

Reclamation of Mining Affected Lands In Colorado

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The wild, wild west.....

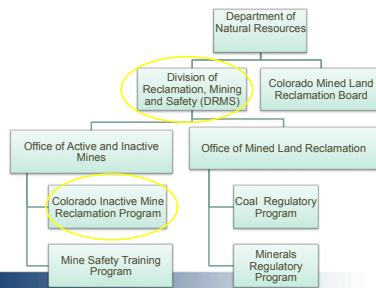


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Colorado Mining Regulatory Organization



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Colorado Mining Reclamation Laws

- **Colorado Revised Statutes (CRS) 34-33-101--Colorado Surface Coal Mining Reclamation Act 1970**
- Regulations of Colorado Mined Land Reclamation Board for Coal Mining
- **Colorado Land Reclamation Act for the Extraction of Construction Materials, 1995 as Amended, CRS 34-32.5-101 et seq.**
- Minerals Rules and Regulation of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials
- **Colorado Mined Land Reclamation Act, as Amended, CRS 34-32-101 et seq.**
- Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal and Designated Mining Operations.

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Cripple Creek and Victor Gold Mine



Gravel Mines



Flagstone Quarry



Molybdenum Mine- Climax



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Mine Reclamation

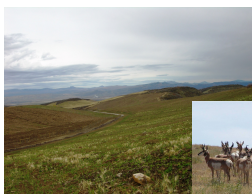


Coal Mine Reclamation

During Mining



After Initial Reclamation



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Objectives of Regulatory Programs

- Objective #1: Promote the responsible development of the State's mineral and energy resources while protecting public health, safety, welfare, and the environment.
- Objective #2: Reclaim mined acres to a beneficial post mining land use.

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Regulatory Processes

- Permitting
- Inspections
- Enforcement
- Bonding



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1992: Summitville changes everything...

December 15, 1992 Galactic Resources files for bankruptcy; Cash Bond= \$3.8million



By 2009, Fed and State agencies have spent \$112M, and counting!

Figure 2. Oblique aerial photograph, looking south-southwest, of the Summitville Mine and vicinity. The mine is located just east of the continental divide at an elevation of 3800 meters (11,500 ft). Total yearly snowfall is approximately 7-11 meters (20-35 ft). Photo by JannaSearch, Inc.



After Summitville- NEW STATE RULES define "Designated Mining Operations"

- Mines that use toxic or acid forming materials (e.g. cyanide).
- Mines that disturb toxic or acid forming materials (sulfide ores).
- Mines that generate acid mine drainage.
- Mines that have a likely potential to release contaminants.
- Includes all Uranium Mines.

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COLORADO Permitting Standards After Summitville

- "DESIGNATED" Mining operations, in addition to a full mining plan, MUST also submit Engineering Designs and an Environmental Protection Plan for:
 - Leach facilities, or heap leach plant
 - Tailings disposal or storage areas
 - Impoundments and dams
 - Waste rock piles
 - Stock piles
 - In-place leach for uranium operations
 - Storage, handling and safety of hazardous chemicals

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Bonding/Cost For Reclamation

- Based on the approved reclamation plan.
- Calculated on what it would actually cost the State of Colorado to fully reclaim the mine site, in the event mine operator fails to fulfill reclamation obligation under the approved permit, and the permit is revoked and bond money is forfeited.
- Indirect Costs (contractor's profit, administration fees, project management, fees, insurance) are included in the bond amount.

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- Mining can only be conducted on land approved for mining by special use permit or zoned for mining by local governments.
- Operators may get a permit from State before they receive a permit from the local government but ...

Local Government Approval

Mining cannot commence until an operator has received approval from the local government

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Legacy Mine Reclamation Program



Mine properties that operated prior to 1977 before reclamation laws were enacted.

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Colorado Legacy Mine Reclamation Program



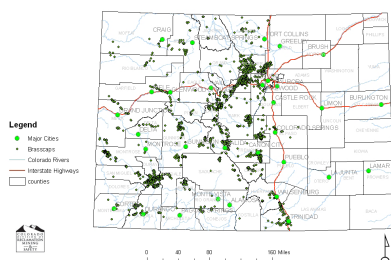
Addresses hazards and environmental problems associated with abandoned or inactive "legacy"/historic mines.

Mine properties that operated prior to 1977 before reclamation laws were enacted.

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Reclaimed and Safeguarded Legacy Mine Sites



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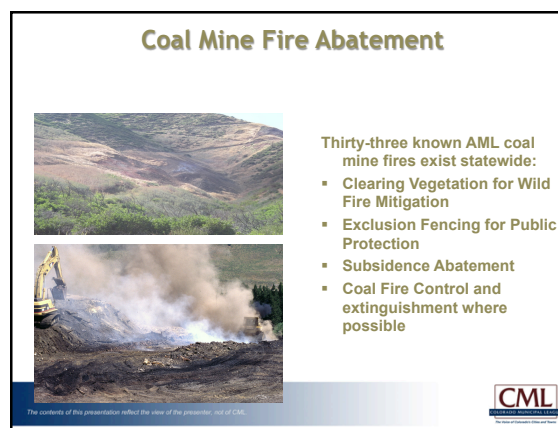
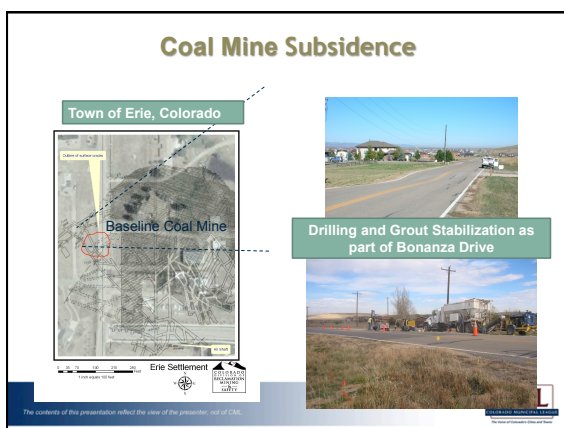
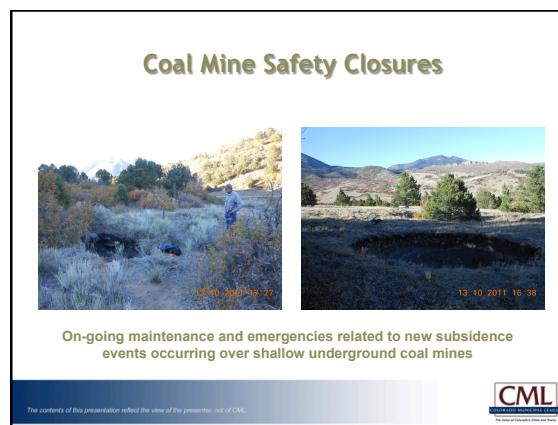
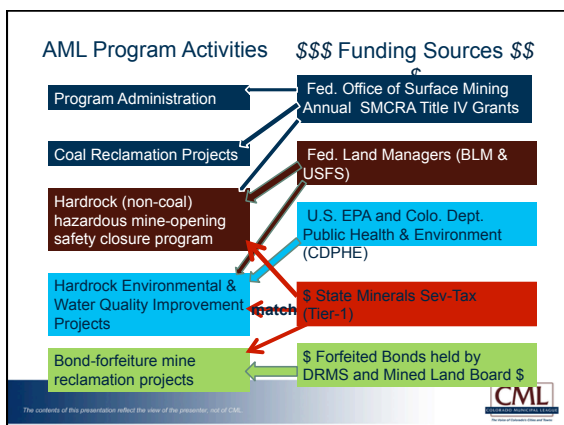


Colorado AML Funding

- SMCRA Funding \$2.5M – \$3M Annual Grants**
From reclamation fees paid on Colorado's coal production and 2006 Reauthorization of AML program that provides payback of funding withheld from state's program in the past (3-yr. grant periods)
- State Minerals Production Severance Tax**
 - Hardrock mine physical safety hazards
 - Water Quality Improvement Funding (\$375,000)
 - Abandoned Mine Fund (~\$500,000/year)
- Partnerships**
 - Federal, State, Local, Industry, Private

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Hazards

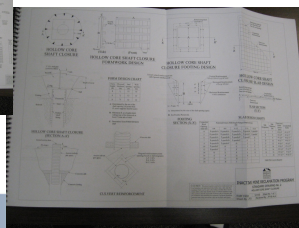
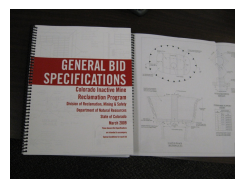


Safeguarding



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Standardized engineering and specifications for a variety of closure techniques



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Hardrock Safety Closures



Setting pre-cast Shaft Panels



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Historic Preservation

- Deterioration and eventual collapse of historic mining structures:
- Restoration or stabilization projects
- Intriguing and often unique old buildings and structures



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Hardrock Safety Closure Program Successes

- Foster small-business "Mom and Pop" local contractors to perform closure construction
- Incorporate historical preservation of mine structures with safety closure construction
- Maintain program flexibility to adapt to changing local and national initiatives (tourism, historic preservation, local land-use planning)
- Systematic coverage of mining districts and geographic areas in sequential project phases

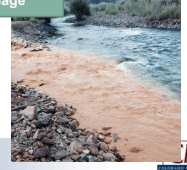
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Water Quality Improvement




Acid Mine Drainage




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Hardrock Environmental Reclamation




Mine waste



Mine drainage



Tailings



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Watershed Partnerships

Improving water quality in legacy-mining impacted streams

Activities:

- Technical assistance
- Watershed metals-loading characterization
- Reclamation project design and execution
- Contracting, reclamation and construction management



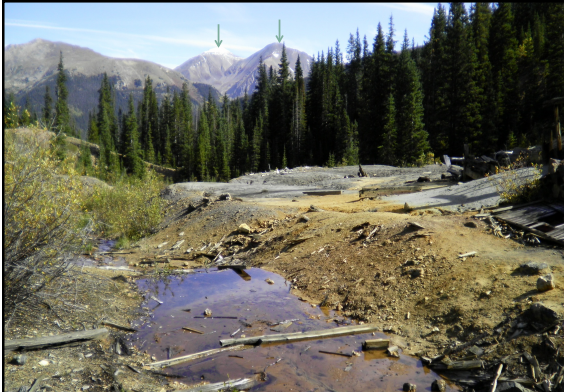

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Typical mine waste reclamation: excavation and removal to repository; restoration of wetlands

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Saints John Creek, Tributary to Snake River





Hardrock Environmental Reclamation Successes

- Collaboration with watershed stakeholders to identify, develop and execute projects
- Watershed approach to determine best “bang-for-the-buck”
- Generally successful with acid-forming mine-waste and tailings cleanup work, but main problems are often draining legacy mines, which are currently not workable under existing federal laws.

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Abandoned Mines- Reclamation Accomplishments

- Over 9,700 hazardous and dangerous mine openings have been safeguarded since 1981.
- Currently safeguarding ~250-300 additional mine features annually at current funding levels.
- 4,000 acres of mined land reclaimed.
- Numerous Federal agency and partners providing approximately \$4 million in additional funding over last few years.

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Reclamation Projects Completed - FY 14-15

	Design and Construction Project Expenditures	Number of Projects	Number of Openings Safeguarded	Acres Reclaimed
Non-coal safety closures & maintenance	\$1,029,430	30	258	65.5
Coal projects & maintenance	\$ 1,441,265	22	23	17.5
Enviro & WQ projects	\$ 1,458,635	26	0	16.25
Bond Forfeiture Projects	\$ 220,062	11	5	14.75
Other supporting projects (NEPA/BATS) & Outreach, etc.	\$ 151,500	13	0	0
GRAND TOTAL	\$ 4,300,892	102	286	114

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