



Standard Guide for Designing Biological Tests with Sediments¹

This standard is issued under the fixed designation E1525; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 As the contamination of freshwater and saltwater ecosystems continues to be reduced through the implementation of regulations governing both point and non-point source discharges, there is a growing emphasis and concern regarding historical inputs and their influence on water and sediment quality. Many locations in urban areas exhibit significant sediment contamination, which poses a continual and long-term threat to the functional condition of benthic communities and other species inhabiting these areas (1).² Benthic communities are an important component of many ecosystems and alterations of these communities may affect water-column and nonaquatic species.

1.2 Biological tests with sediments are an efficient means for evaluating sediment contamination because they provide information complementary to chemical characterizations and ecological surveys (2). Acute sediment toxicity tests can be used as screening tools in the early phase of an assessment hierarchy that ultimately could include chemical measurements or bioaccumulation and chronic toxicity tests. Sediment tests have been applied in both saltwater and freshwater environments (2-6). Sediment tests have been used for dredge material permitting, site ranking for remediation, recovery studies following management actions, and trend monitoring. A particularly important application is for establishing contaminant-specific effects and the processes controlling contaminant bioavailability(7).

1.3 This guide is arranged as follows:

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¹ This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.47 on Biological Effects and Environmental Fate.

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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

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1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:³

- D1129 Terminology Relating to Water
- D4447 Guide for Disposal of Laboratory Chemicals and Samples
- E724 Guide for Conducting Static Acute Toxicity Tests Starting with Embryos of Four Species of Saltwater Bivalve Molluscs
- E729 Guide for Conducting Acute Toxicity Tests on Test Materials with Fishes, Macroinvertebrates, and Amphibians
- E943 Terminology Relating to Biological Effects and Environmental Fate
- E1023 Guide for Assessing the Hazard of a Material to Aquatic Organisms and Their Uses
- E1367 Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Invertebrates
- E1383 Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates (Withdrawn 1995)⁴
- E1391 Guide for Collection, Storage, Characterization, and Manipulation of Sediments for Toxicological Testing and for Selection of Samplers Used to Collect Benthic Invertebrates

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard