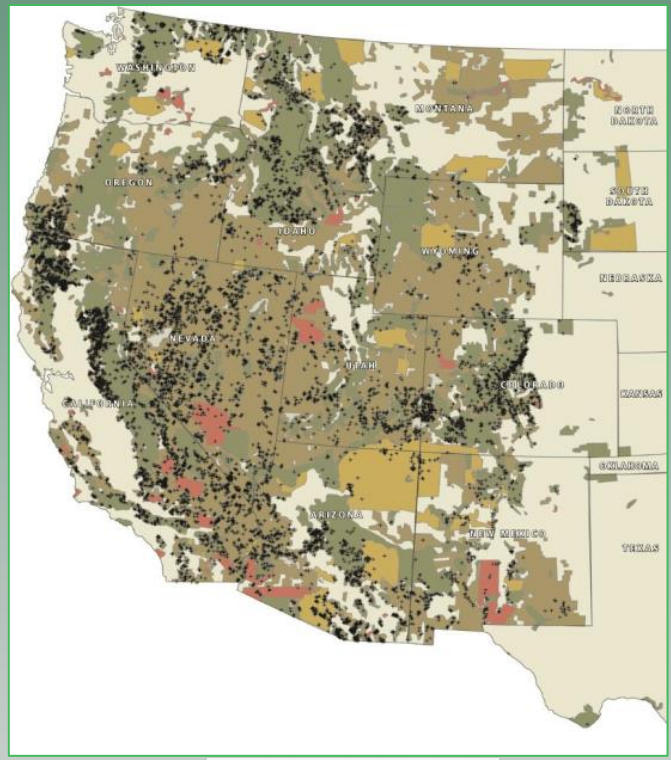
Meeting the Challenge for Technology Solutions

Advancing Innovation in Mine Waste Treatment

SEA

Magnitude

- 500,000 Abandon Mines in Western U.S., 100,000 on public lands in 13 States
- In CO, DNR estimates 23,000 locations
- Total of 5,105 abandoned mines in Colorado on BLM & USFS Lands
- Per DRMS study 230 mines draining contaminated AMD



SEA

Why New Approaches Now?

- AMLs have received increased public awareness (Gold King)
- Alternative Solutions are Needed
- New Technology Development Focus
- Would Benefit From Greater Coordination
- A Technology Center or Center of Excellence with Broad Acceptance might be a Benefit

Need

- Development of Adequate Alternatives to default Lime Treatment
- Minimize Solutions with long-term, O&M aspects
- Coordination/Communication ("Who's on First")
- Protocol to "vet" technologies with Acceptance of Results
- Benefit to CWA & CERCLA
- "Clearinghouse"/Inventory"

Enhanced Communication

- Many present players but… who are they?
- Minimizes Duplication of Effort
- Increases Knowledge of Results
- Helps to Overcome Reduction in Federal Research Budget and Programs
- A Clearinghouse modeled on successes in other media- e.g., BACT, BMP Could Help Communications

Acceptable Protocol

- Will require Development of a Detailed Protocol to Guide Technology Proponents
- Strong EPA Involvement to Have Buy-In
- Results in “Seal of Approval” with Conditions
- Consideration of Ancillary Aspects
  - Infrastructure - Risk Assessment for Waste
  - Environmental Impacts - Community Impacts
  - Land Impacts -Other Environmental, Mini-Life Cycle
  - Cost-Benefit Analysis -Potential Resource Recovery

Protocol-Technical Aspects

- Protocol Must be adequate to preclude “pixie dust” and “black boxes”
- Adequate Physical Facilities- Consistency and QC/QA
  - Facilities vs. Proximity for In-Situ
- Include Opportunities for Private Party Technologies and Implementation
- Academic Involvement for Competency
- Support Chain Strategy Possibilities
- Managed Review of Results

Clearinghouse/Inventory

- Promote alternatives to Lime Treatment for both interim and final solutions
- A Clearinghouse to Track and Document Technology Parameters
  - Accepted Technologies must include suitability criteria
  - Characterization of aspects and impacts, e.g. infrastructure, O&M, etc.

Current Technology Efforts

- “Where are we now”?
- Federal- EPA, DOI, USFS, DOE, DOD
  - Both a Regulator and Responsible Party
  - EPA Superfund Task Force
- State- Arizona, California, Colorado, Montana, Nevada
  - Most Activities appear to be University Based
- NGO- ITRC
- Private Leaders
  - Freeport McMoRan
  - Newmont

Why Not Just Private

- AMLs have Ownership Issues
- Emphasis on Active Sites
  - But Active Sites do have Permit for Discharge
- Production Enhancement Highest Priority
- Technology is Valuable- Nexus between Value to Self vs. Value to Market
- Infrastructure Available and Not as important an Issue

Hurdles

- Engaging Agencies with Commitment to Approach
  - Can Agencies ever agree to a protocol and results without a second “bite of the apple”?
- Developing Sufficient but Manageable Protocols
  - Ability to Utilize Approval at Multiple Sites
  - Inclusion of Site Characterization/Uniqueness
- Defining a Workable Structure with Many Diverse Stakeholders
- Overcoming Liability for In-Situ Demonstrations (“Good Sam”)
- Managing Confidentiality- Sufficient Detail to Evaluate (no “black box”) Versus Risk of Disclosure of Intellectual Property
- Internal v. Commercial Value of Technology Developed
- Understanding and Managing the Regulatory and Practical Requirements.

Way Forward

- Leadership for Development
  - Should this be EPA? $
  - Development of Focused Sub-Groups
- Possible Structure/Organization
  - Independent Entity- “NSF”, $$$$
  - Within an NGO -For Profit- “Pay to Play”
  - University Consortium- Precedent of DOE
  - Government Lead- EPA, history, diffuse
- Initial Focus on Bonita Peak?

Outcomes

- Opportunity for Demonstration of New Technologies
- Increased Acceptance of New Site Specific Solutions
- Enhance Opportunities for Combination Approaches-Pre-treatment, Active, Passive & In-Situ
- Increased Focus on Advancement of Passive Solutions with Resulting O&M Benefits (e.g., infrastructure, maintenance, site accessibility)
- Enhanced Communication with Regulatory Acceptance of Results
- Integration with EPA ORD Efforts