

US EPA ARCHIVE DOCUMENT

Frequently Asked Questions (FAQs): Implementing the 2016 Selenium Criterion in Clean Water Act Sections 303(d) and 305(b) Assessment, Listing, and Total Maximum Daily Load (TMDL) Programs

Draft

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This document supports Clean Water Act (CWA) regulators in states, authorized tribes, and territories in implementing EPA’s four-part selenium water quality criterion (WQC)¹ in EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*² as it relates to the CWA sections 303(d) and 305(b) Assessment, Listing, and Total Maximum Daily Load (TMDL) Programs. A summary of the recommended criterion is provided in the attachment.

This set of FAQs provides information on how to complete assessments, list impaired waters, and develop TMDLs based on EPA approved water quality standards (WQS) that adhere to EPA’s 2016 selenium criterion recommendation. While this document cites statutes and regulations that contain requirements applicable to these programs, it does not impose legally binding requirements on EPA, states, authorized tribes, territories, other regulatory authorities, or the regulated community and its content might not apply to a particular situation based upon the circumstances. EPA, states, authorized tribes, territories and other decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from those provided in this document as appropriate and consistent with statutory and regulatory requirements. EPA may update this document as new information becomes available. In addition to this document, EPA has other documents which provide considerations and recommendations on implementing the selenium criterion and can be found at EPA’s selenium website: <https://www.epa.gov/wqc/aquatic-life-criterion-selenium>.

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¹ Reference to a *four-part criterion* or *four-part selenium criterion* assumes adoption and EPA approval of a four-part aquatic life WQS for selenium that includes elements similar or identical to EPA’s 2016 selenium criterion.

² USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*. EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents>.

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Q1: How should states authorized tribes, and territories implement EPA’s 2016 selenium criterion in their assessment and section 303(d) listing programs?

A1: As described in EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater, 2016*, EPA recommends that states, authorized tribes, and territories (for the remainder of this document referred to as “states and authorized tribes”) adopt the Agency’s 2016 selenium criterion into their WQS.³ EPA’s 2016 selenium criterion includes four elements: (1) a fish egg-ovary element; (2) a fish whole-body and/or muscle element; (3) a water column element (one value for lentic and one value for lotic aquatic systems); and (4) a water column intermittent element to account for potential chronic effects from short-term exposures (one value for lentic and one value for lotic aquatic systems). EPA recommends that states and authorized tribes express all four elements as a single criterion composed of multiple parts and clearly indicate that the fish whole-body and/or muscle element supersedes the two water column elements, and the egg-ovary element supersedes any other element.

EPA’s 2016 selenium criterion is structured to enable assessment of waterbodies with as few as one element of the four-part criterion. Table 1 provides a decision matrix indicating whether the available data and information (collectively referred to as data for the remainder of this document) supports a section 303(d) listing decision for nine aquatic life use assessment scenarios using the recommended four-part selenium criterion, assuming that the waterbody is in steady-state with the selenium sources. See Q11 for situations in which the waterbody is not in steady-state.⁴ Each assessment scenario is further explained following the table.

Table 1. Decision Matrix for EPA’s 2016 Selenium Criterion Assessment Scenarios for Waterbodies with Steady-state Selenium Sources^{a, b}

| | | Water Column Element ^e | | |
|-------------------------------------|---------------|-----------------------------------|-----------------------|-----------------------|
| | | Not Exceeded | Exceeded | Not Available |
| Fish Tissue Element ^{c, d} | Not Exceeded | (1) Criterion Met | (2) Criterion Met | (3) Criterion Met |
| | Exceeded | (4) Criterion Not Met | (5) Criterion Not Met | (6) Criterion Not Met |
| | Not Available | (7) Criterion Met | (8) Criterion Not Met | (9) Not Assessed |

Notes: ^a The scenarios are numbered consecutively, each with its number enclosed in parentheses.

^b Decisions assume steady-state conditions.

^c Fish tissue elements refer to (a) fish egg-ovary and (b) fish whole body and/or muscle.

^d Fish egg-ovary element overrides the fish whole-body and/or muscle element when both types of data are available.

^e The water column elements refers to both the monthly average exposure and intermittent exposure criterion elements.

³ Ibid.

⁴ EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016* indicates that, after new selenium inputs are added to the waterbody, “EPA estimates that the concentration of selenium in fish tissue will not reach steady-state for several months in lotic systems and longer time periods (e.g., 2–3 years) in lentic systems. Achievement of steady-state in an aquatic system also depends on the hydrodynamics of the aquatic system, (particularly reservoirs with multiple riverine inputs), the location of the selenium input and the particular food web. EPA expects the time needed to achieve steady-state with new or increased selenium inputs to be site-specific.”

Explanation of the Decision Matrix

Scenarios 1, 2, and 3: Available data indicate that the waterbody does not exceed the fish tissue elements. The structure of the four-part criterion provides for fish tissue elements to override the water column elements when both forms of data are available. As a result, if there is a conflict between data types, the assessment decision should be based on available fish tissue data. EPA's 2016 selenium criterion is met in all three scenarios, and so the data do not support inclusion of the waterbody-pollutant combination on the state's or authorized tribe's section 303(d) list.

Scenarios 4, 5, and 6: Available data indicate that the waterbody exceeds one or more of the fish tissue elements (i.e., fish egg-ovary element and fish whole-body and/or muscle element). The structure of the four-part criterion provides for fish tissue elements to override the water column elements (i.e., monthly average exposure element and intermittent element) when both forms of data are available. As a result, if there is a conflict between data types, the assessment decision should be based on available fish tissue data. EPA's 2016 selenium criterion is not met in all three scenarios, and so the waterbody-pollutant combination should be included on the state's or authorized tribe's section 303(d) list.

Scenarios 1–6 cover situations in which fish tissue data are available. States and authorized tribes can reference EPA's *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion* for more information about how to collect and analyze fish tissue data, including information about the relative sensitivity of fish species to selenium.⁵

Scenario 7: Available data indicate that the waterbody does not exceed the corresponding water column element (either the monthly average exposure element or the intermittent element) and fish tissue data are not available. EPA's 2016 selenium criterion is met in this scenario.

Scenario 8: Available data indicate that the waterbody exceeds the corresponding water column element and fish tissue data are not available. EPA's 2016 selenium criterion is not met in this scenario, and the waterbody-pollutant combination should be included on the state's or authorized tribe's section 303(d) list.

Scenario 9: Fish tissue and water column data are not available. EPA's 2016 selenium criterion cannot be assessed. EPA recommends that states and authorized tribes consider collecting fish tissue and/or water column data for these waterbodies leading up to the next listing cycle, thus providing for an assessment decision to be made.

Scenarios 7–9 cover situations in which fish tissue data are not available: (1) in fishless waters, which are described as waters with insufficient instream habitat and/or flow to support a population of any fish species on a continuing basis, or waters that once supported populations of one or more fish species but no longer support fish (see the executive summary of EPA's *Aquatic*

⁵ USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Life Ambient Water Quality Criterion for Selenium–Freshwater 2016); (2) in waters with new inputs of selenium where steady-state fish tissue data cannot not be collected; or (3) when fish tissue data are not available because they were not collected or did not meet the state’s or authorized tribe’s quality assurance procedures. In any case, EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater, 2016* document explains that “[w]ater column values are the applicable criterion element in the absence of steady-state condition fish tissue data,” meaning that water column data are sufficient for the state or authorized tribe to determine whether the criterion has been met, as depicted in Table 1.⁶ In situations in which fish are present, but no fish tissue data were collected, EPA recommends that states or authorized tribes consider collecting fish tissue data leading up to the next cycle.

Q2: What data and information should states and tribes assemble and evaluate to complete water quality assessments with the EPA’s 2016 selenium criterion?

A2: States and authorized tribes are required under Title 40 of the *Code of Federal Regulations* section 130.7(b)(5) to assemble and evaluate all existing and readily available water quality-related data and information when conducting a water quality assessment and determining which waters belong on the state’s or authorized tribe’s section 303(d) list. Hence, states and authorized tribes are required to assemble and evaluate water column and fish tissue data and information collected by the state itself as well as other stakeholders (e.g., permitted dischargers under EPA’s National Pollution Discharge Elimination System [NPDES] program). The extent to which the state or authorized tribe will use the data to make an assessment determination will be made based on that evaluation. Additional guidance on data assembly, including sources to solicit for existing and readily available data and information, is provided in section IV, part C, of EPA’s 2006 Integrated Reporting Guidance (IRG).⁷

Q3: How should states and authorized tribes describe their assessment methodology for evaluating selenium data and information?

A3: An assessment methodology constitutes the decision process that a state or authorized tribe employs to determine the water quality attainment status of waters in the state or on tribal lands. The methodology should describe how data and information are used to make water quality attainment determinations and place waterbodies on the state’s or authorized tribe’s section 303(d) list, including data quality, quantity, and representativeness considerations. The methodology should also include a rationale for any decision not to use existing and readily available data and information. EPA encourages states and authorized tribes to make the assessment methodology available to the public for review and comment prior to, or along with, solicitations for data and information. Such engagement helps facilitate stakeholder input to the

⁶ USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*. EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents>.

⁷ USEPA (U.S. Environmental Protection Agency). 2005. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf>.

state's or authorized tribe's assessment of water quality status, including assessments for selenium. Additional information regarding data quality, quantity, and representativeness considerations are available in EPA's 2006 IRG.⁸

Q4: Should states' and authorized tribes' monitoring plans include the collection of fish tissue and water column data to assess for selenium?

A4: EPA recommends that states and authorized tribes collect fish data (egg-ovary or whole-body and/or muscle) for assessment purposes. Fish data reflect integrative accumulation of selenium over time and space in the fish (see section 2.7.6 of EPA's *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*).⁹ Measurements of selenium in fish tissue are most closely linked to the chronic adverse effects of selenium, since chronic selenium toxicity is based on the food-chain bioaccumulation route, not a direct waterborne route. States and authorized tribes can find additional information on collecting and analyzing fish data in EPA's *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*.¹⁰

EPA's four-part selenium criterion allows states and authorized tribes flexibility in how they monitor. This flexibility stems from the fact that all four elements are designed to protect against chronic selenium effects. States and authorized tribes should consider a variety of factors when deciding how to monitor for selenium, including assessment and implementation needs, representativeness of the results, available resources, and public input. For example, when states and authorized tribes determine that TMDLs or discharge limits are necessary, they might wish to collect water column data to facilitate permit or TMDL calculations.

Q5: Should states and authorized tribes complete assessments and section 303(d) listings for waterbodies that have only selenium water column data?

A5: States and authorized tribes should assess and list, when appropriate, waterbodies that have only selenium water column data. As described in Q1, EPA's 2016 selenium criterion is structured to enable assessment of waterbodies with as few as one element of the four-element selenium criterion, including the scenario in which only water column data are available. After a waterbody is added to a section 303(d) list based on water column data alone, states and authorized tribes might want to consider collecting fish tissue data to confirm the assessment determination before developing a water quality management plan (e.g., TMDL).

⁸ Ibid.

⁹ USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*. EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC. <https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents>.

¹⁰ USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*. Unpublished manuscript. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Q6: How should states and authorized tribes complete assessments and section 303(d) listings for *fishless waters*?

A6: For fishless waters, states and authorized tribes should use the appropriate water column element (i.e., the monthly average exposure element or the intermittent element) of EPA’s 2016 selenium criterion to assess the waterbody.¹¹ If fish are not present in a waterbody, states and authorized tribes can make an assessment decision on whether the selenium criterion is met, as depicted in Table 1. Scenarios 7 and 8 in Q1 cover situations in which fish tissue data are not available for assessment, but water column data are available.

Q7: How should states and authorized tribes complete assessments and section 303(d) listings using fish data?

A7: The fish tissue elements of EPA’s 2016 selenium criterion were developed with the goal of protecting populations of fish in a given waterbody. EPA recommends that states and authorized tribes reference EPA’s *Technical Support for Fish Tissue Monitoring for Implementation of EPA’s 2016 Selenium Criterion* for information on the collection and use of fish tissue data.¹² In collecting fish tissue data, states and authorized tribes should plan to collect and assess data for the appropriate time, space, and species that are relevant to a specific waterbody. For example, if gravid (i.e., pregnant, carry eggs) females are not present in the system, states and authorized tribes might want to collect and analyze fish whole-body and/or muscle tissue. If target species are not captured or are not present, then states and authorized tribes should assess the waterbody using the appropriate water column element, in a manner similar to that used for fishless waters (see Q6).

Q8: How should states and authorized tribes complete assessments and section 303(d) listings when there are data for multiple fish species?

A8: EPA’s 2016 selenium criterion is designed to protect all freshwater aquatic life. If data from one or more fish species for a waterbody exceeds the criterion, then the criterion is not met and the waterbody-pollutant combination should be included on the state’s or authorized tribe’s section 303(d) list. States and authorized tribes should not composite or average data from multiple species. The hierarchical elements of the criterion (i.e., egg/ovary data supersedes muscle/whole body) apply within each fish species and across species.

¹¹ EPA describes *fishless waters* as waters with insufficient instream habitat and/or flow to support a population of any fish species on a continuing basis, or waters that once supported populations of one or more fish species but no longer support fish (e.g., extirpation) due to temporary or permanent changes in water quality (e.g., selenium pollution), flow, or instream habitat.

¹² USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA’s 2016 Selenium Criterion*. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC.

Q9: How should states and authorized tribes complete assessments and section 303(d) listings when there are multiple samples for a single fish species?

A9: States and authorized tribes have flexibility on how to evaluate multiple composite and/or individual samples for a single fish species. The state's or authorized tribe's assessment methodology should document the decision process for this scenario (see Q3). As part of the methodology, the state or authorized tribe should discuss the process and rationale for combining and assessing data from individual or composite samples of the same species, including how the time and location of sample collection and size of fish samples were considered. Additional information on approaches and factors to consider in evaluating data from individual or composite fish tissue is provided in EPA's document *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*.¹³

Q10: How should states and authorized tribes complete assessments and section 303(d) listings when there are anadromous or potamodromous fish species in the waterbody?

A10: Anadromous fish species are those spawned in freshwater, then migrate to the ocean as juveniles (e.g., smolts), where they grow into adults before migrating back into freshwater to spawn. Notable among these species are Pacific salmonids like the coho, king, and chinook salmon, as well as marine adapted rainbow trout (steelhead). States and authorized tribes should not use data from adult anadromous fish for completing assessments and section 303(d) listings, due to the limited life history and exposure to freshwater sources of selenium. The smolt (young juvenile) stage of salmonid species is an exception, since this stage is exposed to selenium in freshwater until it migrates to estuarine and marine habitats as it matures. Adult anadromous fish species are not resident of the waterbody and will not have selenium concentrations that are representative of localized selenium sources and concentrations (see section 6.4.1 of the criterion document and the document *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*¹⁴).

Potamodromous fish are species that are spawned in upstream freshwater habitats then migrate downstream (still in freshwater) as juveniles to grow into adults before migrating back upstream to spawn. Notable species include several trout species (e.g., lake, bull, rainbow, cutthroat), sucker and redhorse species, some cyprinids, and flathead catfish. Sampling plans should account for the life history of these species and assessment decisions should account for locations of samples taken and proximity to sources. The nearest source may be located some distance upstream, or it may be located at or near a sampling site.

¹³ Ibid.

¹⁴ USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Fish Tissue Monitoring for Implementation of EPA's 2016 Selenium Criterion*. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC.

Q11: How should states and authorized tribes complete assessments and section 303(d) listings when there are new inputs of selenium?

A11: EPA's 2016 selenium criterion assumes that in most circumstances, steady-state conditions are present in the waterbody (see Q1 for assessment under steady-state conditions). New inputs¹⁵ to the watershed will likely result in greater concentrations of selenium in the food web and a relatively slow increase in the selenium concentration in fish. EPA recommends that fish tissue criterion elements not take precedence over the water column criterion elements until the aquatic system achieves steady state. Hence, when the waterbody is not in steady-state, the waterbody is not meeting the criterion and is considered impaired if either the fish tissue or water column elements are exceeded.

Q12: How should states and authorized tribes implement the water column intermittent element in assessments and section 303(d) listings?

A12: The intermittent element and the monthly average water column element (i.e., 30-day average) are both applicable elements of the recommended criterion. The intermittent element is a calculation based on the known ambient concentration, the monthly average exposure water column element, and the fraction of any 30-day period during which elevated selenium concentrations occur. As explained in section 3.3 of EPA's *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*¹⁶, the intermittent element is a re-expression of the chronic 30-day average water column element of the criterion, and the intermittent element will yield the same level of protection as the monthly average exposure element, provided that the equation uses the average of the concentrations occurring for (1) the fraction of time defined as being intermittently elevated and (2) the remaining time defined as being background.

The intermittent element only can be exceeded under the same conditions that would have caused the monthly average exposure element to be exceeded. Thus, the intermittent element and the monthly average exposure element will always result in the same assessment decision. As such, EPA recommends assessing against the monthly average element, as this provides a more straightforward, simpler method for making an assessment determination using water column data, and does not require knowledge of the background conditions or number of days with an intermittent spike.

Q13: Can states and authorized tribes develop a water column element for selenium that take into account site-specific conditions for purposes of assessment, listing, and TMDL development?

A13: States and authorized tribes can take one of two approaches for developing a water column element for selenium that take into account site-specific conditions. Under the first approach, if a state or authorized tribe thinks that the default national water column element is not appropriate

¹⁵ EPA describes new inputs as new activities resulting in the release of selenium into a lentic or lotic aquatic system.

¹⁶ USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*. EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents>.

for a waterbody, states and authorized tribes can choose to adopt into their WQS and submit to EPA for approval a site-specific water column element developed using the procedures provided in appendix K, Translation of a Selenium Fish Tissue Criterion Element to a Site-Specific Water Column Value, in EPA's *Aquatic Life Ambient Water Quality Criterion for Selenium—Freshwater 2016*¹⁷ or another scientifically defensible method that is protective of the aquatic life use. Under the second approach, states and authorized tribes can choose to adopt into their WQS and submit to EPA for approval a set of procedures to translate the fish tissue criterion concentration elements into a site-specific water column element. This is considered a performance-based approach to site-specific criteria development (see Attachment 1 for example criteria). Information on both approaches is provided in sections 1.2.1 and 1.2.2 of EPA's *Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion in Water Quality Standards*.¹⁸

States and authorized tribes should consider which of the two approaches they want to use when adopting EPA's 2016 selenium criterion. For example, the first approach is more straightforward to apply in assessment, listing, and TMDL development and will likely reduce workload on those programs. Furthermore, the opportunity for public comment on the site-specific water column element would occur in response to a single section 303(c) action. The second, performance-based approach presents greater opportunity for states and authorized tribes to adaptively derive a site-specific water column element to account for the most up-to-date data and information for the site using the EPA approved procedures in the criterion. When a performance-based approach is used, however, more coordination will likely be needed between the CWA implementing programs to consistently employ such water column elements, and the opportunity for public comment on the translated site-specific water column element occurs in response to different program actions (e.g., assessment decisions, or development of TMDLs or permit limits).

Q14: Which elements of the four-part criterion for selenium should be used to develop TMDLs?

A14: For states and authorized tribes that adopt EPA's four-part criterion, EPA expects that they would develop TMDLs based on the monthly average exposure water column element in EPA's 2016 selenium criterion or a site-specific water column element developed through one of the two approaches described in Q13. As discussed in Q1, four scenarios (i.e., 4, 5, 6, and 8) exist for which a waterbody can be assessed as impaired and included on a state's or authorized tribe's section 303(d) list. For three of the scenarios (i.e., 5, 6, and 8), EPA expects that the state or authorized tribe would use the monthly average exposure water column element to develop TMDLs. EPA recommends the approach of using the monthly average exposure water column element for these scenarios because it was derived to ensure adequate protection of the fish tissue elements of the criterion. However, for scenario 4 (wherein available data and information indicate the fish tissue element of the criterion is exceeded and the water column element is not

¹⁷ Ibid.

¹⁸ USEPA (U.S. Environmental Protection Agency). 2016. *Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion in Water Quality Standards*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

exceeded) EPA recommends that states and authorized tribes develop a site-specific water column element and use it for developing TMDLs. Using the monthly average exposure water column element under scenario 4 to develop the TMDL would result in a loading capacity for selenium that exceeds the existing load, which is already resulting in an exceedance of the fish tissue element of the criterion in the waterbody. A site-specific water column element would provide adequate protection of the fish tissue elements of the criterion.

Q15: How should TMDLs account for the intermittent element of the four-part criterion?

A15: For states and authorized tribes that adopt EPA’s four-part selenium criterion, developing TMDLs based on the monthly average exposure water column element of the criterion would also address the intermittent water column element. Section 3.3 of EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016* explains that the intermittent element is a re-expression of the chronic 30-day average water column element of the criterion.¹⁹ As such, the monthly average exposure water column element and the intermittent element of the criterion are intended to provide the same level of protection of the fish tissue elements of the criterion.

Permit writers should develop water quality-based effluent limitations to meet the state’s or authorized tribe’s EPA-approved standards. Hence, for states and authorized tribes that adopt the recommended four-part criterion, the permitting authorities would use the water column element (either monthly average or intermittent, as appropriate) and any available TMDL wasteload allocations to establish NPDES permit limits. Because the intermittent element is a re-expression of the monthly average exposure water column element of the criterion, permits that include an intermittent element would be consistent with wasteload allocations in TMDLs that are based on the monthly average expression water column element.

Q16: Which water quality assessment results indicate that a site-specific water column element might be warranted?

A16: Development of site-specific water column elements might be warranted for the following assessment scenarios described in Q1:

- Scenario 2: The water column element of the criterion is exceeded but the fish tissue element is not exceeded. Under this scenario, the criterion is met.
- Scenario 4: The water column element of the criterion is not exceeded but the fish tissue element is exceeded. Under this scenario, the criterion is not met, and so the waterbody should be included on the state’s or authorized tribe’s section 303(d) list.

EPA’s *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*²⁰ acknowledges that the relationship between the ambient concentration of selenium in water and the concentration of selenium in the fish egg-ovary element is primarily through trophic transfer of selenium, which is greatly affected by site-specific conditions. The assessment results in

¹⁹ USEPA (U.S. Environmental Protection Agency). 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016*. EPA 822-R-16-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <https://www.epa.gov/wqc/aquatic-life-criterion-selenium-documents>.

²⁰ Ibid.

scenarios 2 and 4 could indicate that the site-specific trophic transfer of selenium is different than the trophic transfer used to derive the water column elements of EPA's 2016 selenium criterion. For such scenarios, states and authorized tribes might consider developing site-specific water column elements for their selenium criterion (see approach in Q13). In particular, for scenario 4, EPA recommends that states and authorized tribes develop site-specific water column elements prior to TMDL development. It is assumed that states and authorized tribes have sufficient data to understand waterbody-pollutant dynamics in their system when a site-specific standard development process is pursued.

Attachment 1: Summary of the Recommended Freshwater Selenium Ambient Chronic Water Quality Criterion for Protection of Aquatic Life

| Media Type | Fish Tissue ¹ | | Water Column ⁴ | |
|-------------------|----------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------|
| Criterion Element | Egg/Ovary ² | Fish Whole Body or Muscle ³ | Monthly Average Exposure | Intermittent Exposure ⁵ |
| Magnitude | 15.1 mg/kg dw | 8.5 mg/kg dw whole body or 11.3 mg/kg dw muscle (skinless, boneless filet) | 1.5 µg/L in lentic aquatic systems 3.1 µg/L in lotic aquatic systems | $WQC_{int} = \frac{WQC_{30-day} - C_{bkgrnd}(1 - f_{int})}{f_{int}}$ |
| Duration | Instantaneous measurement ⁶ | Instantaneous measurement ⁶ | 30 days | Number of days/month with an elevated concentration |
| Frequency | Not to be exceeded | Not to be exceeded | Not more than once in three years on average | Not more than once in three years on average |

1. Fish tissue elements are expressed as steady-state.
2. Egg/Ovary supersedes any whole-body, muscle, or water column element when fish egg/ovary concentrations are measured.
3. Fish whole-body or muscle tissue supersedes water column element when both fish tissue and water concentrations are measured.
4. Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data.
5. Where WQC_{30-day} is the water column monthly element for either lentic or lotic waters; C_{bkgrnd} is the average background selenium concentration; and f_{int} is the fraction of any 30-day period during which elevated selenium concentrations occur, with f_{int} assigned a value ≥ 0.033 (corresponding to 1 day).
6. Fish tissue data provide instantaneous point measurements that reflect integrative accumulation of selenium over time and space in fish population(s) at a given site.