



Bureau of Mining Regulation and Reclamation

PREPARATION REQUIREMENTS AND GUIDELINES FOR PERMANENT CLOSURE PLANS AND FINAL CLOSURE REPORTS

This document explains to a permittee the regulatory requirements for closure of a mining operation. The Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) Regulation and Closure Branches issue Water Pollution Control (WPC) Permits to construct, operate and close mining operations pursuant to the Nevada Water Pollution Control Law, Nevada Revised Statutes (NRS) Chapter 445A.300 through 445A.730 inclusive. Chapter 445A.350 through 445A.447 of the Nevada Administrative Code (NAC), titled ‘Mining Facilities’, contains the applicable mining regulations. The primary function of both the BMRR Regulation and Closure Branches is to ensure that “Waters of the State”, as described in NRS 445A.415, are not degraded during and after a mining operation. These regulations apply to all mining operations, with the exceptions of those facilities as provided for within NAC 445A.387, located within the State of Nevada, regardless of land ownership. WPC Permits, as issued, renewed, or subsequently modified, remain in effect throughout the life of the mine until final closure is achieved and approved by the BMRR. Closure-related activities (e.g., monitoring) are coordinated by the BMRR Closure Branch. Branch staff will evaluate chemical data to confirm stabilization of all applicable mine components (or sources) that must be considered for closure.

Appendix A of this guidance document is a list of applicable NRS 445A statutes and NAC 445A regulations which apply to closure.

Required Mine Closure Documents

There are four major mine site closure documents, listed in sequential order that must be submitted to the BMRR for review and approval. The first two documents are regulatory requirements while the third and fourth are BMRR requirements.

1. **Tentative Plan For Permanent Closure (TPPC)** - submitted at the time of application for a WPC Permit (NAC 445A.398);
2. **Final Plan For Permanent Closure (FPPC)** - submitted at least two (2) years prior to the anticipated permanent closure of that process component (NAC 445A.447);
3. **Final Closure Report** - (a) summarizes all completed closure-related activities, for example detoxification of the heap, monitoring, component characterization, leach field construction, and completed earthwork; (b) provides closure related as-builts, if required; and (c) proposes post-closure monitoring, as applicable; and

4. **Request For Final Closure** - demonstrates component stabilization (both chemical and physical) have been achieved and solicits WPC Permit retirement.

Closure Overview

The closure and stabilization requirements pertain to process and non-process components (solid and liquid process mine wastes) such as heap leach pads, tailings impoundments, 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 waters of the State. A mining facility permittee is required to submit a TPPC in accordance with NAC 445A.398 at the time of application for a WPC Permit. Goals and strategies for developing a FPPC should be included in the TPPC.

A FPPC must be submitted to the BMRR two years prior to the anticipated closure of any source which has been identified as a process component in accordance with NAC 445A.447. This plan must provide closure goals and a detailed methodology of activities necessary to achieve a level of stabilization of all known and potential contaminants at the site as defined by NAC 445A.379. The FPPC must include a detailed description of all proposed monitoring that will be conducted to demonstrate how the closure goals are being met. The Permittee should receive BMRRs approval for the closure plans before initiating action. The BMRR recognizes that reclamation activities such as reshaping, regrading, covering, placing of growth medium, applying soil amendments, and revegetation are in many cases major elements of the site stabilization and closure process. These reclamation activities become part of the closure plan and are described or referenced as part of the FPPC. As general closure scenarios become more detailed, the reclamation plan, together with the bond cost calculations, are reviewed and amended as necessary. Failure to coordinate closure and reclamation activities and documentation may result in additional Permittee encumbered expenditures.

To assist in the Permittee's preparation and the Branch's review of both the TPPC and the FPPC, a guideline for these documents is provided beginning on page 3 of this document. The BMRR recognizes that closure of a mine site is a dynamic process subject to changing technology and methods. Changes and updates to the TPPC and the FPPC are necessary as mining progresses. Closure documents should be thoroughly reviewed as part of the application for renewal of the WPC Permit. In addition, and as required by the WPC Permit within the annual reporting section, an updated evaluation of the closure plan using specific characterization data for each process component with respect to achieving stabilization should be discussed. Should a previously submitted closure document need revision, the Permittee should then clearly amend their existing document. This amendment should be reviewed by the BMRR prior to the initiation of the proposed modified closure-related activity(s). It is in the Permittee's interest to keep BMRR informed of all closure activities. Failure to do so may result in costly BMRR stipulated modifications.

Following the completion of all closure related activities; a Final Closure Report (FCR) must be submitted to the BMRR summarizing all completed closure related activities. This document should contain all information necessary for the Permittee to demonstrate to BMRR that the completed closure activities, per process and non-process component, will ensure that waters of the State will not be degraded. This report must include a proposal for post-closure monitoring for an initial period of time not less than five (5) years in order to provide additional supporting data that stabilization has truly been achieved. BMRRs approval for final closure cannot be considered without a satisfactory FCR. At this point, upon approval of the FCR, the mine site is considered to be in the 'post-closure' period and a revised WPC Permit - Post Closure is issued. BMRR defines the 'post-closure' period as that time when the Permittee has completed all required closure activities, the site is chemically stable, and is now in the post-closure monitoring period. The length of time the Permittee will be required to monitor components is a function of both the complexity of the site and the success of the closure activities as documented by the post-closure monitoring. Factors that enter into this time frame include: depth to and quality of ground water; location and quality of surface waters; history of a particular component; etc. It is at the beginning of the post-closure monitoring period that the BMRRs permit fees are reduced to those as provided under NAC 445A.232 - 'fees for WPC Permits'.

The Request for Final Closure is made following the completion of the post-closure monitoring period. The post-closure monitoring period must validate the Permittees' contention that those closure activities completed have indeed stabilized, as defined by NAC 445A.379, a particular component. The request should contain all post-closure monitoring information and clearly demonstrate stabilization. Final closure is complete when the requirements contained in NAC 445A.429, 445A.430 and 445A.431 have been achieved. Upon the successful demonstration of stabilization, the BMRR would now consider the mine site to be closed, would retire the WPC Permit, and eliminate all NAC 445A fee requirements. The BMRR will only retire the WPC Permit and fees when all components are stabilized. The post-closure period may include reclamation activities such as seeding, ripping, and fertilizing; or future activities such as plugging monitoring wells, removing fencing or access road removal. The BMRR encourages concurrent closure and reclamation activities. Concurrent closure activities may include, but are not limited to, solution treatment, regrading, material blending, monitoring and other activities undertaken for permanent closure and performed under an approved FPPC. It is possible for a Permittee to take an individual component into closure, through the post-closure monitoring period, and to demonstrate stabilization while other components of the mine remain active.

Review or approval of facility plans, design drawings, and specifications or other documents by or for the BMRR is for administrative purposes only and does not relieve the Permittee of the responsibility to properly plan, design, build and effectively operate and maintain the facility as required under law, regulations, permits, and good management practices. The BMRR is not responsible for increased costs resulting from defects in the design, plans and specifications of other pertinent documents.

GUIDELINES FOR THE PREPARATION OF PERMANENT CLOSURE PLANS

BMRR has additional guidance documents available that provide more detail on specific topics. Several of these documents are mentioned in context below. All BMRR guidance documents may be obtained either directly from BMRR or may be downloaded from BMRR's website located at <http://ndep.nv.gov/bmrr/index.htm>.

The FPPC must be submitted at least two (2) years before the anticipated permanent closure of that process component. An updated evaluation of the closure plan using specific characterization data for each process component with respect to achieving stabilization is to be submitted as part of the WPC Permit annual report. The Permittee is free to format this document, as well as the TPPC, as they wish, however, as appropriate; both documents should discuss the following items:

I. INTRODUCTION.

- A. The permanent closure plan must be submitted to the BMRR with the intent to fulfill the requirements as defined in NAC 445A. It must detail the procedures proposed for achieving stabilization of all mine source components. Details and direction of any proposed modeling, fate and transport analysis, or other projections of final closure configurations should be clearly described in the permanent closure plan. The BMRR will review all proposed analyses as they relate to the quantity and quality of long term drainage and percolation which may have the potential to degrade waters of the State. The Permittee must clearly demonstrate through the use of credible source, pathway and fate evaluations, modeling, or other projections that the proposed source does not have the potential to degrade waters of the State.

II. SITE LOCATION AND BACKGROUND INFORMATION

The following information should be included in the Plan for Permanent Closure:

- A. Geographic location, site climatology, and overall site geology.
- B. WPC Permit status; pre-mining land use; historic mining activity (under previous ownership); recent mining activity (under current ownership - exploration, construction, mining, leaching, etc.).
- C. Background ground water depth and quality. The Permittee must clearly establish both of these parameters, per component of concern. The establishment of these two parameters is critical for a successful closure program. The Permittee should refer to NAC 445A.424 to review potential closure options. Include a physical description of the aquifer(s) and nearest downgradient users of the aquifer(s).

- D. Background surface water location and quality (if applicable). As with ground water above, background water quality must be established. The Permittee should refer to NRS 445A.565 regarding treatment of and control over if a discharge to surface waters is a possibility. Discuss and indicate location of any springs (whether seasonal or perennial) onsite. Indicate any components located on springs.

III. FACILITY DESCRIPTION

- A. Provide a status of all mine components, both active and inactive, e.g., process solution circuit to include heaps, ore stockpiles, mills, ponds, tailings impoundments; and non-process components such as; waste rock disposal areas, open pits, overflow/event ponds, vehicle maintenance shops, landfills, etc.
- B. Provide applicable figures and flow charts of all process fluid system components. Include dimensions and capacities of all process components. Provide the location of any hydrocarbon remediation pads or areas and any landfills.
- C. As applicable, describe the engineering specifications for all liners, to include sub-base, and leak detection systems for heaps, ponds, tailings impoundments, and all associated conveyance devices that require containment. Provide a schematic that shows the locations of all leak detection systems and sampling ports.
- D. Describe all past, existing, and anticipated solid and liquid mine wastes and/or sources that will require formal closure.
- E. Provide all monitoring, production, condemnation, and exploratory well logs. Provide mapping with all the above wells clearly delineated. The Permittee will be required to clearly demonstrate that all wells and drill holes have been adequately sealed.

- IV. SOURCE CHARACTERIZATION PROGRAM** - As defined by NAC 445A.378, a “Source” means any building, structure, facility or installation from which there is or may be the discharge of pollutants. A Source Characterization Program is a detailed sampling and analytical approach to 1) identify what materials, both solid and liquid, are present, per mining component; and 2) to identify what materials may require special attention, per mining component, in the closure and post-closure phase.

A Nevada State certified Clean Water Act laboratory must be selected for all sample analyses. A listing of those laboratories can be supplied by BMRR or may be found at <http://ndep.nv.gov/bsdw/labservice.htm> under the heading ‘Nevada Certified Lab List’.

The Permittee should discuss with BMRR the proposed goals and protocols prior to initiating a sampling and testing program. In general, the Meteoric Water mobility Procedure (ASTM D2242-13), Acid/Base Accounting and Static/Kinetic (Nevada Modified Sobek Method – 2015) are the primary testing methods BMRR requires on source materials and wastes. Soil testing and analyses must be performed by State of Nevada approved laboratories. A listing of those laboratories may be found at http://ndep.nv.gov/bsdw/lab_mining_industry.htm under the heading 'List of Approved Labs [XLS]'.

- A. **General Requirements** - the following general requirements are requisite for any source that has the potential to degrade waters of the State.
- a. Describe all past and present sampling programs, per source. Discuss field sampling protocols such as field filtering; sample preservation; sample holding times; approved analytical method(s); and respective method detection limits (MDL). Provide the rationale for your sampling program per source; i.e., how the number of samples to adequately characterize the material was arrived at.
 - b. Provide sample analysis results from all previous and ongoing sampling programs.
 - c. Provide an accurate and appropriately scaled map showing all past and present sample locations.
 - d. Acid/Base Accounting is required for each individual lithology in waste rock disposal areas, leach pads, tailings materials, and open pits. The Permittee will be required to provide all test results and a discussion, per component, predicting whether or not a source is or will be a future Acid Rock Drainage (ARD) concern.
 - e. Describe the following physical characteristics (as applicable to source):
 - specific gravity of solids;
 - slurry density (solids: liquids ratio);
 - deposition rate and method of deposition;
 - average operational dry density;
 - final operational height, area, and top surface topography;
 - final operational water balance;
 - final operational embankment geometry;
 - strength characteristics of embankment and related components;
 - potentiometric characteristics of embankment and related components;

- anticipated range of stability characteristics under expected and of operational conditions (static and pseudo-static);
 - anticipated process water inventory at end of operations; and
 - anticipated surface water hydrology at end of operations and for predicted post-operational conditions (upstream diversion, required storm volume storage and flow rate, run-off and infiltration characteristics).
- f. Describe the following chemical characteristics of solids and anticipated residual drainage:
- mineralogy and geochemistry;
 - metals leaching potential;
 - potential final run-off chemistry; and
 - potential final seepage and/or drainage chemistry.

B. Individual Source Specific Discussion

a. Waste Rock Disposal Areas

- i. The BMRR document '*Waste Rock, Ore, and Overburden Evaluation*' provides characterization guidance.
- ii. Provide or reference BMRRs approved waste rock management plans, if applicable.

b. Open Pits

- i. Provide or reference BMRRs approved document(s) used in the discussion of water quality issues as presented in NAC 445A.429.

c. Heap Leach Pads

- i. Heap leach pads must be stabilized per NAC 445A.430. Detail all previous detoxification, characterization, and other closure-related activities for spent heap leach ore (e.g., rinse times and frequencies, pore volumes, sampling, etc.).
- ii. Discuss amounts and kinds of materials that make up the heap, per pad, as applicable (e.g., homogenous vs. heterogeneous ore types). Was the ore crushed or run-of-mine? Provide a discussion on those heap draindown chemical constituents that are or are anticipated to be of concern. Discuss the placement of the ore (i.e., number of lifts, radial stacked, end dumped). If the heap was agglomerated, provide details.

d. Tailings Impoundments

- i. Tailings must be stabilized per NAC 445A.431. Discuss the amounts, and the physical and chemical characteristics of the tailings material.

e. **Process Ponds**

- i. Provide pond sludge quantity and characterization results.

f. **Process Facilities**

- i. Discuss and characterize any liquid and solid wastes not discussed above proposed to be left onsite following mine closure. This would include residual material in tanks, thickeners, and carbon in leach circuit for example.

g. **Ancillary Facilities**

- i. Identify all ancillary sources that will need either chemical characterization or an explanation provided for relative to stabilization.
- ii. Provide characterization information on any hydrocarbon remediation pads or areas and any landfills proposed to remain onsite.
- iii. Indicate those areas, for example: roads, where waste rock was used.

V. **SOURCE STABILIZATION PROGRAM** - A Source Stabilization Program will be those measures, per source, designed to preclude the migration of any contaminant having the potential to degrade the waters of the State.

A. **General Source Stabilization Requirements** - the following general requirements are requisite for any source that has the potential to degrade waters of the State.

- a. Modeling – BMRR will accept computer modeling as a tool in predicting future behavior of a source. The Permittee should, when submitting modeling results to BMRR, provide a discussion of all knowns and assumptions used. In addition, uncertainty analysis; stress runs (high and low extremes); statistical analysis and outputs should be presented.
- b. Long Term Physical Stability - As required by NAC 445A.433 - '*Minimum design criteria; - 1(c) All process components must be designed to withstand the run-off from a 24-hour storm event with a 100-year recurrence interval*'. BMRR interprets this requirement as adequate for an operating mine with personnel available for immediate maintenance. However, in the post-closure operating mode, personnel are generally not available for immediate maintenance/repair. Under this condition, the above design criteria requirement may be inadequate. Therefore, BMRR recommends that all source/components in closure are designed to withstand run-off from a 24-hour storm event with a 500-year recurrence interval.

- c. Preclude Infiltration - It has been BMRRs experience that the best method to ensure that a component does not develop a long term water quality problem is to preclude meteoric water from infiltrating through the component. As such, BMRR will require a thorough discussion of various alternatives in preventing, or at least minimizing, meteoric water infiltration such as an engineered cap, a topsoil cover, diversion ditches, regrading and reshaping, compacting, etc.
- d. Discharges - Should the evaluation of a source indicate that at some point a discharge (either surface or subsurface) may be possible, the Permittee shall provide:
- anticipated seepage discharge rate and chemistry;
 - anticipated drain discharge rate and chemistry;
 - potential storm water discharge and chemistry;
 - physical properties of pathway;
 - potential attenuation and diffusion in pathways.
- e. Potential to Degrade Waters - Should it be determined that there is the potential to degrade waters of the State, the Permittee shall discuss:
- need for additional controls to reduce/treat anticipated source releases, including seepage, drainage and surface run-off;
 - need to further characterize potential pathways for source releases;
 - need for additional storm water run-on and run-off controls;
 - data gaps limiting characterization;
 - proposed methods and schedules for additional data acquisition and evaluation required to refine predictions (e.g., source-pathway-receiving water analysis, bench/field scale treatment tests, attenuation tests, etc.);
 - proposed operational modifications, additional construction, and schedules needed to reduce potential for post-operation releases;
 - proposed additional monitoring to validate the benefits of modifications supporting the demonstration of non-degradation to receiving waters;
 - potential alternatives for reducing and/or treating post-closure source releases (i.e., cover application, anaerobic sulfate reduction);
 - anticipated closure period (i.e., time required for near equilibrium condition to be attained, where after any source releases have no potential to degrade waters of the State).
- f. Reuse or disposal of mine waste solids outside of containment is not allowed without approval from BMRR and may be considered modification to a WPC Permit. To apply for approval, submit a proposal to BMRR in accordance with the guidance document *'Alternate Use Of Mine Waste Solids - Disposal Outside Of Containment'*.

- g. Provide a complete and detailed post-closure monitoring plan. The proposed plan shall include sampling protocols such as field filtering; number of samples; sample preservation; sample holding times; and the approved method of analysis together with the method detection limits (MDL). Include anticipated frequency and duration of closure and post-closure monitoring.

B. Individual Source Specific Requirements

- a. **Waste Rock Disposal Areas** - in general, as part of the active mine operating plan, waste rock is characterized, evaluated, and disposed of in regulatory agency(s) approved manner. The Permittee should only have to reference existing documents, such as waste rock management, to present any required characterization and stabilization information. The Permittee will be required to monitor the waste rock disposal areas(s) in post-closure.
- b. **Open Pits** - as with waste rock disposal area(s) above, the Permittee, as part of the active mine operating plan, should have clearly demonstrated to all concerned agencies that the pit(s) do not have the potential to degrade waters of the State per NAC 445A.429. The Permittee will be required to monitor open pit(s), whether or not they penetrated the ground water table, in post-closure.
- c. **Heap Leach Pads** - there are alternative methods to closing heap leach pads. A complete discussion of all scenarios is beyond the scope of this document. Presented below are basic requirements.
 - i. Heap leach facilities must meet the requirements as set forth in NAC 445A.430 Stabilization of spent ore.
 - ii. Describe or propose heap detoxification activities for WAD cyanide if applicable. Provide required pore volume, application rates and duration, and planned sampling of the heap.
 - iii. Provide a drain down curve (residual draindown flow over time). Provide all knowns and assumptions used in predicting what the long-term residual volume of draindown will be.
 - iv. Discuss the actual and anticipated residual heap draindown quality. Will the heap effluent require long-term treatment? Propose heap effluent treatment, if necessary, and provide specific details of such items as dosing tanks, sampling ports, active/passive treatment systems, and the disposal system for treated effluent (in most cases a septic type leachfield). The BMRR document titled *'Monitoring and*

Analysis of Post-Closure Heap Discharge provides details and guidelines for managing heap draindown in the post-closure period.

- v. Describe the procedures for initiating final closure activities on the heap surface (e.g., re-sloping, capping or covering, solar reshaping, construction of diversion ditches), etc.

d. Tailings Impoundments

- i. Tailings facilities must meet the requirements as set forth in NAC 445A.431 Stabilization of tailings.
- ii. The Permittee must consult with the State of Nevada's Division of Water Resources, Bureau of Engineering and Dam Safety, regarding tailings dams in the post-closure period.
- iii. Describe the procedures for initiating final closure activities on the tailings surface (e.g., re-sloping, capping or covering, construction of diversion ditches), etc.

e. Process Ponds

- i. Based on analytical characterization data, describe the proposed fate of the pond solids (e.g., disposed of or left in place); if proposed to be left in place, describe method of stabilization or encapsulation;
- ii. Describe whether liner material will be disposed of or left in place; and
- iii. Describe the ultimate fate of the process component (i.e., if the pond basin will be backfilled, describe the procedures and what backfill material is proposed for use), etc.

f. Process Facilities

- i. Discuss the ultimate fate of all process facilities (ie, sold, dismantled, stabilized onsite, etc.); and
- ii. Discuss any proposed decontamination of refineries, assay labs or associated areas.

g. Ancillary Facilities

- i. Discuss the ultimate fate of all ancillary facilities (ie, buildings removed, foundations buried onsite, area ripped, stabilized onsite, etc).

APPENDIX A

THE FOLLOWING NAC RELATE TO CLOSURE ACTIVITIES:

The following list may be incomplete depending on site specific conditions. Refer to NAC 445A for the complete State mining regulations list.

NAC 445A.357 "Degrade" defined. "Degrade" means to alter the physical or chemical properties of or to cause a change in the concentration of any substance in the waters of the State in violation of the standards established pursuant to NAC 445A.424.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)(Substituted in revision for NAC 445.24214)

NAC 445A.359 "Facility" defined. "Facility" means all portions of a mining operation, including, but not limited to, the mine, waste rock piles, or piles, beneficiation process components, processed ore disposal sites, and all associated buildings and structures. The term does not include any process component or nonprocess component which is not used for mining or mineral production, and has not been used in the past for mining or mineral production as part of an operation which is active as of September 1, 1989.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24218)

NAC 445A.361 "Ground water" defined. "Ground water" means all subsurface water comprising the zone of saturation, including perched zones of saturation, which could produce usable water.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24222)

NAC 445A.363 "Meteoric waters" defined. "Meteoric waters" means any form of precipitation falling from the earth's atmosphere.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24226)

NAC 445A.367 "Permanent closure" defined. "Permanent closure" means that time in the operating life of a facility when activities for the final stabilization, removal or mitigation of sources are initiated.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24234)

NAC 445A.375 "Process component" defined. "Process component" means a distinct portion of a constructed facility which is a point source.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.2425)

NAC 445A.376 "Process fluid" defined. "Process fluid" means any liquids, including meteoric waters, which are intentionally or unintentionally introduced into any portion of the beneficiation process components.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24252)

NAC 445A.378 "Source" defined. "Source" means any building, structure, facility or installation from which there is or may be the discharge of pollutants.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24256)

NAC 445A.379 "Stabilized" defined. "Stabilized" means the condition which results when contaminants in a material are bound or contained so as to prevent them from degrading the waters of the State under the environmental conditions that may reasonably be expected to exist at a site.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24258)

NAC 445A.382 "Temporary closure" defined. "Temporary closure" means the cessation of the operation of a process component for more than 30 days as a result of a planned or unplanned activity.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24264)

NAC 445A.383 "WAD cyanide" defined. "WAD cyanide" means the cyanide concentration as determined by Method C, Weak Acid Dissociable Cyanide, D2036-082, Part 31 of American Society of Testing Materials Book of Standards.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for 445.24266)

NAC 445A.398 Contents of application: Proposed operating plans. The proposed operating plans for a facility must include:

6. A tentative plan for the permanent closure of the facility which describes the procedures, methods and schedule for stabilizing spent process materials. The plan must include:

- (a) Procedures for characterizing spent process materials as they are generated; and
- (b) The procedures to stabilize all process components with an emphasis on stabilizing spent process materials and the estimated cost for the procedures.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24296)

NAC 445A.424 Limitations on degradation of water; exemptions.

1. A facility, regardless of size or type, may not degrade the waters of the State to the extent that:

(a) The quality of surface water is lowered below that allowed by *NRS 445.253*.

(Now *NRS 445A.565* - see below)

(b) For ground water:

(1) The quality is lowered below a state or federal regulation prescribing standards for drinking water; or

(2) The concentration of WAD cyanide exceeds 0.2 mg/l. The department may establish a numerical limit for any constituent not regulated by subparagraphs 1 and 2 which may reasonably be expected to be discharged by the facility in sufficient volume and concentration to cause an adverse impact on human health.

(c) The quality of those waters of the State which already exceed the criteria established by subsection 2 is lowered to a level that the department finds would render those waters unsuitable for the existing or potential municipal, industrial, domestic or agricultural use.

2. The department may exempt a body of ground water or portion thereof from the standards established in subsection 1 if the request for an exemption to the ground water standards and the supporting information is submitted as part of the application for the permit. The following criteria will be considered by the department in determining whether to exempt a potentially impacted body of ground water from the standards in subsection 1:

(a) The impacted ground water does not currently serve as a source of drinking water and because of the following reasons the ground water will not serve as a source of drinking water:

(1) The ground water produces a mineral, hydrocarbon or geothermal fluid which the applicant can demonstrate to the satisfaction of the department exists at a concentration that is expected to be capable of commercial production and that releases by the facility will not affect this production;

(2) The ground water is situated at a depth or location which makes recovery of water for drinking economically or technologically impractical; or

(3) It would be economically or technologically impractical to render the water fit for human consumption; or

(b) The total dissolved solids in the ground water is more than 10,000 milligrams per liter and the ground water is not reasonably expected to become a supply of drinking water.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24342)

NAC 445A.429 Procedures required to prevent release of contaminants; requirements concerning impoundments.

1. The holder of the permit must institute appropriate procedures to ensure that all mined areas do not release contaminants that have the potential to degrade the waters of the State.
2. Open pit mines must, to the extent practicable, be free-draining or left in a manner which minimizes the impoundment of surface drainage and the potential for contaminants to be transported and degrade the waters of the State.
3. Bodies of water which are a result of mine pits penetrating the water table must not create an impoundment which:
 - (a) Has the potential to degrade the ground waters of the State; or
 - (b) Has the potential to affect adversely the health of human, terrestrial or avian life.
4. The holder of a permit may apply to the commission to establish a beneficial use with a level of protection less than that required by paragraph (b) of subsection 3 for water impounded in a specific mine pit.
(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24352)

NAC 445A.430 Stabilization of spent ore.

1. Spent ore which has been left on pads or which will be removed from a pad must first demonstrate the stability of the discharge effluent from the pads or from the spent ore such that:
 - (a) WAD cyanide levels in the effluent rinse water are less than 0.2 mg/l;
 - (b) The pH level of the effluent is between 6.0 and 9.0; and
 - (c) Contaminants in any effluent from the processed ore which would result from meteoric waters would not degrade waters of the State.
2. If the requirements established in subsection 1 cannot be achieved, the Department will grant a variance to those conditions if the holder of the permit can demonstrate that:
 - (a) The remaining solid material, when representatively sampled, does not contain levels of contaminants that are likely to become mobile and degrade the waters of the State under the conditions that will exist at the site; or
 - (b) The spent ore is stabilized in such a fashion as to inhibit meteoric waters from migrating through the material and transporting contaminants that have the potential to degrade the waters of the State.
3. The Department may approve an alternate method for stabilizing ore that has been leached if the holder of the permit can clearly demonstrate that the condition in which the materials will be left will not create a potential for the waters of the State to be degraded.
(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R141-06, 10-31-2007)--(Substituted in revision for NAC 445.24354)

NAC 445A.431 Stabilization of tailings. Upon termination of the active use of a tailings impoundment, representative samples of the material deposited in the impoundment must be collected and characterized. The tailings must be stabilized during the final closure of a facility so as to inhibit the migration of any contaminant that has the potential to degrade the waters of the State.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24356)

NAC 445A.446 Permanent closure of facility.

1. The permanent closure of a facility must be initiated:
 - (a) Following the request of the holder of the permit;
 - (b) For a facility which is under a temporary closure, no later than at the end of one renewal of a 5-year permit which has been issued pursuant to subsection 2 of NAC 445A.420; or
 - (c) When the end of the design life of that process component is reached.
2. Permanent closure is complete when the requirements contained in NAC 445A.429, 445A.430 and 445A.431 have been achieved.
3. The time required for monitoring the facility following permanent closure depends upon the particular site and process characteristics, but in no event may the time required exceed 30 years.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24386)

NAC 445A.447 Plans for permanent closure; sources not classified as process components.

1. Plans for permanent closure are required for all sources at a facility.
2. A final plan for permanent closure of any source which has been identified as a process component must be submitted to the department at least two (2) years before the anticipated permanent closure of that process component.
3. Sources which have not been classified as process components must be evaluated at the end of their operating life to determine the potential for pollutants from these sources to migrate and degrade the waters of the State under the final proposed site conditions and must be closed in accordance with the state handbook of best management practices prepared pursuant to NAC 445A.336.

(Added to NAC by Environmental Comm'n, eff. 9-1-89)--Substituted in revision for NAC 445.24388)