THE BUREAU OF LAND MANAGEMENT ACID ROCK DRAINAGE POLICY AN EVOLUTION IN ENVIRONMENTAL PROTECTION[1]

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Abstract: In the late 1980's the Bureau of Land Management came under scrutiny from the environmental community and our Nation's Congress for lax enforcement of operations conducted under the Nation's Mining Laws. This attention often focused on operations utilizing cyanide in the processing of gold ores. In response to this, the Bureau developed a Cyanide Management Policy and Cyanide Advisory Committee to provide guidance and technical assistance to field offices and advise management on related issues. The Bureau's Cyanide Management Policy was released in August 1990. Later the role of the Committee was expanded to include other technical issues related to hard-rock mineral development. During this time period it became apparent to the Bureau that a policy on acid rock drainage was as important as the cyanide policy. The Committee identified the need to develop a Bureau policy for mines with the potential to develop acid rock drainage. Several mines on Bureau managed public lands are extracting mineral deposits that have the potential for developing acid rock drainage.

The Bureau Acid Rock Drainage Policy has several major points:

1. All proposals for surface disturbance must be evaluated for acid rock drainage.
2. Mitigating measures addressing acid rock drainage must be applied.
3. Operations that propose active water treatment of acid rock drainage discharge require financial guarantees for water treatment facilities.
4. All portions of the mine facilities that may contain acid-generating materials are to be bonded for 100 percent of the cost to implement the approved reclamation measures.

Additional Key Words: acid rock drainage, mine wastes, Bureau of Land Management.

Introduction

Major open pit mines can have severe impacts on the surrounding landscape and pose threats to air and water quality. For these reasons, strict requirements are placed on companies which propose large scale development of mineral resources.

In the United States, the prospective operator must apply for permits to construct or expand a mining operation. The permitting process is multifaceted and can involve numerous political jurisdictions and agencies. Clean air and water laws must be complied with as well as a host of local, State and Federal laws which protect other resource and natural values.

If the proposed operation is on land administered by the Federal Government, an Environmental Analysis (EA) or Environmental Impact Statement (EIS) must be prepared. Some states also require some form of Environmental Analysis for mining proposals regardless of land ownership.

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Federal lands are most likely under the jurisdiction of either the U.S. Forest Service (Department of Agriculture) or the Bureau of Land Management (Department of Interior).
Both of these agencies are responsible for managing Federal lands located mostly in the Western United States. For larger operations the requirements for an operating permit are similar for both agencies: The operator submits a plan of operations describing all aspects of theproposed mining operation for the agency's review. Following completion of the necessary environmental review, the agencies issue a formal approval. The agencies rely on inspection and enforcement programs to assure the conditions of the permit are complied with.

It is important to note the agencies ordinarily do not have the authority to reject a proposal submitted under the General Mining Law of 1872, which has served as the cornerstone of Federal Mineral Policy for 121 years. Both houses of congress passed revisions to the Mining Law in 1993, but it remains unclear what the ultimate mining law reform legislation will look like.

The General Mining Law of 1872, prior to its numerous amendments, was designed to encourage the settlement of the West and development of the Nation's mineral resources. As the West was settled and developed, the environmental effects of mining activity began to become issues. Some of these issues were surprisingly early on. Farmers in the Sacramento River Valley of California were among the first to look to the legal system for protection from the effects of unrestricted placer mining in the upper reaches of the Sacramento River drainage. A decision in a U.S. Circuit court in 1884 that acted to protect prime agricultural land essentially ended the era of unrestricted hydraulic placer mining in California. Other court decisions throughout the West generally established some minimum level of environmental protection, based primarily on impacts to other land owners and users downstream or downwind of mines or mineral processing facilities. In the 1960's and 1970's new Federal legislation on clean air and clean water began to impact mining development, and several State laws governing mines in the Western States also date to this period.

It was not until 1974, when the U.S. Forest Service developed the 36 CFR 228 Surface Management Regulations, that Federal regulations specific to operations on mining claims came about. These regulations were followed in late 1980 by the Bureau of Land Management's 43 CFR 3809 regulations. These regulations differed from the Forest Service regulations in one important aspect: operations involving less than 5 acres of surface disturbance do not normally need formal approval from the Bureau prior to beginning operations.

Policy Development

The Bureau's surface management regulations coincided approximately with what has been called "the new American gold rush". Increased gold prices (due to the US Government's abandonment of fixed gold prices), new processing technologies using dilute cyanide solutions, and a better understanding of disseminated gold occurrences combined to create renewed interest in mineral properties throughout the West. Much of this initial activity was centered along the Carlin trend of north-central Nevada, but other properties in other Western states were not far behind.

Problems and perceived problems related to the use of cyanide quickly followed some of these early operations. Problems often centered on leaks of solution from the leach pads and solution ponds and on waterfowl mortalities as migrating waterfowl set down on process ponds containing cyanide solutions. These and other unrelated problems on mining claims, typically occupancy trespass and unreclaimed disturbances were presented as evidence in favor of reforming the 1872 mining law by its many critics. The criticism and support from reformers in the U.S. Congress led to a series of reports by both the General Accounting Office (GAO)(1986,1989,1990), the investigative branch of Congress and the Inspector General (IG)(1992), an investigative branch within the U.S. Department of the Interior. The reports were generally quite critical of the Bureau's efforts to enforce the surface management regulations. Internal Bureau reviews also revealed some inconsistencies in inspection and enforcement policies in the various Western States.

These problems forced the Bureau to revaluate its approach to permitting mines using cyanide. The Bureau developed a Cyanide Management Policy which was released in August 1990. This policy addressed (1) minimum acceptable design criteria, (2) coordination among State and Federal agencies, (3) bonds to ensure reclamation of disturbances, (4) mandatory reporting of wildlife mortality and cyanide discharges, (5) regular BLM inspections, (6) mandatory training for Bureau employees, and (7) procedures for closure and reclamation. This policy required State-specific cyanide management plans. In November 1990, the Bureau established a Cyanide Advisory Committee composed of Bureau staff familiar with technical aspects of cyanide recovery technology. Later the role of the Committee was expanded to provide guidance and technical assistance on other issues related to hard-rock mineral development.

As the early heap leach operations have begun to mine out oxidized portions of their ore bodies, operations may be proposed to continue mining into unoxidized sulfide bearing ore at depth. Many of the staff dealing with mine permitting within the Bureau realized that a more pervasive long term environmental threat than cyanide is posed by the potential for acid rock drainage (ARD) to develop from these types of sites. The prospect of several mining companies proposing operations with the potential to generate ARD spurred the Bureau's Cyanide Advisory Committee to develop a policy specific to the long-term threat posed by ARD. This policy was developed in early 1993 and following review by the members of the Cyanide Advisory Committee was released in draft form in late June 1993 (BLM 1993).

The Acid Rock Drainage Policy has several major points highlighted in table 1 and discussed below:

Table 1. Major points in the Bureau of Land Management acid rock drainage policy

• All proposals evaluated for acid rock drainage. • All mining proposals require material characterization. • Acid rock drainage must be mitigated. • Long term treatment proposals require financial guarantees. • Portions of the mine containing acid-generating materials bonded at 100% of the reclamation costs.

-All proposals for surface disturbance must be evaluated for acid rock drainage during review by the Bureau.
-All mining proposals must include waste characterization and appropriate waste handling considerations. These must based on the physical and geochemical properties of the waste and the site specific environmental conditions.
-Mitigating measures must be applied to prevent unnecessary or undue degradation by acid rock drainage.
-Proposed operations which include reclamation measures relying on long term water treatment are not encouraged and will be closely reviewed.
-Proposed operations which include reclamation measures relying on active water treatment of ARD discharges in perpetuity will require bonding or financial guarantee mechanisms sufficient to construct, operate and maintain treatment facilities.
-All portions of the mine facilities that may contain acid-generating materials are to be bonded for 100 percent of the cost to implement the approved reclamation measures.

The Bureau policy makes it clear that waste characterization must be fully integrated with operational procedures throughout the mine life, perhaps even beginning with initial characterization work during the advanced exploration stage. Waste characterization is required for all operations. Assertions by the operator not supported by technical data that the materials are not acid generating or annual precipitation is too low for ARD development will not be adequate. The policy discusses what types of preliminary waste characterization work might be appropriate as well as more advanced testing. More advanced predictive work might include static, kinetic, or some combination of both types of tests.

When initial characterization reveals the potential for an ARD problem, the plan of operations or notice must include measures that prevent or control ARD. The Bureau policy encourages applied research, including the use of test plots at individual mine sites to field test reclamation measures prior to mine closure. The treatment of ARD effluent is almost always a last resort, and the policy makes it clear that long term proposals to treat ARD effluent will be closely reviewed, and that any proposal for active treatment of ARD effluent in perpetuity will require bonding or financial guarantee mechanisms sufficient to construct, operate and maintain treatment facilities.

Other important features of the policy include-

-Use of the Environmental Review process to evaluate the impacts of proposed activities. The analysis will address all the expected impacts anticipated during all phases of the proposed operations.

-Inspections of operations with the potential for the development of ARD will be made no fewer than four times a year or as identified in a site specific plan. Inspections should be scheduled when any potential ARD effluent is most likely, e.g. after major precipitation events or during spring runoff.

-Training is required for BLM personnel responsible for inspecting operations and should include safety, mining and milling processes, and ARD evaluation, monitoring, and mitigation.

-Operator monitoring plans for ground and surface waters throughout the mine life are required for all mine facilities with the potential to produce ARD. The monitoring results are to be reported to the Bureau, which will coordinate with State agencies to assure environmental protection.

-Quality assurance of engineering designs for proposed facilities must be included in plans of operations. The Bureau may require independent verification by a registered professional engineer that facilities are constructed according to the approved design plan and specifications.

-Interagency coordination with other State and Federal agencies that may have responsibility in permitting mines is important in order to avoid duplication and increase efficiency in the regulation of permitted operations.

A 1991 GAO Report, 'Increased Attention Being Given to Cyanide Operations' (GAO/RCED-91-145) concluded, "The cyanide management policy that BLM has adopted appears to be an appropriate response to the potential hazards that cyanide operations present to wildlife and the environment."

Conclusion

By early adoption and refinement of the Acid Rock Drainage Policy the Bureau can hopefully avoid a lengthy and divisive series of reports such as those resulting from the difficulties with early cyanide operations. The Acid Rock Drainage Policy may be even more crucial than the Cyanide Management Policy, Considering the long- term environmental problems that can be associated with acid rock drainage.

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