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**Environmental Health - Toxic Substances Hydrology Program**

# Mercury Found to Migrate Horizontally from Landfill

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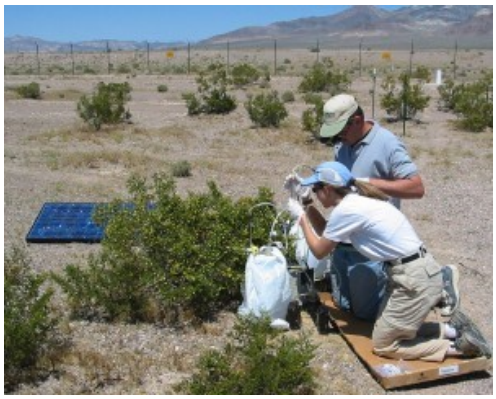
U.S. Geological Survey (USGS) scientists working at the Amargosa Desert Research Site (ADRS) in arid southwestern Nevada found that mercury gas can migrate horizontally over long distances through the unsaturated zone. These findings published in Applied Geochemistry highlight the potential for mercury exposure well beyond the edge of a landfill. Mercury contained in buried landfill waste was known to migrate vertically and be released via upward emission to the atmosphere or downward leaching to groundwater. The scientists found elevated levels of mercury gas in the deep unsaturated zone at distances of 100 to 160 meters from the closest waste burial trench. The study also demonstrates that the prevailing scientific understanding of how gases migrate in the unsaturated zone is inadequate for explaining the pattern of mercury movement through the layers of sediment in the subsurface at the ADRS. Future research will focus on improving understanding of mercury fate and transport from arid waste sites in order to minimize human and ecological exposure. Environmental professionals can use these new findings in their assessments of the potential for mercury exposure and to develop sound waste-disposal practices concerning mercury.



USGS scientists collecting gas samples from the unsaturated zone. Subsurface gases are drawn through a small glass tube filled with an adsorbing material, which traps mercury or volatile organic compounds for later analysis.

## Reference

Walvoord, M.A., Andraski, B.J., Krabbenhoft, D.P., and Striegl, R.G., 2008, Transport of elemental mercury in the unsaturated zone from a waste disposal site in an arid region: Applied Geochemistry, v. 23, no. 3, p. 572-583, doi:10.1016/j.apgeochem.2007.12.014.

**Mercury in Landfills**

Common sources of mercury in landfills include electrical switches, fluorescent light bulbs, batteries, thermometers, and some medical waste. Exposure to mercury may cause brain, liver, kidney and developmental disorders, particularly in young children and developing fetuses. Mercury is often a constituent in gases that are emitted from landfills.

**More Information**

- Frequently Asked Questions About Landfill Gas and How It Affects Public Health, Safety, and the Environment, U.S. Environmental Protection Agency (USEPA)
- Mercury Information for Consumers, USEPA
- Airborne Organic Mercury Emissions from Municipal Solid Waste Landfills, Oak Ridge National Laboratory
- Elemental Mercury (CASRN 7439-97-6), Integrated Risk Information System (IRIS), USEPA

## More Information

- Low-Level Radioactive and Mixed- Hazardous Wastes Investigation—Amargosa Desert Research Site, Nevada
- Mercury in Aquatic Ecosystems

## Related Science Features

- New Tool to Track Sources and Exposure Pathways of Mercury in the Environment -- Application for Predatory Fish in the Great Lakes
- Land Disposal of Wastewater Can Result in Elevated Mercury in Groundwater
- Management of Agricultural Wetlands Used for Rice Production Related to Methylmercury Production
- High Levels of Natural Perchlorate in a Desert Ecosystem

- Complex Response to Decline in Atmospheric Deposition of Mercury
- Some Ecosystems will Respond to Reductions in Mercury Emissions
- Mercury from Yellowstone's Geysers
- Fish in Some Streams Accumulate Mercury
- Mercury Concentrations in Streams Found to Go Through Daily Cycles
- New Model Allows for More Accurate Simulation of Tritium Movement in the Unsaturated Zone
- Widespread Accumulations of Natural Perchlorate in Southwestern Soils
- USGS Mobile Atmospheric Mercury Laboratory Makes an Impact
- Desert Plants Reveal Contaminant Transport Pathways
- New Model Improves Understanding of the Transport of Carbon Isotopes in the Unsaturated-Zone
- Using Plants To Detect Tritium Contamination
- High Nitrate in the Desert? What's Going On?
- New Book on Soil Analysis Methods Destined to Become a Classic
- Glacial Ice Cores Reveal the History of Global Mercury Contamination
- Are Deserts Still Drying Out Since the Ice Age?
- The Atmosphere - A Potential Source of MTBE to Ground Water

# USGS Information on Mercury

- Aquatic Cycling of Mercury in the Everglades (ACME)
- Minerals Information: Mercury, Statistics and Information

**More Science Features**