
Mr. Chairman and Members of the Committee:

I am pleased to be here today to discuss our 2008 work on several hardrock mining issues that are central to the debate on reforming the General Mining Act of 1872: royalties, abandoned mines, and financial assurances.¹

As you know, since the passage of the General Mining Act of 1872, mine operators have extracted billions of dollars worth of silver, gold, copper, and other hardrock (locatable) minerals from federal lands without having to pay a royalty.² Most of these lands are managed by the Department of the Interior's Bureau of Land Management (BLM) and the U.S. Department of Agriculture's Forest Service. Assessing a royalty on hardrock minerals would ensure that the public is compensated for hardrock minerals extracted from federal lands, as more recently enacted laws require for oil, gas, and other minerals.

The vast majority of the federal lands where hardrock mining operations occur are in 12 western states, including Alaska (hereafter referred to as the 12 western states).³ These western states have statutes governing hardrock mining operations on lands in their state. However, unlike the federal government, these states charge royalties that allow them to share in the proceeds from hardrock minerals extracted from state-owned lands. In addition, most of these states charge taxes, such as severance taxes, mine license taxes, or resource excise taxes, on hardrock mining operations that occur on private, state, and federal lands. For the purposes of this report, we use the term "functional royalty" to refer to taxes that function like a royalty in that they permit the state to share in the value of the mine's

¹GAO, *Hardrock Mining: Information on State Royalties and Trends in Mineral Import and Exports*, [GAO-08-849R](#) (Washington, D.C.: July 21, 2008); and GAO, *Hardrock Mining: Information on Abandoned Mines and Value and Coverage of Financial Assurances on BLM Land*, [GAO-08-574T](#) (Washington, D.C.: Mar. 12, 2008).

²Under U.S. mining laws, minerals are classified as locatable, leasable, or saleable. Locatable minerals include those minerals that are not leasable or saleable, for example, copper, lead, zinc, magnesium, gold, silver, and uranium. Only locatable minerals continue to be "claimed" under the Mining Act. For the purposes of this report, we use the term "hardrock minerals" as a synonym for "locatable minerals." Leasable minerals include, for example, oil, gas, and coal. The Mineral Leasing Act of 1920, 41 Stat. 437 (codified at 30 U.S.C. § 181) created a leasing system for coal, gas, oil and other fuels, and chemical minerals. Saleable minerals include, for example, common sand, stone, and gravel. In 1955, the Multiple Use Mining Act of 1955, 69 Stat. 367 (codified at 30 U.S.C. § 601) removed common varieties of sand, stone, and gravel from development under the Mining Act.

³The other 11 western states are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

production. Although states may use similar names for functional royalties they assess, there can be wide variations in their forms and rates.

In addition to not requiring hardrock mining operators to pay royalties, prior to 1981, BLM did not require them to reclaim the federal land they used. Consequently, hardrock mining operators have left thousands of acres of federal land disturbed through mineral exploration, mining, and mineral processing. Some of these disturbed abandoned mine lands pose serious environmental and physical safety hazards. These hazards include environmental hazards such as toxic or acidic water that contaminates soil and groundwater or physical safety hazards such as open or concealed shafts, unstable or decayed mine structures, or explosives. Cleanup costs for these abandoned mines vary by type and size of the operation.⁴

To curb further growth in the number of abandoned hardrock mines, BLM issued regulations, effective in 1981, that required all mining operators to reclaim BLM land disturbed by hardrock mining. In 2001, BLM began requiring all mining operators to provide financial assurances before beginning exploration or mining operations on BLM land. These financial assurances must cover all of the estimated reclamation costs for a given hardrock operation. Having adequate financial assurances to pay reclamation costs for BLM land disturbed by hardrock operations is critical to ensuring that the land is reclaimed if the mining operators fail to do so. In June 2005, we reported that some current hardrock operations on BLM land do not have financial assurances, and some have no or outdated reclamation plans and/or cost estimates on which the financial assurances should be based.⁵

My testimony today focuses on the (1) royalties states currently charge on hardrock mining operations, (2) the number of abandoned hardrock mine sites and number of associated hazards, and (3) value and coverage of the financial assurances operators use to guarantee reclamation costs on lands managed by BLM.

To address these objectives, we interviewed staff at BLM and the Forest Service; examined agency documents and data; and reviewed relevant legislation and regulations. To identify the types of royalties, including functional royalties that

⁴For purposes of this testimony, cleanup refers to the mitigation of environmental impacts at mine sites, such as contaminated water, and the reclamation of land disturbed by hardrock operations.

⁵GAO, *Hardrock Mining: BLM Needs to Better Manage Financial Assurances to Guarantee Coverage of Reclamation Costs*, [GAO-05-377](#) (Washington, D.C.: June 20, 2005).

the 12 western states assess on hardrock mining operations, we reviewed state statutes and regulations pertaining to royalties on hardrock mining operations. To aid in understanding general patterns in state royalties, we consulted academic and industry sources and then we categorized each royalty according to how it is assessed. To assess the number of abandoned hardrock mine sites, we asked the 12 western states and South Dakota—which have significant numbers of abandoned hardrock mining operations—to determine the number of these mine sites in their states. We asked the states to use a consistent definition, which we provided, in estimating the number of abandoned mine sites and associated features that pose a significant hazard to public health and safety and the number of sites that cause environmental degradation.⁶ We specified that states should only include hardrock (also known as locatable), non-coal sites in this estimate. From these data, we estimated the number of features that pose physical safety hazards and the number of sites with environmental hazards in the 12 western states. We also summarized six selected survey efforts by federal agencies and organizations to document differences in estimates, definitions, and methodologies. To assess the value and coverage of financial assurances in place to guarantee reclamation, we reviewed BLM’s Bond Review Report. This report provides information on financial assurances for 11 western states.⁷ This Bond Review Report is generated from BLM’s automated information system—LR 2000. Although the LR2000 data are of undetermined reliability, our limited assessment of these data indicates that they are appropriate as used and presented in this testimony, and we do not base any conclusions or recommendations on them. This testimony is based on prior GAO reports whose work was conducted in accordance with generally accepted government auditing standards.⁸ Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁶We defined an abandoned hardrock mine site as all associated facilities, structures, improvements, and disturbances at a distinct location associated with activities to support a past operation under the general mining laws.

⁷Data for Alaska are not maintained in LR2000 and not reported in the Bond Review Report.

⁸[GAO-08-849R](#) and [GAO-08-574T](#).

The 12 Western States Assess Multiple Types of Royalties, Including Functional Royalties, on Mining Operations

Twelve western states assess royalties on the hardrock mining operations on state lands. In addition, each of these states, except Oregon, assesses taxes that function like a royalty, which we refer to as functional royalties, on the hardrock mining operations on private, state, and federal lands. To aid in the understanding of royalties, including functional royalties, the royalties are grouped as follows:

- *Unit-based* is typically assessed as a dollar rate per quantity or weight of mineral produced or extracted, and does not allow for deductions of mining costs.
- *Gross revenue* is typically assessed as a percentage of the value of the mineral extracted and does not allow for deductions of mining costs.
- *Net smelter returns* is assessed as a percentage of the value of the mineral, but with deductions allowed for costs associated with transporting and processing the mineral (typically referred to as mill, smelter, or treatment costs); however, costs associated with extraction of the mineral are not deductible.
- *Net proceeds* is assessed as a percentage of the net proceeds (or net profit) of the sale of the mineral with deductions for a broad set of mining costs. The particular deductions allowed vary widely from state to state, but may include extraction costs, processing costs, transportation costs, and administrative costs, such as for capital, marketing, and insurance.⁹

Royalties, including functional royalties, often differ depending on land ownership and the mineral being extracted, as the following illustrates:

- For private mining operations conducted on federal, state, or private lands, Arizona assesses a net proceeds functional royalty of 1.25 percent on gold mining operations, and an additional gross revenue royalty of at least 2 percent for gold mining operations on state lands.
- Nine of the 12 states assess different types of royalties for different types of minerals. For example, Wyoming employs three different functional royalties for all lands: (1) net smelter returns for uranium, (2) a different net smelter returns for trona—a mineral used in the production of glass, and (3) gross revenue for all other minerals.

Furthermore, the royalties the states assess often differ in the allowable exclusions, deductions, and limitations.¹⁰ For example, in Colorado, a functional

⁹For a full discussion of the definition and formula for each type of royalty, see [GAO-08-849R](#).

¹⁰For a complete listing of exclusions, deductions, and limitations, see [GAO-08-849R](#), encl. II, table 3.

royalty on metallic mining excludes gross incomes below \$19 million,¹¹ whereas in Montana a functional royalty on metallic mining is applied on all mining operations after the first \$250,000 of revenue.¹²

Finally, the actual amount assessed for a particular mine may depend not only on the type of royalty, its rate, and exclusions, but also on such factors as the mineral's processing requirements, mineral markets, mine efficiency, and mine location relative to markets, among other factors.

Table 1 shows the types of royalties, including functional royalties, that the 12 western states assess on all lands, including federal, state, and private lands, as well as the royalties assessed only on state lands.

Table 1: Types of Royalties, Including Functional Royalties, Assessed on Hardrock Mining Operations in Western States, by State

State	Unit-based	Gross revenue	Net smelter returns	Net proceeds
Alaska				
State lands				<input type="checkbox"/>
All lands				<input type="checkbox"/>
Arizona				
State lands		<input type="checkbox"/>		
All lands		<input type="checkbox"/>		<input type="checkbox"/>
California				
State lands		<input type="checkbox"/>		<input type="checkbox"/>
All lands	<input type="checkbox"/>			
Colorado				
State lands		<input type="checkbox"/>		<input type="checkbox"/>
All lands	<input type="checkbox"/>	<input type="checkbox"/>		
Idaho				
State lands		<input type="checkbox"/>	<input type="checkbox"/>	
All lands				<input type="checkbox"/>

¹¹Gross income is the value of ore immediately after its removal from the mine and does not include any value added subsequent to mining by any treatment processes.

¹²Gross value of product, less first \$250,000; Gross value is the receipts received from the sale of concentrates or metals extracted from mines or recovered from the smelting, milling, reduction, or treatment of such ores. Receipts received is defined as the payment received, less allowable deductions.

State	Unit-based	Gross revenue	Net smelter returns	Net proceeds
Montana				
State lands		□	□	
All lands	□		□	
Nevada^a				
State lands				
All lands				□
New Mexico				
State lands		□	□	
All lands		□	□	□
Oregon				
State lands	□	□		
All lands				
Utah				
State lands		□		
All lands				□
Washington				
State lands		□		
All lands		□		
Wyoming				
State lands	□	□		
All lands		□	□	
Total				
State lands	2	10	3	3
All Lands	3	5	3	6

Source: GAO analysis of state statutes and regulations.

Note: Sales and use taxes are excluded. Royalties often apply only to specific minerals.

^aNevada also has royalty on hardrock mining operations on state lands, however it is unlike these four categories of royalties.

Prior State Estimates of the Number of Abandoned Hardrock Mine Sites Vary Widely, but Our Data Show at Least 161,000 Sites, with Many Posing Hazards

It has been difficult to determine the number of abandoned hardrock mine sites in the 12 western states, and South Dakota, in part because there is no generally accepted definition for a hardrock mine site. The six studies we reviewed relied on the different definitions that the states used, and estimates varied widely from study to study.¹³

Furthermore, BLM and the Forest Service have had difficulty determining the number of abandoned hardrock mines on their lands. In September 2007, the agencies reported an estimated 100,000 abandoned mine sites,¹⁴ but we found problems with this estimate. For example, the Forest Service had reported that it had approximately 39,000 abandoned hardrock mine sites on its lands. However, this estimate includes a substantial number of non-hardrock mines, such as coal mines, and sites that are not on Forest Service land. At our request, the Forest Service provided a revised estimate of the number of abandoned hardrock mine sites on its lands, excluding coal or other non-hardrock sites. According to this estimate, the Forest Service may have about 29,000 abandoned hardrock mine sites on its lands. That said, we still have concerns about the accuracy of the Forest Service's recent estimate because it identified a large number of sites with "undetermined" ownership, and therefore these sites may not all be on Forest Service lands.

BLM has also acknowledged that its estimate of abandoned hardrock mine sites on its lands may not be accurate because it includes sites on its lands that are of unknown or mixed ownership (state, private, and federal) and a few coal sites. In addition, BLM officials said that the agency's field offices used a variety of methods to identify sites in the early 1980s, and the extent and quality of these efforts varied greatly. For example, they estimated that only about 20 percent of BLM land has been surveyed in Arizona. Furthermore, BLM officials said that the agency focuses more on identifying sites closer to human habitation and recreational areas than on identifying more remote sites, such as in the desert. Table 2 shows the Forest Service's and BLM's most recent available estimates of abandoned mine sites on their lands.

¹³For a full discussion of these six studies, see [GAO-08-574T](#), app. III.

¹⁴BLM and Forest Service, *Abandoned Mine Lands: A Decade of Progress Reclaiming Hardrock Mines* (September 2007).

Table 2: BLM's and the Forest Service's Most Currently Available Estimated Number of Abandoned Mines on Their Lands, by State

State	Estimated number of abandoned mine sites on BLM land ^a	Estimated number of abandoned mine sites on Forest Service land ^b	Total
Alaska	6,000	830	6,830
Arizona	22,000	2,183	24,183
California	11,500	6,248	17,748
Colorado	2,500	2,605	5,105
Idaho	400	4,635	5,035
Montana	1,016	3,899	4,915
Nevada	9,000	1,613	10,613
New Mexico	3,000	989	3,989
Oregon	3,400	2,427	5,827
South Dakota	Not reported	503	503
Utah	10,000	697	10,697
Washington	Not reported	1,956	1,956
Wyoming	2,000	336	2,336
Total	70,816	28,921	99,737

Source: GAO analysis of BLM and Forest Service data.

^aThese data are from BLM's Abandoned Mine Land Inventory and Remediation Report, BLM/NV/GI-97/004, November 1996.

^bThese data are from the U.S. Geological Survey's analysis of data in the Mineral Resources Data System (of which the Mineral Availability System/Mineral Industry Locator System is now a part), revised by the Forest Service as of November 2007.

To estimate abandoned hardrock mine sites in the 12 western states and South Dakota, we developed a standard definition for these mine sites. In developing this definition, we consulted with mining experts at the National Association of Abandoned Mine Land Programs; the Interstate Mining Compact Commission; and the Colorado Department of Natural Resources, Division of Reclamation, Mining and Safety, Office of Active and Inactive Mines. We defined an abandoned hardrock mine site as a site that includes all associated facilities, structures, improvements, and disturbances at a distinct location associated with activities to support a past operation, including prospecting, exploration, uncovering, drilling, discovery, mine development, excavation, extraction, or processing of mineral deposits locatable under the general mining laws. We also asked the states to estimate the number of features at these sites that pose physical safety hazards and the number of sites with environmental degradation.

Using this definition, states reported to us the number of abandoned sites in their states, and we calculated that there are at least 161,000 abandoned hardrock mine sites in their states. At these sites, on the basis of state data, we estimated that at least 332,000 features may pose physical safety hazards, such as open shafts or unstable or decayed mine structures. Furthermore, we estimated that at least 33,000 sites have degraded the environment, by, for example, contaminating surface and ground water or leaving arsenic-contaminated tailings piles.¹⁵ Table 3 shows our estimate of the number of abandoned hardrock mine sites in the 12 western states and South Dakota, the number of features that pose significant public health and safety hazards, and the number of sites with environmental degradation.

Table 3: GAO’s Estimate of the Number of Abandoned Hardrock Mine Sites, Features That Pose Significant Public and Safety Hazards, and Sites With Environmental Degradation, in 12 Western States and South Dakota, as of October 1, 2007

State	Estimated number of abandoned hardrock (non-coal, locatable) mine sites	Estimated number of features that pose a significant hazard to public health and safety	Estimated number of sites with environmental degradation
Alaska	469	235	99
Arizona	50,000	59,400	9,900
California	47,084	164,795	5,200
Colorado	7,300	17,000	150
Idaho	7,100	Not reported	Not reported
Montana	6,000	6,000-22,000	331
Nevada	16,000	51,000	150
New Mexico	800	15,000	200-300
Oregon	3,823	Not reported	140
South Dakota	950	Not reported	Not reported
Utah	17,000	17,000	17,000
Washington	3,629	1,608	50
Wyoming	956	519	437
Total	161,111	332,557-348,557	33,657-33,757

Source: GAO analysis of state-reported data.

Notes: While states used our definition to provide data on the estimated number of mine sites and features, these data have two key limitations: (1) the methods and sources used to identify and confirm abandoned sites and hazardous features vary substantially by state and (2) states have markedly different data systems and requirements for recording data on abandoned mines. For complete information on these limitations, see [GAO-08-574T](#).

¹⁵Tailings are a combination of fluid and rock materials that are left behind after the minerals are extracted. Tailings are often disposed of in a nearby pile.

BLM Estimates That Operators Have Provided About \$982 Million in Financial Assurances—About \$61 Million Less Than Needed to Cover Estimated Reclamation Costs

As of November 2007, hardrock mining operators had provided financial assurances valued at approximately \$982 million to guarantee the reclamation cost for 1,463 hardrock mining operations on BLM land in 11 western states, according to BLM's Bond Review Report.¹⁶ The report also indicates that 52 of the 1,463 hardrock mining operations had inadequate financial assurances—about \$28 million less than needed to fully cover estimated reclamation costs. We determined, however, that the financial assurances for these 52 operations should be more accurately reported as about \$61 million less than needed to fully cover estimated reclamation costs. Table 4 shows total operations by state, the number of operations with inadequate financial assurances, the financial assurances required, BLM's calculation of the shortfall in assurances, and our estimate of the shortfall, as of November 2007.

Table 4: Total Hardrock Mining Operations, Operations with Inadequate Financial Assurances, Financial Assurances Required, and Difference Between Requirements and Actual Value, by State, as of November 2007

State	Total operations	Operations with inadequate financial assurances	Financial assurances required	BLM's difference between current and required value of financial assurances	GAO's difference between current and required value of financial assurances
Arizona	107	2	\$7,689,394	(\$49,583)	(\$101,870)
California	95	4	24,530,439	1,593,013	(439,669)
Colorado	250	4	1,605,574	(170,291)	(167,730)
Idaho	46	1	1,556,705	(13,000)	(13,000)
Montana	41	0	67,478,064	1,200	0
New Mexico	28	0	1,066,735	0	0
Nevada	579	28	844,953,161	(33,667,684)	(47,739,814)
Oregon	60	4	366,773	47,327	(1,227)
Utah	150	5	12,247,645	(2,682,539)	(2,769, 802)
Washington	4	0	49,975	0	0
Wyoming	103	4	47,934,110	7,103,396	(9,518,877)
Total	1,463	52	\$1,009,478,575	(\$27,838,161)	(\$60,751,989)

Source: GAO analysis of BLM's Bond Review Report.

¹⁶Data for Alaska are not maintained in LR2000 and not reported in the Bond Review Report.

The \$33 million difference between our estimated shortfall of nearly \$61 million and BLM's estimated shortfall of nearly \$28 million occurs because BLM calculated its shortfall by comparing the total value of financial assurances in place with the total estimated reclamation costs. This calculation approach has the effect of offsetting the shortfalls in some operations with the greater than required financial assurances of other operations. However, the financial assurances that are greater than the amount required for an operation cannot be transferred to an operation with inadequate financial assurances. In contrast, we totaled the difference between the financial assurance in place for an operation and the financial assurances needed for that operation to determine the actual shortfall for each of the 52 operations for which BLM had determined that financial assurances were inadequate.

BLM's approach to determining the adequacy of financial assurances is not useful because it does not clearly lay out the extent to which financial assurances are inadequate. For example, in California, BLM reported that, statewide, the financial assurances in place were \$1.5 million greater than required as of November 2007, suggesting reclamation costs are being more than fully covered. However, according to our analysis of only those California operations with inadequate financial assurances, the financial assurances in place were nearly \$440,000 less than needed to fully cover reclamation costs. BLM officials agreed that it would be valuable for the Bond Review Report to report the dollar value of the difference between financial assurances in place and required for those operations where financial assurances are inadequate and have taken steps to modify LR2000.

BLM officials said that financial assurances may appear inadequate in the Bond Review Report when

- expansions or other changes in the operation have occurred, thus requiring an increase in the amount of the financial assurance;
- BLM's estimate of reclamation costs has increased and there is a delay between when BLM enters the new estimate into LR2000 and when the operator provides the additional bond amount; and
- BLM has delayed updating its case records in LR2000.

Conversely, hardrock mining operators may have financial assurances greater than required for a number of reasons; for example, they may increase their financial assurances because they anticipate expanding their hardrock operations.

In addition, according to the Bond Review Report, there are about 2.4 times as many notice-level operations—generally, operations that cause surface

disturbance on 5 acres or less—as there are plan-level operations on BLM land—generally operations that disturb more than 5 acres (1,033 notice-level operations and 430 plan-level operations). However, about 99 percent of the value of financial assurances is for plan-level operations, while 1 percent of the value is for notice-level operations. While financial assurances were inadequate for both notice- and plan-level operations, a greater percentage of plan-level operations had inadequate financial assurances than did notice-level operations—6.7 percent and 2.2 percent, respectively. Finally, over one-third of the number of all hardrock operations and about 84 percent of the value of all financial assurances are for hardrock mining operations located in Nevada.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or Members of the Committee may have.

Contact and Staff Acknowledgments

Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this testimony. For further information about this testimony, please contact Robin M. Nazzaro, Director, Natural Resources and Environment (202) 512-3841 or Nazzaror@gao.gov. Key contributors to this testimony were Andrea Wamstad Brown (Assistant Director); Elizabeth Beardsley; Casey L. Brown; Kristen Sullivan Massey; Rebecca Shea; and Carol Herrnsstadt Shulman.

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday afternoon, GAO posts on its Web site newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to www.gao.gov and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's Web site, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Ralph Dawn, Managing Director, dawnr@gao.gov, (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548