

# Cleaning Up Mining Waste

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## Introduction

Since the California gold rush a century and a half ago, hardrock mining has produced hundreds of billions of dollars' worth of gold, silver, copper, lead, and other minerals. Mining operations now employ some 360,000 people in the United States, producing annual personal and business income of an estimated \$42 billion.<sup>1</sup> One downside of this legacy, however, is that mining sites were often abandoned after the minerals were no longer economically retrievable. In some cases, these sites have caused environmental, health and safety problems. Discharges of acid and heavy metals from mine sites can pollute water supplies, affecting residential usage, fish populations, and wildlife habitats.

To illustrate how severe the damage can be, let us take one example: the High Ore Creek area near Helena, Montana.<sup>2</sup> For decades, the area had dozens of mines producing gold, silver, and lead. The mine tailings left behind turned the creek orange as it ran to the Boulder River. "In 1998 when officials from U.S. Geological Survey tested the water, using live fish tests, all the fish died within 72 hours."<sup>3</sup> Other tests conducted by the state of Montana found high levels of arsenic, lead, and zinc in the creek.

Fortunately, High Ore Creek is being cleaned up. Montana's Mine Waste Cleanup Bureau, with nearly \$2 million in funding from the Bureau of Land Management's Abandoned Mine Land (AML) program, formed a partnership with contractors and the Army Corps of Engineers to remove hundreds of thousands of cubic yards of mine tailings.

Other sites, however, have yet to receive such cleanup. The questions this article addresses are: 1) What is the best system to encourage the cleanup of waste left behind by past mining operations? and 2) How can we best prevent damage from being inflicted in the future? That is, what should we do about both abandoned mining sites and current mining sites?

The first problem is *who* should be held responsible. Much of the

environmental damage is caused by the remnants of mining operations that ceased decades ago, prior to modern environmental concerns and standards. Thus, it is often difficult to establish who, if anybody, can rightfully be held accountable for cleanup. In the first place the current owner may not have caused the damage. Many businesses (especially smaller mining companies) may lack the financial resources to remedy the damage and some may have gone bankrupt or left the area. According to one news report, and “Governors in Colorado, Montana and Idaho have all seen Canadian companies with [mining] operations declare bankruptcy and flee, leaving millions of dollars in cleanup costs at taxpayers’ feet.”<sup>4</sup> The Bureau of Land Management has reported that “many of the AML sites on BLM-managed lands are so old that no financially viable parties exist today, leaving the cleanup costs to the government and, ultimately, the taxpayer to bear.”<sup>5</sup>

A second problem is the sheer number of abandoned sites, and correspondingly, the potentially staggering cost of remediation. According to the Mineral Policy Center, a group that conducts research about mining, there are over one-half million abandoned and inactive mine sites across 32 states, including almost 15,000 with water contamination problems (see Table). The official estimate—admittedly a rough one—from the federal Bureau of Land Management is that there are between 100,000 and 500,000 abandoned hardrock mines on the public lands administered by that Bureau.<sup>6</sup> The Arizona State Mine Inspector’s Office estimates that Arizona alone may have up to 27,000 abandoned sites.<sup>7</sup> The BLM estimates that about 5 percent of abandoned mines are causing or could cause environmental damage, mostly water pollution.<sup>8</sup>

Current policy does not seem to address these problems very well. In the words of one critic, “After the mining is over, federal policy seems to disappear, and reclamation becomes a patchwork of local arrangements and accommodations and economic pressures. . . . Only when the patchwork fails does the federal government come back in with the Superfund laws and its lawsuits. By then, of course, the wealth is long gone, and only the environmental costs and impacts remain.”<sup>9</sup> At the same time current policies are sending mineral companies scurrying. Today, a major mining operation can be subject to 30 or more federal, state, and local regulations.<sup>10</sup> The resulting cost, confusion and uncertainty has caused “mining companies to replace domestic operations with overseas projects, a trend that is already strongly demonstrated in exploration.”<sup>11</sup>

In this paper, we describe the problems caused by abandoned mines and the way that some federal environmental laws create a disincentive for anyone to clean up mine sites. We then suggest possible solutions to the problem.

**Table**  
**Estimates of Abandoned Mine Cleanup Costs**

Category	Number of Sites	% of Total Sites	Characteristics of Site	Average Cleanup Cost Per Site (thousands \$)
Benign	194,500	34.88	no safety hazards or water quality threats	\$ -
Landscape Disturbance	231,900	41.59	waste piles, poor vegetation, severe erosion	4.4
Safety Hazard	116,300	20.86	shafts, adits, collapsed or unstable ground	19.5
Surface Water Contamination	14,400	2.58	acid discharge, heavy metal contamination of surface water	1,000 – 3,000
Groundwater Contamination	500	0.09	acid discharge, heavy metal contamination of groundwater	7,500 – 12,500
Superfund	<u>52</u>	0.01	extreme nastiness	250,000 – 350,000
Total Sites	557,652			

Note: The estimates are for 32 western states. The Mineral Policy Center estimates total cleanup costs at \$33 to \$72 billion; whereas, the now defunct Bureau of Mines estimated cleanup costs at \$4 to \$35.3 billion.

Sources: James S. Lyon, Thomas J. Hilliard, and Thomas N. Bethell, *BURDEN OF GILT*, Mineral Policy Center (1993); United States General Accounting Office, *FEDERAL LAND MANAGEMENT: INFORMATION ON EFFORTS TO INVENTORY ABANDONED HARD ROCK MINES*. RCED-96-30, February 23, 1996, 16.

## Background

Mining necessarily involves digging up and moving tons of rock and soil and then separating the valuable metal from the rock through chemical treatment or smelting of the crushed material. This process usually generates large amounts of waste, the disposal of which can create several problems:

- Heavy metal contamination can reduce soil productivity or sterilize the soil altogether. The absence of vegetation can make the site more susceptible to runoff, soil erosion, and potentially unstable ground.

- Acid drainage, “water containing acidity, iron, manganese, aluminum,” and possibly “iron hydroxide and sulfuric acid,”<sup>12</sup> can enter water supplies according to the Environmental Protection Agency, thousands of miles of streams have so much acid drainage that it has destroyed plant and animal life; some of the worst examples of this type of pollution are “from decades-old abandoned mines in Pennsylvania and West Virginia.”<sup>13</sup>
- Blown dust and tailings are a source of air pollution.
- Ruptures of dams, ponds, and impoundments can flood adjacent lands and discharge pollutants into waterways.

Summarizing the problems, the Bureau of Land Management reports that typical environmental problems include “contaminated/acidic water (surface and ground); stockpiled waste rock and tailings; contaminated soils; stored chemicals/leaking containers; fallout from impacts on wildlife, vegetation, and human habitation.”<sup>14</sup>

The process of fixing these problems is called reclamation. Reclamation restores the site to something similar to its condition before mining. According to the National Research Council, it involves “reducing the slopes on the edges of waste rock dumps and heaps to minimize erosion; capping these piles and tailings piles with soil; planting grasses or other plants that will benefit wildlife or grazing stock and help prevent erosion; directing water flow with French drains and other means to minimize the contact of meteoric water with potentially acid-generating sulfides in the dumps, heaps, and tailings piles; removing buildings; and eliminating roads to minimize unnecessary future entry by vehicles.”<sup>15</sup>

The cost can be substantial. For instance, removing and securing waste material at the Blackfoot Tailings site in Montana—an abandoned gold mine on Forest Service land—cost almost \$250,000.<sup>16</sup> If there is an acid drainage 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—which in theory addresses only the most serious of environmental problems—is \$170.4 million.<sup>17</sup>

## The Evolution from Common Law to Modern Regulation

### Common Law

Prior to the major regulatory efforts of the mid-20th century, the common law doctrines of tort and nuisance were the chief means of controlling damage caused by mining. As mining was not a nuisance *per se*,<sup>18</sup> the plaintiff in such cases had to demonstrate that some harm had resulted through intentional or negligent action and that there was a causal connection between the defendant's conduct and the realized harm. In cases where the defendant's activity is extraordinarily dangerous (such as the storage of mining wastes in tailings impoundments) the courts used a strict liability rule. Tort awards were generally in the form of monetary compensation, while nuisance remedies could either be monetary compensation or injunctive relief to put a stop to the offending activity. City and town governments, farmers, and agricultural groups often successfully sued mining operations for water pollution and soil contamination.<sup>19</sup>

Starting in the mid-20th century, however, common law rules began to be supplemented by an array of federal environmental statutes that held polluters and others associated with mining activities accountable for damage. The Clean Water Act, the Clean Air Act, the National Environmental Policy Act, the Endangered Species Act, and CERCLA all apply to mining and mineral development. In 1974 the Forest Service promulgated surface management regulations covering exploration, development, and reclamation, and the BLM established similar regulations for its lands in 1981. As noted above, over 30 state, federal, and local laws can conceivably apply to any major mining operation.<sup>20</sup> It is beyond the scope of this article to discuss most of these laws,<sup>21</sup> so we focus on the two most important laws that can apply to water-based pollution at abandoned mining sites: The Clean Water Act, and CERCLA.

### Current Regulations

#### *The Clean Water Act*

The Clean Water Act<sup>22</sup> prohibits any polluting discharges from "point sources" into navigable waters of the United States.<sup>23</sup> The term "point source" includes any "discernible, confined, and discrete conveyance, including such structures as pipes, ditches, and channels."<sup>24</sup> Discharges are allowed only with an NPDES (National Pollutant Discharge Elimination System) permit.<sup>25</sup>

Under the Clean Water Act, the states are charged with adopting their own water quality standards for their own waters.<sup>26</sup> In most cases, the EPA does not administer the permits itself; that task is delegated to the respective state as long as the EPA has approved the state's regulatory program.<sup>27</sup> The only

western states that do not have EPA-approved permit programs under the Clean Water Act are Alaska, Arizona, Idaho, and New Mexico.<sup>28</sup> Typically, mining companies are subject to Clean Water Act liability for violating effluent limitations based on water quality standards.<sup>29</sup> Private citizens can enforce the Clean Water Act through civil suits,<sup>30</sup> while the government often brings civil or even criminal actions against landowners.<sup>31</sup>

The crucial thing to know about liability under the Clean Water Act is that it is effectively retroactive—that is, it makes the current landowner liable for pollution resulting from past activities on that land, even if the landowner is completely innocent.<sup>32</sup> In fact, innocent parties who attempted to contain the effects of acid mine drainage have been held liable for the remaining pollution. In one famous case, the Ninth Circuit Court of Appeals held that the East Bay Municipal Utility District—which had built a dam and reservoir in order to contain toxic runoff from a mining site abandoned in the 1950s—could be held liable under the Clean Water Act for any pollution ultimately discharged from the reservoir.<sup>33</sup> The utility district argued that the water flowing into the river was no more polluted than before the dam was constructed, and that it should not be liable unless the “facility produces a net increase in the acidity of the surface runoff.”<sup>34</sup> The court disagreed, saying that the Clean Water Act does not exempt point sources that create no net increase in the level of pollution, but rather “categorically prohibits any discharge of a pollutant from a point source without a permit.”<sup>35</sup> Thus, the utility district was liable for pollution that already existed and that it was trying to remedy.

### **CERCLA**

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (the Superfund law) is the most significant environmental cleanup legislation of all. Under CERCLA, the EPA classifies polluted sites by their level of dangerousness, and puts the most dangerous on the National Priority List. This makes these sites eligible for cleanup funds from Superfund. Superfund is a congressionally authorized multi-billion dollar fund (mostly taken from taxes on the chemical and petroleum industries and costs recovered from responsible parties) to help clean up sites on the National Priority List.<sup>36</sup> When a site is put on the National Priority List, the EPA and private citizens<sup>37</sup> can sue any companies or individuals that are even remotely connected to the site in order to force them to pay for cleanup costs. Such parties—called potentially responsible parties, or PRPs—include anyone who generated or arranged for the treatment or disposal of hazardous substances or who transported hazardous substances for treatment or disposal; or any present and past owner or operator of a facility at which hazardous substances have been disposed of.<sup>38</sup> The EPA can also sue for damages for the “injury to, destruction

of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss.”<sup>39</sup>

What is crucial about CERCLA is that liability under it is *strict* (that is, the potentially responsible party or PRP need not have been negligent), *joint and several* (that is, any one PRP can be sued for the *entire* damage),<sup>40</sup> and *retroactive* (that is, a current owner can be sued for any damages caused by past disposal of hazardous substances).<sup>41</sup> The only limit on liability for damages caused by another party is the “third-party” defense, which arises for an innocent purchaser who inquires about the property but is unaware of the pollution at the time of purchase.<sup>42</sup> Though a comparatively small number of abandoned mines have serious enough damage to make the EPA’s National Priority List—a September 2001 search of the Superfund Web site for the terms “mine” and “mining” turned up 200 files—the potential for placement on that list, with the accompanying CERCLA liability, causes great fear among many owners of mining sites.

To make matters worse, the cost of remediating Superfund sites is greatly increased by the sheer cost of negotiating and litigating over who is responsible.<sup>43</sup> Many entities, including the EPA, the Justice Department, PRPs, state agencies, local communities, and insurers, must hire lawyers and expert witnesses during the battle over the distribution of liability. According to one widely cited estimate, such background transaction costs account for approximately one-third of private sector expenditures under Superfund.<sup>44</sup>

## **Retroactive Liability**

### ***Penalizing the Wrong Party***

As described above, liability under CERCLA and the Clean Water Act is often retroactive, penalizing the current owner of a mining site for damage caused in the past. The first problem with retroactive liability is that it fails to place the cost of cleanup on the party that is actually responsible for the damage. Mining sites on the Superfund National Priority List (the sites the EPA has designated as having the highest priority for cleanup) are typically places where large-scale mining activities took place over several decades. Firms used practices that were acceptable at the time, even though these practices did not account for the full environmental costs of the activity (at least as viewed through the lens of contemporary priorities). As a result, production costs were less than the full costs of the activity as valued today.

In a competitive market, these lower costs were passed on to consumers in the form of lower prices, benefiting consumers of copper wires, lead batteries, and hosts of other products. Thus, the companies and their shareholders (i.e., the polluters) did not necessarily generate extraordinary profits stemming from the polluting activities. Furthermore, there is no reason to expect that current

shareholders are benefiting from past polluting activities. In other words, the party tagged with the cleanup bill is unlikely to be the same party (or parties) that benefited from pollution in the first place.<sup>45</sup>

Let us look at an example of this problem: Midvale, Utah, was the site of a lead-zinc processing facility, where 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 potentially responsible party (PRP) by the EPA and the Department of Justice.

A firm with more extensive involvement at Midvale 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, the company changed its name, became involved in commercial electronics, and subsequently went bankrupt. Its liquidating trust was identified as a second PRP.

A third company was the International Smelting and Refining Company, a subsidiary of Anaconda, which began sending materials to Midvale for processing in 1958. The Atlantic Richfield Company (ARCO) purchased Anaconda, and consequently ARCO was identified as a third PRP. Each company shouldered roughly equal shares of a \$63 million settlement.<sup>46</sup>

Of these three, Sharon Steel clearly had no responsibility for generating the pollution, and was therefore a responsible party only in a 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 they experienced were probably passed on to consumers. So, while three PRPs were identified and agreed to pay for the cleanup, it would be difficult to argue that any of these parties could reasonably be classified as the polluters of the site.<sup>47</sup>

### ***Creating the Wrong Incentives***

Another problem with retroactive liability is that it creates a disincentive to clean up old sites. Modern mining companies can often find ways to “remine” old mining sites, while cleaning up old waste products in the process.<sup>48</sup>

Remining can be beneficial in several respects. First, allowing remining gives the private sector an incentive to undertake remedial actions. Second, revenues from remining will offset the total cleanup costs and shift cleanup costs from the public to the private sector. Third, remining old sites reduces the need for mining companies to develop new sites.

For example, the Office of Surface Mining reports on a cleanup project near Wilkes-Barre, Pennsylvania. At the abandoned mine site there, waste was left in “80 to 100 foot high piles,” causing “air and water pollution problems, danger from waste pile fires,” not to mention sheer ugliness.<sup>49</sup> “Although this



material was considered waste when it was originally mined,” the office observes, “today with modern cleaning and processing equipment a large amount of usable coal can be remined and used to produce electricity.”<sup>50</sup> During the cleanup process, a mobile processing plant was set up on site to separate the usable coal from rock and clay waste. The waste was used to fill underground spaces and “prevent future subsidence of the land surface.”<sup>51</sup> After reclamation, the site was “transformed from a blighted wasteland with its towering black mountains into a gently sloped green grassland.”<sup>52</sup>

Such success stories, however, are inhibited by the possibility of retroactive liability. As the National Resource Council put it:

[S]ome federal environmental laws, such as the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and potentially the Resource Conservation and Recovery Act, discourage these opportunities and encourage companies to design their operations to avoid redisturbing previously disturbed areas. Similarly, operators are discouraged from reclaiming previously mined areas in the vicinity of new mining operations, even though the work would be beneficial and voluntary on the part of the miner. Reclamation of some abandoned mines has been integrated into current operations, and nearby historic waste disposal sites have been reclaimed in connection with ongoing mining activities. This is done, however, at the miners’ risk. As a result of existing statutes, mine operators conducting work at an abandoned mine site could incur liabilities. Some states have environmental laws that may pose additional barriers to voluntary clean up. Therefore, operators avoid redisturbance of abandoned mine discharges and arrange their own discharges so that the pre-existing discharge is not affected. This is not in the best interests of environmental protection; opportunities for remediation are missed and new operations are, in effect, encouraged to disturb undisturbed lands.<sup>53</sup>

This problem can be illustrated by what happened at the Crown Butte mine in Montana. As described by Ray Ring,<sup>54</sup> Crown Butte Resources, Ltd. decided to open a new gold mine in the 1980s on a site where claims had been worked by some 20 previous owners. Crown Butte spent \$500,000 to begin reclaiming old mines. The government kicked in another \$500,000 for reclamation as well. But then, in an attempt to prevent any further mining, several environmental groups (including the Earthjustice Legal Defense Fund) sued under the Clean Water Act in federal court. In a 1995 ruling, a federal judge held that even though most of the pollution was due to the historic abandoned mines, the company was in violation of the Clean Water Act.<sup>55</sup> The result? The company agreed to be bought out by the federal government, which then began

reclamation efforts.

This might seem like a happy ending for the environmentalists because it avoided additional mining. But the incentive illustrated here is one that discourages companies from undertaking any reclamation efforts at thousands of old sites. “Companies have become hesitant to remine or have anything else to do with old diggings. ‘It discourages new enterprises,’ says Chris Hayes, a Colorado attorney who works on reclamation issues. It also reduces one of the few sources of money, because companies engaged in re-entry and remining had paid for some reclamation of old diggings.”<sup>56</sup>

The same perverse incentive affects even state governments, which can equally face federal environmental liability if they attempt to reclaim mining sites and fail to improve the water enough to meet the Clean Water Act’s ambiguous standards.<sup>57</sup> An official of Montana’s waste cleanup bureau has said that the state “has hesitated to try to clean up some mines.”<sup>58</sup> The Western Governors’ Association has noted that fear of liability has hampered cooperation between federal and state governments; in some instances, “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.”<sup>59</sup>

To take another example, at the Alta Mine in Jefferson County, Montana, gold, silver, copper, lead, and zinc were mined and smelted from 1870 through 1957, resulting in a severely contaminated watershed.<sup>60</sup> The site produces a discharge of heavy metals, including arsenic, cadmium, lead, and mercury, that affects at least seven miles of streams. Eleven homes in the town of Corbin have had to replace their drinking water supply at a cost of \$300,000. The Montana Department of Environmental Quality (DEQ) has conducted remedial work, including closing hazardous openings and securing contaminated soil. However, it has not de-contaminated the water, even though it could do so by neutralizing the acidic discharge with lime and by producing filtration areas. Any diversion of the water would make the state culpable for the full cleanup under the Clean Water Act, and that is not a price the state is willing to pay.

Finally, Boyd and Kunreuther argue that retroactive liability has the unintended consequence of limiting deterrence.<sup>61</sup> Assigning liability for past pollution reduces a company’s assets, reducing 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 it might cause. All else constant, we expect firms with deep pockets to take greater precaution because such firms have more at stake. Firms that cannot cover the damages they cause are “judgment proof,” and are likely to engage in excessively risky behavior. Boyd and Kunreuther’s reasoning suggests that the \$20 million judgment against Sharon Steel reduced the company’s assets, and increased the chance that the company would go bankrupt; this limited the deterrent effect for any of the company’s ongoing operations.

## Legislative Remedies to Retroactivity

### *Private Agreements*

On occasion, the government will agree not to sue prospective purchasers under CERCLA, subject to some stringent conditions.<sup>62</sup> In some situations, these agreements can indeed eliminate the disincentives for new purchasers to buy polluted sites and clean them up. But transaction costs are probably much too high for this to be an effective solution. Lynn Kornfeld points out that the negotiation process can be “very costly and time consuming,” that mining companies fear that even investigating an abandoned site could lead to CERCLA liability, and that neither the EPA nor mining companies are likely to waste time negotiating in the first place unless there is some prospect of a successful deal.<sup>63</sup> Thus, while such private agreements can be useful where they occur, their application is limited. We will move on to a more promising solution.

### *Good Samaritan Legislation*

Just as the first principle of Hippocrates is “Do no harm,” the first principle for mining liability should be, “Don’t prevent companies from acting in the public good when that is what they want to do.” The best way to eliminate the bad incentives created by CERCLA and the Clean Water Act is simply to *eliminate all liability for pre-existing environmental pollution*. That is, if a company buys an old mining site in order to clean up, remine it, build a golf course, or do anything else, it should not be held liable for any pollution unless and until the levels of pollution exceed the previous levels. Thus, the standard should be: “No liability unless you make things worse than before.”

How does this differ from current law? CERCLA does have a provision that allows “response action contractors”<sup>64</sup> to repair environmental damage without liability, unless damage results from their negligence, gross negligence, or intentional misconduct.<sup>65</sup> A response action contractor, however, is defined as a party who contracts with the responsible party or the government to clean up the site; the term does not include any prospective owner of the site.<sup>66</sup> CERCLA also has an “innocent owner” provision, which provides that landowners can be exempt if they “exercised due care with respect to the hazardous substance,”<sup>67</sup> made “all appropriate inquiry into the previous ownership and uses of the property,”<sup>68</sup> and did not know or have reason to know of the hazardous substance at the time of purchase.<sup>69</sup> And the Clean Water Act allows states to take into account the previous level of pollution when setting effluent limitations for coal remining operations.<sup>70</sup> While these possibilities appear to be reasonable, they are applied case-by-case,

not consistently, making the process uncertain and expensive.

In any event, there does not exist in federal law anything resembling our proposal that liability attach only where a new siteowner leaves the site in worse condition than before. Because this proposal resembles in some respects the various “Good Samaritan” laws that have been proposed, we will briefly discuss the many controversies that have plagued such laws.

First, people have disagreed over *who* should be allowed to remediate without liability. Our conclusion is that anyone should be able to do so. As long as the environmental pollution is no worse than before, no one should have a right to complain about remining or remedial efforts. Allowing anyone to be a remediating party increases the chances that voluntary cleanup will occur, which is something to be favored.

The second problem is whether anyone should try to find the original polluter. Most people agree that if the original polluter (or responsible party) can be found, that party should still be liable.<sup>71</sup> A more difficult question, though, is whether the potential Good Samaritan should be required to search for a “responsible party” before beginning cleanup, and how much effort should go into such a search. Today, funding sources for state cleanups are often tied to completing such a search. For instance, states must complete a PRP search in order to tap Surface Mining Control and Reclamation Act funding for site reclamation. Such searches are also routine under federal and state Superfund programs. But while the government may wish to engage in such searches on its own, there is absolutely no reason to make a private party—who wishes only to clean up or remine the property—hold off its cleanup efforts until it has borne the cost of searching for original polluters. No matter who an original polluter may be, that is irrelevant to the question of whether a new party should be allowed to clean up or remine the property. The overall effect of any search requirement is to increase the costs of private Good Samaritan efforts, making them less likely.

Yet another problem is that of citizen suits. Federal environmental statutes typically allow private citizens to file suit to enforce federal environmental laws. Should such suits should be allowed against a party acting as a Good Samaritan? Environmental groups support citizen suit provisions as a check against remedial or redevelopment projects that might result in more pollution instead of less. Again, though, as long as things are not worse than before, no one should have anything to complain about with regard to a remediating party’s efforts.<sup>72</sup>

In sum, this proposal—no liability unless things are worse than before—is the best way to remove the bad incentives created by retroactive liability under federal environmental laws.

## Public Funding

### Current Funding Sources—Federal and State

Several sources of funding exist for abandoned mine reclamation projects. These include the federal Superfund program, Clean Water Act grants, an interagency watershed cleanup project operated by the Forest Service and the Bureau of Land Management, and state programs financed by Surface Mining Control and Reclamation Act (SMCRA) funds and other sources.

As for the federal government's efforts, the main program has been the Abandoned Mine Land program (AML), which was set up by the Surface Mining Control and Reclamation Act of 1977.<sup>73</sup> At that time, the estimated cost of reclaiming the AML sites was estimated to be \$33 billion.<sup>74</sup> The AML Fund receives fees from current coal production—35 cents per ton of coal mined from the surface, 15 cents per ton of coal mined underground, and 10 cents per ton of lignite—and deposits the fees into the Abandoned Mine Reclamation Fund. As of September 30, 2000, the fund had collected almost \$6 billion.<sup>75</sup> As a general matter, half of the AML trust fund money goes to the states, and the rest is allocated by the federal government to various programs and projects related to mine cleanups.<sup>76</sup> 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. In addition, between 1977 and 1995, the Rural Abandoned Mine Program (operated by the Department of Agriculture) spent some \$95 million on the reclamation of small rural mines, a relatively small amount compared to the nearly \$3 billion spent under the AML program during the same period.<sup>77</sup>

Beginning in 1997, the Bureau of Land Management began cleanup operations under the AML program.<sup>78</sup> As of late 2000, the BLM reported that it had completed 78 such cleanups, mostly in western states.<sup>79</sup> Sixty-five AML projects were funded for fiscal year 2001.<sup>80</sup> In addition to the AML funds, a few smaller projects are under way from the federal government's Office of Surface Mining, part of the Department of the Interior. Its Reforestation Initiative is an ongoing attempt to develop methods of reforestation on land once devoted to mining.<sup>81</sup> Its Appalachian Clean Stream Initiative provides grants of up to \$100,000 to local nonprofit organizations that undertake acid mine drainage reclamation projects on land used for coal mining.<sup>82</sup>

Restrictions on the use of SMCRA funds reduce its effectiveness. First, SMCRA funding is limited to the extent of coal mining in any given state, which means that SMCRA funds are of little help to major mining states like California, Nevada, Idaho, and Arizona where there is little or no coal mining. Wyoming has had modest hardrock mineral production, but has substantial SMCRA funding due to its coal production; while Arizona and Nevada, two

dominant hardrock mineral states, have no access to SMCRA funding for remediation. The restriction seems reasonable, given that SMCRA funds are generated from a tax on coal producers. However, it 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.

Another limitation is that funds can be spent on noncoal mines *only* after a state “certifies” that all its coal mines have been sufficiently reclaimed, and even then the only eligible sites are those that were abandoned or inadequately reclaimed prior to August 3, 1977, the date of the Surface Mining Act.<sup>83</sup> As a result, the Office of Surface Mining reports, only about 5.9 percent of AML funds so far have been available for noncoal mining reclamation efforts.<sup>84</sup>

Funding remains extremely limited compared to the scope of the problem. In fiscal year 1997, only \$31,100,164 was spent on SMCRA-noncoal reclamation, and nearly two-thirds of that figure (\$22 million) was spent in Wyoming.<sup>85</sup> As for federal lands, the BLM received a mere \$1 million in 1997, \$3 million in 1998, and \$10 million in each of 1999, 2000, and 2001.<sup>86</sup>

In addition, the federal government has failed to return millions of dollars of surplus SMCRA funds to the states, hamstringing the budgets of agencies involved in identifying and remediating sites. While almost \$6 billion has been paid into the AML fund, \$1.3 billion of that money has not been appropriated, including over \$80 million to major hardrock mining states in the West.<sup>87</sup>

The performance of state programs has varied, but a number of states have taken major steps to address historic hardrock mining pollution. In a few cases, notably the Penn Mine in California, Congress has appropriated funds to finance specific remediation efforts. Some states receive funding through Clean Water Act grants for nonpoint source pollution problems, including Colorado, Montana, New Mexico, and Utah. Colorado generates funds through a gaming tax, and Nevada finances projects through a tax on mining claims. State funding remains limited, however—in 1997, total state spending on reclamation of hardrock mines was barely over \$2 million<sup>88</sup>—which is far short of what would be necessary to solve the problems.

### **Is Public Funding a Good Idea?**

A number of factors argue in favor of a greater emphasis on public funding for addressing abandoned and inactive mine sites. The problem with most abandoned mines is that the polluter is gone. Unless some group or corporation cleans it up voluntarily (or a new mining company remines the site), any cleanup will have to be done with public funds.

On the other hand, there are several reasons to be wary of public financing, at least as currently structured. First, AML funds have typically come from fees imposed on current mining operations. While this may seem fair, when mining

companies are required to pay both—AML fees (for the damage caused by miners decades ago) as well as post reclamation bonds (for their own ongoing activities), the result is double liability. The efficient level of liability, of course, forces companies to account for the costs of their operations. Adding to that the costs of cleaning up past operations can only cause the amount of mining to be inefficiently low.

Moreover, economists view a publicly funded remediation project as efficient only if the marginal benefits exceed the marginal social opportunity cost of the funds. It may well be the case that a number of sites characterized as environmental and safety hazards simply do not merit public funding for cleanup because resources would be better spent elsewhere. It seems unlikely that the public would be willing to pay for full restoration of every abandoned mine site—especially since the cleanup of some sites may generate no benefit at all.

In addition to the costs of program outlays, the costs of public funding mechanisms include potential distortions associated with generating and distributing funds. Some economists argue that the self-interest of politicians and interest groups is central to determining the allocation of funds, so that funding is distributed as political pork for legislators seeking funds for their home states or districts.<sup>89</sup>

Finally, the case for federal intervention is particularly weak here. Few, if any, abandoned mining sites create interstate pollution (a factor that, if present, creates a disincentive for a given state to clean up its own pollution).<sup>90</sup> Even though many sites are on federal lands, the benefits of cleanup would almost always be local. This suggests that cleanup costs—to the extent they are government funded—should come from state funds. Cleanup programs should face the full opportunity costs of their funding sources, because only then are states likely to order priorities and complete remedial actions in a cost-minimizing fashion.

## Ways to Prevent or Mitigate Future Damage

### An Industry Tax?

Some have suggested that an industry tax might be the best way to a) deter environmental damage and b) provide funds for cleanups. While appealing on the surface, this sort of tax would be extraordinarily difficult to administer properly.

Since Arthur Pigou first proposed the idea of a pollution tax,<sup>91</sup> economists have believed that such a tax is more efficient than a specific limit on pollution.<sup>92</sup> There are several reasons why this is so: a) specific limits fail to

account for increasing marginal costs of abatement,<sup>93</sup> whereas a tax allows the polluters to choose whether or not a particular reduction is cost-effective,<sup>94</sup> thus encouraging “the reduction of emissions where it can be done at least cost”<sup>95</sup>; b) uniform limits fail to allow flexibility according to local conditions (an industrial park need not be as clean as a children’s park, for example)<sup>96</sup>; c) the proceeds of a tax can be used to alleviate the distortional effects of other taxes<sup>97</sup>; and d) under specific limits, producers who meet the standard have no incentive to reduce pollution further, whereas a tax provides an incentive to keep searching for more efficient technologies.<sup>98</sup>

In theory, the per unit tax on output should be equivalent to the marginal social damage of that output. If so, the tax will lead to the efficient amount of production and will also generate a source of revenue that can be used to remediate past damages caused by the industry.

Most schemes devised to finance hazardous waste cleanups, however, fall short of this theoretical standard. In the case of the CERCLA tax (which generated Superfund), chemical and petroleum producers were taxed based on their production, not on their actual levels of pollution. As a result, there was no correlation between the level of pollution and the amount of the tax. Any company that produced, say, 1 million barrels of oil would pay the same tax, whether the company polluted a lot or not at all. Thus, a tax on goods provides no incentive to reduce waste emissions. Overall production is discouraged, but actual pollution is not.

The same has happened with coal mining, where a tax on coal production has been the source of the SMCRA trust fund. The tax applies to all coal production, whether it is done with a little pollution or a lot.

So, the question is: Can there be an effective tax on mining pollution? The answer, unfortunately, is probably no. With abandoned mines, it is simply not possible to tax each unit of pollution that is emitted. The very problem with abandoned mine sites is that they can continue to produce pollution—acid drainage, for example—for many decades after the site has been abandoned and the polluter has disappeared, which means there is no one to tax and no current revenue stream available to pay a tax, anyway. If a tax were imposed on hardrock mining—similar to the coal mining fee under SMCRA or the Superfund tax—the effect would be primarily distortional rather than efficient.

## **Bonding**

Requiring mining companies to post bonds may be the best way to encourage efficient decision-making by current mining companies, while also providing a source of funds for cleanups later. Under the Surface Mining Control and Reclamation Act, for example, a reclamation bond must be posted before anyone can obtain a coal mining permit.<sup>99</sup> As long as the bond is large



enough to equal the costs of reclamation, this ensures that public authorities will have the resources to reclaim the mine if the company fails to do so.<sup>100</sup>

If bonds are set too low, companies can end up leaving the cleanup costs to the public treasury. In one infamous example, the Colorado state government required only \$4.5 million in bonding (of which only \$2.3 million was cash) from Galactic Resources Ltd., the company that ran the Summitville Gold Mine.<sup>101</sup> In 1992, Galactic went bankrupt, leaving behind a mining site that leaked cyanide into the Alamosa River. As of 2001, the cleanup had cost some \$155 million dollars.<sup>102</sup> Almost all the money had to come from Superfund, and at the time it was the “biggest mine reclamation” ever under the Superfund program, according to an EPA manager.<sup>103</sup> After that fiasco, Colorado required a new mine near Cripple Creek to post a minimum of \$40 million in cash.<sup>104</sup> For another example, the owners of Montana’s Gulch Mining Company “fled . . . in the middle of the night in 1989 after being confronted belatedly by understaffed state regulators,” leaving a mere \$30,000 reclamation bond for what would likely be millions of dollars in reclamation expenses.<sup>105</sup>

Other states should heed these stories. As long as the bond rates are set accurately (which, admittedly, can be difficult given the uncertainties associated with predicting decades into the future), then any mining site that does not appear to offer enough ore to cover the bond and other expenses would not be mined in the first place.<sup>106</sup> A manager at a mining company has stated, “If the property is not profitable enough for them to reclaim the ground as they’re mining, then they shouldn’t be mining it. It’s that simple.”<sup>107</sup> While current-day mining companies may resist being forced to post large bonds up front, such a policy is more equitable than allowing companies to avoid liability altogether for the damage caused by their activities. Indeed, a responsible company would probably prefer the certain cost of bonding over the uncertain prospect of being held liable itself for the damage caused by *another* long-gone company.

States should also consider requiring bonding from small companies that mine fewer than five acres. Such companies are often exempt from state and federal laws. Montana, for example, requires only a \$10,000 bond and no reclamation from small miners,<sup>108</sup> while the BLM requires only that such operations give notice to the Bureau, which does not conduct an environmental review and imposes no bonding requirements at all.<sup>109</sup>

It is important to remember that if bonding requirements, as with any regulation, are not realistic, too much mining will be discouraged. This is particularly true in the case of companies that wish to remine abandoned sites where a high level of pollution already exists. If the bond is set so high that it would cover, for example, restoration of water quality to pristine standards, many companies will be discouraged from remining those sites at all. In keeping with our above suggestion that companies should not be liable except

if they leave a site worse than before, we suggest that bonds for re-mining sites be set no higher than necessary to repair any *additional* damage to the site. To demand any higher bond would cause some companies to divert their resources into mining new sites—surely a perverse result from an environmental perspective.

## A Cooperative Model?

When mining companies abandon current mining sites, the typical “solution” is for an environmental group to sue under a federal environmental law. Yet lawsuits often end up enriching lawyers at the expense of any actual environmental cleanup.

The natural question then is, How are environmental laws to be enforced, if not by filing suits? For a model, we might look at the Sunnyside Mine near Silverton, Colorado.<sup>110</sup> After more than a century of various mining companies trying unsuccessfully to work this site, the Sunnyside Gold Corporation tried to make a go of it in 1985. It set up a water treatment plant, because the mine drained water into a creek that eventually ended up in the Animas River. But the ore body soon gave out. As Ray Ring notes, in earlier times, “the company would have walked away with a shrug, public opinion and the environment be damned.”<sup>111</sup>

Here, though, various parties were able to form a cooperative solution. What the company wanted was to be able to close down, plug the mine’s drains, and be free from the fear of future liability for any pollution caused by the natural process of water seepage. What the community and the government wanted was for the water in the creek and the Animas River to be in as good a condition as it would have been without the mining operations at Sunnyside.

The state and the company eventually signed a consent decree. Under the terms of the decree, “The company can plug the mine and shut down the treatment plan, and as long as the water quality in the river doesn’t get worse over five years of continued sampling, the company has no more liability.”<sup>112</sup> Additionally—and importantly—the company agreed to compensate for the possibility of future seepage by cleaning up parts of several other mine sites. In the words of Bill Simon, who ran an organization of local people called the Animas River Stakeholders Group,<sup>113</sup> “This sets a precedent nationwide. In effect, we’re rewriting the regulations to allow partial cleanup, and the company can go to these other companies’ sites and clean them up with no liability there, either. Third-party cleanups—that’s going to be the key to reclamation of these abandoned mines.”<sup>114</sup> The company’s reclamation manager was also quoted as saying, “It’s good for the mining industry, in that there’s a mechanism for avoiding perpetual liability. It’s good for the state (and

the public) because it has the potential to improve water quality.”<sup>115</sup>

The most intriguing aspect of the Sunnyside story is that federal environmental laws seem to have played little role at all, at least not directly. It may be that the threat of liability encouraged the company to agree to terms that it might not have accepted if it were free simply to pack up and leave. But the actual substance of environmental laws was not followed here. The state and local governments gave up any attempt to “nail” the company for all it was worth, instead offering the company something valuable—release from perpetual liability. Thus, the local stakeholders—the people with the strongest interest in the matter—were able to achieve their objective—maintaining water quality in the stream, plus the cleanup of other mine sites.

While the long-term success of Sunnyside has yet to be determined, the cooperative approach used there may be a model for future negotiations between mining companies and their surrounding communities. Even the Environmental Protection Act—given as it is to the command-and-control model of regulation—has started to promote, at least nominally, what it calls “Community-Based Environmental Protection,” a term that includes attempts to involve local stakeholders in environmental decisions.<sup>116</sup> It remains to be seen whether the EPA really means to allow local people and governmental entities to bargain away the EPA’s right to seek strict liability under the Clean Water Act and CERCLA. That would be a valuable step, though, because as in the Sunnyside case, companies might be more willing to take on cleanup projects—even of other mining sites—if in exchange they could avoid the specter of unlimited and perpetual liability.

## Conclusion

As we have seen, one legacy of hardrock mining in the United States is the presence of many abandoned mines around the West. Some of these sites are causing severe environmental problems. The chief one is acid drainage, contaminated water that leaks from the mines into streams and rivers.

Current government policies to cope with these abandoned mines are counterproductive. The Clean Water Act and the Superfund law (CERCLA) make current mine owners liable for the costs of cleaning up harm that previous owners caused—even more than a century earlier. These laws apply even to those who want to renew mining at an old site, cleaning it up as they do. Not only is this unfair to new owners, but it discourages private remediation.

Public reclamation of old sites does occur, but the available funds have many restrictions that keep them from being used efficiently. The total amount of money available from these sources is small compared to the apparent need.

It is our view that the only way to achieve significant cleanup of old sites is a change in liability. The Clean Water Act and CERCLA should be revised so that liability attaches only if a new site owner leaves the site in worse condition than before. Such a law would encourage additional mining and additional cleanup.

To prevent future environmental harm, other policies are under consideration. One is to require companies to put up bonds that would be used if problems occur. This is a sound approach. Such bonds should be established locally and should be large enough to cover possible disasters without being so punitive as to halt all mining. An industry tax has also been considered, primarily to cover the costs of cleanup of abandoned mines, but the experience of other so-called pollution taxes indicates that this would be a production tax rather than a pollution tax. It would not be directed at those who pollute but rather at those who mine.

One promising solution for abandoned mines cleanup may be a cooperative model in which the Environmental Protection Agency backs off and allows local companies, residents, and governments to work out problems on their own. There is some evidence that this can work. However, critical to such a solution is the absence of retroactive liability. Only if liability is restricted to persons or companies that actually cause harm will efforts to clean up abandoned mines achieve success.

## Notes

1. Summary of Selected U.S. and World Mining Statistics, *available at* [http://www.nma.org/SMB\\_percent20intlsummary.pdf](http://www.nma.org/SMB_percent20intlsummary.pdf) (last visited Sept. 5, 2001).

2. The facts in this paragraph are taken from an article on the Department of Interior's Web site: Jean Nelson Dean, *High Ore Creek Wins New Lease on Life*, <http://www.doi.gov/plw/octnov2000/High.htm>.

3. *Id.*

4. Eric Whitney, *South Dakota Tells a Mine To Stay Put*, HIGH COUNTRY NEWS, Feb. 1, 1999, *available at* [http://www.hcn.org/servlets/hcn.Article?article\\_id=4750](http://www.hcn.org/servlets/hcn.Article?article_id=4750).

5. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001).

6. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001). For a table with rough estimates on a state-by-state basis, see WESTERN GOVERNORS' ASSOCIATION, CLEANING UP ABANDONED MINES: A WESTERN PARTNERSHIP 4 (1998), *available at* <http://www.westgov.org/wga/publicat/miningre.pdf> (last visited Aug. 10, 2001).

7. See <http://www.az.blm.gov/mines/mines.htm> (last visited Aug. 15, 2001). Of the mines actually inventoried between June 1992 and January 1999—5,091 in all—a total of 288, or 3.28 percent, were thought to have some type of environmental hazard. See Abandoned and Inactive Mines, <http://www.asmi.state.az.us/abandoned.html> (last visited Aug. 7, 2001).

8. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001).

9. Bruce Selcraig, *This Reclamation Plan Uses Waste to Bury Waste*, HIGH COUNTRY NEWS, Jan. 19, 1998, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=3886](http://www.hcn.org/servlets/hcn.Article?article_id=3886) (last visited Aug. 15, 2001).

10. See NATIONAL RESEARCH COUNCIL, HARDROCK MINING ON FEDERAL LANDS 40 (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch2.html](http://books.nap.edu/html/hardrock_fed_land/ch2.html) (last visited Aug. 10, 2001).

11. See NATIONAL RESEARCH COUNCIL, HARDROCK MINING ON FEDERAL LANDS (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch1.html](http://books.nap.edu/html/hardrock_fed_land/ch1.html) (last visited Aug. 10, 2001).

12. See *A Plan to Clean Up Streams Polluted by Acid Drainage*, <http://www.osmre.gov/acsiplan.htm> (last visited Aug. 15, 2001).

13. *Id.*

14. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001).

15. See NATIONAL RESEARCH COUNCIL, HARDROCK MINING ON FEDERAL LANDS (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch1.html](http://books.nap.edu/html/hardrock_fed_land/ch1.html) (last visited Aug. 10, 2001).

16. D. W. STRUHSACKER & J. W. TODD, RECLAIMING INACTIVE AND ABANDONED HARDROCK MINE LANDS IN THE WEST—WHAT REALLY IS HAPPENING, National Mining Association (1998).

17. KATHERINE N. PROBST, DON FULLERTON, ROBERT E. LITAN, AND PAUL R. PORTNEY, FOOTING THE BILL FOR SUPERFUND CLEANUPS: WHO PAYS AND HOW?, Brookings Institution (1995). It should also be noted that cleanup standards of the federal Superfund program are considered excessively stringent. James T. Hamilton & W. Kip Viscusi, CALCULATING RISKS?: THE SPATIAL AND POLITICAL DIMENSIONS OF HAZARDOUS WASTE POLICY (1999).

18. See, e.g., *Strong v. Brown*, 140 P. 773 (Idaho 1914); *Alexander v. Wilkes-Barre Anthracite Coal Co.*, 98 A. 794 (Penn. 1916); *Potter v. Consolidation Coal Co.*, 124 S.W.2d 68 (Ky. 1938).

19. David Gerard & Timothy J. LeCain, *Property Rights and Technological Innovation: Legal Remedies and Pollution Abatement in U.S. Mining*, in THE TECHNOLOGY OF PROPERTY RIGHTS 147 (Terry L. Anderson and Peter J. Hill eds., 2001).

20. See NATIONAL RESEARCH COUNCIL, *HARDROCK MINING ON FEDERAL LANDS* 40 (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch2.html](http://books.nap.edu/html/hardrock_fed_land/ch2.html) (last visited Aug. 10, 2001).

21. In addition to the laws already mentioned, the National Historic Preservation Act, the Clean Air Act, the Emergency Planning and Community Right-to-Know Act, the Uranium Mill Tailings Radiation Control Act, and the American Indian Religious Freedom Act are just a few examples of federal laws that potentially affect mining operations.

22. 33 U.S.C. § 1251 - 1387.

23. 33 U.S.C. § 1342. The term “navigable waters” has been interpreted to include any surface waters. *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 123 - 24 (1985).

24. 33 U.S.C. § 1365.

25. 33 U.S.C. § 1342(a)(1).

26. 33 U.S.C. § 1313(a) - (c) (1994).

27. See 33 U.S.C. § 1313(c)(1), (3) (1994).

28. See NATIONAL RESEARCH COUNCIL, *HARDROCK MINING ON FEDERAL LANDS* 46 (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch2.html](http://books.nap.edu/html/hardrock_fed_land/ch2.html) (last visited Aug. 10, 2001).

29. See 33 U.S.C. §§ 1313(c), 1314(l).

30. 33 U.S.C. § 1365.

31. See 33 U.S.C. § 1319; *United States v. Law*, 979 F.2d 977 (4th Cir. 1992).

32. The Ninth Circuit so held in *American Mining Congress v. United States Envtl. Protection Agency*, 965 F.2d 759 (9th Cir. 1992). That court, however, thought that CWA liability was not really retroactive:

The EPA’s rule does not penalize inactive mine owners for mining activities or contaminated discharges that occurred in the past; it regulates discharges of contaminated storm water that occur in the future. The fact that the present contamination is the result of past mining activities does not make EPA’s rule retroactive.

*Id.* at 770 (citation omitted).

33. *Committee to Save Mokelumne River v. East Bay Municipal Utility Dist.*, 13 F.3d 305 (9<sup>th</sup> Cir. 1993).

34. *Id.* at 309.

35. *Id.*

36. 42 U.S.C. § 9611.

37. 42 U.S.C. § 9659(a)(1).

38. 42 U.S.C. § 9607(a).

39. 42 U.S.C. § 9607(a)(4)(C).

40. A PRP who pays the entire damage can of course seek contribution from any other PRP who may have contributed to the damage, but this

responsibility falls on the first PRP sued, rather than on the EPA. 42 U.S.C. § 9613(f).

41. See, e.g., *United States v. Northeastern Pharm. & Chem. Co.*, 810 F.2d 726, 732 - 34 (8th Cir. 1986).

42. 42 U.S.C. § 9601(35) (defining “contractual relationship”); 42 U.S.C. § 9607(b) (providing that there is no liability for acts of a third party with no contractual relationship to the current owner).

43. Lloyd S. Dixon, *The Transaction Costs Generated by Superfund's Liability Approach*, in *ANALYZING SUPERFUND: ECONOMICS, SCIENCE, AND LAW* (Richard L. Revesz & Richard B. Stewart eds., 1995).

44. *Id.* at 183.

45. John E. Tilton, *Assigning Liability for Past Pollution: Lessons from the U.S. Mining Industry*, 151 *JOURNAL OF INSTITUTIONAL AND THEORETICAL ECONOMICS* 139 (1995). One might argue that once the possibility for retroactive liability became clear, the purchase price of any historic mining property would be lowered to reflect any potential liability. This argument neglects, however, the deadweight loss that would still be imposed on society by retroactive liability, which would create an effective tax on the innocent ownership of property that had been environmentally damaged in the past.

46. ARCO, like many oil companies, purchased a number of hardrock mining enterprises during the energy crunch and resource depletion scares of the 1970s. As a result, a number of oil companies are on the hook for Superfund cleanups related to activities at old hardrock mine sites.

47. Common law rules would make the current owner responsible for limiting offsite impacts of their properties. The common law would not, however, require the owner to remediate the site to any given set of environmental standards, unless there was some imminent danger (e.g., a tailings pond that had some positive probability of breaking and wreaking havoc) or current measurable damage to downstream water users.

48. On the other hand, it is possible that reworking of old sites could expose more source contaminants and thus escalate environmental degradation.

49. See Coal Mining and Reclamation under the Surface Mining Law, <http://www.osmre.gov/coverpho.htm> (last visited Aug. 15, 2001).

50. *Id.*

51. *Id.*

52. *Id.*

53. NATIONAL RESOURCES COUNCIL, *HARDROCK MINING ON FEDERAL LANDS* (1999), available at

[http://books.nap.edu/html/hardrock\\_fed\\_land/ch3.html](http://books.nap.edu/html/hardrock_fed_land/ch3.html) (last visited Aug. 15, 2001).

54. Ray Ring, *All the King's Horses and All the King's Men . . .*, *HIGH COUNTRY NEWS*, Jan. 19, 1998, available at

[http://www.hcn.org/servlets/hcn.Article?article\\_id=3876](http://www.hcn.org/servlets/hcn.Article?article_id=3876).

55. *Beartooth Alliance v. Crown Butte Mines*, 904 F. Supp. 1168 (D. Mont. 1995).

56. Ring, *id.*

57. See, e.g., Andrew P. Morriss, Bruce Yandle and Roger Meiners, *The Failure of EPA's Water Quality Control Reforms*, UCLA JOURNAL OF ENVIRONMENTAL LAW (forthcoming).

58. *Id.*

59. WESTERN GOVERNORS' ASSOCIATION, CLEANING UP ABANDONED MINES: A WESTERN PARTNERSHIP 8 (1998), available at <http://www.westgov.org/wga/publicat/miningre.pdf> (last visited Aug. 10, 2001).

60. For a number of years, the mine shipped ore to be smelted in East Helena, Montana, about 15 miles away; the smelter site now a federal Superfund site.

61. James Boyd & Howard Kunreuther, *Retroactive Liability or the Public Purse?*, 11 JOURNAL OF REGULATORY ECONOMICS 79 (1997).

62. See Superfund Program: De Minimus Landowner Settlements, Prospective Purchaser Settlements, 54 Fed. Reg. 34,241 to 34,242 (1989). Frona Powell also notes the practice (rather rare, it seems) of issuing "comfort letters," by which the EPA can agree not to bring suit or can explain its policy regarding a particular site. Frona M. Powell, *Amending CERCLA to Encourage the Redevelopment of Brownfields: Issues, Concerns, and Recommendations*, 53 WASH. U. J. URB. & CONTEMP. L. 113, 126 - 27 (1998).

63. Lynn M. Kornfeld, Comment, *Reclamation of Inactive and Abandoned Hardrock Mine Sites: Remining and Liability under CERCLA and the CWA*, 69 U. COLO. L. REV. 597, 618 (1998).

64. 42 U.S.C. § 9619(a)(1).

65. 42 U.S.C. § 9619(a)(2).

66. 42 U.S.C. § 9619(e).

67. 42 U.S.C. § 9607(b)(3).

68. 42 U.S.C. § 9601(35)(B).

69. 42 U.S.C. § 9601(35)(A)(i). Needless to say, this "innocent owner" exception does not shield the new landowner from liability in very many situations. Some landowners have been denied protection because they failed to take affirmative action after learning of the hazardous substance. See, e.g., *Idylwoods Assoc. v. Mader Capital, Inc.*, 956 F. Supp. 410 (W.D.N.Y. 1997).

70. 33 U.S.C. § 1311(p).

71. This does not address the issue of statute of limitation. In almost all areas of law, including criminal law, liability eventually expires. Does it make sense to track down a successor corporation a century after damages were done and assert that it is responsible for remediation costs it is not logically related to? The endless liability of Superfund is recognized as generating excessive litigation and producing perverse incentives discussed here.



72. Citizen suit provisions produce incentives for extortion from potentially responsible parties that are obviously harmful to creating incentives to protect environmental assets. See Terry L. Anderson and Holly L. Fretwell, *Environmental Extortion (working title)*, Forthcoming, PERC, 2002.

73. 30 U.S.C. § 1201 *et seq.*

74. ROBERT L. BAMBERGER, THE ABANDONED MINE LAND FUND: GRANTS DISTRIBUTION AND ISSUES, Congressional Research Service Report No. 97-401 (Mar. 26, 1997), *available at* <http://www.cnie.org/nle/mine-10.html> (last visited Aug. 10, 2001).

75. See Abandoned Mine Land Fund Status, <http://www.osmre.gov/fundstat.htm> (last visited Aug. 15, 2001).

76. Robert L. Bamberger, The Abandoned Mine Land Fund: Grants Distribution and Issues, Congressional Research Service Report No. 97-401 (Mar. 26, 1997), *available at* <http://www.cnie.org/nle/mine-10.html> (last visited Aug. 10, 2001).

77. DUANE A. THOMPSON, THE RURAL ABANDONED MINE PROGRAM—A FACT SHEET, Congressional Research Service Report No. 95-706 ENR (June 12, 1995), *available at* <http://www.cnie.org/nle/mine-5.html> (last visited Aug. 14, 2001).

78. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001).

79. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001).

80. For a complete list of AML projects, see <http://www.blm.gov/aml/amldocs/AMLprojects2001.htm> (last visited Aug. 15, 2001).

81. See <http://www.mcrcc.osmre.gov/tree> (last visited Aug. 15, 2001).

82. See Funding for local acid mine drainage reclamation projects, <http://www.osmre.gov/acsifunding.htm> (last visited Aug. 15, 2001). States currently eligible for these projects are mostly in the South and Midwest: Alabama, Illinois, Indiana, Iowa, Kentucky, Maryland, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. *Id.* For more information, see Frequently Asked Questions About OSM's Appalachian Clean Streams Initiative (ACIS) Funding, <http://www.osmre.gov/acsiq&a.txt> (last visited Aug. 15, 2001).

83. See Surface Mining Control and Reclamation Act of 1977, Pub. L. 95-87, §§ 411(a), (b), codified at 30 U.S.C. §§ 1240(a), (b). 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.

84. See Abandoned Mine Land Program, <http://www.osmre.gov/aml/inven/zq&a.htm> (last visited Aug. 15, 2001).

85. WESTERN GOVERNORS' ASSOCIATION, CLEANING UP ABANDONED MINES: A WESTERN PARTNERSHIP 7 (1998), *available at* <http://www.westgov.org/wga/publicat/miningre.pdf> (last visited Aug. 10,

2001).

86. See <http://www.blm.gov/aml/brfgdoc2-2001.htm> (last visited Aug. 15, 2001). Recall that the total estimated cost reaches into the billions.

87. The unappropriated balances include \$15.9 million to New Mexico, \$36.1 million to Montana, \$11 million to Utah, \$16.6 million to Colorado, and \$1.6 million to Alaska. The figures are from the Office of Surface Mining. <http://www.osmre.gov/fundstateshare.htm>

88. WESTERN GOVERNORS' ASSOCIATION, CLEANING UP ABANDONED MINES: A WESTERN PARTNERSHIP 4 (1998), available at <http://www.westgov.org/wga/publicat/miningre.pdf> (last visited Aug. 10, 2001).

89. See, e.g., Richard L. Stroup, *Superfund: The Shortcut that Failed*, PERC POLICY SERIES, PS-5 (1996). In the context of the federal Superfund program, Stratmann finds support for this view but also finds that sites with greater health hazards received more funds. Thomas Stratmann, *The Politics of Superfund*, in POLITICAL ENVIRONMENTALISM: GOING BEYOND THE GREEN CURTAIN 239 (Terry L. Anderson ed., 2000).

90. Paul Stokstad, *Structuring a Reclamation Program for Abandoned Noncoal Mines*, 25 ECOLOGY L. Q. 121, 154 (1998).

91. See ARTHUR C. PIGOU, ECONOMICS OF WELFARE (1920).

92. See, e.g., DAVID W. PEARCE & R. KERRY TURNER, ECONOMICS OF NATURAL RESOURCES AND THE ENVIRONMENT 84 (1990). Baumol and Oates, for example, argue that the most efficient environmental policy is a pollution tax set at the marginal external cost associated with the desired level of pollution. W. BAUMOL & W. OATES, THE THEORY OF ENVIRONMENTAL POLICY (1988).

93. Hahn and Stavins report that the "cost of controlling a given pollutant may vary by a factor of one hundred or more among sources, depending on the age and location of plants and the available technologies." Robert W. Hahn & Robert N. Stavins, *Trading in Greenhouse Permits: A Critical Examination of Design and Implementation Issues*, in SHAPING NATIONAL RESPONSES TO CLIMATE CHANGE: A POST-RIO GUIDE 177, 180 (Henry Lee ed., 1995).

94. STEPHEN BREYER, REGULATION AND ITS REFORM 263 - 64 (1982).

95. RICHARD N. COOPER, ENVIRONMENT AND RESOURCE POLICIES FOR THE WORLD ECONOMY 62 (1994).

96. STEPHEN BREYER, REGULATION AND ITS REFORM 263 - 64 (1982).

97. This is called the "revenue recycling effect." See Ian W. H. Parry, Roberton C. Williams III, & Lawrence H. Goulder, *When Can Carbon Abatement Policies Increase Welfare? The Fundamental Role of Distorted Factor Markets*, Resources for the Future Discussion Paper 97-18, at 2 (Dec. 1996), available at [http://www.rff.org/CFDOCS/disc\\_papers/PDF\\_files/9718.pdf](http://www.rff.org/CFDOCS/disc_papers/PDF_files/9718.pdf) (last visited July 27, 2001).

98. DAVID W. PEARCE & R. KERRY TURNER, *ECONOMICS OF NATURAL RESOURCES AND THE ENVIRONMENT* 106 (1990).
99. 30 U.S.C. § 1259.
100. For a good background on mining bonds, see *Reclamation Bonds for Coal Mining Operations*, <http://www.osmre.gov/bonding.htm> (last visited Aug. 15, 2001).
101. Ray Ring, *Summitville: An Expensive Lesson*, HIGH COUNTRY NEWS, Jan. 19, 1998, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=3882](http://www.hcn.org/servlets/hcn.Article?article_id=3882).
102. Summitville Mine, <http://www.epa.gov/region08/superfund/sites/sville.html> (last visited Sept. 10, 2001).
103. Ray Ring, *Summitville: An Expensive Lesson*, HIGH COUNTRY NEWS, Jan. 19, 1998, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=3882](http://www.hcn.org/servlets/hcn.Article?article_id=3882).
104. *Id.*
105. Andrea Barnett, *Small Mines Stay under the Radar*, HIGH COUNTRY NEWS, Aug. 14, 2000, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=5938](http://www.hcn.org/servlets/hcn.Article?article_id=5938) (last visited Aug. 8, 2001).
106. As the Interior Department's Board of Land Appeals said, "[T]he mere filing of a plan of operations by a holder of a mining claim invests no rights in the claimant to have any plan of operations approved. . . . If the costs of compliance render the mineral development of a claim uneconomic, the claim itself is invalid and any plan of operations therefor is properly rejected." *Great Basin Mine Watch et al.*, IBLA No. 97-307, 97-506, 97-510 (Nov. 9, 1998).
107. Andrea Barnett, *Small Mines Stay under the Radar*, HIGH COUNTRY NEWS, Aug. 14, 2000, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=5938](http://www.hcn.org/servlets/hcn.Article?article_id=5938) (last visited Aug. 8, 2001).
108. *Id.* According to an official at the Montana Department of Environmental Quality, 462 out of 580 active small mines in the state are "operating virtually unrestricted."
109. See NATIONAL RESEARCH COUNCIL, *HARDROCK MINING ON FEDERAL LANDS* 41 (1999), available at [http://books.nap.edu/html/hardrock\\_fed\\_land/ch2.html](http://books.nap.edu/html/hardrock_fed_land/ch2.html) (last visited Aug. 10, 2001); see also *Sierra Club v. Penfold*, 857 F.2d 1307 (9th Cir. 1988).
110. The following details come from Ray Ring, *A Radical Approach to Mine Reclamation*, HIGH COUNTRY NEWS, Jan. 19, 1998, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=3884](http://www.hcn.org/servlets/hcn.Article?article_id=3884) (last visited Aug. 8, 2001).
111. Ray Ring, *A Radical Approach to Mine Reclamation*, HIGH COUNTRY NEWS, Jan. 19, 1998.

112. *Id.*

113. For information on this collaborative group—which includes citizens, companies, environmental groups, land owners, and governmental officials—see generally <http://www.waterinfo.org>; Sean T. McAllister, *The Confluence of a River and a Community: An Experiment with Community-Based Watershed Management in Southwestern Colorado*, 3 U. DENVER WATER L. REV. 287 (2000).

114. Ray Ring, *A Radical Approach to Mine Reclamation*, HIGH COUNTRY NEWS, Jan. 19, 1998.

115. *Id.*

116. EPA, *EPA's Framework for Community-Based Environmental Protection* (Feb. 1999), available at <http://www.epa.gov/reinvent/cbep/frame40.pdf> (last visited Sept. 10, 2001); see also EPA, *About CBEP*, <http://www.epa.gov/ecocommunity/about.htm> (last visited Sept. 10, 2001).