Addressing Administrative Challenges to Abandoned Mine Site Cleanup

Stephen McCord, Ph.D., P.E.

Gregory J. Reller, P.G.
California’s Mining Legacy in the Mountains and Valleys

THE SITUATION
2001 Report to Legislature

~47,000 abandoned mines in California:

- 67% on federal land (BLM, NPS, USFS…)
- 2% on state/local land
- 31% on private land
Mercury Mine Site – Abbott Mine, 1949

Source: California Geological Survey
Sierra Nevada Hydraulic Mining
Hard Rock Gold Mine and Mill

Waste Rock

Stamp Mill

Tailings
Technical Challenges to Addressing the Mining Legacy

TECHNICAL CHALLENGES
Technical Challenges

- Location
- Hazards
- Resources
- Objectives

Malakoff Diggins, 2011
Technical Challenge – Location

- Remote
- No Utilities
- Limited Access
- Poor Site Controls
Technical Challenges – Hazards

- Hazards
  - Physical
  - Chemical
    - Metals (As, Cu, Hg, Pb, Zn...)
    - Cyanide
    - Asbestos
Technical Challenges – Resources

- $100,000s to $10,000,000s
- Many on federal or state lands
- Some on private lands

Abbott-Turkey Run Mine Cleanup, 2006-2007
Technical Challenges – Objectives

- Protect human health
- Protect ecological health
- Protect water quality
- Re-use
- (Restoration)
The Laws and Regulatory Programs that Drive (or Hinder) Progress

KEY STATUTES AND PROGRAMS
Regulatory Processes that could be applied to California AML

- Risk/Hazard based
  - CERCLA
  - California Health and Safety Code

- Water Quality based
  - CWA
  - Porter Cologne
Key Statutes

- Federal
  - CERCLA (a.k.a. Superfund)
  - Clean Water Act

- California
  - Public Health and Safety Code
  - California Water Code (a.k.a. Porter-Cologne Water Quality Control Act)
EPA’s Programs

- Site Assessment
- Emergency Response
- Brownfield
- Superfund
- Water
Other Federal Programs

- US Forest Service
- US BLM
- US National Park Service
Regional Board Programs

- Mining
- Waste Discharges to Land
- Waste Discharges to Surface Water
- Storm Water
- Site Assessment and Cleanup
- NPDES
- TMDL
DTSC Programs

- Emergency Response
- Site Mitigation and Brownfields
- Voluntary Cleanup Program
- State Superfund
MINE CLEANUP PROJECT EXAMPLES
Abandoned Copper and Sulfur Mine

Added to Superfund List in 2000

RI/FS ongoing to enable risk assessment and identify remedies

Resource Damage Assessment ongoing
Leviathan Mine

- Mined material and infiltrating water combined create water quality and chemical risks/hazards
- Water Quality and Risk/Hazard Programs
- Affects water quality in California and Nevada
- Tribal resources potentially affected include water, land use, and food sources
California assumed responsibility in early 1980s

Early 1980’s stabilization reduced metal loading by 95%

Seasonal treatment since 2000 complies with numerical criteria

Seasonal treatment reduces metal loading additional 4.5%
Typical Mill Site

- About 5 acres on public land
- Tailings ‘ponds’
- Concrete walls and foundations
- Steep slopes
- Popular unimproved campsite
- Agency learned of elevated lead and arsenic
Typical Mill Site

- Demolished concrete and placed in ‘ponds’
- Filled ponds and covered with 2 feet of native soil
- Surface water controls
- Access barriers
Mine Drainage

- Treat and Infiltrate
- Must comply with state’s Waste Discharge Requirements
Typical Mine Cleanup Efforts

Clockwise from top left: stabilization-revegetation, encapsulation, physical separation, demolition and on-site burial, acid drainage treatment
Summary

- Many cleanup opportunities
- Significant technical challenges
- Legal code requires cleanup
- Legal code can hinder cleanup
- Examples are available
For More Information

Stephen McCord
McCord Environmental, Inc.
sam@mccenv.com
530-220-3165
www.mccenv.com

Gregory J. Reller
Burleson Consulting, Inc.
gr@burlesonconsulting.com
916-984-4651, x11
www.burlesonconsulting.com