pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

February 15, 2024

Ms. Hannah Lesch
Office of Water, Standards and Health Protection Division
Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Re: Docket ID No. EPA–HQ–OW–2023–0222

Dear Ms. Lesch,

The Pennsylvania Department of Environmental Protection (DEP) appreciates this opportunity to review and comment on the Water Quality Standards to Protect Aquatic Life in the Delaware River proposed rule published by the United States Environmental Protection Agency (EPA) on December 21, 2023 at 88 FR 88315.

The DEP appreciates EPA's efforts and scientific expertise in the development of water quality standards (WQS) for the Delaware River. The DEP is supportive of the effort to improve water quality in the river, to recognize an aquatic life use that includes propagation, and to protect and maintain all aquatic life uses of the river.

The DEP offers the following comments on EPA's proposed rule with the intent to share DEP's technical expertise, gain greater clarity of the proposed provisions, and reduce ambiguity to facilitate implementation.

A Lack of Criteria Minima Creates an Opportunity for Detrimental Effects to Aquatic Life

It is unclear to DEP how the proposed dissolved oxygen (DO) criteria provide adequate protection for aquatic life given there are no minimum criteria included and the 66% saturation criteria magnitudes and associated criteria durations may be exceeded for 12 days in each of three seasons.

The EPA's current national water quality criteria recommendations for DO include multiple categories of criteria magnitudes, durations, and frequencies, including 1-day minimum values. According to EPA, the minimum values should be considered as instantaneous concentrations to be achieved at all times; more specifically, the 1986 EPA Gold Book states: "*A daily minimum has been included to make certain that no acute mortality of sensitive species occurs as a result of lack of oxygen. Because repeated exposure to dissolved oxygen concentrations at or near the acute lethal threshold will be stressful and because stress can indirectly produce mortality or other adverse effects (e.g., through disease), the criteria are designed to prevent significant episodes of continuous or regularly recurring exposures to dissolved oxygen concentrations at or near the lethal threshold. This protection has been achieved by setting the daily minimum for early life stages at the subacute lethality threshold…*"

In the Technical Support Document (TSD) accompanying the proposed rule, EPA states that it "*followed the approach used by Niklitschek and Secor (2005) to define suitable habitat for juvenile Atlantic sturgeon growth and survival as habitats with water quality resulting in Habitat Suitability Index (HSI) [scores] greater than zero. When HSI is less than or equal to zero,*

seasonal average mortality rates are greater than or equal to seasonal average growth rates and overall biomass of the cohort is likely to decrease. This outcome is particularly problematic for juveniles as they enter the overwintering period when feeding is strongly limited by low water temperature. During the winter, juvenile sturgeon rely on energy accumulated during the summer and fall. If they enter the overwintering season in poor condition (e.g., small in size with inadequate energy reserves), then they might be less likely to survive the winter." The proposed rule contains similar language. In the ecological modeling subsection of Section IV.C.1 of the preamble to the proposed rule, it is stated directly that (emphasis added) "*EPA evaluated seasonal percentiles of percent oxygen saturation to find the lowest value at which [the ecological models used by EPA] predict expected median HSI>0 as the minimum thresholds for percent oxygen saturation that, if attained, would provide suitable habitat during that seasonal period.*"

The TSD, in Section 4.1 on page 37, goes on to state that EPA selected two percentiles at thresholds at or above which median HSI is expected to be greater than zero: "*These two percentiles ... protect against a detrimental change in the lower half of the distribution that could result in a harmful effect on sturgeon. The 10th percentile is a reliable measure of the frequency of low dissolved oxygen values that may be especially harmful to aquatic life. Empirically, if the criterion for the 10th percentile is attained, then minimum values that would impact the cohort are unlikely. The 50th percentile represents the midpoint of the distribution and ensures that the center of the distribution does not become skewed towards low dissolved oxygen values.*"

In DEP's opinion, the information found in the TSD describing the 10th percentile value is confusing as this value seems to be presented as a daily minimum not to be exceeded rather than a daily average that can be exceeded for 12 days per season. The current language suggests that exceeding this value at any time would likely result in negative, or "especially harmful" effects to aquatic life. If that was not EPA's intent, DEP recommends EPA amend the language to provide clarification on what is represented by the 10th percentile criterion and how the application of the 10th percentile value in the proposed rule is protective. Additional graphics and visual aids may also be helpful in communicating the information to the public.

The proposed rule and TSD both contain footnotes (#68 in the proposed rule and #81 in the TSD) which state that (emphasis added) "*EPA selected a daily average duration because it is a readily measurable indicator of oxygen levels at a daily timescale. The daily average is protective because variability of dissolved oxygen levels on a single day is small in the Delaware River.*" The DEP requests that EPA provide further explanation as to what constitutes a "small" amount of daily variability along with the water quality data used to support that determination.

Based on DEP's review of the available water data for this section of the Delaware River, it appears that differences between DO daily minimum percent oxygen saturations and daily maximum percent oxygen saturations can range between approximately 3% to greater than 15% over a 24-hour period. Given that levels are averaged over a 24-hour period and can be exceeded for up to 12 consecutive days in the proposed rule, DO levels could drop to harmful levels for extended periods of time (that is, well below the 66% saturation threshold for hours or days). As currently proposed, there would be no violation of the proposed DO criteria as long as the daily average DO value did not remain below 66% saturation for more than 12 days during the seasonal period of the criterion. The DEP's analyses, including of provisional data from United States Geological Survey gages in the lower Delaware River, suggest that some locations – such as the Delaware River near Chester, Pennsylvania – have the potential to experience DO levels

well below the proposed magnitude of 66% saturation for extended periods (potentially up to 12 consecutive days).

The DEP does not understand how the proposed criteria magnitudes can be combined with a duration of daily average and frequency of 12 days and be adequately protective of aquatic life. Without criteria minimum values, aquatic life may be subjected to stressful, or even fatal, levels of DO during the allowable exceedance period of 12 days without triggering a violation of the proposed criteria. In addition to the percent saturation criteria values, DEP would recommend EPA consider the addition of concentration-based, minimum criteria values to protect aquatic life from deleterious or lethal effects that could result from acute exposures to critical DO levels. There are at least four states (Vermont, New Hampshire, Maine, and Rhode Island) that have statewide DO criteria containing both concentration-based and percent saturation-based DO criteria to protect aquatic life.

Seasonal Periods with Extensive Frequencies May Lead to Long Periods of Magnitude and Duration Exceedance

Having three seasonal periods for the DO criteria allows for situations where instream DO levels could be below the seasonal criteria magnitude for up to 24 consecutive days (that is, 12 days at the end of one season and 12 days at the beginning of the next season) and not violate the criteria since the criteria frequency allows for 12 days of exceedances in each seasonal period. The DEP requests that EPA better explain and demonstrate how the proposed criteria magnitude, duration, and frequency protect the aquatic use for the Delaware River.

Need for Seasonal Criteria

While DEP appreciates EPA's goal to develop protective criteria values that are neither underprotective or overprotective, DEP requests EPA provide the additional explanation and documentation to support the need for a 66% saturation criterion for the late fall, winter, and early spring (equivalent to 7.0 mg/L at 54.3° F or 8.3 mg/L at 42°F).

In the proposed rule, EPA recognizes that the cohort model was only used to develop the 66% saturation threshold for the juvenile development period. The EPA states it did not use the model to derive the criteria for the spawning and overwintering periods and recognizes that the values may be overprotective due to lower metabolic and other needs of fish during the winter. Additionally, EPA states it determined the percent oxygen saturation threshold that would be protective of juveniles experiencing stressful (high) water temperatures during the juvenile development season would also be protective of larvae and overwintering juveniles not experiencing high water temperatures. While DEP agrees that the proposed criteria should be protective, a 66% saturation criterion seems likely to be overly protective. When converted to concentration-based values, EPA calculated a criterion of 7.0 mg/L at 54.3° F, which represents the average seasonal water temperature, and 8.3 mg/L at 42°F, which represents an approximate highest seasonal temperature (90^{th} percentile). The DEP is unaware of any studies or publications demonstrating that warm water fish require a DO level of 66% saturation (7.0 or 8.3 mg/L) during the overwintering period (November to February). The DEP is also not aware of a need for wintertime seasonal DO limits in permits discharging to the Delaware Estuary.

Furthermore, EPA has not established national seasonal DO criteria recommendations, and it is unclear why seasonal criteria are needed specifically for the Delaware Estuary, particularly since the criteria (66% saturation) are the same for each season with the addition of a second percent saturation value for the juvenile development period.

"Once Every 3 Years" Frequency Provision

The EPA's proposed criteria do not include an interannual exceedance frequency (once every 3 years, for example) and, through the proposed rule, EPA has specifically requested comment on the appropriateness of potentially applying an interannual exceedance frequency. Near the end of Section IV.C.3 of the preamble to the proposed rule, EPA states,

> "*The EPA has historically considered it appropriate to apply a 1-in-3-year exceedance frequency in the context of aquatic life criteria for toxic pollutants, based on the ability of aquatic ecosystems to recover from criteria exceedances and natural variations in flow and the concentrations of the pollutant in a waterbody. However, the EPA does not typically apply this construct to criteria for conventional water quality parameters like dissolved oxygen due to inherent differences between these parameters and toxic pollutants. For example, dissolved oxygen is typically not directly regulated in the same manner as toxic pollutants because low dissolved oxygen conditions (such as hypoxia) are a symptom of a related issue, such as nutrient or ammonia pollution.*"

The DEP agrees with this statement and rationale, but would also point back to the supporting rationale that includes the cohort model used to develop the proposed criteria, which does not account for this additional frequency provision. The DEP does not agree with applying an interannual exceedance frequency.

Implementation of Percent Saturation Criteria in NPDES Permits

The DEP has concerns regarding its ability to implement a percent saturation DO criterion in National Pollutant Discharge Elimination System (NPDES) permits using its current models and tools for determining permit effluent limitations. If criteria are finalized as proposed, DEP would likely need to either expend a significant amount of time and effort creating new models or convert the criteria into concentration-based values. Alternatively, DEP may need to rely upon other available models, such as models developed by the Delaware River Basin Commission (DRBC).

Even if DEP uses DRBC's models to assist with the development of permit effluent limitations, DEP must still meet its regulatory obligations under both the WQS program and the NPDES program, including an evaluation of all relevant water quality-based effluent limitations (WQBELs) and technology-based effluent limitations (TBELs). In all cases, the more stringent value must be applied.

Percent Saturation vs. Concentration-Based Criteria and Permit Limits

Since allowable DO concentrations would constantly vary dependent upon the temperature under the rule as proposed, DEP is concerned that trying to maintain a minimum of 66% percent saturation could potentially result in a real-time management challenges for permitted facilities. Much of this concern will depend upon how the criteria are implemented in permits.

In Section IV.C.1 of the preamble to the proposed rule, EPA states, "*Given this relationship between temperature and dissolved oxygen concentration, criteria expressed as concentration will be above or below the protective threshold at various times of the year as temperature*

changes, whereas criteria expressed as percent oxygen saturation can be protective throughout the year."

Permitted facilities require static permit effluent limitations upon which they can design, install, and operate wastewater treatment plants. As noted previously, using current Pennsylvania permit effluent limitation models, DEP would likely need to convert percent saturation criteria into minimum, concentration-based values. In addition, DEP would need to identify the critical temperature/conditions necessary to achieve the criteria in a worst-case scenario and would convert the percent saturation criteria into a single concentration-based number to ensure the criteria are not violated. Given that the proposed criteria include three seasonal values, the critical conditions would be different for each season. For example, if the lowest water temperatures observed during the overwintering period would result in the most stringent concentration-based values, DEP would use these values to establish the permit effluent limitations.

If implementation of percent saturation criteria would result in the same outcome as having concentration-based criteria, DEP would recommend the EPA consider adopting concentration-based values.

The regulated community, non-governmental organizations, and the public are most familiar with concentration-based DO criteria. The DEP is concerned that the proposed percent saturation criteria will be difficult to explain to the public and for the public to comprehend. The DEP supports the development of DO criteria expressed as concentration. Such criteria should be protective if calculated to be protective at critical conditions (such as, low-flow conditions, summertime high-temperature conditions).

Technical Support Document

In the TSD, EPA identified a number of limitations and uncertainties associated with the model and criteria recommendations. For example, EPA estimated mortality due to low oxygen and high water temperature based on rates observed for laboratory-reared fish exposed in a laboratory setting. In natural settings, fish typically experience mortality as a result of cumulative effects from predation, disease, resource competition, exposure to toxic substances, and other causes. The DEP generally agrees with EPA's concerns about these limitations and uncertainties discussed in the TSD.

EPA Recommends States Consider Water Quality Variances for Implementation

Section VIII of the preamble to the proposed rule indicates that the regulations provide several approaches that each state could use, at each state's discretion, when implementing the new designated use and DO criteria, namely WQS variances and NPDES permit compliance schedules. The DEP recognizes the necessity and utility of NPDES permit compliance schedules when implementing updated water quality criteria through permits or other circumstances where additional time would be needed by permittees to develop, build, and implement new or additional treatment technologies. The NPDES permit compliance schedules are provided for under federal and state regulations. Conversely, WQS variances require an actual change to WQS regulations, which DEP believes defeats the purpose of this proposed WQS rule.

As explained in the preamble, "protection and propagation of resident and migratory aquatic life" (referred to as "propagation" hereafter in this letter) would, if this rule is finalized as proposed, be an "attainable" use in the specified zones of the Delaware River (88 FR 88321). The

preamble does not state that this designated use is not attainable in the near-term. Yet, as proposed, the WQS variances may only apply if the use and criteria are "unattainable" (88 FR 88329). A WQS variance must identify the highest "attainable" condition, which in this case is propagation. If a time-limited designated use (that does not include propagation) is intended, DEP advises that EPA should specify this highest attainable use in the rule. Further, any time-limited WQS variance of a water use would need to specify "the highest attainable interim criterion" that would support the time-limited designated use. The rule should provide the appropriate interim criteria to protect the highest attainable condition. Without these elements included in this rule, a WQS variance is not an efficient way to implement this rule as proposed. Further, it is unclear to DEP what implementation would be expected during the extensive period of time it takes to develop, promulgate and obtain EPA review of a WQS variance.

The EPA has performed the extensive work necessary to determine that the Section 101(a)(2) aquatic life use, under the Federal Clean Water Act, is "attainable" in the lower Delaware River and Estuary. It appears EPA is asking the states to consider developing subsequent rulemakings to "remove" this new designated use, for some period of time, using the factors at 40 CFR 131.10(g), to "implement" the proposed designated use. In addition, it appears EPA is asking the states to adopt "the highest attainable interim criterion," which undermines all the science EPA used to determine protection of the most sensitive species, the Atlantic sturgeon.

The DEP advises that EPA should promulgate a regulation that can be implemented without the need for subsequent rulemakings by states.

Revision of Aquatic Life Criteria other than Dissolved Oxygen

The EPA suggests that states should evaluate whether other aquatic life criteria should similarly be added or revised for the specified zones or other zones of the Delaware River (88 FR 88328). Under Section 303(c)(4) the Federal Clean Water Act and the Federal regulations at 40 CFR 131.22 (relating to EPA promulgation of water quality standards), EPA may propose and promulgate a regulation setting forth a new or revised standard upon determining such a standard is necessary to meet the requirements of the Clean Water Act. In promulgating water quality standards, EPA is subject to the same policies, procedures, analyses, and public participation requirements established for the States in the Federal regulations at 40 CFR Part 131. Under 40 CFR 131.11 (relating to criteria), States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use.

The proposed rule would recognize a new aquatic life use for the Delaware Estuary that includes the protection of early life stages. However, the proposed rule includes only a single water quality criterion for DO to support this amended use. Based on the interstate nature of this waterbody and the presence of endangered species and habitat, DEP recommends that EPA, not the states, should determine which of EPA's Clean Water Act Section 304(a) national recommendations for aquatic life criteria are not protective of the proposed new propagation designated use. Further, DEP advises that EPA should provide protective criteria if the national recommendations do not support the use. The EPA is promulgating this aquatic life use for the Delaware River, and thus, is obligated to follow the same regulations in developing water quality standards regulations as the States.

Equivalency of the Proposed Section 101(a)(2) Aquatic Life Use Protection to Pennsylvania's Warm Water Fishes Protected Use

Pennsylvania is seeking concurrence from EPA that the proposed new "protection and propagation of resident and migratory aquatic life" designated use is equivalent to Pennsylvania's Warm Water Fishes (WWF) protected use. This determination is important because Pennsylvania must understand which of its EPA-approved aquatic life criteria are applicable to this new use.

The DEP appreciates EPA's consideration of these comments and will continue to work cooperatively and collaboratively with EPA, DRBC, and other Delaware River basin states to protect the Delaware River and Estuary.

Sincerely,

Jessica L. Shirley

Jessica Shirley
Interim Acting Secretary