exhibit Three; 21 Pa.B. 5513, Cooks Creek Package final rulemaking). At that time, Chapter 93 was amended to reflect the redesignation to HQ-TSF, MF; however, a duplicate entry for Reynolds Run was also inadvertently introduced at that time. The duplicate entry was deleted, but the designation for Reynolds Run was erroneously changed back to HQ-CWF, MF in the Corrections Package (see Supplement; Exhibit Four and Exhibit Five). The Preamble for the Corrections Package (Exhibit Four, 26 Pa.B. 3638) describes that Reynolds Run was converted back to its pre-reformatted designation. The reformatting of the *Pennsylvania Code* occurred circa 1992, just after the Cooks Creek package. Since there are no known data or reports to suggest that Reynolds Run was achieving a use of HQ-CWF, MF at that time (i.e., between 1991 and 1996), it is being viewed as an error that occurred because the reformatting occurred just after the Cooks Creek package. The Board restored the intended designation of HQ-TSF, MF for Reynolds Run.

Drainage List R – §93.9r

Comment 87: In Drainage List R, PADEP indicates that the erroneous stream listing for Mill Run is being deleted, but provides no indication as to why the listing is erroneous. (4)

Response: The stream in question is actually Mill Creek (stream code = 49706). The Preamble refers to “Mill Run” but this is incorrect. Mill Creek originates in Jefferson County and flows into Clarion County. Mill Creek enters the Clarion River on the east bank within State Game Land 74. The particular entry that is being deleted appears in 25 Pa. Code § 93.9r between the entry for the unnamed tributaries to Mill Creek from its source to Little Mill Creek and the entry for Parks Run. The Mill Creek entry consists of “4-Mill Creek” in the stream column and there is no information in any of the other columns. Typically, that format would indicate that the stream originates at the point of confluence of two streams; and this entry would be the very first entry for that basin. However, in this instance there are other upstream entries for waters in the Mill Creek basin that precede this entry, and none of the mouths of Parks Run, Martin Run, Rankin Run, Updike Run, and McCanna Run coincide with one another. This stray entry for Mill Creek has no informational value to anyone trying to interpret § 93.9r. This entry could only serve to confuse someone trying to interpret the code. It is clearly in error and is deleted in the final Annex A.

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