

What We Provide For Our Clients

- State-of-the-art analytical methods and instrumentation
- Low method detection limit mercury and monomethylmercury analytical methods
- Capability to determine mercury and monomethylmercury in soils, sediments, water, biological tissues and other matrices
- Ultra-clean sample handling and processing capabilities
- Ultra-clean sampling bottles
- Analytical procedures and data reports follow a rigorous quality assurance process
- EPA Level 4 reporting capability
- Advice and training on EPA Method 1669 – Trace Clean Sample Collection Techniques
- Extensive experience with environmental mercury measurements

Environmental Mercury Measurements

The Battelle Marine Sciences Laboratory in Sequim, Washington, is internationally recognized for its unique specialized ability to conduct ultra-trace level measurements of both total mercury and monomethylmercury in soil, sediments, water, biological tissue, and other matrices.

Our scientists played a major role in the development and validation of the analytical methods currently promulgated by the U.S. Environmental Protection Agency (EPA) for the determination of total mercury in environmental samples.

Our Mercury Analytical Laboratory has been providing timely, defensible and high-quality mercury analytical services to public, private, and government clients since 1988.

Determination of Total Mercury

We conduct total mercury measurements of water, sediment and biological tissues as outlined in EPA Method 1631e – Mercury in Water by Oxidation Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry (CVAFS) (<http://www.epa.gov/waterscience/methods/1631e.pdf>).

Determination of Monomethylmercury

We conduct monomethylmercury measurements of water, sediment, and biological tissues using EPA Method 1630 – Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS (EPA 821-R-01-020).

Mercury and Monomethylmercury Methods and Analytical Figures of Merit

Measurement	Method	Method Detection Limits (2006)
Total Mercury in Water	EPA 1631	0.121 ng/L (ppt)
Monomethylmercury in Water	EPA 1630 w/distillation	0.0192 ng/L (ppt)
Total Mercury in Sediment/Tissue	EPA 1631	0.302 ng/g (ppb) / 0.378 ng/g (ppb)
Monomethylmercury in Sediment/Soil	EPA 1630 w/extraction	0.0124 ng/g (ppb)
Monomethylmercury in Tissue	EPA 1630 w/digestion	1.29 ng/g (ppb)
Total Mercury in Sediment/Tissue	EPA 7473	4.5 ng/g (ppb) / 5.5 ng/g (ppb)
Total Mercury in Sediment/Tissue	EPA 245.5/245.6	3.0 ng/g (ppb) / 9.6 ng/g (ppb)

Ultra-Clean Sample Handling

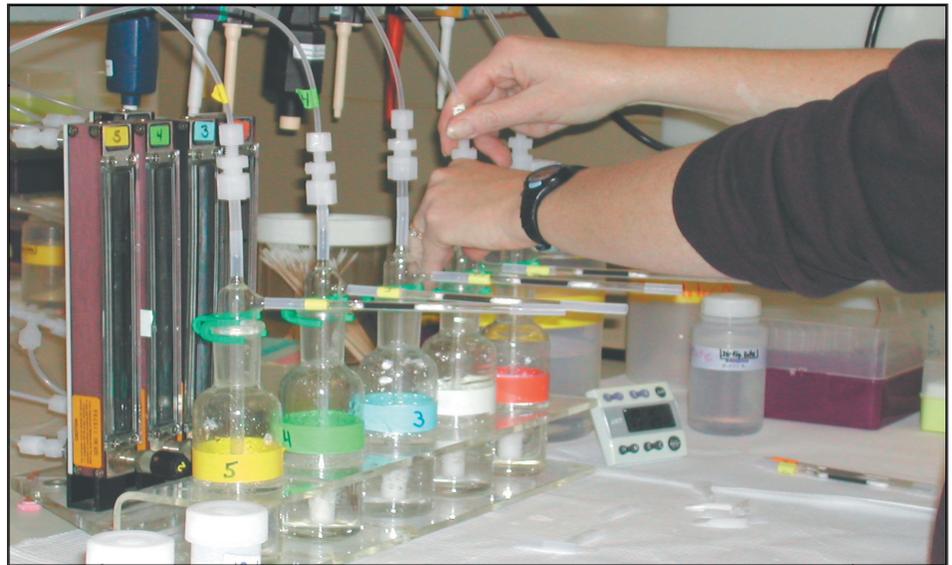
Accurate and reliable determinations of trace elements, such as mercury and monomethylmercury, require greater attention be paid during sample collection and processing to avoid contamination bias. To minimize contamination and assure high-quality analytical results, we

- Use Class-100 clean-air stations
- Perform rigorous hot acid cleaning of sample bottles and laboratory ware
- Make sure aqueous mercury samples only contact acid-cleaned glass or Teflon® bottles
- Acidify samples only with high-purity acids verified to have low mercury content.



To assure accurate mercury analyses, we use clean air stations for sample handling and processing.

The Mercury Analytical Laboratory provides timely, defensible and high-quality mercury analytical services to our clients.



Researchers perform ethylation of monomethylmercury in aqueous solution followed by gas phase stripping onto carbotrap columns

QA/QC

The Mercury Analytical Laboratory maintains a stringent quality assurance (QA) and quality control program. Among the routine QA conducted to assure accuracy and reliable results are:

- Matrix spikes, matrix spike duplicates, and method blanks included with all sample batches at the 10% level
- Analysis of certified reference materials
- Electronic data delivery
- Independent data reviews by a Quality Assurance Officer
- Annual determination of method detection limits
- Laboratory certifications by the National Environmental Laboratory Accreditation Program (NELAP), state and federal agencies
- The Mercury Analytical Laboratory routinely participates in round robin analytical exercises.

Mercury Instrumentation

- Multiple Tekran Model 2500 atomic fluorescence detectors for low-level mercury analyses
- Milestone DMA-80 direct mercury analyzer
- Leeman Labs Hydra AA automated mercury analysis system.

For more information or to obtain a price quote for analytical services, contact

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