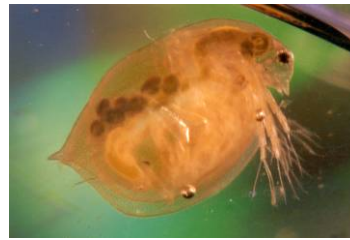


Aquatic Toxicology

Providing Field, Laboratory and Consulting Services



ERM's Aquatic Toxicology Services provide a comprehensive spectrum of environmental assessment and toxicity testing services, with particular emphasis on defensible data, delivered on time, every time.

Aquatic Toxicology is a unique service that Environmental Resources Management (ERM) offers. ERM is a leading global provider of environmental, health, safety, risk, social consulting services, and sustainability-related services. We have over 160 offices in over 40 countries and territories, employing more than 5,000 people. For over 40 years we have been working with clients around the world and in diverse industry sectors to help them to understand and manage their environmental, health, safety, risk, and social impacts.

Services

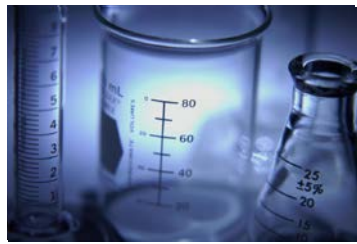
The precise nature of aquatic toxicity is a critical element in water quality, sediment management, and discharge monitoring programs. In order to meet ever-changing regulatory standards, we perform an array of aquatic toxicity tests for such diverse purposes as compliance with NPDES permits, hazardous waste classifications, and ecological risk assessment.

Services include but are not limited to

- Whole Effluent Toxicity Testing
- Water Additive Testing
- Chemical-specific Toxicity Testing
- Toxicity Identification Evaluations (TIEs)
- Toxicity Reduction Evaluations (TRES)
- Solid-phase and Elutriate Sediment Toxicity Tests
- Water-Effect Ratio Studies
- Ion Balance Studies
- Treatability Studies
- Water and Wastewater Consulting
- Product Registration Assistance
- Analytical Chemistry Support

Key Laboratory Components

- *NELAP Accreditation*
Accreditation (PA DEP Lab ID No. 68-04227; NJ DEP ID No. MI013) demonstrates ERM's commitment to a nationally recognized quality control system designed to provide data that are traceable, reproducible, and of known quality.
- *Quality Test Organisms*
In-house culture capabilities provide readily available, high-quality test organisms to meet rigorous testing needs.
- *State-of-the-Art Facility*
With independent culture and test facilities, multiple environmentally controlled exposure chambers, and state-of-the-art instrumentation, the laboratory provides consistent, high-quality test data.
- *Extensive Experience*
The laboratory has provided aquatic toxicological testing services to a wide variety of facilities, ranging from small municipalities to large manufacturing complexes.



Staff

Our laboratory staff includes chemists, biologists, and technicians, whose assignments include performance of analytical procedures and data recording in accordance with accepted procedures, performance and documentation of instrument calibration and preventive maintenance of instruments, data processing and validation, and preparation of final reports. Our staff has earned undergraduate and/or graduate degrees in life/physical sciences and received rigorous on-the-job training.

The laboratory is fully equipped to perform static, static renewal, and flow-through toxicity assessments and bioassays of complex wastewaters, groundwater, stormwater, whole sediment, sediment elutriate, and single chemicals using warm- and cold-water fish and invertebrates. Our staff is rigorously trained to perform studies in accordance with state, EPA, ASTM, OECD, and client-specified guidelines.

Representative Projects

ERM conducted a metal toxicity characterization study involving an acid mine drainage site in Western Pennsylvania. As part of a site remediation, analytical profiles and mock sample toxicity exposures to waterflea, *Ceriodaphnia dubia* and Rainbow Trout (*Oncorhynchus mykiss*) were used to define metal toxicity contributions from various site discharges.

ERM assisted a global health product manufacturer with the development of a site-specific water quality criterion for chloroethane. As part of a RCRA Corrective Action remediation project, acute toxicity data were generated for *Daphnia magna* and fathead minnows. These data were

supported by predictive modeling data to development a Tier II Final Acute Value for chloroethane. This information assisted with the RCRA Corrective Action and the ultimate completion of the project.

ERM managed a TRE project for an industrial facility that produces magnesium-based products used in pharmaceuticals, flame-retardants, rubber, plastics, and other applications. TRE methods included EPA's traditional toxicity characterization/identification analyses coupled with NINTEQA2 water quality modeling to identify toxicity sources. Correlative relationships among alkalinity, TSS, pH, CO₂, and effluent toxicity were identified. Bench-scale treatability studies revealed three WWTP improvements that removed toxicity (pH control and equalization, increased aeration and alternative clarifier polymer with upgraded polymer feed system). Based on the toxicity identification/ benchscale studies, permanent modifications to WWTP operations resulted in full permit compliance.

ERM performed a toxicity investigation for a pulp and paper mill in the Midwest. The facility demonstrated chronic toxicity to the invertebrate, *Ceriodaphnia dubia*. Toxicity was associated with elevated levels of TDS. Through the use of an alternate ASTM 21-Day *Daphnia magna* Life-Cycle Toxicity Test procedure, the facility was able to demonstrate consistent compliance with the State's NPDES permit requirement.

Additional Information

For more information about ERM's Aquatic Toxicology Laboratory and Testing Services, please contact Bruce Rabe at 616.738.7308.