

## Freshwater Sediment Standards

### Issue

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**How should the Sediment Management Standards rule be revised to provide sediment standards in fresh water environments?**

### Problem Statement

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Currently the Sediment Management Standards (SMS) rule outlines specific standards and decision-making processes to protect biological resources and clean up contaminated sediment. The SMS rule includes adopted chemical and biological standards for marine sediments but lacks adopted freshwater chemical standards and approved freshwater bioassays with their respective endpoints. Instead, the SMS has only a narrative standard for freshwater systems.

There are many contaminated freshwater sediment sites in the state of Washington under the Model Toxics Control Act (MTCA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) oversight. Because of the lack of adopted freshwater standards, the narrative standard requires a site-specific evaluation to determine cleanup standards. This site-specific process can create inconsistency on how freshwater sediment sites are cleaned up.

The SMS narrative language (which allows for the development of site-specific cleanup levels) is an Applicable or Relevant and Appropriate Requirement (ARAR) under a CERCLA cleanup. However, the U.S. Environmental Protection Agency (EPA) prefers adopted chemical and biological standards as ARARs for CERCLA cleanups.

Since the SMS were adopted in 1991, a variety of published research papers and developmental documents<sup>1234</sup> have addressed freshwater sediment standards and sediment quality guidelines. The Department of Ecology (Ecology) has used these documents as guidance to develop cleanup standards at freshwater sites and to aid in the development of freshwater sediment quality values.

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<sup>1</sup> Ecology. 1995. Summary of guidelines for contaminated freshwater sediments. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA. Publication No.: 95-.308.

<sup>2</sup> Ecology. 1997. Creation and analysis of freshwater sediment quality values in Washington State. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA. Publication No.: 97-323a.

<sup>3</sup> SAIC and Avocet Consulting. 2002. Development of freshwater sediment quality values in Washington State, Phase I Final Report. Prepared by SAIC, Bothwell, WA and Avocet Consulting, Kenmore, WA for the Washington State Department of Ecology, Olympia, WA. Publication No.: 02-09-050.

<sup>4</sup> Avocet Consulting. 2003. Development of freshwater sediment quality values in Washington State, Phase II Final Report. Prepared by Avocet Consulting, Kenmore, WA for the Washington State Department of Ecology, Olympia, WA. Publication No.: 03-09-088.

The Regional Sediment Evaluation Team (RSET), a multi-state and federal collaboration, is applying a statistical approach consistent with current literature to data sets from Washington, Oregon, and Idaho. A published report on the results is expected in 2009. This report, as well as the published literature, may provide useful guidance for Washington State to develop freshwater chemical and biological standards.

The issue of how the SMS can more clearly address development of cleanup levels for protection of human health is addressed in the issue paper “Addressing Human Health Risks When Setting Sediment Cleanup Standards.”

## Overview

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The SMS does not provide numeric standards to evaluate freshwater contaminated sediments. Instead, Ecology conducts site specific evaluations for freshwater sediment cleanups using guidance. This has caused inconsistency across the state. In addition, the lack of clear freshwater sediment standards limits how the EPA uses the SMS at Federal sediment cleanup sites in Washington.

Significant work has been done to develop freshwater sediment standards to protect biological resources. A number of agencies have developed guidance to use freshwater sediment quality values to conduct sediment cleanup, while a few have adopted standards into law. Ecology has developed several guidance documents on freshwater sediment quality values which are used to conduct sediment cleanup. RSET will publish a document this year that may be helpful for Washington State to develop freshwater numeric and biological standards.

Ecology is considering revisions to the SMS rule to provide freshwater sediment standards. This issue paper provides a summary of issues related to protecting biological resources in freshwater sediment. The options being considered include:

- Do nothing and continue case-by-case evaluation.
- Develop numeric freshwater sediment standards only.
- Develop biological freshwater sediment standards only.
- Develop both numeric and biological freshwater sediment standards.

## Options

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1. **Develop Numeric Chemical Freshwater Sediment Standards Only:** A number of approaches will be considered to develop numeric chemical standards including:
  - a. Review Sediment Quality Guidelines published in recent scientific literature and previous developmental documents (see footnotes 1-4).
  - b. Evaluate the different approaches for developing freshwater numeric standards: floating or flat percentile of Apparent Effects Threshold, Effects Range Low and Effects Range Medium.
  - c. Evaluate the numeric standards produced by RSET in 2009.
2. **Develop Biological Freshwater Sediment Standards Only.** A number of approaches will be considered to develop biological standards which will include the adoption of American Standard for Testing and Materials approved freshwater biological evaluation tests, performance standards, and related biological effects standards. This process could include:
  - a. Adopt the freshwater bioassays used in the freshwater sediment chemistry data evaluation by RSET.
  - b. Adopt the freshwater bioassays that have been reviewed and recommended by RSET.<sup>5</sup>
  - c. Adopt benthic community assessments as a biological evaluation test similar to the SMS marine standards.
  - d. Review current, published scientific literature and other agency (State, Tribe and Federal) regulations for approved biological evaluation tests.
  - e. Seek input from Ecology personnel and the public for appropriate biological tests or standards.
3. **Develop Both Numeric Chemical and Biological Freshwater Sediment Standards.** The process to develop both standards would follow the options listed previously for each of the respective standards.

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<sup>5</sup> RSET. 2009. Draft of the Final Sediment Evaluation Framework for the Pacific Northwest. <https://www.nwp.usace.army.mil/pm/e/rset.asp>

4. **Clarify how chemical or biological standards will be applied to evaluate contaminated sediment sites.**
  - a. Adopted chemical or biological standards would be set at the Sediment Quality Standard and Cleanup Screening Level and would apply to the following sections of the SMS:
    - i. WAC 173-204-310: Performing the initial designation.
    - ii. WAC 173-204-315: Potential confirmatory analysis.
    - iii. WAC 173-204-510: Screening of sediment station clusters of potential concern.
    - iv. 173-204-530: Hazard Assessment.
  - b. Option for evaluating freshwater contaminated sediment sites if only numeric chemical standards are adopted: Continue following the designation procedure in WAC 173-204-310 and allow the biological tests used to be based on Best Professional Judgment and Best Available Science.
  - c. Options for evaluating freshwater contaminated sediment sites if only biological standards are adopted:
    - i. Use Best Professional Judgment based on all available site data to determine if biological tests are needed.
    - ii. Biological tests are required at all freshwater contaminated sediment sites.
    - iii. Continue following the designation procedure in WAC 173-204-310. Any chemical screening levels developed must be approved by Ecology on a case-by-case basis.
    - iv. Determine the minimum number of chronic and acute biological tests required for a confirmatory designation.

## Factors to Consider When Selecting an Option

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The development of the amendments will involve the consideration and balancing of a number of issues and interests. The proposed options will also be developed to satisfy several, sometimes conflicting, regulatory goals, including the following:

- Whether the option provides for the selection of cleanup actions that protect human health and the environment.
- Whether the option provides for developing scientifically and legally defensible cleanup standards.

- Whether the option provides consistent standards and methodologies for assessing and managing risk.
- Whether the option provides flexibility to address site-specific factors.
- Whether the option promotes efficient and cost-effective cleanup of contaminated sites.
- Whether the option provides enhanced opportunities for public involvement.
- Whether the option improves the clarity and usability of the rule.
- Whether the option complies with key requirements of the Administrative Procedures Act.