

# EPA's National Hardrock Mining Framework

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## **1.0 Purpose and Organization of the Framework**

### **1.1 Purpose of the Hardrock Mining Framework**

This Framework has been developed to help the U.S. Environmental Protection Agency (EPA) implement a multi-media, multi-statute approach to dealing with the environmental concerns posed by hardrock mining. Although the Framework focuses on understanding and improving the use of existing EPA authorities it does so with a clear recognition of the role of other parties. Building effective working relationships with other mining stakeholders is a key element of EPA's efforts to improve the effectiveness of its own programs.

In developing the Framework, EPA invited input from a number of mining stakeholders, including other Federal agencies, States, Tribes, local government, industry, and environmental groups. The final Framework presented here reflects many of the ideas provided by these groups on two earlier drafts.

For the purposes of the Framework, mining refers to proposed, active, and inactive and abandoned mines (IAMs) and mills from the metal, phosphate, uranium, and industrial mineral sectors; it does not include coal mining, crushed stone quarrying and mining, or aggregate mining.

### **1.2 Why develop an EPA National Mining Framework Now?**

#### **1.2.1 Need For Program Integration**

Environmental policies are increasingly focusing on integrating media protection (air, water, and land) and emphasizing multi-statute education, research, permitting, and enforcement to more effectively implement single-media statutes mandated by Congress. For example, EPA's Office of Enforcement and Compliance Assurance (OECA) has developed a number of industry profiles (including a Profile of the Metal Mining Industry) to encourage an integrated approach towards designing environmental policies for facilities within an industrial sector.

As the Agency faces increasing demands on limited resources, it becomes even more critical that EPA continue to manage its responsibilities efficiently, including those related to mining. The collective experience of EPA Regional offices and Headquarters in addressing the environmental concerns posed by mining should be shared and serve as a basis for development of consistent Agency policies for mine sites.

#### **1.2.2 The Environmental Impacts of Mining**

Mining has played a significant role in the development of this country. The industry has, and continues to be, an important contributor to both national and regional economies and is critical to national defense (See Appendix A). Mining, and the industries it supports, are among the basic building blocks of a modern society.

The benefits of mining to this country have been many, but have come at a cost to the environment. As the country has matured there has been increasing recognition that environmental protection is as fundamental to a healthy economy and society as is development. The challenge is to simultaneously promote both economic growth and environmental protection.

The historic impacts of mining on the environment are significant. While estimates vary it is generally recognized that there are over 200,000 inactive and abandoned mines (IAMs) nationwide. Only a fraction of these are believed to contribute significantly to environmental problems, but the aggregate impact is substantial and in specific cases there are serious localized environmental impacts (see Appendix B).

A 1993 survey by the U.S. Forest Service estimates that 5,000 to 10,000 miles of streams and rivers are impacted by acid drainage from mines on National Forests. The U.S. Geological Survey estimates that over 60 million tons of contaminated sediment cover the bottom of Lake Coeur d'Alene in northern Idaho as a result of historic mining in the Coeur d'Alene mining district. There are approximately 60 mine, or mining related, sites on the Superfund National Priorities List (NPL). Identifying, prioritizing, and implementing necessary cleanup actions at IAMs across the country is expected to take many years. Much of the cleanup cost will likely be borne by the public.

As mines have increased in size and complexity, environmental controls have become increasingly sophisticated. Mine operating plans must address stringent water quality standards, increased emphasis on protection of endangered species, requirements for mitigation of habitat losses, and concerns about long term reclamation and closure. Modern mines are required to more fully evaluate environmental concerns at the earliest stages of mine planning and design. Environmental controls are now considered as an integral part of overall mine management.

In recent years environmental practices employed by the mining industry have improved considerably. Installation of Best Management Practices (BMPs) for control of storm water runoff, improvements in treatment of wastewater, better management of tailings and waste rock, and more efficient metal recovery technologies have all contributed to reduced environmental impacts from mining projects.

However, in spite of these improvements, nearly 20 percent of the mining facilities inspected by EPA and the States between August 1990 and August 1995 were subject to enforcement actions. About 90 percent of the actions involved the Clean Water Act, the Clean Air Act, or the Resource Conservation and Recovery Act. Acid mine drainage and acid drainage from waste rock and tailings disposal areas continue to create environmental concerns at some sites. A number of mines that were designed to be zero discharge are now coming to regulatory agencies requesting discharge permits. The Summitville Mine in Colorado is perhaps the best known example of a modern mine with significant environmental problems; the cleanup costs for this site are expected to be over \$100 million.

On August 16, 1994, EPA's former Deputy Administrator Robert Sussman convened a Senior EPA Management retreat to discuss Agency activities regarding hardrock mining. This meeting was used to identify key questions the Agency must face in addressing environmental and human health

concerns and improving EPA's program delivery. Attendees included several Assistant Administrators and Regional Administrators. In an October 17, 1994 memorandum, Deputy Administrator Sussman directed the Office of Water (OW) to lead a multi-program, cross-organizational workgroup to draft an Agency-wide mining framework. The workgroup was comprised of staff from the Regions, Office of General Counsel (OGC), Office of Solid Waste and Emergency Response (OSWER), Office of Enforcement Compliance and Assurance (OECA), and other affected programs.

### **1.3 Goals of EPA's Mining Framework**

In developing this Framework EPA began with three principal goals. First was environmental protection. EPA's environmental goal is to protect human health and the environment through appropriate and timely pollution prevention, control, and remediation at proposed, active, and inactive and abandoned mine and mill sites (on both Federal and non-Federal land, consistent with Agency statutory authorities). The Agency's administrative goal is to foster efficient use of available resources and authorities on the highest priority concerns, using a multi-media/multi-statute geographic approach (watershed), and working closely with other Federal, State, Tribal, and local stakeholders. Finally, EPA is seeking to promote fiscal responsibility in managing environmental concerns at mine sites. This goal includes efforts to promote cost effective environmental controls at existing facilities, as well as historic mining sites. The need to minimize both current and future environmental and fiscal costs borne by the public provides a backdrop for each of these three goals.

### **1.4 Guide to the Framework**

This EPA Hardrock Mining Framework is intended primarily to assist EPA staff in implementing an effective multi-media/multi-statute mining program. It was developed by a diverse group of EPA geologists, engineers, scientists, researchers, economists, and others to identify important issues in the mining sector, and to suggest improvements in how EPA does its business.

The Framework is divided into two parts. This first section (Chapters 1-5) provides a brief problem statement, then focuses on how EPA can improve its mining program. The second section of the Framework is a set of Appendices that provide the reader with a more thorough discussion of specific issues that provide greater context for the Framework's recommendations.

## **2.0 Current Status**

### **2.1 Overview of Regulatory Framework for Mining**

Regulation of mining activities occurs via a complex web of sometimes overlapping jurisdictions, laws, and regulations covering several environmental media. Land ownership and tenancy issues further complicate regulatory issues. Each mine faces a somewhat unique set of regulatory requirements, depending upon State statute or regulation; whether it is on State, Federal, Tribal, or private land; local regulations; the kind of mining and metal recovery operation proposed; and the specific environmental considerations unique to the site.

States and Tribes have often been leaders in mining regulation. While no federal legislation specifically addressing the environmental impacts of mining has been passed, many States have established their own statutory programs. In addition, all States have general environmental statutes that provide coverage to mining operations. Many states have been authorized to implement federal environmental programs, such as the hazardous waste program under the Resource Conservation and Recovery Act (RCRA) and the National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act (CWA). The role of States and Tribes in mining regulation cannot be overstated; it is imperative that EPA understand these programs in order to improve its own program implementation (see Appendix E).

There are a number of statutes and associated regulatory programs that govern Federal land management programs as well as the disposition of minerals on federal lands. Through the 1872 Mining Law, Congress has encouraged the development of mineral resources on Federal lands for well over a century. In the Federal Land Policy and Management Act of 1976 Congress provided that the Bureau of Land Management is to take any action necessary to prevent unnecessary or undue degradation of Bureau-administered lands. Federal land management agencies recognize the legitimacy of mining on Federal land and administer claims consistent with environmental statutes and agency regulations. The Bureau of Land Management (BLM), U.S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS), National Park Service (NPS), Bureau of Indian Affairs (BIA), Bureau of Reclamation (BR), Office of Surface Mining (OSM), and Departments of Energy (DOE) and Defense (DOD) all play a role in influencing environmental outcomes at mine sites where they have ownership or jurisdiction (see Appendix D).

## **2.2 EPA Statutory Authority**

The principal environmental statutes that EPA has used to regulate and clean up releases to the environment as a consequence of mining over the past decade are the Clean Water Act (CWA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Resource Conservation and Recovery Act (RCRA) has been used by the Agency to examine the environmental impacts of mining. EPA's role in the National Environmental Policy Act (NEPA) process has been important in mine site evaluation and planning. These statutes are discussed briefly below.

### **Clean Water Act**

Over the past decade CWA Section 402 (NPDES permitting authority) has gradually shifted from control of single point sources of pollution, based on a relatively small number of conventional pollutants (biological oxygen demand, total suspended solids, pH, fecal coliform), to more complex permitting strategies that consider multiple sources of pollution and multiple pollutant parameters, including non-conventional (ammonia, chlorine, color, iron, and total phenols) and toxic pollutants.

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.

An important Section 404 (dredge and fill permitting) regulatory development is implementation of the Administration's Wetlands Plan, a set of 40 initiatives to make Federal wetland policy more flexible for the landowner and more effective in protecting valuable wetlands. The initiatives, many of which have been implemented, emphasize: improving wetland science; streamlining the permit process; increasing cooperation with private landowners; and increasing participation by States, Tribes, local governments, and the public in wetland protection.

### **The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund)**

The Superfund program has been used to respond to environmental threats at a number of major mineral mining and processing sites over the past decade. Anaconda, Bunker Hill, East Helena, California Gulch, Blackbird, and Summitville are all sites addressed by Superfund. Each of these sites has posed a significant threat to human health or the environment. Many other smaller mine sites have also been addressed under Superfund authorities. Response actions have been funded by both the government and private parties liable under CERCLA; some sites have included funding by both government and private parties.

Although Superfund authorities can potentially be applied to a broad range of mining sites, EPA has generally used it only at significant sites where other regulatory tools have not achieved needed environmental protection goals. For the largest, most complex cases EPA has placed mine sites on the Superfund National Priorities List. In many instances EPA has used CERCLA to implement response actions at sites not on the National Priorities List, commensurate with the risk posed by the site.

The use of CERCLA authorities is not limited to EPA. Other federal agencies, under the authority of Executive Order 12580, have used CERCLA to implement cleanup activities on their lands. Recently, the President (by Executive Order 13016) expanded the ability of other federal agencies to use CERCLA to achieve mine site cleanup.

The liability provisions of CERCLA, coupled with the availability of federal funding (largely from a tax on the chemical industry) for implementing response actions, make it a powerful tool for achieving mine site cleanup where other statutes or programs have proven ineffective. States have also played an important role in CERCLA implementation at mine sites, both in support of EPA efforts, and in leading cleanup initiatives.

### **Resource Conservation and Recovery Act**

Much of RCRA's history in mining regulation has involved rulemaking designed to determine which mining waste streams should be regulated as "hazardous waste". In October, 1980, Congress

amended RCRA by adding the Bevill exclusion, for “solid waste from the extraction, beneficiation, and processing of ores and minerals”. The Bevill amendment excluded these mining waste from regulation as a hazardous waste under Subtitle C of RCRA, pending completion of a study and a report to Congress. As a consequence of EPA’s analysis and subsequent regulatory interpretations and rulemakings, relatively little mining waste is currently subject to RCRA regulation as hazardous waste.

After most mining waste was exempted from Subtitle C regulation, EPA began work on development of a mine waste management program under RCRA Subtitle D. Though the effort, commonly referred to as “Strawman”, was never adopted as regulation, it helped provide a basis for mining regulation at the State level.

### **National Environmental Policy Act (NEPA)**

Under NEPA, Federal agencies prepare environmental impact statements (EISs) for major federal actions significantly affecting the quality of the human environment. Other agencies, including EPA, can comment on EISs. In addition, EPA has a unique role under Section 309 of the Clean Air Act (CAA) to review and comment in writing on the environmental impact of any matter, including those relating to the duties and responsibilities within the authority of the Administrator, those contained in any Federal action subject to NEPA’s EIS requirement, and other Federal actions.

Actions specifically related to mining that may require EISs include federal land management agency approval of Plans of Operations for hardrock 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 NPDES wastewater discharge permits issued by EPA for mines subject to new source performance standards, or Section 404 (dredge and fill) permits issued by the Army Corps of Engineers (COE).

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. EPA has been actively involved in NEPA as a lead agency, a cooperating agency, and a reviewer. 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.

### **2.3 Partnerships**

In developing this Framework EPA recognized that programs influencing the environmental impacts of mining were administered by many parties. States, Tribes, other federal agencies, and local government each have a role in mine regulation. Non-regulatory efforts to improve environmental conditions at mine sites are also an integral part of mine site management and include an even broader group of stakeholders, including industry and environmental groups.

Effective stakeholder partnerships have proven themselves to have tremendous value in addressing mining issues. Efforts in the Clear Creek Watershed in Colorado and the Coeur d’Alene Basin in



Idaho are two examples where partnerships in addressing environmental impacts from historic mining have yielded greater benefits than any single party could have achieved. In instances where successful partnerships were not established environmental goals have been more difficult to realize.

Understanding the tools available to each of the stakeholders involved in a particular mining issue is critical to forging an effective partnership (see Appendix C). Developing a clear understanding of what each party needs or has to offer helps to clearly define the roles and responsibilities of each party, minimizes overlap, and makes the most of available resources.

### **3.0 Improving How We Do Business**

The preceding sections provide a brief background on EPA's role in mine site management to give perspective for the recommendations in this section. The Recommendations and the Tasks identified in the Implementation section that follows, provide a strategy for improving EPA's mining program. The reader is encouraged to refer to the appendices for a more complete discussion of specific issues of interest.

#### **3.1 Key Considerations**

EPA recognizes that a number of tools are available to address mining issues. Many are administered by others, including Tribes, States, other Federal agencies, and local government. Industry and environmental groups also have a valuable role to play. In developing the Recommendations in this section EPA is focusing primarily on how to fulfill agency responsibilities more effectively, but it does so with the understanding that EPA must work in partnership with others.

This document has been developed to assist EPA staff working on mining issues, and a number of the recommendations offered can be implemented independently by EPA. However, many suggestions for improving program delivery require the agency to work more effectively with others. Obviously that requires cooperation, improving existing relationships, and in some cases building new ones.

To the extent that these recommendations rely on some change in the way EPA works with others, the Agency recognizes that it is incumbent upon EPA to seek other stakeholder's support. Nothing in this document is intended to suggest that EPA can redefine the role of other stakeholders, or set their agenda for them. However, EPA believes the recommendations and principles they represent are sound, and welcomes the opportunity to work with other mining stakeholders to move forward with their implementation.

In developing these recommendations EPA focused on working more effectively within the context of existing regulatory and programmatic responsibilities. Comments received on earlier drafts of the Framework suggested that EPA was seeking to broaden the scope of its responsibilities beyond legislative mandates. The Agency believes that all the recommendations provided are within the scope of EPA responsibilities and existing authorities.

When the workgroup began to develop the National Hardrock Mining Framework it was envisioned that the document would foster improvements in the way EPA delivers its mining program responsibilities. The Agency has already seen results. The process of developing the Framework

has improved communication within EPA and facilitated new dialogues with States, other federal agencies, Tribes, environmental interests, and industry. The Framework recommendations emphasize continued efforts to strengthen communication among stakeholders.

Framework recommendations were developed to be responsive to the goals identified in Section 1.3; to achieve improved environmental protection, to foster more efficient utilization of agency resources and authorities, and to promote fiscal responsibility in managing environmental concerns at mine sites.

## **3.2 Recommendations**

### **Achieving Improved Environmental Protection**

Fundamental to achieving improved environmental protection is identification of potential environmental concerns early in mine site planning, developing appropriate environmental management controls, and assuring implementation both during the operating life of the mine, and post-closure management. It is essential that this work be done in cooperation with stakeholders; specific recommendations follow:

1. EPA should promote improvement of scientifically based predictive tools used in evaluating the environmental impacts of mine sites. This includes collaborative research, participation in information exchanges and training opportunities, and technology development. Tools to better predict acid mine drainage and metals mobility would be a priority. Other subjects would include; site characterization and monitoring, fate and transport, treatment and remediation technology development and evaluation, and risk assessment (including both human health and ecological risk).
2. In States where EPA retains NPDES responsibilities the Agency should integrate permitting and NEPA site evaluation functions. These cases provide an opportunity to streamline the regulatory process for mine site evaluation and planning, while assuring that permits include appropriate provisions requiring that the preferred alternative be implemented as presented in the EIS.
3. EPA should promote an adequate consideration of environmentally protective standards and preferred alternatives at proposed mine sites during the EIS development. An appropriate range of environmentally sound alternatives should be included in each mining EIS.
4. The Agency should evaluate the adequacy of current mine waste management practices and promote standards of practice that achieve appropriate risk based, long term, environmental protection goals.

### **Using Our Resources More Efficiently**

Agency resources can be more effectively utilized in two ways. EPA can do a better job in direct program implementation, and the Agency can foster more effective partnerships with others.

5. The Agency should promote utilization of a geographic/risk-based approach to determining priorities for Inactive and Abandoned Mine (IAM) reclamation. Setting priorities and selecting appropriate cleanup strategies (including tools for implementation) should be conducted in cooperation with appropriate stakeholders (see Appendix F).
6. EPA should use targeted enforcement and compliance approaches as a tool to better focus resources on the highest priority mining operations. These approaches should emphasize compliance assistance as a priority, but may also include traditional enforcement mechanisms.
7. EPA should work with the Corps of Engineers to develop a consistent approach to defining “fill material” (in the context of Section 404 permitting) and determining the applicability of the waste treatment exclusion to certain mining activities.
8. EPA should prepare guidance and provide training to State and Federal agencies on the use of CERCLA site assessment, investigation, and screening tools for mine sites.
9. EPA should compile, and periodically update, information regarding grants available to fund mining remediation projects for distribution to mine site management partners.

### **Promoting Fiscal Responsibility**

Promoting cost effective strategies for management of environmental concerns at mine sites, and assuring that mine planning includes consideration of mechanisms for implementation of necessary environmental controls (both during the operating life of the mine and through reclamation and closure) are included in the following recommendations.

10. EPA should encourage development of cost-effective environmental control technologies for both active and inactive mine sites.
11. EPA should evaluate the adequacy of EISs for mining operations in predicting the long-term environmental impacts of mining operations. Assessment of financial assurance mechanisms that will be utilized to provide funding of required long term environmental management systems is critical to this analysis.
12. EPA should encourage reprocessing of historic mine wastes in conjunction with, or as a component of, site cleanup.
13. EPA should develop (or support) legal and administrative mechanisms to encourage implementation of environmentally beneficial response actions at mine sites, such as the

good Samaritan provisions being considered as an amendment to the CWA.

14. In the interest of reducing uncertainty for the regulated community, EPA should work with other mining stakeholders, to develop standardized methods for characterizing and analyzing environmental impacts at mine sites, predicting and verifying acid mine drainage and metals mobility, and establishing environmental performance standards.

#### **4.0 Implementation Actions**

##### **4.1 Putting the Framework into Action**

Implementation of the recommendations provided above requires improved coordination and cooperation within EPA Regions, between Regions and Headquarters, among various programs at EPA Headquarters, and with partners in mine site management. In many instances Regions are in the best position to understand local environmental concerns, stakeholder needs and capabilities, and opportunities for program improvement. However, Headquarters will play a critical role in supporting implementation of the Framework's recommendations. The following action items were identified to support implementation of the Framework:

1. Regions with significant mining activity should establish Regional Mining Coordinators and cross program mining teams to optimize internal EPA program delivery, enhance technical capabilities, and serve as a focal point for mining program improvement and delivery.
2. EPA Headquarters should establish a cross-program mining team to foster effective working relationships with stakeholders at the National level (including other federal agencies), provide appropriate support to Regions, promote coordination among Headquarters program staff, and communicate with Senior EPA management.
3. Each Region with significant mining activity should develop (and periodically update) a Regional Mining Profile to assess the scope of proposed, active, and inactive and abandoned mines in the Region, identify environmental issues of concern, and understand the concerns and capabilities of key Regional stakeholders. Meetings with States, other federal agencies, industry, environmental groups, and mining communities will be an essential element of developing a Regional Mining Profile.
4. Regions with significant mining activity should develop Regional Mining Strategies to guide mining program improvements. Development of such strategies is key to implementation of Framework recommendations at the Regional level. EPA Headquarters should provide support to Regional efforts where feasible.
5. The National Interagency Coordinating Committee on mining should be promoted as a forum for development of consensus approaches to critical technical and policy issues (e.g. evaluating financial assurance concerns related to long term environmental compliance at mine sites) on Federal lands.

6. Regions and Headquarters should sponsor periodic workshops on the “toolbox” approach to foster innovative problem solving, technology transfer, and stakeholder cooperation.
7. Regions should sponsor workgroups (including appropriate stakeholders) to develop methodologies for mine site characterization, EIS development, wastewater treatment strategies, and reclamation and closure standards.
8. Regions should hold workshops for identifying legal and administrative obstacles, and recommendations for promoting, good Samaritan mine site cleanup and reprocessing/ re-mining of inactive and abandoned mines.
9. Regions should screen upcoming mining EISs to determine priorities for agency involvement. EPA should be actively involved in all major EISs for mining projects, participating as a cooperating agency where appropriate.
10. EPA Headquarters should request comment on whether a reexamination of high risk Beville wastes is warranted with the possibility of bringing some high-risk waste streams under Subtitle C in a future rulemaking. The Agency should consider revival of the Policy Dialogue Committee or another group to discuss this issue.

## **4.2 Next Steps**

The Recommendations and Implementation Actions above provide a strategy for improving EPA's work in the mining sector. Carrying out the above steps are critical to improving our relations with other agencies. Clarification by EPA of its expectations for environmental performance for mining operations facilitates communication and coordination with other federal and state agencies. By working with others to establish a common vision for mine site management EPA can improve the effectiveness of Agency programs.

Regional staff will play a major role in Framework implementation at the field level. However, Headquarters commitment to implementing the Framework's recommendations will be critical to making long term program improvements, particularly with respect to working relationships with other federal agencies.

Fundamental to many of the ideas presented for improving EPA's mining programs is recognition of the critical role of others in managing the environmental concerns posed by mining. Building effective partnerships, both at the National and Regional levels, are among the most important elements of this Framework.

## **5.0 Introduction to the Appendices**

In earlier versions of this Framework much of the information in the Appendices was contained in the body of the Framework. To make the Framework more useable this information was consolidated in the Appendices.

The EPA Hardrock Mining Workgroup devoted considerable effort to development of this material and the reader is strongly encouraged to review the Appendices for additional information on topics of interest. The Appendices provide a Profile of the Mining Industry, background on the Environmental Impacts of Hardrock Mining, a discussion of Regulatory and Non-Regulatory tools available to address mining issues, information on other Federal agencies role in mining, a Summary of State Programs, ideas for Priority Setting, and a summary of comments on earlier versions of the Framework.