

Summary of Performance Monitoring Workshop, June 2005, Butte, MT

MSE Technology Applications Inc. and EM-21 organized and hosted a workshop in Butte, MT, June 21-23, 2005. The workshop was designed to elevate the bar in site performance monitoring by adapting to the transition from remediation to restoration and long-term maintenance and implementing new monitoring techniques. Topics included current practices and future directions for improving performance monitoring and validation while reducing long-term costs.

The 75 participants included environmental engineers geochemists, geophysicists, and hydrologists from across DOE/EM and DOE/LM. Technology developers, end users and regulators were represented. In addition, EPA Region VIII, Ada and Cincinnati laboratories; ITRC and State of Montana regulators; and DOD/Army/COE contributed.

The workshop opened and closed with plenary sessions, which featured five presentations on the local Silver Bow superfund site by representatives from EPA Region VIII, the State of Montana, and Silver Bow County government. Goals for this Superfund effort are not only to clean up or stabilize contaminants from the massive former mining operations at Butte but also to restore some 20 miles of Silver Bow Creek floodplain to beneficial use. Reuse of the land is intended to provide a component of long-term monitoring. EPA and Montana are pursuing a no-frills monitoring program that is designed to support the restoration effort by recognizing shortcomings in restoration and identifying their causes. Monitoring is focused on specific goals but is flexibly adaptable to new information.

The plenary session included a presentation by the ITRC on its efforts to expedite the consistent use of innovative technology in multiple State jurisdictions.

Participants from the DOE complex led three breakout sessions, which were organized around specific topics:

- **Monitoring and Modeling for Performance Assessment** An effective overall strategy to monitoring will be to use a phased approach that incorporates modeling for interpretation and planning.
- **Waste Isolation Monitoring (State of the Practice)** The goal of the waste isolation breakout session is to compile and distribute information on strategies, tools, and practices for performance monitoring for waste isolation systems.
- **Performance Monitoring for Contaminant Remediation and Stabilization** The goal of this breakout session is to discuss leading-edge approaches for performance monitoring of *in situ* contaminant stabilization and treatment methods and natural attenuation strategies.

The *Montana Standard* newspaper in Butte as well as ABC and NBC affiliate television stations provided news coverage of the workshop.

General recommendations from workshop deliberations include:

- Integrate Performance Monitoring
 - Develop combined technical (e.g., plume stability) and risk (e.g., concentration) goals
 - Use lower-cost indicator or surrogate parameters, where possible
 - Use multiple sensing modalities and optimization
- Use multidisciplinary teams to develop and implement performance monitoring and Data Quality Objectives – include both EM and LM in the planning and execution.
 - Consider expanded access methods and data types
 - Include saturated and vadose systems in performance monitoring, as well as terrestrial/surface water systems and remote sensing.
 - Develop analysis rules for decisions on cleanup vs. leaving waste in place
- Document scaling guidelines to relate point measurements to site-scale processes
- Develop contingency plans to ensure robust monitoring systems.

Each breakout session generated recommendations for performance monitoring and these will be published in a workshop report in the near future. Consistent features of the workshop conclusions are:

- Monitoring needs to support decision-making
- Monitoring plans should be flexible to meet changing needs
- Modeling (conceptual, descriptive, predictive) is essential
- Better systems for managing and presenting data and model results are needed
- Point-measurements should be replaced by ‘volumetric’ (i.e. large-scale) measurements
- Geophysical techniques are approaching readiness for use in monitoring
- Greater use of push-pull techniques and other new methods such as the passive flux meter will simplify and improve monitoring
- Less-invasive (than wells), remote methods are preferable

When completed, the workshop report on deliberations and recommendations will be available from Claire Sink, EM-21.

2summaryofperformancemonitoring workshop.doc