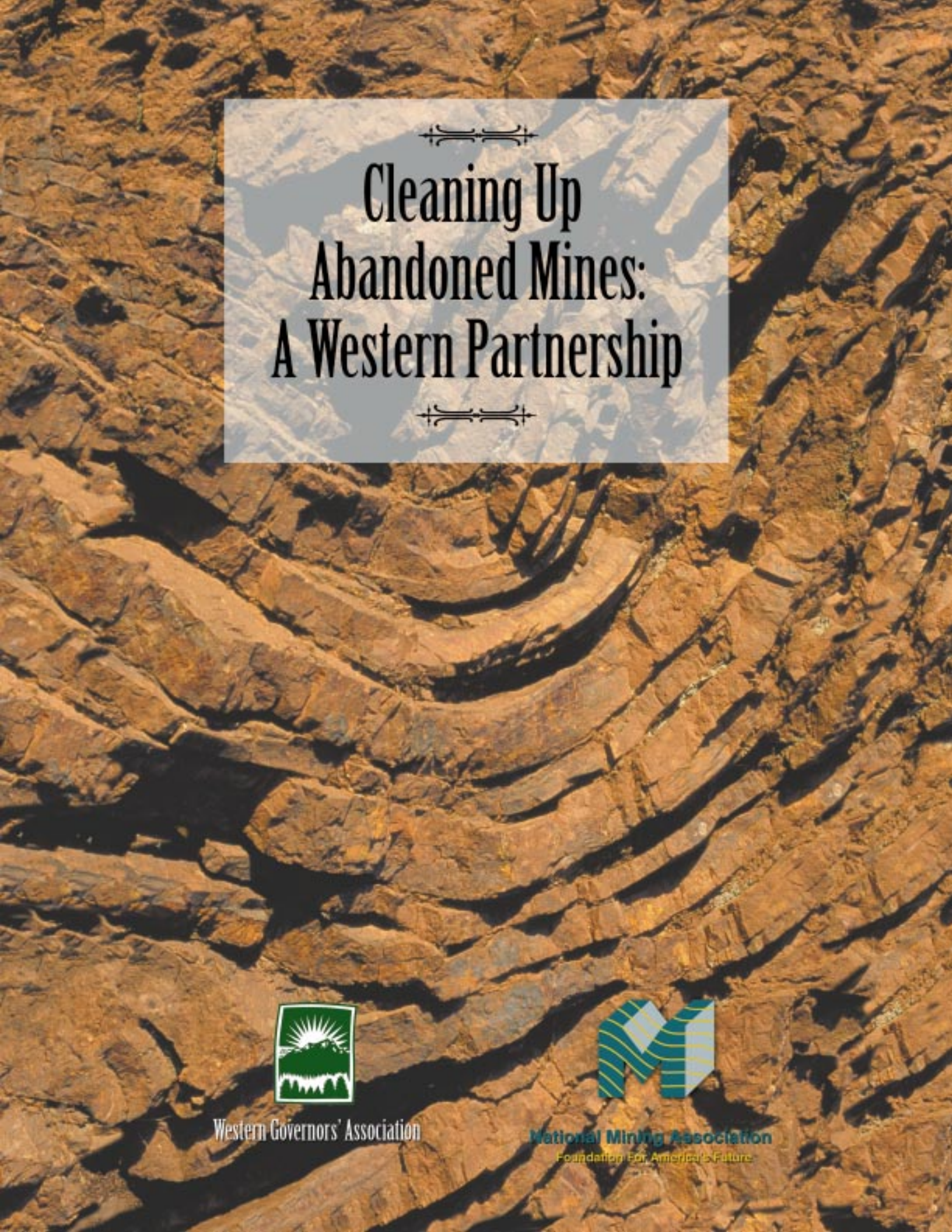
Cleaning Up Abandoned Mines: A Western Partnership



Western Governors' Association

National Mining Association
Foundation For America's Future

Abandoned Hardrock & Noncoal Mines in the West
A Partnership Report
Preface and Acknowledgments

This report marks the first time federal and state agencies and the mining industry have worked together to jointly describe the status of abandoned hardrock mines in the Western United States. While the report is being released jointly by the Western Governors' Association and the National Mining Association, it was developed with active involvement and assistance from representatives from the Bureau of Land Management, National Park Service, Office of Surface Mining, Forest Service, Environmental Protection Agency, and U.S. Geological Service. A draft of this report was also provided to the Mineral Policy Center, an environmental advocacy group, for comment. While no specific comments were offered by the Mineral Policy Center, it did support the idea of developing an integrated state, federal, industry report on abandoned mines.

The report is intended to give state and federal policymakers and private sector leaders an understanding of:

- the scope of the hardrock abandoned mine problem;
- the types of problems associated with abandoned mines;
- the resources being committed to reclaim and secure abandoned mines;
- accomplishments to date in cleaning up and securing abandoned mines;
- the obstacles to better progress in cleaning up sites; and
- a list of three significant abandoned sites in each state.

The partners involved in developing this report are committed to updating this report either annually or bi-annually. Funding for development and production of this report was provided by the Bureau of Land Management and the National Mining Association.

The Western Governors' Association and the National Mining Association wish to thank all of the representatives of the participating state and federal agencies and mining companies for their assistance in gathering the data and reviewing the drafts of this report. Special thanks goes to Mark Mesch of the State of Utah Abandoned Mine Reclamation Program, who gathered and integrated state data for the first draft of the report, and Jinx Fox and Rob Robinson of the Bureau of Land Management, who coordinated federal involvement in developing the report. The Steering Committee for the report included: Alene Jones (AZ), Mike Long (CO), Dave Bucknam (CO), Vic Anderson (MT), Doug Driesner (NV), Gary Lynch (OR), Tom Durkin (SD), Mary Ann Wright (UT), Mark Mesch (UT), Jinx Fox (BLM), Rob Robinson (BLM-CO), Tim Bozarth (BLM-MT), Bernie Hyde (BLM), Gary Hudiburgh (EPA), Jim Dunn (EPA-8), Carol Russell (EPA-8), Nick Ceto (EPA-9), Larry Gadt (Forest Service), Mike Greeley (Forest Service), Vern Schmidt (Forest Service-CO), Norm Yogerst (Forest Service-MT), Bob Higgins (NPS), Mary Josie Blanchard (OSM), Rick Seibel (OSM-CO), Ginger Kaldenbach (OSM-CO), Stan Church (USGS), Mary Beth Donnelly (Newmont Gold), Glenn Eurick (Barrick Gold), Les Darling (Cyprus Amax), Robert Muth (Asarco), Don Ewigleben (Echo Bay), Dean Williams (Homestake Mining), Bill Upton (Placer Dome), Larry Corte (Phelps Dodge), and Linda Findlay (Phelps Dodge).

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Introduction

Abandoned hardrock and noncoal mines, resulting from mining activities which occurred over the past century and a half, are scattered throughout the western United States. These abandoned mines, which are located on private, state, and public lands, contain numerous public safety and environmental hazards such as open shafts and acid rock drainage.

Most of these sites were mined and abandoned prior to modern environmental regulations being enacted in the 1970s. Ownership of these sites, and the attendant responsibility to clean them up, has often been transferred over the decades to individuals or companies which had nothing to do with causing the environmental or safety problems at the site. Many of these "owners" do not have the resources to clean up problems associated with the abandoned mines they inherited.

Unlike abandoned coal mines, there is no single dedicated source of federal funds to clean up these abandoned hardrock sites. At the state level, there are very few funding mechanisms to fill the gap (See Table 2). As a result, state and federal land management agencies piece together whatever funding they can, but they are clearly limited in the amount of clean up and safety work they can accomplish.

The purpose of this joint report is to collectively illustrate the extent of the abandoned mine problem in the West, indicate the progress being made to address the problem, and point out obstacles that impede efforts to clean up more abandoned hardrock mine sites in the region.

How Many Abandoned Hardrock Mines Are There?

As Table 1 shows, abandoned mines are spread unevenly throughout the West. The data in Table 1 come from state databases that cover the entire state (state, private, and federally owned land) and federal inventories on federal land. It should be noted that the confidence level of the data in the databases varies among states. Generally, the states which have active coal mining occurring in the state (and therefore receive funding from taxes levied on coal producers under the Surface Mining Control and Reclamation Act) have a better abandoned mine reclamation infrastructure in place and consequently have better information than non-SMCRA eligible states.

Every state defines an abandoned mine slightly differently. That is also true of federal land management agencies. Some consider multiple shafts and openings in one location as one mine, others consider each opening, shaft or disturbance a separate abandoned "mine". As such, data in Table 1 are not comparable among states and cannot be added together to create a westwide picture.

Table 1

1998 Western Hardrock Abandoned Mines Summary

	State Estimated Number of AML Sites Statewide	Total Number Reclaimed Statewide	BLM Estimated Number of AML Sites on BLM Land	Park Service Estimated Number of AML Sites on NPS Land	Forest Service Estimated Number of AML Sites on Forest Lands
Alaska	**432**	**4**	n.a	459	172
Arizona	**100,000**	**500**	n.a.	238	2,400
California	**20,000**	**3**	n.a.	238[1]	6,000
Colorado	**22,000**	**3,618**	n.a.	39	2,500
Idaho	**9,000**	**100**	n.a.	11	877
Montana	**6,000**	**1,656**	n.a.	45	1,300
Nevada	**50,000**	**4,616[2]**	n.a.	85	280
New Mexico	**20,000**	**2,126**	n.a.	13	1,600
North Dakota	**150**	**90**	n.a.	5	0
Oregon	**n.a.[3]**	**n.a.**	n.a.	10	150
South Dakota	**900[4]**	**63**	n.a.	2	360
Texas	**11,900**	**1,655**	n.a.	25	0
Utah	**20,000**	**1,774**	n.a.	64	2,000
Washington	**n.a.[5]**	**n.a.**	n.a.	61	100
Wyoming	**2,649**	**715**	n.a.	132	280

Notes: Data for number of mines (column 1) and number reclaimed (column 2) are from state databases or records and include all known abandoned mine sites on state, private and federal land including BLM, Park Service, and Forest Service. Data for number of mines on federal land are shown for informational purposes (columns 3, 4, and 5) and are from federal databases. Because federal and state agencies define what constitutes a "site" in different ways, one should not compare numbers or draw conclusions based upon numbers from different columns or add state numbers to develop a total for abandoned mines in the West.
n.a — not available. BLM estimates a total of 64,748 sites on BLM property for the states listed.

[1] Inventories in the California Desert Parks are incomplete; work is being initiated in 1998 on the 3.1 million acres transferred to the NPS as part of the 1994 California Desert Protection Act. It is estimated that over 1,000 additional sites exist in those parks.

[2] Represents predominately mine openings physically secured by fencing and signage.

[3] The BLM and Forest Service have completed inventories on federal land. The Oregon Department of Geology and Mineral Industries is working with EPA Region X, Idaho, and Washington to develop partnerships for reclamation at this time.

[4] Mines are limited to Black Hills area.

[5] While there have been scattered investigations conducted by federal, state, and county agencies to identify AML sites in the state, no valid estimate of the number of such sites can be given. The main technical barrier to ranking AML sites on a statewide basis is the lack of an effective process for identifying, classifying, and prioritizing them. Also contributing to this situation are the lack of consistently applicable, objective yardsticks for measuring natural resources impacts from these sites and the lack of funding.

What Types of Problems Do Abandoned Mines Pose?

Abandoned mines can cause a variety of problems. They can create on-going water quality problems, public safety concerns, or a combination of both. However, a majority of abandoned mines (greater than 80%) create neither environmental nor immediate public safety concerns. Table 3 lists three state-identified significant abandoned sites in each state in need of reclamation. These sites do not necessarily represent the worst, or largest, abandoned mine problem in the state. In some cases, they represent problem sites on which the states believe reclamation can be accomplished in the foreseeable future as a result of efforts and/or plans that are currently underway to reclaim them. As the list illustrates, priority problems are different in every state. The types of problems listed include:

- open vertical or inclined shafts, adits, and exposed stopes
- dangerous highwalls
- erosion and sedimentation
- acid rock drainage
- heavy metals leaching into streams
- sulfide waste piles
- dangerous structures
- soil contamination
- large open pits
- relic tailings as waste rock
- mineral processing chemicals

Some of these problems can be solved relatively inexpensively by securing openings with durable caps, and/or recontouring the land. Other problems require more expensive on-going treatment of water or the creation of repositories for containing waste.

Alice Glory Hole, Colorado
Pre-reclamation

Alice Glory Hole, Colorado
Post-reclamation

What is Being Done to Clean Up These Sites?

As Table 1 indicates, state and federal agencies are making progress in securing and cleaning up abandoned mines, often in cooperation with the mining industry. Comparing Table 1 and Table 2, it is clear there is a relationship between funding and progress on cleaning up and/or securing abandoned mines. Nevada, with a state funding mechanism, has made good progress on securing and cleaning up abandoned sites. Colorado, Montana, Utah and Wyoming, with access to SMCRA coal tax funding, have also made headway on dealing with their AML problems.

The mining industry is contributing significantly to abandoned mine cleanups. A recent study by the National Mining Association, *Reclaiming Inactive and Abandoned Mine Lands: What is Really Happening* [1], provides an analysis of a sampling of 83 successfully reclaimed sites. Of those, 47 were privately conducted or financed. The study also indicates that industry remining projects have contributed significantly to AML cleanups through the synergism that can be achieved when active mining operations reclaim and remediate problems at adjacent or nearby AML sites. State voluntary cleanup laws, where they exist, have also facilitated many abandoned mine cleanup projects.

Workers seed a tailings pile at a Colorado mine.

[1] This study was based on a survey that was conducted over a short timeframe and was not intended to be all inclusive.

Table 2

State and Federal Funds Spent in FY 1997 for Cleanup and Securing of Abandoned Hardrock Mine Land

	Funds	SMCRA - Noncoal	Total
Alaska	- 0 -	$180,000	$180,000
Arizona	$30,000	——-	$30,000
Colorado	$110,000	$1,500,000	$1,610,000
Idaho	$520,000	- 0 -	$520,000
Montana	$1,271,000	$4,381,164	$5,652,164
Nevada	$98,000	——	$98,000
New Mexico	- 0 -	$175,000	$175,000
Oregon	*	——	- 0 -
Texas	- 0 -	$1,500,000	$1,500,000
Utah	**	$1,364,000	$1,364,000
Wyoming	- 0 -	$22,000,000	$22,000,000
BLM	——	——	$1,000,000
FS	——	——	- 0 -
NPS	——	——	$45,000
Total***	$2,029,000	$31,100,164	$34,174,164

Note: Information was not provided or there is no state or SMCRA funding in CA, ND, SD, and WA.

AK SMCRA funds are FY98 (FY 97 funds held in reserve for Treadwell Mine reclamation project.)

AZ $30,000/year 1997-99 for fencing and posting

CO $110,000/year from gaming industry for work around gaming towns. Also, State cost- shares on cleanups with landowners.

ID $520,000 FY 97 and $800,000 FY 98 at Bunker Hill

MT 3 projects authorized at $300,000/project over the last three years (FY96-98) for pilot reclamation demonstrations. Funded from Montana Metalliferous Mine Tax.

NV $38,000 for travel costs and fencing materials for securing openings. Funded by $1.00 fee on mining claim transactions and $20 per acre for new disturbance in a plan of operation. Includes $60,000 grant from BLM.

*OR FY 95 $140,000 through Governor's Watershed Council — FY 94-96 $1.0 million forfeited bond. State Superfund could be tapped but not to date.

**UT Legislature approved $150,000 for FY 98.

BLM Received $3 million for AML water restoration in FY 98.

FS Received $4.6 million in FY 98 plus additional funds for hazardous waste work.

NPS NPS has received $500,000 in AML funding for FY98.

***Total The total does not include EPA Clean Water Act Section 319 or Section 104 grants, EPA Regional Geographic Initiative Funds, and Superfund expenditures which can include work at AML sites.

What Can be Done to Clean Up More of These Sites?

There are two main reasons more isn't being done to clean up and secure abandoned mine sites: money and statutory and regulatory environmental liability. As stated previously, there often are no viable owners to pay for the cleanup. Much of the land where these mines exist is either federally owned or privately owned land patented under the 1872 Mining Law. Federal land management agencies must rely on annual appropriations for cleanup funding because there is no dedicated source of federal funding to clean up these sites. In addition, state funding, where it exists, is small and/or irregular. There is some good news on this front. The BLM and Forest Service received significant increases in appropriations for AML work in 1998 and the Utah legislature appropriated $150,000 for FY 1998 for abandoned mine cleanup. In addition, members of the mining industry have contributed about $450,000 to work cooperatively with the Western Governors' Association on AML issues. That is in addition to the significant contributions industry makes in terms of voluntary cleanups of AML sites.

One of the reasons there isn't a more urgent call to action and pressure to increase funding for cleanups of abandoned mines is that they are very different from the more obvious types of environmental problems like point source discharges from factories. Abandoned mines are often located in remote areas, they are diffuse, and there are a lot of small sites. In some cases, open shafts become a safety problem as a result of subsidence that has occurred over decades. Heavy metals from tailings piles may cause harm to plant and animal life only during spring runoff and not during the rest of the year. However, increased residential development and recreational activity in back country areas are bringing more people closer to, and in contact with, abandoned mines. This raises the risk exposure associated with abandoned mines and could lead to more interest from policymakers.

Another major stumbling block to increasing cleanup efforts is the concern about liability. Currently, under the Clean Water Act, anyone conducting reclamation or remediation at an abandoned mine site may become liable for any continuing discharges of pollution from that site. This applies to state and federal agencies as well as other "Good Samaritans". Recognizing this problem, western governors have called on Congress to amend the Clean Water Act to at least shield state agencies, and others working with the state, from liability at sites where they conduct "Good Samaritan" cleanups. Good Samaritans and others doing voluntary cleanup work at abandoned mines sites are also exposed to liability under the Comprehensive Environmental Response, Compensation and Liability Act.

The mining industry has also indicated that liability concerns hamper their ability to go back into historic mining districts and remine abandoned sites or do voluntary cleanup work. Using today's technologies, the mining industry believes it can profitably remine some abandoned mine sites and improve the environment at these sites if it didn't mean becoming jointly and severally liable for complete cleanup for the entire site.

Liability concerns also hamper joint federal-state cooperation on some mine cleanups. If a state and federal land management agency are doing cleanup work in the same area, it would make sense for them to work together. However, liability concerns keep them from developing joint repositories to manage wastes from cleanups of abandoned mines. As a result, the state could end up building one repository for its waste and, less than a mile away, the federal agency would build its own repository.

Table 3

Significant Sites For Abandoned Mine Reclamation

Alaska

1. **Treadwell Mine — Juneau, Alaska**
   Vertical shafts, open portals and pits, 500 feet of dangerous highwall. Area is adjacent to cities of Juneau and Douglas and receives extensive use.
2. **Alice Mine — Valdez, Alaska**
   Hazards are open portal and shaft within a few hundred feet of a public use cabin in a state park.
3. **Nevada Creek — Juneau, Alaska**
   Hazards are a mill site, open portals, and vertical shafts.

Arizona

1. **Tonopah-Belmont Mine — Maricopa County (adjacent to federal lands)**
   Hill honey-combed with adits, shafts and stopes, high visitation indicated by garbage and vandalism.
2. **Swansea Area — LaPaz County (BLM)**
   A vacant mining town that receives heavy visitation that has dangerous buildings, a smelter and seven deep, open mine shafts.
3. **Saginaw Hills in southwest Tucson area — Pima County (BLM)**
   A 600 ft. deep shaft re-opened after collapse of an internal plug.

California

1. **Iron Mountain Mine, Shasta County**
   NPL site privately owned, addressed through Federal (EPA R9) and RP actions. 4,400-acre site producing acid rock drainage with heavy metals, most notably copper, cadmium, and zinc.
2. **Sulphur Bank Mine, Lake County**
   NPL site privately owned, addressed through Federal action (EPA R9). 23-acre low pH water-filled mine pit and 120 acres of mine wastes (194,000 cubic yards) producing acid rock drainage with sulfate, mercury (methyl-mercury), arsenic, antimony, and hydrogen sulfide gas.
3. **Leviathan Mine, Alpine County**
   Owned by State of California (though recently some potential for responsibility revisited on the private RP), managed by Lahonton Regional Water Quality Control Board, subject to EPA Emergency Actions 265-acre site producing acid rock drainage with sulfate, nickel, aluminum, iron, and arsenic.
4. **Penn Mine, Calaveras County**
   Privately and publicly owned, but managed by East Bay Municipal Utility District and the Central Valley Regional Water Quality Control Board, with COE involvement under Section 206 of Water Resources Development Act. 200,000 cubic yards of reactive waste rock and mine tailings producing acid rock drainage with the major contaminants being copper, cadmium, and zinc (with sulfate, aluminum, and iron). It is currently in the process of being cleaned up by the entities that inherited the liability. Cleanup is supposed to be complete next year.

Colorado

1. **Leadville Mining District — Lake County (BLM)**
   Several hundred open shafts with high visitation.
2. **Clear Creek Basin — Clear Creek and Gilpin Counties (BLM)**
   Thousands of open shafts with high visitation and impacts to water quality.
3. **Upper Animas Basin — San Juan (BLM)**
   Hundreds of open shafts and adits with high visitation, acid rock drainage.

Idaho

1. **Coeur d'Alene Mining District and Coeur d'Alene Basin — (BLM)**
   District contains over 100 mines with environmental and physical hazards. Basin's Couer d'Alene Lake contains 70 million tons of mill tailings.
2. **Blackbird Mine**
   Old colbalt-copper mine under reclamation by Noranda Mining Company.
3. **Triumph Mine — (BLM)**
   Under reclamation by Department of Lands, Division of Environmental Quality and ASARCO.

Montana

1. **Belt Creek — Cascade and Judith Counties**
   Exceedances of MCL/MCLG and/or aquatic life criteria for cadmium, zinc, iron, lead, antimony, copper, nickel, mercury.
2. **Ten Mile Creek — Lewis and Clark County**
   Exceedances of MCL/MCLG and/or aquatic life criteria for arsenic, cadmium, zinc, silver, lead, copper, antimony, iron and mercury.
3. **Prickly Pear Creek — Jefferson, Lewis and Clark Counties (BLM)**
   Exceedances of MCL/MCLG and/or aquatic life criteria for zinc, cadmium, arsenic iron, lead, copper, mercury, nickel, and antimony.

Nevada

1. **Carson River — Lyon and Church Counties (mostly private, some state, BuRec, BLM)**
   Mercury contamination from Virginia City mines. EPA superfund cleanup site.
2. **Buckskin Mine — Humboldt County (private and Forest Service)**
   Heavy metal contamination due to acid rock drainage.
3. **Big Mike Mine — Pershing County (mostly BLM, some private)**
   Heavy metal contamination in mine pit lake.

Additionally, approximately 950 orphaned mine openings are known to be physical hazards that require securing.

New Mexico

1. **Lake Valley Mining District — Sierra County**
   Contains over 500 mine openings in a concentrated area; NM AML is working under a cooperative agreement with the BLM, and with private interest holders. Tourist visitation to this historic manganese/silver/lead region is increasing.
2. **Orogrande Mining District — Otero County**
   Hundreds of sites with approximately 1,300 mine features in former copper/gold/silver/lead/iron/tungsten district.
3. **Cerrillos/New Placers/Old Placers Mining Districts — Santa Fe County**
   Several projects encompass over one hundred mine features in these historic gold/silver/copper/lead/zinc mining districts positioned between rapidly expanding population centers of Santa Fe and Albuquerque.

Oregon

1. **Virtue Mine — Baker County**
   Open shafts
2. **Martha Mine — Douglas County**
   Open shafts
3. **White King-Lucky Lass Mine — Lake County**
   Acid rock drainage and radionuclides.

South Dakota

1. **Minnesota Ridge — Lawerence County (USFS and private)**
   Draining adit, acid rock drainage, sulfide waste pile, dangerous structures, and open shaft.
2. **Belle Eldridge — Lawerence County (BLM)**
   Draining adit, acid rock drainage, sulfide waste pile, eroding tailings and open shaft.
3. **Eagle Bird — Lawerence County (private)**
   Draining adit, acid rock drainage, and streamside waste pile.

Utah

1. **Temple Mountain/San Rafael Swell — Emery County (BLM)**
   An estimated 300 open uranium mines with moderate to high, radionuclides.
2. **East Reef — Washington County (BLM)**
   Approximately 200 open mines adjacent to an area undergoing rapid development. High visitation and dangerous openings.
3. **Thompson Mining District/Yellow Cat Flat — Grand County (BLM)**
   Preliminary inventory estimates over 100 open mines adjacent Arches National Park. High visitation at abandoned uranium mines.

Washington

1. **Holden Mine and Mill Tailings — Chelan County (USFS)**
   Metals leaching into ground water and surface water from approximately 8 million tons of mill tailings, ARD contaminated water flowing from the mine portal, and seepage and runoff from the millsite are among the issues that require remediation. Discharges from these mine-related facilities fail to meet state ground water standards and surface water quality standards in Railroad Creek, the second largest tributary to Lake Chelan.
2. **Midnight Uranium Mine — Spokane Indian Reservation**
   Approximately 50 million gallons of acid rock drainage water is produced annually from the mine, threatening a rainbow trout spawning stream that is tributary to the Spokane Arm of Lake Roosevelt. This important recreational area and fisheries resource is a part of the 150 mile long lake that forms above Grand Coulee Dam. This National Recreation Area received more than 1.4 million visitors in 1997. This mine is associated with the Dawn Tailings cleanup that is in progress.
3. **Lack of an AML program precludes identification of a third site from among many candidates.**

Wyoming

1. **Day Loma abandoned uranium mining area, Gas Hills — Freemont County (BLM)**
   Large open-pit and spoil disturbance with impoundments of groundwater and spoils, severe highwall hazards, radioactive waste and severe erosion degradation.
2. **Central Gas Hills abandoned uranium mining area, Gas Hills — Freemont County (BLM/Private)**
   Radioactive materials, acid generating materials and highwall hazards.
3. **Rock Springs (I-80 and Swanson Drive)**
   Subsidence affecting interstate, a 24” municipal water line, and residential housing.

Conclusion

State, federal, and private interests are making slow but steady progress on cleaning up priority abandoned mines in the West. By working together, Congress, governors, state legislatures, and the mining industry can help accelerate the pace of cleanups of priority abandoned mine sites by looking for ways to increase funding for on-the-ground cleanups and securing of dangerous mines in heavily trafficked areas. More studies and inventories of the problem are not needed to begin addressing priority sites today. Congress can help by examining disincentives to voluntary cleanup efforts in current statutes and where reasonable, limiting liability, to facilitate more cleanups. In addition, the creation of a consolidated data base or Internet Web site of existing sources of federal funding that could be used for abandoned mine cleanup would help those entities trying to piece together several sources of funding to get an abandoned mine site cleaned up.

Anema Mine Tailings, Colorado
Burying tailings

Alaska Division of Mining and Water Management, Abandoned Mine Land Program

Funded through AML grants from the Office of Surface Mining.

The Alaska AML Program completed an inventory of known noncoal abandoned mines in 1991. A total of 432 sites were found and 123 sites contained priority 1 and 2 hazards requiring reclamation. The types of hazards found were predominantly open portals, vertical shafts and open pits with dangerous highwalls. Additional inventory work is needed on state and private lands.

Alaska has reclaimed four hardrock sites and abated the following hazards: mine portals (14), vertical openings (13), hazardous equipment and facilities (51), and hazardous highwalls (50 ft.)

The estimated reclamation cost for the 123 priority 1 and 2 sites was $2,700,000. The state of Alaska receives $180,000 annually for noncoal projects. It is not conceivable that all priority 1 and 2 sites would be reclaimed at this funding level. It will be necessary to identify the most hazardous sites through field investigation and reclaim the worst hazards first.

Alaska has not ranked the noncoal sites to determine which sites should be worked on first, but three high priority sites were identified and will be addressed while ranking of other sites is taking place.

Arizona State Mine Inspector's Office, Abandoned Mines Division

Funded through state appropriations and contracts with Bureau of Land Management and National Park Service.

Federal lands comprise nearly 75% of Arizona. The state receives no funding from the Office of Surface Mining since all active coal operations lie on the Hopi and Navajo Reservations in the northeast portion of the state. Arizona State Mine Inspector's office contracted with the National Park Service to assist with closures of abandoned mines on national parks and monuments throughout the state. Through this agreement, ASMI will contract local companies to complete the required work on the mines. The first project is the fencing of mine shafts and associated tailings at the Katherine Mine located in the Lake Mead National Recreation Area near the resort town of Laughlin, Nevada.

In 1996, a tour of the NPS sites in southern Arizona revealed bats using a mine along the Fort Bowie National Historical Site boundary on BLM lands. A colony of Townsend's big-eared bats and Cave Myotis were utilizing this mine. A cooperative agreement between BLM and NPS was reached to construct a bat gate to protect the bat colonies and safeguard the public.

Colorado Division of Minerals and Geology, Inactive Mine Reclamation Program

Funded through AML grants from the Office of Surface Mining.

The Colorado Inactive Mine Reclamation Program (CIMRP) has been reclaiming noncoal mines since 1985. The CIMRP has safeguarded 935 adits and 2,683 shafts during the past twelve years. A reconnaissance of mining districts in 1980 compiled information on 8,000 hazardous openings. From that inventory, Colorado estimates there are almost 22,000 openings in 36 of the state's 63 counties.

As Federal land inventories are completed, reclamation costs are being increasingly shared by the Bureau of Land Management and U.S. Forest Service on lands they manage. The National Park Service has also been providing funding for reclamation of their mine sites since 1990. Private landowners are encouraged, with good results, to share the cost of safeguarding mine openings on their land. The Legislature has also made additional funds available for mine sites near the three limited-stakes gaming towns.

Colorado's priorities for reclamation are driven by the residential development of the Front Range, limited-stakes gaming in the historic mining towns of Central City, Blackhawk, and Cripple Creek, and the expanding recreational use of Colorado's mineral belt from Boulder to Durango.

Idaho

The Idaho Geologic Survey maintains a digital database listing over 9,000 mines and prospects in the state. At least 2,000 sites have accessible mine openings, which pose the greatest physical hazard from abandoned mines in the state, and there are over 190 known mill sites around the state with mill tailings, which comprise most of the sites with environmental problems associated with abandoned mines in Idaho. The individual mine records contain selected fields from MRDS and MILS databases as well as state data.

In 1994, under a contract with the Forest Service, the State visited 300 sites south of the Salmon River. Over the last two years, the State has looked at about 50 sites for BLM and over 500 sites for the Forest Service north of the Salmon River. There are about 500 sites remaining to be visited for the Forest Service north of the Salmon River. These visits include water, dump, and mill tailings sampling and each site is recorded on videotape as well. Reconnaissance work has also been done in other parts of the state including the Nezperce and Clearwater national forests.

Over two-thirds of Idaho's 84,000 square miles is Federal land. Both the U.S. Forest Service and Bureau of Land Management have active abandoned mine programs in the state. Other state agencies in Idaho involved in abandoned mine work include the Department of Lands (Bureau of Minerals) and the Division of Environmental Quality. The Department of Water Resources also has an interest. All agencies are working together on the inventory and reclamation of abandoned mines.

Kansas Department of Health and Environment, Surface Mining Section

Kansas has significant noncoal abandoned mine land (AML) problems. Of these, limestone, lead-zinc, and salt mining are probably the most notable. Most of the AML problem in Kansas occurs on private land and, as a result, funding partnerships with other Federal agencies is not available.

The legacy of lead mining appears to be the major noncoal AML problem in Kansas. The southeastern corner of Kansas is part of the famous Tri-State Lead District. For more than a century this area was a major producer of lead and zinc. As a result, there are lead and heavy metal pollution problems, acid rock drainage, tailings piles, structures and open shafts. Some of this area has been identified by the EPA as Superfund sites and at least two Superfund projects have been targeted to address the lead and zinc mine problems.

Recently, Kansas has decided to regulate noncoal mining through the Kansas State Conservation Commission. This action will lessen adverse impacts of future quarry and other noncoal mining in Kansas. However, there is no mechanism within these regulations to collect funds to handle abandoned mine problems.

Montana Department of Environmental Quality, Mine Waste Cleanup Bureau

Funded through AML grants from the Office of Surface Mining, responsible party contributions and cost recovery through U.S. EPA superfund actions, responsible party contributions and cost recovery through Montana Comprehensive Environmental Cleanup and Recovery Act (CECRA, known as "Mini-Superfund"), voluntary Cleanup and Redevelopment Act through CECRA, pilot program for reclamation demonstration projects, and federal agency (USFS and BLM) contributions from federal agency budgets and appropriations.

The Montana Mine Waste Cleanup Bureau (AML) has been a leader in reclamation of noncoal sites since the approval of the state's Title IV SMCRA Abandoned Mine Reclamation Program in 1980. The AML program began an inventory of abandoned noncoal in 1989, and that inventory of hardrock mine sites (6,000+ sites), industrial mineral sites (5,000+ acres) and sand and gravel sites (2,000+ acres) has been the basis for identifying the priority sites that are the program's current focus. The Abandoned and Hard Rock Priority Sites Inventory contains geochemical sampling data and water quality analysis from 359 high priority mine waste sites throughout Montana. The data in the Priority Site Inventory has been further developed to produce a Watershed Analysis of Abandoned Hard Rock Mine Priority Sites. The

Watershed Analysis locates, maps, and ranks twenty-eight (28) USGS Hydrologic Units and one hundred thirteen (113) smaller sub-basins in the State that are currently impacted by mining waste from abandoned hardrock mining. The ranking of Hydrologic Units and sub-basins is based on the geochemical characteristics and volumes of mining wastes, and by measured impacts to water quality directly attributable to mine waste. Geochemical characteristics of the mine waste and annual surface water contaminant loading data are calculated as part of the watershed analysis.

Nevada Division of Minerals

Funded through industry fees on mining claims and mining disturbances on public land. Additional funding has been obtained through grants from WGA and BLM.

Nevada's AML program began in 1987 through legislative mandate. The program's goal is to reduce the rate of injuries and fatalities occurring at abandoned mines. Program staff identify and rank hazardous conditions at abandoned mine areas, conduct ownership research, notify claimants/owners of their responsibility to secure hazards or, if no claimant/owner exists, secure the hazardous conditions. Securing is usually accomplished by fencing the hazard and posting warning signs to prevent accidental exposure to the hazard. Of the estimated 50,000 hazardous mines in Nevada about 7,000 have been identified and about 5,000 secured. Staff also conduct education and public awareness programs to urge the public to "Stay Out and Stay Alive" when it comes to abandoned mines. Funding for the program is almost totally generated from industry fees of $1 per mining claim filing, and $20 per acre of newly permitted mining disturbance on public lands. About $200,000 per year is generated depending on the level of mineral industry activity. In addition, Nevada's program occasionally receives grants from various sources.

New Mexico Mining and Minerals Division, Abandoned Mine Land Bureau

Funded through AML grants from the Office of Surface Mining.

Since program inception in the early 1980's, NM AML has completed over 120 projects comprising well over 2,000 mine features (coal and non-coal). Although abandoned coal mines remain New Mexico's highest priority, the state has potentially upwards of 20,000 inactive and abandoned non-coal mine features, such as shafts and adits. New Mexico has no comprehensive statewide non-coal inventory, although work continues on incorporating both MILS and MRDS data into a state database/GIS system. Currently, no funding mechanism exists for supplementing these databases with additional information or field checking the data.

Mine sites are situated on a mix of private, federal (mostly BLM and NFS), and state or municipal lands. For past projects, about 70% of the work was performed on private lands, 20% on federal lands (slightly over half of which was BLM), and the remainder on state or municipal properties. NM AML has entered into various degrees of partnership with the BLM, NFS, State Land Office, and other entities in an effort to coordinate reclamation activities.

North Dakota Public Service Commission, North Dakota Abandoned Mine Lands Program

Funded by AML grants through the Office of Surface Mining.

The North Dakota Abandoned Mine Lands Program has no noncoal sites other than scoria, sand and gravel. North Dakota is a "minimum program state" with total funding for reclamation coming from the Office of Surface Mining.

South Dakota Department of Environment and Natural Resources, Minerals and Mining Program

The South Dakota Department of Environment and Natural Resources (SD DENR) Minerals and Mining Program regulates the active mining industry, but does not have an abandoned mine reclamation program or adequate funds to reclaim AML sites. Thus, the majority of non-coal AML sites in South Dakota remain unreclaimed. Of the non-coal AML sites reclaimed in South Dakota, most work has been done on a voluntary basis by the active mining industry on sites located on properties that they own or control. The mining industry has expended about $6.2 million on voluntary AML cleanup projects in the Black Hills. A few reclamation projects have been completed by the U.S. Forest Service and the state.

The SD DENR recently completed an inventory of known abandoned mines in the Black Hills. The inventory identified approximately 900 hardrock AML sites within a specified area of four counties, where the majority of historic hardrock mining occurred in South Dakota. About 200 of these sites are located on U.S. Forest Service lands and 700 on private lands. About 65 of these sites have been reclaimed or become part of an active mining operation. The 200 sites on U.S. Forest Service lands were subjected to a hazard screening for physical and environmental problems. Ten percent of the sites located on private lands were visited in the field. Based on information collected in the inventory, the SD DENR believes that the majority of the 900 sites do not pose a significant environmental threat, but physical safety hazards exist at many of the sites. Many abandoned mine sites do pose physical safety, human health and/or environmental hazards, and are in need of cleanup.

It is important to point out that in most cases of abandoned mines in the Black Hills, risks to human health, safety, and the environment have not been properly assessed. Thus, in most instances, the specific risks posed by individual abandoned mine sites are largely unknown. Because of this, the SD DENR is evaluating what it may be able to do to better assess these sites and take remedial steps that are appropriate. The SD DENR is engaged with the U.S. Forest Service and the EPA in current assessment work and planned cleanup at the Minnesota Ridge Mine. Likewise, the SD DENR is working with the U.S. Bureau of Land Management to assess and reclaim the Belle Eldridge Mine. Lessons learned from these two AML cleanup projects will be evaluated for their potential application to other sites. Although it is currently not certain what might be done at the remaining AML sites that are in need of assessment and cleanup, opportunities for this type of work will be evaluated as they arise and pursued as deemed appropriate.

A mine reclamation fund exists under state mine reclamation laws and may receive moneys to reclaim lands previously affected by mining, as allocated by the South Dakota Board of Minerals and Environment. Contributions to that fund have been very limited to date, mainly consisting of bond forfeitures. If funding for AML reclamation were to be secured through an offshoot of the Abandoned Mine Land Initiative or other such effort, the state mine reclamation fund may be able to serve as a means of allocating moneys for on-the-ground cleanup of select AML sites. Alternatively, new enabling legislation may be required.

The SD DENR has a Web page on Inactive and Abandoned Mines in the Black Hills located at the following Web address
http://www.state.sd.us/denr/DES/mining/acid-mine.htm

Railroad Commission of Texas, Abandoned Mine Lands Section, Surface Mining Division

Funded by AML grants through the Office of Surface Mining.

The Texas AML Program has certified completion of its coal reclamation and as such is concentrating on noncoal AML problems. The primary focus has been on abandoned surface uranium mines in south Texas and abandoned hardrock mine openings in west Texas. The Texas program has completed approximately 20% of the abandoned uranium mines on its inventory. Texas has completed over 50% of the openings on its hardrock inventory including all

known abandoned openings in Big Bend and Guadalupe National Parks, which were completed as a result of cooperative agreements with the National Park Service. At the current funding rate of approximately $1.5 million annually, it is estimated that the Texas AML Program can complete all remaining uranium and hardrock AML sites on the inventory by 2007.

Utah Division of Oil, Gas and Mining, Abandoned Mine Reclamation Program

Funded by AML grants from Office of Surface Mining.

The Utah Abandoned Mine Reclamation Program (UAMRP) has aggressively pursued the reclamation of noncoal mines in its state. Since the approval of its state plan in 1983, the program has reclaimed 1,232 horizontal openings (adits), 542 vertical openings (shafts), and 81 acres of subsidence. The noncoal inventory data base contains 4,100 sites of an estimated 20,000 suspected to occur in the state.

Federal land comprises 63% of the state's land area and cooperation with federal agencies such as NPS and BLM on AML work has been extremely successful. On-the-ground results have occurred on 4 of the 9 NPS administered areas in Utah. The BLM inventory in the state has meshed with UAMRP inventory to achieve standardization and avoid duplication of effort.

Increases in recreational activity and a desire for the solitude provided by country living are placing a greater number of people in contact with abandoned mines than ever before. The need to protect these individuals from mine hazards has created a heightened sense of urgency that is compounded by shrinking budgets.

Washington State Abandoned Mine Land Program

The state of Washington does not have a formal program for identification and reclamation of abandoned mines. There are two state agencies with potential involvement in AML remediation and reclamation. In the Department of Ecology, the Toxics Cleanup Program and the Water Quality Program address AML remediation issues. For these AML sites, the Toxics Cleanup Program has primary responsibility for site management. The Water Quality Program is involved where sites require permitting or when adjacent water bodies are water quality limited. The Department of Natural Resources is responsible for addressing reclamation issues. DNR has applied for EPA grant money to reclaim three small abandoned operations that are on state lands.

Wyoming Abandoned Mine Lands Division, Department of Environmental Quality

Funded by AML grants from the Office of Surface Mining.

The State of Wyoming has pursued non-coal abandoned mine land reclamation since 1984. The State has maintained a practice of defining shaft, adit, pit, spoil, and other features in groupings as "sites". A site consists of a group of features treatable as a unit for design and construction. A "site" typically contains at least a single feature, however, many sites have multiples. Uranium and bentonite sites have one or more large (up to 40 acres) pits and areas of disturbance at times in excess of 200 acres. Over 17,000 acres of abandoned uranium, bentonite, gravel, limestone, and iron ore surface mine disturbances have been reclaimed by Wyoming AML since 1984. The typical hardrock mine site, however, involves negligible acreage and the only meaningful unit of measurement for gold, copper, etc. is by site. A hardrock site may contain numerous shafts, adits, or mine subsidence openings. Wyoming has reclaimed 591 non-coal "sites", counting both the large surface mine sites and the gold, silver, copper type small sites.

The non-coal inventory of remaining sites for reclamation consists of 17,000 sites. All of these sites have been assessed to some degree, some quite thoroughly and others sparingly when it has been indicated that reclamation is not needed or will not be consented to. Additional sites will be minimal due to the thoroughness of the inventory methods employed.

Additional sites are created when new mine subsidences occur and when legal decisions affect the status of disturbances which are brought to the State's attention (i.e. the land is sold and the new owner requests the AML site to be reclaimed).

The Federal government manages almost 20% of the area in Wyoming. Therefore reclamation efforts must be well coordinated between the State, BLM, USFS, and NPS. The State's inventory efforts were carried out without regard to ownership considerations so the State has been able to advise the Federal agencies of disturbances within their domains, and the agencies have utilized the State's AML findings. When possible, the Federal agencies have provided investigative information and cultural resource survey information on areas eligible for AML reclamation.

Beryl Project, Colorado
Shapy (#115) with grate cover and copola for bat access

Federal Reports

United States Department of the Interior, Bureau of Land Management

Funded through multi-program internal funding sources, such as Water, Minerals, Recreation and Hazardous Materials.

The Bureau of Land Management (BLM) administers approximately 264 million acres of public lands, the majority of which are located in the western United States and Alaska. These public lands contain thousands of abandoned mines, some of which pose significant threats to public safety and the environment. BLM estimates that over 25 percent of the abandoned mine disturbances on BLM-managed public lands contain public safety hazards such as open shafts and adits, flooded pits, and unstable slopes. Approximately 4 percent have potential environmental problems, such as acidic waters, which often have widespread impacts to other resources both on and off the abandoned mine sites. BLM's primary concerns are sites with public safety hazards and abandoned mines that degrade the environment and impact resources such as water, fisheries, and wildlife habitat.

There are many BLM programs which address or are impacted by abandoned mines, including minerals, water, recreation, hazardous materials, and cultural and wildlife resources. BLM uses a variety of federal authorities to address AML hazards and problems. BLM also must rely upon partnerships with state, federal and private partners to accomplish on-the-ground reclamation activities at abandoned mines. For example, the State of Nevada fenced over 100 safety hazards located during BLM abandoned mine surveys. In Utah, BLM and the State conducted joint AML inventories to locate open shafts, pits, and adits in an area slated for off-highway-vehicle recreational use. BLM also works with the States to implement CERCLA cleanups of historic mining disturbances which have financially viable responsible parties.

BLM has historically been limited by a lack of funding specific to abandoned mines. In 1997, however, BLM received initial funding of $1 million specifically designated for improving water resources impacted by abandoned mines. That year, BLM and the States of Colorado and Montana, the U.S. Forest Service, and other watershed partners leveraged their combined resources to generate $7 million in funding and technical support for watershed-based cleanup pilot projects in Montana and Colorado. The work included removal of tailings and mine wastes from stream beds, stabilization of flood plains, and capture of acidic drainage in priority watersheds. The long-term goals for these projects include the restoration of trout fisheries along sections of the drainages. In 1998, BLM's funding for AML water impacts increased to $3 million. A third pilot project, in Utah, was initiated with the State and the U.S. Forest Service. With continued funding to address AML, BLM plans to complete the current watershed-based AML pilot projects as well as expand AML activities in other states through BLM resource management programs and new partnerships.

U. S. Department of Agriculture, U. S. Forest Service

Funded through multi-program internal sources, including the USDA Central Hazardous Waste Management Account, Watershed and Air management, and Minerals and Geology Management.

The USDA Forest Service administers approximately 191 million acres of public land, distributed in 44 states across the nation, with the majority in the western states. The USDA Office of Inspector General estimates that approximately 38,000 abandoned mines reside on lands managed by the FS, with the largest number of mines in the western states. Roughly five percent of these mines may contain hazardous materials and require response action under CERCLA. Another 10 - 20 percent, while not

requiring CERCLA response, may violate various provisions of the Clean Water Act. The remaining mines may pose a safety risk to forest visitors or employees, impact other resources such as wildlife and fisheries, or mar the visual landscape.

The existing Forest Service funds used to deal with abandoned mines are found in three program areas: (1) Engineering Management, which manages the hazardous materials (CERCLA) program for the Forest Service with funding from the USDA Central Hazardous Waste Management Account, (2) Minerals and Geology management, which has focused significant effort on safety concerns, and (3) Watershed and Air Management, which is placing additional effort into mines that violate state water quality standards. The Forest Service has also maintained an active research program focused on the rehabilitation of severely disturbed lands, although funding for these efforts has dwindled in recent years.

In previous years the Forest Service has not received specific funds dedicated to remediation of abandoned mines. While various agencies and bureaus within the Department of Interior have spent specific funding in 1997 in Colorado and Montana in the Interdepartmental Abandoned Mine Lands Watershed Cleanup Initiative, the FS participated to a limited degree. In 1998, the Forest Service received funding of $4.6 million for AML which will be focused on sites with Clean Water Act concerns. The funding will allow increased participation in partnerships with BLM and the State reclamation agencies in Montana, Colorado, and Utah, as well as expansion into additional states. The Forest Service anticipates similar funding in 1999.

United States Department of the Interior, National Park Service

The National Park Service (NPS) had no specific servicewide funding set aside for AML until FY98.

In fiscal year 1998 the NPS received $500,000 in newly appropriated funding for the purpose of implementing clean up of AML sites using a “watershed” approach. The NPS anticipates similar funding in FY99.

The NPS administers approximately 84 million acres of land, withdrawn from the public domain, in 374 units of the National Park System. More than 145 Park System units contain approximately 2,500 AML sites. A survey, about 90 percent complete, reveals 7,500 hazardous openings and 33,000 acres of disturbed land. These numbers do not include sites within the 3.1 million acres transferred to the NPS in the 1994 California Desert Protection Act. It is estimated that 5 percent of the abandoned mine sites on land administered by the NPS could pose environmental threats to water resources.

The NPS began collecting AML information in 1984. The NPS AML program is focused on five objectives: 1) Inventory all AML sites in the NPS; 2) Eliminate public safety hazards at these sites; 3) Eliminate or reduce environmental impacts to park resources; 4) Provide for education and public awareness through preservation and interpretation of historic and cultural artifacts and structures; and 5) Maintain critical wildlife habitat, especially for threatened and endangered species. At FY98 funding levels, monies are directed toward high-priority on-the-ground projects in categories 2, 3, and occasionally 5.

Since 1984 approximately $7.5 million has been spent in the Park Service to address AML issues. These funds have come from various sources such as other federal and state agencies and the NPS operating budget. Based on the experience gained thus far, the NPS template for its AML program will be based on cooperative efforts, such as those with the states of Utah, Colorado, Texas and Wyoming and other partners.

United States Department of the Interior, Office of Surface Mining Reclamation and Enforcement

Funded from funds collected pursuant to the Surface Mining Control and Reclamation Act (SMCRA) of 1977 for grants to States and Tribes for AML reclamation.

Office of Surface Mining (OSM) has practical experience from the operation of the Appalachian Clean Streams Initiative to transfer into an analogous

Western program. OSM possesses technical knowledge regarding acid rock drainage prediction, avoidance and abatement. OSM has a working relationship with State Abandoned Mine Land Programs throughout much of the West as a result of the SMCRA AML program. OSM has standing to deal with issues and sites not involving Federal lands which facilitates development of projects involving sites with multiple ownership types.

U.S. Department of the Interior, U. S. Geological Survey

(USGS Abandoned Mine Lands Initiative funded from existing SIR appropriations)

The USGS is working collaboratively with Federal and state agencies and local communities to provide scientific data under the Federal Abandoned Mine Lands (AML) Initiative to characterize and evaluate remediation of watersheds affected by historic mining activity in two watersheds. This effort was initiated by a DOI/USDA task force that sought ways to implement provisions of the President's 1994 Clean Water Initiative. The task force worked with the States of Colorado and Montana to create a watershed-based strategy to remediate contaminated acid rock water discharges from historic and abandoned hardrock mines on public lands.

The watershed approach used in the AML Initiative consists of four major stages: 1) statewide characterization and watershed prioritization, 2) watershed characterization, 3) mine site characterization, prioritization, and remediation/mitigation, and 4) monitoring. This tiered structure permits the Federal land managers to rank watersheds within a State based on potential for environmental risk of metal loadings and acid-mine drainage both from human activities, including mining, and natural mineralized sources. The task force initiated pilot projects in Colorado and Montana, prioritized watersheds, and implemented two pilot projects, the Animas River Basin in Colorado and the Boulder River Basin in Montana. The USGS, in cooperation with the BLM, USFS, State agencies, and local stakeholders, is investigating these basins in detail during 1997-2000. Information obtained from geologic, hydrologic, and biologic studies will assist in setting priorities and the design of remediation in the pilot watersheds. Results of USGS studies in fiscal years 1997 and 1998 have targeted the most significant pollution sources in each pilot watershed and reduced the number of AML sites that would require remediation using the site-by-site approach. This watershed approach accelerates the site characterization and remediation efforts.

The President's Budget for FY 1999 proposes funding under the Clean Water Action Plan (CWAP) for the USGS to continue working on abandoned mine lands. If funded, the USGS will initiate statewide characterizations in six states (California, Idaho, Nevada, New Mexico, Utah, and Wyoming), in collaboration with State and Federal agencies, to develop a strategy for ranking the environmental impact of historic mining on watersheds. The USGS will provide science-based recommendations to guide cleanup actions in impacted watersheds as further funding is available.

United States Environmental Protection Agency

The Environmental Protection Agency (EPA) has no specific agency wide funding set aside for AML.

EPA funds for assessment, characterization, and remediation of sites and geographic areas that exhibit environmental impacts associated with abandoned mine lands generally falls into two(2) categories. Funds allocated from Clean Water Act (CWA) sources may be granted to State agencies and non-governmental organizations to assess and characterize AML water quality impacts. These sources supply grants to non-point source investigations (Section 319 funds), water quality assessments (Section 104 funds), and geographic (watershed) studies (Regional geographic initiative funds). Typical grants are in the $10,000 to $100,000 range per site or activity, and they range from scientific assessment investigations to site remediation demonstration projects. Grants are usually awarded based on a yearly competitive process, and these funds are managed from the respective EPA Regional offices, as opposed to a National competition. In FY 1998, there were

approximately ten (10) such awards made to these type of geographic-specific projects, in addition to the more generic Section 104 and Section 319 awards granted directly to the individual States for their priority projects, which may also include AML work.

The other major source of AML directed funds is derived from projects that are priorities of the CERCLA, or Superfund program. Nationally, there are currently approximately 67 Superfund sites that qualify for listing on the CERCLA National Priorities List (NPL). These sites range in size and complexity from individual AML mine properties to entire river basins that are in various stages of remediation. It is difficult to pinpoint the exact cost of this remediation at any one point in time; many of these NPL-listed sites are being addressed through ongoing efforts by identified responsible parties. EPA's overall expenditures typically averages in the tens of million dollars ($10M's) per year per site. AML sites are not specifically targeted for NPL listing; they qualify for this priority by virtue of a National scoring process that ranks the human health and environmental impacts posed by each site listing.

EPA is coordinating the identification, assessment, and remediation of AML sites at the Regional Office level through implementation of the National Hardrock Mining Framework, a policy directive issued by the Agency in 1997. This Framework emphasizes partnership and interaction of all stakeholders in achieving success in mining environmental protection, not only in the AML arena but also with proposed and active mining-related operations. Coordination with the EPA Headquarters offices as well as with other Federal agencies and States is also enhanced through Framework implementation activities.

State/Federal/Private Partnerships

Abandoned Mine Land Initiative

The Western Governors' Association and the National Mining Association initiated a partnership in 1997 to work cooperatively to address obstacles and barriers to reclamation of abandoned mines. AMLI is focusing on three issues — examining liability issues that impede cleanups, exploring the creation of an on-line database of reclamation technologies to facilitate cleanup, and reporting on the nature of the abandoned mine problem.

Western Mine Restoration Partnership

The Western Mine Restoration Partnership, also created in 1997, is a federal/state partnership focusing on many of the same issues as the state/industry partnership mentioned above. Participating federal agencies include the Bureau of Land Management, the National Park Service, the Office of Surface Mining, the Forest Service, the Environmental Protection Agency, and the U.S. Geological Service. As a result of common interests, states, federal agencies, and the mining industry are jointly working on resolving liability issues and reporting on the nature of the abandoned mine problem. In addition, the state/federal partnership is looking at issues related to co-locating mine waste repositories and developing boilerplate memorandums of understanding to guide cooperative cleanups.

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