



# Evaluation of Wildland Fire Chemicals

## STANDARD TEST PROCEDURES

### STP 1.5 Fish Toxicity

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**Summary:** To protect fish and other aquatic life that may be exposed to fire management chemicals either from a spill directly into a body of water or from run off following an accidental or intended application near a body of water, fish toxicity tests are performed on all products prior to qualification and use.

The specific species, age, and other test conditions were established based on research by the Environmental and Contaminants Research Centers at Columbia, Missouri, and Yankton, South Dakota.

A sample of the product that was submitted to the Forest Service for qualification testing is sent to an approved testing lab. Results are sent back to the Forest Service.

The Project Leader for Fire Chemicals compiles the results and prepares a letter to the supplier showing the performance of the submitted product. A copy of the lab report is also provided to the supplier.

#### Method:

1. All testing shall be performed in accordance with protocols of the U.S. Environmental Protection Agency (EPA), Office of Prevention, Pesticides, and Toxic Substances (OPPTS), using the species and conditions defined below.
  - a. Species: rainbow trout (*Oncorhynchus mykiss*), 60 ( $\pm$ 7) days post hatch
  - b. Test conditions: 96-hr, static exposure
  - c. Water quality: ASTM soft water
2. Laboratories performing the testing shall comply with the EPA established Good Laboratory Practices.

#### References:

U.S. Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances. Fish Acute Toxicity Test, Freshwater and Marine; 850.1075.

U.S. Environmental Protection Agency, Federal Insecticide, Fungicide, and Rodenticide Act. Good Laboratory Practices; 40 CFR 160.

U.S. Environmental Protection Agency, Toxic Substances Control Act. Good Laboratory Practices, 40 CFR 792.

American Society of Testing and Materials. Standard Guide for Conduction Acute Toxicity Tests on Test Materials with Fishes, Macroinvertebrates, and Amphibians; E729-96(2002).

Susan Finger, editor; U.S. Geological Survey, Biological Resources Division. Toxicity of Fire Retardant and Foam Suppressant Chemicals to Plant and animal Communities. 1997.

McDonald, Susan F., Hamilton, Steven J., Buhl, Kevin J., and Heisinger, James F. Acute Toxicity of Fire Control Chemicals to *Daphnia magna* (Straus) and *Selenastrum capricornutum* (Printz). Ecotoxicology and Environmental Safety Vol. 33, pp 62-72. 1996.

McDonald, Susan F., Hamilton, Steven J., Buhl, Kevin J., and Heisinger, James F. Acute Toxicity of Fire-Retardant and Foam-Suppressant Chemicals to *Hyaella azteca* (Saussure). Environmental Toxicology and Chemistry, Vol. 16, No. 7, pp 1370-1376. 1997.

Gaikowski, Mark P., Hamilton, Steven J., Buhl, Kevin J., McDonald, Susan F., and Summers, Cliff H. Acute Toxicity of Firefighting Chemical Formulations to Four Life Stages of Fathead Minnow. Ecotoxicology and Environmental Safety Vol. 34, pp 252-263. 1996.

Gaikowski, Mark P., Hamilton, Steven J., Buhl, Kevin J., McDonald, Susan F., and Summers, Cliff H. Acute Toxicity of Three Fire-Retardant and Two Fire-Suppressant Foam Formulations to the Early Life Stages of Rainbow Trout (*Oncorhynchus mykiss*). Environmental Toxicology and Chemistry, Vol. 15, No. 8, pp 1365-1374. 1996.

Buhl, Kevin J. and Hamilton, Steven J. Acute Toxicity of Fire-Control Chemicals, Nitrogenous Chemicals, and Surfactants to Rainbow Trout. Transactions of the American Fisheries Society, Vol. 129, pp 408-418. 2000.

Buhl, Kevin J. and Hamilton, Steven J. Acute Toxicity of Fire-Retardant and Foam-Suppressant Chemicals to Early Life States of Chinook Salmon (*Oncorhynchus tshawytscha*). Environmental Toxicology and Chemistry, Vol. 17, No. 8, pp 1589-1599. 1998.