


Proposed Rulemaking: Water Quality Standards Site-Specific Criteria

Environmental Quality Board Meeting

July 11, 2023

Josh Shapiro, Governor

Richard Negrin, Secretary

Purpose of the Regulation

- Update the Commonwealth's water quality standards to reflect current scientific methods and guidance with respect to the development of site-specific criteria

- Update the mercury water quality criterion for Ebaughs Creek, York County

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Site-Specific Criteria Development

- Site-specific criteria afford the most appropriate level of protection to specific waterbodies.
- Site-specific criteria development process was established in 1979.
- Proposed updates will provide clarification on how to request site-specific criteria and when site-specific criteria may or may not be requested.

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Site-Specific Criteria Development

Summary of updates to § 93.8d(a):

- Addition of “aquatic life” to (1)
- Addition of Table 5 and language regarding threatened and endangered species to (2)
- Addition of Table 3 to (3)

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Site-Specific Criteria Development

Addition of a new § 93.8d(a.1) identifies the conditions under which site-specific criteria may not be requested and include the following:

- A substance is a cause of nonattainment or would interfere with attainment of protected water uses
- A waterbody where an aquatic life use is not attained unless all causes of nonattainment are due to causes other than pollutants.
- A waterbody with an existing or designated use of High Quality Waters (HQ) or Exceptional Value Waters (EV)

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Site-Specific Criteria Development

§ 93.8d(b) describes the information to be submitted regarding requests for site-specific criteria.

Requests must include the following, at a minimum:

- Identification of pollutant of concern
- Identification of the qualifying factor in § 93.8d(a)
- Identification of the receiving waterbody
- Scientific studies, data or information to demonstrate the qualifying factor in § 93.8d(a) is met
- Information that demonstrates the factors in § 93.8d(a.1) are not applicable
- Information that demonstrates a water-quality-based effluent limitation based on a Table 3 or Table 5 criterion is not achievable

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Site-Specific Criteria Development

§ 93.8d(c.1) - (c.3) updates information previously contained in §93.8(f) to clarify that:

- Site-specific criteria will be protective of existing and designated uses; and
- All site-specific criteria
  - Will be incorporated into Chapter 93,
  - Will be maintained in a publicly available table, and
  - Are not effective for Clean Water Act purposes until approved by EPA.

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Site-Specific Criteria Development

§ 93.8d(c) describes additional information that may need to be submitted regarding requests for site-specific criteria, including:

- Definition of the aerial boundaries for the site-specific criterion
- Identification of all potentially affected National Pollutant Discharge Elimination System (NPDES)-permitted discharges, water withdrawals, total maximum daily loads (TMDLs) and surface water assessments
- All peer-reviewed scientific literature or other Department approved data to be used in criterion development
- Signed copies of all reports, if applicable
- Any additional data or information requested by the Department

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Site-Specific Methylmercury Criterion for Ebaughs Creek

(York County)

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Site-Specific MeHg Criterion – Ebaughs Creek

In 2015, York County Solid Waste and Refuse Authority (YCSWRA) initiated a request for site-specific criteria.

- Owns and operates the York County Sanitary Landfill
- Discharges to an unnamed tributary (UNT) to Ebaughs Creek in York County (CWF, MF) under NPDES permit PA 0081744
- Request satisfies § 93.8d(a)(3)
- Deletion of the statewide total mercury criterion of 0.05 µg/L
- Addition of a site-specific dissolved methylmercury criterion

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Site-Specific MeHg Criterion – Ebaughs Creek

- YCSWRA submitted a study plan to the Department for review and approval in 2015.
- The Department approved a revised study plan in 2016.
- YCSWRA collected monthly water quality samples from Ebaughs Creek between October 2016 and September 2017 (1 year). Fish tissue samples were collected twice during the study in October 2016 and September 2017.
- Submitted a final study report in December 2017.
- The Department reviewed the results of the final study report and developed a dissolved methylmercury water quality criterion recommendation to protect human health using site-specific bioaccumulation factors (BAFs).

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Site-Specific MeHg Criterion – Ebaughs Creek

- Bioaccumulation is the process of a chemical moving from the external environment into an organism.
- A BAF is a measure of how much a chemical accumulates within an organism.
- BAFs are generally determined for higher trophic level organisms within an ecosystem (e.g., fish vs. aquatic bugs).
- YCSWRA collected fish tissue data for brown trout and American eel.

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Site-Specific MeHg Criterion – Ebaughs Creek

The Department calculated individual BAF values for each set of monthly fish tissue data collected. Values ranged between 2,110,000 L/kg and 11,900,000 L/kg.

$$BAF = \frac{\text{concentration of total mercury in fish tissue (mg/kg)}}{\text{concentration of dissolved methylmercury in water (mg/L)}}$$

A final BAF was determined by calculating the geometric mean of the individual BAF values:

Final $BAF_{(Ebaughs)}$ = geometric mean of individual BAFs for Ebaughs Creek

= 5,882,398 L/kg

= 5.882398×10^6 L/kg

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Site-Specific MeHg Criterion – Ebaughs Creek

To develop the proposed recommendation for Ebaughs Creek, the Department used EPA's *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion* (2010), which provides the following equation:

$$AWQC_{MeHg} = [BW \times (RfD\text{-}RSC)]/[DI + (FI \times BAF)]$$

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Site-Specific MeHg Criterion – Ebaughs Creek

$$AWQC_{MeHg} = [BW \times (RfD\text{-}RSC)]/[DI + (FI \times BAF)]$$

Where: $AWQC_{MeHg}$ = methylmercury ambient water quality criteria

- BW = human body weight (80 kg)
- RfD = reference dose (0.0001 mg/kg-d)
- RSC = relative source contribution (0.000027 mg/kg-d)
- DI = drinking water intake (2.4L/day)
- FI = fish intake, current EPA recommended value (0.022 kg/day)
- BAF = bioaccumulation factor in L/kg (5882398 L/kg)

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Site-Specific MeHg Criterion – Ebaughs Creek

$AWQC_{MeHg(Ebaughs)}$ = [80 kg x (0.0001mg/kg-d-0.000027 mg/kg-d)]
/[2.4 L + (0.022 kg x 5882398 L/kg)]

= [0.00584 mg]/[129415 L]

= 0.000000045 mg/L

= 4×10^{-8} mg/L

$AWQC_{MeHg(Ebaughs)}$ = 4×10^{-5} µg/L

= 0.00004 µg /L

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Advisory Committees

- Presented draft recommendations to the Agricultural Advisory Board on March 15 and to the Water Resources Advisory Committee on March 16.
- WRAC voted to support presentation of this proposed rulemaking to the Board.

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Recommendation

The Department recommends the Board adopt the proposed regulation with a 45-day public comment period with one public hearing.

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