**The Cleanup of Abandoned Mine Sites: Problems and Prospects**

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**Part 1: Introduction**

Hardrock mining has been widespread in the western states since the gold rush to California a century and a half ago. As a result of historic mining operations, there are thousands of abandoned mine sites spread across public and private lands in major mining states across the western states. Many of these sites now pose significant environmental and public safety hazards. For example, soil erosion, heavy metal contamination, and acid drainage from hardrock mines degrade or threaten more than 3,000 miles of western streams and rivers (*Economic Report of the President*, 1997). In addition, many old mine sites pose physical safety hazards, and a number of people meet untimely deaths at abandoned mine sites each year.[[1]](#endnote-1)

The estimated cost of addressing environmental and safety hazards at old mine sites runs into the billions of dollars (USGAO, 1996), but resources available for cleanup are scarce. The ideal source of funding would be the party responsible for creating the conditions.[[2]](#endnote-2) The legal system, whether the common law tradition or environmental statutes, emphasizes that polluters should be responsible for cleaning up their messes. Finding parties responsible for historic mining wastes, however, is often an elusive task. Many operations were shut down long ago, and as a result the responsible parties are often difficult to locate, and these parties (or their heirs) are often not financially equipped to bankroll a hazardous waste cleanup.[[3]](#endnote-3)

Without exception, the western states face significant public policy challenges identifying sites, prioritizing, setting cleanup standards, and securing financing. A publicly funded remediation project is efficient if the total benefit exceeds the total social opportunity cost of the funds. Obviously, this is partly contingent on the cleanup standard. An efficient allocation of funds is one where the next dollar spent has the highest realized benefit in terms of environmental restoration or improved public safety. It would be poor public policy indeed where a few sites were restored to a few sites were restored to pristine condition, while serious threats to public health and safety languished elsewhere. Even so, it may well be the case that there are a number of sites characterized as environmental and safety hazards that simply do not merit public funding for cleanup because resources would be better spent elsewhere.

State and federal cleanup programs, volunteer cleanups, and remining and redevelopment projects are each promising avenues for addressing problems at abandoned mine sites. Yet, these alternatives are constrained by the existing liability structure of federal environmental law, the general lack of funding for abandoned mine programs, and constraints on the use of these funds. For instance, liability concerns stymie both voluntary cleanup efforts and potentially beneficial redevelopment projects. In effect, a party that remediates or redevelops a site can be saddled with liability for pre-existing environmental conditions, even though the remediating party had no role in creating the existing conditions, and even if remediation or redevelopment efforts improve environmental conditions at the site. These liability concerns also discourage state agencies involved in cleanup work, limiting both the number of remediation efforts and the types of measures state officials are willing to take.

Moreover, state and federal funding for remediation projects has paled in comparison to the multi-billion dollar price tag that cleanups are expected to cost. The amount and reliability of public funds for remediation work varies widely across states, but as a rule the need for funding is far greater than actual funding. A major source of public funding has been overflow funds that states receive under the federal Surface Mining Control and Reclamation Act (SMCRA) program. There are a number of restrictions that impede the efficient allocation of these funds. on Moreover, these funds only go to states where there is coal production, leaving major hardrock mining states such as Nevada and Arizona that have no coal production with no source of reclamation funds. Public land management agencies – the Bureau of Land Management and the Forest Service – also have programs to address water quality problems on federal lands.

We explore issues and controversies surrounding abandoned mine cleanup in the western United States, and develop the following recommendations to promote abandoned mine reclamation:

1. Limit Clean Water Act and CERCLA liability to allow for voluntary cleanups at abandoned mine sites.

2. Amend CERCLA liability to allow for remining.

3. Remove restrictions on the use of SMCRA funding, and release excess funds to the states.

4. Increase public financing of abandoned mine cleanups by distributing public funds to existing state and federal abandoned mine cleanup programs. Some of this funding could be raised through a mineral royalty on the production from federal lands.

Part 2 contains background information, including why abandoned mine lands are so pervasive, the types of hazards these sites pose, and the expected costs of remediating these sites. Part 3 discusses issues surrounding liability reform, including Good Samaritan and Brownfields legislation. Parts 4 and 5 examine retroactive liability and public funding as alternate means of financing cleanups. Part 6 provides recommendations and closing remarks.

**Part 2. Background**

Mining and mineral processing cause major short-term transformations of the physical environment, which can create short and long-term environmental and safety hazards. The mineral development process involves digging up and moving tons of rock and soil, and the process of separating the valuable metal from the worthless rock involves chemical treatment or smelting of this material.[[4]](#endnote-4) Mineral development generates large amounts of waste material, and this material typically contains substantial amounts of heavy metals. When this waste material is not properly secured after mining activities are completed, the environmental effects can include continuing soil erosion, stream sedimentation, and heavy metal contamination of soil and water. One of the most serious problems, and also most costly to address, is the generation of acid mine drainage. Acid mine drainage occurs when sulfides are exposed to water and air, producing sulfuric acid. Once started, the oxidation process perpetuates itself using a virtually limitless supply of sulphide rock.

Planning for site reclamation before and during mineral development is a key to limiting long-term environmental impacts. The attention to the post-development site conditions, however, is a somewhat recent phenomenon.[[5]](#endnote-5) Mineral development often occurred in remote areas where there was no obvious benefit of reclamation, and no public expectation for restoring site to pre-mining conditions. As a result, mine wastes (e.g., tailings piles and slag heaps) were often situated near or dumped directly into drainages simply because of the ease of disposal and cost considerations. As a matter of public policy, limiting the potential offsite impacts of mineral development was simply not a priority. Unless there was a damaged party to file suit, there was no impetus for cleanup. Of course, even if there was a damaged party, the courts often gave the mining industry preferential treatment in major mining states (Gerard and LeCain, 2001). As a result, historic mine sites are often the source of current environmental and safety problems.

Where environmental contamination is a problem, remedial actions typically focus on reducing and securing hazardous material. In some cases, existing waste is put in a more secure storage facility, either an existing, permitted facility, or a facility specifically built for a reclamation project. In other cases, the existing waste pile is secured in place (Struhsacker and Todd, 1998). In almost all cases, the costs of these remedial actions are substantial. For instance, removing and securing tailings at the Blackfoot Tailings site in Montana – an abandoned gold mine on Forest Service land – involved , and cost just under $250,000. If acid drainage is problem, remediation costs often exceed $1 million, even if the mine had a modest production history. The average cost of remediating environmental contamination at mine sites in the federal Superfund program is $170.4 million[[6]](#endnote-6) (Probst et. al, 1995).

Safety hazards, such as crumbling structures, open shafts, and open pits are more pervasive than environmental problems, and a number of states have begun to limit the public exposure. In Nevada, for instance, the state erects fences and posts warning signs around potentially hazardous areas, rather than trying to cap or seal every potential opening. The cost is less than $200 for each feature that is secured. The state of Montana does more extensive work, including backfilling and closing openings, at a significantly higher average cost of $1500 per feature that is secured.

There have been a number of efforts to inventory the number of abandoned mines and develop estimates of remediation costs, but accurate and meaningful estimates are elusive (USGAO, 1996; Western Governors Association, 1991).[[7]](#endnote-7) A widely cite figure of abandoned and inactive mine sites is the Mineral Policy Center’s estimate of 557,650 abandoned and inactive sites across 32 states (Lyon, Hilliard, and Bethel, 1993). Table 1 shows that in their estimates, the term “abandoned mine” is used to describe anything from a minor surface disturbance to a multi-million dollar hazardous waste cleanup project. Given what passes for an abandoned mine site – more than seventy five percent of these sites are categorized as *Benign* or *Landscape Disturbance* – most sites either do not need to be addressed, or can be addressed at low cost. The estimate accurately reflects that there are more sites with safety hazards than environmental problems, and that the costs of addressing environmental problems are typically far greater than those for addressing safety hazards.

That still leaves thousands of sites that pose potential safety hazards and environmental contamination. This estimate is somewhat higher than evidence from state programs. In Montana, for instance, the state has evaluated more than 3,800 sites based on their environmental and safety characteristics, and has designated 380 priority cleanup sites from this list (**cite**). The department feels that it is unlikely that it is not aware of abandoned mine sites that pose significant environmental problems.

The Mineral Policy Center also estimated a range for cleanup at all sites across 32 states at $32.7 to $71.5 billion. This estimate has been criticized by industry groups, but the range is somewhat consistent with the Bureau of Mines estimate of total cleanup costs for sites on federal lands at $4 to $35.3 billion (USGAO, 1996, 16). Neither estimate inspires confidence for its precision, which is appropriate given the many sources of uncertainty. For example, total cleanup costs will be a function of a number of variables, including cleanup standards (e.g., Nevada versus Montana standards for addressing safety hazards),[[8]](#endnote-8) technology standards, and allowances for remining.[[9]](#endnote-9) Whatever the cleanup standards, it is reasonable to think that total cleanup costs will be several billion dollars.

**Part 3: Liability Issues**

Under CERCLA liability is *strict*, *joint and several*, and *retroactive*. Liability is strict, so behaving in a non-negligent manner is not a defense. It is also joint and several, meaning that any single PRP can be held liable for the entire cost of the remediation effort. Finally, liability is retroactive, meaning that cleanup standards devised in the 1980 legislation apply retroactively to generation, transport, and storage of wastes that occurred before 1980. Similarly, Clean Water Act liability can also be assigned retroactively.

Although federal and state programs across the West are making significant progress, these projects are small in comparison to the scale of the problem. Consequently, there is interest in encouraging private volunteer efforts and remining projects that have the potential to improve environmental quality. However, the liability provisions of CERCLA and the Clean Water Act deter such efforts because parties that undertake reclamation or redevelopment risk being saddled with liability for pre-existing environmental conditions.

The reason that these provisions deter cleanups is that one set of rules is used to address two distinct tasks – the remediation of past pollution and deterrence against future pollution. Parties that initiate remedial actions are treated no differently than parties that generated the pollution in the first place. The result is that volunteer parties risk being held accountable for the extent of the entire cleanup.

Addressing these problems has taken two forms – Good Samaritan legislation to promote volunteer cleanups and Brownfields legislation to promote redevelopment. Conceptually, these two are related because in both cases potential liability is the major barrier. There has been some overlap in the legislative debate on these issues, specifically on the question of remining, but separate bills put forth addressing Good Samaritan and Brownfields legislation.

**A. Good Samaritan Cleanups**

The primary source of concern at abandoned mine sites are discharges that contribute to water quality degradation. The EPA policy, which has been upheld by the courts,[[10]](#endnote-10) is that these discharges need to be permitted though the National Pollutant Discharge Elimination System (NPDES) under Section 402 of the Clean Water Act. Any party that begins remediation activity, or in any way affects the current discharge, has to be permitted, and therefore that party assumes responsibility and potentially unlimited liability for meeting the permit standard. The assignment of liability occurs even if the remediating party had no role in generating the pollution, and even if the party had nothing to do with generating the water quality degradation at the site.

One of the unfortunate impacts of this liability is that it constrains the types of remeidal actions that states are willing to take. At the Alta Mine in Montana, for example, the state refuses to take steps to alter the discharge in fear that it will be forced to finance cleanup of what is a severely degraded watershed. Because the state feels that the cost of such a project would be prohibitive, it chooses to avoid actions that could expose it to liability (**cite, expand**).

There is almost universal agreement that relaxing Clean Water Act liability is necessary to promote abandoned mine cleanups. The remediating party would obtain a permit (from either a state agency or the EPA) that would limit some liability for pre-existing conditions, provided that the provisions of the permit are met. In principle, there is broad support for measures that would relax or eliminate liability to promote these voluntary “Good Samaritan” remediation efforts. The broad support quickly dissipates, however, when specific details are liability reform are considered. The sticking points concern whether the permits will be issued by a state or a federal agency, whether a permit can be issued for sites on federal lands, and the terms of the permit. However, the underlying disagreement primarily concerns who can be a remediating party. Environmental groups support a narrow definition of remediating party, which would essentially limit Good Samaritan status to state agencies. Other groups, including the mining industry, have advocated a borader interpretation that is more accommodating toward private parties as Good Samaritans, including remining and redevelopment.

These divides can be seen in every major issue surrounding Good Samaritan legislation, and the tradeoffs are generally transparent. The narrow interpretation would give these agencies more discretion in the way they handle water pollution discharges. Clearly, as the definition of the remediating parties expands, the chance that voluntary cleanup will occur increases. At issue, however, is building safeguards that will ensure that a responsible party will not escape liability, and that Good Samaritan legislation will not lead to projects where environmental quality is degraded further.

**1. PRP Search:** There is some question as to whether a volunteer must conduct a PRP search (however defined)[[11]](#endnote-11) before engaging in any remedial activities. If a PRP does exist, then a Good Samaritan cleanup will not be allowed. The purpose of the search provision is to ensure that responsible parties will not be able to avoid cleanup responsibility. This provision, however, is detrimental to private cleanups because it consumes both time and resources, and if a responsible party is located, the Good Samaritan effort will not go forward. In contrast, funding sources for state cleanups are often tied to completing a search. For instance, states must complete a PRP search in order to tap SMCRA funding for site reclamation. PRP searches are also routine under federal and state Superfund programs. Thus, a PRP search requirement would not create an additional hurdle for state abandoned mine programs because that hurdle already exists, and consequently state agencies generally do not object to these search provisions.[[12]](#endnote-12)

**2. Citizen Suits:** Citizen suits are allowable under the Clean Water Act. It is clear, however, that the citizen suit provision would provide a disincentive for any potential Good Samaritan cleanups. The argument against the citizen suit provision is that the rationale for Good Samaritan cleanups is that voluntary party is not a polluter, and therefore allowing for citizen suits is inappropriate. Environmental groups support the provision as a check against projects with potentially deleterious consequences. Industry interests counter that the provisions would severely curtail private cleanup efforts.

**3. State v. Federal Role:**  The federalism issue is whether EPA should maintain authority over a Good Samaritan program, or delegate permitting authority to the states. Under the Clean Water Act the EPA delegates authority to 43 states (1) to issue discharge permits to industries and municipalities and (2) to enforce the permit requirements. Both the EPA and enviornmental groups support control at the federal level (cite). The rationale for federal control is that it is inappropriate for a state to issue a permit to itself, given the uncertainty surrounding enforcement and the general absence of checks. There are also well-established arguments for devolving environmental control. States are closer to the actual situation, and therefore have a better chance to make appropriate decisions than the national government (**cites**).

**4. CERCLA Liability**: The question is whether Good Samaritan legislation should include a waiver for CERLA liability for remediating parties. Although the problems at abandoned mines are often not serious enough[[13]](#endnote-13) to warrant classification as Superfund sites (there are fewer than 100 mining sites being remediated through the Superfund program), the specter of liability that is strict, joint and several, and retroactive is more than sufficient deterrent to keep volunteer remediation efforts at bay. As a result, volunteer groups, the mining industry, and prospective lenders are unlikely to take on a project that could leave them liable for the cost of a hazardous waste cleanup. As we will see below, CERCLA liability is also central to the question of whether remining and redevelopment will be allowable. These are very contentious issues in the Good Samaritan debate, and the division is along predictable lines. At the same time, state agencies are not affected by CERCLA liability.

**5. Federal Lands:** The argument for excluding federal lands is that the federal government should adhere only to the highest standards in its management of public lands. Unfortunately, this stance is likely to leave many sites with no remediation whatever, and it limits the number of sites that might be addressed. In Montana, more than 20 percent of priority sites are on federal land, and there are some estimates that as many as 70 percent of abandoned mine lands are located on federal land.

Although Good Samaritan reform appears to be an issue with bipartisan support in principle, clearly there are deep divisions in practice. Many environmental organizations prefer federal oversight and deeply distrust the mining industry. Thus, the position of environmental groups on Good Samaritan legislation is to limit cleanups to state agencies by limiting the definition of remediating party, allowing for citizen suits, keeping CERCLA liability intact, excluding federal lands, and prohibiting remining and redevelopment. The mining industry takes the opposite side of every one of these provisions.

These deep divisions are unfortunate, because any Good Samaritan legislation that grants broader discretion to state agencies is likely to have immediate beneficial impacts across the West. One possibility would be to enact stopgap legislation to provide immediate liability relief for state abandoned mine programs, with an eye toward having private remediation and redevelopment issues packaged within proposed Brownfields legislation.

**B. Remining, Redevelopment, and Brownfields Legislation**

Mining companies often revisit old sites as exploration targets. As technology improves, it becomes possible for firms to profitably develop lower grade material. The promise of remining is that processing old workings can significantly reduce source contaminants that lead to acid drainage and heavy metals contamination by (1) removing or relocating old waste to new or improved storage, or (2) by stabilizing old waste using new control techniques. For example, a remining project at the Mercur Mine in Utah removed four million tons of tailings that were produced during operations conducted between 1890 and 1913 (Cite). Of course, it is possible that reworking of old sites could prove to be a failure, even escalating environmental degradation.

Thus, there are a number of promising reasons to examine remining. First, allowing remining increases the probability that the private sector will undertake remedial actions. Second, remining increases the number of potential avenues for addressing environmental problems. Third, revenues from remining will offset the total cleanup costs, along with shifting cleanup costs from the public to the private sector. Fourth, remining old sites reduces the need to develop new sites.

Remining has essentially be a deal breaker in Good Samaritan legislation, but the issue can also be packaged with Brownfields programs that promote environmentally-friendly urban renewal. Brownfields are generally considered abandoned urban industrial facilities where redevelopment is discouraged by liability concerns stemming from some form of environmental contamination. The focus of Brownfields legislation has been the provision of liability relief, direct subsidies, and tax incentives to promote redevelopment of these sites, while creating new jobs and fostering stronger tax bases. There are currently a number of federal funding sources for Brownfield projects, including EPA, HUD, and the Economic Development Administration.

The key question is whether the Brownfields argument for inner-city redevelopment also applies to redevelopment of abandoned and inactive mine sites. Like Brownfields projects, the primary obstacle to remining is liability. Clearly, however, there are substantial differences between typical Brownfield sites and what are predominantly rural abandoned mine sites. Moreover, there are no serious proponents of subsidizing private remining projects.

There is much overlap conceptually between Good Samaritan and Brownfields legislation, especially with respect to liability concerns and the question of state versus federal control. The primary difference is that redevelopment muddies the distinction between what is historic pollution and what is current pollution.

**1. Liability**

One option to limit liability is to provide some form of indemnification to remediating parties. There is some precedent for this for CERCLA cleanups, where remedial contractors are not held liable unless they cause damages through their own negligent actions. This is a straightforward program, in that it limits liability for the remediating party, but not for any potentially responsible parties. A second option is for the EPA to enter into a contract with the prospective remediating party not to sue under CERCLA. Contrating has the advantage of addressing with site-specific problems.

**2. Federalism** Again, the federalism question is important. The EPA and environmental groups favor some form of control at the federal level, specifically with respect to authority to intervene in emergency cases. For the most part, however, states have been much more effective at promoting redevelopment projects (**cite + expand**).

**3. Deterrence and Future Use** Another critical issue is the prevention of future harm stemming from redevelopment itself, as the means for establishing environmental safeguards for such projects moves us out of the domain of remediation, and presents the question of where to draw the line between historic and prospective pollution. One question is whether the party that redevelops a site should be required to bring the site to current environmental standards, or simply to ensure that the initial baseline conditions do not deteriorate further. Of course, there is likely to be plenty of room between these two extremes. Therefore, the task has been to craft rules that ensure some degree of environmental improvements, without making rules so stringent as to discourage redevelopment altogether. However, it is hard to imagine a case where a full-blown redevelopment program would not be subject to existing federal and state reclamation standards (and loosening these standards for specific projects may well generate local and national controversies). Therefore, deterrence will be dealt with through the existing regulatory structure, including some form of bonding mechanism (Boyd and Kunreuther, 1997; Gerard, 2000).

In this vein, linking environmental standards to the expected future land use has moved to the center of discussions of reforming CERCLA liability. In short, not all cleanups will be subsequently turned into residential developments or public schools, and therefore cleanup standards may well be too rigid for many or most potential redevelopment projects. By basing standards on local risk assessment, it is argued, can promote both economic development and environmental cleanup at the same time. It is further argued that the states will be more effective at crafting flexible standards than the federal EPA.[[14]](#endnote-14)

The issues surrounding remining are similar to those surrounding Good Samaritan cleanups. The allowance of remining complicates the basic scope of Good Samaritan legislation by extending it beyond the purview of the Clean Water Act. In practice, the subject of Good Samaritan cleanups and redevelopment projects have been separated because of the stiff opposition to remining from environmental groups. Recent political developments, however, suggest that Brownfield measures are gaining momementum, while Good Samaritan legislation has stalled. Therefore, it will be useful to think about how Brownfields is likely to work, and how Good Samaritan measures can be included in that package.

**Part 4: Retroactive Liability**

Given that the need for funding is far greater than actual funding, it is clear that addressing abandoned mine lands some requires discourse on how to fund cleanups. At issue is whether the costs of remediating pollution should be applied retroactively to firms, or financed through tax revenues. Under CERCLA, Congress established taxes to finance sites where no responsible party exists (orphan sites), but expected that the bulk of cleanup costs would be shouldered by private parties (Probst, et. al. 1995, 17). To meet this end, Congress broadly defined potentially responsible party to include generation, transport, or storing waste.

There are a number of arguments for maintaining the current liability structure,[[15]](#endnote-15) as well as a number of arguments against the current liability structure as a funding mechanism (Stroup, 1996; DeLong, 1995; Yandle, 2000), but in this section discussion is confined to applications to the mining industry (Tilton, 1995; Boyd and Kunreuther, 1997). First, retroactive liability has been assigned to only a handful of contaminated mining sites. Second, retroactive liability can assign liability to a potentially responsible party, but this party is not necessarily the party that is responsible, or that benefitted, from polluting activity. Third, retroactive liability can reduce deterrence against future harms.

Mining sites on CERCLA’s National Priorities List are typically sites where large-scale mining activities took place over the course of a number of decades, and are extremely costly to address (especially given Superfund’s stringent cleanup standards). Tilton (1995) argues that using retroactive liability is an inappropriate mechanism to make the polluter pay because the party tagged with the cleanup bill is unlikely to be the same party that benefitted from pollution in the first place. In many cases of historic pollution, Tilton argues that the shareholders and managers responsible for the polluting activities are not the same people incurring the burden of CERCLA liability. Firms used practices that were acceptable at the time, even though these practices did not account for the full environmental costs of the activity. As a result, production costs were less than the full social costs of the activity. However, in a competitive market, these lower costs would be passed on to consumers in the form of lower prices, and therefore consumers directly benefitted from the polluting activities. This reasoning, however, applies to cases where pollution took place before the property market began to recognize the effects of CERCLA liability. After CERCLA was enacted and the liability implications became clear, the purchase price of any historic mining property should have reflected its possible listing as a Superfund site.

As an example, Tilton (1995) examines the PRPs at the Superfund sites at Midvale, Utah. Midvale was the site of a lead-zinc floatation mill and a lead smelter, and mineral processing activities took place from 1906 through 1971. Sharon Steel purchased the site in 1979, the year prior to the passage of CERCLA, and subsequently was identified as a PRP by the EPA and the Department of Justice. A firm with more extensive involvement at Midvlae was the U.S. Smelting, Refining, and Mining Company, which had processed materials at the site since 1906. After mineral processing operations shut down in 1971, however, the company changed its name and became involved in commercial electronics, and subsequently went bankrupt. Its liquidating trust was identified as a second PRP. A third company with involvement at the site was the International Smelting and Refining Company, a subsidiary of Anaconda, which began sending materials to be processed in Midvale beginning in 1958. The Atlantic Richfield Company (Arco) purchased Anaconda, and consequently Arco was identified as a third PRP. Each of these PRPs shouldered roughly equal shares of a $63 million settlement.

Of these three PRPs, Sharon Steel clearly had no responsibility for generating the pollution, and was therefore only a responsible party in the legal sense. The other two firms both had direct or indirect involvement, but because of the competitive nature of the lead market, any cost savings were likely passed on to consumers. From the standpoint of the congressional intent of CERCLA, the PRP search was a success – three PRPs were identified and agreed to pay for the cleanup. What is much less clear is whether any of these parties could reasonably be classified as the polluters.

Boyd and Kunreuther (1997) argue against retroactive liability on different grounds. Specifically, assigning liability for past pollution reduces a company’s assets, and therefore reduces incentives to take precautions against risky activities. This is because liability rules only provide sufficient deterrent effects if the firm is responsible for the full extent of the harm that they might case. All else constant, we expect firms with deep pockets to take greater precautionary actions because such firms have more at stake. Firms that cannot cover the damages they cause are “judgement proof,” and are expected to engage in excessively risky behavior. Boyd and Kunreuther’s reasoning suggests, for instance, that the $20 million judgement against Sharon Steel reduced the company’s assets, and therefore increased the chance that the company would go bankrupt.

In general, arguments favoring retroactive liability are not very persuasive. In the context of abandoned mine cleanups, the arguments are even less persuasive. As a funding mechanism, it applies to only a few sites, and therefore it has done a poor job at addressing the universe of abandoned mines. Even when a PRP is identified and assigned liability, it is rare that this legally responsible party was the actual polluter. Moreover, as we have seen, retroactive liability has a significant deterrent effect against voluntary cleanup and redevelopment efforts.

**B. The Case Against the PRP Search**

The PRP search applies broadly. SMCRA funds cannot be allocated to projects where a PRP exists. Proposed Good Samaritan cleanups cannot go forward if a PRP exits. The Forest Service will not allocate funds to cleanup sites until a PRP search takes place, and BLM is conducting PRP searches on its cleanup sites. These are not necessarily subject to the same criticisms as the PRP searches under CERCLA because there are a number of cases where the operator failed to comply with a reclamation agreement. In such cases, the polluter should rightfully be held accountable for the cleanup costs.

The rationale for the PRP search requirement is sound: the public should not pay for cleanup if there is a responsible party. In the context of abandoned mine sites, however, the PRP search is a failed idea in need of reform. The expenditure of resources identifying a party uses funds that could have gone toward site assessment and remediation; and these searches delay cleanups.

In effect, the potential remediating party (whether a state agency planning to use SMCRA funds for a cleanup or a private party contemplating a Good Samaritan cleanup) is required to take steps to identify an owner or operator (e.g., current or past owners, mine operators, lessees). An identifiable owner is defined as a party that (1) is responsible for creating or contributing to the current conditions, and (2) is financially capable of compliance with current environmental standards or reclamation requirements. This process is likely to be complicated. As we have seen, land ownership in historic mining districts is most often a mixture of public and private land, and therefore there are often several parties with partial ownership or some history of operations at a given site. The search requirement does nothing to improve environmental quality. Instead it creates uncertainty as to whether cleanup will be allowed, and it diverts resources that could otherwise be allocated toward cleanup.

The Forest Service’s abandoned mine cleanup efforts are instructive on these issues. According to a 1996 Inspector General (IG) audit, the Forest Service had identified 335 contaminated sites, but the agency had remediated only 16 of these sites. The IG makes the case that the PRP search limited the number of site cleanups:

Because of emphasis on sites where [the Forest Service] is the only responsible party, [the Forest Service] has, so far, spent about $12.7 million on actual cleanup of mines and only 16 sites have been completely cleanup up (USDA, 1996, 9).

Even where the Forest Service found a PRP, however, it found it difficult to collect funds. The IG found that:

[The Forest Service] has pursued PRP’s (sic) at 29 sites with estimated cleanup cost of $48.5 million. Bills of collection totaling $4.3 million have been issued at only 6 sites and only $2.2 million collected. Of the $2.2 million collected, $1.56 million came from one PRP (USDA, 1996, 16).

Although the emphasis on sites with no identifiable PRPs delayed cleanup efforts, it did little to actually collect funds from PRPs. Presumably no cleanup had occurred at these sites. At the same time, because the Forest Service identified owners, these 29 sites would have been off limits to any remedial actions.

The arguments against identifying a PRP under CERCLA are that the legal definition of a PRP is unfair, leading to excessive litigation. The argument against a PRP search for Good Samaritan cleanups and the use of SMCRA funds is a waste of time and money, and it has no obvious environmental benefits. In some cases an owner or operator with clear liability is actually identified, and subsequently ponies up the funds for the cleanup. Such cases, however, appear to be rare.

If private funds are used, that is the choice of the private party; if public funds are used, the state or federal agency would be able to put a lien on the property or to sue to recover the remediation costs. There is no reason to believe that environmental quality would suffer if a PRP search was not required.

**Part 5: Public Funding**

Retroactive liability has been a failure in two major respects. First, it provides a strong deterrent against private remediation and redevelopment efforts. Second, it has secured funding for only a few sites, and the efficiency and fairness in these cases is questionable. Thus, public funding of cleanups is appropriate for addressing abandoned mine sites.

There are a number of sources of funding for abandoned mine reclamation projects, including the federal Superfund program, Clean Water Act grants, an interagency watershed cleanup run by the Forest Service and the BLM, and state programs financed by SMCRA funding and other sources. Funding has been extremely modest relative to the advertised cleanup costs in the billions of dollars.

At the federal level, BLM and the Forest Service are currently developing and expanding a watershed cleanup initiative to address problems stemming from abandoned mine lands on federal lands. BLM first received $1 million in 1997 to begin work on degraded watersheds in Montana and Colorado. The funding has since been expanded considerably. In 1998 BLM received $3 million, and the Forest Service also received $4.6 million, as the program expanded to include one watershed in Utah. By the end of 1998 three sites in Montana had been completed, and there was remediation activities at 13 other on-going cleanup projects in Montana, six in Colorado, and one in Utah. In 1999 BLM funding jumped to $10 million and Forest Service funding increased to $4.7 million. These programs are having positive impacts, but the scale and scope are both limited – the program covers only three states, and the focus on addressing safety hazards at individual sites is limited.

The performance of state programs has varied, but a number of states have taken major steps to address historic hardrock mining pollution. These programs often depend on federal funding sources. A number of states finance cleanups through excess funds from the federal Surface Mining Control and Reclamation Act (SMCRA). SMCRA taxes coal production within each state, and the funds are returned to the state for reclamation projects at abandoned coal mines. After a state has addressed all of its known coal‑related reclamation problems, it can use its funds to finance hardrock mine reclamation. For instance, SMCRA funds the Mine Waste Cleanup Bureau in Montana, which has reclaimed 408 coal mines, and has put surplus funds toward problems at 38 hardrock mine sites. SMCRA funds are of no help to major mining states like California, Nevada, Idaho, and Arizona where there is little or no coal mining, and therefore no SMCRA trust fund.

In a few cases, notably the Penn Mine in California, Congress has appropriated funds to finance specific remediation efforts. Some states receive considerable funding through Clean Water Act grants for non-point source pollution problems have been used in Colorado, Montana, New Mexico, and Utah. Colorado generates funds through a gaming tax, and Nevada finances projects through a tax on mining claims.

**A. Problems with Funding Sources**

There are a number of problems with current funding schemes. First, there is not enough money to address current needs. Second, government cleanup programs are constrained by inefficient restrictions on prioritizing and spending cleanup funds. Third, federal government has been reluctant to return SMCRA funds to the states.

**1. Restrictions on the Use of Funds** There are a number of restrictions on the use of SMCRA funds that reduce potential effectiveness of state remediation and restoration efforts. First, all coal mines must be reclaimed before funds can be used for hardrock mines. Second, SMCRA funds cannot be used if there is a party that can be held responsible for the cleanup. Third, SMCRA funds can only be applied to sites that were abandoned before the passage of the statute in 1977.[[16]](#endnote-16)

This seems like a reasonable restriction given that SMCRA funds are generated from a tax on coal producers. However, the restriction is inefficient except in the unlikely case that the last dollar spent on reclaiming the final coal mine has a higher realized benefit than the first dollar spent on hardrock mine cleanup.

**2. Funds not Returned to States** The federal government has failed to return millions of dollars of surplus funds to the states, hamstringing the budgets of agencies involved in identifying and remediating sites. The Abandoned Mine Land program receives all of its funding from a fee on coal production. Between 1978 and 1995 $5.4 billion was paid into the fund, but $1.4 billion of that money has not been appropriated. (Western Governors Association, 2000).

**3. Limitations for non-coal producing states.** SMCRA funds are of no help to major mining states like California, Nevada, Idaho, and Arizona where there is little or no coal mining, and therefore no SMCRA trust fund. Consequently, Wyoming has had modest hardrock mineral production, but has substantial SMCRA funding due to its coal production; whereas Arizona and Nevada, two dominant sources of hardrock mineral production, have no access to SMCRA funding for remediation projects.

With federal appropriations for federal projects and SMCRA funding for state projects, states like Colorado and Montana are making significant progress in their efforts to address problems with historic mining pollution. Even so, serious environmental and safety problems remain.

**B. The Case Against (and for) the Industry Specific Tax**

Taxes on specific industries to finance the cleanup of historic sites are a mixed bag. In the case of the CERCLA tax (that generated the Superfund) chemical and petroleum producers were taxed based on the amount of output of goods, not the generation of bads. As a result, there was no relationship between the amount of pollution and the amount of the tax, essentially providing no incentive to reduce waste emissions. So production was discouraged, but pollution per unit of production was not. Likewise, a tax on coal production is the source of the SMCRA trust fund. The benefits of generating tax revenue through this mechanism are offset by the costs of reduced production, higher prices for consumers, and lower profits for producers.

Under the 1872 Mining Law, the production of hardrock minerals on federal lands are not subject to a mineral royalty. This has been a major source of controversy in the debate over Mining Law reform, especially because there is a 12.5% royalty on production of oil and gas from federal lands.

There is little serious dispute that an increase in taxes will discourage domestic mineral exploration and production to some degree. The industry has agreed that some royalty is appropriate, and environmental and industry groups alike have agreed (again, in principle only) that a hardrock mineral royalty could be used to finance the cleanup of abandoned mine sites (cite). Given that greater public funding is necessary to address environmental and safety hazards at abandoned mine sites, the mineral royalty seems like an ideal fit.

There are, however, a number of potential drawbacks to imposing a mineral royalty to finance cleanups. First, the royalty is a tax on goods, not bads, and the mining industry is probably not equipped to absorb a significant tax increase.[[17]](#endnote-17) Second, royalties are not likely to generate a substantial amount of money (Expand). Third, if the tax is costly to administer, it is possible that costs of administering and complying with the tax will overwhelm the revenue generated.

**C. Recommendations**

AML sites are spread across public and private lands, and consequently there are myriad agencies involved in remediation activities (e.g., the Bureau of Land Management (BLM), The Forest Service, the National Park Service, state agencies, and the Environmental Protection Agency). Many states have already done extensive work identifying and prioritizing cleanups. There is no reason to supercede these efforts by developing a national program, especially if Brownfield legislation that is expected to pass has allowances for remining. However, there is a need for more public funding. Some of these funds could be generated through a mineral royalty; others should be financed through state and federal revenues.

State agencies receive overflow funds from the federal Surface Mining Control and Reclamation Act (SMCRA). Whatever the merits of funding hardrock cleanups with a tax on another industry, there are problems with federal appropriations process. These funds should be released immediately, and restrictions on use of funds should be lifted.

Funding for federal agencies is generally included in the normal budgetary process. Internal Inspector General audits should be conducted to evaluate progress of BLM and Forest Service progress to determine whether continuing and/or expanding funding of current projects is appropriate.

**Part 6: Conclusions and Recommendations**

There are thousands of abandoned mine sites in the western states, and these sites pose a range of environmental and safety hazards. For sites that are continuing sources of environmental degradation, and especially those affecting water quality, there should be immediate action. The biggest hurdles to addressing these problems are liability concerns and the absence of funding.

This paper develops a number of recommendations to make abandoned mine cleanup more effective.

1. Reform the Clean Water Act to allow for Good Samaritan cleanups.
2. Reform CERCLA. Specifically, place limitations on the use of retroactive liability in the search process for a potentially responsible party (PRP). In addition, encourage remining and redevelopment through a Brownfields-type redevelopment program.
3. Loosen restrictions on states’ use of SMCRA funds, including reform of the PRP search provisions.
4. An alternate approach to PRP search should be devised for proposed Good Samaritan cleanup legislation, and for cleanup of sites by public land management agencies.
5. Subject to an Inspector General or GAO audit, there should be an increase in funding for BLM and Forest Service watershed cleanups on federal lands.
6. Given the infrastructure developed both by state and federal agencies, there is no need for a national abandoned mines reclamation program.
7. There should, however, be a general increase in state and federal funding for environmental restoration projects given to the states in the form of block grants.
8. Many states, for instance, have primacy in administering and enforcing federal laws such as the Clean Water Act and SMCRA. Funding for remediation could be made contingent on having a certified state program.

This paper has examined problems of remediating historic pollution at abandoned mine sites. Although the analysis focuses on the nuances and peculiarities of abandoned mines, it is clear that there are some fundamental problems with the structure of federal environmental law. As we have seen, liability rules build in disincentives for remediation and redevelopment projects. There are a number of challenges for reforming liability rules, however. These include drawing the line between historic and prospective pollution, and dealing with parties already stung by liability. Recognizing the fundamental problems of existing law will take us a long way towards dealing with these problems.

**Endnotes**

1. . Detail some of the recent calamities. [↑](#endnote-ref-1)
2. . In practice, issues surrounding potentially responsible parties are not quite so straightforward. These issues are addressed in Parts 4 and 5. [↑](#endnote-ref-2)
3. .These problems are compounded by the complex ownership patterns of historic mining districts, where there were often multiple owners across private, state, and federal lands. In other cases there are dozens of parties who own part of the site, or have some history with mineral operations in the area. [↑](#endnote-ref-3)
4. .Explanatory note on smelting and processing... [↑](#endnote-ref-4)
5. . Note on Treasure on the Sierra Madre. [↑](#endnote-ref-5)
6. . Explanatory note on what sites are included in cost estimate.... It should also be noted that cleanup standards of the federal Superfund program are considered excessively stringent (Hamilton and Viscusi, 2000). [↑](#endnote-ref-6)
7. .For example, some estimates count an individual mining operations or mining district as a single site. Other surveys count each individual shaft, adit, or open pit as its own distinct site. In Arizona, for instance, the state surveyed 5,890 openings, shafts, adits, prospects, and quarried out areas and found 118 (2 percent) to pose possible environmental hazards, and another 668 (11 percent) to pose public safety hazards (Arizona State Mine Inspector, 1999). [↑](#endnote-ref-7)
8. . If every site was cleaned up to meet CERCLA standards, there is no telling how expensive the cleanup would be. [↑](#endnote-ref-8)
9. . In many cases, revenues generated through remining and reprocessing would offset costs of remediation (NMA, 1998; Poluter) [↑](#endnote-ref-9)
10. . **Cite court cases.** [↑](#endnote-ref-10)
11. . Discuss difference between PRP under CERCLA and PRP otherwise. [↑](#endnote-ref-11)
12. . The PRP search is examined more closely in the next section. [↑](#endnote-ref-12)
13. . The scoring system for including sites on the National Priorities List includes the size of the population exposed to the hazard. Many mine sites are in remote locations, or in areas with small populations, and consequently the risks to public health are not as immediate as sites in urban areas. [↑](#endnote-ref-13)
14. . Cite opposing views from RFF. [↑](#endnote-ref-14)
15. .First, retroactive liability can shift cleanup costs from poorly funded public agencies to better funded private sector entities. Second, eliminating joint and several liability scheme could hamstring negotiations concerning voluntary cleanup efforts. Third, eliminating retroactive liability would provide disincentives for current owners to pursue remedial actions to limit their own liability. Fourth, changing the current rules would penalize those who have already been subject to CERCLA liability; and would reward those who chose litigation over remediation. Fifth, eliminating retroactive liability would spawn litigation with respect to when pollution was generated. [↑](#endnote-ref-15)
16. . For hardrock mining sites on federal lands, the site must have been abandoned prior to August 28, 1974 on Forest Service lands and November 26, 1980, on BLM lands. [↑](#endnote-ref-16)
17. . Probst et.al. (1995) estimate that annual cleanup and transaction costs of the mining industry were $220.5 million annually, compared with industry profitability in the range of $300 million to $1 billion. Therefore, a tax would further cut into industry profitability, making domestic mining less attractive. [↑](#endnote-ref-17)