US EPA's Response to ICCL Mining Site Remediation and Reuse Questionnaire

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Section I. Risk Assessment and Cleanup Technologies

1. Are cleanup goals used when remediating contaminated mining sites?

Yes, cleanup goals or objectives are used when remediating contaminated mining sites. Cleanup goals are first identified during the project scoping process and refined as additional information from the site investigation is obtained. The final specific cleanup goals or objectives used for remediating mining sites will depend on the legal authority (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA, or commonly known as Superfund]), governing the cleanup and the primary threats, potential routes of exposure, and associated receptors identified in the site characterization and risk assessment. (See Section IV below for a brief discussion of the legal and regulatory framework used to clean up contaminated mining sites).

For example, Preliminary Remediation Goals (PRG) or Regional Screening Levels (RSL) are used to establish initial cleanup goals at most sites, including mining sites, remediated under CERCLA authority. PRGs and RSLs were developed by US EPA using risk assessment guidance from the Superfund program. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with US EPA toxicity data. RSLs are considered by the US EPA to be protective for humans (including sensitive groups) over a lifetime; however, RSLs are not always applicable to a particular site and do not address non-human health endpoints, such as ecological impacts.

It should be noted that PRGs and RSLs are generic screening values, not de facto cleanup standards. Once the Baseline Risk Assessment (BLRA) is completed under CERCLA, site-specific risk-based remediation goals can be derived using the BLRA results. Under CERCLA, the selection of final cleanup goals may also include federal and state Applicable or Relevant and Appropriate Requirements (ARAR) and criteria, advisories, and guidance to be considered (TBC), as well as site-specific risk-based goals.

Provisions under the Clean Water Act (CWA) may be used to address water pollution emanating from contaminated mining sites. U.S. Courts have ruled that water pollution from active and inactive mining operations do fall under the definition of point source discharges regulated under the Clean Water Act (CWA). The amount and types of allowable pollutants that can be discharged under a CWA permit are determined by technology-based and water-quality based criteria. Section 402(p) of the CWA also requires a permit for stormwater discharge associated with industrial activities. US EPA has defined "industrial activities" to include abandoned and inactive mines. Under the stormwater program, runoff from mining operations requires a permit if it comes into contact with "any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of such operation".

2. Is site-specific risk assessment used to clean up mining sites? If yes, what methodology is being used?

Yes, site-specific risk assessments are used to clean up contaminated mining sites. US EPA and other federal agencies have developed methodologies and criteria to perform site-specific human health and ecological risk assessments.

US EPA has identified key issues relevant to mine waste site risk assessments as well as a compilation of references to other helpful resources in the Agency's Abandoned Mine Site Characterization and Cleanup Handbook (August 2000). In Chapter 8 of the Handbook, US EPA discusses scoping and conducting ecological and human health risk assessments. Specifically, US EPA Risk Assessment Guidance for Superfund (RAGS), including Volume 1 parts A1, B2, C3, D4, and a supplemental volume 5, provide a broad, conceptual framework for conducting human health risk assessments at CERCLA sites. These concepts, while originally developed to address risk assessment issues during CERCLA action, are appropriate to consider in evaluating risk at non-CERCLA sites. Guidance for conducting ecological risk assessments may be found in the Ecological Risk Assessment Guidance for Superfund (ERAGS), the US EPA Guidelines for Ecological Risk Assessment, among other US EPA Regional and field guides. In addition, US EPA utilizes the Integrated Exposure Uptake Biokinetic (IEUBK) Model to predict blood lead concentrations given that lead is a common contaminant of concern at mining sites.

Under Executive Order 12580, federal agencies and departments are authorized to implement CERCLA response authorities at sites under their jurisdiction. For example the US Forest Service (USFS) within the Department of Agriculture and the US Bureau of Land Management (BLM) within the Department of Interior serve as the lead agencies under CERCLA concerning the cleanup of mining sites within their respective jurisdictions. Both the USFS and BLM have developed risk assessment criteria for mining sites (BLM 1996; Western Water & Land Inc. 2002). These risk assessment approaches, which are referenced below, include evaluations of ecological and human health risks.

BLM, 1996. Risk Management Criteria for Metals at BLM Mining Sites. Technical Note 390 rev. National Applied Resource Sciences Center, Denver Federal Center. December.

Western Water & Land, Inc. 2002. Abandoned/Inactive Mine Lands Screening Assessment Plan. Prepared for US Forest Service, Grand meas, Uncompahgre, and Gunnison National Forests. July.

Section II. Waste and Water Management/Treatment Technologies

3. Are any Best Management Practices (BMP) or Best Available Technologies (BAT) implemented when treating mining waste, mine tailings and/or mine influenced waters?

There are a number of conventional technologies, both treatment and containment/diversion, that have become standard practice in the mining and mineral processing industries. Current treatment technologies include chemical treatment, stabilization, solidification, and soil flushing. When treatment technologies cannot treat the contaminants to an acceptable level, collection, diversion, and containment technologies are used.

Water treatment is the most common type of treatment in a mining site using settling agents in clarifying tanks to precipitate the heavy metals. A cheaper less effective way to treat is to use a settling pond. A new more novel approach for treating nitrates and some dissolved metals in mine waters that has been used in pilots is an anaerobic bioreactor. This process involves adding biological nutrients to stimulate natural microorganisms to assimilate the nitrate compounds and to co-precipitate heavy metals. Other novel solutions are phytoremediation where plants and trees extract and stabilize or detoxify contaminants in soil and soil solution.[i] US EPA's Abandoned Mine Site Characterization and Cleanup Handbook (August 2000) contains a complete list of technologies and their typical costs and effectiveness. Another source is the US EPA's Mine Site Cleanup for Brownfields Redevelopment: A Three-Part Primer.

There also is research being done on novel mining technologies and practices. For example, there is research being performed by the US Department of Energy's (DOE) National Energy Technology Laboratory and the National Mine Land Reclamation Center (NMLRC), headquartered at West Virginia University. These research groups are working on creating new technologies and techniques to use on mining reclamation sites.

In addition, research on cleanup technologies and reclamation of mining lands has been performed under the Land Research Program Restoration in US EPA's Office of Research and Development (ORD). The purpose of this research

program is to provide improved scientific knowledge and develop and apply more cost-effective tools, models, and methods to inform decisions on land restoration.

Section III. Recovery, Reuse, and other Sustainable Practices

4. Is mining waste being reused for beneficial purposes? If so, what are the common beneficial uses of mining waste (for example, road bed/road construction projects, capping materials)?

Yes, in some instances. Some of the copper mine wastes have been put to use, but on a limited scale. Mixtures of crushed waste rock, including waste rock from the copper mines, have been used to construct embankments, fills, or pavement bases for highways (http://www.epa.gov/radiation/tenorm/copper.html#disposal). Aluminum mining mud might be used for land reclamation, for the construction of site dams or embankments, or as a feed material for other extraction processes because of the high iron content. (http://www.epa.gov/radiation/tenorm/aluminum.html)

There also are cases where slag from hard rock smelter operations has been reprocessed to remove metals that were not originally removed during their initial smelting (for example zinc and molybdenum). Historic slag also has been added as the flux for current smelter operations and has been tested and used for small-scale demonstrations for additives to asphalt and natural gas "fracture" sand. Additionally, "Chat" (gravel-like waste created from lead and zinc mining) is allowed to be beneficially used for road construction projects.

5. Are there any initiatives or practices to encourage locating alternative energy facilities at contaminated or active mining sites? If so, what kind of alternative energy projects are being sited (e.g., solar, wind, hydroelectric)?

Yes. US EPA's *The RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites Initiative* is an effort to identify the renewable energy potential of contaminated properties and provide other useful resources for communities, developers, industry, state and local governments, or anyone interested in reusing these properties for renewable energy development. US EPA's Initiative seeks to address both the contamination and liability issues in order to place these properties back into productive use. US EPA has identified more than 11,000 US EPA-and state-tracked contaminated properties and mine sites (comprising nearly 15 million acres) that have potential for development as solar, wind, biomass, and/or geothermal facilities.

Some examples of alternative energy projects being planned or constructed at formerly contaminated mining sites include:

- The 1,400-acre Summitville Mine Superfund site near Del Norte, Colorado. This former gold mine is still being reclaimed. As part of this process, a 35kW hydroelectric plant was just recently completed. The plant currently supplies around 20% of the electricity needed for an onsite water treatment plant. However, a new more efficient treatment facility is under construction.[ii]

- Currently, a feasibility study is being conducted at the Leviathan Mine Superfund Site in Alpine County, California. The site is contaminated with waste from open-pit sulfur mining in the 1950s and 1960s and covers 253-acres at an elevation of 7,000 feet on the dry eastern flank of the Sierra Nevada, near the California-Nevada border. Due to the remoteness of the site it was recommended that a study be produced to see if a hybrid power generation system using renewable energy, including wind, solar, and water-based technologies along with the existing diesel generator system could power the remediation operations which are expected to be long and ongoing.[iii]

- Wind energy projects are in place at Buffalo Mountain and Somerset. The two-acre Buffalo Mountain wind farm is located twenty-five miles west of Knoxville, Tennessee on a former strip mine operated during the 1980s. The turbines at the Buffalo Mountain wind farm generate 4,000MW hours of electricity annually, enough to supply approximately 400 homes.[iv] The 400-acre Somerset wind farm is located on farmland in Somerset County, Pennsylvania that was previously used by two different mining operations. In the early 1960s, the land was strip-mined for coal, removing much of the land's surface soil. In the 1980s, another mining company deep-mined the same area for coal, creating underground shafts. The former coal mines were cleaned up between 1987 and 1990, using funds set aside by the two mining companies. Six 1.5MW wind turbines have been placed on a former mining site adjacent to the Pennsylvania Turnpike. The turbines at the Somerset wind farm generate 25,000MW hours of electricity annually, enough to supply approximately 2,500 homes.[v]

- The Molycorp, Inc., site located near the town of Qesta, Taos County, New Mexico, encompasses two distinct areas, a molybdenum mine and its associated tailings ponds. Mining operations began at the site in 1920 and continue today. The Molycorp site remediation includes containment of waste rock and tailing source materials, ground water extraction and treatment, and temporary ground water restrictions. Also included in the plan was for Chevron Technology Ventures to place 175 concentrated photovoltaic panels on a 20-acre portion of the site which will produce up to 1MW of energy or enough to power around 500 homes.[vi]

  For more information about alternative energy generation on contaminated and Superfund sites, visit http://www.epa.gov/superfund/programs/recycle/activities/altenergy.html

6. Are reuse practices (such as carbon sequestration) and/or ecological revitalization activities implemented at contaminated mining sites (e.g., education centers, historical landmarks, commercial or industrial parks, wildlife refuge, etc.)?

Yes, contaminated mining sites addressed by the Superfund program have been returned to productive reuses. The reuses include green space, alternative energy, commercial, residential, public service, industrial, federal and mixed use. The Agency tries to select cleanup options that encourage and support future use of a site. US EPA uses two fundamental methods to facilitate reuse of Superfund sites: (1) Exploring future uses before the cleanup remedy is implemented, an approach that provides the Agency the best chance of designing cleanup remedies to support the likely future use of a site; and (2) Working with landowners and communities to remove barriers not considered necessary for the protection of human health or the environment at those sites where remedies are already in place.

Some examples of reuses of formerly contaminated mining sites include:

- California Gulch Superfund Site in Lake County, Colorado, encompasses more than 18 square miles in the Rocky Mountains, about 120 miles west of Denver. Mining, mineral processing, and smelting activities there produced gold, silver, lead, copper, manganese, and zinc for more than 130 continuous years. Nearly all of the mines within the California Gulch site boundary are presently inactive, and all of the mills and smelters have been either decommissioned or demolished. Many areas within the site are still undergoing continuing remedial activities, but some of the cleaned up portions of the site are already in reuse. A Return to Use Initiative supported the Lake County Recreation Advisory Board to secure a $10,000 grant to develop conceptual plans for Lake County Community Park. Other redevelopment efforts have included helping to develop the Mineral Belt Trail and awarding two Lake County redevelopment grants. One grant assisted with historic preservation planning, interpretation of the historic mining district, and developing the Hayden Meadows Reservoir.[vii]

- Torch Lake Superfund site is located on the Keweenaw Peninsula in Houghton County, Michigan, copper mining activities at the Torch Lake site from 1890s until 1969 led to the deposition of mine wastes, including slag and tailings, into surrounding surface water and soils. The US EPA has taken steps to integrate future land use considerations into its remedy selection process. All portions of the site are suitable for residential land uses, and non-residential reuse, such as commercial, ecological, recreation or open space uses. Habitat restoration activities on Torch Lake's Gull Island include the construction of a recreation area with nature trails and a campground, and an outreach and monitoring/educational program.[viii]

- The Cherokee County Superfund site in Cherokee County, Kansas was an old mining site. One hundred years of mining ravaged the landscape. Today, however, a 900-acre portion of the site has been restored to its natural state and is now a wildlife habitat.[ix]

- The Silver Bow Creek Superfund site in Butte, Montana was used in the late 1800's when mining wastes were deposited from the copper mines, mills, and smelters that surround the Butte area. For 60 years, miners dumped their wastes into streams and wetlands near mining operations, severely polluting ponds and soil. The area has now been transformed into a sports complex that includes youth baseball fields, a driving range, and volleyball courts. Ponds and wetlands have been restored, drawing fly-fishing enthusiasts from neighboring towns.[x]

- From 1902 to the 1960s, the Silver Mountain Mine in Okanogan County, Washington operated sporadically, producing small amounts of silver and gold. In the early 1980s, speculators returned to the mine and used chemicals to extract precious metals from the old ore tailings. They left behind more than 7,000 tons of cyanide-laced mine tailings and a basin filled with 20,000 gallons of cyanide-contaminated water. In 1985, the Washington

Department of Ecology treated the cyanide-tainted water on site. US EPA then added the site to its list of hazardous waste sites needing cleanup in 1986 (i.e., The Superfund Program's National Priorities List [NPL]). US EPA closed the mine entrance, and placed the contaminated mine tailings under a protective cap. With the capped area fenced off, US EPA revegetated the land around the mine. A partnership between US EPA, the state of Washington, the local community, and a local rancher resulted in a cleanup that made it possible to once again use portions of the site as grazing land for cattle.[xi]

These are just a few examples of the large amount of work being done just on Superfund sites. For more information on this, visit http://www.epa.gov/superfund/programs/recycle/index.html.

In addition, US EPA has prepared a document entitled *Mine Site Cleanup for Brownfields Redevelopment: A Three-Part Primer* to provide information about approaches that have been used for redevelopment of mining sites. It provides an overview of mining site redevelopment, as well as new and innovative approaches, such as the Triad approach, to more efficiently characterize and cleanup those sites. New and innovative approaches to streamline characterization and remediation of mining sites offer stakeholders the potential for redevelopment at a lower cost and within a shorter timeframe. This document as well as a number of other relevant technical and policy documents related to mining sites may be found at http://www.brownfieldstsc.org/miningsites.cfm.

Section IV. Legal/Policy

7. Do you have a regulatory framework(s) or other programs in your country that addresses the cleanup of properties impacted by mining contamination? Who is responsible for the cleanup of sites?

Yes, mining activities, including the investigation and cleanup of abandoned mine sites, are governed under a complex web of jurisdictions, laws, and regulations covering several environmental media. The Surface Mining Control and Reclamation Act (SMCRA) of 1977 is the primary federal law addressing coal mining operations and reclamation. Title IV of SMCRA authorized creation of the Abandoned Mine Land (AML) program (discussed more below and in Question 12). Depending on the circumstances of any specific mine site, its operations, air emissions, discharges to water bodies, wastes generated, and/or cleanup may be governed by the provisions of the National Environmental Policy Act (NEPA), the Clean Air Act (CWA), the Emergency Planning and Community Right-to-Know Act (EPCRA), the Safe Drinking Water Act (SDWA), the Atomic Energy Act (AEA), the Toxic Substances Control Act (TSCA), the Uranium Mill Tailings Radiation Control Act (UMTRCA), and in limited cases of Resource Conservation and Recovery Act (RCRA), and state or local statutes.

CERCLA, commonly known as Superfund, was enacted in 1980 and is used to investigate and cleanup properties impacted by mining contamination. CERCLA response authorities are triggered by a release or a substantial threat of release of dangerous substances into the environment. The release must involve either: (1) a hazardous substance, or (2) a pollutant or contaminant that poses an imminent and substantial danger to public health or welfare.

CERCLA authorized cleanups at mining sites may be performed by responsible parties (e.g., parties found liable under CERCLA such as the mine owner) or the lead agency at the site (US EPA, another federal department with jurisdiction over the site [e.g., Department of Agriculture (USFS), Department of Interior (BLM)], or a state). Cleanups performed under CERCLA authority must follow the procedures established in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and involve the public. Under CERCLA, cleanups performed by the responsible party are overseen by US EPA and states. Cleanups performed under other federal and state environmental laws, such as RCRA corrective action, are generally completed by the owner or operator of the mining facility subject to oversight by the US EPA or state.

Under CERCLA responsibility or liability for site cleanup can be broad. "Anyone fitting the following categories is liable under CERCLA: (1) current owner (including lessees) or operator of the facility; (2) past owner or operator at the time of the disposal of hazardous substances in question; (3) anyone who arranged for the treatment, transportation, or disposal of the hazardous substances in question; and (4) any transporter of the hazardous substances in question if the transporter chose the disposal location. Liability is strict. That is, if the party falls into one of the above four categories, it is liable, regardless of fault."[xii]

Together with their authority under CERCLA, the BLM and USFS inventory, investigate, and cleanup mining sites under their AML programs. These programs cover sites on or affecting lands administered by the BLM and USFS, and provides solutions to degraded water quality and other environmental impacts. Primary funding of the AML programs comes from Congressional appropriations.

The BLM's AML program addresses mine sites that were abandoned prior to January 1, 1981, the effective date of the BLM's surface management regulations (43 CFR 3809) that implement the "unnecessary or undue degradation" provision of the Federal Land Policy and Management Act of 1976 (FLPMA), as amended (43 U.S.C. 1700, et seq.). With 11,000 known sites in the BLM's AML inventory database (as of September 2006), hundreds of thousands of sites not inventoried, and limited resources, the BLM establishes program priorities in the context of the broader BLM mission.

The USFS established its combined Environmental Compliance and Protection (ECAP) and Abandoned Mine Lands (AML) programs to reclaim the several thousand abandoned underground and open pit hard rock, placer, and coal mine sites and related mine and mill waste sites on NFS lands that are causing damage to the environment or risks to public health and safety. Because many AML sites involve a combination of federal, state, and private lands, the USFS actively seeks partnerships with other agencies, private groups or persons, and companies or owners potentially responsible for the site. This allows USFS to "leverage" its funds to maximize accomplishments and achieve reclamation of all sites in an entire watershed regardless of ownership.

The abandoned mine cleanup and restoration work that is funded by the USFS AML Program falls into 3 general categories: (1) Large & Complex Mine and Mill Sites in Heavily Impacted Watersheds; (2) Drainages Affected By Historic Placer Mining; and (3) Small Mine Cleanups and Safety Hazards.

See http://www.clu-in.org/download/market/2004market.pdf, http://www.epa.gov/superfund/policy/remedy/pdfs/amscch.pdf, and http://www.epa.gov/aml/policy/hardrock.pdf for more information on regulatory frameworks.

8. What types of enforcement measures and/or programs are available to recover costs from mining companies that caused the contamination?

CERCLA can be used to recover the costs caused by contamination. US EPA can either use Superfund to perform response (removal or remedial) activities or require private parties to perform such activities. US EPA typically only issues orders to parties who are potentially liable under CERCLA Section 107. The scope of liability under CERCLA is broad (see above). CERCLA Section 107 provides for the recovery of certain costs expended by the government in responding to environmental contamination from responsible parties. These response costs must be incurred as a result of a release or threatened release of a hazardous substance from a facility. Like most recovery provisions in the law, US EPA's cost recovery authority does have a statute of limitations. CERCLA imposes a fine of $25,000 per day for failure to comply with an order issued under CERCLA. In addition, if US EPA spends Superfund dollars performing work where a responsible party has failed to perform such work under order, that party may be liable for punitive damages in an amount equal to three times the costs incurred by the United States. Mining and mineral processing sites generally qualify as CERCLA facilities.[xiii]

Many US states and federal land management agencies have coal and hard rock metal mine permitting and reclamation programs that require the mining companies to post bond for the mine's closure and reclamation. Additionally, federal land management agencies can also use CERCLA 104 and 106 authorities to compel responsible parties to cleanup mine sites. Some states also have programs to order mine site cleanups by responsible parties. However, many mines do not have adequate reclamation bonds due to ever increasing mine disturbances, inflation, and long term treatment of mine influenced waters.

9. Is cleanup and reclamation of mined land part of the mine permitting process?

Yes, for coal mining part of the SMCRA section 515 mandates that permits require "restore the land affected to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is reasonable likelihood" (http://www.osmre.gov/topic/SMCRA/SMCRA.pdf).

For hard rock metal mines, federal land management agencies such as BLM and USFS and some US state agencies require approved permits and reclamation plans but often do not have the authority to fully reclaim the mine sites. BLM's 3809 regulations and USFS 228 regulations require financial assurances from mining companies for mine site reclamation activities. However, reclamation activities both at the federal and state level may not cost out long term treatment of mine influenced waters. In some states, for example, open pit metal mines may require reclamation of the tailings impoundments and waste rock dumps but do not require the backfilling of the mine pit.

The CWA also requires permitting which would likely include mining sites. The 1987 CWA amendments provided a mandate for establishing water quality standards for toxic pollutants and for developing NPDES permits that ensure that such standards are attained. In addition, those amendments provide a stronger basis for control of point source discharges associated with storm events, including those at mine sites. Increasingly, permits issued by state and federal regulators pursuant to CWA authorities include limitations necessary to meet specific in-stream water quality criteria. Such limits often go beyond technology based permit requirements. For example, whole effluent toxicity testing is a compliance parameter included in many NPDES permits.[xiv]

10. Is "designing for closure and post-closure" actively practiced?

For coal mines, the SMCRA requires that the mined land be returned to a productive land use. Many hard rock metal mines have closure plans for parts of the site but will leave the open pits to fill or partially fill with water and in many cases not address long term treatment of mine influenced waters. At limited mining sites regulated under Subtitle C of RCRA, certain hazardous waste management units may be subject to closure and post-closure requirements. Additionally, private organizations are increasingly recognizing the challenges and are implementing and developing BMPs for mine closure plans to promote ecological and economic revitalization for closed mines.

11. Is an Environmental Impact Analysis/Statement (EIA/EIS) performed for proposed mining operations? If so, how is closure and long-term liability considered in this process?

For coal mining the Office of Surface Mining (OSM) regulates and governs coal mining through its own program and through oversight of State Approved Mine Land programs. The OSM may be the lead agency for an EIA/EIS, or more likely will be a co-lead agency with the state agency or another federal agency such as the US EPA, US Army Corps of Engineers (USACOE), USFS, or BLM. http://www.osmre.gov/topic/SMCRA/SMCRA.pdf

EIS and EIAs would be required in cases where NEPA comes into play. Under NEPA, federal agencies prepare EISs for major federal actions significantly affecting the quality of the human environment. Other agencies, including US EPA, can comment on EISs.

Actions specifically related to mining that may require EISs include federal land management agency approval of Plans of Operations and reclamation plans for hard rock mining and/or milling operations on federally managed lands (or tribal lands), approval of mineral leases and sales on federal or tribal lands or federal mineral estates, and certain federal permits such as Section 402 NPDES wastewater discharge permits issued by US EPA for mines subject to new source performance standards, or Section 404 (dredge and fill) permits issued by the USACOE.

For new mining projects requiring federal permits, NEPA offers the opportunity to identify environmental concerns that are to be addressed in evaluating the proposed action, as well as alternatives that may be available to the applicant. The NEPA process offers an opportunity to understand the potential direct, indirect, and cumulative impacts of mining projects and to identify permit conditions that may be appropriate to manage, or mitigate, environmental concerns.[xv] See http://www.epa.gov/aml/policy/hardrock.pdf for more information.

Section V. Financial

12. What are the funding mechanisms used to clean up abandoned mine/mining impacted areas?

Congress authorized creation of the AML Program under Title IV of SMCRA. The program is funded by fees from current coal production, including tonnage-based fees paid by active coal mines - 35¢/ton of surface mined coal, 15¢/ton of coal mined underground, and 10¢/ton of lignite. The fund also consists of fees, contributions, late payment interest, penalties, administrative charges, and interest earned on investment of principal. The coal AML program provides funding to states to restore lands mined for coal and abandoned or left inadequately restored before August 3, 1977. Section 409 of SMCRA also authorizes states to use AML grant funds to address high priority non-coal mine hazards.

The Office of Surface Mining Reclamation and Enforcement (OSMRE) is authorized to carry out the AML program under Title IV of SMRCRA. Regulations issued by the OSMRE affect how states use AML funds for non-coal mine hazards. While the state AML programs are limited to using SMCRA funds to only address public health and safety hazards at abandoned non-coal mines, and not purely environmental threats, the state programs have employed this provision to make a dent in the public safety threats posed by abandoned mines.

Unlike coal mining, there is no single source of federal funding for the reclamation of abandoned hard rock mining lands. However, as noted above, states with both coal and non-coal mines may use funds left over from the coal mining reclamation funds for non-coal mining remediation."[xvi] (Note, OSMRE rules and proposed federal budget cuts may severely limit certain states from using AML funds for non-coal mine hazards, particularly western states that have certified that they've already cleaned up their abandoned coal mines.)
See http://www.clu-in.org/download/market/2004market.pdf for more information.

13. How are these mechanisms funded (e.g., public or mining industry contributions)?

There is no single source of federal funding of abandoned hard rock mining sites, however states could use the SMCRA funding source after all coal mines reclamation had been completed. In general the reclamation budgets of the federal and state agencies that manage mine lands are small in comparison to the magnitude of the abandoned mine waste problem. And most of the costs will be borne by private companies, and owners of state and federal facilities, such as the US Department of Defense (DoD) and DOE who are held liable for the pollution.[xvii] See http://www.clu-in.org/download/market/2004market.pdf for more information.

The Superfund cleanups also are funded through congressionally appropriated funds. Cost recovery by the government is a critical element of ensuring the adequacy of Superfund. There are also several small funding mechanisms from a variety of sources when non-regulatory approaches are used. Funds are often leveraged, and budgets are typically lean.[xviii]

14. Are there any laws, regulations, and policies and practices setting the approach for environmental financial assurance for mine closure? If so, what are key issues associated with the application of these policies?

Yes, mining on federal land triggers either the BLM's Part 3809 regulations (43 CFR Part 3809) and the USFS's Part 228 regulations (36 CFR Part 228), both have financial responsibility requirements that cover reclamation costs. As discussed above, many states also have reclamation laws. However, section 108(b) of CERCLA gives US EPA (and, for transportation-related facilities, the US Department of Transportation) the authority to require that classes of facilities maintain financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage or disposal of hazardous substances. In July 2009, US EPA designated portions of the hard-rock mining industry as its priority for the development of financial responsibility requirements (see Federal Register, July 28, 2009 (Volume 74, Number 143, Page 37213-37219). US EPA plans to propose a financial responsibility rule in 2012 for classes of facilities within the hard-rock mining industry.

Estimated costs of remediation for all hard rock mining facilities from several sources have generally been in the range of billions of dollars. US EPA has estimated that the cost of remediating all hard rock mining facilities is between $20 and $54 billion. US 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 twenty percent of all cleanup work could be completed within 30 years. In another analysis based on a survey of 154 large sites, US EPA's Office of Inspector General (OIG) projected that the potential total hard rock mining remediation costs totaled $7 to $24 billion. OIG calculated that this amount is over 12 times US EPA's total annual Superfund budget of about $1.2 billion from 1999 to 2004. The annual Superfund budget from 2004 through 2008 remained consistent with OIG's assessment, at approximately $1.25 billion.

US EPA will carefully examine specific activities, processes, and/or metals and minerals in order to determine what proposed financial responsibility requirements may be appropriate. As part of this process, US EPA will conduct a close examination and review of existing federal and state authorities, policies, and practices that currently focus on hard rock mining activities. As part of developing proposed and final rules the Agency will consider whether hard rock 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. As noted above, US EPA is aware and will consider in its development of proposed and final rules, that mining on federal land triggers either the BLM's and the USFS's regulations, both have financial responsibility requirements that cover reclamation costs as well as states reclamation laws.

Section VI. Social

15. How does the local community participate in mine permitting, design/construction, financial responsibility calculations and the mine closure process?

There are a number of avenues in which the public may participate in the permitting, closure, and cleanup of mining operations. As noted above, mining operations are governed by a complex jurisdiction of federal and state laws and regulations. Depending on the legal authority, public concerns must be addressed by the federal or state departments and agencies during the permitting process or when the federal or state government implements cleanup authorities. US EPA and states must also engage the public and respond to public comments when issuing regulations governing mining operations. For example, the public must and will be afforded the opportunity to comment on US EPA's proposed financial assurance rules for mining operation under section 108(b) of CERCLA. When issuing the final rule, US EPA must address those public comments.

NEPA plays an important role in the review of proposed mining activities. NEPA provides a framework for a comprehensive consideration of the environmental impacts associated with federal permit decisions, and provides opportunities for public involvement.

CERCLA, RCRA Corrective Action authorities, and state cleanup authorities all mandate community involvement in decisions regarding cleanups and during implementation of the cleanup. Under CERCLA, US EPA follows a step-by-step process established in the NCP to determine the best way to clean up the site and protect human health and the environment. Opportunities for community involvement occur throughout the process. US EPA guidance recommends that community involvement and engagement planning should parallel all aspects of the site cleanup process from the onset of scoping to conclusion of site work. This includes taking into consideration a wide array of community issues such as community values and culture (where the community may value the heritage of mining), risk perception (where the community might question the risk assessment), liability (where the community may fear who will be liable for the cleanup efforts), economic impacts (to the community) and fiscal Impacts on local government, among other issues.[xix] In the Agency's Abandoned Mine Site Characterization and Cleanup Handbook (August 2000) there is an entire chapter on community involvement and tips to make sure the community is more involved at all levels during the cleanup. The handbook can be found at http://www.epa.gov/superfund/policy/remedy/pdfs/amscch.pdf.

16. Are there any regulations/programs that address/manage social impacts of mining and mine reclamation?

Yes. As noted above, mining operations are governed by a complex jurisdiction of federal and state laws and regulations. Certain laws, such as the SMCRA were specifically created to address and manage the social impacts of mining and mine reclamation. In SMCRA, the US Congress states that "the purposes of the Act are to: establish a nationwide program to protect society and the environment from the adverse effects of surface coal mining operations; assure that surface mining operations are not conducted where reclamation is not feasible and are conducted so as to protect the environment; assure that adequate procedures are undertaken to reclaim surface areas as contemporaneously as possible with the surface coal mining operations; strike a balance between protection of the environment and agricultural productivity and the nation's need for coal as an essential source of energy; assist the states in developing and implementing a program to achieve the purposes of the Act; promote the reclamation of mined areas left without adequate reclamation…". As noted above, NEPA provides a framework for a comprehensive consideration of the environmental impacts associated with federal permit decisions, and provides opportunities for public involvement. Other laws, such as CERCLA, while not specifically created for mining activities, provide the federal government with authority to respond to the release or threatened release of hazardous substances into the environment that threaten public health and the environment caused by mining operations. Opportunities for community involvement occur throughout the CERCLA response process.
In addition, Executive Order (E.O.) 12898 - *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* - was issued by President William J. Clinton in 1994. Its purpose is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The E.O. directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The order also directs each agency to develop a strategy for implementing environmental justice. The order is also intended to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation.

Recently, US EPA has issued Plan EJ 2014, a roadmap that will help US EPA integrate environmental justice into the Agency's programs, policies, and activities. Plan EJ 2014 identifies Cross-Agency Focus Areas, Tools Development, and Program Initiatives as three essential elements that will advance environmental justice across the US EPA and the federal government. Plan EJ 2014 is named in recognition of the 20th anniversary of President Clinton's issuance of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. In implementing the Plan, US EPA will seek to meaningfully engage with communities and stakeholders.

The goals of the plan are to: protect health in communities over-burdened by pollution; empower communities to take action to improve their health and environment; and establish partnerships with local, state, tribal and federal organizations to achieve healthy and sustainable communities. Plan EJ 2014 is not a rule or regulation. It is a strategy to help integrate environmental justice into US EPA's day to day activities.

With respect to addressing environmental justice concerns at mining operations, US EPA recently issued a memorandum on *Improving US EPA Review of Appalachian Surface Coal Mining Operations Under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order* (July 21,2011). The purpose of this memorandum is to clarify the roles and expectations of the US EPA, in coordinating with our federal and state partners, to assure more consistent, effective, and timely US EPA review of Appalachian surface coal mining operations with respect to provisions of the CWA, NEPA, and E.O.12898. This memorandum does not impose legally binding requirements and will not be implemented as binding in practice. It does not impose any obligations on private parties. Its goal is to clarify existing understandings and to improve and strengthen permit decision-making consistent with existing law, thereby improving compliance with federal environmental statutes, implementing regulations, and policies. US EPA's goal is to work with our federal and state partners, and the public, to protect public health and the environment and promote the Nation's economic and energy security.

The memorandum directs US EPA to work with the USACOE to evaluate proposed projects and to ensure that NEPA and EJ concerns are more effectively articulated in US EPA's comments. While appropriate NEPA documentation for Section 404 CWA permit reviews is determined by the USACOE on a case-by-case basis, US EPA has recommended that serious consideration be given to the preparation of an Environmental Impact Statement (EIS) for proposed mining projects with multiple valley fills or large stream impacts. In order to foster the early and meaningful public involvement important to the NEPA process as well as effective environmental justice analysis, US EPA continues to recommend circulation of draft Environmental Assessments (EA) for public review and comment. Finally, US EPA continues to work with OSM and the USACOE to promote improved analysis of impacts to environmental justice communities, and these discussions have prompted US EPA to offer more specific examples in this final guidance of the types of impacts to these communities that US EPA believes should be considered.

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[i] http://www.epa.gov/superfund/policy/remedy/pdfs/amscch.pdf
[ii] http://www.epa.gov/renewableenergyland/docs/success_summitvillemine_co.pdf
[iii] http://www.epa.gov/renewableenergyland/docs/develop_potential/alpine.pdf
[iv] http://www.epa.gov/superfund/programs/recycle/pdf/wind_energy.pdf
[v] http://www.epa.gov/superfund/programs/recycle/pdf/wind_energy.pdf
[vi] http://www.epa.gov/superfund/programs/recycle/pdf/molycorp-success.pdf
[vii] http://www.epa.gov/superfund/programs/recycle/pdf/2002pilot.pdf
[viii] http://www.epa.gov/superfund/programs/recycle/live/region5_mi.html#10
[ix] http://www.epa.gov/superfund/programs/recycle/live/region7_ks.html#2
[x] http://www.epa.gov/superfund/programs/recycle/live/region8_mt.html#4
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