

**ENVIRONMENTAL PROTECTION AGENCY****40 CFR Part 320****[EPA-HQ-SFUND-2009-0265; FRL-8931-7]****RIN 2050-AG56****Identification of Priority Classes of Facilities for Development of CERCLA Section 108(b) Financial Responsibility Requirements.****AGENCY:** Environmental Protection Agency (EPA)**ACTION:** Priority Notice of Action.

**SUMMARY:** Section 108(b) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, establishes certain regulatory authorities concerning financial responsibility requirements. Specifically, the statutory language addresses the promulgation of regulations that require classes of facilities to establish and maintain evidence of financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances. CERCLA Section 108(b) also requires EPA to publish a notice of the classes for which financial responsibility requirements will be first developed. To fulfill this requirement, EPA is by this notice identifying classes of facilities within the hardrock mining industry for which the Agency will first develop financial responsibility requirements under CERCLA Section 108(b). For purposes of this notice, hardrock mining facilities include those which extract, beneficiate or process metals (e.g., copper, gold, iron, lead, magnesium, molybdenum, silver, uranium, and zinc) and non-metallic, non-fuel minerals (e.g., asbestos, gypsum, phosphate rock, and sulfur).

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## **SUPPLEMENTARY INFORMATION:**

### **A. How Can I Get Copies of This Document and Other Related Information?**

This Federal Register notice and supporting documentation are available in a docket EPA has established for this action under Docket ID No. EPA-HQ-SFUND-2009-0265. All documents in the docket are listed on the <http://www.regulations.gov> web site. Although listed in the index, some information may not be publicly available, because for example, it may be Confidential Business Information (CBI) or other information, the disclosure of which is restricted by statute. Certain material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through <http://www.regulations.gov> or in hard copy at the RCRA Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Avenue, NW, Washington, DC. The Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Superfund Docket is (202) 566-0270. A reasonable fee may be charged for copying docket materials.

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## **I. Introduction**

Section 108(b), 42 U.S.C. 9608 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, requires in specified circumstances that owners and operators of facilities establish evidence of financial responsibility. Specifically, it requires the promulgation of regulations that require classes of facilities to establish and maintain evidence of financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances. The section also instructs that the President<sup>1</sup>:

...identify those classes for which requirements will be first developed and publish notice of such identification in the Federal Register.<sup>2</sup>

EPA is publishing this notice to fulfill its obligations under CERCLA Section 108(b) to identify those classes of facilities, owners, and operators (herein referred to as classes of facilities) for which financial responsibility requirements will first be developed.

For the reasons that follow, the Agency has identified classes of facilities within the hard-rock mining industry as its priority for the development of financial responsibility requirements under CERCLA Section 108(b). For purposes of this notice only, hardrock mining is defined as the extraction, beneficiation or processing of metals (e.g., copper, gold, iron, lead, magnesium, molybdenum, silver, uranium, and zinc) and non-metallic, non-fuel minerals (e.g., asbestos,

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<sup>1</sup> Executive Order 12580 delegates this responsibility to the Administrator of the U.S. Environmental Protection Agency ("EPA" or "the Agency") for non-transportation related facilities. 52 FR 2923, 3 CFR, 1987 Comp., p. 193.

<sup>2</sup> 42 U.S.C. 9608 (b)(1)

gypsum, phosphate rock, and sulfur).<sup>3</sup> (See Section VI of this notice for a discussion of EPA’s consideration of additional classes of facilities for developing financial responsibility requirements under Section 108(b) of CERCLA.)

## **II. EPA's Approach for Identifying those Classes of Facilities for which Requirements will be First Developed**

In accordance with CERCLA Section 108(b) EPA worked to determine which classes of facilities it should identify as its priority. CERCLA Section 108(b) directs the President to “identify those classes for which requirements will be first developed and publish notice of such identification [.]” However, this simple sentence does not spell out a particular methodology by which the identification is to be made. While EPA views this statutory ambiguity as allowing substantial discretion in making the identification, EPA looked to the rest of CERCLA Section 108(b) to inform its exercise of this discretion.

Examination of CERCLA Section 108(b) as a whole reveals repeated references to the concept of “risk.” The first sentence of paragraph (b)(1) refers to “requirements . . . that classes of facilities establish and maintain evidence of financial responsibility consistent with the *degree and duration of risk*” and the last sentence states that “[p]riority in the development of such requirements shall be accorded to those classes of facilities . . . which the President determines present the *highest level of risk of injury*.” Paragraph (b)(2) also states that “[t]he level of financial responsibility shall be initially established, and, when necessary, adjusted to *protect against the level of risk* which the President in his discretion believes is appropriate . . . .” Accordingly, EPA chose to look for indicators of risk and its related effects to inform its selection of classes for which it would first develop requirements under CERCLA Section 108(b). As a practical method of

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<sup>3</sup> See memorandum to Jim Berlow, USEPA from Stephen Hoffman, USEPA and Shahid Mahmud USEPA. *Re: Mining Classes Not Included in Identified Classes of Hardrock Mining*. June, 2009.

doing so, EPA reviewed information contained in a number of studies, reports, and analyses. This review pointed to numerous factors EPA should consider. For example, typical elements in evaluating risk to human health and the environment include: the probability of release, exposure, and toxicity.<sup>4</sup> While some of the considerations reflect these basic elements of risk evaluation, others relate more closely to the severity of consequences that result when those risks are realized, such as the releases' duration if not prevented or quickly controlled as a result of economic factors and the exposures that can result. Therefore, EPA has chosen to evaluate the following factors: (1) annual amounts of hazardous substances released to the environment; (2) the number of facilities in active operation and production; (3) the physical size of the operation; (4) the extent of environmental contamination; (5) the number of sites on the CERCLA site inventory (including both National Priority List (NPL) sites and non-NPL sites); (6) government expenditures; (7) projected clean-up expenditures; and (8) corporate structure and bankruptcy potential.

Toxicity is reflected in the designation of substances as CERCLA hazardous substances. Current releases of hazardous substances, number of operating facilities, the physical size of an operation, the extent of environmental contamination, and the number of sites on the CERCLA site inventory (non-NPL sites and NPL sites) are factors that can relate to the probability of a release of a hazardous substance, as well as the potential for exposure. These are discussed in detail, in Section IV of this notice. Government expenditures, projected clean-up costs, and corporate structure and bankruptcy potential can relate to the severity of the consequences as a result of releases and exposure of hazardous substances. These are discussed in Section V of this notice.

EPA's review of all these factors, as reflected in the information presented in this notice and included in the docket, makes it readily apparent that hardrock mining facilities present the

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<sup>4</sup> "Risk Assessment in the Federal Government: Managing the Process." National Research Council. National Academy Press, Washington, DC. 1983.

type of risk that, in light of EPA's current assessment, justifies designating such facilities as those for which EPA will first develop financial responsibility requirements pursuant to CERCLA Section 108(b).<sup>5</sup>

### **III. Identification of Classes of Facilities in Hardrock Mining**

For purposes of this notice, EPA has included the following classes of facilities under the general title of hardrock mining: facilities which extract, beneficiate or process metals (e.g. copper, gold, iron, lead, magnesium, molybdenum, silver, uranium, and zinc) and non-metallic, non-fuel minerals (e.g. asbestos, gypsum, phosphate rock, and sulfur).<sup>6</sup> As explained below, hardrock mining facilities share common characteristics, and are thus being identified as a group. At the same time, those facilities included in the definition above differ such that "hardrock mining facilities" are properly considered to encompass multiple "classes" of facilities. The various classes in this notice's definition of hardrock mining are involved in two general activities: (1) the extraction of an ore or mineral from the earth; and (2) using various beneficiation activities and processing operations to produce a targeted material product, such as a metal ingot. The operations that comprise hardrock mining (i.e., extraction, beneficiation, and then processing) are all part of a sequential process of converting material removed from the earth into marketable products, even though the intermediate and end products differ. Extraction, beneficiation or processing of ores and minerals can involve similar processes across types of mining, as discussed below.

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<sup>5</sup> Today's identification of hardrock mining is only the first step in the rulemaking process under CERCLA Section 108(b), but is not itself a rule, and does not create any binding duties or obligations on any party. Additional research, outreach to stakeholders, proposed regulations, review of public comments, and finalization of those regulations are needed before hardrock mining facilities are subject to any financial assurance requirements.

<sup>6</sup> EPA notes that this notice does not affect the current Bevill status of extraction, beneficiation and processing wastes as codified in 40 CFR 261.4(b)(7).

However, hardrock mining is also properly considered to encompass multiple “classes” that represent a range of activities and marketable products. Extraction differs from beneficiation and both differ from processing, and depending upon the product sought, different types of processes are used. Extraction, also called mining, is the removal of rock and other materials that contain the target ore and/or mineral. The physical processes used to accomplish this vary, but are nonetheless often shared across different types of mining. These physical processes include surface, underground, and in-situ solution mining. Overburden and waste rock are removed during surface and underground extraction processes in order to gain access to the ore. Overburden and waste rock are disposed of in dumps near the mine. The dumps may or may not be lined or covered. In-situ mining involves the recovery of the metal from the ore by circulating solutions through the ore in its undisturbed geologic state and recovering those solutions for processing. The principal environmental protection concern with in-situ mining is the control and containment of the leach solutions.

Typically the next step after extraction, beneficiation involves separating and concentrating the target mineral from the ore. There are, however, many different ways in which beneficiation can occur. Beneficiation activities generally do not change the mineral values themselves other than by reducing (e.g. crushing or grinding) or enlarging (pelletizing or briquetting) particle size to facilitate processing, but can involve the introduction of water, other substances, and chemicals (including hazardous substances). A common beneficiation technique is flotation. Froth flotation involves adding forced air and chemicals to an ore slurry causing the target mineral surfaces to become hydrophobic and attach to air bubbles that carry the target minerals to the top of a flotation vessel. The surface froth containing the concentrated mineral is removed, and thus separated from the other waste minerals. The remaining waste minerals are called tailings.

Leaching, another beneficiation technique, involves the addition of chemicals to ores or flotation concentrates in order to dissolve the target metal. For example, solvents, such as sulfuric acid are used to leach copper and sodium cyanide is used to leach gold. Following leaching, the leftover waste product is called spent ore (in heap leaching) or tailings (in other types of leaching). There are various other beneficiation techniques and intermediate processes that are used and not described here. However, flotation and leaching are the most common techniques used in the mining industry. Tailings from beneficiation are disposed in a variety of ways, most commonly in tailing ponds. Design of tailings ponds differ and may or may not include liners, seepage control, surface water diversions, and final covers. Regardless, many tailings ponds require long-term management of waste and the impoundment dam.

Processing is the refining of ores or mineral concentrates after beneficiation to extract the target material. As with beneficiation, there are many different ways of processing the ores or mineral concentrates. For example, mineral processing operations can use pyrometallurgical techniques (the use of higher temperatures as in smelting), to produce a metal or high grade metallic mixture. Smelting generates a waste product called slag. Slag is initially placed directly on the ground to cool, and is often subsequently managed into a wide range of construction materials (e.g., road bed or foundation bedding).

Both because of the ways that the facilities covered by this notice fit together, and because of the range of activities that they cover, EPA believes hardrock mining is properly identified as a group and considered to include multiple classes of facilities.

#### **IV. Hardrock Mining – Releases and Exposure to Hazardous Substances**

As discussed above, evaluations of risk typically include considerations of the probability of a release, including its potential scale and scope, the exposure potential and toxicity. EPA

research indicates that the hardrock mining industry typically operates on a large scale, with releases to the environment and, in some situations, subsequent exposure of humans, organisms, and ecosystems to hazardous substances on a similarly large scale. Indeed, EPA estimates that the hardrock mining industry is responsible for polluting 3,400 miles of streams and 440,000 acres of land.<sup>7</sup> The U.S. Forest Service (USFS) estimates that approximately 10,000 miles of rivers and streams may have been contaminated by acid mine drainage from the metal mining industry.<sup>8</sup>

The Agency examined its 2007 Toxic Release Inventory (TRI), and this data revealed that the metal mining industry<sup>9</sup> (e.g., gold ore mining, lead ore and zinc ore mining, and copper ore and nickel ore mining) releases enormous quantities of toxic chemicals, at nearly 1.15 billion pounds or approximately 28 percent of the total releases by U.S. industry that is required to report under the TRI program.<sup>10, 11</sup> This overall percentage has remained relatively stable since 2003, ranging from 25 percent (1.07 billion pounds) of total releases in 2004 to 29 percent (1.26 billion pounds) of total releases in 2006. In 2007, the majority of releases of hazardous substances from the metal mining industry were to the land, with additional releases to both the air and surface waters. Additional releases of hazardous substances were reported to TRI from metal processing facilities (e.g., primary smelting of copper) with significant releases to the air and land.

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<sup>7</sup> U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

<sup>8</sup> U.S. EPA 2004. "Nationwide Identification of Hardrock Mining Sites." Office of Inspector General. Report No. 2004-P-00005. Accessed at: <http://epa.gov/oig/reports/2004/20040331-2004-p-00005.pdf>

<sup>9</sup> Metal mining industry is defined as NAICS Code 2122 (Metal Mining).

<sup>10</sup> U.S. EPA 2009. Toxic Release Inventory, 2007 Updated Data Releases, as of March 19, 2009.

<sup>11</sup> TRI estimates include all on-site and off-site releases to the land, air and surface water, including those disposed of in RCRA Subtitle C hazardous waste land disposal units and Safe Drinking Water Act (SDWA) permitted underground injection (UIC) wells. However, less than one percent of hazardous substances are managed in this manner. Thus, the data demonstrates the enormous volume of hazardous chemical releases reported to TRI by the metal mining industry and is an indication of the high volume of hazardous substances it manages, and the industry's potential for posing health and environmental risk.

The potential for releases of and exposure to hazardous substances is also reflected in the number of active facilities operating in the U.S. While estimates of the number of active mining facilities vary, in 2004, EPA estimated that there were 1,000 metal and non-metal mineral mines and processing facilities in the U.S. Furthermore, many mining facilities have been in operation for decades and can exceed thousands of acres in size.<sup>12</sup> Since large mines may be operated for decades, this can extend the time frame for potential releases and exposure of hazardous substances. At individual facilities, hardrock mining operations may disturb thousands of acres of land and impact watersheds including, to varying degrees, effects on groundwater, surface water, aquatic biota, aquatic and terrestrial vegetation, wetlands, wildlife, soils, air, cultural resources, and humans that use these resources recreationally or for subsistence.<sup>13</sup>

Hardrock mining facilities also generate an enormous volume of waste, which may increase the risk of releases of hazardous substances. Annually, hardrock mining facilities generate between one to two billion tons of mine waste.<sup>14</sup> This waste can take a variety of forms, including mine water, waste rock, overburden, tailings, slag, and flue dust and can contain significant quantities of hazardous substances. The 2007 TRI data demonstrate that hardrock mining facilities reported large releases of many hazardous substances, including ammonia, benzene, chlorine, hydrogen cyanide, hydrogen fluoride, toluene, and xylene, as well as heavy metals and their compounds (e.g., antimony, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel,

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<sup>12</sup> National Research Council. 2005. *Superfund and Mining Megsites: Lessons from the Coeur d'Alene River Basin*. The National Academies Press, Washington, D.C. Accessed at: [http://www.nap.edu/catalog.php?record\\_id=11359](http://www.nap.edu/catalog.php?record_id=11359)

<sup>13</sup> National Research Council. 1999. *Hardrock Mining on Federal Lands*. National Academies Press. Washington, DC.

<sup>14</sup> U.S. EPA 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

selenium, vanadium and zinc).<sup>15</sup> Similarly, the National Research Council (NRC) has indicated that hazardous substances of particular concern include heavy metals, ammonia, nitrates, and nitrites.<sup>16</sup>

These releases, in some cases, have led to ground and surface water contamination from acid mine drainage and metal leachate, and air quality issues resulting from heavy metal-contaminated dust or emissions of gaseous metals from thermal processes.<sup>17</sup> Acid mine drainage is the formation and movement of acidic water which dissolves and transports metals into the environment. This acidic water forms through the chemical reaction of surface water (rainwater, snowmelt, pond water) and shallow subsurface water with rocks (e.g., waste rock, tailings, mine walls) that contain sulfur-bearing minerals, resulting in the production of sulfuric acid. Metals can be leached from rocks that come in contact with the acid, a process that may be substantially enhanced by bacterial action.<sup>18</sup> The resulting acidic and metal-contaminated fluids may be acutely or chronically toxic and, when mixed with groundwater, surface water and soil, may have harmful effects on humans, fish, animals, and plants.<sup>19</sup> When acid mine drainage occurs, it is extremely difficult and often expensive to control and often requires long-term management measures.<sup>20</sup> Air,

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<sup>15</sup> See Memorandum to the Record: Toxic Release Inventory (TRI) Releases from Hardrock Mining Operations. June 2009.

<sup>16</sup> National Research Council. 1999. *Hardrock Mining on Federal Lands*. National Academies Press. Washington, DC. Also, EPA conducted a preliminary review of the Records of Decisions (RODs) for a selected group mining NPL sites. These substances were found to be common contaminants at these sites. Accessed at [http://books.nap.edu/catalog.php?record\\_id=9682](http://books.nap.edu/catalog.php?record_id=9682)

<sup>17</sup> U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

<sup>18</sup> U.S. EPA. 1997. "EPA's National Hardrock Mining Framework." Accessed at: <http://www.epa.gov/owm/frame.pdf>

<sup>19</sup> U.S. EPA 2009. Accessed at: [http://www.epa.gov/nps/acid\\_mine.html](http://www.epa.gov/nps/acid_mine.html).

<sup>20</sup> The conventional approach to treating contaminated ground or surface water produced through acid drainage involves an expensive, multi-step process that pumps polluted water to a treatment facility, neutralizes the contaminants in the water, and turns these neutralized wastes into sludge for disposal. U.S. EPA. *Profile of the Metal Mining Industry*. September 1995. See also: Lind, Greg.

land and water contamination may also result when waste rock dumps, tailings disposal facilities and open pits are not maintained properly and there are releases of hazardous substances to the environment.<sup>21</sup> Additional risks can occur with the use of cyanide in gold mining operations, including the possible release of cyanide into soil, groundwater, and/or surface waters or catastrophic cyanide spills.<sup>22</sup> Contaminants of concern at uranium mines include radionuclides. Due to the volume of the hazardous substances generated and released and the potential for long-term management of acid mine drainage, the cause for concern is only heightened.

Other studies and EPA's analysis of NPL data also underscores the risk of hardrock mining facilities. The NPL is a list of national priorities among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the U. S. The Hazard Ranking System (HRS), the scoring system EPA uses to assess the relative threat associated with a release from a site, is the primary method used to determine whether a site should be placed on the NPL.<sup>23</sup> The HRS takes into account the three elements of environmental and human health risk: (1) probability of release; (2) exposure; and (3) toxicity. EPA generally will list sites with scores of 28.50 or above. The HRS is a proven tool for evaluating and prioritizing the releases that may pose threats to human health and the environment throughout the nation. In 2005, the NRC noted that at the largest mining sites, or mega sites (i.e., those with projected cleanup costs exceeding \$50 million), "wastes... are dispersed over a large area and deposited in complex hydrogeochemical and ecologic

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2007. Testimony to the Subcommittee on Energy and Mineral Resources of the Committee on Natural Resources, U.S. House of Representatives, One Hundred Tenth Congress. Serial No. 110-46.

<sup>21</sup> U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

<sup>22</sup> U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

<sup>23</sup> U.S. EPA. 2007. "Introduction to the Hazard Ranking System (HRS)." Accessed at: [http://www.epa.gov/superfund/programs/npl\\_hrs/hrsint.htm](http://www.epa.gov/superfund/programs/npl_hrs/hrsint.htm).

systems that often include human communities and public natural resources.”<sup>24</sup> For example, a molybdenum mine located near Questa, New Mexico, began operations in 1919 and some underground mining operations are still in operation today. The mine's operational capacity is reportedly 20,000 tons of ore processed at the facility per day, although it does not typically operate at capacity. The site stretches over approximately three square miles of land. Across this large area, operations include an underground mine, a milling facility, a nine-mile long tailings pipeline and a tailing disposal facility. There is also an open pit and waste rock dumps at the mine site, which were created during open-pit mining operations. Other problems at the site include subsidence areas with a surface depression from active underground operations.<sup>25</sup>

In 2004, EPA's Office of Inspector General (OIG) examined 156 hardrock mining sites that are part of the CERCLA site inventory and concluded that ecological and environmental risks are often substantial. For the 82 Non-NPL sites that were evaluated, 64 percent had a current high or medium ecological/environmental risk, while the percentage of sites that were found to have low risk was only 13%. Another 23% had an unknown level of risk.<sup>26</sup>

In support of this notice, EPA examined not only sites listed on the NPL, but also sites proposed (including sites with Superfund alternative approach agreements in place) and deleted

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<sup>24</sup> National Research Council. 2005. *Superfund and Mining Megsites: Lessons from the Coeur d'Alene River Basin*. The National Academies Press, Washington, D.C. Accessed at: [http://www.nap.edu/catalog.php?record\\_id=11359](http://www.nap.edu/catalog.php?record_id=11359)

<sup>25</sup> USEPA Administrative Order on Consent for Molycorp RI/FS (2001). Molycorp is proposed for listing on the NPL. More information is at <http://www.epa.gov/region6/6sf/pdf/files/0600806.pdf>

<sup>26</sup> U.S. EPA 2004. “Nationwide Identification of Hardrock Mining Sites.” Office of Inspector General. Report No. 2004-P-00005, Figure 4.2. Accessed at: <http://epa.gov/oig/reports/2004/20040331-2004-p-00005.pdf>

from the NPL.<sup>27</sup> As of April, 2009, approximately 90 hardrock mining sites have been listed on the NPL, and another 20 facilities have been proposed for inclusion on the list.<sup>28</sup>

## **V. Hardrock Mining - Severity of Consequences Resulting from Releases and Exposure to Hazardous Substances**

The severity of the consequences impacting human health and the environment as a result of releases and exposure of hazardous substances is evident by analyzing a number of factors. Specifically, the past and estimated future costs associated with protecting public health and the environment through what is often extensive and long-term reclamation and remediation efforts, as well as corporate structure and bankruptcy potential. This information also plays a significant role in leading EPA to conclude that classes of facilities involved in hardrock mining should be the first for which financial assurance requirements are developed under CERCLA Section 108(b).

The severity of consequences posed by hardrock mining facilities is evident in the enormous costs associated with past and projected future actions necessary to protect public health and the environment, after releases from hardrock mining facilities occur. In other words, the documented expenditures reflect efforts to correct the realized risks from hardrock mining facilities. As noted earlier, these facilities release large quantities of hazardous substances, often

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<sup>27</sup> A significant number of response actions have been taken by several federal agencies at hardrock mining facilities under CERCLA removal and emergency response authorities. Those actions were not evaluated for purposes of this Notice because of the lack of immediately available data. EPA alone took non-NPL removal actions at 99 mining sites between 1988 and October 2007. Provided to GAO for GAO 2008, "Hardrock Mining: Information on Abandoned Mines and Value and Coverage of Financial Assurance on BLM Land." GAO-08-574T. Other federal agencies also use non-NPL removal authorities to address releases from mining sites. Accessed at: <http://www.gao.gov/highlights/d08574thigh.pdf>

<sup>28</sup> Provided to GAO for GAO 2008, "Hardrock Mining: Information on Abandoned Mines and Value and Coverage of Financial Assurance on BLM Land." GAO-08-574T. Accessed at: <http://www.gao.gov/new.items/d08574t.pdf>. and updated to reflect sites finalized on the NPL in 2008 and 2009. The 2008 and 2009 NPL updates can be found at: <http://www.epa.gov/superfund/sites/npl/status.htm>.

over hundreds of square miles and, in some instances, have resulted in groundwater and surface water contamination that requires long-term management and treatment. Remediation of these hardrock mining facilities has therefore been historically costly. EPA's past experience with these sites leads it to conclude that hardrock mining facilities are likely to continue to present a substantial financial burden that could be met by financial responsibility requirements. These enormous expenditures have been documented in a United States Government Accountability Office (GAO) study, and EPA's own data confirm the large amounts of money spent by the federal government alone. The GAO, in its report "Current Government Expenditures to Cleanup Hard Rock Mining Sites," reported that in total, the federal government spent at least \$2.6 billion to remediate hardrock mine sites from 1998 to 2007. EPA spent the largest amount at \$2.2 billion, with the USFS, the Office of Surface Mining, and the Bureau of Land Management spending \$208 million, \$198 million, and \$50 million, respectively.<sup>29</sup> EPA's expenditure data show that between 1988 and 2007, for mining sites with response actions taken under EPA removal and remedial authorities (including sites proposed, listed, and deleted from the NPL and sites with Superfund alternative approach agreements in place), approximately \$2.7 billion was spent.<sup>30, 31</sup> Of this total, \$2.4 billion was spent at the 84 sites listed as final on the NPL list at that time.<sup>32</sup>

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<sup>29</sup> U.S. Government Accountability Office. 2008. "Information on Abandoned Mines and Value and Coverage of Financial Assurance on BLM Land. GAO-08-574T. Accessed at: <http://www.gao.gov/highlights/d08574thigh.pdf>

<sup>30</sup> Moreover, EPA's cost data likely underestimates true cleanup costs, because they do not include costs borne by the states and potentially responsible parties. These costs only reflect expenditures to date. To reach construction completion, many sites will require additional, substantial remediation efforts. In addition, sites with acid mine drainage may require water quality treatment in perpetuity. Lind, Greg. 2007. Testimony to the Subcommittee on Energy and Mineral Resources of the Committee on Natural Resources, U.S. House of Representatives, One Hundred Tenth Congress. Serial No. 110-46.

<sup>31</sup> U.S. EPA. 2007. Superfund eFacts Database. Accessed: October 24, 2007; U.S. Environmental Protection Agency. 2007 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). Provided to GAO for their report, GAO 2008, "Hardrock Mining:

Estimated costs of remediation for all hardrock mining facilities from several sources have generally been in the range of billions of dollars. EPA has estimated that the cost of remediating all hardrock mining facilities is between \$20 and \$54 billion. EPA's analysis showed that if the total federal, state, and potentially responsible party outlays for remediation were to continue at existing levels (\$100 to \$150 million annually), no more than eight to 20 percent of all cleanup work could be completed within 30 years.<sup>33</sup> In another analysis based on a survey of 154 large sites, EPA's OIG projected that the potential total hardrock mining remediation costs totaled \$7 to \$24 billion. OIG calculated that this amount is over 12 times EPA's total annual Superfund budget of about \$1.2 billion from 1999 to 2004.<sup>34</sup> The annual Superfund budget from 2004 through 2008 remained consistent with OIG's assessment, at approximately \$1.25 billion.<sup>35, 36</sup>

Common corporate structures and interrelated corporate failures within the hardrock mining industry increase the likelihood of uncontrolled releases of hazardous substances being left unmanaged, increasing risks. To begin with, mine ownership is typically complex, with individual

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Information on Abandoned Mines and Value and Coverage of Financial Assurance on BLM Land." GAO-08-574T. Accessed at: <http://www.gao.gov/highlights/d08574thigh.pdf>

<sup>32</sup> U.S. EPA. 2007. Superfund eFacts Database. Accessed: October 24, 2007; U.S. Environmental Protection Agency. 2007 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). Provided to GAO for their report, GAO 2008, "Hardrock Mining: Information on Abandoned Mines and Value and Coverage of Financial Assurance on BLM Land." GAO-08-574T, <http://www.gao.gov/new.items/d08574t.pdf>.

<sup>33</sup> U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

<sup>34</sup> U.S. EPA 2004. "Nationwide Identification of Hardrock Mining Sites." Office of Inspector General. Report No. 2004-P-00005. Accessed at: <http://epa.gov/oig/reports/2004/20040331-2004-p-00005.pdf>

<sup>35</sup> Appropriation amounts reflect an average of the discretionary appropriation amounts in the President's Budget or Operating Plan between 2004 and 2008.

<sup>36</sup> No single source provides information on estimated future reclamation and remediation costs for hardrock mining facilities. In addition, for those estimates that do exist, remediation costs are often folded in with other reclamation activities, such as correcting safety hazards and landscaping, which leaves the amount attributable to remediation unknown. See U.S. EPA. 2004. "Cleaning Up the Nation's Waste Sites: Markets and Technology Trends." EPA 542-R-04-015. Accessed at: <http://www.epa.gov/tio/pubisd.htm>

mines often separately incorporated.<sup>37</sup> The existence of a parent-subsidary relationship can present several risks. First, corporate structures may allow parent corporations to shield themselves from liabilities of their subsidiaries.<sup>38</sup> In a 2005 study, the GAO cited mining facilities as an example of businesses at risk of incurring substantial liability and transferring the most valuable assets to the parent that could not be reached for cleanup.<sup>39</sup>

Second, many mining interests are located outside of the U. S. According to one report, six of the top ten mining claim owners in the U.S. are multi-national corporations with headquarters outside the U.S.<sup>40</sup> Such multi-national corporations can be difficult to hold responsible for contamination in the U.S. because of the difficulties of locating and then obtaining jurisdiction over the ultimate parent company.

This is of particular concern since the hardrock mining industry has experienced a pattern of failed operations, which often require significant environmental responses that cannot be financed by industry.<sup>41</sup> The pattern of failed operations has been well documented. GAO investigated 48 hardrock mining operations on U.S. Department of Interior (DOI), Bureau of Land Management

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<sup>37</sup> For example, one mining company's 2008 SEC 10-K filing noted that its segments included "The Greens Creek unit, a 100%-owned joint venture arrangement, through our subsidiaries Hecla Alaska LLC, Hecla Greens Creek Mining Company and Hecla Juneau Mining Company. We acquired 70.3% of our ownership of Greens Creek in April 2008 from indirect subsidiaries of Rio Tinto, PLC." From this description, it appears that ownership of the mine has involved multiple subsidiaries, under both its current owner and under the previous ownership.

<sup>38</sup> See *U.S. v. Bestfoods*, 524 U.S. 51, 61(1998) ("[i]t is a general principle of corporate law . . . that a parent corporation . . . is not liable for the acts of its subsidiaries.")

<sup>39</sup> U.S. Government Accountability Office. 2005. "Environmental Liabilities: EPA Should Do More to Ensure That Liable Parties Meet Their Cleanup Obligations." Report to Congressional Requesters. GAO-05-658, pp. 21-24. Accessed at: <http://www.gao.gov/highlights/d05658high.pdf>

<sup>40</sup> Environmental Working Group. 2006. "Who Owns the West?" Accessed at: <http://www.ewg.org/mining/claims/index.php>.

<sup>41</sup> EPA notes that there are several potential explanations for these failures, such as a boom and bust cycle in the price of commodities, the finite life of a particular ore body or the possibility that closure or reclamation obligations exceed the remaining value of the operation, in addition to factors that can cause bankruptcies in other sectors. However, regardless of the cause, the fact remains a large number of bankruptcies and abandonments have occurred.

(BLM) federal lands that had ceased operations and not been reclaimed by operators since BLM began requiring financial assurance under its regulations. Of the 48 operations, 30 cited bankruptcy as the reason for completing reclamation activities.<sup>42</sup> Numerous other examples exist of bankruptcies in the hardrock mining industry that resulted in or will likely require significant federal responses, such as:

- When the owner/operator filed for bankruptcy in 1992, it left the Summitville mine in Colorado with serious cyanide contamination and acid mine drainage. In 1994, the site was listed on the NPL. In 2000, EPA estimated that the remediation cost at the mine would be \$170 million.<sup>43</sup> As of October 2007, EPA had spent approximately \$192 million in cleanup costs.<sup>44</sup>
- In 1999, another mining company filed for bankruptcy, leaving more than 100 million gallons of contaminated water and millions of cubic yards of waste rock at the Gilt Edge Mine in South Dakota.<sup>45</sup> EPA listed the site on the NPL in 2000 and estimated at that time the present value remediation costs to be \$50.3 million.<sup>46</sup> Even this estimate, however, does not include water collection and treatment costs

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<sup>42</sup> U.S. Government Accountability Office. 2005. Hardrock Mining: BLM Needs to Better Manage Financial Assurances to Guarantee Coverage of Reclamation Costs. GAO-05-377. Accessed at: <http://gao.gov/products/GAO-05-377>

<sup>43</sup> U.S. Environmental Protection Agency. 2000. *Liquid Assets 2000: America's Water Resources at a Turning Point*. EPA-840-B-00-001. Accessed at: <http://www.epa.gov/water/liquidassest.pdf>

<sup>44</sup> U.S. Environmental Protection Agency. 2007. Superfund eFacts Database. Accessed: October 24, 2007.

<sup>45</sup> CDM. 2008. Final Feasibility Study Report for the Gilt Edge Superfund Site, Operable Unit 1 (OU1). Prepared for EPA, Region VIII. May 2008.

<sup>46</sup> U.S. EPA 2008. Record of Decision for the Gilt Edge Superfund Site Operable Unit 1 (OU1). Accessed at: [http://www.epa.gov/region8/superfund/sd/giltedge/RODGiltEdgeVolumeOne\\_Text.pdf](http://www.epa.gov/region8/superfund/sd/giltedge/RODGiltEdgeVolumeOne_Text.pdf)

that will be handled under additional remediation plans. As of October 2007, EPA expenditures at this site exceeded \$56.1 million.<sup>47</sup>

- In 1998, operators of the Zortman Landusky mine in Montana filed for bankruptcy. Numerous cyanide releases occurred during operations which have affected the community drinking water supply on a nearby tribal reservation. Acid mine drainage has also permeated the ground and surface waters. The projected cleanup costs at the site are estimated to be approximately \$85.2 million, of which only \$57.8 million will be paid for by the responsible party. State and federal authorities are projected to pay the remaining \$27.4 million for cleanup.<sup>48</sup>
- A large mining company filed for bankruptcy in 2005. The company has estimated the total environmental claims filed against it to have been in excess of \$5 billion. Recently approved settlements with the U. S. and certain State governments involving environmental clean-up claims, when combined with settlements already approved by the bankruptcy court for environmental clean-up claims, provide for allowed claims and payments in the bankruptcy in an amount in excess of \$1.5 billion and involve in excess of 50 sites. EPA and DOI estimate their combined claims in the bankruptcy at the largest of these sites, an NPL site located in Idaho and Eastern Washington, to be in excess of \$2 billion.<sup>49</sup>

Taking all this information into account, EPA concludes that classes of facilities within the hardrock mining industry are those for which EPA should first develop financial responsibility

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<sup>47</sup> U.S. EPA. 2007. Superfund eFacts Database. Accessed: October 24, 2007.

<sup>48</sup> U.S. Government Accountability Office. 2005. Hardrock Mining: BLM Needs to Better Manage Financial Assurances to Guarantee Coverage of Reclamation Costs. GAO-05-377. Accessed at: <http://gao.gov/products/GAO-05-377>

<sup>49</sup> Asarco, LLC, et al. U.S. Bankruptcy Court Southern District of Texas. May 15, 2009, Case No. 05-21207, Docket No. 11343.

requirements under CERCLA Section 108(b), based upon those facilities' sheer size; the enormous quantities of waste and other materials exposed to the environment; the wide range of hazardous substances released to the environment; the number of active hardrock mining facilities; the extent of environmental contamination; the number of sites in the CERCLA site inventory, government expenditures, projected clean-up costs and corporate structure and bankruptcy potential.

## **VI. EPA's Consideration of Additional Classes of Facilities for Developing Financial Responsibility Requirements**

The Agency believes classes of facilities outside of the hardrock mining industry also may warrant the development of financial responsibility requirements under CERCLA Section 108(b). Therefore, the Agency will continue to gather and analyze data on additional classes of facilities, beyond the hardrock mining industry, and will consider them for possible development of financial responsibility requirements. In determining whether to propose requirements under CERCLA Section 108(b) for such additional classes of facilities, EPA will consider the risks posed and, to do so, may take into account factors such as: (1) the amounts of hazardous substances released to the environment; (2) the toxicity of these substances; (3) the existence and proximity of potential receptors; (4) contamination historically found from facilities; (5) whether the causes of this contamination still exist; (6) experiences from federal cleanup programs; (7) projected costs of federal cleanup programs; and (8) corporate structures and bankruptcy potential. EPA also intends to consider whether financial responsibility requirements under CERCLA Section 108(b) will effectively reduce these risks. While the Agency recognizes that data for some of these factors may be unavailable or limited in availability, it plans to consider whatever data are available.

As part of the Agency's evaluation, it plans to examine, at a minimum, the following classes of facilities: hazardous waste generators, hazardous waste recyclers, metal finishers, wood

treatment facilities, and chemical manufacturers. This list may be revised as the Agency's evaluation proceeds. EPA is currently scheduled to complete and publish in the *Federal Register* a notice addressing additional classes of facilities the Agency plans to evaluate regarding financial responsibility requirements under CERCLA Section 108(b) by December 2009, and, at that time, will solicit public comment.

**VII. Conclusion**

Based upon the Agency's analysis and review, it concludes that hardrock mining facilities, as defined in this notice, are those classes of facilities for which EPA should identify and first develop requirements pursuant to CERCLA Section 108(b). EPA will carefully examine specific activities, processes, and/or metals and minerals in order to determine what proposed financial responsibility requirements may be appropriate. Those proposed regulations will then be subject to further public notice and comment before they are finalized. As part of this process, EPA will conduct a close examination and review of existing federal and state authorities, policies, and practices that currently focus on hardrock mining activities.<sup>50</sup>



Lisa P. Jackson,  
Administrator

Dated:

7/10/09

<sup>50</sup> As part of developing proposed and final rules the Agency will consider whether hardrock mining facilities which have a RCRA Part B permit or are subject to interim status under RCRA Subtitle C and already are subject to RCRA financial assurance and facility-wide corrective action requirements need to also be subject to the financial responsibility requirements under Section 108(b) of CERCLA. In addition, EPA is aware and will consider in its development of proposed and final rules, that mining on Federal land triggers either the Bureau of Land Management's (BLM) Part 3809 regulations (43 CFR Part 3809) and the Forest Service's Part 228 regulations (36 CFR Part 228), both have financial responsibility requirements that cover reclamation costs. Many states also have reclamation laws.