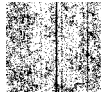


United States Department of the Interior

BUREAU OF LAND MANAGEMENT



Nevada State Office  
P.O. Box 12000  
Reno, Nevada 89520-0006

IN REPLY REFER TO:  
3000 (NV-920) P

August 3, 2000

EMS Transmission 8/3/00  
Instruction Memorandum No. NV-2000-066  
Expires 9/30/2001

To: Field Managers, Nevada  
Deputy State Directors and Staff Chiefs, NSO

From: Associate State Director, Nevada

Subject: Nevada Bureau of Land Management's Reclamation/Closure Policy for Water  
Management for Hardrock Mining Activities

**ISSUE:** A number of mining operations that were originally permitted in the 1980's have or are preparing to cease mining operations. Several Bureau of Land Management (BLM) field offices have raised issues concerning closure or final reclamation procedures under the Surface Management Regulations (43 CFR 3809) for these operations. The issues range from the adequacy of the original National Environmental Policy Act (NEPA) compliance documentation to specific technical issues such as land application of heap drain down.

Under the guidance of the Nevada BLM State Leadership Team, a task force was formed to address these issues, including formulate policy and develop a guidance document. Make up of the task force included field and state office specialists and managers.

The policy and guidance document was prepared in coordination with the Federal and State regulatory and land managing agencies. In addition, input was solicited from interest groups, including mining interests and environmental groups.

**POLICY:** It is the policy of the Nevada BLM that reclamation, including closure, of hardrock mining operations be conducted and completed in a proper manner to ensure the protection of the public lands under BLM jurisdiction. It is the responsibility of the BLM to protect the long-term health of the public lands. Authorization to allow the release of contaminated waters into the environment must be in compliance with the Clean Water Act, Safe Drinking Water Act, Nevada Groundwater Protection Act, Endangered Species Act, other applicable environmental laws, and consistent with BLM's multiple use and resource protection responsibilities under the Federal Land Policy and Management Act (FLPMA).

It is the policy of the Nevada BLM that all modifications to an approved Plan of Operations regarding closure will be reviewed and approved by the authorized officer under 43 CFR 3809. Any Federal decision to approve a modification to an approved Plan of Operations, including changes to the closure plan, must be in compliance with the requirements of NEPA.

It is the policy of the Nevada BLM to coordinate and collaborate to the fullest extent practical with the State regulatory agencies responsible for the permitting and oversight of mine reclamation and closure activities. Where appropriate, the BLM will utilize the State environmental regulatory requirements, guidance and standards as the base for its analyses and reviews. The BLM recognizes the State's authority under the Clean Water Act, Safe Drinking Water Act, and Nevada Groundwater Protection Act and in carrying out its responsibilities under FLPMA will rely on the State's decisions pursuant to that authority.

**IMPLEMENTATION:** The "Nevada Bureau of Land Management's Guidance for Hardrock Mining Reclamation/Closure Activities - Management of Heap Leach Effluents -" (attached) is intended as a guide in meeting the requirements of this policy. Specifically the attached document provides guidance to the BLM in meeting its responsibilities to ensure the evaluation and analysis of potential impacts to surface waters, groundwaters and unsaturated zones. The appropriateness of the individual discussions will depend on the issues being addressed and the decisions being made.

**CONTACT PERSON:** Questions concerning this policy and the attached guidance document should be directed to Dr. Tom Olsen, BLM Nevada State Office, Division of Minerals Management at 775-861-6451.

  
Jean Rivers - Council

**1 Attachment**

- 1 - Nevada Bureau of Land Management's Guidance for Hardrock Mining Reclamation/Closure Activities - Management of Heap Leach Effluents (15 pp)

# Nevada Bureau of Land Management's Guidance for Hardrock Mining Reclamation/Closure Activities - Management of Heap Leach Effluents -

## INTRODUCTION

The Bureau of Land Management (BLM) is responsible for management of public lands and resources for present and future generations under our statutory mandates. BLM is committed to close coordination and working through State and local regulators and their statutory primacy requirements to meet our Federal statutory and resource management objectives. BLM has the responsibility to ensure reclamation, including closure, of hardrock mining operations on BLM-administered lands is conducted and does not result in unnecessary or undue degradation of the public lands. This responsibility includes understanding technical issues associated with the closure of hardrock mining operations and making informed decisions. This guidance document is intended to facilitate Nevada BLM field offices in carrying out their responsibilities, ensuring coordination with the appropriate State regulatory agencies.

There are four main topics covered in this guidance document.

When faced with hardrock mining reclamation, including closure, the authorized officer must ensure decisions will not result in unnecessary or undue degradation of the public lands. All actions must comply with the appropriate federal and state laws, and consistent with BLM's multiple use responsibilities under the Federal Land Policy and Management Act (FLPMA).

- Reclamation decisions need to be coordinated and made in collaboration with the State regulatory agencies responsible for the permitting and oversight of mine reclamation, including closure activities.

The BLM must ensure that adequate financial guarantees are in-place for mining operations on public lands which will include reasonably foreseeable reclamation costs, including closure and monitoring, on BLM-administered lands.

The BLM field specialists and managers need to understand and consider all the technical issues associated with hardrock mine reclamation, including closure activities and the long-term implications of closure, while ensuring that reclamation, including closure activities, is conducted in a timely and effective manner.

Specific technical issues addressed in this guide are disposal and monitoring of heap detoxification waters, heap drain-down waters and process pond sludge.

## **CLOSURE**

In this guidance document, the term “closure” refers to the act of closing any phase of a mining operation where further operations are not intended. It is the final step of reclamation in closing down a mining operation or any phase of an operation.

It is important to be aware of the different usage of the term “closure” by the Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation (BMRR). As used by BMRR, closure is when chemical stabilization of a mine site has been achieved after mining activity ceases. State closure requirements primarily deal with stabilization of process and non-process components, solid and liquid process mine waste, pits, waste rock dumps, ore stockpiles, and any other associated mine components that, if not properly managed during operation and closure, could potentially lead to the degradation of the environment.

## **AUTHORITY, ANALYSES AND DECISIONS**

All surface management activities, including reclamation, must comply with all pertinent Federal laws and regulations, and all applicable State environmental laws and regulations. The fundamental requirement, implemented in 43 CFR 3809, is that all hardrock mining under Plan of Operations or Notice on the public lands must prevent unnecessary or undue degradation. The Plan of Operations and any modifications to the approved Plan of Operations must meet the requirement to prevent unnecessary or undue degradation. Authorization to allow the release of effluents into the environment must be in compliance with the Clean Water Act, Safe Drinking Water Act, Endangered Species Act, other applicable Federal and State environmental laws, consistent with BLM’s multiple use responsibilities under the Federal Land Policy and Management Act and fully reviewed in the appropriate National Environmental Policy Act (NEPA) document.

The BLM should ensure reclamation issues, including closure, are adequately addressed as part of the initial Plan of Operations. However, it needs to be recognized that proposed reclamation activities found in the original Plan of Operations are subject to change and are likely to change. With mine development, more detailed hydrologic, geologic and chemical information and actual monitoring data becomes available that may warrant changes to the reclamation, including closure activities, described in the approved Plan of Operations. Where the operator proposes or the BLM requires modification to the proposed reclamation activities, including closure, the Plan of Operations must be modified.

The authorized officer is responsible for ensuring modifications to approved Plans of Operations, including mine closure decisions, are properly reviewed prior to approval. In assessing the need for additional NEPA documentation, the authorized officer should consider the significance of the proposed modification and the adequacy of the original NEPA documentation. Any Federal decision to approve a modification to an approved Plan of Operations must be in compliance with

the requirements of NEPA. If the modification involves actions that have been evaluated under previous NEPA review, the authorized officer may issue a Documentation of Land Use Plan Conformance and NEPA Adequacy (DNA).

The following actions will usually be considered a significant modification of an approved Plan of Operations. These actions will be analyzed in an appropriate NEPA document.

- The proposed modification involves disturbance or use of public land not covered in an approved Plan of Operations.
- The proposed modification is not fully covered in an existing NEPA document.
- The proposed modification has potential impacts not identified and analyzed during approval of the original Plan of Operations or subsequent modifications.

Any required NEPA document needs to consider the potential environmental impacts of the proposed modification, including impacts to resources associated with the unsaturated zone. For the purpose of this guidance document, the unsaturated zone is the portion of the earth immediately below the land surface and above the water table. Within this zone the pores contain both water and air, but are not totally saturated with water. If a mine closure plan proposes discharge of fluids then zero-discharge and fluid treatment alternatives must be considered in the NEPA document. Environmental analyses will be conducted according to BLM's NEPA guidelines contained in H-1790-1.

## **COORDINATION**

Early, consistent cooperation and participation by all Federal, State, local and Tribal entities with review and approval responsibilities for hardrock mining, including closure decisions, is likely the single most effective way to reduce costs and delays in the current approval process. For hardrock mining on public lands, the BLM is the lead agency and land manager, and as such needs to take the responsibility to ensure the appropriate coordination takes place with all parties. In addition to the need to coordinate with other governmental entities, the BLM needs to ensure it meets its obligations under NEPA to provide the public an opportunity to review and comment on decisions affecting public lands.

The Nevada BLM is specifically committed to coordinate and collaborate to the fullest extent practical with the State regulatory agencies responsible for the permitting and oversight of mine reclamation and closure activities. To aid in the coordination with the State regulatory agencies, BLM personnel need to understand the State permit requirements and approval process. When there is disagreement that cannot be resolved by the BLM field office and the BMRR, the issue

should be forwarded to the State Director through the Deputy State Director, Mineral Resources at the Nevada State Office for resolution.

### **Bureau of Mining Regulation and Reclamation**

In Nevada, the State regulatory agency with primary responsibility for closure decisions is BMRR. For mine closure, BMRR requires the operator to submit several major documents for review and approval. Discussed below are the four BMRR documents required for mine closure: Tentative Permanent Closure Plan, Final Permanent Closure Plan, and Final Closure Report and Request for Final Closure. The description of these documents is intended to aid the BLM's understanding BMRR's closure process and to facilitate BLM in its commitment to coordinate with the State agencies on mine reclamation and closure issues.

**Tentative Permanent Closure Plan** - Reclamation, including closure, of a mine site is addressed in the Plan of Operations approved by the BLM. At the same time the Tentative Permanent Closure Plan is submitted to the BMRR as part of the Water Pollution Control Permit approval process. BLM and BMRR coordination on the Tentative Permanent Closure Plan should occur as part of the review and approval of the original Plan of Operations and Water Pollution Control Permit. However as these plans are submitted as part of the original mine approval, it may not reflect the reclamation options when a mine nears actual closure. Closure activities being proposed by the operator may represent a modification from what was originally approved. If the proposed closure method is not in the approved Plan of Operations, then the Plan of Operations must be modified.

**Final Permanent Closure Plan** - The operator is required to submit a Final Permanent Closure Plan to the BMRR two years prior to the anticipated closure of the mine site. (However, it should be noted that Final Permanent Closure Plans are not always submitted two years prior to closure as required.) In order to expedite the NEPA and State permitting processes, the operator should concurrently submit the Final Permanent Closure Plans to BMRR and any proposed modifications to the Plan of Operations to the BLM. Ideally, the process should flow as follows:

- Operator submits a Final Permanent Closure Plan to BMRR and appropriate modifications to the Plan of Operations to BLM.

BLM, in coordination with BMRR, compares the Final Permanent Closure. Plan/Modification to the Plan of Operations with the approved Plan of Operations to determine whether the modifications are significant, and whether the modifications have been reviewed under previous NEPA analysis.

- If BLM determines new NEPA documentation is necessary, the BLM will coordinate with BMRR and the operator on project-specific issues, including schedules for review and approval of the plans.
- BLM assessment of potential impacts, including resources associated with the unsaturated zone, should occur at the same time as BMRR is reviewing water quality impacts.

BLM prepares the appropriate NEPA documentation.

- If required, BLM and BMRR should coordinate public review of the NEPA document and modification to the Water Pollution Control Permit.

To meet BMRR's requirement, the Final Permanent Closure Plan provides closure goals and a detailed methodology of activities necessary to achieve a level of stabilization of all known and potential contaminants at the site. The Final Permanent Closure Plan also includes a detailed description of all proposed monitoring that will be conducted to demonstrate how the closure goals are being met. The operator must receive BMRR approval for the Final Permanent Closure Plan before initiating action. Activities including reshaping and regrading, covering, placing growth medium, applying soil amendments, and revegetation are in many cases major components of the site stabilization and closure process, and will be described or referenced as part of the Final Permanent Closure Plan.

It is in the operator's interest to review and amend the reclamation plan and bond cost calculations as general closure plans become more specific. Failure to properly document closure and reclamation activities may result in additional operator expenditures or project delays.

**Final Closure Report/Post-Closure Monitoring** - Following the completion of all closure related activities, a Final Closure Report is submitted to the BMRR that summarizes all completed closure related activities. This document should also be concurrently submitted to the BLM. Upon approval of the Final Closure Report, the mine site is considered to be in the "post-closure" period. The Request for Final Closure is made following the completion of the post-closure monitoring period. For BMRR purposes, this period lasts anywhere from five to a maximum of 30 years. The post-closure monitoring period is intended to validate the operators contention that those closure activities completed have indeed stabilized and verify no undue degradation of waters of the State. The request contains all pertinent post-closure monitoring information and clearly demonstrates stabilization. BLM's post-reclamation responsibilities are defined on a case-by-case basis in the approved plan of operations. As such, the time frames used by BMRR may not be relevant or appropriate to the BLM requirements.

## **Coordinated Review of Technical Issues**

The BLM will cooperatively review and approve methodology and technology necessary to ensure adequate evaluation of water quality issues with BMRR. The agencies should concur on data adequacy and conclusions at the earliest possible time. Where appropriate, the BLM will utilize the State environmental regulatory requirements, guidance, standards and testing methods as the basis for its analyses and reviews. This includes deferring to the State BMRR and U.S. Environmental Protection Agency (EPA) decisions pursuant to their authority under the Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, and other applicable Federal and State environmental laws where appropriate. For your reference, attached is an EPA information sheet identifying federal requirements affecting groundwater discharge. Except for point source discharges to waters of the U.S., currently there are no numeric Federal standards for permitting discharges into the environment as part of mine closure. The overriding BLM standard is found in the 43 CFR 3809 regulations, specifically the requirement to prevent unnecessary or undue degradation.

### **TECHNICAL ISSUES**

This section of the guidance covers three technical issues: disposal of heap detoxification waters, disposal of heap drain-down waters, and disposal of process pond sludge. Each issue discussion contains methods and technical alternatives that should be evaluated under best management practices for water and sludge disposal.

**General Disposal Criteria** - The general criteria for review and decisions regarding disposal are:

Compliance with all applicable Federal and State Laws

- Reduction and minimization of environmental harmful constituents
- Utilization of a risk management approach if necessary to address any remaining constituents or concerns.

**Disposal of Heap Detoxification and Heap Drain-Down Waters** - The following methods for the disposal of heap detoxification and heap drain-down waters should be evaluated in the Plan of Operations and NEPA document:

Land application by infiltration, leach field, or injection of treated water

Land application by infiltration, leach field, or injection of untreated water

Evaporation (zero discharge)



The following information needs to be collected and evaluated for any proposed method of disposal:

The locations for the proposed disposal

Volume of disposal solutions

- Predicted drain-down analysis

In addition, the following information needs to be collected and evaluated for proposed land application methods of disposal:

Chemical characteristics of the solution to be disposed

Survey of surface waters (locations of streams, springs, lakes, wetlands)

Depth of the shallowest water table or ground water aquifer

Hydrogeological characteristics of the disposal area

Ground water quality

Soils and subsurface lithology, including attenuation analysis

Vegetative survey

Ecological survey

These analyses would include, but not be limited to, state-required analyses for potential degradation of waters of the State.

When disposing of detoxification and heap drain-down waters utilizing land disposal of any type, the soils and sediments in the subsurface need to be tested for metal content. The test methods for metal content in earth materials should conform to those identified in EPA/SW-846 or ASTM.

**Disposal of Process Pond Sludge** - Process pond sludge must be tested to determine metal content, pH, and water content prior to evaluating disposal alternatives. The test method utilized to test the sludge should be identified in either EPA/SW-846 or ASTM. In addition, the sludge should be dried to the greatest extent possible before disposal takes place, this can be completed by evaporating the water out of the sludge.

Ways to dispose of sludge:

- Dry the sludge and bury it on-site.
- Treat the sludge and bury it on-site.
- Remove the sludge to an off site facility.

If sludge(s) are disposed of on-site through burial, an appropriate cover and capping system must be designed to:

Provide optimum evaporation.

Provide optimum surface water run-off and routing.

Provide in-place physical stabilization.

- Provide optimum evaporation (use of soil materials, vegetation, engineering design, etc.).

Minimize infiltration through sludge burial system with geosynthetic liners.

**Risk Management** - A risk management approach may be initiated when all reasonable technologies have been used to reduce environmentally harmful constituents that may reside in soils, drain-down waters, effluents, and sludge.

When contaminants of concern are identified in either residual waters, soils or sludges during reclamation, and that material is being proposed for land application, a risk-based management process can be utilized if appropriate. The risk management process that must be used is outlined in the Environmental Protection Agency Guidance for Risk Assessment, as well as, other guidance referenced in this policy, such as BLM Management Criteria for Metals at BLM Mining Sites, Technical Note 390, 1996, revised 1999.

*The following steps outline the EPA guidance and should be accomplished:*

Identify the type of contaminant(s) present and the threat posed to both human and ecological resources.

Assess, through screening the waters, soils, and sludges to determine if site-specific contaminant levels are exceeding State, Federal and other appropriate standards.

If contaminants exceed State, Federal, or other appropriate standards then conduct a risk assessment to determine the associated risk to human and ecological resources.

The risk assessment will determine land application suitability and any additional treatment, redesign, mitigation necessary to ensure human and ecological health and safety.

The risk assessment process will allow the BLM to make an informed decision on land application proposals with regard to reclamation plans.

BLM managers should adhere to the principles listed below when making human and ecological risk management decisions:

The goal is to reduce human and ecological risks to levels that will result in the health and maintenance of the land for multiple use objectives.

Use site specific human and ecological risk data to make informed decisions.

Characterize the site risks.

Communicate the risks to the public.

Remediate and mitigate unacceptable human and ecological risk.

**Monitoring Water Disposal in the Unsaturated and Saturated Zones** - When land application is utilized to discharge and dispose of process and drain-down waters through an engineered system, the performance of the system must be monitored. The monitoring can be conducted by a monitoring point or series of monitoring points, specifically wells, piezometers and lysimeters.

The piezometers and lysimeters should be located within the soil or unsaturated lithology zone to collect any discharge and monitor the discharge process for unsaturated zone characteristics. The piezometers and lysimeters should be placed at varying depths and distances around and away from the engineered system.

The well(s) should be located in the saturated zone (water table or aquifer), down-gradient of the engineered system, and have enough coverage to account for both horizontal and vertical spatial movement of contaminants. The well(s) should also be located to show system or natural

conditions down-gradient from the discharge point(s) in distance increments. To observe the performance of the engineered system and confirm efficiency or effectiveness, wells should be placed at incremental distances down-gradient from the discharge point(s).

## **FINANCIAL GUARANTEES**

Adequate financial guarantees have long been recognized as an essential component of the BLM's effort to ensure the protection of the public lands. Specifically, financial guarantees are needed when an operator is unable or unwilling to perform reclamation, including closure activities, and other obligations. Existing guidance, *Nevada BLM Bonding Process for Plans of Operations Authorized by 43 CFR 3802/3809*, details the procedures for calculating, establishing and releasing financial guarantees.

For the BLM, closure does not occur until all obligations have been met. As such, the BLM must require some form of a financial guarantee to cover any long-term obligation, including maintenance of long-term water treatment systems and monitoring, that is identified in the approved Plan of Operations. Final release of the financial guarantee may not occur until all reclamation, including closure requirements, are met. These requirements include the need to maintain a financial guarantee until the operator can demonstrate the ability to discharge any residual effluents into the environment to meet standards approved in the Plan of Operations. BLM has the option of considering a separate financial instrument other than the reclamation bond, specific to long-term closure, water and effluent management or monitoring requirements if agreed to with the operator. The Plan of Operations and associated bond must cover maintenance and monitoring of all fluid disposal systems.

## REFERENCES

- Soil testing: American Society for Testing and Materials (ASTM), Testing Methods for Earth Materials
- Environmental Protection Agency (EPA)/SW-846, Test Methods
- ASTM, Guide to Site Characterization for Environmental Purposes with Emphasis on Soil, Rock, and Vadose Zone and Ground Water, D5730, 1997.
- Risk Assessment: EPA/625/4-89/024, Risk Assessment, Management and Communication of Drinking Water Contamination, EPA, Office of Research and Development (ORD), June 1990.
- ASTM, STP 1218, Environmental Toxicology and Risk Assessment, third volume, 1995.
- EPA 540/R-97/006, Ecological Risk Assessment Guidance.
- EPA Guidance to Human Health Evaluation Manual, 1991
- EPA 540/1-89/002, Risk Assessment Guidance for Super fund.
- Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) Baseline Risk Assessment: Reference Manual, 1995.
- Understanding Risk, National Research Council (NRC), 1996.
- Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants, ORNL, 1995.
- Risks Posed by Beville Wastes, EPA, 1997.
- EPA/600/S-97/002, Priorities for Ecological Protection, 1997.
- Bureau of Land Management (BLM), National Applied Research Service Center NARSC, Technical Note 390, Risk Management for Metals at BLM Mining Sites (Interim Revision of Wildlife Risk Management Criteria, RS-99-004, 1999).

Cleanup Criteria for Contaminated Soil and Groundwater, ASTM, DS 64, second edition, 1996.

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EPA/600/2-91/002, Compilation of Information on Alternative Barriers for Liners and Cover Systems, 1990.

Monitoring: Practical Handbook of Ground-Water Monitoring, D. Nielson, NGWA, 1991.

Vadose Zone Monitoring for Hazardous Waste Sites, Everett, Wilson, and Hoylman, Noyes Data Corporation, 1984, 251 p.

Sludges: EPA/540/288/004, Technology Screening Guide for Treatment of CERCLA Soils and Sludges, 1988.

Estimation of Infiltration Rate in the 1998. Vadose Zone: Compilation of Simple Mathematical Models, Volume I, EPA/600/R-97/128a.

Estimation of Infiltration Rate in the 1998. Vadose Zone: Application of Selected Mathematical Models, Volume II, EPA/600/R-97/128b.

## **EPA Information Sheet**

The purpose of this information sheet is to summarize Federal requirements affecting groundwater discharges in Nevada. The information sheet is arranged as a series of questions and answers.

### **1. What Defines an Underground Source of Drinking Water?**

The Safe Drinking Water Act defines an Underground Source of Drinking Water (USDW) as and ground water containing 10,000 parts per million (ppm) or less total dissolved solid (TDS). However, EPA or a state can determine that water with less than 10,000 ppm TDS is exempted as an underground source of drinking water because of the factors such as: 1) whether or not it is currently a source of drinking water, 2) the economic and technical feasibility of extracting the water, 3) water quality of the aquifer (is it contaminated already, TDS too high to treat most effectively, or minerals or hydrocarbons naturally occur), or 4) subsidence or collapse likely is likely.

### **2. Is there Federal authority to protect an Underground Source of Drinking Water?**

The Federal Safe Drinking Water Act (SDWA) Section 1431 gives EPA the authority to protect underground sources of drinking water. SDWA Section 1431 states that EPA can stop any activity which may cause an imminent and substantial endangerment to an underground source of drinking water.

### **3. Does the Underground Injection Control Program Apply to the Groundwater Infiltration Basin or Leach Field?**

The Underground Injection Control (UIC) program was established under the Safe Drinking Water Act to protect ground water supplies. UIC program regulates the subsurface injection of waste fluids below, into and above underground sources of drinking water. Injection includes seeping, flowing, leaching and pumping with or without pressure. An injection well is a bored, drilled or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or subsurface fluid distribution system (an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground). These are the new rules, effective April, 2000. Nevada regulations currently do not include the subsurface fluid distribution system part, although leach fields, per NDEA policy, are considered injection wells.

The federal regulations are located at 40 CFR Part 144-147. There are five well classes:

- Class I: Deep wells injecting below the lowermost USDW. Permit required.
- Class II: Wells used for oil and gas production. Permit required.
- Class III: Wells which inject fluids used mineral extraction. Permit required.
- Class IV: Wells which inject hazardous or radioactive waste into or above a USDW. Prohibited except as a part of a CERCLA or RCRA clean-up action.
- Class V: Shallow wells that discharge into or above a USDW. These wells are currently authorized by real, however all wells must 1) be inventoried and 2) cannot endanger a USDW. examples of Class V wells: dry wells collecting surface water runoff, automotive disposal wells, and septic tanks which accept industrial waste. A new Class V Rule was promulgated in December 1999, but only affects cesspools and automotive waste disposal wells. This rule added the new definition, and ties these well types to SWAP areas and sensitive ground water protection areas.

Percolation ponds are not covered by the federal UTC program because they do not fit the definition of injection well. Leach fields for drainage from a closed heap leach facility are currently not regulated under any of the five classes in the UIC program. However a facility would be covered under SDWA 1421 if it is endangering an underground source of drinking water.

#### **What will EPA look for in NEPA reviews for Closing Gold Heap Leach Facilities?**

Post-closure toxins mobility and acid generation may remain a problem for years the heap and subsequently in the heap drainage going out to an underground leach field. Some of the questions to ask when evaluating the chemical constituents of the water that will be discharged are:

Look at the sulfide content of ore and spent ore. How was the geochemistry done? Were static or kinetic tests conducted?

What are the performance standards for closure? What would be the requirements if the heap leach pile drainage were placed in percolation ponds if it is toxic?

What is the geochemistry, structure, and hydrogeology of the substrate/rock under the heap leach pile drainage leach field?

What is the fate and transport capability of each contaminant in the drainage water?

What is the chemical composition of the solution remaining in the heap leach pile after the rinsing process to get below 0.2 mg/l CN in the residual solution? Will metals and other harmful contaminants become more concentrated in heaps over time?



Over what period of time will salts in the heap leach pile be discharged to the leach field?  
How does the chemical composition of heap leach pile drainage vary over time? Do salts and metals accumulate in perc ponds and move down through substrate in increasing amounts?

Look at heap cover design, vegetation, and climatic factors. Does it preclude meteoric water from moving down through closed heap?

Look at the success criteria for reclamation/revegetation. How will integrity of cover be maintained?

Should lime or other neutralizing agent be added to heap cover to neutralize meteoric water?

What is the monitoring program for closure and post-closure leach field discharges to enable close tracking of water chemistry of changes and to evaluate the need for interventions?

Closure monitoring should continue through at least one rest period (or dry season) and wet season after the water meets all standards to check for upward trends or spikes in contaminant concentrations.

Are the leach fields going to receive heap leach pile drainage forever, or is there some period after which the leach fields will not longer be necessary?

Have runoff/runoff controls for closed heap piles been evaluated to reduce the infiltration of water into heap and erosion of cover?

Are there contingency plans for large storm events, catastrophic failures of heaps infiltration rates too slow, etc.?

Will post-closure passive or active maintenance be needed?

- Are there bonds for closure, reclamation, and post-closure activities for the heap leach piles and the heap leach pile drainage leach field?

Does closure meet post-mining land uses?

Where are drinking water wells, agricultural wells, and surface water bodies in the project vicinity? How could seepage from the project affect these wells and water bodies?

Will seasonal changes affect the heap each drainage capacity or effectiveness?

How are the closed facilities treated by regulatory agencies? Are they industrial facilities?









It is the policy of the Nevada BLM to coordinate and collaborate in the fullest extent possible with the State regulatory agencies responsible for the permitting and oversight of water

with the State regulatory agencies. Where appropriate, the BLM will utilize the State and FEDERAL REGULATORY organizations. BLM will work closely with the State for the review and approval of water permits under the Clean Water Act, State Groundwater Management Act, and the State's decisions pursuant to that authority.

*Mr. [Signature]*

It is the policy of the Nevada BLM that all modifications to an approved Plan of Operations regarding closure will be reviewed and approved by the authorized officer under 43 CFR 3809. Any Federal decision to approve a modification to an approved Plan of Operations, including changes to the closure plan, must be in compliance with the requirements of NEPA.

It is the policy of the Nevada BLM to coordinate and collaborate to the fullest extent practical with the State regulatory agencies responsible for the permitting and oversight of mine reclamation and closure activities. Where appropriate, the BLM will utilize the State environmental regulatory requirements, guidance and standards as the base for its analyses and reviews. The BLM recognizes the State's authority under the Clean Water Act, Safe Drinking Water Act, and Nevada Groundwater Protection Act and in carrying out its responsibilities under FLPMA will rely on the State's decisions pursuant to that authority.

**IMPLEMENTATION:** The "Nevada Bureau of Land Management's Guidance for Hardrock Mining Reclamation/Closure Activities - Management of Heap Leach Effluents -" (attached) is intended as a guide in meeting the requirements of this policy. Specifically the attached document provides guidance to the BLM in meeting its responsibilities to ensure the evaluation and analysis of potential impacts to surface waters, groundwaters and unsaturated zones. The appropriateness of the individual discussions will depend on the issues being addressed and the decisions being made.

**CONTACT PERSON:** Questions concerning this policy and the attached guidance document should be directed to Dr. Tom Olsen, BLM Nevada State Office, Division of Minerals Management at 775-861-6451.

  
Jean Rivers - Council

**1 Attachment**

**1 - Nevada Bureau of Land Management's Guidance for Hardrock Mining Reclamation/Closure Activities - Management of Heap Leach Effluents (15 pp)**