

ITRC PROJECT PROPOSAL: [Mining Waste](#)

PROPOSAL DATE: May 30th, 2007

Proposal Contact:

Paul Eger,
MN Dept of Natural Resources
651-259-5384
paul.eger@dnr.state.mn.us

Cherri Baysinger
MO Dept Health and Senior Services
573-751-6102
cherri.baysinger@dhss.mo.gov

Problem Statement (why is this project necessary?)

Mining is an historic and economically important industry in the U.S. Mining is land intensive, producing elements of commercial interest, as well as millions of tons of waste each year. Waste materials that have not been reclaimed or restored have led to sites with significant environmental and human health issues. Contaminants from unreclaimed or unremediated areas have affected millions of acres of land and over 10,000 miles of stream. Typical remedial solutions for these areas are lengthy and expensive, and are often unacceptable to the mining community, the regulatory community and to the public.

Industry, government and the public often struggle with this legacy. Many mined areas are in remote areas, which lack access or infrastructure needed to remediate the area. Where remediation or reclamation projects are feasible, the process is expensive and long-term treatment costs are a major issue for state agencies. Industry is reluctant to explore the remaining resources at existing mining properties because of liability issues. Thus, useable ores and energy resources at historic mine sites often remain untouched. Innovative approaches and technologies that solve our environmental and health issues and remove existing regulatory barriers are needed to achieve long-term, cost effective improvements in these current and former mining areas.

Solution / Impact (how will the project impact the environmental marketplace?)

The ITRC Mining Waste team identified 4 major topics to consider:

- pollution prevention;
- waste management;
- remediation, reclamation, and restoration;
- legacy management at mining sites

The team plans to explore technologies that may increase the potential for industry to recover mineral resources and reduce environmental liabilities in existing active and abandoned mines sites. The team will:

- Identify and evaluate, emerging technologies that are cost effective and can be successfully used to characterize, remove, treat, reuse or stabilize mining, milling,

processing, and smelting wastes and mitigate environmental problems or human exposure resulting from them.

- Identify state or federal regulatory obstacles to deployment of conventional or innovative environmental technologies.
- Identify approaches and/or solutions to overcome regulatory barriers.
- Describe innovative environmental solutions to solve legacy mine waste issues

This will promote more voluntary reclamation or remediation as well as recovery of mineral commodities. A net environmental benefit analysis may be used to demonstrate the cost and value of decisions at a mined land site.

Success Measures (how you determine the project impact to the market place)

A white paper has been completed summarizing the major issues for the states, industry and federal agencies. Mining impacted water (MIW) and mining solid waste and their associated environmental and human health impacts are the major concerns.

We expect that cost effective choices for reclamation, mitigation and remediation will accelerate and improve the nation's opportunities to not only realize greater environmental protection but also recover mineral resources previously unavailable due to environmental liabilities.

Net environmental benefits resulting from mitigation, remediation and environmental management will improve the environmental conditions at abandoned and active mining sites.

By identifying and addressing existing regulatory barriers the industry and state and federal government can address mining problems cost effectively with minimal long-term maintenance.

Summary of Deliverables (primary project outputs)

The team will research technologies, in close association with INAP and ADTI, which address environmental impacts resulting from mining activities using case studies and literature research and evaluate their performance. For those technologies that have a likely contribution to the industry, the team will prepare Tech-Reg guidance assisting the user through the unique technical and regulatory decisions of the technologies, which are capable of treating mine solid wastes and MIW. The final form of the guidance will depend on the findings during the research and will focus on assisting the industry and state and federal regulators.

Three general problems have been identified in the White paper prepared by the Mine waste team during 2006.

- Solid mining waste is not a specifically regulated waste and involves huge volumes of material. The volume of material alone makes some techniques for minimizing the risk unreasonably costly. On the other hand the exposure posed by direct and indirect ingestion to some of this waste is a major health concern
- The relationship between mining solid waste and MIW must be considered for effective remediation of environmental and human health problems. MIW is difficult to treat cost effectively to consistently meet all water quality standards.
- Improved environmental management at active mining operations can prevent legacy

issues from developing. The ITRC Mining Waste Team will pursue a partnership with the Society of Mining Engineers (SME) to provide the state perspective to their draft Environmental Management System.

Product – The team will develop an ITRC Tech-Reg Guidance Document describing unique technical and regulatory (where appropriate) decision points for technologies to treat impacted media resulting from mining activities.

Project Schedule

Year 1 – (12 mo) - Collect information on techniques and technologies used to treat mine related environmental contaminants in the form of case studies of full field applications, demonstrations, or bench scale studies.

- Specifically identify case studies where regulatory flexibility was used to target a net environmental benefit when selecting remedial actions.

Year 2 & 3 – (18 mo) - Evaluate technologies to treat mine related environmental issues.

Year 3, 4 & 5 - (24 mo) - Develop Tech-Reg ITRC Guidance to assist the user through the unique features of each technology when applied to mine solid waste and mine impacted water and the associated free internet training. The guidance will include application of new passive and active environmental technologies and recommendations where regulatory flexibility will encourage a net environmental benefit to protection of human health and the environment.

Year 5, 6 & 7 - (24 months) - team closeout and development of an ITRC Implementation strategy for the guidance. The team Leaders and ITRC Points of Contact (POCs) work closely to proactively get the Tech Reg Guidance in the hands of the users.

Target Audience

- The Mining Industry, State and Federal Mine Reclamation Agencies, State and Federal Remediation Agencies, environmental consultants and contractors and community interest.

Resources Required

Personnel:

- Team Co-Leader
 - MN & MO
- States that are Interested in Supporting this Project
 - PA, UT, MO, OK, MN, VT, ME, WA, ID, CO, NY, MO, VA, MS, NJ, Ak
- EPA
 - Superfund HQ,
 - Region 3
 - Region 8
 - ORD
- Other Federal Agencies
 - US Fish and Wildlife
 - USACE
 - DOE
 - DOD
 - BLM
 - Forest Service

- University
 - University of Nevada Reno
 - Colorado School of Mines
 - University of Georgia
 - Jackson State
 - Desert Research Institute
 - University of Wyoming, Western Research Institute

- Industry
 - Arcadis
 - Secaps
 - Phelps/Dodge
 - Doe Run
 - AMEC
 - FTN Consultants
 - MSE
 - XCG Consultants LTD
 - Quanta Holdings
 - Golder and Associates
 - Kennecott
 - Ionic Water Technologies
 - BP Corp
 - North American Mine Services
 - Weber Sustainability Consulting
 - Hecla Mining
 - Gore

Public Stakeholder

- Skill Mix of Team Members requires a thorough understanding of;
 - State and federal regulatory personnel whose programs provide oversight of human health and the environment at mine impacted lands and water. (Scientist, Engineers or Managers)
 - Environmental personnel from the mining industry faced with environmental liabilities, (Scientist, Engineers or Managers)
 - Consultants and contracts responsible for designing and managing environmental technologies, (Scientist, Engineers or Managers)
 - Academics who are researching new techniques and technologies used to treat and manage MIW and Mine Solid Waste, (Scientist or Engineers)
 - Vendors who develop and/or distribute technologies used to treat or manage MIW or mine solid waste, (Scientist, Engineers or Managers)
 - Community stakeholders (community representative)
- Sectors of Team Members Federal agencies who manage federal land containing resources and mined lands, Federal agencies who have contracted mining for strategic metals, Federal agencies who oversee environmental conditions of federal property impacted by mining or milling operations, state and federal agencies who manage wildlife resources that may be impacted by MIW or mine solid wastes

Financial Resources:				
Mining Waste	Team	Contractor	Calls, Print, & Materials	Project
Calendar Year	Travel	Support		Totals
2008 Case study collection	\$25,000	65000	\$2,500	\$92,500
2009 Review and evaluate technologies	\$25,000	65000	\$2,500	\$92,500
2010 Review and evaluate technologies and begin preparing Tech-Reg development	\$25,000	65000	\$2,500	\$92,500
2011 Tech-Reg development	\$25,000	65000	\$2,500	\$92,500
2012 Tech-Reg final publication and Internet Training, Team Closeout	\$25,000	65000	\$8,500	\$98,500
2013 Project Implementation	\$10,000	\$5,000	0	\$15,000
2014 Project Implementation – Project End	\$10,000	\$5,000	0	\$15,000
Project Total	\$145,000	\$335,000	18,500	\$498,500

2Related Work:

Completed ITRC Guidance that contribute directly to mining solid waste and mine impacted water include:

- [Technical and Regulatory Guidance Document for Constructed Treatment Wetlands](#) (December 2003)
- [Characterization, Design, Construction, and Monitoring of Mitigation Wetlands](#), February 2005
- [Planning and Promoting Ecological Land Reuse of Remediated Sites](#) (July 2006)
- [Technical and Regulatory Guidance for Design, Installation, and Monitoring of Alternative Final Landfill Covers](#) (December 2003),
- [Technical and Regulatory Guidelines for Soil Washing](#) (December 1997)
- [Fixed Facilities for Soil Washing: A Regulatory Analysis](#) (December 1997)
- [In-situ Stabilization/In-place Inactivation](#) (December 1997)
- [Characterization and Remediation of Soils at Closed Small Arms Firing Ranges](#) (January 2003)
- [Phytotechnology Technical and Regulatory Guidance Document](#) (April 2001), under revision
- [Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management](#) (December 2003)
- [The Use of Direct Push Well Technology for Long-term Environmental Monitoring in Groundwater Investigations](#) (March 2006)
- [Examination of Risk-Based Screening Values and Approaches of Selected States](#) (December 2005)
- [Determining Cleanup Goals at Radioactively Contaminated Sites: Case Studies](#) (April 2002)

- [Issues of Long-Term Stewardship: State Regulators' Perspectives](#) (July 2004)
- [Real-Time Measurement of Radionuclides in Soil: Technology and Case Studies](#) (February 2006)
- [Property Revitalization– Lessons Learned from BRAC and Brownfields](#) (January 2006)

Organizational partnership being pursued with working groups addressing mine waste related issues:

- ADTI (Acid Drainage Technology Initiative)
- INAP (International Network of Acid Prevention).
- SME (Society of Mining Engineers)
-
-