



Environmental Analysis Facility

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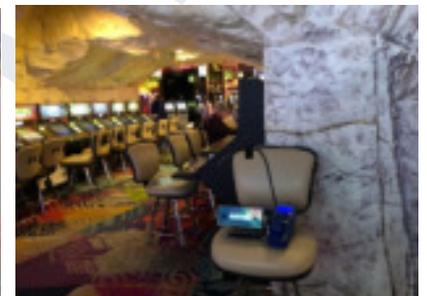
The **Environmental Analysis Facility (EAF)** hosts state-of-the-art chemical speciation and research laboratories equipped to quantify atmospheric, water, and soil contaminants in minute quantities. EAF is an international leader in particulate matter (PM) and gas sampling and analysis. EAF has assisted many government and private entities with their long-term monitoring networks by providing consistently high quality data spanning decades. EAF has completed hundreds of research projects involving multipollutant physical and chemical characterization and has assisted the U.S. EPA, state agencies, and other countries, to develop pollutant source assessment and control programs. EAF is accredited by the National Environmental Laboratory Accreditation Program [NELAP].

Research Areas

- Environmental monitoring
- Pollutant physical and chemical characterization
- Real-world emission source characterization
- Source apportionment with source and receptor models
- Multipollutant microsensor evaluation and deployment
- System and performance audits



PHOTO CAPTIONS: Top left: Training for fugitive dust monitoring at a sand and gravel processing facility; Top right: Air quality sampling in the Museum of Qin Terra-cotta Warriors and Horses, Xi'an, China; Left: On-board testing of real-world emissions from the world's largest heavy haulers using EAF's multipollutant sampling system; Bottom from left to right: EAF field measurements at the Canadian Oil-sands; Fugitive dust emission sampling; Dilution sampling from an industrial stack; and indoor air quality surveillance.



NEVADA SCIENCE, GLOBAL SOLUTIONS

The Desert Research Institute (DRI) is a recognized world leader in basic and applied interdisciplinary research. Committed to scientific excellence and integrity, DRI faculty, students, and staff have developed scientific knowledge and innovative technologies in research projects around the globe. Since 1959, DRI's research has advanced scientific knowledge, supported Nevada's diversifying economy, provided science-based educational opportunities, and informed policy makers, business leaders, and community members. With campuses in Reno and Las Vegas, DRI serves as the non-profit research arm of the Nevada System of Higher Education.

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SERVICES AND CAPABILITIES

- **Environmental sensing network design:** Selecting and evaluating instrumentation, measurement locations, and sampling periods to solve pollution problems.
- **Environmental sampling:** Filter-, deposition plate, absorbent, liquid, and solid samplers, sampling media, and continuous monitoring instruments for large and small field studies, including systems for emission source measurements.
- **Mass:** Precision gravimetric analysis of samples in controlled environments with 1 microgram precision.
- **Elements:** Ambient and source elemental concentrations by energy dispersive X-ray fluorescence (EDXRF) for 51 elements (Na to U) and inductively coupled plasma-mass spectrometry (ICP-MS) for toxic metals and isotopes.
- **Ions:** Ambient and source anion and cation concentrations by ion chromatography (IC) including biomass combustion markers for organic acids and carbohydrates.
- **Carbon fractions:** Ambient and source organic and elemental carbon fraction (including brown carbon) concentrations by multiwavelength thermal/optical analysis.
- **New procedures and methods:** EAF is continuously developing new and improved laboratory methods for environmental sample analysis.
- **Data management:** EAF works with sponsors to ensure data is validated and transferred to databases in appropriate formats.
- **Standardization, auditing, and training:** On-site and remote auditing of field operations and instrumentation. Creation of standard operating procedures, guidance documents, and instructional materials.
- **Dust suspension:** Characterize particles for different size fractions (e.g., PM₁, PM_{2.5}, PM₁₀, and total suspended particles) in a laboratory resuspension chamber.
- **Source apportionment:** CMB, PMF, Neural Networks, Time Series, WRF-CHEM, CAMx, and other models use measured data to determine contributions to excessive pollutant levels.
- **Air quality and environmental research:** EAF has been and is conducting research projects related to the interaction among pollutants in air, water, and soil on all seven continents.



PHOTO CAPTIONS: from top to bottom: Gravimetry Laboratory; Sampling substrates are prepared and weighed in controlled environment; Element Laboratory-XRF; Acid-block digestion; Element Laboratory-ICP-MS; From left to right: Wet Chemistry Laboratory-IC; Carbon Laboratory- DRI Model 2015 Multiwavelength Thermal/Optical Carbon Analyzer; DRI Dust Resuspension Chamber; and sampling tubes and inlets for size segregation in a resuspension chamber.

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