Texas Commission on Environmental Quality (TCEQ) Comments on *Recommended Aquatic Life Ambient Water Quality Chronic Criterion for Selenium-Freshwater 2015*

Docket ID Number EPA–HQ–OW–2004–0019

# Background

On July 27, 2015, the U.S. Environmental Protection Agency (EPA) proposed revisions to the draft nationally-recommended aquatic life water quality criterion for selenium in freshwater. Section 304(a)(1) of the Clean Water Act (CWA) requires EPA to develop, publish and revise criteria for protection of aquatic life and human health to accurately reflect the latest scientific knowledge. The EPA published the current nationally-recommended chronic selenium water quality criterion in 1987, which is expressed solely as a water column concentration. Since then, there has been considerable scientific review on the exposure pathways and effects of selenium on aquatic life. EPA published initial proposed revisions to the criterion in 2004, which were based upon whole-body fish tissue concentrations. In 2014, EPA developed the 2014 External Peer Review draft, which expanded the criterion to include four elements, including concentrations of selenium in fish tissue and the water column. The latest draft proposal includes four elements comprising six aspects of the criterion: (1) fish tissue concentration in egg-ovaries, (2) fish tissue concentration in muscle, (3) fish tissue concentration in the whole-body, (4) monthly water column concentration for lentic (non-flowing) systems such as reservoirs, (5) monthly water column concentration for lotic (flowing) systems such as streams and rivers, and (6) intermittent concentrations for lotic and lentic aquatic systems to account for pulses of elevated selenium concentrations. EPA’s draft proposed criterion incorporates all six of these targets, and EPA recommends all aspects to be adopted into state water quality standards. When available, fish-tissue based aspects would override water column concentrations, since selenium is bioaccumulative. Considerable uncertainty exists regarding how these elements would be implemented in regulatory programs under the CWA, particularly due to the complex nature of the criterion and lack of implementation guidance. The TCEQ offers the comments provided below.

# Comments on Proposed Draft Criterion

## General Comments and Overview.

**A. EPA’s statement that the criterion is comprised of four elements is misleading.**

The draft criterion document states “the draft criterion has four elements” (Table 1), consisting of two fish tissue-based and two water column-based elements." However, EPA is requesting states and authorized tribes to protect for a total of six different numeric aspects, as identified above. EPA should clearly state the various components of the criterion and provide sufficient guidance to incorporate these components into water quality management programs.

1. *Lack of Implementation Guidance for Incorporation of the Criterion into Water Quality Management Programs of the Clean Water Act.*

**A. The proposed criterion lacks guidance for implementation. EPA is requested to coordinate with the states and tribes to provide guidance for implementation of the draft criterion in permitting, Total Maximum Daily Loads (TMDL) and water quality assessment. EPA should postpone the adoption of the criteria until all the necessary information, including the guidance, is available for public review and comment.**

Current implementation procedures to establish effluent limits for National Pollution Discharge Elimination System permits are based upon water column concentrations. Guidance is needed to address various aspects of the six-part criterion, particularly since EPA is recommending that fish tissue elements be given precedence over water column components. The following key areas need to be addressed in the guidance:

* The development of water quality based effluent limits necessary to ensure attainment of the fish tissue criterion from whole-body, muscle, eggs or ovaries. Since permit limits are not written directly from tissue-based criteria, guidance is needed to assist states and tribes with the translation of fish tissue to water-column concentrations for use in site-specific wastewater permitting and TMDLs.
* The characterization of intermittent exposure scenarios (including determination of background concentrations), to account for pulses of selenium occurring during single day, high exposure events.
* Procedures for determining a “steady-state equilibrium” has been achieved in lentic and lotic environments as a result of increased inputs of selenium.
* Recommendations for determining attainment of criteria during assessment scenarios, particularly when data to evaluate all aspects of the criterion are not available. It is unclear whether all six numeric components must be considered or whether a combination of less than the six components can be used.

It is requested EPA seek input from the states and tribes to develop adequate guidance for the implementation of the criterion prior to final publication.

**B. The proposal lacks clarity regarding the expectations for inclusion of the draft criterion in water quality standards. EPA should postpone adoption of this document and develop guidance through coordination with the states and tribes.**

Due to the lack of guidance provided by EPA, additional uncertainties for entities with adopted acute and chronic selenium criteria remain:

* EPA has provided insufficient discussion regarding expectations of the timeframe for inclusion of this criterion in the triennial reviews of water quality standards. It is unclear whether states and tribes are expected to immediately adopt this complex criterion with no considerations to implementation or existing criteria.
* EPA is requested to provide information regarding acute effects. The draft criterion document states that these endpoints are of minor concern when compared to chronic exposure and maternal transfer, but the document does not expressly continue to endorse the current nationally recommended acute criterion. If an acute criterion is no longer needed, please directly state this in the final document.

The Federal Register notice states that EPA is developing information material to aid state and tribal adoption and that these materials will be released when the final criterion is published. Given the complex nature of this criterion and the significant change to the approach, EPA should postpone adoption of the proposed criterion and coordinate with states and tribes regarding the expectations for inclusion of this criterion in triennial reviews. EPA is requested to develop guidance documents and propose them together with the final criterion document. Informational material should be provided for review prior to finalization of the criterion. Without this additional information, stakeholders cannot completely evaluate the proposal and will miss the opportunity to provide proper feedback on the proposal.

**C. EPA is requested to develop suggested monitoring guidance for sample protocols, including target fish species and fish eggs.**

## Guidance is needed standardizing the various aspects of fish tissue sample collection with respect to selenium evaluation. Clarifications for the target fish species or trophic levels, time of year of sampling and harvesting of eggs, as well as general considerations such as sample collection and handling are needed. Current research has determined that the bioaccumulation of selenium through aquatic food webs is the primary mechanism of exposure for aquatic life. However, EPA suggests that exposure and accumulation occurs significantly at base levels of the food chain, and site-specific factors such as dietary preferences of consumers can play a large role in determining exposure. Guidance is needed to specify what trophic levels should be sampled for evaluation and compliance with the criteria. Additionally, the monitoring of fish eggs is not practical for the state or permittees. The harvesting of eggs may require additional considerations such as spawning periods, special sample collection or analysis protocols. As a result, it is anticipated that this particular sample effort may be much more complex than the simple collection of fish for whole-body or tissue analysis. Without guidance and standard protocols, states and tribes may develop inconsistent methods for sampling and monitoring.

**D. EPA is requested to provide guidance on the development of site-specific criteria to account for regional differences in naturally-occurring selenium.**

## EPA states in the draft criterion that underlying geology may contain deposits of selenium-rich materials, such as organic-enriched, sedimentary shales and petroleum source rocks. In locations where elevated selenium is naturally occurring, native fish species may have lower sensitivities to these naturally occurring concentrations. The draft criterion does not account for variability in selenium levels based on region or aquatic species’ sensitivity. Guidance for the development of site-specific bioaccumulation factors for selenium is needed to account for regional differences and elevated background concentrations in lotic and lentic environments. Site-specific studies evaluating bioaccumulation certainly seem possible; however, it is unclear how criterion will affect permit reviews and effluent limits until implementation guidance is provided by EPA.