Abandoned Mine Lands in California

- Background
  - Extent
  - Types of Hazards

- Identifying Priorities
  - Criteria
  - Guiding Decisions
  - Collaboration
  - Project Development
EXTENT
California’s estimated **47,000** abandoned mines

* Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Tuolumne, Mariposa, Plumas, and Madera counties.
ENVIRONMENTAL CONTAMINATION

ACID ROCK DRAINAGE

ARD from Iron Mountain Mine, Shasta Co.

Mercury retort and condenser pipes

MERCURY & METHYL MERCURY

Child playing in arsenic-laden tailings from Lava Cap Mine, Nevada Co. Photo: Dan Ziarkowski, DTSC.
SAFETY HAZARDS

Islander Mine, San Bernardino Co., bat gate installed.

SHAFTS, STOPES, & VERTICAL OPENINGS

Cupola over deep shaft of Kelly Mine, Kern Co.

ADITS & HORIZONTAL OPENINGS

HIGHWALLS & FALL HAZARDS

Unstable highwalls, Iron Age Mine, San Bernardino Co.
AGENCY PARTNERSHIPS – CALIFORNIA ABANDONED MINE LANDS AGENCY GROUP

CAMLAG purposes:
1) Support a more efficient and effective implementation of programs and tools used to address California’s abandoned mine land problems.
2) Develop criteria for selecting and addressing abandoned mine sites for remediation.

State and Regional Water Boards
TMDLs, Cleanup and Abatement Orders, Clean Water Act enforcement

Dept. of Toxic Substances Control
Preliminary Endangerment Assessments

U.S. Environmental Protection Agency
Superfund, Brownfields grants

Public Land Management Agencies
Federal, State, Local

State Program
Department of Conservation
CAMLAG
Prioritizing Remediation

Why Prioritize and Rank AML problems or sites?

- **Risk**
  - Rank based on risk to human health and environment
  - Ranks sites relative to each other

- **Transparency**
  - Transparent & explainable rationale

- **Limited Resources**
  - Apply limited government resources strategically
  - Focus resources on highest risk sites
  - Build future budget requests
  - Leverage funding sources

- **Collaboration**
  - RemEDIATE more of highest priorities
  - Clean up more quickly
CAMLAG
Criteria - Scoring and Ranking Mine Sites

- Contaminant Hazard
  - Type of Contaminants
  - Threat to human health, environment
  - Type of mine/ore processing
  - Stability and Mobility
  - Water quality indicators
  - Population, Access, Exposure

- Physical Safety Hazard
  - Number, Condition of openings (shafts, adits)
  - High walls
  - Threat to safety of people or animals
  - Stability (openings, structures, waste piles, mill tailings)
  - Population, Access, Exposure
3 SCREENING LEVELS - RANKING MINE SITES

- Not yet inventoried/Not yet screened
- Inventory - Site Discovery & Screening
  - Apply criteria for conducting inventory
  - Investigate for contaminants
  - Apply criteria based on data from site inventory. Rank sites to perform site investigation for contaminants.
  - Full site assessment
  - Apply criteria based on data from investigation. Rank sites for full scale site assessment.
  - Low Risk
  - High Risk
- Remediate
Next Steps

- **Phase I – complete planning**
  - Criteria selection & definitions (underway)
  - Identify data sets (underway)
  - Develop business process for using the tool consistently

- **Phase II – build tool**
  - Create scoring system, weighting factors

\[
\{ \left( TL \times 50 \right) + \left( WR \times 10 \right) + \left( ML \times FML \right) \times 200 \} \times CP
\]

\[
v = \text{Chemical Hazard Score}
\]

\[
\left( \left( CO \times FO \right) \times 100 \right) + \left( \left( CH \times FH \right) \times 50 \right) + \left( SSS \times 10 \right) + \left( SLS \times 10 \right) + \left( \left( CWB \times FWB \right) \times 20 \right) + \left( \left( CMT \times FMT \right) \times 20 \right)
\]

\[
= \text{Physical Hazard Score}
\]

- **Phase III – implement**
  - Test against foundation data set of mines
  - Vet with users
AML CLEANUP - Process Overview

Inventory Site | Preliminary Screening

Preliminary Endangerment Assessment

Data

Land Management Agency

Physical Hazards

• Prioritize, Close, Maintain

Environmental Hazards

• Prioritize for Further Investigation

Federal or State Contaminant Clean Up Programs

Site & Remedial Investigation

Risk Assessment

Feasibility Study

Remediation Action Plan | CEQA/NEPA

Cleanup Certification O & M
AML REMEDIATION PROJECT DEVELOPMENT

AML Remediation Matrix

Area & Site Priorities
Partner Programs
Authorities
Funds

Remediation/Reclamation of Legacy Mines
AML Cleanup - Process Overview

Inventory Site | Preliminary Screening
Preliminary Endangerment Assessment

Data

Land Management Agency

Physical Hazards

- Prioritize, Close, Maintain

Environmental Hazards

- Prioritize for Further Investigation

Federal or State Contaminant Clean Up Programs

Site & Remedial Investigation
Risk Assessment
Feasibility Study
Remediation Action Plan | CEQA/NEPA

Cleanup → Certification → O & M
Questions

More Information:
Glenda Marsh
Program Manager
glenda.marsh@conservation.ca.gov