

MINE PLAN

RECLAMATION PLAN AND PERMIT APPLICATION FOR THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION, BUREAU OF MINING REGULATION AND RECLAMATION FOR A MINING OPERATION

1.0 Applicant Information

1.1 Claim Name(s) _____

Claim Type (Lode, Millsite, etc.) _____

Claim Owner(s) _____

Claim Owner's Mailing Address _____

City _____ State _____ Zip Code _____

Project Name _____

BLM Case Number(s) _____

Location of Project (Township, Range, Section) T _____; R _____; S _____

1.2 Individual Completing Application:

Full Name _____

Title _____

Telephone No. (including area code) _____

Email Address: _____

Date _____

1.3 Business Address of Individual Completing Application:

Federal Tax ID Number _____

Business Name _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

1.4. Corporation Information, if applicable:

Corporation Name _____

1.4.1 President _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.4.2 Treasurer _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.4.3 Secretary _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.4.4 Nevada Registered Resident Agent _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.5 Partnership Information, if applicable:

1.5.1 Name of Partnership _____

Type of Partnership _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.5.2 Registered Resident Agent _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

1.5.3 Authorized Field Representative _____

Physical Address _____

Mailing Address (if different) _____

City _____ State _____ Zip Code _____

Country, if not United States of America _____

Telephone No. (including area code) _____

Email Address: _____

Note: A signed authorization must be attached which gives the Field Representative authority to act on behalf of the operator.

2.0. Application Fee

Provide an application fee for the proposed land acres include in the Reclamation Plan/Reclamation Permit Application that will be affected/disturbed. The application fee should be calculated as described below:

_____ Acres of Public Land at \$1.50/acre = _____
_____ Acres of Private Land at \$2.50/acre = _____
Total Fee = _____

NOTE: A check, money order, or e-payment confirmation receipt must be submitted with the Reclamation Plan for the total amount of the calculated application fee. Checks and/or money orders must be made 'Payable to the Nevada Division of Environmental Protection'.

3.0 Acknowledgements

The following acknowledgements must be included in the plan:

- A. It is understood that the operator agrees to accept reclamation responsibility for all surface areas affected by the project as out lined in this Reclamation Plan, and an acceptable surety, pursuant to NAC 519A.350, will be provided in an amount sufficient to ensure reclamation of the entire area affected by the project as required by NAC 519A.360.
- B. It is understood should the nature of the operation change, a modified or supplemental Reclamation Plan may be required.
- C. It is understood approval of this Reclamation Plan does not constitute:
 - a. Certification of ownership to any person named herein; and
 - b. Recognition of the validity of any mining claim herein.
- D. It is understood bond equivalent to the actual cost of performing the agreed upon reclamation measures will be required prior to Reclamation Plan approval and proposed construction activities. The bond amount required, increased or decreased, will be set on a site-specific basis by the lead agency in coordination with the cooperating agencies.
- E. It is understood approval of the Reclamation Plan does not relieve the operator of responsibility to comply with all applicable State or federal laws, rules or regulations.
- F. It is understood any information provided with the Reclamation Plan marked 'Confidential' will be treated in accordance with the agency's laws, rules and regulations.

I/We have read and agree to comply with all conditions in the Plan, including recommended changes and reclamation requirements. I/We understand the bond will not be released until the lead agency provides written approval of the reclamation work done and authorizes such release.

Print Name

Signature of Operator (or Authorized Official)

Date

4.0 Operating Plan

A summary of the proposed project should be provided. This summary should provide an overview of where the project is going to be constructed, how big the project is going to be, the various facilities associated with the project, and the anticipated duration of the project.

4.1 Topographic Map(s)

Maps at an appropriate scale with sufficient detail should be provided showing the proposed project boundary, surface land ownership, the proposed layout of the project facilities, existing roads, and location of surface water bodies within one-half mile of the project boundary. The details of mapping requirements are described in the following sections.

4.1.1 Boundaries of Project Area

The boundaries of the project should be shown on a map. The legal description of the project (Section, Range, Township, Mount Diablo Baseline and Meridian) should be described in the plan.

4.1.2 Surface Ownership and Estimate of Disturbance Acreage

Surface land ownership within the project area should be shown on a map. A table should be included which identifies the disturbance associated with each facility or component and lists the acres of private land and/or public land that will be disturbed for each project component. The disturbance acreage estimate needs to include reasonably accurate cut and fill disturbances associated with all facilities. Additional surface disturbances adjacent to the permitted facilities typically created by heavy equipment during construction and reclamation activities should be included. An overall total of private and public land acres that will be disturbed should be included in the table.

Sections 4.1.3 to 4.1.9 should be addressed in the reclamation plan if applicable

4.1.3 Areas Disturbed by Previous Operator and Inactive

4.1.4 Areas Disturbed by Current Operator Prior to January 1, 1981 and Inactive

4.1.5 Areas Disturbed by Current Operator Prior to January 1, 1981 and Still Active

4.1.6 Areas Disturbed by Current Operator after January 1, 1981, but Prior to October 1, 1990 and Inactive

4.1.7 Areas Disturbed by Current Operator after January 1, 1981, but Prior to October 1, 1990 and Still Active

4.1.8 Areas Active On or After October 1, 1990

4.1.9 Access Roads Existing Prior to January 1, 1981

The location of these access roads should be shown on the map and discussed if such roads are to be used for project access. Any maintenance or reconstruction activities that will be done on such roads should be described in the plan.

5.0 Reclamation Plan

The Reclamation Plan should describe the required reclamation, closure, and long-term management activities to be undertaken during and after completion of the mining operation needed to stabilize the disturbed areas to a safe condition and to protect both disturbed and undisturbed areas from unnecessary and undue degradation. The Reclamation Plan serves as the basic construction plan for calculating the reclamation cost estimate (RCE). The attached Basis and Checklist for the RCE describe the supporting information, individual drawings or figures, and level of detail required to calculate a project RCE. The plan should provide references to the detailed topographic maps, figures, and tables that are included to support the RCE when describing the reclamation of project facilities.

5.1 Methods Taken to Prevent Unnecessary or Undue Degradation

The plan should provide an overview of proposed concurrent reclamation activities and Best Management Practices (BMPs) that will be employed to control erosion and reduce sedimentation from disturbed areas. An overview of the revegetation plan should also be described including the proposed seed mixture and whether any measures such as temporary fencing or noxious weed control will be used on the reclaimed areas.

5.2 Other Reclamation Activities, such as Reclamation of Historic Disturbances

If applicable, the plan should describe any planned reclamation activities not related to proposed project disturbances.

5.3 Proposed Reclamation Schedule and Constraints on the Estimated Time to Complete Reclamation Caused by

the Residual Moisture Content or Physical or Chemical Qualities of Impoundments

The anticipated schedule for initiating and completing reclamation activities for each project facility at the conclusion of operational use should be provided. Those facilities or components that will be used for post-closure monitoring and not reclaimed until later should be identified. The timeframes expected to be required for managing and stabilizing fluids from process components should be included in the schedule.

5.4 Post-Mining Land Use and Description of any Surface Facilities such as buildings or roads which will not be subject to reclamation to achieve the proposed post-mining use

The proposed post-mining land use and compatibility with surrounding uses should be described in the plan. If sustainable development of portions of the project is proposed, the reclamation plan should outline existing mine infrastructure (e.g. buildings, roads, power lines, water lines, etc.) that would be used for post-closure economic uses. Documentation will need to be included in the reclamation plan that the post-closure use of the site conforms to land use plans approved by the local government entity. If an exemption from reclamation of the open pit is requested, the reclamation plan should contain a discussion of the requirements for requesting this exemption as outlined in NAC 519A.250.

5.5 Post-Mining Topography

A map(s) showing the conceptual post-reclamation topography for the areas affected by the proposed project should be provided. The map(s) should be at a scale which provides sufficient detail of the planned post-operation surface configuration to illustrate the regrading plan, allow for verification of the amount of material to be moved during reclamation, and to assess the adequacy of storm water runoff controls.

5.6 Slope Stability Technical Criteria

If reclaimed slope surfaces will be left at a slope greater than 3 Horizontal to 1 Vertical (3H:1V), a summary of the geotechnical analysis and results which demonstrate the proposed reclaimed configuration will provide geotechnical stability, erosional stability, and suitability for revegetation purposes must be included with the plan.

5.7 Description of Reclamation Necessary Because of Instream Mining

If applicable, the plan should contain a discussion of required reclamation activities.

5.8 Effect of Proposed Reclamation on Future Mining and Public Safety

The effect of proposed reclamation activities on future mining and mineral exploration activities should be discussed. Include a written statement setting forth the effect the proposed reclamation will have on public safety. NAC 513 may be obtained at <http://www.leg.state.nv.us/nac/NAC-513.html> which provides safety requirements for abandonment of mines.

5.9 Measures to be Taken During Extended Periods of Non-Operation

A discussion should be provided of the measures or procedures to be implemented during an extended period of non-operation to maintain a stable and safe project site. If not filed at the time of plan submittal, this information shall be filed whenever the operator anticipates a period of non-operation.

5.10 Reclamation Methods

This section of the reclamation plan should summarize the disturbance amounts and proposed methods of reclamation for all proposed project facilities. To the extent possible, all facility disturbances should be assigned to reclamation categories consistent with the reclamation categories as listed in the cost summary of the Nevada Standardized Reclamation Cost Estimator (SRCE). The reclamation plan needs to include a discussion of growth media and closure cover material management plan that identifies the estimated volume of materials that are anticipated to be salvaged and stored during construction and operations.

For each of the reclamation categories listed below, the regrading, recontouring, growth medium placement, and revegetation tasks that would be completed should be described.

5.10.1 Exploration

This disturbance category includes abandonment of exploration drill holes and reclamation of exploration trenches. The number of exploration drill holes that will remain open during the operational phase of the project should be identified.

5.10.2 Exploration Roads and Pads

This disturbance category includes exploration roads and pads, overland travel, storage ponds, and staging areas. Proposed construction of exploration roads and pads in steeper terrain should account for the underlying

natural ground slope when determining disturbances.

5.10.3 Roads

This reclamation category should include all access, light duty, and haul roads. Location of these roads should be shown on a map or figure in the plan. Roads that will be required for monitoring activities during reclamation and closure of the project and the roads that will not be reclaimed should be identified.

5.10.4 Well Abandonment

The reclamation plan should describe all water production, dewatering, infiltration, and ground water monitoring wells that will be used during operations and when the wells will be abandoned. A figure or map should be included that shows the locations of the above wells within the project area. The wells which will be used for monitoring purposes during closure and reclamation should be identified. Abandonment methods for the wells as well as any open boreholes should be described and follow the Division of Water Resources requirements for plugging water wells, monitoring wells, and boreholes (NAC 534.420, 534.4365, 534.4369, and 534.4371, respectively).

5.10.5 Pits

The reclamation plan should describe whether a pit lake will be present at the conclusion of active operations. The anticipated water quality and quantity over time should be discussed as well as whether access to the pit lake will be allowed as a post-mining use. Safety controls (berms, fencing, etc.) planned around the pit perimeter to restrict access should be described and shown on a map or drawing. If pit backfilling is proposed, the reclamation plan must contain supporting information and analysis that details environmental, safety, and economic information related to the proposed pit backfilling.

5.10.6 Quarries and Borrow Pits

This category includes reclamation of quarries and materials borrow sources constructed during operation and/or reclamation. Locations and proposed post-mining extents and topographic contours of these areas should be shown on a figure or map.

5.10.7 Underground Openings

If applicable, the reclamation plan should discuss all closure and reclamation activities required for portals, adits, shafts, declines, vent raises and secondary escape ways, etc., or other underground openings. All such openings should be identified on a figure or map. If an opening will penetrate a groundwater aquifer, the proposed closure design must be approved by the Division of Water Resources.

5.10.8 Process Ponds and Other Ponds

Reclamation activities that will be required for all process ponds, reclaim ponds, storm event ponds, and sediment/settling ponds should be discussed. Process ponds that will be converted to ET ponds or E-cells should be identified and whether any removal and disposal of sediments or sludge may be required. Details of the pond conversion should be discussed in Section 5.11.

5.10.9 Heap Leach Facilities

The post-mining topographic configuration of the leach pads prior to regrading and recontouring should be provided on a figure or drawing. The figure or drawing should contain enough detail to illustrate the operational lift heights, bench setback widths, mid-bench lengths, etc. A post-reclamation figure or drawing should also be provided to show the final slope angles after regrading/recontouring and final limits of disturbance of the reclaimed facility. The reclamation plan should discuss the cover thickness and volume of cover that is proposed to be placed over the heap leach facilities, the origin of the cover material, and the anticipated infiltration rate of meteoric waters through the cover. If the cover will be constructed as an ET cover, the store and release capability should be discussed. The Process Fluid Stabilization of heap leach solutions and residual draindown is discussed in Section 5.11.

5.10.10 Waste Rock Storage Facilities

The reclamation plan should contain a figure or drawing that depicts post-mining topographic configuration of each waste rock storage facility prior to regrading and recontouring. The figure or drawing should contain enough detail to illustrate the operational lift heights, bench setback widths, mid-bench lengths, etc. A post-reclamation figure or drawing should also be provided to show the final slope angles after regrading/recontouring and final limits of disturbance of the reclaimed facility. If planned reclamation includes placing a synthetic cover or constructing an evapotranspiration (ET) cover, the reclamation plan should

describe the activities involved and anticipated performance of the cover systems. For an ET cover, the plan should describe the cover thickness and volume of cover that is proposed to be placed over the waste rock storage facility, and the origin of the cover material. Additionally, if the waste rock storage facilities are constructed based on an approved waste rock management plan, the reclamation plan must incorporate the measures approved for handling, source control, and mitigation of potentially acid generating waste rock. Diversion structures to convey surface water around the facilities should be described in the plan and shown on the appropriate maps or drawings.

5.10.11 Landfills

If a permitted landfill is proposed as part of the project, the reclamation plan should discuss the anticipated size of the landfill, where it will be located, and the reclamation activities that will be required. With the exception of burying concrete foundations and underground pipes in-place, all other solids wastes disposed of on-site must be performed in compliance with Class III Waivered Landfill regulations. The burial of solid waste products on-site in any locations other than permitted landfill locations is not permitted.

5.10.12 Tailings Storage Facilities

This reclamation category should describe the tasks associated with reclamation of the tailings embankment and impoundment. The reclamation plan should contain figures or drawings that show the topographic configuration of the tailings impoundment at the end of operations and after proposed reclamation. Anticipated timeframes for reclamation and closure of the impoundment (e.g., tailings consolidation, regrading, and cover placement) should be discussed. This discussion should include the proposed closure cover including growth media depth, volume, and origin of cover material. If the embankment will not be constructed at the final reclaimed slope, the reclamation required to provide a stable slope that will support revegetation should be described. Construction of surface water runoff control and spill way structures should be described. The Process Fluid Stabilization of tailings solutions and residual draindown should be discussed in Section 5.15.

5.10.13 Foundations and Buildings

The reclamation methods for demolition of buildings and structures, and concrete foundations, walls and pads should be described. The proposed disposal and burial depth of non-salvageable material should be explained. Any special handling requirements, such as rinsing and hazardous waste removal prior to demolition should be discussed.

5.10.14 Yards

This category includes areas used for a variety of purposes such as growth medium stockpile, yards, offices, mill area disturbances, and ancillary facilities. The reclamation plan should describe the planned reclamation activities, including the thickness of growth medium to be placed over these areas during reclamation, if applicable.

5.10.15 Drainage and Sediment Control

The reclamation plan should describe the storm water drainage control features that will be constructed as temporary or permanent structures. Disturbance associated with these facilities should account for design dimensions, adjacent cuts and fills, and access that may be required for construction, reclamation, and monitoring. The tasks associated with reclamation and maintenance of the structures should be discussed.

5.10.16 Waste Disposal

The reclamation plan should describe the tasks involved for disposal of any hazardous waste and petroleum contaminated soils that may require disposal. An estimate of the quantity of materials requiring disposal should be included in the plan. This category should also include any mercury-bearing waste product and/or equipment associated with air pollution controls or mercury retorts which will require special handling, transport, and disposal off-site in a hazardous waste facility.

5.10.17 Miscellaneous

The tasks involved with removal of fencing, culverts, septic systems, tanks, vats, and all other facilities not addressed elsewhere in the Plan, etc. should be included in this reclamation category.

5.10.18 Monitoring

This category will include erosion, revegetation monitoring, and water quality monitoring. Revegetation monitoring will be required on a bi-annual basis for three years, while water quality monitoring will be

required for five years on a quarterly basis after closure of the project.

5.11 Fluid Management and Process Fluid Stabilization

The reclamation plan should detail the methods that will be used to achieve process fluid stabilization (PFS) of the process components (such as leach pads, tailings impoundments, and associated process ponds) associated with the project. A discussion of the proposed strategy to reduce the contained process solution inventory, establish conditions to reduce infiltration, and to manage long-term residual draindown should be provided. The plan should also summarize the methods used to estimate infiltration rates of meteoric waters through the cover material and to project solution draindown rates from the process components. The plan needs to identify which existing ponds will be used for PFS and whether additional ponds will be required. The activities required for conversion of the ponds to ET basins should be discussed. Any piping and ditch modifications that would need to be done for management of long-term draindown solutions should be discussed.

This section of the reclamation plan should also describe the proposed tasks necessary in the event of a premature project shut down, and circulation and management of the contained process solutions over an interim fluid management period is required.

6.0 Reclamation Cost Estimate

A reclamation cost estimate (RCE) for completing the reclamation activities described in the plan needs to be included. These costs should be based on labor wage rates and equipment rental rates for the estimated time to complete the tasks and the anticipated costs of materials that would be needed. The RCE can be calculated by using:

- The Nevada Standard Reclamation Cost Estimator (SRCE) found at <http://www.nvbond.org/index.htm> and the Cost Data File found at <http://ndep.nv.gov/bmrr/cost.htm> or equal; or
- The estimate of cost from an outside contractor with completed cost estimate certification form (see “Contractor and Operator Certification of Exploration/Mining Operation Reclamation Cost Estimate for Federal and Private/State Lands” at <http://ndep.nv.gov/bmrr/recapp.htm>); or
- Any other method which is acceptable to the Administrator, the Bureau of Land Management (BLM), the United States Forest Service (USFS) or another federal land management agency, if appropriate.

6.1 Cost Calculations

Reclamation costs for each disturbance category (Section 5.14) and PFS costs (Section 5.15) need to be presented and discussed. The attached guidance, Basis and Checklist for the RCE, describes the methodology which should be used to develop the costs and provides examples of information, data, figures, and tables that should be included with the Reclamation Plan to support the cost calculations.

Mine Project Reclamation Plan Basis and Checklist for the Reclamation Cost Estimate

This guidance information and checklist is provided to assist the operator in calculating the engineering and environmental costs required to properly stabilize, reclaim, and restore the area disturbed by the project. It is not all inclusive, but includes most reclamation activities required at mine projects.

For mine projects, including a supplemental section to the reclamation plan that describes the *basis of the reclamation cost estimate* is needed to ensure the Reclamation Plan includes the level of detail necessary to support the assumptions used to develop the reclamation cost estimate (RCE). The basis of the reclamation cost estimate should address all project facilities and generally follow the format of the Nevada Standardized Reclamation Cost Estimator (SRCE) Summary Sheet. **Operators should be familiar with the SRCE User Manual as it provides additional detailed information needed to prepare the RCE.**

Accurate topographic maps showing all project facilities both at the time of closure and after reclamation is complete are critical to develop the reclamation cost estimate.

The basis for the reclamation cost estimate should include the following information:

- For major facilities such as leach pads and waste rock dumps, individual topographic maps or figures that depict anticipated end of mining configurations should be provided to show the following information:
 - Where mid-bench lengths were measured, and include a table that summarizes the total length of mid-benches, by height intervals of not greater than 10 feet (vertical). The figure should clearly document how the preparer determined the numerical values that are used in the calculations to determine the reclamation costs.
 - Where the toe of the facility will be located prior to, and after regrading is performed, and include disturbance beyond the toe that may be created by equipment to complete reclamation.
 - Show the permitted limits of disturbance for each major component.

Growth Media Salvage and Management Plan

The reclamation plan needs to describe all of the facilities that will require replacing growth media material, or using stockpiled materials during reclamation and closure activities. The RCE needs to account for the quantity of material that will be needed at each facility, and where the material will be located when reclamation and closure activities commence. This may best be quantified by providing two tables as follows:

One table would show the volume of material that is anticipated to be salvaged from within the footprints of various facilities at the time of initial clearing and grubbing and during operations. This may be done by using published soils maps, or more site specific information. This table would identify both the anticipated volume of material that would be salvaged and stockpiled, and the volume of material that would be required at each major facility during reclamation and closure work. See example Growth Media Salvage Inventory and Project Requirements table at the end of this document.

A second table would show the anticipated volume of material that would be placed in each stockpile, and provide a unique identification for each stockpile to correlate to a mapped location. The table will also identify where the material in each stockpile would be used during reclamation and closure activities. See example Growth Media Stockpile Inventory table at the end of this document.

A figure should be provided that shows and labels the various haul routes that would be utilized from stockpile locations to the receiving facilities. The labels should include the haul distance from centroid positions of the facilities and the average slope of the haul route. This information is needed to determine haulage costs from the stockpile locations to the receiving facility. Facilities such as roads where the growth media is typically stored in the road fill slope and/or berms would not need to be included in the inventory.

RCE Checklist:

The RCE should present the costs for Earthwork, Recontouring, Revegetation and Stabilization associated with reclamation of the following disturbance categories.

1. Exploration Drill Hole Abandonment
 - a. The RCE must include costs for proper abandonment of water wells, monitoring wells, and exploration drill holes per the Division of Water Resources requirements as contained in NAC 534.420, 534.4365, 534.4369, and 534.4371, respectively. The plan must state the maximum number drill rigs that may be present on site. The RCE

must include cost for proper abandonment of the maximum number of bore holes that may be left open at any one time, and assume at least one bore hole for each drill rig that may be on site.

- b. Exploration trenches should be located on a figure. The RCE must include costs to backfill the trenches and revegetate the trench and spoil pile, if applicable.

2. Exploration Roads and Drill Pads

- a. Existing and/or proposed exploration drill road and pad locations need to be shown on a figure that identifies which roads will be overland travel and which roads will be constructed (bladed in). The length and width of each road type should be quantified. For constructed roads, the underlying slope, average travel width and additional cut and fill cross-sectional widths need to be accounted for in the RCE.
- b. The RCE should include costs for reclaiming drill pads and sumps that will be constructed. The average width and length of pad working platforms and additional cut and fill disturbance based on underlying ground slope need to be accounted for in the cost calculations. The RCE for backfilling the sumps should be based on the average size and depth of sumps.

3. Roads

- a. A figure should be provided in the plan that locates all access, light duty and haul roads. All road segments should be provided a unique identifier. Roads that will require berms on one or both sides of the road bed should be identified.
- b. An accompanying table that provides a comprehensive inventory and dimensions of all roads to be reclaimed will summarize the information needed to calculate reclamation costs. See example Access and Haul Road Inventory Table at the end of this document.

4. Well Abandonment

- a. The RCE should include costs for abandonment of all water production, dewatering, infiltration and ground water monitor wells within the project area. All wells and boreholes must be properly abandoned pursuant with NAC 534 requirements.
- b. A table that includes a comprehensive inventory of all wells that will be used for the operation and require closure should be included to develop the RCE. See example Production, Dewatering, Infiltration and Monitoring Well Inventory table at the end of this document.

5. Pits

- a. The RCE should include costs for public safety measures such as berms and/or fences around the pit rim. Cost should be based on length of berm required, projected berm dimensions and if berms would be constructed by hauling material in, or pushing a berm up with a dozer.
- b. If pit backfill is proposed, the RCE should reflect the volume of backfill required, haulage distance, and compaction of the backfill, if necessary. The cost should also reflect whether lime addition to the backfill is necessary prior to placement.

6. Quarries and Borrow Areas

- a. The RCE should include costs for all reclamation activities required for these types of disturbances.

7. Underground Openings

- a. Costs associated with closure of each underground opening such as portals, adits, declines, vent raises and secondary escape ways, etc., need to be accounted for in the RCE.
- b. If any opening will intercept a ground water aquifer, the proposed closure design must be approved by the Division of Water Resources before the proposed closure design can be approved in the plan for reclamation.

8. Process Ponds and Other Ponds

- a. The RCE should include costs for closure and reclamation of all process ponds, reclaim ponds, storm event ponds, and sediment/settling ponds.
- b. A table which provides a comprehensive inventory of all ponds to be constructed, including pond capacity with freeboard, types of liner(s) information, and whether the pond is to be converted to an evaporation cell for process fluid stabilization activities should be provided as part of the RCE. See example Process and Other Ponds Inventory Table at the end of this document.

- c. Costs for conversion of ponds to evaporation cells should be provided in the Process Fluid Stabilization, Water Treatment and Disposal of Waste section of the RCE. Conversion costs should be based on a conceptual evaporation cell design, illustrating all activities that will be required to construct the evaporation cells.
9. Heap Leach Pads
 - a. The costs for reclaiming a heap leach pad should be developed based on a figure that depicts the projected configuration of the leach pad at the end of operations prior to regrading/recontouring. The figure should show where mid-bench lengths measurements were made, and label and quantify the various operational lift heights and lengths constructed during operations. The figure should also show the final footprint of the reclaimed facility.
 - b. The RCE should also include costs for cover placement based on the volume of cover required and the origin of the cover.
 - c. Costs should also be assigned to reclamation activities that will be required to transition from an operational facility to a closed facility. For example: During operations process flows may be conveyed in open lined trenches and during closure draindown flows may be conveyed in slotted pipes placed in the lined channels and backfilled with coarse drain rock.
10. Waste Rock Dumps
 - a. The costs for reclaiming a waste rock dump should be developed based on a figure that depicts the projected configuration of the waste rock dump at the end of operations prior to regrading/recontouring. The figure should show where mid-bench lengths measurements were made, and label and quantify the various operational lift heights and lengths constructed during operations. The figure should also show the final footprint of the reclaimed facility.
 - b. If a cover system (ET cover or synthetic liner) is proposed, the RCE should include all associated costs for construction of the cover.
 - c. If any water quality issues are anticipated with a waste rock dump, such as acid drainage that may require specific operational, reclamation, closure and monitoring/mitigation activities, costs need to be included for such.
11. Landfills
 - a. The RCE should include costs for all closure and reclamation activities that will be required for the anticipated maximum size of the landfill.
12. Tailings Impoundments
 - a. The RCE should include the costs for all projected activities required to reclaim and close the tailings impoundment, including but not limited to:
 - Embankment regrading and/or placing material against the embankment to provide a stable and productive final reclaimed slope.
 - Surface regrading activities required to impede ponding and diversion of storm water from the reclaimed surface of the tailings.
 - Breaching the embankment and construction of a spillway, and any other surface drainage controls that may be necessary.
 - The costs for the closure cover should reflect growth media depth, volume, origin of material, and haul distance.
13. Yards
 - a. The RCE should reflect the reclamation activities that will be required for the proposed yard disturbances, including but not limited to regrading, cover and growth media applications, ripping and scarification, and seeding.
 - b. The costs must reflect growth media depth, volume, origin of material, and haul distance.
14. Drainage and Sediment Control
 - a. Costs should be included for revegetation and maintenance of operational storm water controls that would be left in place after operations. This would include installation of riprap in erosion prone areas of ditches and channels.
 - b. Permanent structures that will not be constructed to engineered specifications within the first year of operations should have the construction costs included in the reclamation cost estimate until the time the facilities are constructed.

Process Fluid Stabilization, Water Treatment and Disposal of Wastes

15. Heap Leach and Tailings Storage Facilities
 - a. Costs should be included for process fluid stabilization of the solution collection system for each heap leach facility and/or tailings storage facility. These costs should include calculations for estimating the time and quantity of solution to be recirculated and evaporated (actively and/or passively). The Heap Leach Draindown Estimator spreadsheet, the Process Fluid Cost Estimator spreadsheet, or other approved calculations may be used. Provide supporting documentation in the form of a technical memorandum or calculations sheet to include, but not limited to, a discussion of the procedures required for fluid stabilization, input parameters, input assumptions, calculations of all inputs, a list of all associated ponds with their sizes and capacities, number of pumps and the pump capacities required for recirculation, and associated figures on 8 ½" x 11" or 11" x 17". See example Process and Other Ponds Inventory Table at the end of this document.
 - b. Costs should be included for converting existing ponds into evapotranspiration cells (ET cells) or constructing new ET cells. Provide supporting documentation in the form of a technical memorandum or calculation sheet to include, but not limited to, a discussion to identify ponds proposed for conversion to an ET cell, plans for constructing new ET cells (if required), if any existing ponds will require sediment/sludge removal, liner replacement, and/or piping modifications, assumptions, calculations, and associated figures on 8 ½" x 11" or 11" x 17".
 - c. The plan needs to identify which existing ponds will be used for process fluid stabilization, and identify ponds proposed for conversion to evapotranspiration cells. Additionally the plan needs to identify if new ponds will be required, or if any existing ponds will require sediment/sludge removal, liner replacement and/or piping modifications at the end of operations for use as active, passive and long-term fluid management facilities.
16. Surplus Water Disposal
 - a. A comprehensive site water balance needs to be developed that includes all facilities within the project area that retain either process fluids, other water from treatment facilities, stormwater ponds, and pit water that may require disposal.
17. Monitoring and Miscellaneous
 - a. The RCE should include costs for the following process fluid stabilization related activities. The activities may also require bonding under a long-term funding mechanism (LTFM):
 - Evaporation cell replacement or rehabilitation due to mass loading of solids over time.
 - Periodic maintaining of access roads, fencing and gates and other public safety facilities.
 - All other process fluid stabilization and water disposal activities and facilities which are not included elsewhere in the RCE or LTFM.
18. Solid Waste Disposal
 - a. The RCE should include costs for proper disposal of all solid waste types that may be required during reclamation and closure activities. If special handling or pretreatment is required prior to disposal, the cost for such should be included.
19. Hazardous Materials Disposal
 - a. The RCE should include costs for all activities required for disposal of the maximum volume of hazardous waste that may be present on site. The RCE should include the costs associated with any pre-treatment, transport, and proper disposal of any mercury-bearing waste product or contaminated equipment that would need to be removed from site during reclamation and closure activities.
20. Hydrocarbon Contaminated Soils (HCS)
 - a. The RCE should include costs for proper disposal of the maximum volume of HCS that would need to be disposed off-site or would be present in the HCS storage facility at any time.

Structure, Equipment, Facility Removal, and Miscellaneous

21. Foundations and Buildings Areas
 - a. The RCE must include all costs for demolition and disposal of buildings and foundations. If foundations are proposed to be buried in-place, assume a minimum 3-foot burial depth for broken foundations and a minimum 5-foot burial depth over unbroken foundations. Provide and reference a figure that locates and identifies all buildings and structures that will require demolition and/or removal after operations.

- b. Include a table and figure that lists and locates all of the facilities requiring demolition will be useful in developing the costs. See example Buildings and Foundations Inventory Table and Figure at the end of this document.
22. Other Demolition
- a. Costs should be included for any other demolition and disposal activities of facilities and/or equipment.
 - b. The RCE should reflect any special handling required prior to demolition.
23. Equipment Removal
- a. Costs should be included for any equipment that will require removal from the project area during reclamation activities that has not been addressed elsewhere in the cost estimate.
 - b. The RCE should reflect any special handling required prior to removal from the site.
24. Fence Removal and Installation
- a. The RCE should include costs for fencing that will require relocation, installation, and/or removal after operations.
 - b. If fencing around process and event ponds will require temporary removal for equipment access to convert ponds to evaporation cells, costs should be included for fence reinstallation.
25. Culvert Removal
- a. All culverts proposed to be removed during site reclamation activities need to be included in the RCE.
 - b. Costs should be included for earthwork and erosion stabilization activities that may be required to reestablish a natural drainage channel in the locations where culverts will be removed.
26. Pipe Removal
- a. The RCE should include costs for all major process fluid and other piping systems that will be removed or cut and capped and left buried in place after operations.
 - b. The RCE should also account for installation and burial of any pipe lines during reclamation and closure activities to transition the process fluid stabilization facilities to a passive system. No piping systems should remain on the surface during long-term passive fluid management.
 - c. Costs should be included for any special handling, such as triple-rinsing prior to removal and disposal.
27. Powerline and Transformer Removal
- a. The RCE should include costs for removal of power lines and transformer stations. Provide and reference a figure that locates and identifies all power lines and transformer stations that will be present within the project area.
 - b. The reclamation plan should discuss which power lines and transformer stations are proposed to remain within the project area after operations and the responsible party for the facilities after operations.
28. Rip-rap, Rock Lining and Gabion Installation
- a. Costs should be included for sediment and erosion control measures after operations and reclamation has been completed.
 - b. The RCE should reflect the costs required to stabilize facilities from long-term erosion. Facilities to consider include constructed storm water channels, culvert removals in drainages, tailing embankment rock spillways.
29. Other Miscellaneous Costs
- a. This category includes costs that have been calculated for other activities proposed in the reclamation plan. For example the installation and removal of temporary and/or permanent erosion control structures (or BMPs- best management practices), such as straw bales, silt fencing, erosion mats, willow wattles, etc.

Monitoring

30. Reclamation Monitoring and Maintenance
- a. The RCE should include costs for anticipated site monitoring and periodic maintenance of reclaimed areas that may require additional site work to stabilize areas where erosion may have occurred. The RCE should include cost for reseeding a minimum of the percent (10%) of the total project disturbance area that will be seeded.
31. Ground and Surface Water Monitoring.
- a. The RCE should include cost to perform at least two inspections per year to monitor post-reclamation and seeded areas for erosion and revegetation success for a minimum of three growing seasons after a facility has been

recontoured and seeded.

- b. To calculate surface and ground water monitoring costs the Plan should include a table that lists all monitoring points in the Water Pollution Control Permit that will require sampling for a minimum of five years after mining and processing is completed. The table should include and quantify the type, and number, and frequency of analytical samples that will be required. See example Post-mining Water Monitoring table at the end of this document.

32. Other Mitigation and Monitoring

- a. Any mitigation and monitoring requirements not included elsewhere in the RCE should be accounted for. Some examples of mitigation and monitoring often required by the federal land manager may include the following:
 - Monitoring regional hydrogeologic conditions.
 - Wetland and riparian area mitigation.
 - Biological monitoring and reporting, and habitat maintenance or restoration.

Construction Management and Support

33. Construction Management

- a. More than one construction manager may be required on larger project sites, or if the site reclamation/closure schedule indicates significant process fluid management activities will occur at the same time other significant reclamation activities will be performed. More than one construction manager may also be required if a site has several facilities that are located significant distances from each other, and the reclamation schedule indicates reclamation regrading activities will occur at several facilities at the same time.
- b. Construction management should be included for subsequent activities that will not be completed during the initial reclamation campaign.

34. Construction Support

- a. Costs for facilities such as temporary office space, bathrooms, water and power supplies that will be needed during reclamation and closure activities need to be included.
- b. The costs should also include the security staff required during reclamation and closure activities.

35. Road Maintenance

- a. The RCE needs to include cost for road maintenance during reclamation activities. The equipment productivity rates are based on roads being maintained in good condition. Road maintenance typically will require a grader, a water truck, and an identified water source.

36. Equipment Mobilization and Demobilization

- a. The reclamation cost estimate needs to include mobilization costs for all equipment identified to be on site at the same time, and be consistent with the assumptions and timeframes used to determine construction management costs, and the reclamation schedule. For example, mobilization for multiple fleets may be required if the reclamation schedule indicates a multiple fleets will be working simultaneously on different facilities within the project area.
- b. Cost for multiple equipment mobilization and demobilization events may be required to perform subsequent site activities after the initial reclamation campaign may be finished, such as converting open ponds to evaporation cells, final earthwork and seeding on heap leach pads and tailings impoundments, removing and reclaiming power facilities, roads and monitoring wells.

Example Tables:

Tables are a practical and preferred method of providing comprehensive inventories all mine facilities, and quantifying required reclamation activities and material volumes. Tables are also readily adjustable as needed over the life of the operation, and for required periodic reviews of the RCE. Below are a set of example tables typically needed to inventory mine components at most mine sites. Each plan should develop tables as appropriate to the individual project site. For process and event ponds this information may also be used to support the process fluid stabilization and closure activities. Example tables shown below include recommended column headers general layout to identify information that is required to develop the RCE:

- Soil Inventory and Project Requirements.
- Growth Media Stockpile Inventory.
- Access and Haul Road Inventory.
- Production, Dewatering, Infiltration and Monitoring Well Inventory.
- Process and Other Ponds Inventory.
- Buildings, Pads and Other Structures Inventory.
- Post-mining Water Monitoring Requirements.

Table 1. Soil Inventory and Project Requirements

| Soil type ¹ | Soil depth (in.) | Area (acres) /Volume (c.y.) | Facility | | | | Totals |
|-----------------------------|------------------|-----------------------------|----------------------|--------------------------|-----------------------------|------------------------------|----------------|
| | | | PAG WRD ² | Non-PAG WRD ³ | Heap Leach Pad ⁴ | Ancillary Areas ⁵ | |
| AT | 12 | Area | 20 | 30 | 10 | 5 | 65 |
| | | Volume | 32,267 | 48,400 | 16,133 | 8,067 | 104,867 |
| LK | 6 | Area | 10 | 15 | 20 | 5 | 50 |
| | | Volume | 8,067 | 12,100 | 16,133 | 4,034 | 40,344 |
| Total salvaged | | Area (acres) | 30 | 45 | 30 | 10 | 115 |
| | | Volume (c.y.) | 40,344 | 60,500 | 32,266 | 12,101 | 145,211 |
| Total required at 6" depth | | Volume (c.y.) | 0 | 0 | 0 | 8,067 | 8,067 |
| Total required at 12" depth | | Volume (c.y.) | 0 | 72,600 | 0 | 0 | 72,600 |
| Total required at 24" depth | | Volume (c.y.) | 0 | 0 | 96,800 | 0 | 96,800 |
| Total required at 36" depth | | Volume (c.y.) | 145,200 | 0 | 0 | 0 | 145,200 |
| Total Required | | Volume (c.y.) | 145,200 | 72,600 | 96,800 | 8,067 | 322,667 |

Notes:

1. Soil Type (from USGS –SCS).
2. PAG WRD requires 36" depth.
3. Non-PAG WRD requires 12" depth.
4. Heap Leach Pad requires 24" depth.
5. Ancillary Areas requires 6" depth.

Table 2. Growth Media Stockpile Inventory

| Growth Media Stockpile Number | RCE Stockpile number | Stockpile Volume (c.y.) | Receiving Facility | Haul distance (feet) / average slope (negative slope = uphill loaded) |
|-------------------------------|----------------------|-------------------------|--------------------|---|
| GMS-1 | 1 | 45,000 | Heap Leach Pad 1 | 1320' @ -6% |
| GMS-2 | 2 | 60,000 | Waste Dump 1 | 2630' @ -10% |
| GMS-3 | 3 | 100,000 | PAG-WRD | 5280' @ -8% |

Table 3. Access and Haul Road Inventory

| Road Type/Description | RCE Road Number | Average Travel Width (feet) | Road Length (feet) | Average Underlying Ground Slope (_H:1V) | Cut Slope (degrees) | Slope Replacement (%) |
|---------------------------|-----------------|-----------------------------|--------------------|---|---------------------|-----------------------|
| North Haul Road | 1 | 80 | 5,280 | 10 | 45 | 100 |
| Main Access Road | 2 | 40 | 10,560 | 2 | 45 | 50 |
| Heap Leach Perimeter Road | 3 | 18 | 7,920 | 5 | 45 | 100 |
| MW-1 Access Road | 4 | 12 | 2,640 | 6 | 45 | 100 |
| Powerline Road | 5 | 12 | 21,120 | 3 | 45 | 0 |

Table 4. Production, Dewatering, Infiltration and Monitoring Well Inventory

| Facility ID/Description | RCE Well Number | Casing diameter (inches) | Depth (feet) | Comments |
|-------------------------------------|-----------------|--------------------------|--------------|----------|
| WP-1/Water Production Well | 1 | 12 | 1,200 | |
| DWW-1/Dewater Well 1 | 2 | 12 | 1,000 | |
| MW-1/HLP Up gradient monitor well | 3 | 4 | 140 | |
| MW-2/HLP Down gradient monitor well | 4 | 4 | 200 | |

Table 5. Process and Other Ponds Inventory

| Pond type/description | Pond Length (feet) | Pond Width (feet) | Pond Surface Area (acres) | Pond Depth (feet) | Pond Side Slope (H:1V) | Pond Capacity* (gallons) | Operating Volume (gallons) |
|-----------------------|--------------------|-------------------|---------------------------|-------------------|------------------------|--------------------------|----------------------------|
| Preg Pond 1 | 200 | 100 | 0.46 | 10 | 2 | 1,107,115 | 400,000 |
| Barren Pond 1 | 200 | 100 | 0.46 | 10 | 2 | 1,107,115 | 400,000 |
| Event Pond 1 | 400 | 200 | 1.84 | 10 | 2 | 2,214,230 | 0 |

* Pond capacity while maintaining required freeboard.

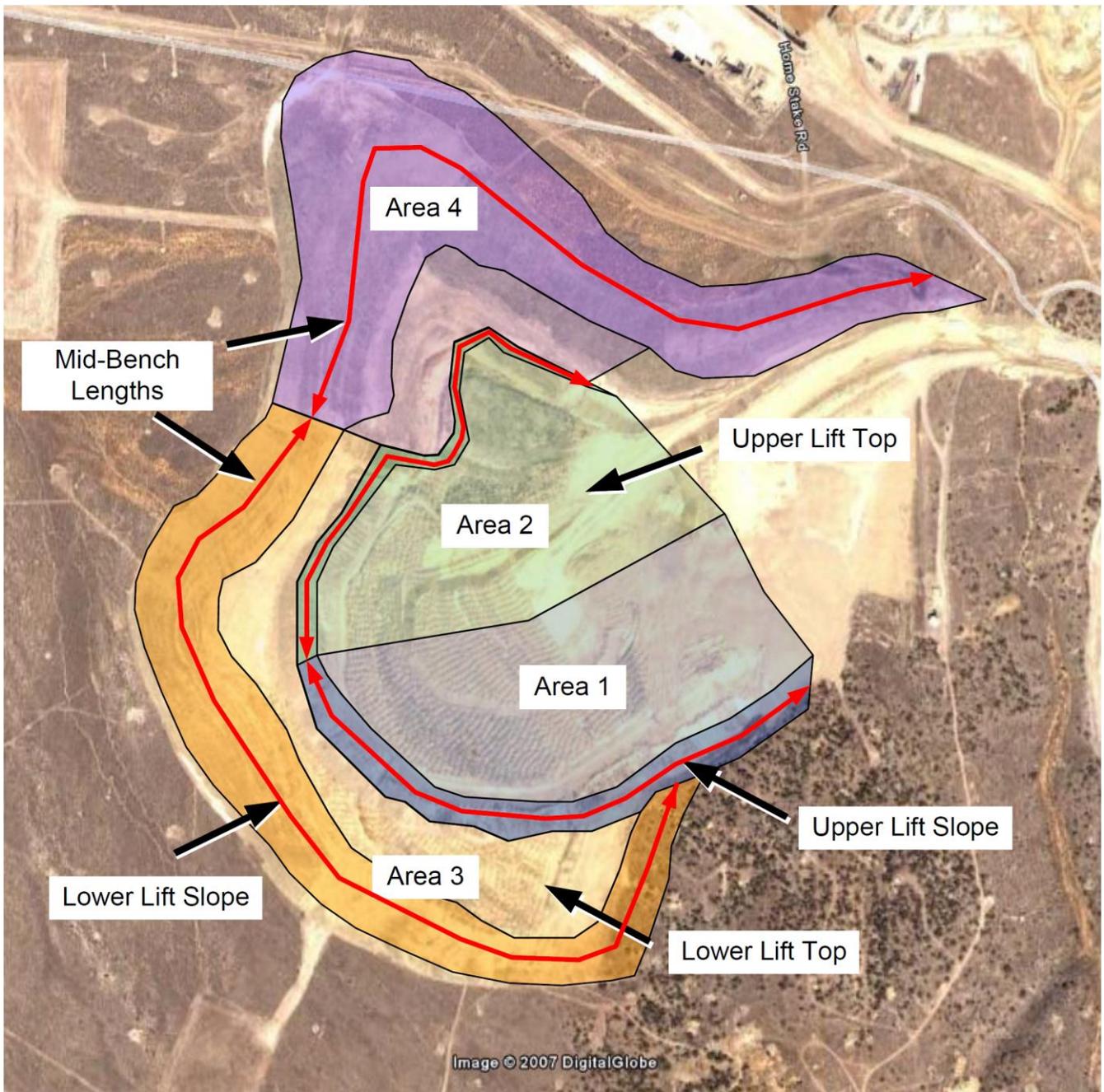
Table 6. Buildings, Pads and Other Structures Inventory List

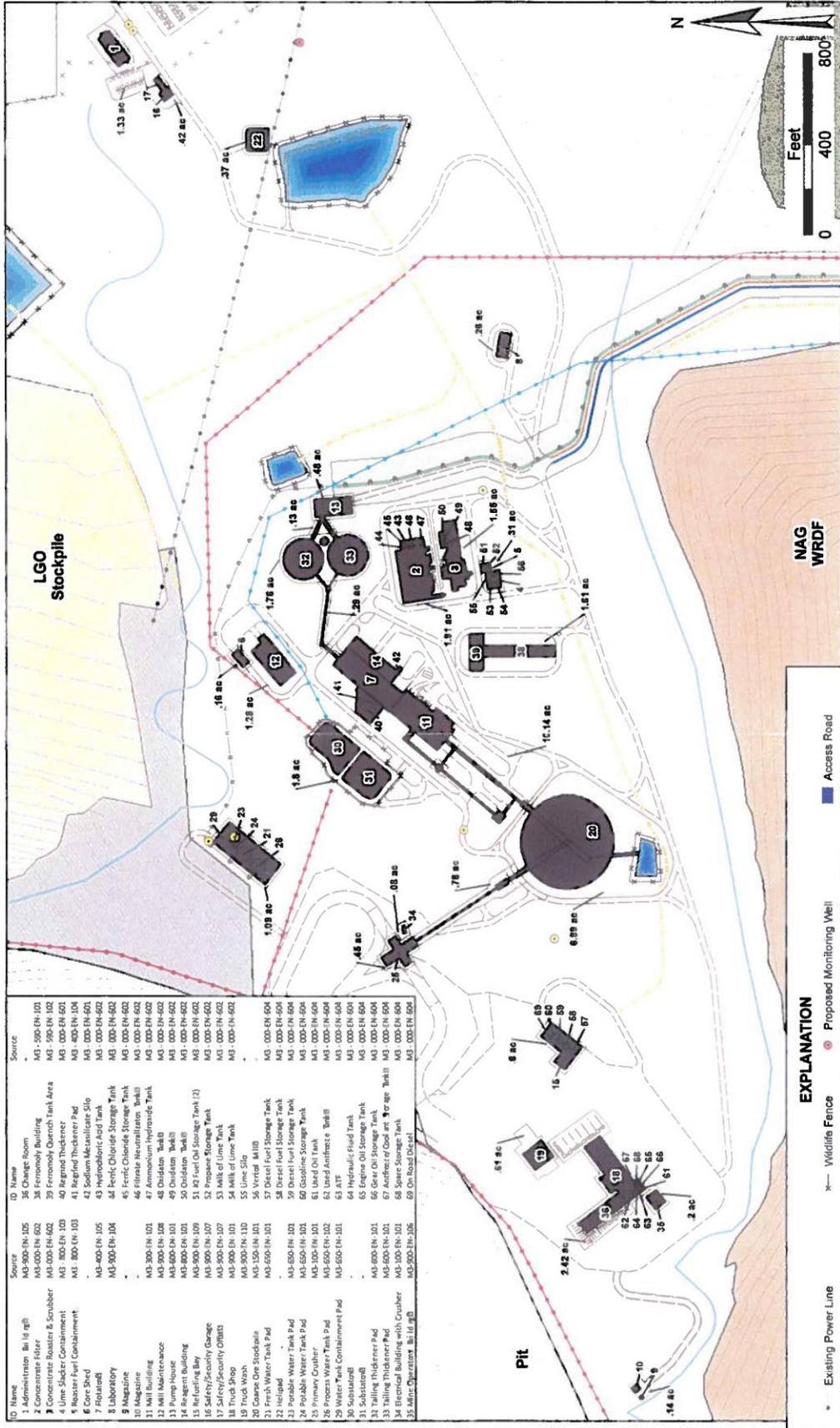
| Facility Description | RCE Facility Number |
|-------------------------|---------------------|
| Mill Building | 1 |
| Administrative Building | 2 |
| Truck Shop | 3 |
| Truck Wash Pad | 4 |
| Thickener Tank | 5 |

Table 7. Post-mining Water Monitoring Requirements

| Facility ID/Sample Location | Quarterly Event 5-Year Duration | Quarterly Event 30-Year Duration | Annual Event 5-Year Duration | Annual Event 30-Year Duration |
|---|---------------------------------|----------------------------------|------------------------------|-------------------------------|
| WP-1/Water Production Well | | | | X |
| DWW-1/Dewater Well 1 | | | X | |
| MW-1/HLP Up gradient monitor well | X | | | X |
| MW-2/HLP Down gradient monitor well | X | | | X |
| MW-3/PAG WRD down gradient monitor well | | X | | |
| Total Samples | 40 | 120 | 5 | 90 |

Example Figures:





| ID Name | Source | ID Name | Source |
|-------------------------------------|---------------|--|---------------|
| 1 Administration Bldg | M3-900-EN-105 | 36 Change Room | M3-000-EN-101 |
| 2 Concrete Filter & Scrubber | M3-000-EN-102 | 37 Primary Building | M3-000-EN-101 |
| 3 Lime Sludge Containment | M3-000-EN-103 | 38 Primary Open Tank Area | M3-000-EN-101 |
| 4 Recycle Fuel Containment | M3-000-EN-103 | 39 Secondary Thickener Pad | M3-000-EN-104 |
| 5 Core Shed | M3-000-EN-105 | 40 Barfed Thickener Pad | M3-000-EN-104 |
| 6 Laboratory | M3-000-EN-104 | 41 Sodium Metasilicate Silo | M3-000-EN-602 |
| 7 Magazine | M3-000-EN-101 | 42 Hydrochloric Acid Tank | M3-000-EN-602 |
| 8 Mill Building | M3-900-EN-108 | 43 Ferric Chloride Storage Tank | M3-000-EN-602 |
| 9 Mill Maintenance | M3-000-EN-101 | 44 Ferric Chloride Neutralization Tank | M3-000-EN-602 |
| 10 Pump House | M3-000-EN-101 | 45 Ammonium Hydroxide Tank | M3-000-EN-602 |
| 11 Recipient Building | M3-000-EN-107 | 46 Oxidation Tank | M3-000-EN-602 |
| 12 Safety/Security Garage | M3-000-EN-107 | 47 Oxidation Tank (2) | M3-000-EN-602 |
| 13 Safety/Security Office | M3-900-EN-110 | 48 Milk of Lime Tank | M3-000-EN-602 |
| 14 Truck Wash | M3-900-EN-110 | 49 Milk of Lime Tank | M3-000-EN-602 |
| 15 Fresh Water Tank Pad | M3-500-EN-101 | 50 Diesel Fuel Storage Tank | M3-000-EN-604 |
| 16 Portable Water Tank Pad | M3-500-EN-101 | 51 Diesel Fuel Storage Tank | M3-000-EN-604 |
| 17 Portable Water Tank Pad | M3-500-EN-101 | 52 Gasoline Storage Tank | M3-000-EN-604 |
| 18 Process Water Tank Pad | M3-500-EN-102 | 53 Used Antifreeze Tank | M3-000-EN-604 |
| 19 Water Tank Containment Pad | M3-500-EN-101 | 54 ATF | M3-000-EN-604 |
| 20 Substation | M3-000-EN-101 | 55 Hydraulic Fluid Tank | M3-000-EN-604 |
| 21 Tailing Thickener Pad | M3-000-EN-101 | 56 Engine Oil Storage Tank | M3-000-EN-604 |
| 22 Tailing Thickener Pad | M3-000-EN-101 | 57 Antifreeze of Cool ant Storage Tank | M3-000-EN-604 |
| 23 Electrical Building with Crusher | M3-000-EN-101 | 58 Spare Storage Tank | M3-000-EN-604 |
| 24 Mine Operator Bldg | M3-000-EN-101 | 59 On-Road Disposal | M3-000-EN-604 |

EXPLANATION

- Exiting Power Line
- TSM/Mine Power Line
- 230-kV Power Line
- Light Vehicle Road
- Growth Media Stockpile/Access Road
- BLM Wire Fence
- Wildlife Fence
- Diversion Channel
- Collection Channel
- Reclaim Line
- Tailing Line
- Well Field Water Line
- Proposed Monitoring Well
- Proposed Monitoring Well (existing)
- Tailing Corridor
- Growth Media / Cover Stockpile
- Low Grade Ore Stockpile (25' Contours)
- Waste Rock Disposal Facility (20' Contours)
- Access Road
- Building/Structure
- Pit (50' Contours)
- Interpit Area
- Pond
- Yard