



Nixon Fork Mine

Plan of Operations & Reclamation Plan

Volume II of II

Submitted to the

Anchorage Field Office
Bureau of Land Management
6881 Abbott Loop Road
Anchorage, AK 99507

By

Mystery Creek Resources, Inc.
1200 West 73rd Avenue Suite 1100
Vancouver BC, V6P 6G5

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1.0 INTRODUCTION

This document presents the Reclamation Plan and Cost Estimate for the Nixon Fork Mine near McGrath, Alaska. The Nixon Fork Mine and associated facilities are owned by Mystery Creek Resources, Inc. (MCRI) a subsidiary of Fire River Gold Corp. The Nixon Fork Mine has been in temporary closure and no mining or milling of ore has occurred since 2007.

This report contains:

- Base assumptions and general information (Section 1.0)
- Reclamation and closure plan by site feature (Section 2.0);
- Basis of estimate explanation (Section 2.0);
- Post closure monitoring requirements (Section 3.0); and
- Cost Estimate Summary (Section 4.0).

Figures are provided in Appendix A. Acronyms and references used to develop the cost estimate and reclamation plan, spreadsheets and vendor supplied backup are provided in Appendix B, C and D respectively. Geochemical and water quality data are presented in Appendix E and F respectively. A sample schedule is provided in Appendix G.

1.1 BACKGROUND AND PURPOSE

The mine site is located approximately 32 miles northeast of McGrath and 8 miles north of Medfra in west central Alaska (Figure 1, Appendix A). The Nixon Fork Mine is not road accessible; access to site is by charter plane flown out of Anchorage, Fairbanks, or McGrath. (Figure 1, Appendix A). The Nixon Fork Mine is located on a mix of Federal and State mining claims located in Township 26 South, Range 21 East, and Township 26 South, Range 22 East, Kateel River Meridian. The Nixon Fork Mine property consists of 95 unpatented hardrock mining claims, 15 unpatented placer claims and 48 State mining claims. Site elevation varies from approximately 925 feet above mean sea level (amsl) at the Mystery Creek water intake (northeast portion of the site) to approximately 1,375 feet amsl in the vicinity of the main camp area (central portion of the site). The main tailing impoundment, located on the western portion of the site within the Ruby Creek drainage, has an embankment crest elevation of 986 feet amsl.

Access to the property is limited to air transport or via winter trail. A 4,200 feet landing strip is present at the site, capable of handling DC-6 or C-130 Hercules sized aircraft. The runway is oriented, generally, north to south direction along the west flank of a ridge that extends through the property. Seasonal barging on the Kuskokwim River is possible as far as the villages of McGrath or Medfra. Supplies can also be transported via the winter road (under permit) from either of these villages.

1.2 CHANGES SINCE 2005 RECLAMATION PLAN AND COST ESTIMATE

The following material changes have been made to the reclamation plan and cost estimate submitted for the Nixon Fork Mine in 2005:

- The underground workings at the Mystery Portal will not be used for final disposal of solid waste generated during closure;
- The amount of contaminated soil associated with the Crystal Development Waste Rock Stockpile industrial area and the bulk fuel storage facility have increased based upon site investigations;
- Ventilation shaft seals will be constructed of concrete instead of timbers and polyurethane foam to promote seal longevity;
- Erosion and sediment control was incorporated into the reclamation plan;
- Broadcast seeding was changed from land based application to aerial application; and
- Costs were prepared in accordance with the ADNR Reclamation Cost Guidelines published in 2009.

1.3 ASSUMPTIONS

The Reclamation Plan and Cost Estimate (“the Plan”) have been prepared on the basis that the U.S. Bureau of Land Management (BLM) and/or Alaska Department of Natural Resources (ADNR) would contract with a third-party contractor from a proximal regional location to complete the required closure and reclamation activities. All costs associated with reclamation activities at the Nixon Fork Mine therefore reflect air delivery of mobile equipment and supplies, as well as all crew requirements (on a rotational basis), as further described below. In general, the Plan addresses all reasonably foreseeable mine closure and reclamation requirements, while also incorporating a 30-year post-closure monitoring and maintenance program.

1.3.1 Reclamation Performance Objectives

Reclamation implies the return of ecosystem conditions similar to or better than that existing prior to disturbance. Rehabilitation of the mine site involves returning drastically disturbed sites to a condition that is stable and does not require maintenance. The State of Alaska has established the following tasks for mine land reclamation:

- Waste Rock Dumps
 - Erosion sediment control devices;
 - Recontouring of waste rock dump to final reclamation contours;
 - Construction of an engineered cover if required;
 - Topsoiling of exposed/constructed surfaces;
 - Installation of permanent drainage/runoff structures;
 - Seedbed preparation; and
 - Revegetation.

- Tailings
 - Erosion and Sediment Control;
 - Recontouring of tailings facility to final reclamation contours;
 - Construction of an engineered cover if required;
 - Topsoiling of exposed/constructed surfaces;
 - Installation of permanent drainage/runoff structures;
 - Seedbed preparation;
 - Revegetation;
 - Dewatering, water treatment, and disposal (if necessary); and
 - Long-term care and maintenance if closure involves leaving a jurisdictional dam.

- Filtered Tailings Disposal Site
 - Erosion and Sediment Control;
 - Recontouring of tailings facility to final reclamation contours;
 - Construction of an engineered cover if required;
 - Topsoiling of exposed/constructed surfaces;
 - Installation of permanent drainage/runoff structures;
 - Seedbed preparation; and
 - Revegetation.

- Material Sites or Borrow Areas
 - Recontouring of material site to final reclamation contours;
 - Topsoiling of dump surfaces;
 - Installation of permanent drainage/runoff structures if needed;
 - Seedbed preparation; and
 - Revegetation.

- Underground Development
 - Adits and shafts shall be plugged in terms of the approved closure plan;
 - Stability assessment of stopes/voids with the potential to fail to surface; and
 - Underground waste disposal as specified in the Waste Management Plan.

- Support facilities
 - Must be removed following mining; and
 - Surface disturbance rehabilitated.

1.3.2 Specifically Excluded Areas

The following features or areas are either considered not subject to reclamation, or are otherwise specifically excluded from MCRI's Reclamation Plan for the reasons indicated in the following sections.

1.3.2.1 Hercules (1995) Airstrip Landing Surface

The Hercules Airstrip landing surface would be left intact to provide future site access for post-closure monitoring activities and to serve as an emergency landing strip. On completion of long term monitoring activities it would continue to remain intact to function as an unmanned emergency landing strip. MCRI, in conjunction with ADNR and BLM, has determined that the airstrip surface exhibits densely compacted and stable characteristics and as such, is not subject to washout or erosion under normal weather conditions. The east (cut slope) embankment of the Hercules Airstrip will, however, be subject to revegetation processes as described in Section 2.2.1.

1.3.2.2 Historic Features

A number of onsite features have been determined to exhibit potential historical significance and/or eligibility for nomination to the National Historic Register. Because of this, and the fact that most of the features are specifically excluded from MCRI's planned operations per conditions of a February 4, 2003 mining lease agreement between Mespelt, M. L., Almasy, T. J., Mespelt & Almasy Mining Company, LLC (as "Lessor") and Mystery Creek Resources, Inc. (as "Lessee"), the features are excluded from the reclamation Plan. Accordingly, MCRI has no obligation for reclamation associated with the following features:

Eligible for Inclusion in National Historic Register

- Treadwell 10-Stamp Mill (along upper Ruby Creek)
- Tailings Pond (along upper Ruby Creek)
- Bunkhouses (2) at Almasy Camp
- Mespelt Camp
- Winan Cabin

Excluded Per Lease

- Mespelt Hoisthouse and Buried Sawmill
- Located at south end of Crystal Development Rock Stockpile
 - Mespelt Camp Area
- Located near stamp mill on upper Ruby Creek
 - Large cabin
 - Small cabin (powerhouse)
 - Bunkhouse
 - Mess house
 - Warehouse at old mill
- Lower Mespelt Camp Area, located downslope from Mespelt Camp Area
 - Warehouse
 - Stamp mill
- Margaret Mespelt Cabin Area
 - Cabin
 - Cache on poles

- Small warehouse
- Pupinsky Claims Area
 - Wannigan structure

1.3.2.3 Historic Mine Shafts

A total of 14 historic shafts have been identified as being present at various locations on the property. These features pre-date MCRI activities at the site, and in addition, have been determined to exhibit potential historic significance (Bacon, 1990). MCRI has no reclamation obligation associated with these features. However, in the event it is determined that closure of a given shaft is required to mitigate water inflow to the mine; MCRI will voluntarily assume closure/reclamation obligation associated with the respective shaft feature(s). Also, in the event the features are determined to be safety hazards, MCRI has indicated a willingness to assist BLM/ADNR with closure or sealing of those features. A survey of these shafts during June 2010 (TPECI, 2010) indicates that of the 14 shafts identified in 2005, only five remained open to surface within the footprint of mining operations at the Nixon Fork Mine.

1.3.2.4 Historic Roadways and Trails

There are at least two (2) documented historically significant roads or trails that enter upon or cross the Nixon Fork Mine site. In addition, there are historic trails associated with mining activity throughout the site, as generally identified below (may not be all-inclusive) and depicted in Figures 3-5. None of the following site features are subject to reclamation:

- Ruby Creek Trail – approaches from west side of site
- Medfra Road (and trail) – approaches from east side of site
- Unnamed Trail(s) – vicinity of Mespelt Camp Area
- Unnamed Trail(s) – vicinity of Southern Cross Mine

1.3.2.5 Areas Subject to CERCLA Removal Authority

MCRI has no reclamation obligation (other than that which may be incurred as a result of, and to the extent attributable to, its own subsequent activities, if any) on or at areas that are the subject of the ongoing BLM-administered Removal Action. This Removal Action is related to disposition of hazardous substances identified in the February 11, 2005 report entitled “Removal Site Evaluation – Nixon Fork Mine” prepared by MACTEC (MACTEC Project No. 4034040003).

Certain Removal Actions have been carried out and are ongoing as related to removal of drummed wastes and/or contaminated soils. It is presumed that these actions are or will be completed prior to startup of MCRI operations, and would be fully documented in the Administrative Record. Specific items that are being or are to be addressed by the Removal Action(s) are generally described as follows:

- Historic tailings at old mill location;
- Used oil and grease (357 drums approximately);
- Mill reagents (organic chemicals and lime); and
- Explosives.

1.3.3 Operation Duration

The current anticipated “operational” (active mining) life of the Nixon Fork Project is in excess of five (5) years, with an anticipated project start date (dependent on receipt of all required permits and authorizations) of December 2011. Mine operations covered under this reclamation plan are anticipated to extend from December 2011 to approximately the end of 2015, and accordingly, mine closure would commence immediately on cessation, or not later than April/May 2016 (to be completed over a six-month duration). A sample schedule for the project is attached in Appendix G.

1.3.4 Work Schedule and Rotation

It is anticipated that closure and reclamation activities would be completed over the course of a single construction season of approximately six months, with the more significant activities (major structure demolition/disposal and recontouring of slopes) being accomplished during the initial four months. In developing scheduling for closure and reclamation of the Nixon Fork Mine, a 6-month duration has been assumed. The Reclamation Plan reflects a total of twelve (12) two-week shift rotations. Shift rotations are based on 12-hour days over a continuous 14-day period. The prepared cost estimate is calculated based on a modified weekly cost which accounts for 40 hours of straight time and 44 hours of overtime per week. The weekly rate is the summation of regular hours and overtime hours plus, Davis-Bacon mandated ‘fringe’ and 21 percent burden (calculated on wages only) divided by 7 days to obtain a per shift rate. It is assumed that labor will be kept busy on project components for the full duration onsite. Calculation of shift rates in this manner results in an average shift rate that totals to a known weekly quantity without having to resort to assumptions regarding scheduling.

1.3.5 Man Power

On the basis of the identified equipment suite and recognition of additional support personnel requirements, a detailed manpower spread was compiled for the proposed closure and reclamation activities. This spread and the resultant costs recognize all anticipated factors, to include: (a) fly-in and fly-out of crews on a rotational basis; (b) direct wage/salary (reflective of prevailing straight wage plus overtime) along with benefits burden; (c) room and board onsite; and, (d) other costs as noted.

The roster of anticipated personnel (on a per rotational shift “peak” basis) and a general description of job responsibilities for reclamation activities is as indicated below (maximum 16-person crew plus camp service staff). However, the total number of personnel onsite would vary over the duration of the closure and reclamation effort

based on jobsite demands (i.e., individual component requirements) and manpower utilization optimization.

PEAK PERSONNEL REQUIREMENTS

Title:	Quantity:	Responsibility:
<i>Management/Technical:</i>		
Project Manager/Superintendent	1	Site Manager; HS&E; and administrative
<i>Equipment Operators:</i>		
Haul Truck Operators	2	Cat 725 Articulated Truck
Front End Loader Operator	2	Cat IT62H Front End Loader
Dozer Operator	2	Cat D6 LGP Dozer
Backhoe Operator	1	Cat 420
<i>Technicians:</i>		
Oiler/Maintenance Spec.	1	Mobile equipment maintenance; mechanical demo
Craft - Electrician	1	Electrical demolition; maintenance as required
General Labor	3	Dismantling/demolition/cleanup/miscellaneous
Mason	1	Concrete work
Plumber/pipefitter	1	Mill Complex piping demolition
<i>Other:</i>		
Camp Management	1	Contract Service – food service; cleaning, etc.

The labor allocation schedule and labor capital spread for the project are provided in Appendix C.

1.3.6 Manpower Support

Manpower support activities for the project including provision of food lodging and transportation to and from site were independently calculated based on vendor quotes. It is assumed that the existing camp facilities will be used during reclamation activities while on site. The manpower support spread for the project is provided in Appendix C.

1.3.7 Equipment Fleet Considerations and Assumptions

While work activities reflect the 24-week duration, equipment leasing is based on a full six-month's duration, allowing one week for fly-in delivery and vendor assembly of heavy equipment and an equivalent one week for teardown and fly-out. Actual onsite reclamation activities are proposed to be carried out from May 2016 through October 2016, to include all activities through final site preparation, revegetation, project closeout, and establishment of monitoring program requirements.

Vendor quotes were obtained for equipment rental/lease rates from NC Machinery, Inc. In addition to the direct leasing rate (based on a maximum usage of 200 hrs. per month), the rates were adjusted upward to reflect the 336 hrs. Per month usage for the projected operating schedule (14-day rotations; 12-hour shifts = 168 hours per rotation; therefore = 336 hours per "month").

Equipment capital costs are considered to be inclusive of all minor accessory equipment such as removable fork tines (adaptable to the front-end loader), detachable hydraulic hammer (for the utility backhoe loader), etc. A provision for air delivery of the equipment fleet via Hercules C-130 aircraft from Anchorage, Alaska as well as vendor-provided estimates for mobilization and assembly/disassembly at the site has also been incorporated. The number of transport trips was calculated on the basis of maximum allowable load capacity as well as volumetric capacity (i.e., optimization of equipment loads to fit into the C-130 on a maximum allowable load basis either completely assembled, or with some disassembly, as necessary).

The onsite major equipment fleet mix was predicated upon the following considerations:

1. The equipment be transportable by C-130 Hercules Aircraft; and
2. Six month duration of active reclamation and closure activities.

The major capital equipment shift allocation was developed for the most significant closure components (described in Section 2.0). The allotted shifts were then totaled to verify that the selected major equipment suite is capable of providing the required production within the six month time frame. Major equipment allocation schedule and equipment capital spread for the project is provided in Appendix C.

1.3.8 Equipment Operating and Maintenance Costs

Equipment operating costs have been developed in general accordance with the Caterpillar Handbook format. It should be noted that the hourly operating and maintenance (O&M) cost does not include the operator wage, as operator expense is carried under manpower (see Section 1.3.5.), nor does it include ownership and depreciation/amortization costs, since rented/leased equipment is utilized. Similarly, labor cost for repair/maintenance is carried under manpower in Section 2.4. The hourly operating costs conservatively incorporate cost provision for various operating expenses to include:

- Preventative Maintenance Consumables (e.g., lubrication, oil, filters, grease);
- Tires (e.g., repair, replacement);
- Special Wear Items (e.g., cutting edges, ground engaging tools, etc.); and
- Fuel Consumption.

As a verification measure, the hourly operating costs for each piece of major equipment were crosschecked with staff at NC Machinery, Inc. It was ascertained that the utilized costs adequately cover and most likely significantly exceed anticipated costs for the given application at a remote Alaska site. The equipment operating and maintenance cost spread for the project is provided in Appendix C.

1.4 Methodology

The reclamation plan was developed based upon the plan of operations for the facility developed by Mystery Creek Resources, Inc. and minimum closure and reclamation standards contained in the *Draft Mine Closure and Reclamation Cost Estimation Guidelines*, dated November 3, 2009. The overriding performance goal for closure is to leave the site in a safe and stable configuration which returns the site to a condition that allows natural physical, biological, and chemical process to function.

1.5 List of Acceptable Source Data

The list of acceptable source data used to generate this cost estimate is found in Appendix B. The cost estimate spread sheet is provided in Appendix C. Vendor supplied quotes and current wage and hour, and machine rental costs are found in Appendix D.

2.0 RECLAMATION PLAN

2.1 Storm Water Pollution Controls

Reclamation will entail soil disturbing activities greater than 1 acre and result in storm water discharges which potentially may reach waters of the United States. For the purposes of this cost estimate it is assumed that the Storm Water Pollution Prevention Plan (SWPPP) prepared under the Alaska Pollutant Discharge Elimination System (APDES) Multi-Sector Permit for Industrial Activities is no longer in force and the third party contractor will need to obtain coverage under the APDES Construction General Permit (CGP). The SWPPP and permit application process would cost \$15,000 from a third party consultant. Administrative requirements mandated by the CGP including maintenance of records and inspection are estimated to require 4 hours per week of the Project Manager's time. For the purposes of this estimate, it is assumed that the site will be in winter shutdown from October 1 through May 15 due to frozen ground conditions which preclude soil erosion. Unless otherwise noted, erosion and sediment control incorporates both temporary and permanent Best Management Practices (BMPs).

Estimated Incremental Requirements:

SWPPP: \$ 15,000.00

Dedicated Assets and Duration

Dedicated Labor: \$ 10,495.00

Estimated Direct Component Cost

Total: \$ 25,495.00

The costs of erosion sediment control protection (ESCP) for each feature are included under the incremental cost for each site feature. As a general principle, vegetation buffers will be used.

2.2 LAND RECLAMATION

2.2.1 Seeding and Fertilization Requirements

The seeding and fertilization requirements for disturbed areas constitute a uniform standard (Standard Specification) unless otherwise noted. Fertilizer shall be applied at a rate of 350 pounds per acre and seed shall be applied at rate of 24 pounds to the acre. For the purposes of this reclamation plan, the following seed mixture shall be used:

- | | |
|--|-----------------|
| • Slender Wheatgrass (<i>Elymus trachycaulus</i>) | 8.5 pounds/acre |
| • Red fescue (<i>Festuca rubra</i>) | 7.5 pounds/acre |
| • Tufted hairgrass (<i>Deschampsia caespitosa</i>) | 2.0 pounds/acre |
| • Alpine blue grass (<i>Poa alpine</i>) | 3.5 pounds/acre |
| • Annual rye (<i>Lolium multiflorum</i>) | 2.0 pounds/acre |

Seed and fertilizer shall be applied with hydroseeding equipment staged at the Nixon Fork Mine concurrent with the reclamation activities and in all cases within 14 days of permanently ceasing grading activities on all or part of the feature being reclaimed. The cost of revegetation for each component is provided in Appendix C.

Reclamation growth medium at the Nixon Fork mine will consist of salvaged topsoil and subsoil. Based on initial surveys, the native soils at the Nixon Fork Mine are shallow over lithic contact (typically between 6 and 10 inches) and salvage methods have typically consisted of using a tracked bulldozer to remove the soils and consist of the O, A, B, C, and R horizons. Nixon Fork Mine will perform a survey of the existing growth medium stockpiles at the facility, which will be updated annually. The purpose of the survey is to identify location and quantities of growth medium. Additionally, soil profile information will be obtained from representative sites on the mine site to determine the native soil depths at the Nixon Fork Mine. The soil survey information will be used to develop a Growth Medium Replacement Plan for the Nixon Fork Mine.

2.2.2 Site Roadways

The existing network of roads (Figure 4, Appendix A) that are directly associated with modern and proposed mining operations comprises an aggregate 13.3 acres of surface disturbance, inclusive of cut and fill slopes, where present. No additional road construction is anticipated (except as noted below under Section 2.2.3 - Exploration Sites). There are also a number of historic roads and/or trails that approach and/or cross the site; however, these are not included in the aforementioned total and are not

subject to reclamation (see Section 1.3.2.4). Specific reclamation objectives that apply to the site roadways:

- Site roadways must be removed following mining; and
- Surface disturbance resulting from roadways must be rehabilitated.

Specific subtasks to be performed on the site roadways to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Reclamation of the roadway surface;
- c) Seedbed preparation; and
- d) Revegetation.

For the purposes of the reclamation and closure plan, the following has been assumed:

1. For those road segments that exist on level ground (versus a cut/fill profile), a dozer would be utilized to rip the compacted surface longitudinally. It has been assumed that 25 percent of the roadway area fits this description.
2. The average existing road surface width is 20 feet;
3. For those road segments that exist as cut/fill profiles (assumed as 75 percent of the total roadway area), a dozer would be positioned perpendicular to the bank and the ripper shank utilized in a manner such that the upslope bank is pulled down into the roadway.
4. Recontouring would be accomplished with a track bulldozer;
5. Surface roughening of the reclaimed road surface will be performed as seedbed preparation

Site Roadways Subtask a - Erosion and Sediment Control:

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for site roadways will consist of vegetation buffers and preservation of existing vegetation along the roadways. The BMPs for the site roadways rely on existing site features that have no cost or that will be constructed as part of reclamation effort.

Site Roadways Subtask b - Reclamation of Roadway Surface

Those roads subject to reclamation would be reclaimed as follows. For those road segments that exist on level ground (versus a cut/fill profile), a dozer would be utilized to rip the compacted surface longitudinally. It has been assumed that 25 percent of the roadway area fits this description. For those road segments that exist as cut/fill profiles (assumed as 75 percent of the total roadway area), a dozer would be positioned perpendicular to the bank and the ripper shank utilized in a manner such that the upslope bank is pulled down into the roadway. It has been assumed that the 75 percent portion would experience a disturbed surface area increase of approximately 15 percent due to the upslope ripping/pull down and subsequent grading. The estimated existing surface disturbance attributable to site roadways is 13.3 acres. No additional roads are

proposed or planned as part of plan of operations. Additional disturbance during roadway reclamation is 1.5 acres. The total area of surface roadways to be reclaimed is 14.8 acres.

Site Roadways Subtask c - Recontouring of Roadway Surface

The available growth medium throughout the site is limited. Final grade would be prepared to an aesthetically blending profile. The blending of topography would be performed with a track type bulldozer. Recontouring is anticipated to be required for the cut and fill profile roadway sections (75 percent of surface disturbance). Ripping of the road surfaces will be confined to placed material above bedrock. For estimating purposes it was assumed that the majority of soil movement will occur during ripping operations and only minor soil movement (back blading) will be required in conjunction with track walking to complete the recontouring and seedbed preparation.

Site Roadways Subtask d - Seedbed Preparation

Track walking will be the only seedbed preparation following recontouring and reclamation activities. For the purposes of this estimate, track walking is assumed to occur across the entire disturbed roadway surface. The width of each pass during track walking is the width of the grouser pads (not blade width) because the entire surface must be walked. Track walking is projected to be done concurrently with recontouring and has been included in the estimate for recontouring.

Site Roadways Subtask e - Revegetation

Revegetation will be accomplished by hydro seeding performed concurrently with reclamation.

Site Roadways Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing
Preservation of Existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	0.0 days
Subtask b	D6 Bulldozer	13.8 days
Subtask c	D6 Bulldozer	13.0 days
Subtask b	Hydroseeder	2.2 days

2.2.3 Exploration Sites

MCRI would carry out exploration programs on an annual basis, with concurrent reclamation also occurring on an annual basis and subject to annual ADNR inspection. Individually, the Exploration Sites are generally very small areas, on the order of ¼ acre, and future drilling locations at this juncture are indeterminate and considered proprietary information. On average, MCRI anticipates approximately 10 acres of surface disturbance per year to be associated with exploration access roads and drilling pads and/or trenching.

In general, site preparation for these activities would be limited to tree removal (where necessary), and the surficial soils and vegetative mats would remain in place. Trails used to access drill sites would be constructed in a similar manner. On this basis, it has been conservatively assumed for bonding requirements (as a “worst-case” basis) that a maximum two years of exploration activity (i.e., 20 acres) would remain unreclaimed at any time or at termination of mining operations. Specific reclamation objectives that apply to the exploration areas:

- Exploration sites must be removed following mining; and
- Surface disturbance resulting from exploration sites must be rehabilitated.

Specific subtasks to be performed on the exploration sites to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Plug boreholes/backfilling of surface depressions
- c) Preparation of seedbed surface; and
- d) Revegetation.

For the purposes of the reclamation and closure plan, the following has been assumed:

1. Due to the probable remoteness and relative inaccessibility of exploration sites, allowance has been made for equipment travel time.
2. Closure/reclamation is estimated to include the use of D6 Dozer for a duration of 5 shifts, augmented with use of the IT62H Loader for 2 shifts; and
3. Use of 1 labor person and the 420 utility backhoe/loader for a period of 3 shifts to plug boreholes.

Exploration Sites Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for exploration sites will consist of vegetation buffers and preservation of existing vegetation along the margins of the exploration sites. The BMPs for the exploration sites rely on existing site features that have no cost or that will be constructed as part of reclamation effort.

Exploration Sites Subtask b - Plug Boreholes/backfilling of surface depressions

No exploration trenching is anticipated for the project. Exploration from surface will be accomplished by drilling. The closure of boreholes is envisioned to involve the following steps:

- a) Boreholes will be plugged with a bentonite hole plug, a benseal mud, or equivalent slurry, for a minimum of 10 feet within the top 20 feet of the drill hole in competent material.
- b) The remainder of the hole would be backfilled to the surface with drill cuttings.
- c) In the event water is encountered in any drill hole, a minimum of 7 feet of bentonite hole plug, benseal mud, or equivalent slurry would be placed immediately above the static water level in the drill hole. Boreholes exhibiting artesian conditions would require special notification to ADNR or ADEC as to method of closure/abandonment.

Exploration Sites Subtask c - Preparation of Seedbed/Surface

Final closure of exploration sites would include dozer backfilling of trenches and any other surface depressions created as a result of drilling activities. The backfilled areas would then be lightly track walked and final grade. The disturbed surface area(s) would be fertilized and seeded in accordance with the standard specifications.

Exploration Sites Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Exploration Site Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	0.0 days
Subtask b	materials	5,000 lbs benseal (100-50 lb sacks)
	Laborer 2	3.0 days
	420 backhoe	3.0 days
Subtask c	D6 Bulldozer	5.0 days
Subtask d	Hydroseeder	3.0 days

2.2.4 Hercules Airstrip East Embankment Cut

The 4,200 feet Hercules Airstrip (Figure 4, Appendix A) will be left intact to serve as an emergency landing strip (see Section 1.3.2.1). However, the original 1995 cut and fill construction of the runway resulted in an exposed embankment along the extent of the east side of the runway that remains non-vegetated and as such is subject to minor erosion. The embankment cut exhibits an approximate 2.5H:1V gradient. The maximum total disturbance the nominal distance to be addressed would be on the order of 5,000 feet. It has been assumed that the slope width is approximately 50 feet, resulting in a total area of 5.7 acres to be revegetated.

Specific reclamation objectives that apply to the Hercules airstrip east embankment cut:

- Surface disturbance must be rehabilitated.

Specific subtasks to be performed on the Hercules airstrip east embankment cut to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Preparation of seedbed surface;
- c) Ditch rehabilitation; and
- d) Revegetation.

Hercules East Embankment Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for Hercules airstrip east embankment cut will consist of vegetation buffers and preservation of existing vegetation along the margins of the exploration sites. The BMPs for the Hercules airstrip east embankment cut rely on existing site features that have no cost or that will be constructed as part of reclamation effort.

Hercules East Embankment Subtask b - Preparation of Seedbed Surface

Utilizing a dozer, the embankment would be scarified in the longitudinal direction to introduce erosion resistant furrows and zones for seed entrapment. Final grade would be established by dozer pushing of toe materials back upslope, followed by using the dozer to slope walk (traverse perpendicular to the slope to introduce full upslope grouser compaction and seed bed traps) the length of the embankment.

Hercules East Embankment Subtask c - Ditch Rehabilitation

The runway adjacent v-ditch would be rehabilitated and a windrow of the material placed along the runway side of the ditch to mitigate potential run-on from the runway surface. The rehabilitated ditch dimensions would be 1 foot deep and 10 feet wide. A linear distance of 5,000 feet of ditch rehabilitation and berm has been assumed for estimating purposes.

Hercules East Embankment Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Hercules East Embankment Cut Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask b
Conveyance structures	subtask c
Sediment berm	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	0.0 days
Subtask b	D6 Bulldozer	4.8 days
Subtask c	D6 Bulldozer	1.2 days
Subtask b	Hydroseeder	1.0 day

2.3 Waste Rock Dumps

2.3.1 Mystery Development Rock Stockpile

The Mystery Development Rock Stockpile, established by the development of the Mystery decline, consists of an approximately 600 feet long development rock pile with a surface elevation of 750 feet amsl. The material extends outward roughly 150 feet (at its southeasterly end) to as much as 200 feet (at its northwesterly end), with a total disturbed area of 2.9 acres. Estimated development rock depth at the face ranges from about 45 feet to as much as 50 feet, with the face at an angle of repose (approximately 1H:1V).

Reclamation constraints associated with the feature include: (i) the presence of the permit boundary (Doyon Regional Lands) immediately exterior to the northwest end; (ii) the dump's proximity to Mystery Creek, the flow course of which is approximately 125 feet to 150 feet from the dump toe; and, (iii) the steepness of the outslope. The dump material is primarily comprised of non-mineralized marble and quartz monzonite, and is non-acid generating. A growth medium stockpile is located adjacent to the toe of the existing feature, and is estimated to contain approximately 1,300 cubic yards of recoverable growth medium. No further increase in disturbed area is anticipated. Specific reclamation objectives that apply to the Mystery Development Rock Stockpile include:

- Installation of erosion sediment control devices;
- Recontouring of waste rock dump to final reclamation contours;
- Installation of permanent drainage/runoff structures;
- Topsoiling of exposed/constructed surfaces;
- Seedbed preparation; and
- Revegetation.

Specific subtasks to be performed on the Mystery Development Rock Stockpile to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of stockpile face
- c) Preparation of seedbed surface; and
- d) Revegetation.

Mystery Stockpile Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the Mystery Development Rock Stockpile will consist of vegetation buffers and preservation of existing vegetation along the toe of the rock dump. There are jurisdictional wetlands located within 20 feet of the existing toe. Sediment control devices will need to be placed along the wetland margin prior to the start of soil disturbing activities. Wetland boundaries will need to be marked prior to the placement of the sediment control devices. The wetland boundaries identification and marking will be accomplished by a person who has a minimum of three years wetland delineation experience and who has completed formal wetland delineation training acceptable to the U.S. Army Corps of Engineers.

Mystery Stockpile Subtask b - Recontouring of Development Rock Stockpile

The Mystery Development Rock Stockpile will be recontoured by terracing the face and grading the surfaces to hold water (contour terracing). Vertical terrace spacing was determined using the following equations (USDA/SCS, 1984):

$$VI = XS + Y;$$
$$HI = X(100) + Y(100)/S.$$

Where:

VI = vertical spacing in feet

HI= horizontal interval in feet

X = a variable with values from 0.4 to 0.8 for graded terraces and 0.8 for level terraces;

S = land slope in feet per 100 feet;

Y = a variable with values of 1.0 or 4.0 that is influenced by soil erodibility. A Y value of 1.0 (highly erodible soil with high runoff potential) has been assumed for the post reclamation top soiled condition of the waste rock face.

The average undisturbed land slope adjacent to the waste rock dump is 30 percent. The maximum vertical interval of level terrace is calculated to be 25 feet. The maximum horizontal interval of the level terrace is calculated to be 84 feet. The proposed post reclamation contours will be 25 feet high, with the terrace riser slope to 3 horizontal to 1 vertical (75 foot long slope) and the level terrace tread will be 45 feet. Excess material will drift onto the dump surface and used to create an additional terrace riser that connects with the existing slope. Terrace construction will be accomplished by dozing a bench into the face from each end of the dump, moving the material generally upward and toward the central portion of the dump in the vicinity of the portal (to augment portal closure activities). The material would then be pushed into the existing hillside to result in a nominal slope gradient of approximately 3H:1V along the extent of the dump. Due to the presence of jurisdictional wetlands and other sensitive riparian habitat, the tread riser adjacent to Mystery Creek will be left at the angle of repose and not topsoiled as part of reclamation activities.

Mystery Stockpile Subtask c - Seedbed Preparation

Approximately 1,300 cubic yards of recoverable growth medium is stockpiled near the toe of the existing dump. Topsoil would be retrieved from the stockpile utilizing a front-end loader and truck, and the topsoil would be placed on the slope for spreading by dozer. It is anticipated that the limited available growth medium would provide a nominal 4 in. cover on the reclaimed stockpile.

Mystery Stockpile Subtask d - Revegetation

No fertilizer will be used at this site because it is within 100 feet of Waters of the United States, including Jurisdictional wetlands. Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Mystery Development Rock Stockpile Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Perimeter sediment control	subtask a
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	straw wattles	600 linear feet
	Laborer 1	1.0 day
	F250	1.0 day
	Wetlands specialist	3.0 days (subcontractor)
Subtask b	D6 Bulldozer	15.0 days
Subtask c	725 Haul Truck	1.0 day

	IT62 Loader	1.0 day
	D6 Bulldozer	1.0 day
Subtask b	Hydroseeder	1.0 days

2.3.2 Crystal Development Rock Stockpile

The Crystal Development Rock Stockpile (Figure 4, Appendix A) currently occupies a footprint area of approximately 5.3 acres. It is anticipated that underground development work associated with the Nixon Fork Project would expand the dump feature in the southerly direction to a maximum build-out area of approximately 12.0 acres. The development rock is generally comprised of limestone, marble, and quartz monzonite, and as such does not pose an acid generating concern. A limited volume of stockpiled growth medium (estimated to be on the order of 900 cubic yards) is situated along the west edge, just off the toe of the feature. Specific reclamation objectives that apply to the Crystal Development Rock Stockpile include:

- Installation of erosion sediment control devices;
- Recontouring of waste rock dump to final reclamation contours;
- Installation of permanent drainage/runoff structures;
- Topsoiling of exposed/constructed surfaces;
- Seedbed preparation; and
- Revegetation.

Specific subtasks to be performed on the Crystal Development Rock Stockpile to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of stockpile face
- c) Preparation of seedbed surface; and
- d) Revegetation.

The closure plan associated with this feature incorporates final site reclamation activities associated with the numerous features located on or contiguous to the dump features. The costs associated with the demolition of the infrastructure located on the Crystal Waste Rock Stockpile are calculated in Section 2.8 in this plan. Additionally, prior to final dump recontouring, an estimated 44,000 cubic yards of development rock material (46,000 cubic yards coarse rock including 8,000 cubic yards of fines) would have been removed from the development rock dump to facilitate closure of the Main Tailing Impoundment feature (see also Section 2.4.1). It is assumed that the tailing impoundment borrow material would be excavated by benching the outslope along the southern portion of the east edge of the dump in a manner that augments ultimate dump recontouring (slope reduction) efforts.

Reclamation activities will be carried out in a manner that precludes damage to the historic Garnet #3 Shaft and appurtenant hoist house and sawmill structures. The

Garnet Shaft and the Garnet #2 Shaft positions are located within the outline of the current dump, and were previously inundated by prior operators.

Crystal Stockpile Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the Crystal Development Rock Stockpile will consist of vegetation buffers and preservation of existing vegetation along the toe of the rock dump.

Crystal Stockpile Subtask b - Recontouring of Development Rock Stockpile

The Crystal Development Rock Stockpile will be recontoured by reducing the face and providing a uniform slope from the dump surface to the existing ground surface. The average undisturbed land slope adjacent to the waste rock dump is 30 percent. The dump surface will be cut with a dozer approximately 60 feet back from the face. Material from the roughly triangular cut will drift down slope until the slope connects with the existing slope. For the basis of this estimate, the Crystal Development Rock Stockpile dimensions at maximum build out are assumed to be:

- 200 feet wide surface;
- 2 horizontal to 1 vertical dump face slope;
- An average thickness of 100 feet;
- A base width of 400 feet; and
- Length of 1,300 feet.

The recontouring plan will reduce the 2:1 slope to 2.5:1 adding an additional 3.0 acres of surface disturbance. The total disturbance following reclamation will be 15 acres. Topsoil from the base of the stockpile will be bladed off prior to recontouring for use as growth media following recontouring. The estimated volume of material to be salvaged from the base of the stockpile is 4,800 cubic yards.

Crystal Stockpile Subtask c - Seedbed Preparation

Approximately 900 cubic yards of recoverable growth medium is stockpiled near the toe of the existing dump. Topsoil salvage during recontouring accounts for an additional 4,800 cubic yards of growth media. A total of 5,700 cubic yards of growth media is anticipated to be available for seedbed preparation. Available growth media would be retrieved from the stockpile utilizing a front-end loader and truck, and the topsoil would be placed on the slope for spreading by dozer. It is anticipated that the limited available growth medium would provide a nominal 2 in. cover on the reclaimed stockpile.

Crystal Stockpile Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

*Crystal Development Rock Stockpile Summary of Reclamation and Closure
Estimated Incremental Requirements:*

ESCP Materials

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	14.3 days
Subtask c	725 Haul truck	5.0 days
	IT62 Loader	5.0 days
Subtask d	D6 Bulldozer	3.0 days
	Subcontractor	2.2 days

2.3.3 Rock Quarry

The Rock Quarry is a former runway that is situated immediately west of and proximal to the Landfill Area. It occupies an approximately 4.6 acres, somewhat undulating area of crushed rock surface. Multiple face excavations are present as the area has been previously used as a borrow source. MCRI may also utilize the feature as a potential source of borrow material. However, it is unlikely that doing so would result in any increase in disturbed area as there are numerous accessible faces already opened up within the already disturbed surface area. Specific reclamation objectives that apply to the rock quarry include:

- Recontouring of material site to final reclamation contours;
- Topsoiling of exposed surfaces;
- Seedbed preparation; and
- Revegetation.

Specific subtasks to be performed on the rock quarry to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of ‘highwalls’;
- c) Preparation of seedbed surface; and
- d) Revegetation.

Rock Quarry Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for rock quarry will consist of vegetation buffers and preservation of existing vegetation along the toe of the rock quarry.

Rock Quarry Subtask b - Recontouring of Rock Quarry

At closure, the rock quarry would be recontoured and ripped (by dozer) to eliminate any active face (highwall) areas and to re-establish the undulating surface such that it blends with the surrounding terrain. It is envisioned that ripping of the already fragmented material would generate “fines” and porosity in the upper zone to aid in the establishment of vegetation. Maximum final slope gradients will be maintained at 2.5H:1V.

Rock Quarry Subtask c - Seedbed Preparation

As there is no readily identifiable source of growth medium in the vicinity, there would be no placement of growth medium. Fines will be generated by ripping operations and the entire surface will be track walked prior to seeding.

Rock Quarry Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Rock Quarry Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	2.6 days
Subtask c	D6 Bulldozer	2.1 days
Subtask b	Subcontractor	0.7 days

2.4 Tailings

2.4.1 Main Tailing Impoundment and Pipeline Corridor

The Main Tailing Impoundment (Figure 4, Appendix A) is an approximately 10.2 acre feature located approximately 1,500 feet downslope and west of the mill (Central Operations Area). The current impoundment crest elevation is at approximately 986 feet amsl. The Tailing Impoundment is lined with a 60 mil HDPE liner, and upslope perimeter diversions are present exterior to the lined area. The HDPE tailing launder (delivery line from mill) and supernatant return lines were previously laid on surface along a corridor extending from the mill to the Main Tailing Impoundment. No significant disturbance was

associated with this above ground line placement, and the corridor is considered naturally reclaimed.

The closure of the TSF will consist of the following elements:

- TSF Task 1 – Site Preparation Activities
 - a) Erosion and Sediment Control;
 - b) Stability Analysis;
 - c) Thermal Analysis;
 - d) Dewatering, water treatment, and disposal (if necessary);
 - e) Air drying period for formerly inundated tailings;
 - f) Haul road grading;
 - g) Recontouring of tailings facility to final reclamation contours; and
 - h) Placement of woven geotextile.
- TSF Task 2 – Engineered Cover Placement
 - a) Construction of an engineered cover if required;
 - b) Topsoiling of exposed constructed surfaces;
 - c) Seedbed preparation;
- TSF Task 3 – Drainage Structure Construction
 - a) Installation of permanent drainage/runoff structures;
 - b) Removal of tailings pipeline; and
 - c) Seedbed preparation along pipeline corridor.
- TSF Task 4 – Revegetation;

For the purposes of the reclamation plan, the following activities have been assumed:

1. Residual fluids would be removed via land application at an area southeast of and below the earthen embankment or with evaporators directed over the TSF if the water does not meet land application criteria.
2. Stability analysis of the embankment will be done by a qualified professional engineer prior to construction;
3. Thermal analysis of freeze back potential of tailings will be performed by a qualified professional engineer prior to construction;
4. The formerly inundated (interior) area would be allotted sufficient drain down and air-dry time to accommodate heavy equipment.
5. The earthen embankment would then be breached along one side.
6. The tailing material surface would be lightly worked in order to modify the surface to effectuate positive drainage off the feature (dry closure).
7. A non-woven geotextile fabric would then be placed atop approximately 50 percent of the reconfigured tailing to augment bearing capacity (August 2005 field examination indicates approximately 50 percent of the area would not require placement of geotextile material to augment the encapsulating cover) and to facilitate placement of development rock cover.

8. A nominal 2 feet cover of development rock (obtained from the expanded Crystal Development Rock Stockpile) would then be placed atop the geotextile, followed by a mechanically spread, nominal 6 inch cover of development rock fines and/or growth medium from the tailings margin.
9. The entire feature would then be revegetated in accordance with standard specifications.

2.4.1.1 TSF Task 1 – Site Preparation Activities

TSF Task 1 - Site Preparation will involve:

- a) Erosion and sediment control;
- b) Stability analysis;
- c) Thermal analysis;
- d) Dewatering, water treatment, and disposal (if necessary);
- e) Air drying period for formerly inundated tailings;
- f) Haul road grading;
- g) Recontouring of tailings facility to final reclamation contours; and
- h) Placement of woven geotextile.

TSF Task 1 Subtask a - Erosion and Sediment Control:

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMP for the Tailings Facility will be to maintain the TSF in a non free-draining configuration until TSF Task 3 is completed. There is no cost associated with storm water management in TSF Task 1.

TSF Task 1 Subtask b - Stability Analysis

Prior to work being conducted on the TSF, a stability analysis of the TSF will be conducted by a registered professional engineer. The TSF stability analysis is included in the engineer redesign contingency for the overall project. However, a nominal \$10,000 value has been assigned to this task for estimating purposes.

TSF Task 1 Subtask c - Thermal Analysis

Prior to work being conducted on the TSF, a thermal analysis of the TSF will be conducted by a registered professional engineer. The TSF thermal analysis is included in the engineer redesign contingency for the overall project. However, a nominal \$10,000 value has been assigned to this task for estimating purposes.

TSF Task 1 Subtask d - Dewatering and Water Treatment and Disposal (If Necessary)

This estimate assumes that the TSF will be at or near capacity with a small surface water pond near the upstream embankment face. This estimate assumes a total volume of 2.5 million gallons will need to be land applied at this point. The final dam elevation and disturbance will be at its maximum at the start of operations. This estimate assumes of a 1-man labor crew and F-150 pickup for 2 days to install the conveyance lines and to monitor pumping. Water from the TSF would be pumped into existing conveyance system along the margin of the TSF and discharged. Water in the

TSF will be tested prior to discharge to conform that applicable water quality parameters are met. For the purposes of this estimate, the water in the TSF is assumed to meet water quality standards and may be discharged into existing conveyances. In the event that water chemistry is not suitable for direct discharge, water will be evaporated over the pond at a rate of 400 gpm.

TSF Task 1 Subtask e - Air Drying Period for Formerly Inundated Tailings

This estimate assumes a minimum of 30 days drying time will be required to dry the surface of dewatered tails to a point that equipment and personnel can safely traverse the surface to perform reclamation activities.

TSF Task 1 Subtask f - Haul Road Grading

The haul route selection assumes that existing roads will be improved to meet the needs of the TSF. Except to access the Crystal Portal Rock dump, no new disturbance will be created. The dozer mobilized onto site will be used to grade and crown the haul road to allow use by haul units. For the purposes of this estimate it has been assumed that the dozer will use a cut and fill technique along a 14 foot swath from either side of existing road centerline. It has been further assumed that material will be carried less than 40 feet on the blade. A total of three passes with the dozer along the entire 2,400 foot long haul road has been assumed.

TSF Task 1 Subtask g - Recontouring of Tailings Surface

In order to facilitate the placement of the engineered cover, the surface of the tailings within the TSF will be recontoured. This will encompass approximately one half of the TSF surface. The surface will be graded using the dozer to a 20 percent slope from centerline to edge of slope. Maximum drifted material depth will be 3 feet at the existing edge to 0 feet at centerline. The dozer will be used to push dry sand from the upper end of the tailings towards the area where the pool was located. For estimating purposes it assumed that after the pool is drained, recontouring the tails will encompass moving 25,000 cubic yards of material to generate the desired 5:1 slope. Maximum push distance is projected to be approximately 600 feet. An average one way loaded drifting distance of 500 feet was used for estimating purposes.

TSF Task 1 Subtask h - Placement of Geotextile

Due to near saturation of surface tailings and the fine grained nature of the tailings, the air drying of the material is assumed to be incomplete for the purposes of this estimate. A geotextile fabric is assumed to be required for approximately one half of the surface area of the TSF.

TSF Task 1 Summary of Reclamation and Closure

TSF TASK 1 - Estimated Incremental Requirements:

ESCP Materials

Topographic control:	Existing
Stability assessment:	subtask b
Thermal assessment	subtask c
Hose and pump	subtask d

Waste Generated: Geotextile (90 rolls) subtask h
Minor – roll cylinders/packing materials- to onsite landfill

Dedicated Assets and Duration

Subtask a	none	
Subtask b	subcontractor	1.0 day onsite
	Laborer 1	0.4 days
	F250	0.4 days
Subtask c	subcontractor	1.0 day onsite
	Laborer 1	0.4 days
	F250	0.4 days
Subtask d	Laborer 1	4.0 days
	Pump	2.0 days
Subtask e	none	30 days
Subtask f	D6 Bulldozer	8.0 days
Subtask g	D6 Bulldozer	13 days
Subtask h	Laborer 1	2.0 day
	420	2.0 day
	F250	2.0 day

2.4.1.2 TSF Task 2 – Engineered Cover Placement

TSF Task 2 – Engineered Cover Placement will consist of the following subtasks:

- a) Erosion and sediment control;
- b) Construction and topsoiling of engineered cover
- c) Seedbed preparation

TSF Task 2 Subtask a - Erosion and Sediment Control:

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMP for the Tailings Facility will be to maintain the TSF in a non free-draining configuration until TSF Task 3 is completed. There is no cost associated with storm water management in TSF Task 2.

TSF Task 2 Subtask b - Construction and Topsoiling of Engineered Cover

A 2.5 foot nominal dry cover will be installed on the surface of the TSF. The first layer of the soil cover will consist of rock end dumped from the edge of the TSF and extended out across the TSF. A dozer will be used to smooth the end dumped rock to allow truck traffic. For the purposes of this estimate: the following has been assumed:

- TSF surface area is 10.2 acres;
- Dozer usage will be 50 percent total haul time;
- 41,000 cubic yards of waste development rock will be hauled to the TSF from the Crystal Portal Rock Dump using existing roadways;

- Fines will be obtained from the hauled development rock and supplemented with fines from the TSF margin and embankment (estimated volume of fines in embankment); and
- Liner along margin will be incorporated into TSF surface during topsoil salvage from TSF margins.

TSF Task 2 Subtask b - Seedbed Preparation

Seedbed preparation will be limited to track walking placed rocks and fines materials with dozer.

TSF Task 2 Summary of Reclamation and Closure

TSF TASK 2 - Estimated Incremental Requirements:

ESCP Materials

Topographic Control	existing
Scarified Surface:	subtask c

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	725 haul truck	62 days
	IT62 Loader	62 days
	D6 Bulldozer	33 days
Subtask c	D6 Bulldozer	4.0 days

2.4.1.3 TSF Task 3 – Drainage Structure Construction

TSF Task 3 – Drainage Structure Construction will consist of the following subtasks:

- a) Erosion and sediment controls
- b) Installation of permanent drainage/runoff structures;
- c) Removal of tailings pipeline; and
- d) Seedbed preparation along pipeline corridor.

TSF Task 3 Subtask a - Erosion and Sediment Control:

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. For this portion of the TSF reclamation effort, the existing outfall channels will need to be equipped with a rock lining. An inspection of the existing channels indicates that rock is present and sufficient to prevent erosion starting in the existing outfall channels.

TSF Task 3 Subtask b - Installation of Permanent Drainage/Runoff Structures

The existing interception ditches will be left in place to intercept any surface runoff from upslope areas above the TSF. The proposed 5 percent surface slope of the final cover will insure that water will concentrate along the TSF margins. The perimeter drainage ways created during the placement of the TSF cover will need to be cut into the existing

channels at the embankment end of the TSF. Based upon an areal discharge of 200 cubic feet per second per square mile, the anticipated runoff from a 500 year rainfall event on the 10.2 acre TSF is estimated to be 3.1 cubic feet per second in total. It is assumed that flow will be evenly divided between the two margins due to sloping of the rock cover. In order to maintain a maximum flow velocity of 0.5 feet per second (non erosive velocity) across the channel, two parabolic channels with a cross sectional area of 6 square feet will be constructed to allow the reclaimed TSF surface to drain into the existing channels. The assumed dimension of the drainage channels is 1.0 feet with a required top width of 12 feet for a cross-sectional area of 12 square feet and a velocity of 0.5 feet per second bank full.

TSF Task 3 Subtask c -Removal of Tailings Pipeline

Due to steep topography and to minimize disturbance, the removal of the tailings pipeline would be accomplished by a crew of three laborers. The basis of the estimate is that the TSF pipelines would be cut into lengths able to be handled by the crew. The material would be staged at the base of the hill and collected with the backhoe for transport to the inert solid waste landfill located at the Crystal Portal decline. The removal of the pipeline is estimated to take four full shifts to complete and one additional shift for cleanup of debris. The 420 is estimated to be used for the entire 5 shifts.

TSF Task 3 Subtask d - Seedbed Preparation

No seedbed preparation is anticipated for this subtask due to small disturbance footprint.

TSF Task 3 Summary of Reclamation and Closure

TSF Task 3 - Estimated Incremental Requirements:

ESCP Materials

Topographic Control	existing
Conveyance ditches:	subtask b

Waste Generated:

Plastic pipe- transported to Crystal Decline for disposal

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	1.0 day
Subtask c	Laborer 1	5.0 days
	Laborer 1	5.0 days
	Laborer 1	5.0 days
	420 backhoe	5.0 days

2.4.1.4 Task 4 – Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation. The revegetation effort is estimated to take 2.2 days.

2.4.1.5 TSF Closure Assumption

It should be noted that the above closure scenario is based on closure of an “at or near capacity” Main Tailing Impoundment. In the event the Main Tailing Impoundment were to be closed after virtual “emptying” (i.e., indicative that transfer of substantially all tailing materials to the Filtered Tailings Disposal Site would occur), the Main Tailing Impoundment closure requirements would be significantly reduced. In general, the modified closure would likely involve limited to no free liquid removal, followed by impoundment breaching and minimal drainage earthworks, liner destruction and burial, and placement of a nominal 4-inch growth medium across the surface formerly occupied by the impoundment feature. In the event MCRI operations result in this type of modified closure, it shall be incumbent upon MCRI to amend the reclamation plan and address any resultant change in bonding requirements accordingly.

2.4.2 Filtered Tailings Disposal Site

The Filtered Tailings Disposal Site (FTDS) is located east of the existing runway. During mining and FTDS deposition, the edges of the tailings pile will be sloped to blend in with the existing topography and will not exceed a 4:1 H:V slope. The laboratory testing for geotechnical engineering properties (Golder letter dated September 7, 2004, Volume II Appendix E) indicates that the dry tailings can stand a 4:1 slope with an adequate factor of safety to demonstrate long-term stability. The tests indicate compacted dry stack tailings with moisture content of 17% or less will have a friction angle of 35 degrees. The anticipated moisture content range is 12 to 14%, but it should not exceed 15%. A conservative moisture content of 16% was used to evaluate the geotechnical stability of the tailings.

The pile height will not exceed 30 feet. As the repository is filled and shaped, the previously excavated overburden will be pushed back on top of the tailings, maintaining a cover for tails and a bed for revegetation. It is anticipated that reclamation by soil cover will be done concurrently with tailings disposal during the months of May through October. During the winter months, tailings will be placed and shaped before they freeze. The overburden will be placed on the tailings during the following summer. Upon completion, the filtered tailings disposal site slopes will not exceed 4:1 H:V and the top will slope with a 3% grade to ensure that precipitation does not pond on top of the stack. Specific reclamation objectives that apply to the FTDS include:

- Installation of erosion sediment control devices;
- Recontouring of waste rock dump to final reclamation contours;
- Installation of permanent drainage/runoff structures;
- Topsoiling of exposed/constructed surfaces;

- Seedbed preparation; and
- Revegetation.

Specific subtasks to be performed on the FTDS to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of FTDS;
- c) Preparation of seedbed surface; and
- d) Revegetation.

For the purposes of this estimate, the following has been assumed:

1. The maximum disturbance extent will be 13.5 acres;
2. Concurrent reclamation will be performed on the FTDS annually;
3. Annual maximum disturbance due to placement of tails in the FTDS will be 3 acres;
4. The existing disturbance of 4.1 acres is unreclaimed;
5. Seepage water will be allowed to percolate through the collection pond following closure.

The existing disturbance (4.1 acres), one year's maximum disturbance (3.0 acres), and one acre collection pond for a total of 8 acres is the maximum unreclaimed closure disturbance associated with the FTDS.

FTDS Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the FTDS will consist of vegetation buffers and preservation of existing vegetation along the toe of the FTDS.

FTDS Subtask b - Recontouring of the FTDS

The FTDS would be closed through recontouring the mound (by dozer) such that terraces are eliminated and outslopes are maintained at a maximum 4H:1V gradient. The top of the feature would be altered to a "domed" configuration with a nominal 3 percent slope gradient to the north. In order to accomplish this, a ramp would first be constructed up the north face of the feature by dozer. The 1 acre pond would be ripped using the dozer to perforate the liner.

FTDS Subtask c - Seedbed Preparation

A thin mantle of development rock would be placed upon the ramp to create a working surface for rubber-tired equipment. Stockpiled cover material (from the original excavation) would be moved up the ramp by haul trucks and distributed for subsequent downslope placement. (It has been assumed that the excavated cover volume (due to swell) would be sufficient to provide nominal 3-foot cover of natural growth medium). Growth media would originate from the material stripped during FTDS construction. 5,600 BCY of available growth media per acre has been assumed to be available and

stockpiled near the base of the FTDS. For the purposes of this estimate, approximately 39,200 BCY of growth media will be transported onto FTDS surface. A dozer would be utilized to complete the final contouring and spreading of the cover material (to include closure/cover of the ramp as well as the collection pond).

FTDS Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Estimated Incremental Requirements:

ESCP Materials

Vegetated Buffer:	Existing
Preservation of Existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	0 days
Subtask b	D6 Bulldozer	8.0 days
Subtask c	725 Haul truck	27 days
	IT62Loader	27 days
	D6 Bulldozer	3.0 days
Subtask b	Hydroseeder	1.2 days

2.5 MATERIAL SITES AND BORROW AREAS

2.5.1 Sand Pit Borrow Area

The Sand Pit Borrow Area (Figure 4, Appendix A) was developed in 2011 to replace an existing 0.9 acre borrow area which was reclaimed. The Sand Borrow Pit will consist of a level-floor, excavated area with an open face cut ranging from approximately 3 feet to as much as 15 feet in height along an estimated 300 feet length. The adjacent undisturbed area is predominantly dense forestation of aspen and spruce. It is proposed that this area would be utilized as a borrow source during operations and reclamation (cover material for concrete foundations), resulting in an anticipated final disturbed surface area of 1.1 acres. It is assumed that this incremental borrow volume would be obtained by directly advancing into the open face. Specific reclamation objectives that apply to the sand pit borrow area include:

- Recontouring of material site to final reclamation contours;
- Topsoiling of exposed surfaces;
- Seedbed preparation; and
- Revegetation.

Specific subtasks to be performed on the sand pit borrow area to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of ‘highwalls’;
- c) Preparation of seedbed surface; and
- d) Revegetation.

Sand Pit Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for rock quarry will consist of vegetation buffers and preservation of existing vegetation along the toe of the rock quarry.

Sand Pit Subtask b - Recontouring of Sand Pit Borrow Area

At closure, the sand pit borrow area would be recontoured and ripped (by dozer) to eliminate any active face (highwall) areas and to re-establish the undulating surface such that it blends with the surrounding terrain. It is envisioned that ripping of the already fragmented material would generate “fines” and porosity in the upper zone to aid in the establishment of vegetation. Maximum final slope gradients will be maintained at 2.5H:1V.

Sand Pit Subtask c - Seedbed Preparation

As there is no readily identifiable source of growth medium in the vicinity, there would be no placement of growth medium. Fines generated by ripping operations and the entire surface will be track walked prior to seeding.

Sandpit Subtask d - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	1.4 days
Subtask c	D6 Bulldozer	0.6 days
Subtask b	Hydroseeder	0.2 days

2.6 OPEN PITS

There are no active open pits or other surface mining methods employed at the Nixon Fork Gold Mine. The reclamation of surface disturbances resulting from surface drilling are described in Section 2.2.3.

2.7 UNDERGROUND DEVELOPMENT

2.7.1 Mystery Decline Portal

The Mystery Decline Portal is situated in the northeast portion of the site (Figure 4, Appendix A). The cross-sectional dimensions of the actual adit opening are approximately 14 feet high x 15 feet wide; however, the brow area enlarges to approximately three times the width in the surrounding slope. The Mystery Portal ramp descends at an approximate 15 percent gradient commencing at a point approximately 30 feet out on the Mystery Development Rock Stockpile surface. The current estimated area of disturbance is approximately 0.2 acre. No further disturbance is anticipated. The closure of the Mystery Decline Portal will occur in conjunction with the reclamation and closure of the Mystery Development Rock Stockpile (Section 2.3.1). Specific reclamation and closure objectives for the Mystery Decline Portal include:

- Adits and shafts shall be plugged in terms of the approved closure plan;
- Stability assessment of stopes/voids with the potential to fail to surface; and
- Underground waste disposal as specified in the Waste Management Plan.

To prevent a failure to surface following reclamation, the Mystery decline portal will be filled with rock for a linear distance of 50 feet beyond the portal opening. There are no waste disposal activities proposed within the Mystery decline portal. There are no known roof stability issues at the Mystery decline portal. Specific subtasks to be performed on the Mystery decline portal to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Backfill placement;
- c) Recontouring of the Mystery Decline brow;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Mystery Portal Subtask a - Erosion and Sediment Control Plan

Erosion and sediment controls for this feature has been included in the cost estimate for the reclamation and closure of the Mystery Development Rock Stockpile (Section 2.3.1).

Mystery Portal Subtask b - Backfill Placement

The Mystery Portal would be closed by placing backfill against the portal opening. Development rock from the surrounding area would be moved to the adit opening during

recontouring operations and forced into the portal by the dozer. The estimated backfill quantity of backfill to be placed by dozer in the Mystery decline portal is 400 BCY.

Mystery Portal Subtask c - Recontouring of the Mystery Decline Brow

The entire dump will be recontoured by dozer such that the feature would be backfilled to blend with the surrounding topography. The costs associated with the recontouring of the Mystery decline portal are included in the recontouring activities proposed for the Mystery Development rock stockpile (Section 2.3.1).

Mystery Portal Subtask d - Seedbed Preparation

Seedbed preparation will consist of track walking. The costs associated with seedbed preparation have been included as part of the Mystery Development Rock Stockpile estimate in Section 2.3.1.

Mystery Portal Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation. No fertilizer will be used at this site because it is within 100 feet of Waters of the United States, including Jurisdictional wetlands.

Mystery Decline Portal Summary of Reclamation and Closure

Estimated Incremental Costs:

ESCP Materials:

Vegetated Buffer:	Existing Section 2.3.1.
Preservation of existing vegetation:	Existing Section 2.3.1
Scarified Surface:	Section 2.31 subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	0.5 days
Subtask c	Section 2.3.1	
Subtask d	Section 2.3.1	
Subtask e	Hydroseeder	0.1 days

2.7.2 Mystery Ventilation Raise

The Mystery Ventilation Raise (Figure 4, Appendix A) consists of a rectangular, vertical shaft (approximate dimensions 8.5 feet x 8.5 feet) extended from the underground workings. The shaft collar is enclosed by a steel Connex box that is also utilized to house a boiler, and an associated 500-gallon diesel fuel day tank (w/secondary containment). The ventilation fan is top-mounted on the Connex. A graveled service drive enters the area from the main road. Specific reclamation and closure objectives for the Mystery ventilation raise include:

- Adits and shafts shall be plugged in terms of the approved closure plan;
- Stability assessment of stopes/voids with the potential to fail to surface; and
- Underground waste disposal as specified in the Waste Management Plan.

Specific subtasks to be performed on the Mystery Ventilation Raise to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Dismantling of underground infrastructure;
- c) Shaft sealing;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Mystery Ventilation Raise Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for mystery ventilation raise will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing 0.5 acre disturbance.

Mystery Ventilation Raise Subtask b - Dismantling of Underground Infrastructure

The fan and boiler units (and appurtenant piping, etc.) would be dismantled and transported down to the Crystal Portal monofill. While it is assumed that a minimal quantity of asbestos material may be present in conjunction with the boiler unit, the material would remain integral to the boiler unit and as such be acceptable for monofill disposal (as part of the boiler unit) in the Crystal Portal monofill. It is further assumed that an estimated five 55-gallon drums of glycol would be drained from the system prior to disassembly and managed as special waste for offsite transport and recycling at an approved facility. The day tank would be inerted and demolished (torch-cut). Any residual fuels would be either consumed in reclamation activities or burned. In conjunction with tank removal, it is assumed that a nominal 5 cubic yards of hydrocarbon contaminated soils that would be encountered, and managed onsite. All steel structural materials (i.e., fan housing/shroud, stacks, and Connex box) would be dozer crushed and/or torch-cut into manageable size for transport to the Crystal Portal monofill.

Mystery Ventilation Raise Subtask c – Shaft Sealing

The raise feature would be plugged by over excavating 4 feet beyond the existing raise opening, placing pan decking across the raise and then pouring a 1 foot thick reinforced concrete pad. Number 5 rebar is assumed to be placed and tied on 12 in. centers. The resulting concrete shaft seal will be 16 square foot and be composed of 10 cubic yards of concrete.

Mystery Ventilation Raise Subtask d – Preparation of Seedbed Surface

Stockpiled material from rock column would be introduced to surface level. The 0.5 acre area would be scarified by dozer.

Mystery Ventilation Raise Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Mystery Ventilation Raise Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

Five (5) CY POL contaminated soil – to onsite land farm
Four (4) 65 gallon glycol –backhaul to Anchorage for recycling

Dedicated Assets and Duration

Subtask a	none	
Subtask b	Demolition crew	0.4 days
Subtask c	Concrete crew	1.5 days
	Concrete	512 bags (30,750 lbs in 3000 lb pallets)
	Pan decking	256 square feet (2,500 lbs)
	#5 rebar	32 sticks
Subtask d	D6 Bulldozer	1.2 shifts
Subtask e	Hydroseeder	0.1 days

2.7.3 Crystal Decline Portal

The Crystal Decline Portal (Figure 4, Appendix A) would be the primary production adit for MCRl's Nixon Fork Project. The approximately 14 feet wide x 12.5 feet high portal occupies a 0.2 acre area and is situated roughly 250 feet south of the Mill Building. It is accessed via a 15 percent decline ramp commencing from the back edge (at the approximate mid-point) of the Crystal Development Rock Stockpile. The slope above the portal brow has been laid back such that the overall slot opening for the decline approach is on the order of 30 feet deep (ramp surface to pre-existing slope contour at the portal entry point). Side cut slopes are at approximately 1H:1V along the ramp as it approaches the portal. Specific reclamation and closure objectives for the Crystal Decline Portal include:

- Adits and shafts shall be plugged in terms of the approved closure plan;
- Stability assessment of stopes/voids with the potential to fail to surface; and
- Underground waste disposal as specified in the Waste Management Plan.

To prevent a failure to surface following reclamation, the Crystal Decline Portal will be filled with rock for a linear distance of 50 feet beyond the portal opening. There are

waste disposal activities proposed within the Crystal Decline Portal. There are no known roof stability issues at the Crystal decline portal. Specific subtasks to be performed on the Crystal Decline Portal to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Backfill placement;
- c) Recontouring of the Mystery Decline brow;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Crystal Portal Subtask a - Erosion and Sediment Control Plan

Erosion and sediment controls for this feature has been included in the cost estimate for the reclamation and closure of the Mystery Development Rock Stockpile (Section 2.3.1).

Mystery Portal Subtask b - Backfill Placement

The Crystal Portal would be closed by placing backfill against the portal opening. Development rock from the surrounding area would be moved to the adit opening during recontouring operations and forced into the portal by the dozer. The estimated backfill quantity of backfill to be placed by dozer in the Crystal decline portal is 400 BCY.

Crystal Portal Subtask c - Recontouring of the Crystal Decline Brow

The entire dump will be recontoured by dozer such that the feature would be backfilled to blend with the surrounding topography. The costs associated with the recontouring of the Crystal decline portal are included in the recontouring activities proposed for the Crystal Development Rock Stockpile (Section 2.3.2).

Crystal Portal Subtask d - Seedbed Preparation

Seedbed preparation will consist of track walking. The costs associated with seedbed preparation have been included as part of the Crystal Development Rock Stockpile estimate in Section 2.3.2.

Crystal Portal Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Crystal Decline Portal Summary of Reclamation and Closure

Estimated Incremental Costs:

ESCP Materials:

Vegetated Buffer:	Existing Section 2.3.1.
Preservation of existing vegetation:	Existing Section 2.3.1
Scarified Surface:	Section 2.31 subtask c
Revegetation:	subtask d

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	D6 Bulldozer	0.5 days
Subtask c	Section 2.3.1	
Subtask d	Section 2.3.1	
Subtask e	Hydroseeder	0.1 days

2.7.4 Crystal Ventilation Raise

The Crystal Ventilation Raise (Figure 4, Appendix A) consists of a rectangular, vertical shaft (approximate dimensions 8.5 feet x 8.5 feet) extended from the underground workings. The shaft collar is enclosed by a steel Connex box that is also utilized to house a boiler, and an associated 500-gallon diesel fuel day tank (w/secondary containment). The ventilation fan is top-mounted on the Connex. A graveled service drive enters the area from the main road. Specific reclamation and closure objectives for the Crystal ventilation raise include:

- Adits and shafts shall be plugged in terms of the approved closure plan;
- Stability assessment of stopes/voids with the potential to fail to surface; and
- Underground waste disposal as specified in the Waste Management Plan.

Specific subtasks to be performed on the Crystal Ventilation Raise to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Dismantling of underground infrastructure;
- c) Shaft sealing;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Crystal Ventilation Raise Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for Crystal ventilation raise will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing 0.5 acre disturbance.

Crystal Ventilation Raise Subtask b - Dismantling of Underground Infrastructure

The fan and boiler units (and appurtenant piping, etc.) would be dismantled and transported down to the Crystal Portal monofill. While it is assumed that a minimal quantity of asbestos material may be present in conjunction with the boiler unit, the material would remain integral to the boiler unit and as such be acceptable for monofill disposal (as part of the boiler unit) in the Crystal Portal monofill. It is further assumed that an estimated five 55-gallon drums of glycol would be drained from the system prior to disassembly and managed as special waste for offsite transport and recycling at an approved facility. The day tank would be inerted and demolished (torch-cut). Any

residual fuels would be either consumed in reclamation activities or burned. In conjunction with tank removal, it is assumed that a nominal 5 cubic yards of hydrocarbon contaminated soils that would be encountered, and managed onsite. All steel structural materials (i.e., fan housing/shroud, stacks, and Connex box) would be dozer crushed and/or torch-cut into manageable size for transport to the Crystal Portal monofill.

Crystal Ventilation Raise Subtask c – Shaft Sealing

The raise feature would be plugged by over excavating 4 feet beyond the existing raise opening, placing pan decking across the raise and then pouring a 1 foot thick reinforced concrete pad. Number 5 rebar is assumed to be placed and tied on 12 in. centers. The resulting concrete shaft seal will be 16 square foot and be composed of 10 cubic yards of concrete.

Crystal Ventilation Raise Subtask d – Preparation of Seedbed Surface

Stockpiled material from rock column would be introduced to surface level. The 0.5 acre area would be scarified by dozer.

Crystal Ventilation Raise Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Crystal Ventilation Raise Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

Five (5) CY POL contaminated soil – to onsite land farm
Four (4) 65 gallon glycol –backhaul to Anchorage for recycling

Dedicated Assets and Duration

Subtask a	none	
Subtask b	Demolition crew	0.4 days
Subtask c	Concrete crew	1.5 days
	Concrete	512 bags (30,750 lbs in 3000 lb pallets)
	Pan decking	256 square feet (2,500 lbs)
	#5 rebar	32 sticks
Subtask d	D6 Bulldozer	1.2 shifts
Subtask e	Hydroseeder	0.1 days

2.7.5 Underground Workings

At termination of mining activities, there would be an extensive network of underground workings that includes decline ramps, working levels, mined out stopes, cross-cuts, and ventilation raises, etc. Mine equipment that remains present at closure would likely be at or near the end of economic life and therefore would be abandoned in place underground. Specific reclamation and closure objectives for the underground workings include:

- Underground waste disposal as specified in the Waste Management Plan.

Specific subtasks to be performed on the underground workings to meet the reclamation performance standards include:

- a) Underground infrastructure/material survey;
- b) Dismantling/Deenergizing of underground infrastructure; and
- c) Removal of unsuitable materials from underground workings.

Final portal closure is independently addressed under Section 2.7.1 – Mystery Portal and Section 2.7.3 - Crystal Portal, respectively.

Underground Subtask a – Underground infrastructure survey

Closure of the Underground Workings would include a comprehensive underground reconnaissance/assessment to determine the presence of hazardous materials, if any. This subtask is estimated to take 1 day.

Underground Subtask b – Dismantling/Deenergizing Underground Infrastructure

Fixed equipment that is determined not to present a hazardous or toxic material concern would remain in place. All underground equipment would be deenergized and equipment would be consolidated in designated disposal areas. This subtask is estimated to take 2 days.

Underground Subtask c – Removal of unsuitable materials from underground workings

Any unsuitable material (hazardous materials) would be brought to surface for inventory and disposal. . This subtask will include the removal of fluids, lubricants, oils, and batteries from mobile equipment that will be placed in the Crystal Portal for disposal. This subtask is estimated to take 1 day

Underground Workings Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

none

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	Demolition Crew	1.0 day
Subtask b	Demolition crew	2.0 days
Subtask c	Demolition crew	1.0 day

2.8 SUPPORT FACILITIES

2.8.1 Living Areas

2.8.1.1 Multi-Use Complex (Camp)

The 1.7 acre (total area estimated at 1.9 acres, inclusive of outbuildings described in Sections 2.8.1.2 and 2.8.1.3) Multi-Use Complex (Figure 4, Appendix A) consists of a series of an estimated 7,500 square feet of interconnected modular units that comprise sleeping quarters and bathroom facilities, a kitchen area and mess hall, and an entrance/foyer, and common (recreation) area. The units are similar to manufactured housing, with wood and/or steel stud frame, batt insulation, and aluminum exterior sheathing. Septic tank and leach field facilities are associated with the complex. In addition, the complex contains 3 satellite receivers, a fire protection system that includes pressure tank and piping, and a cold-box refrigeration unit. There is also a 500-gallon diesel fuel day tank (with secondary containment) situated adjacent to the Multi-Use Complex. Two small growth medium stockpiles are located along the western edge of the existing facility. It is estimated that approximately 1,700 cubic yards of growth medium is present. Specific reclamation and closure objectives for the multi-use complex include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the multi-use complex to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Multi-Use Complex Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for Multi-use complex will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing 1.7 acre disturbance.

Multi-Use Complex Subtask b – Removal of Hazardous Materials and Waste

Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. It has been estimated that two 55-gallon drums of hazardous waste would be containerized for offsite disposal at an approved RCRA TSD facility. The day tank would be inerted and torch-cut; remnant materials would be trammed to the Crystal Portal monofill for emplacement. Any residual fuels would be either consumed in reclamation activities or burned. It has been assumed that there will be 20 cubic yards of hydrocarbon contaminated soils that will be excavated and transported to the Landfill treatment area. This task is projected to take 1 day.

Multi-Use Complex Subtask c – Demolition of Structure and Infrastructure

Structures would then be leveled utilizing a dozer and/or front-end loader. Assuming an existing height of 10 feet and the facility encompasses 7,500 square feet it is estimated that the volume of material present in the existing multi-use facility is 2,800 LCY. A consolidation factor of 50 percent has been assumed following mechanical consolidation of the facility. An estimated 1,400 cubic yards of scrap materials would be loaded with the front-end loader and transported directly to the Crystal Portal monofill area for emplacement burial.

Multi-Use Complex Subtask d – Seedbed Preparation

The eastern edge (slope cut) of the area would be ripped and blended with the surrounding terrain (also providing incremental seedbed material). The entire area would then be scarified by track walking. 1,700 BCY of available growth medium would be pushed across the area using a dozer.

Multi-Use Complex Subtask e – Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Multi-Use Complex Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

Twenty (20) CY POL contaminated soil – to onsite land farm
One (1) 55 gallon drum glycol – back haul to Anchorage
Two (2) 65 gallon RCRA Waste –backhaul to Anchorage

Dedicated Assets and Duration

Subtask a	none	
Subtask b	Demolition crew	1.1 days
Subtask c	Demolition crew	3.1 days
Subtask d	D6 Bulldozer	4.4 days
Subtask e	Hydroseeder	0.3 days

2.8.1.2 Miscellaneous Camp Area Outbuildings

In addition to the main complex, there is a 0.2 acre area (actually a part of the total 1.9 - acre main camp surface area) occupied by a total of nine associated outbuildings (Figure 4, Appendix A). These outbuildings consist of four plywood platform tent structures and five wood frame/plywood structures. All are approximately 10 feet x 15 feet in size and (individually) occupy about 150 square feet in footprint area. Specific reclamation and closure objectives for the miscellaneous camp outbuildings include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the miscellaneous camp outbuildings to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Misc. Camp Outbuildings Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the miscellaneous camp outbuildings will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing multi-use complex.

Misc. Camp Outbuildings subtask b – Removal of Hazardous Materials and Waste

Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. It has been estimated that the camp complex will generate two 55- gallon drums of hazardous waste which would be containerized for offsite disposal at an approved RCRA TSD facility. This subtask will be completed as part of the Multi-use Complex subtask 2 (Section 2.8.1.1).

Misc. Camp Outbuildings Subtask c – Demolition of Structure and Infrastructure

Structures would then be leveled utilizing a dozer and/or front-end loader. Assuming an existing height of 10 feet and each structure encompasses 150 square feet it is estimated that the volume of material present in the existing miscellaneous camp outbuildings is 56 LCY. A consolidation factor of 50 percent has been assumed

following mechanical consolidation of the facility. An estimated 28 cubic yards of scrap materials would be loaded with the front-end loader and transported directly to the Crystal Portal monofill area for emplacement burial.

Misc. Camp Outbuildings Subtask d – Seedbed Preparation

The preparation of the seedbed surface and recontouring has been included in the tasks for the multi-use complex area (Section 2.8.1.1)

Misc. Camp Outbuildings Subtask e – Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Misc. Camp Outbuildings Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d (section 2.8.1.1)
Revegetation:	subtask e (section 2.8.1.1)

Waste Generated:

Section 2.8.1.1

Dedicated Assets and Duration

Subtask a	none
Subtask b	none (section 2,8,1.1)
Subtask c	Demolition crew 0.8 days
Subtask d	none (section 2.8.1.1)
Subtask e	none (section 2.8.1.1)

2.8.1.3 Miscellaneous Mill Area Outbuildings

The west side of the Mill Area (Figure 4, Appendix A) is occupied by a series of miscellaneous outbuildings generally comprised of three platform tent structures, five Connex boxes, and one wood-framed/sided building. Two of the tent structures and four of the Connex boxes are utilized for storage of miscellaneous parts and supplies. The remaining tent structure, as well as one Connex box and the recently constructed slab-on-grade wood-framed structure are associated with exploration core sawing, logging/analysis, and storage activities. In addition, there is a large area of the surface yard in this vicinity (north of the Office/Dry Complex) that is occupied by palletized core box storage. There is also a series of steel racks, etc. and parts storage at the south end of the row of outbuildings. Specific reclamation and closure objectives for the miscellaneous mill outbuildings include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the miscellaneous mill outbuildings to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

The following estimates assumes that ultimately, this entire area would be scarified and available growth medium placed across the area using a dozer, with final reclamation activities (scarification, fertilization, and seeding) being deferred until final closeout of the entire Crystal Development Rock Stockpile area (Section 2.3.2).

Misc. Mill Outbuildings Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for miscellaneous mill outbuildings will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing Crystal development rock stockpile.

Misc. Mill Outbuildings subtask b – Removal of Hazardous Materials and Waste

Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. This subtask will be completed as part of the Mill Complex subtask 2 (Section 2.8.3.3).

Misc. Mill Outbuildings Subtask c – Demolition of Structure and Infrastructure

Any/all remaining parts and supplies would be removed for disposition. Connex boxes would then be dozer crushed and/or torch-cut into manageable size. All tent platform structures and the wood-framed structure would be demolished by dozer. The concrete slab (wood structure) would remain intact for eventual burial in conjunction with development rock recontouring and reclamation. Core samples would be pushed (by dozer) against the easterly adjacent hillside cut to provide fill. Wood pallets would be separated for eventual disposition by burning. An estimated 42 cubic yards of scrap materials would be loaded with the front-end loader and transported directly to the Crystal Portal monofill area for emplacement burial.

Misc Mill Outbuildings Subtask d – Seedbed Preparation

The preparation of the seedbed surface and recontouring has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Misc. Mill Outbuildings Subtask e - Revegetation

The preparation of revegetation has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Misc Mil Outbuildings Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c (Section 2.3.2)
Revegetation:	subtask d (Section 2.3.2)

Waste Generated:

Section 2.8.3.3

Dedicated Assets and Duration

Subtask a	none
Subtask b	none (section 2.8.3.3)
Subtask c	Demolition crew 1.1 days
Subtask d	none (subtask b and c, Section 2.3.2)
Subtask e	none (subtask d, Section 2.3.2)

2.8.1.4 Old (South) Camp Area

The Old South Camp Area (Figure 4, Appendix A) has been utilized as a seasonal exploration camp since about 1990. Located approximately 2,500 feet. south of the south end of the Hercules Airstrip (and accessible by road), the area constitutes approximately 0.8 acre of disturbed surface. Two weather port buildings, several plywood tent platforms, a maintenance shed, and a core sawing shed remain present at the site, along with several stacks of palletized drill core. The area may be utilized by MCRI as part of the proposed project; however, no additional surface disturbance is anticipated other than incremental disturbance associated with site closure. Specific reclamation and closure objectives for the old (south) camp area include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the old (south) camp area to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Old South Camp Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for old (south) camp area will

consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Old South Camp subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

Old South Camp Subtask c – Demolition of Structures and Infrastructure

Closure would be accomplished by using a dozer and/or loader to excavate a bank cut and/or burial trench at the location. Structures would be demolished (using the dozer) and pushed into the burial trench and compacted. The stored drill core would be dozed into the slot atop the structural debris and consolidated using the dozer. Excavation spoil would then be dozed back over the burial trench and final grade consistent with surrounding topography would be established.

Old South Camp Subtask d – Seedbed Preparation

The old (south) camp area would be ripped and blended with the surrounding terrain (also providing incremental seedbed material). The entire area would then be scarified by track walking.

Old South Camp Subtask e - Revegetation

The approximately 0.8 acre of disturbed surface area attributable to the burial trench and equipment movement would then be fertilized and seeded in accordance with the standard specifications. Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Old South Camp Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	Demolition crew	0.6 days
	D6 Bulldozer	0.8 days
Subtask d	D6 Bulldozer	1.2 days
Subtask e	Hydroseeder	0.1 days

2.8.2 Utility Services and Infrastructure

2.8.2.1 Infiltration Gallery and Pump House

The Infiltration Gallery and Pump house (Figure 4, Appendix A) provide the raw water supply for the Nixon Fork Mine operations. It consists of a small earthen core and rock impoundment structure located within Mystery Creek that is on the order of 3 feet in height. The trapezoidal-shaped embankment has a crest length of approximately 35 feet to 40 feet from bank to bank, with the visible downstream face exhibiting an approximately 2.5H:1V outslope. The feature is constructed with large (12" to 15") angular shot rock, and perforated PVC infiltration piping is present below the creek bed within the interior catchment area. The pump house consists of a wood-frame structure approximately 8 feet x 16 feet in overall size. Siding and roof are constructed of plywood, with roofing felt present on the roof. Inside the non-floored building are dual pumps and feed lines which are routed along a buried utility corridor to the Water Supply Tank (Section 2.8.2.4). The feature currently occupies 0.1 acre; no increase in disturbed surface is anticipated. Specific reclamation and closure objectives for pump house and infiltration gallery area include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the pump house and infiltration gallery area to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Pump House Area Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the pump house area and infiltration gallery will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Pump House Area subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

Pump House Area Subtask c – Demolition of Structures and Infrastructure

The central portion of the impoundment feature would be breached utilizing a small utility backhoe, leaving the remainder of the feature in place. This approach would result in minimal disturbance of the streambed sediments, and would allow for rapid natural stream recovery through the zone. The minimal volume of excavated material (primarily

rock) would be cast onto the adjacent downstream face of the impoundment. Pumps and related piping would be removed from the pump house and transported to the Crystal Portal monofill for burial. The pump house structure would be disassembled, and wood materials either are burned or disposed in the Crystal Portal monofill.

Pump House Area Subtask d – Seedbed Preparation

The area occupied by the pump house structure is considered riparian zone, therefore no growth medium material is considered necessary. The disturbed area associated with the pump house would be ripped and blended with the surrounding terrain (also providing incremental seedbed material). The entire area would then be scarified by track walking.

Pump House Area Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation. The approximately 0.1 acre of disturbed surface area attributable to the pump house area and infiltration gallery will not be fertilized.

Pump House Area Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	Demolition crew	0.2 days
Subtask d	D6 Bulldozer	0.2 days
Subtask e	Hydroseeder	0.1 days

2.8.2.2 Utility Corridor

The utility corridor (Figure 4, Appendix A) extends from the infiltration gallery to the main camp area (water storage tank), and contains a buried 4 in. diameter raw water line and an associated buried electrical service line to provide power for pump house operation. The approximately 2,100 feet corridor has been substantially revegetated either through natural progression or via reclamation activities previously carried out by MCRI. Specific reclamation and closure objectives for utility corridor area include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the utility corridor area to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Utility Corridor Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the utility corridor will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Utility Corridor subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

Utility Corridor Subtask c – Demolition of Structures and Infrastructure

Closure assumes that the buried utility lines would be left in place. The power line would be de-energized and cut to a depth of 6 in. below ground surface at both the source end and the load end. The water line would be similarly cut at each end. A foam sealant and cap would be placed on each end of the water line. Surface disturbance at either end would be minimal. The previously reclaimed utility corridor would be inspected along its length for vegetative success. Estimated to include the utilization of electrician (0.5 day) and 1 laborer for 0.5 day to de-energize and sever the power line. Use of the 420 utility backhoe for 1 day to cut and cap pipeline and scarify areas requiring supplemental revegetation efforts.

Utility Corridor Subtask d – Seedbed Preparation

As indicated under subtask c, the estimate assumes the use of the 420 utility backhoe for 1 day to cut and cap pipeline and scarify areas requiring supplemental revegetation efforts.

Utility Corridor Subtask e - Revegetation

For purposes of this estimate, MCRI has conservatively assumed vegetative enhancement would be required over 30 percent of its length (12 feet width assumed), resulting in <0.2 acres of revegetation. Revegetation will be accomplished by hydroseeding performed concurrently with reclamation

Utility Corridor Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing

Scarified Surface:	subtask d
Revegetation:	subtask e
Waste Generated:	none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	electrician	0.5 days
	Laborer 2	0.5 days
	420	1.0 days
Subtask d	420	subtask c
Subtask e	Hydroseeder	0.1 days

2.8.2.3 Water Treatment Plant

The water treatment plant (WTP) is a modular facility situated in a standard Connex box that occupies less than 0.1 acre (Figure 4, Appendix A). Raw water is delivered to the plant (from the water storage tank) via a buried pipeline, and treated water is supplied to the Multi-Use Complex via a buried pipeline. Contents primarily consist of chemical treatment and filtration equipment. A second Connex box (utilized for storage) is adjacent to the unit. . Specific reclamation and closure objectives for the WTP include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the WTP to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

WTP Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the WTP will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

WTP subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

WTP Subtask c – Demolition of Structures and Infrastructure

Interior equipment would be dismantled and trammed to the Crystal Portal monofill area for burial emplacement. The two Connex structures would be dozer crushed and/or torch cut into manageable sized pieces and also transported to the Crystal Portal monofill area for emplacement burial. Supply and delivery pipelines would be cut 6 in. below ground surface. Foam plugs would be installed and ends capped prior to burial. The WTP and contents have a footprint of approximately 40 x 20 x 10 feet. The estimated volume of material is 300 LCY. Due to the mechanical contents, debris from the WTP is assumed to have 10 percent consolidation. Interior equipment would be dismantled and trammed to the Crystal Portal monofill area for burial emplacement. The two Connex structures would be dozer crushed and/or torch cut into manageable sized pieces and also transported to the Crystal Portal monofill area for emplacement burial. Supply and delivery pipelines would be cut 6 in. below ground surface. Foam plugs would be installed and ends capped prior to burial.

WTP Subtask d – Seedbed Preparation

The surface area estimated to be disturbed by reclamation activities is less than 1,000 square feet. Vehicle traffic during subtask b will be sufficient to prepare the seedbed.

WTP Subtask e - Revegetation

A disturbance footprint of 0.1 acres has been assumed for estimating purposes. Revegetation will be accomplished by hydroseeding performed concurrently with reclamation

WTP Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

50 gallon drum sodium hypochlorite

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	Demolition Crew	0.6 days
Subtask d	none	
Subtask e	Hydrosedeer	0.1 days

2.8.2.4 Water Storage Tank

The 20,000-gallon raw water storage tank (WST) is a double-walled, cylindrical steel tank situated at the top of the hill immediately east of the main camp area (Figure 4, Appendix A). The tank rests on a concrete ring pad, and has an associated area of

disturbance of approximately 0.1 acre. Specific reclamation and closure objectives for the WST include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the WST to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

WST Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the WST will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

WST subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

WST Subtask c – Demolition of Structures and Infrastructure

The tank would be emptied of all contents and torch cut into manageable sized pieces for transport to the Crystal Portal monofill for emplacement burial. The concrete ring pad will be broken and resultant debris also taken to the Crystal Portal monofill. The immediate area would then be scarified using a dozer. The <0.1 acre surface area would then be fertilized and seeded in accordance with the standard specifications.

Note: Capping of incoming and outgoing pipelines has been previously addressed under other components and is therefore not addressed here.

WST Subtask d – Seedbed Preparation

The surface area estimated to be disturbed by reclamation activities is less than 1,000 square feet. Vehicle traffic during subtask b will be sufficient to prepare the seedbed.

WST Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation. A disturbance footprint of 0.1 acres has been assumed for estimating purposes.

WST Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	Demolition Crew	0.5 days
Subtask d	none	
Subtask e	Hydroseeder	0.1 days

2.8.3 Other Buildings

2.8.3.1 Office/Dry Complex

The Office/Dry Complex occupies approximately 0.7 acres of the overall 2.1 acre mill area. It is a multiple-use structure that contains administrative, engineering, and geological offices, two miner's dries, and sample preparation and assay lab facilities (Figure 4, Appendix A). Geologic and assay support infrastructure is augmented by a series of adjacent outbuildings and an area of palletized outdoor core storage, all of which are addressed under Section 2.8.1.3 – Miscellaneous Mill Area Outbuildings. The Office/Dry complex consists of a series of nine interconnected modular units that comprise an estimated total of 5,400 square feet of office, dry and lab space. The units are similar to manufactured housing, with wood and/or steel stud frame, batt insulation, and aluminum exterior sheathing. Specific reclamation and closure objectives for the office/dry complex include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the office/dry complex to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

The following estimates assumes that ultimately, this entire area would be scarified and available growth medium placed across the area using a dozer, with final reclamation

activities (scarification, fertilization, and seeding) being deferred until final closeout of the entire Crystal Development Rock Stockpile area (Section 2.3.2).

Office/Dry Complex Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for office/dry complex will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing Crystal development rock stockpile.

Office/Dry Complex subtask b – Removal of Hazardous Materials and Waste

Structure demolition would commence with utility disconnects (electrical, water/sewer, and fuel). Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. For this Plan, it is estimated that two 65-gallon drums of associated hazardous waste consolidation would result. It is also estimated that in addition, four 65-gallon drums of special and/or hazardous waste would result from assay lab materials (i.e., crucibles, chemicals, refractory brick, etc.).

Office/Dry Complex Subtask c – Demolition of Structure and Infrastructure

Structures will be leveled utilizing a dozer and/or frontend loader. Scrap materials would be loaded with the front-end loader and directly trucked to the Crystal Portal monofill area for emplacement burial.

Office/Dry Complex Subtask d – Seedbed Preparation

This entire area would be scarified and available growth medium placed across the area using a dozer,

Office/Dry Complex Subtask e - Revegetation

The preparation of revegetation has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Office/Dry Complex Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c (Section 2.3.2)
Revegetation:	subtask d (Section 2.3.2)

Waste Generated:

6 65-gallon poly drums of RCRA waste – to anchorage

Dedicated Assets and Duration

Subtask a	none
Subtask b	Demolition crew 1.1 days
Subtask c	Demolition crew 2.2 days
Subtask d	none (subtask b and c, Section 2.3.2)

Subtask e none (subtask d, Section 2.3.2)

2.8.3.2 Maintenance Shop

The Maintenance Shop occupies approximately 0.3 acres of the overall 2.1 acre mill area, and is located immediately south of the Office/Dry Complex (Figure 4, Appendix A). It is an elliptical-shaped, domed structure (nominally 115 feet x 62 feet) situated on a radiant-heated concrete slab, with steel framework and woven fabric cover construction. The slab floor heating system incorporates recirculating glycol lines, and there is also a 7 feet x 3 feet x 3 feet deep oil and grease separator pit. There is an exterior 500-gallon diesel fuel day tank (with secondary containment) located on the south side of the structure. Specific reclamation and closure objectives for the Maintenance shop include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the maintenance shop to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

The following estimates assumes that ultimately, this entire area would be scarified and available growth medium placed across the area using a dozer, with final reclamation activities (scarification, fertilization, and seeding) being deferred until final closeout of the entire Crystal Development Rock Stockpile area (Section 2.3.2).

Maintenance Shop Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for maintenance shop will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing Crystal development rock stockpile.

Maintenance Shop subtask b – Removal of Hazardous Materials and Waste

Structure demolition would commence with utility disconnects (electrical, water/sewer, and fuel). Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. For this Plan, it is estimated that two 65-gallon drums of associated hazardous waste consolidation would result.

All glycol would be extracted from the floor system and collected for management offsite. It is estimated that five 65-gallon drums of glycol would be extracted for offsite transport and recycling.

The day tank would be inerted and the steel tank would be torch cut for burial emplacement at the Crystal Portal monofill. Any residual fuels would be either consumed in reclamation activities or burned. It is assumed that 100 yd³ of hydrocarbon contaminated soils would be excavated and transported to the Landfill treatment area (to include residual materials from the oil-water separator sump).

Maintenance Shop Subtask c – Demolition of Structure and Infrastructure

All non-hazardous interior equipment and supplies would be removed from the shop area for disposal. Interior divider wall (drywall, wood, etc.) materials would be removed for disposal. The superstructure would be demolished by removing and cutting the woven fabric material into manageable sizes for disposal, and steel structural supports would be similarly torch-cut into manageable lengths. All of these materials would be transported to the Crystal Portal monofill for burial emplacement.

The concrete slab would remain intact; however, it would be subject to burial upon final reclamation of the overall area.

Maintenance Shop Subtask d – Seedbed Preparation

The preparation of the seedbed surface and recontouring has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Maintenance Shop Subtask e - Revegetation

The preparation of revegetation has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Maintenance Shop Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c (Section 2.3.2)
Revegetation:	subtask d (Section 2.3.2)

Waste Generated:

- 2 ea. 65-gallon drums of Haz. Waste (RCRA TSD)
- 5 ea. 65-gallon drums of glycol (offsite recycle)
- 100 yd³ hydrocarbon contaminated soils (onsite containment)

Dedicated Assets and Duration

Subtask a	none
Subtask b	Demolition crew 2.9 days
Subtask c	Demolition crew 2.9 days
Subtask d	none (subtask b and c, Section 2.3.2)
Subtask e	none (subtask d, Section 2.3.2)

2.8.3.3 Mill Complex

The Mill Complex is the next structure south of the Maintenance Shop. It is the largest structure on the property, and will likely be the most labor-intensive feature from a closure/demolition perspective due to the extensive mineral processing equipment contained therein (Figure 4, Appendix A). It is a generally rectangular structure (152 feet x 89 feet with one half-circular end), with an adjoining 26 feet x 10 feet hopper on the south end. The domed structure is situated on a radiant heated concrete slab, and is of steel framework and woven fabric cover construction. The 0.7 acre facility includes 4160V and 440V step-down transformers, electrical switchgear, and various electric motors.

In general, the southern portion of the structure is occupied by primary and secondary ore crushers, fine ore bins, and conveyor galleries. The central portion is occupied by two ball mills and rougher and cleaner flotation cell banks, gravity tables, and other processing equipment, tanks, and piping. One of the ball mills is pedestal-mounted, whereas the other is skid-mounted. For the purposes of this reclamation plan, a “dead switch” shut down of the mill has been assumed. Hence, the mill process vessels will be assumed to be filled at normal operating capacity and reagent storage on site has been assumed to be 2/3 normal capacity. The scope of mill process decommissioning will include:

- Unused process reagents will be shipped back to supplier;
- CIL circuit will be detoxified and process waters would be treated chemically until testing indicates they meet water quality standards;
- Flotation circuit cells will be drained of process water and no chemical neutralization is anticipated; and
- The gravity tank will be drained of fluids and no chemical treatment is anticipated.

The northern portion is occupied by 2 ea. 25 feet and 1 ea. 18 feet diameter thickener tanks and filtration equipment, and there is an open area utilized for concentrate bagging and temporary storage present at the extreme north end. With the exception of the one ball mill on a 6 feet fixed concrete pedestal, all equipment is supported by structural steel bolted directly to the concrete slab. Exterior to the mill (near the northwest corner) is a 1,000-gallon diesel fuel storage tank (with secondary containment). New equipment will be added for completion of the cyanide in leach (CIL) circuit, including a evaporator tank north of the office/dry complex. A schematic of the completed mill appears in Appendix A, Figure 5. Specific reclamation and closure objectives for the Maintenance shop include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the maintenance shop to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

The following estimates assumes that ultimately, this entire area would be scarified and available growth medium placed across the area using a dozer, with final reclamation activities (scarification, fertilization, and seeding) being deferred until final closeout of the entire Crystal Development Rock Stockpile area (Section 2.3.2).

Mill Complex Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for mill complex will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing Crystal development rock stockpile.

Mill Complex subtask b – Removal of Hazardous Materials and Waste

Structure demolition would commence with utility disconnects (electrical, water/sewer, and fuel). Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite disposal. It is assumed a total of ten 65-gallon drums of hazardous or special waste (i.e., process or reagent residuals, etc.) would be generated in closure of the mill feature for ultimate offsite transport and disposal at an approved RCRA TSD facility.

All glycol would be extracted from the floor system and collected for management offsite. The radiant floor heating system is assumed to contain the equivalent of twenty-five 65-gallon drums of glycol requiring management for recycle.

The 1,000-gallon day tank would be inerted and the steel tank would be torch cut for burial emplacement at the Crystal Portal monofill. Any residual fuels would be either consumed in reclamation activities or burned. It is assumed that 100 cubic yards of hydrocarbon contaminated soils would be excavated and transported to the Landfill treatment area.

Mill Complex Subtask c – Demolition of Structure and Infrastructure

All non-hazardous interior equipment and supplies would be removed from the shop area for disposal. Interior divider wall (drywall, wood, etc.) materials would be removed for disposal. All of these materials would be transported to the Crystal Portal monofill for burial emplacement.

Electrical transformers and switchgear would be dismantled and removed. Crushing and grinding equipment would be dismantled and/or torch-cut to manageable size for disposition. Piping and small tanks, etc. would be torch cut. Large (thickener) tanks, including the evaporator tank west of the office/dry complex, would be dismantled into sections by torch cutting connection bolts and then cutting sections, as warranted.

Structural steel and matting would be torch-cut. The concrete ball mill pedestal would be reduced mechanically to grade and resultant concrete debris either removed for disposition or utilized as fill in the sub grade conveyor gallery slot. The superstructure would be demolished by removing and cutting the woven fabric material into manageable sizes for disposal, and steel structural supports would be similarly torch-cut into manageable lengths.

All of the foregoing materials (with the exception of hazardous wastes and hydrocarbon-contaminated soils) would be transported via front-end loader and/or dozer to the Crystal Portal monofill area for emplacement burial. The concrete slab base would remain intact at ground level. Any wing-walls, etc. would be mechanically reduced down to grade, and resultant concrete debris would be utilized to fill the sub grade conveyor gallery slot. The concrete slabs associated with the mill complex would remain intact, subject to burial upon final reclamation of the Crystal Development Rock Stockpile.

Mill Complex Subtask d – Seedbed Preparation

The preparation of the seedbed surface and recontouring has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Mill Complex Subtask e - Revegetation

The preparation of revegetation has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Mill Complex Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c (Section 2.3.2)
Revegetation:	subtask d (Section 2.3.2)

Waste Generated:

10 ea. 65-gallon drums of Haz. Waste (RCRA TSD)
25 ea. 65-gallon drums of glycol (offsite recycle)
100 cubic yards hydrocarbon contaminated soils (onsite containment).

Dedicated Assets and Duration

Subtask a	none
Subtask b	Demolition crew 2.9 days
Subtask c	Demolition crew 29.4 days
Subtask d	none (subtask b and c, Section 2.3.2)
Subtask e	none (subtask d, Section 2.3.2)

2.8.3.4 Generator Set Enclosure

Three existing 820 kW permanent diesel-electric generators will produce power required by all project facilities (Figure 4, Appendix A). Two operating generators will meet power needs. The third 820 kW generator will be maintained as a spare. The building footprint is approximately 40 x 40 feet.

The power plant is located at the south end of the Crystal development rock dump area across from the crushing area of the mill. It is located in a building with the compressor station and air receiver. The generators are fed by a common 1,000 gallon day tank, which in turn is fed by a double wall buried fuel line (1½ inch pipe within a 3 pipe) from the fuel storage tanks at the airstrip. Power is transmitted via a buried cable to the Crystal raise and mill. Specific reclamation and closure objectives for the generator shed include:

- Fuel, lubricants, oils, and glycol drained from equipment;
- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the generator shed to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

The following estimates assumes that ultimately, this entire area would be scarified and available growth medium placed across the area using a dozer, with final reclamation activities (scarification, fertilization, and seeding) being deferred until final closeout of the entire Crystal Development Rock Stockpile area (Section 2.3.2).

Generator Shed Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for generator shed will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing Crystal development rock stockpile.

Generator Shed subtask b – Removal of Hazardous Materials and Waste

Structure demolition would commence with utility disconnects (electrical and fuel). Hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) would be selectively removed and temporarily stored for offsite as part of mill closure (Section 2.8.3.3)

All glycol would be extracted from the floor system and collected for management offsite. Closure of this feature would include draining all fluids from the generator units.

MCRI has estimated that a total of three 65-gallon drums of glycol would require management as a special waste.

The 1,000-gallon day tank would be inerted and the steel tank would be torch cut for burial emplacement at the Crystal Portal monofill. Any residual fuels and oils would be either consumed in reclamation activities or burned. It is assumed that no hydrocarbon contaminated soils would be encountered.

Generator Shed Subtask c – Demolition of Structure and Infrastructure

All non-hazardous interior equipment and supplies would be removed from the shop area for disposal. Interior divider wall (drywall, wood, etc.) materials would be removed for disposal. All of these materials would be transported to the Crystal Portal monofill for burial emplacement. The generator units would then be removed and transported by dozer (towed on skids) to the Crystal Portal monofill for emplacement burial along with the building debris. The superstructure would be reduced mechanically. Associated buried utility and glycol lines would be cut and/or capped at or below grade.

All of the foregoing materials (with the exception of hazardous wastes and hydrocarbon-contaminated soils) would be transported via front-end loader and/or dozer to the Crystal Portal monofill area for emplacement burial. The concrete slab base would remain intact at ground level. The concrete slabs associated with the Generator Shed would remain intact, subject to burial upon final reclamation of the Crystal Development Rock Stockpile.

Generator Shed Subtask d – Seedbed Preparation

The preparation of the seedbed surface and recontouring has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Generator Shed Subtask e - Revegetation

The preparation of revegetation has been included in the reclamation tasks for the Crystal Development Stockpile (Section 2.3.2)

Generator Shed Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask c (Section 2.3.2)
Revegetation:	subtask d (Section 2.3.2)

Waste Generated:

3 ea. 65-gallon drums of glycol (offsite recycle)

Dedicated Assets and Duration

Subtask a	none	
Subtask b	Demolition crew	1.7 days
Subtask c	Demolition crew	1.0 days

Subtask d none (subtask b and c, Section 2.3.2)
Subtask e none (subtask d, Section 2.3.2)

2.8.3.5 Meteorological Station

The Meteorological Station consists of a single metal tower located immediately north of the Crystal Ventilation Raise (Figure 4, Appendix A). The tower is mounted on a concrete pad and is guyed to ground anchors and occupies approximately 0.05 acres.

Specific reclamation and closure objectives for the Meteorological Station include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the Meteorological Station to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Meteorological Station Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the Meteorological Station will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Meteorological Station subtask b – Removal of Hazardous Materials and Waste

No hazardous materials (i.e., fluorescent bulbs, ballasts, etc.) are anticipated at this location.

Meteorological Station Subtask c – Demolition of Structures and Infrastructure

The guy wires would be severed and the tower pulled down using the utility backhoe. The tower would then be broken down into segments along bolted connecting plates and/or torch cut. Debris would then be transported to the Landfill for disposal utilizing the utility backhoe/loader. The concrete pad would be buried using surrounding soil materials (by dozer).

Meteorological Station Subtask d – Seedbed Preparation

The surface area estimated to be disturbed by reclamation activities is less than 1,000 square feet. Vehicle traffic during subtask b will be sufficient to prepare the seedbed.

Meteorological Station Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation. A disturbance footprint of 0.1 acres has been assumed for estimating purposes.

Meteorological Station Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none anticipated	
Subtask c	Demolition Crew	0.2 days
Subtask d	none	
Subtask e	Hydroseeding	0.1 days

2.8.3.6 Fuel Depot

Description: The 0.6 acre Nixon Fork fuel depot is located immediately off the north end of the Hercules Airstrip. The fuel arm consists of a bermed and lined secondary containment unit, 8 tanks, and associated piping. Specific reclamation and closure objectives for the Fuel Depot include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the Fuel Depot to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Removal of hazardous wastes;
- c) Demolition of structures/infrastructure;
- d) Preparation of seedbed surface; and
- e) Revegetation.

Fuel Depot Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the Fuel Depot will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Fuel Depot subtask b – Removal of Hazardous Materials and Waste

Provision has been allowed for potential shallow-zone hydrocarbon soil contamination to be present beneath the containment liner. It has been assumed that a nominal contamination is present under the fuel farm (60 feet x 60 feet), resulting in approximately 100 yd³ of contaminated soil to be managed onsite, to include transport to the Landfill containment area.

Fuel Depot Subtask c – Demolition of Structures and Infrastructure

Pump equipment, hoses, and valves would be removed from the wood structures and placed on the interior crest of the containment cell and allowed to air dry to ensure there is no residual free product, and transported to the Landfill. Wood structures would be demolished and debris transported to the central burn area. The buried fuel delivery line would be cut, allowed to siphon (with residual product being collected and utilized for reclamation activities or burned), capped at each end, and left in place. Above ground delivery lines would be cut, drained, and allowed to air dry, and then transported to the Landfill. Tanks would be emptied of contents (to be either consumed in reclamation activities or burned), cut open, and wiped down with absorbent materials. The tanks would then be further cut up or crushed into smaller segments and allowed to air dry to ensure there is no residual free product, and then transported to the monofill. The containment cell liners would be wiped down with absorbent materials, then cut and/or folded for burial in place. The area would then be backfilled and leveled by dozer using the locally available soils (generally present as the perimeter berming features).

Fuel Depot Subtask d – Seedbed Preparation

The 0.6 acre surface area would be recontoured and roughened.

Fuel Depot Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Fuel Depot Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

100 cubic yards POL contaminate soil – onsite treatment

Dedicated Assets and Duration

Subtask a	none	
Subtask b	Demolition crew	2.6 days
Subtask c	Demolition Crew	2.2 days
Subtask d	D6	0.2 days
Subtask e	Hydroseeder	0.1 days

2.8.3.7 Solid Waste Landfill

The Solid Waste Landfill is located adjacent to the Rock Quarry (also referred to as the former “upper airstrip”) and is approximately 0.4 miles west of the south end of the Hercules Airstrip. The 0.3 acre site is permitted and utilized for disposal of solid waste, and it is anticipated that an additional 0.2 acres of landfill capacity would be developed by MCRI. However, concurrent reclamation would occur during the operational life of mining operations. Regardless (in order to address maximum total disturbance), it has been assumed that total disturbance at time of closure would be on the order of 3.0 acres as the landfill would serve as the final staging area and repository for various demolition related wastes. Easterly adjacent to the active landfill area is a hydrocarbon contaminated soil containment (treatment by aeration/biodegradation) area approximately 50 feet x 12 feet x 2 feet. It is estimated to currently contain approximately 50 yd³ of contaminated soil, and it is anticipated that the area will be enlarged during closure activities in order to accept and treat additional hydrocarbon contaminated soils. Based on Plan development, it is anticipated that an additional 200 to 300 yd³ of hydrocarbon contaminated soil would be added to the area for in-place aeration/biodegradation treatment. An empty fuel tank trailer (tanker) and a mobile generator unit are also present at the Landfill. Specific reclamation and closure objectives for the solid waste landfill include:

- Must be removed following mining; and
- Surface disturbance rehabilitated.

Specific subtasks to be performed at the solid waste landfill to meet the reclamation performance standards include:

- a) Erosion and Sediment Control;
- b) Recontouring of landfill surface;
- c) Preparation of seedbed surface; and
- d) Revegetation.

Solid Waste Landfill Subtask a - Erosion and Sediment Control

The installation of erosion and sediment control BMPs will be performed as specified in the overall SWPPP for the project. The primary BMPs for the solid waste landfill will consist of vegetation buffers and preservation of existing vegetation along the margins of the existing disturbance.

Solid Waste landfill subtask b – Removal of Hazardous Materials and Waste

No hazardous wastes are anticipated at the solid waste landfill.

Solid Waste Landfill subtask c – Demolition of Structures and Infrastructure

The tanker would be inerted and cut apart for disposal in the adjacent landfill area. The mobile generator unit (if still present) would be transported to the Crystal Portal Monofill for emplacement burial. The Landfill would be closed by placement of adjacent

stockpiled material augmented by rock cover materials obtained from the adjacent Rock Quarry (former landing strip), as necessary. It is assumed that the rock cover would be placed directly atop compacted waste and in any remaining void areas to consolidate underlying materials and obtain a stable, recontoured surface that blends with surrounding topography

Solid Waste Landfill Subtask d – Seedbed Preparation

The approximately 3.0 acres of disturbed surface area would be recontoured and roughened.

Solid Waste Landfill Subtask e - Revegetation

Revegetation will be accomplished by hydroseeding performed concurrently with reclamation.

Solid Waste Landfill Summary of Reclamation and Closure

Estimated Incremental Requirements:

ESCP Materials:

Vegetated Buffer:	Existing.
Preservation of existing vegetation:	Existing
Scarified Surface:	subtask d
Revegetation:	subtask e

Waste Generated:

none

Dedicated Assets and Duration

Subtask a	none	
Subtask b	none	
Subtask c	Demolition Crew	2.2 days
Subtask d	D6	0.7 days
Subtask e	subcontractor	0.4 days

2.9 HOLDING YEAR

The State of Alaska has found that there is a lag time between the time the State assumes financial responsibility for a site and the time when actual site reclamation can begin. The reasons for the lag time may be due to ongoing litigation, disputes regarding ownership of equipment and facilities, additional data gathering or engineering studies and design, and/or seasonal climatic restrictions. The State of Alaska assumes that there will be a one year period between the dates that the public agency assumes responsibility for the site and when reclamation and closure activities begin. For the purposes of this estimate the following assumptions have been made:

- Two person onsite caretaker staff;
- All camp management will be performed by caretaker staff; and
- A bi-weekly shift rotation of camp staff; to be staggered at one week intervals.

The following duties will be assigned to caretaker staff while onsite:

- Mill decommissioning activities; and
- Removal of fluids, batteries from on site equipment.

As such, labor will be calculated on a time in service basis (8 hours per day, seven days per week) and the costs associated with each of the above tasks has been estimated exclusive of labor.

Holding Year Task 1 – Decommission Mill

The first task following an unplanned ‘dead-switch’ closure of the Nixon Fork Mine will be to remove unused process reagents and decommissioning of the mill circuitry. The removal of potentially hazardous materials from the mine site and rendering of the mill safe is of paramount importance following an unplanned closure for both the protection of the environment and human health and safety. This task should not be delayed until reclamation activities can commence, which by the State of Alaska’s own admission may be a year following the cessation of operation, and must therefore occur as soon as possible following the assumption of responsibility by a public agency. The following subtasks will need to be performed:

Holding Year Task 2 – Remove fluids and batteries from onsite equipment

All major equipment at the Nixon Fork Mine is currently leased. Based on discussions with NC Machinery staff (Mr. Larry Timmons), lease agreements for remote sites typically include a provision for retrieval of equipment in the event of bankruptcy. Three underground drills are currently owned by MCRI. These drills will be parked in the Crystal portal and all batteries and fluids removed and placed in the Maintenance Shop for disposal during reclamation activities.

3.0 POST CLOSURE MONITORING

A 30-year post-closure monitoring plan would be implemented following completion of closure and reclamation activities. The plan would provide for site visits/inspections to conduct routine monitoring of the following major components.

- Tailing Dam Stability
- Surface Water Quality
- Storm Water Management Controls
- Reclamation Status
- Invasive Species

Since no active water treatment is required at the Nixon Fork Mine, annual water quality monitoring will be required in years 1, 2, 5, 10, 15, 20, and 30 post closure. The post-closure monitoring would be conducted on the following schedule commencing in 2016

Event 1 – 2015
Event 2 – 2016

Event 3 – 2019
Event 4 – 2024
Event 5 – 2029
Event 6 – 2034
Event 7 – 2044

The costs of future monitoring events has been inflation adjusted and are provided in Appendix C.

4.0 COST ESTIMATE SUMMARY

The costs presented in the Section are based on an estimate completed in September 2011 and may not reflect the most recent updated reclamation and closure costs. The most current reclamation and closure costs for the Nixon Fork Mine are available from the Alaska Department of Natural Resources, Division of Mining, Land, and Water, Mining Section. The following cost estimate summary has been developed for reclamation and post closure monitoring at the Nixon Fork Mine. The cost estimate is attached in electronic form in Appendix C.

ESTIMATE SUMMARY

<i>Direct Component</i>		<i>Amount</i>
Equipment Capital Costs		\$ 947,234
Equipment O & M Costs		\$ 288,890
Revegetation		\$ 109,949
Manpower		\$ 1,137,390
Manpower support		\$ 324,974
Materials, supplies, other		\$ 379,458
1-Year Holding Period		\$ 551,379
Post Closure Monitoring		\$ 242,507
Subtotal Direct Costs		\$ 3,981,782
<i>Indirect Components</i>	Percent*	
Contractor Profit	10	\$ 398,000
Contractor Overhead	4	\$ 159,000
subtotal		\$ 4,538,782
Performance and Payment Bond	3	\$ 136,000
Liability Insurance	1.5	\$ 17,000
subtotal		\$ 4,691,782
BLM Contract Administration	9.4	\$ 374,000
Engineering Redesign	6	\$ 239,000
Contingency	12	\$ 478,000
State Agency Oversight	1.5	\$ 60,000

†Total \$ 5,842,782

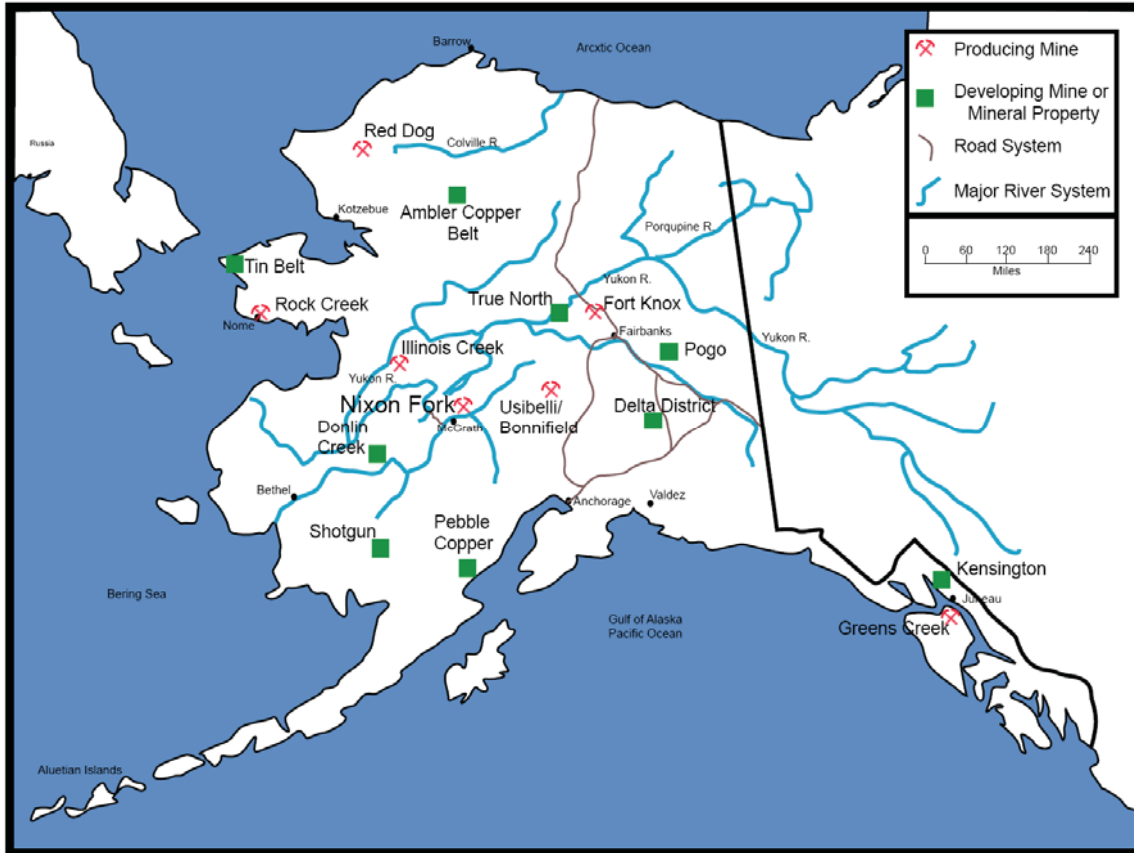
Inflation Anchorage CPI	2.67
‡INFLATION ADJUSTED TOTAL	\$5,999,000

*Percent of direct component subtotal.

† Net present value of estimate.‡

‡2012 dollars adjusted for inflation based on Anchorage 3-year CPI of 2.67 percent per annum

APPENDIX A
FIGURES



Note: Illinois Creek Mine is in final reclamation and closure phase of operations.

Figure 1: Location and Vicinity Map, Nixon Fork Gold Mine.

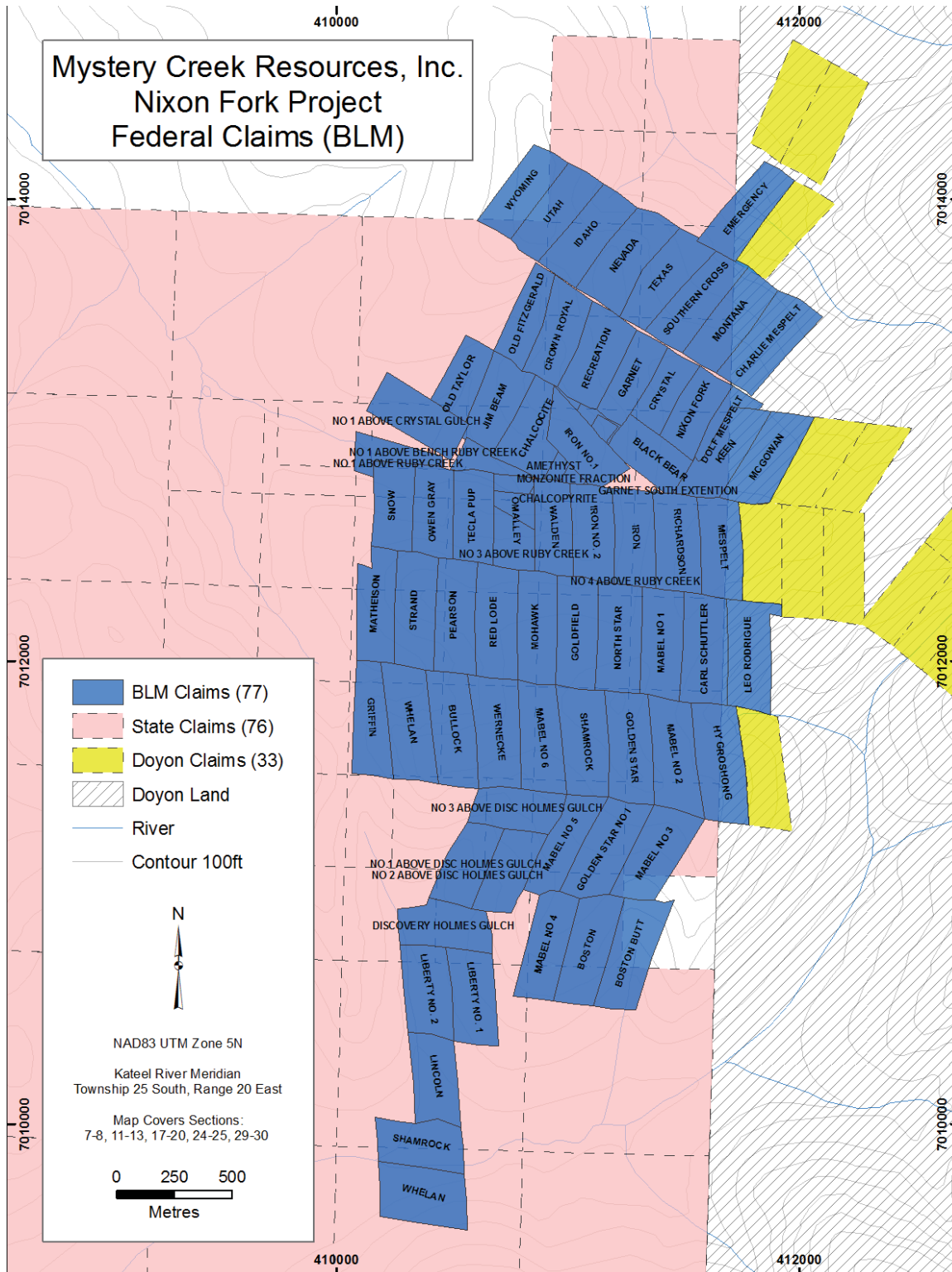


Figure 2: Federal Mining Claims, Nixon Fork Gold Mine

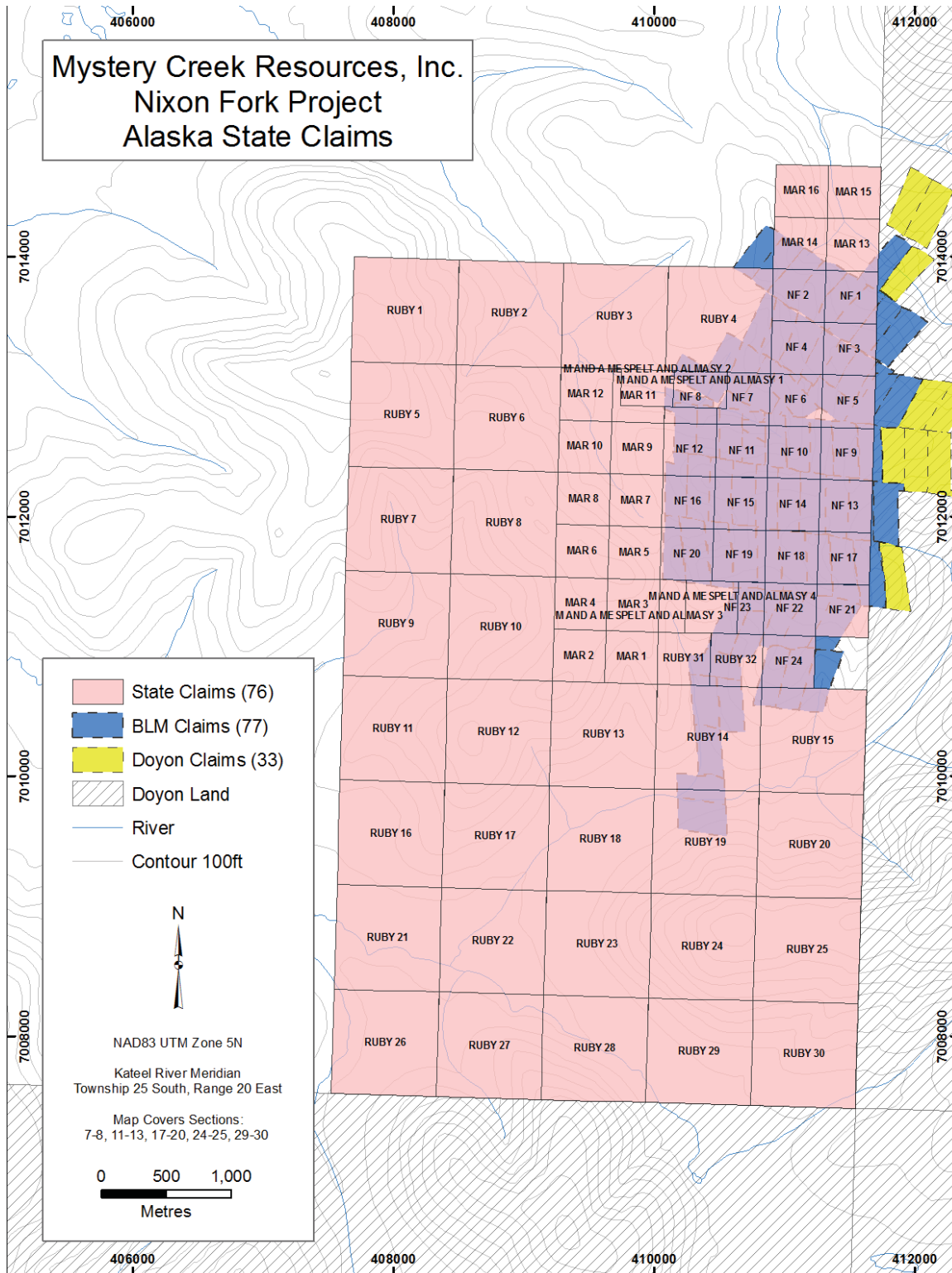


Figure 3: State Mining Claims, Nixon Fork Gold Mine.

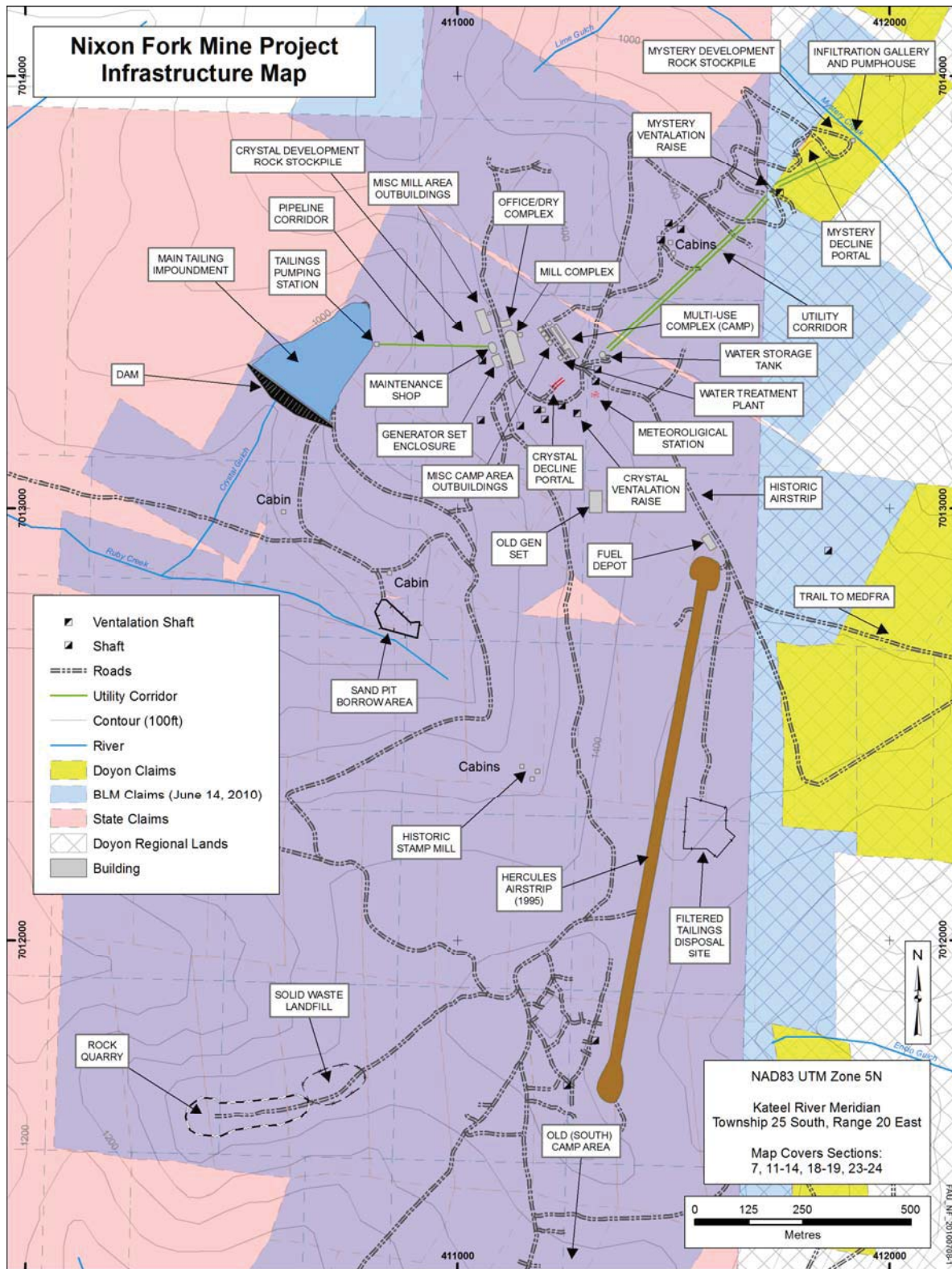


Figure 4: Facility Site Plan. Nixon Fork Gold Mine.

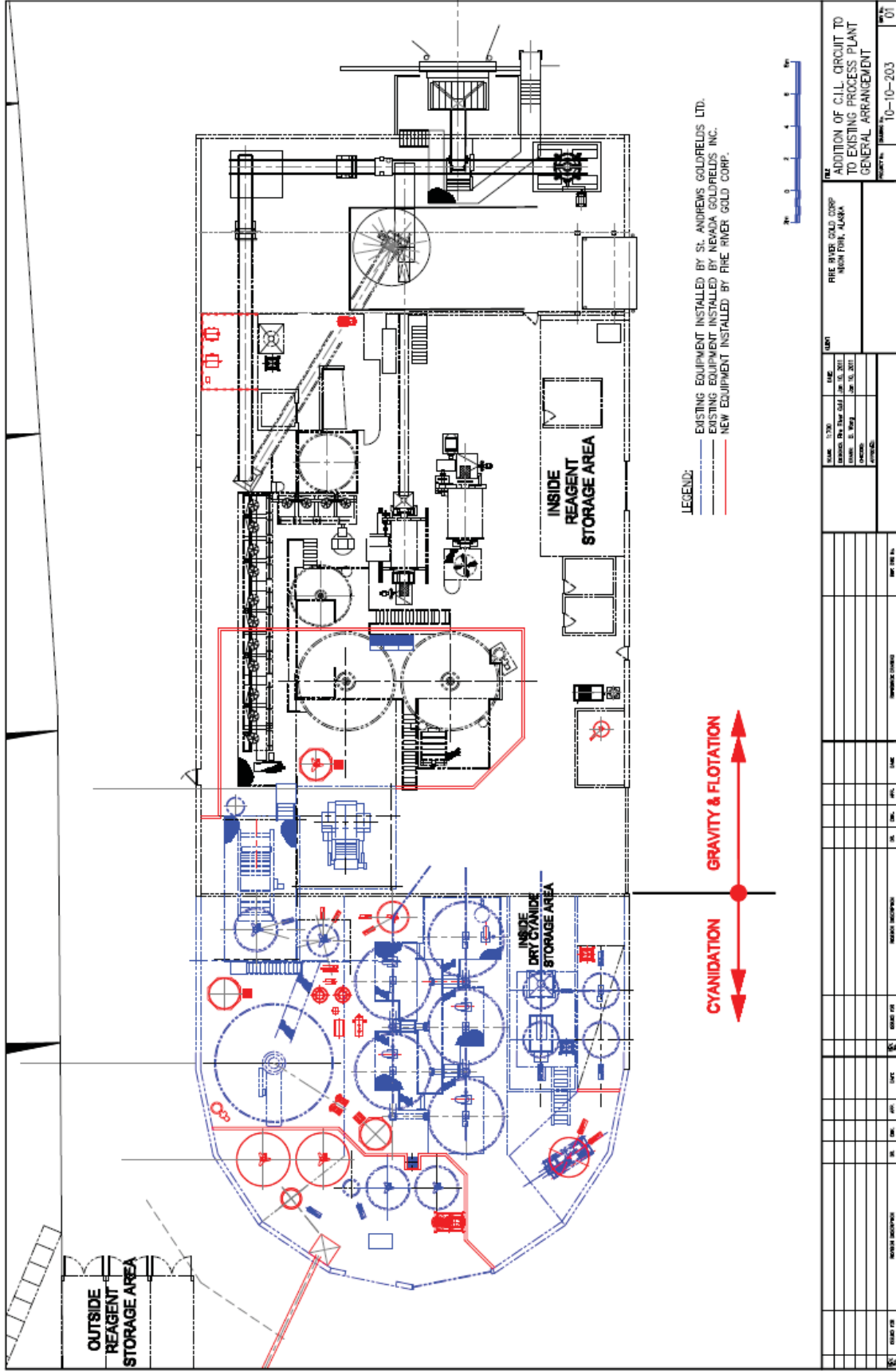


Figure 5: Mill Facility, Existing and Proposed, Nixon Fork Gold Mine.

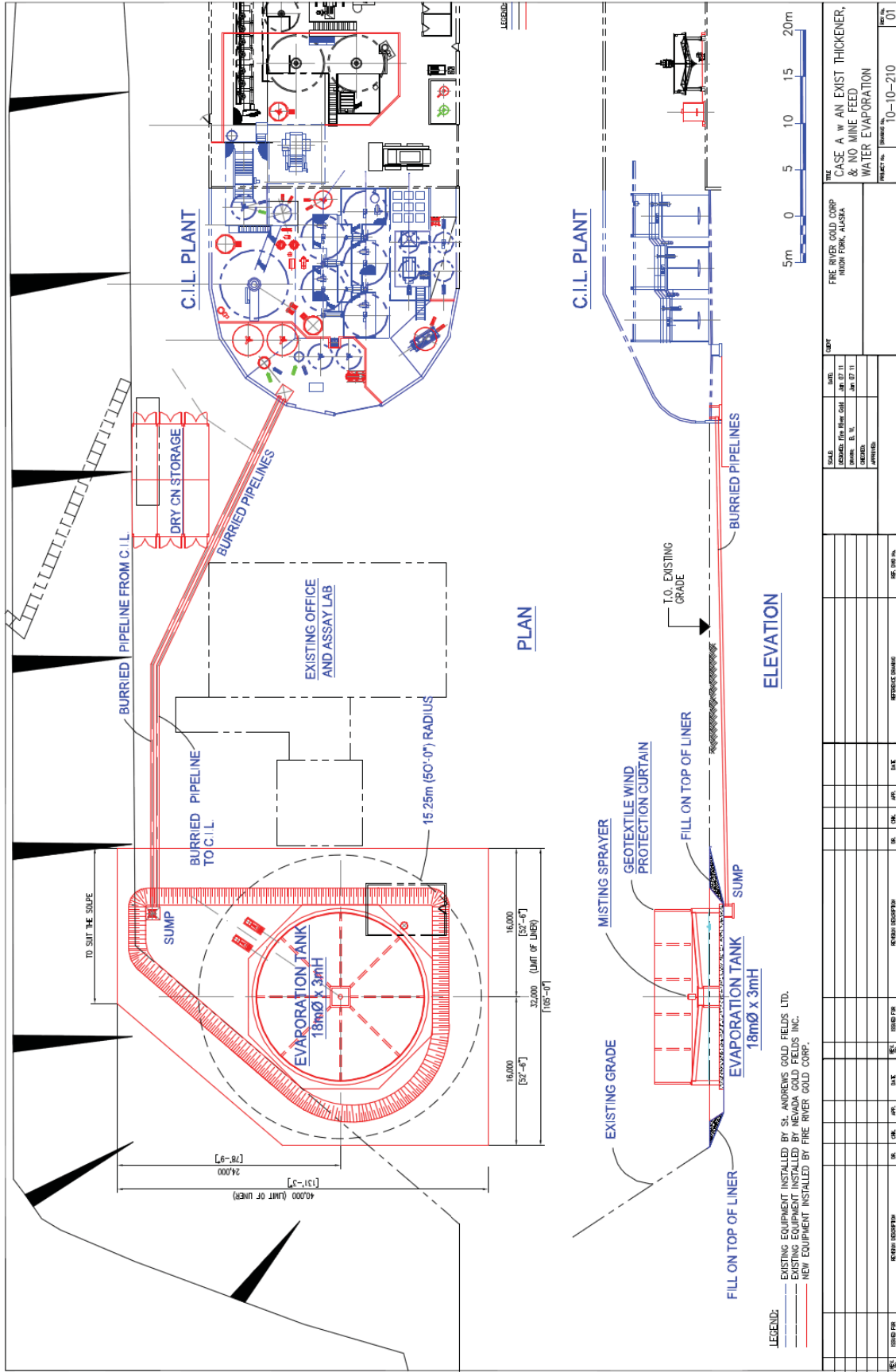


Figure 6 Proposed Evaporator Tank and CIL Additions to the Mill.

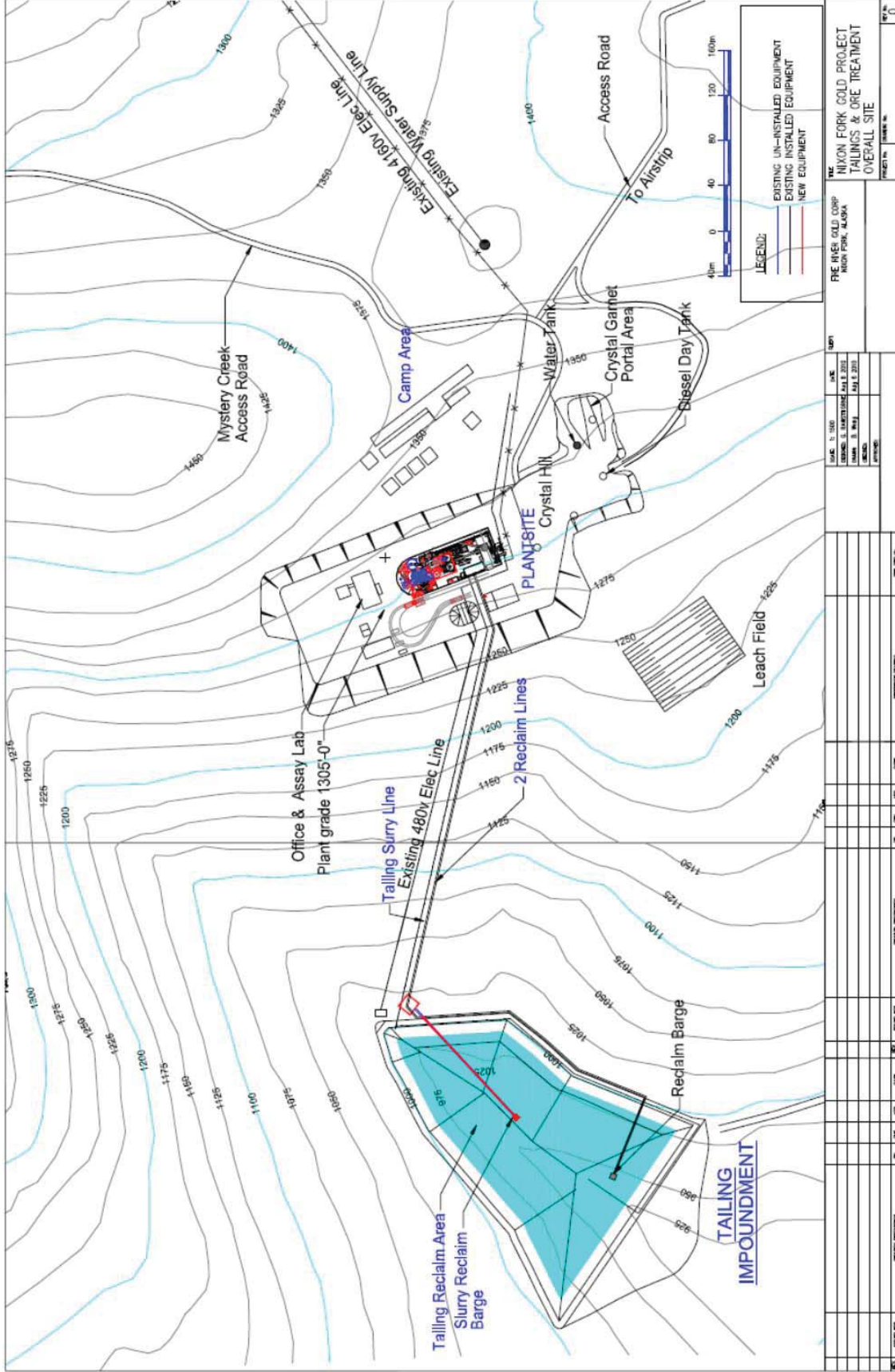


Figure 7 General Site Plan from Tailings Impoundment to Mill and Plant Site.

APPENDIX B

ACRONYMS AND REFERENCES

ACRONYMS

AAC	<i>Alaska Administrative Code</i>
ABA	Acid Base accounting
ac	Acre
ADFG	Alaska Department of Fish & Game
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
amsl	Above mean sea level
ANFO	Ammonium nitrate/fuel oil
AP	Acid generating potential
APDES	Alaska Pollutant Discharge Elimination System
ASL	Above Sea Level
ATV	All terrain vehicle
BLM	Bureau of Land Management
CERCLA Act	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>U.S. Code of Federal Regulations</i>
CGP	Construction General Permit
CIL	Carbon in leach
DLP	Defense of Life and Property
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESCP	Erosion and Sediment Control Protection
FONSI	Finding of No Significant Impact
ft	Feet/foot
square feet	Square feet
FTDS	Filtered tailings disposal site (dry stack)
g	Grams (32.151 grams per troy ounce)
g/d	Gallons per day
g/t	Grams per tonne (1 troy ounce per ton equals 34.29 grams per/tonne)
gal	Gallons
gpm	Gallons per minute
HDPE	High density polyethylene (pipe)
HMHP	Hazardous Materials Handling Plan
in	Inch
kW	Kilowatts
LAD	Land Application Disposal
LOM	Life of Mine
m/l	
MAMC	Mespelt & Almasy Mining Company LLC
MCL	Maximum Contaminant Levels
MCRI	Mystery Creek Resources, Inc.
mg/L	Milligrams per liter
mi	Mile

mil	Millimeters
MSHA	Mining Safety and Health Administration
MWMP	Meteoric Water Modeling Procedure
NAAQS	National Ambient Air Quality Standards
NGI	Nevada Goldfields, Inc.
NP	Neutralization potential
APDES	Alaska Pollution Discharge Elimination System
O & M	Operation and Maintenance
ORL	Owner Requested Limits
oz	Ounce (for gold use troy ounces – 12 troy ounces per pound)
PEA	Preliminary economic assessment
POO	Plan of Operations
RCRA	Resource Conservation and Recovery Act
SAS	St. Andrews Goldfields Ltd.
SPCC	Spill Prevention Control and Countermeasures Plan
SWPPP	Storm Water Pollution Prevention Plan
t	Tonne (metric ton – 2204.622 pounds)
tds	Total dissolved solids
tpd	Tonnes per day
TPECI	Travis/Peterson Environmental Consulting
tpy	Tonnes per year
TSF	Tailings storage facility (tailings pond)
UIC	Underground Injection Control
WAD	Weak acid dissociable
yd ³	Cubic yard

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