



Massachusetts
Department
of
ENVIRONMENTAL
PROTECTION

technical update

Area-Based Screening for Sediment Contamination

Update to: Section 9 of *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1996)

INTRODUCTION

This Technical Update proposes a minimum area over which sediment contamination would be considered extensive enough to require a site-specific risk assessment or remediation. The minimum area is referred to as the “area-based screening criterion.” Currently, the MCP and supporting guidance contain provisions for a “Stage I Screening” procedure that allows sediment screening based only on contaminant concentrations. The size of the contaminated area is not considered. As a consequence, a Stage II site-specific risk characterization is required for any site where detected sediment contaminant levels exceed the screening benchmarks, no matter how small the contaminated area. DEP believes that a lower limit on size would eliminate the need for expensive assessment activities at sites where contamination is limited and potential environmental effects are likely to be negligible.

This update is intended to supplement Chapter 9 of DEP’s *Guidance for Disposal Site Risk Characterization*. Like the guidance, this update has been developed specifically for the purpose of improving the MCP risk assessment process. It is not intended for use as guidance under any other regulatory program.

RECOMMENDATION:

DEP recommends area-based screening of sites with sediment contamination so that a site with a small area of sediment contamination that is unlikely to pose a significant risk of harm to the environment are eliminated from the risk assessment. DEP has identified certain conditions, however, under which even a small area of sediment contamination could pose a significant risk of harm to the environment. These are:

- Mercury contamination in the sediment;
- PBT (persistent bioaccumulative toxin) contamination detected at a level greater than 10 times the Threshold Effect Concentration, or TEC (MacDonald et al., 2000);
- Contamination in sediment underlying a certified vernal pool;
- Sediment contamination that could affect rare wildlife habitat;
- Sediment saturated with non-aqueous material; and
- Surface water concentrations that exceed National Recommended Water Quality Criteria for contaminants that are also detected at elevated concentrations in sediment.

Where any of these conditions prevails, sediment contamination should not be eliminated from the ecological risk assessment.

DEP recommends the following area-based screening criteria for lakes and ponds and rivers and streams:

- For lakes and ponds, an area of sediment contamination may be eliminated from the ecological risk assessment if the entire extent of sediment contamination at the site is less than both:

- 1,000 square feet¹, and
 - 10% of the area of the aquatic resource of concern. For a small pond, the entire pond may be considered the resource of concern. For larger ponds and lakes, each plant zone along the perimeter should be considered a separate aquatic resource.
- For rivers and streams, an area of sediment contamination may be eliminated from the ecological risk assessment if the entire extent of sediment contamination at the site:
 - Covers less than 1,000 square feet,
 - Does not extend more than 50% of the width of the river or stream; and
 - Does not extend more than 500 linear feet along the length of the river or stream².

In cases where the size of the contaminated area of sediment is less than the applicable criteria, and where none of the conditions listed in the first paragraph of this section applies, then neither a Stage II risk assessment nor remediation will be required, and a condition of “no significant risk of harm” from sediment contamination may be established.

LIMITATIONS

The area-based screening criteria apply only to ecological risk assessment of sediment contamination. These criteria do not apply to human health risk assessment. For example, contaminated sediment in a shellfish bed could not be screened out based on the size of the affected area. Such a condition would be of concern regardless of the extent of contamination, and assessment of the risk of harm to human health from shellfish consumption and the risk of harm to welfare from degradation of the fishery would be required.

The area-based screening criteria apply to the entire area within which sediment from a site in question has been contaminated. They do not apply to portions of contaminated sediment associated with a site. If the sediment contamination is patchy (discontinuous), the criteria cannot be applied to individual patches of sediment contamination.

Reference:

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology 39, 20-31.

Questions about this document should be directed to:

Thomas Angus at (617)292-5513 or thomas.angus@state.ma.us
 Nancy Bettinger at (617)556-1159 or nancy.bettinger@state.ma.us

Massachusetts Department of
 Environmental Protection
 One Winter Street
 Boston, MA 02108-4746

Commonwealth of
 Massachusetts
 Mitt Romney
 Governor

Executive Office of
 Environmental Affairs
 Stephen R. Pritchard
 Secretary

Department of
 Environmental Protection
 Robert W. Gollege, Jr.
 Commissioner

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 ADA Coordinator at
 (617) 574-6872.



¹ One thousand square feet has already been identified in the “Readily Apparent Harm” provisions of the MCP as an area that would be assumed to pose a significant risk if it were contaminated with non-aqueous material (for example, if it were saturated with oil). Setting the screening criterion at 1,000 square feet (as opposed to a larger area) would preclude discontinuity between this screening criterion and the Readily Apparent Harm provisions.

² According to 301CMR 11.03 (3)(b)1.a., an alteration of 500 or more linear feet of bank along a fish run or inland bank is a threshold for requiring an “ENF and Other MEPA Review.”