



ALDERON
IRON ORE CORP

KAMI IRON ORE PROJECT

**Kami Iron Ore Project
Amendment to the
Environmental Impact Statement**

APPENDICES

February 2013

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Appendix A

Draft Rehabilitation and Closure Plan



Rehabilitation & Closure Plan

Kami Iron Ore Project

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1.0 INTRODUCTION

Alderon Iron Ore Corp. (Alderon) is proposing to construct and operate the Kamistiatusset (Kami) Iron Ore Project, which will consist of an open-pit iron ore mine and associated infrastructure in western Labrador, as well as a terminal facility (The Kami Pointe-Noire Terminal) at the Port of Sept-Îles, Pointe-Noire, Québec (the Project).

Alderon has retained Stantec Consulting Ltd. (Stantec), to complete a rehabilitation and closure plan in support of the Project development.

There are currently no plans to close or rehabilitate the proposed Kami Pointe-Noire Terminal facilities (further details are provided below). Therefore, this document has been prepared specifically to address the requirements outlined under the Newfoundland and Labrador *Mining Act* for the Rehabilitation and Closure Plan submission for the Kami Mine and Rail Line portion of the Project only.

The scope of this Plan is primarily defined by the Guidelines for the preparation of a Rehabilitation and Closure Plan for submission provided by the Department of Natural Resources of the Province of Newfoundland and Labrador (A copy of the guidance document is provided in Appendix A). These guidelines are based on the standards and requirements outlined by the *Mining Act* of the Province. Where necessary, alternate or additional information is presented based on the specific Project details for this proposed mine development.

1.1 Background

The Project's Labrador components and activities will include the construction, operation, and eventual closure and rehabilitation of the following key elements:

- Open Pit Mine (Rose Pit);
- Mineral Processing Infrastructure and Site Buildings;
- Waste Rock and Overburden Stockpiles (Rose North and Rose South);
- Tailings Management Facility (TMF) and associated TMF discharge water treatment facility;
- Access Roads;
- Power / Transmission Lines;
- Rail Line; and
- Other Ancillary Infrastructure and Equipment.

The iron ore concentrate that is produced by the Project's Labrador mining and processing components will be transported by rail using the existing Québec North Shore and Labrador (QNS&L) and Cliffs rail infrastructure to the Port of Sept-Îles in Pointe-Noire, Québec.

The Project's Québec components and activities will include the construction and operation of Alderon's proposed Kami Pointe-Noire Terminal, which will include the following key elements:

- A Concentrate Unloading, Stacking, Storage and Reclaiming Facility; and
- Associated Rail infrastructure (Rail Loop).

From Alderon's proposed terminal facilities, the iron ore concentrate will be reclaimed and directed to a common conveyor and ship loading facility owned and operated by the Port of Sept-Îles.

1.2 Rehabilitation and Closure Principles and Planning

There is currently no intention to close or rehabilitate the proposed Kami Pointe-Noire Terminal facilities, given the clear value and utility of this infrastructure for future port operations and its likely adaptability to other existing or future users. It is therefore planned that, upon conclusion of Alderon operations, this infrastructure will be transferred to another owner and operator.

The Pointe-Noire Terminal facility will be subject to regular maintenance, as required, and it is assumed that it will be operated on a permanent basis. As such, formal and separate plans for rehabilitation and closure have not been developed for the facility. Should rehabilitation be required for all or a part of the facility, a detailed Rehabilitation and Closure Plan will be developed and implemented in accordance with acceptable standards of the day by the then owner / operator of the facility, and in consultation with relevant regulatory agencies.

Therefore, this document has been prepared specifically to address the requirements outlined under the Newfoundland and Labrador *Mining Act* for the Rehabilitation and Closure principles and planning for the Kami Mine and Rail Line portion of the Project only.

1.2.1 Regulation, Design and Implementation

For mining projects, a Rehabilitation and Closure Plan is a requirement under the Newfoundland and Labrador *Mining Act* (Chapter M-15.1, Sections 8, 9 and 10), which defines it as a plan which describes the process of rehabilitation of a project at any stage of the project up to and including closure. Rehabilitation is defined as measures taken to restore a property as close as is reasonably possible to its former use or condition or to an alternate use or condition that is considered appropriate and acceptable by the Department of Natural Resources.

There are three key stages of rehabilitation activity that occur over the life of a mine:

- 1) Progressive rehabilitation;
- 2) Closure rehabilitation; and
- 3) Post-closure monitoring and treatment.

Progressive rehabilitation involves rehabilitation that is completed, where possible or practical, throughout the mine operation stage and prior to closure. This will include activities that contribute to the rehabilitation effort that would otherwise necessarily be carried out upon

cessation of mining operations (closure rehabilitation). In some cases, a crossover between “progressive rehabilitation” activities and operational activities may exist.

Closure rehabilitation involves measures undertaken after mining operations, in order to restore or reclaim the property as close as reasonably possible to its pre-mining condition. This will include demolition and removal of site infrastructure, re-vegetation, and any other activities required to achieve the requirements and goals detailed in the Rehabilitation and Closure Plan.

Upon completion of the closure rehabilitation activities, a period of “post-closure monitoring” is then required to ensure that the rehabilitation activities have been successful in achieving the prescribed goals. Once it can be demonstrated that practical rehabilitation of the site has been successful, the site will be closed-out or released by the Department of Natural Resources, and the land relinquished to the Crown.

1.2.2 Rehabilitation and Closure Plan Submission and Review

A formal Rehabilitation and Closure Plan is required to obtain approval for project development under the *Mining Act*. This Plan is required to be submitted with or immediately following the submission of the Project Development Plan and provides the basis for the establishment of the Financial Assurance for the Project. The *Mining Act* requirements will only be reviewed by NLDNR following release of the Project from Environmental Assessment and the review and approval process can typically take six (6) months to one (1) year.

The Rehabilitation and Closure Plan is directly linked to mine development and operation over the life of a mine and therefore must be considered a “live” document. It is common practice in the industry to review and revise the Rehabilitation and Closure Plan throughout the development and operational stages of a project. The process of reviewing and updating the Plan commonly occurs on a five year cycle after the start of operations; however the review cycle is typically established on a site by site basis.

The final review of the Rehabilitation and Closure Plan generally occurs once the mine closure schedule is known (typically 12 months or more before end of mining). This final review forms a “Closure Plan” which defines in detail the actions necessary to achieve the Rehabilitation and Closure objectives and requirements. This Plan utilizes the actual site conditions and knowledge of the operation of the site and can therefore provide specific reference to activities and goals.

1.2.3 Rehabilitation at the Kami Iron Ore Project

This document presents the current opportunities and plans to rehabilitate the Project site progressively during mine operation and at closure. The opportunities and plans described herein are based on the mine design information and best practice rehabilitation technology and procedures available at the time of writing. Therefore, this document should be considered a conceptual plan subject to revision, alteration, or update, based on actual site conditions that are determined as the Project develops.

1.3 Objectives and Scope of the Rehabilitation and Closure Plan

The overall objectives of the Rehabilitation and Closure Plan proposed for the Kami Iron Ore Mine site include:

- Restoration of the land to as close to natural state as possible;
- Creation of a landscape which is compatible with surrounding terrain and land use;
- Mitigation and control to within acceptable levels, the potential sources of pollution, fire risk, and public liability; and
- Providing an environment and landscape that is suitable for long term public access and use.

The Rehabilitation and Closure Plan outlines the mine site development and operational characteristics for the Project and details the steps and procedures to be taken to progressively rehabilitate the site during operations and to provide final rehabilitation upon closure of the mine.

The following sections describe the natural and existing characteristics of the site which provide the basis for the Rehabilitation and Closure Plan design described herein.

1.3.1 Physical and Chemical Stability

The Rehabilitation and Closure Plan works towards achieving both physical and chemical stability of the entire project area based on a progressive rehabilitation approach, followed by a comprehensive closure and environmental effects monitoring (EEM) program.

Physical Stability

The Rehabilitation and Closure Plan addresses the physical stability aspect of the site components which remain after operations have ceased. In the case of the Kami site, these components may include collection / sedimentation pond berms and associated outlet structures and channels; TMF berms and associated infrastructure; slopes and high walls associated with the open pit; waste rock and overburden stockpile slopes; and construction features associated with buildings and site infrastructure. The Plan considers the deterioration of site components over the long term, by perpetual forces such as precipitation, wind, chemical weathering, and seismic events.

Chemical Stability

To meet the Rehabilitation and Closure Plan objectives, it is necessary to ensure long term chemical stability of the rehabilitated mine site. The Plan design contains appropriate methods to ensure that on-site water, drainage, and surface runoff from the site meet acceptable water quality standards.

Chemical stability issues at the Project site include: erosion and surface water sedimentation that may degrade water quality; and possible nitrogen species contamination of open pit mine

surface runoff and groundwater from incomplete combustion of explosives used in open pit mining.

Acid drainage and associated metal leaching from ore, waste rock or tailings is not expected to be an issue in the Project (EIS Draft July 2012). Sulphide minerals are generally not prevalent in the geology of the Kami deposit. While sulfide mineralization in the form of pyrrhotite identified by the Kami geologists within the Menihek formation in the Rose Pit area poses a small acid drainage risk; the acid neutralizing properties of the other rock types will mitigate this potential. There have been no reported instances of acid generation by nearby mining operations in the past 40 years. Based on this, the risk of Acid Rock (Mine) Drainage (ARD) is extremely low. Alderon will conduct ARD and metal leaching (ML) test work during the permitting and development stages of the Project to ensure that waste materials to be stored on surface will produce only chemically stable drainage (EIS Draft July 2012).

1.3.2 Natural Aesthetic Requirements

The proposed Project site is situated within an undeveloped natural landscape typified by rugged physiography with rolling hills and valleys, which trend from northeast-southwest to north-south, reflecting the structure of the underlying bedrock. Elevation ranges from 580 to over 700 m, with slopes that are generally standing at angles of 2 to 15%. Ground cover consists of sedges in open wetland bogs and coniferous and deciduous trees, with alder growth over those areas exposed by past forest fires.

Visual impact of the mine site is an important consideration. There exists the concern of red water aesthetic discolouration of the TMF effluent during operations. Mitigation measures proposed include red water treatment through the addition of flocculant. At closure, with the tailings surface stabilized there is no expected need for closure red water treatment facilities, and surface runoff will be free of potential red water concerns.

As part of the Rehabilitation and Closure Plan, the primary objective is to return the site as close to pre-mining conditions, as practical, with due consideration to the natural aesthetics that currently exist.

1.3.3 Re-vegetation and Wildlife

To achieve overall objectives, the Rehabilitation and Closure Plan ensures that re-vegetation will be self-sustaining over the long term by being compatible with on-site soil and local climatic conditions. Establishment of vegetation will facilitate the natural recovery of the area for use by local wildlife and will be conducted in areas that were vegetated prior to the initiation of the development program.

Prior to re-vegetation, the Rehabilitation and Closure Plan ensures that disturbed areas of the site such as roadways, building areas, storage pads and storage area bases are suitably prepared either by scarification to loosen the soil and/or loosened and covered with a cap of local soils where possible. Concrete structures will be removed or buried under a suitable cover of local soils to permit vegetation growth. In all cases, the primary objective of re-vegetation is to

stabilize the soil against the erosion forces of both wind and water, and provide a naturally sustainable surface cover.

1.3.4 Water Management

The Rehabilitation and Closure Plan considers water management issues as they relate to:

- Potential control and mitigation of drainage issues (potential ARD/ML, nitrogen species, red-water) from both surface waste materials and mine workings;
- The long term fate of discharges of process water from the process plant, sanitary sewage and other wastewater from the site infrastructure following closure of the proposed mine;
- Control and mitigation of discharge water from the TMF area following closure of the mine; and
- Site drainage and surface run-off from the mine site to control erosion, sedimentation, and the degradation of adjacent water courses.

The overall objective of the water management program is to minimize any potential impact on the site and the down-gradient surface and groundwater system to acceptable guideline levels, without creating the requirement for long term post-closure water treatment.

1.3.5 Air Quality

During mine development and operations, vehicle traffic on access and site roads has the potential to create some dust and there will be emissions from combustion engines and other hydrocarbon-fuelled equipment. Rehabilitation activities also have the potential to create some dust during excavation and earthwork associated with removal, grading and/or stabilization of embankments, waste rock and overburden stockpiles, and soils. Dust levels will be minimized during these activities through the use of water sprays or coverings, where practical.

Following the closure construction activities, only occasional light truck traffic, related to mine closure monitoring activities, will occur on site and are expected to have a negligible impact on local air quality.

1.3.6 Noise Levels

Noise levels during the development and operating period of the mine will be similar to other open pit mining operations. The main sources of noise will include site vehicles, ore transport, compressors, blasting, crushing and grinding, and maintenance shop activities. With the exception of noise created by site vehicles, most of the other activities will be within buildings or enclosures which will minimize the exterior noise level.

During mine rehabilitation, sources of noise will include site vehicles and earthmoving equipment, periodic blasting as required for pit slope wall stability and building demolition. Following rehabilitation and closure, noise levels on the mine site will return to ambient background levels.

1.3.7 Long Term Land Use

The Rehabilitation and Closure Plan considers long term land use for the mine site that is sustainable and compatible with local and regional topography, soil and climatic conditions.

Other land use options, such as agricultural, commercial/industrial, and forestry activity are not considered viable at this time.

Final closure planning will be based on the current Canadian Council of Ministers of the Environment (CCME) soil quality guidelines to industrial classification. The surface rights will be returned to the Crown once the lands are rehabilitated and stabilized to the level prescribed in the final Rehabilitation and Closure planning document.

2.0 PROPOSED APPROACH TO REHABILITATION AND CLOSURE

The approach to rehabilitation will involve advanced progressive and closure rehabilitation techniques through integrated development, operational and closure technology and design.

In addition to the requirements under the *Mining Act*, the Rehabilitation and Closure Plan forms part of the required submission for the application to obtain a mill licence and to obtain the Provincial Certificate of Approvals for Construction and Operations. This Plan will be subject to scheduled reviews and updates as additional or revised information pertaining to rehabilitation and closure activities becomes available through the development stage and during the operational life of the mine. The proposed rehabilitation and closure planning and implementation schedule for the Kami Iron Ore Mine is presented in Figure 2.1, summarized below and discussed in detail in following sections.

On-going and future Project planning and design activities will include the proactive consideration of future closure issues and requirements. The site design will follow the concept of “designing for closure” for all site structures. Steps to promote the overall rehabilitation process will include the following:

- Terrain, soil and vegetation disturbances will be limited to that which is absolutely necessary to complete the work within the defined Project boundaries;
- Wherever possible, organic soils, mineral soils, glacial till, and excavated rock will be stockpiled separately and protected for later rehabilitation work;
- Surface disturbances will be stabilized to limit erosion and promote natural re-vegetation;
- Natural re-vegetation of surface disturbances will be encouraged; and
- Alderon will incorporate environmental measures in the contract documents. As such, contract documents will reflect the conditions specified for the construction and operation of the Project. Contractors will be bound contractually to comply with the environmental protection standards set by Alderon and be compliant with applicable federal and provincial regulatory requirements.

Strategies and methods, which will be employed to minimize environmental disturbances during construction and operations, are described in the following sections.

2.1 Mine Development

All aspects of the mine development (engineering and construction phases), including mine design, infrastructure locations, construction planning and implementation and operations planning will be conducted with full consideration of available progressive rehabilitation opportunities and closure rehabilitation requirements. An environmental monitoring program will be conducted as part of the mine development and this data will be utilized to evaluate the progressive rehabilitation program on an ongoing basis. The Project will be planned and designed to minimize the disturbed area of the site, where possible, and to avoid or reduce environmental effects.

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Figure 2.1 Kami Iron Ore Mine Rehabilitation and Closure Schedule

Mine Development Planning, Construction and Operation
Environmental Monitoring and Post-Closure Monitoring
Rehabilitation Activities
Close-Out and Relinquishment of Land

2.2 Mine Operations

Once the mine advances from the development stage to the operational stage, progressive rehabilitation activities can commence. Progressive rehabilitation opportunities for the site during the operational stage include:

- Dredging and removal of Polishing Pond sludge to the tailings impoundment area of the TMF;
- Rehabilitation of construction-related buildings and lay down areas;
- Grading and re-vegetation of tailings (downstream slopes of embankments);
- Stabilization and concentrated re-vegetation of waste rock and overburden stockpile areas;
- Development and implementation of an integrated Waste Management Plan;
- Installing barricades and signage around sections of the open pit, where required; and
- Completing re-vegetation studies and trials.

As described throughout this document, an environmental monitoring program will be conducted as part of the mining operations and this data will be utilized to evaluate the progressive rehabilitation program on an ongoing basis. Studies, such as re-vegetation trials, may be conducted as required over the operational phase of the mine, the results of which will be integrated into ongoing progressive rehabilitation activities and used, if appropriate, in the development of the final closure rehabilitation design.

Part of the rehabilitation and closure activities conducted during mine operations will include scheduled reviews and updates of this Rehabilitation and Closure Plan, as required. These scheduled reviews will incorporate any new or revised data gained from operating experience, progressive rehabilitation activities, environmental monitoring, and rehabilitation-related operational studies. The proposed Plan review schedule may be altered if significant changes to the Development Plan or Mine Plan are required due to changing technology, economics, or increases in resources are identified.

2.3 Mine Closure

Typically, the final review and update of the Rehabilitation and Closure Plan is conducted approximately one year prior to the cessation of operations. The final review of the Plan will provide the detailed closure rehabilitation design and procedures to fully reclaim the mine site. This Plan will be developed to a contract ready stage and will include Contract Documents and Drawings, as well as, a detailed cost estimate for the work (± 15 percent).

Final closure rehabilitation activities are anticipated to require one or two years and will generally include:

- Removal of hazardous chemicals, reagents and other such materials for re-sale or disposal at an approved facility;
- Equipment will be disconnected, drained and cleaned, disassembled and sold for reuse or to a licensed scrap dealer. This includes tanks, mechanical equipment, electrical switchgear, pipes, pumps, vehicles, equipment and office furniture;
- Any equipment deemed potentially hazardous will be removed from the site and disposed of in accordance with appropriate regulations;
- Dismantling and removal / disposal of all buildings and surface infrastructure including the rail line;
- Materials with salvage value will be removed and sold. Note that this expected salvage value will not be used to reduce the decommissioning cost estimate in the formal Project Rehabilitation and Closure Plan. Demolition debris with no marketable value will be disposed of in a manner consistent with the disposal of other building demolition waste;
- Demolishing all concrete foundations to 0.3 m below surface grade, at a minimum, and burial in place if possible or disposal in an appropriate landfill off-site;
- Permanent sealing of the sub-surface portion of the gyratory crusher building through the placement of a reinforced concrete slab and waste rock backfill to surface;
- Permanent sealing of the crushed ore conveyor tunnel through infilling with waste rock;
- Removal and rehabilitation of fuel storage and dispensing facilities;
- Assessing soil and groundwater conditions in areas that warrant assessment (such as fuel dispensing facilities, chemical storage buildings, ore storage areas, effluent treatment ponds) and implementing remedial measures where necessary;
- Stabilization and concentrated re-vegetation of remaining waste rock and overburden stockpile areas;
- Installation of barricades and signage around any remaining open pit in areas, as necessary;
- The tailings pile will be left in place, with progressive re-vegetation, and following the effluent treatment transition period, will eventually be completely graded and vegetated. The Polishing Pond and associated decant structures and TMF water treatment facility will be removed and the area re-graded and stabilized against erosion;
- Decommissioning of dewatering wells / groundwater monitoring wells;
- Following water quality testing, breaching of sedimentation ponds to allow drainage to surrounding vegetated areas for natural filtration;
- Re-establishment of general site drainage patterns as near as practical to natural, pre-development conditions;
- Grading and/or scarification of disturbed areas to promote natural re-vegetation, or the placement and grading of overburden for re-vegetation in areas where natural re-vegetation is not sufficiently rapid to control erosion and sedimentation; and

- Any additional or special rehabilitation requirements associated with the site such as removal of culverts and power lines, and infilling of any drainage or diversion ditches which are no longer required.

The post-closure monitoring program will continue for an anticipated period of five (5) years after final closure activities are completed or earlier should Alderon and the appropriate regulatory bodies be satisfied that all physical and chemical characteristics are acceptable and stable. When the site is considered physically and chemically stable, the land will be relinquished to the Crown.

The following sections of this Plan detail the rehabilitation opportunities, plans, schedules and estimated costs as they are currently envisioned for the Kami Project. The opportunities and plans described herein are based on the mine design information and best practice rehabilitation technology and procedures available at the time of writing.

3.0 PROGRESSIVE REHABILITATION

As previously stated, progressive rehabilitation is considered to include rehabilitation completed, where possible or practical, throughout the mine operation stage, prior to closure. This includes activities that contribute to the rehabilitation effort that would otherwise be carried out at mine closure. In some cases a cross-over between “progressive rehabilitation” activities and operational activities may exist.

Progressive rehabilitation opportunities identified for the proposed Kami Iron Ore Mine at the time of writing include: dredging and removal of Polishing Pond sludge; rehabilitation of construction-related buildings and lay down areas; grading and re-vegetation of tailings (downstream slopes of embankments); stabilization and re-vegetation; stabilization and re-vegetation of waste rock and overburden stockpile areas; development and implementation of an integrated Waste Management Plan; installing barricades and signage around sections of the open pit; and, completing re-vegetation studies and trials. Additional progressive rehabilitation activities may be identified during the design, development, and operational stages of the mine and these will be actively pursued where practical.

4.0 CLOSURE REHABILITATION

Closure rehabilitation, carried out once mining operations have ceased, includes all activities required to fully restore or reclaim the property as close as reasonably possible to its former condition. This will include demolition and removal of site infrastructure, re-vegetation and all other activities required to achieve the requirements and goals detailed in the Rehabilitation and Closure Plan.

Closure rehabilitation activities planned for the Project, based on the information available at the time of writing are described in the following sub-sections.

Closure rehabilitation activities will be carried out on the mine site with the general objectives as previously noted. As required in the *Mining Act* and associated guidelines, the rehabilitation activities are based on the completion of these activities by Alderon and their contractors. Whereas, the closure cost estimates provided in Section 6.0 are based on the owner default scenario. In this case the costing is based on others having to carry out and manage this work and, as outlined in the *Mining Act*, credit for salvageable materials and equipment is not accounted for, even though these options will be pursued assuming Alderon completes the closure activities.

4.1 Infrastructure

All affected ground will be incorporated as part of the general site grading and contouring. Any remaining wastewater and sewage in the holding tanks of the engineered treatment facilities will be pumped of their contents by an appropriate waste disposal contractor and the tanks will be collapsed and removed to an appropriate waste disposal area. Any salvageable equipment will be identified and preserved for salvage, if possible. Infrastructure items carrying no salvage value will be removed and disposed of off-site where practicable to do so. It is assumed all demolition material will be disposed in Labrador City.

All above-ground buildings will be dismantled and removed / disposed of. Steel structures will be salvaged if conditions permit. Evaluations of salvage values for processing equipment will be conducted. All foundations below grade will be left in place while all above grade concrete will be demolished to a minimum of 0.3 m below grade and then be buried in place. Any concrete associated with the demolished structures will be disposed of at an approved location following verification of the removal of any potential hazardous materials. These materials may be treated as contaminated wastes and be disposed of at an appropriate site or waste disposal facility.

Although best practices will be employed at the Project area, the ground around and under the structures will be visually assessed for the potential presence of oils or lubricants upon removal of any equipment and recommendations for further action, if required, will be made. Once the existing structure remnants have been addressed, the site will be re-graded to provide for a uniform and smooth transitional contour. All building site areas will be re-graded to match the surrounding grades and the surface will be loosened or capped with local soils of a type suitable for natural re-vegetation.

4.2 Underground Facilities

4.2.1 Gyratory Crusher Building and Conveyor Tunnel

Contingent on the results of an underground stability analysis carried out for the gyratory crusher building and conveyor tunnel just prior to mine closure, the detailed Rehabilitation and Closure Plan will define the safe closure of any underground openings to remain. Preliminary plans will be that all environmentally sensitive materials and equipment drained of all oil and petroleum products will be removed and transferred to the surface for proper controlled disposal.

Once all equipment and environmentally sensitive materials are removed from the underground portion of the gyratory crusher building, the openings will be permanently closed. The building opening will be protected and permanently closed by placing a reinforced concrete slab over the opening. The concrete slab will be anchored to the upper level floor slabs of the building, which will have been designed for closure. The surface excavation above the upper level floor slab will be backfilled using clean (non-sulphide) mine waste rock. The conveyor tunnel will be backfilled to a depth of approximately 25 m from the surface entrance using clean (non-sulphide) waste rock. The surfaces will be contoured to match the surrounding grades and conditioned with local overburden materials and vegetated to match the surrounding area.

All work will be designed and carried out to the satisfaction of the Department of Natural Resources based on the standards at the time of the work.

4.3 Waste Rock and Overburden Stockpiles

The waste rock and overburden stockpiles will be segregated. These areas will be designed for closure and benched, with waste placement in tiers starting at the lowest elevation. The stockpiles are planned to be completed in sections (in plan), with clearing and grubbing carried out only on the next section where waste is to be placed. Organic / overburden materials will be used over the life of the Project for use in progressive rehabilitation, to conduct re-vegetation trials, and in the final closure phase.

For rehabilitation and closure planning and providing a cost estimate for closure, and in consideration of existing local site conditions and the pending completion of re-vegetation trials, it is assumed that concentrated re-vegetation "mosaics" or areas, located in relatively protected areas, will be the most effective re-vegetation strategy. Mosaics of locally sourced overburden and/or organic soils will be placed over approximately 20% of the total area. These topsoil mosaics will then be fertilized and vegetated. This method will concentrate the limited organic materials and overburden in areas relatively protected from wind and water scour near the toe of the stockpile where the underlying soils (waste rock) will not drain moisture away. These vegetation mosaics then shed organic materials, primarily in the prevailing wind direction, which will accumulate and provide sufficient base for the same vegetation to spread and cover additional area naturally.

Associated sedimentation ponds will be maintained until the stockpile surface areas are stabilized then rehabilitated as described below. Perimeter drains will also be retained to route perimeter drainage to the sedimentation ponds.

4.4 Open Pit

The Rose Pit will be decommissioned through a sequence of events designed to help ensure its long-term stability. Based on surface runoff and seepage estimates, if headwater diversion strategies are kept in place to maintain flow to the lake to the north (Pike Lake South), it may take as much as 150 years for the open pit to fill to its natural outlet elevation (approximately 470 m). The costs, timeline and necessary monitoring requirements associated with maintaining the perimeter ditching, headwater diversion pipeline, and proposed dam across the outlet from Mid Lake over this period would be substantial and not feasible. Therefore, early closure is

proposed and the dam will be breached, the pipeline removed and headwater drainage will be routed into the open pit to increase the refilling rate. This early closure strategy will reduce flows to Pike Lake South and will only be undertaken following the direct approval of the applicable regulatory agencies.

As per engineering specifications, the pit walls will be excavated to a stable slope angle during mining operations. Pit slopes will be graded and contoured above and just below the anticipated final water surface for safety and access over portions of the pit perimeter.

During mining operations, large rocks (waste rock particles in the order of 1 to 2 m) excavated from the pit will be collected and hauled to the perimeter of the open pit, where practical and necessary, to where slopes will exist above the final flooded pit water surface. The rocks will then be placed along the top of these sections to form a warning and protective barrier to prevent people and vehicles from travelling directly over the top of the slope. Signs warning people of any steep slopes, if present, will also be erected at suitable intervals across these perimeter slope sections. In addition, the pit access ramp will provide safe slope access at closure.

4.5 Tailings Management Facility

The Tailings Management Facility includes a tailings impoundment area (with a Tailings Pond), Polishing Pond, a TMF water treatment facility, and associated elements and structures.

Upon cessation of processing and plant effluent discharge, the effluent will be held and treated for the required treatment period. Preliminary estimates to draw down and treat the tailings and the polishing pond water have been determined to be approximately 2 years, therefore advanced drawdown of the Tailings Pond will commence prior to closure to avoid extending the closure period.

Following the treatment period, rehabilitation and closure activities of the TMF will commence. These activities will include re-vegetation across the top (flat) area of the impoundment area and will consist of a “mosaic” of vegetation areas. Mosaics of locally sourced overburden and/or organic soils will be placed over approximately 20% of the total tailings area. These topsoil mosaics will then be fertilized and vegetated. This technique will allow organic material and seed generated by the living plants to spread over the soil covered tailings area over time.

After the vegetation cover is established and the tailings surface is stabilized the following activities related to surface water are expected:

- Dykes and dams will remain in-place to contain the tailings, although dams will be breached to avoid the impoundment of water and to lower the risk of wet weather dam breach;
- To the extent feasible the TMF will be graded to re-establish drainage patterns to existing conditions;
- Testing will be completed to ensure that the water in both the Tailings and Polishing Ponds is suitable for discharge;

- The Tailings Pond may naturally dewater or at least lower in water surface elevation and as such should naturalize into a wetland feature over time;
- The Polishing Pond will be retained until after post-monitoring activities cease and will be dewatered, red sediment removed and the dam breached to allow restoration of the existing condition watercourse; and
- With the tailings surface stabilized there is no expected need for closure sedimentation facilities. Surface runoff should be free of potential red water concerns. Groundwater will move through the tailings and red water in seepage beyond the TMF footprint is not expected. However the potential for tailings groundwater seepage routing through the dam breaches to have red water content will be monitored and if confirmed then an appropriately sized and graded aggregate filter installed to prevent red water TSS migration, but allow groundwater passage.

4.6 Sedimentation Ponds and Diversion Ditches

After the remainder of the site has undergone rehabilitation and surrounding vegetation is established, sedimentation ponds and diversion ditches will be rehabilitated. Testing will be completed to confirm that the water quality in the ponds meet regulatory requirements (i.e., ammonia has been flushed from the system) for discharge to the environment. The sedimentation ponds will be breached and the water drained to surrounding vegetated areas for natural filtration. The ponds should naturalize into wetland features over time. The sediment contained within ponds associated with run-off catchment will be left in place unless removal is required to re-establish drainage. Diversion ditches will be engineered to permit the re-establishment of natural drainage. Vegetation growth will be monitored to determine if additional measures to establish vegetation are deemed necessary.

4.7 Pipelines

Pipelines related to fresh water intake, washwater diversion, TMF, in-pit pump, and dewatering systems will be removed. All mechanical equipment (pumps and pipelines) will be salvaged, intake structures will be demolished, and the demolition debris will be removed. The surrounding area will be graded and rehabilitated. All remaining trenches resulting from pipeline removal will be backfilled and contoured to match the existing surrounding grade. Dewatering and groundwater wells will be backfilled and capped in accordance with applicable regulations.

4.8 Railway

The rehabilitation and closure of the railway will consist of removing all ties, rails and other track materials. Rails will be removed and transported off-site for recycling / reuse. Ties and any culverts installed during project development will be removed and disposed of off-site. The culvert locations will be sloped at a minimum of 3:1 to ensure no erosion into existing watercourses. Rock fill will be used during construction at these locations; therefore; during rehabilitation, this material will be of adequate size to achieve required slopes providing additional stability and erosion protection. Standard creosote treated Harwood #1 ties are currently anticipated for use on the line. Harwood #1 ties are well known for their durability and have been applied universally on main line track construction projects throughout Canada

without environmental concerns, however, Alderon proposes to conduct post-operational soil sampling beneath the ballast to assess for the potential of the primary potential contaminants of concern.

The rail bed will be graded and left in place to facilitate use by local residents and to provide access for long term monitoring and maintenance of the site, if required. The rail bed will also be assessed for re-vegetation opportunities, where practical.

4.9 Roadways

Haul Roads, access roads and service roads will be rehabilitated. The main site access road will remain intact for post-decommissioning activities and emergency situations. The roads will be scarified to loosen the surface structure and promote re-vegetation, and the existing drainage ditches will be infilled by grading, and the cross section contour will be shaped to match the adjacent ground. Any culverts and bridges installed during development will be removed and disposed of off-site, and the roads will be assessed for re-vegetation opportunities where practical. As stated for culverts associated with the rail, the culvert and bridge locations will be sloped at a minimum of 3:1 and rock fill will be used during construction to achieve required slopes at closure.

4.10 Electrical Distribution Line

At this stage of the project, Alderon is in discussions with Nalcor Energy regarding the possible establishment of a 46 kV electrical distribution line to the site for construction and for emergency back-up power, as well as construction and operation of a larger 315 kV power line from western Labrador to supply the power required during Project operations. Assuming this agreement is in place, Nalcor Energy will be responsible for constructing, owning and operating these transmission lines, which will bring power directly to the plant main substation, as well as for obtaining and complying with all associated environmental permits and authorizations for the construction and operation of these lines. Therefore, rehabilitation and closure of the transmission line will be the responsibility of Nalcor Energy, and costs have not been included in the closure cost estimate.

4.11 Solid Waste Disposal

The operations daily waste stream at the site will likely have consisted of plastics, wood, shipping and packaging materials and paper products that cannot be further recycled in the offices and laboratories. Also included in this waste stream will be a very small amount of employee generated waste from packaging of meals. This material will be handled by the domestic waste collection system during operations and will not be on site at the time of closure.

4.12 Process Waste

A certain amount of industrial waste will also be generated over the operating period of the mine. This material will include mostly scrap metal, used conveyor belts, abandoned vehicles, and machine parts. It is expected that these materials will be disposed of off-site with a certified waste collector during mine operations as part of the Waste Management Plan. Materials

remaining upon closure will be removed and disposed of with the general demolition waste or recycled, where possible.

4.13 Hazardous Materials

Portions of the site may be identified at the time of closure as having the potential to contain hazardous materials either in storage or in the ground as a result of normal activities and/or accidental spills. In the case of stored materials such as fuel, oils, lubricants, explosives, hazardous chemicals, and other hazardous materials, these will be removed from site and handled either by disposal, resale or restocking in accordance with the transportation and safety procedures outlined in the appropriate Material Safety Data Handling Sheets. All such materials will be identified and inventoried on the surface and underground and will be removed from the site prior to the commencement of closure activities.

4.14 Re-establishment of Site Drainage Patterns and Vegetation

The rehabilitation procedures described above will be planned and carried out to ensure the general re-establishment of pre-Project surface runoff patterns. A key objective of the rehabilitation and closure activities and program will be to create the necessary conditions for the re-establishment and long-term propagation of indigenous native species in the areas disturbed by Project-related construction and operational activities. These areas will be rehabilitated as follows:

- Grading and contouring the disturbed surface area as necessary to reduce erosion potential from surface runoff;
- Applying a soil cover where it is considered necessary for vegetation growth;
- Establishing vegetation, rock armour, or other low maintenance erosion control devices in areas where erosion is a potential concern from the loosened or contoured surface;
- Establishing vegetation cover on reclaimed surfaces in the Alderon development area that is of a similar density and diversity as that which exists in proximate areas; and
- Providing for temporary controls for erosion stability during the period of vegetation establishment.

These general procedures may be modified and more detailed methods specified based on knowledge gained in the planned pre-closure site studies, which will be carried out during the operating period of the mine.

4.15 Salvage and Local Recycle of Materials

In the period leading up to decommissioning of project facilities and mine closure, the mine operator will evaluate options to identify the potential for recycle and reuse of materials. Where such potential exists, the final Rehabilitation and Closure Plan will be modified to include:

- Details of materials and demolition wastes which are to be salvaged;
- Locations where such materials are present on site;

- Any conditions which render the materials unsuitable for salvage and reuse, such as structural damage, wetting, or contamination;
- Methods for salvaging the materials to ensure they meet required conditions for reuse;
- Any requirements for cleaning or otherwise rendering the materials safe for use; and
- Locations for stockpiling salvaged materials separate from other demolition wastes.

5.0 POST-CLOSURE MONITORING AND TREATMENT

Post-closure monitoring and treatment will be conducted to ensure the chemical and physical outcomes and effectiveness of the rehabilitation work and general site prior to close-out and relinquishment of the land to the Crown. Alderon must plan and undertake any such post-closure monitoring in consultation and cooperation with the relevant regulatory agencies and following the relevant regulations and standards in place at the time.

The development of a detailed post-closure monitoring program is not practical until Project design and actual development and operations are sufficiently advanced. The post-closure monitoring program will follow directly from the operating monitoring program to ensure continuity of data sources and provide historical data for monitoring sites. It is expected that post-closure monitoring will be conducted on a less regular basis (time and number of sites) as site activities cease and the monitoring requirements will eventually be reduced and then eliminated over time. A general indication of some of the potential components of the anticipated monitoring and reporting program is provided below.

5.1 Effluent Treatment and Discharge

On the day that operations cease, recently discharged effluent from the process plant to the TMF will be relatively untreated. Effluent within the TMF will be held and treated for the required treatment period. As described above, advanced drawdown of the Tailings Pond should commence at closure to avoid extending the closure period. This handling, treatment and release of effluent within the TMF and effluent treatment facilities (Tailings Pond, Polishing Pond and TMF Water Treatment Facility) will follow the standard operating procedures. As it is part of the final operation cycle of the process plant, the costs of treatment are carried under operations, not as rehabilitation costs.

During closure rehabilitation activities, water levels within the TMF and discharge chemistry will be monitored as part of the post-closure monitoring program to determine when effluent treatment can be discontinued.

5.2 Physical Monitoring

Physical monitoring will involve a review of rehabilitation and re-vegetation efforts to identify erosion concerns and evaluate the sustainability and success of the vegetation programs.

5.2.1 Vegetation

Monitoring will be carried out to evaluate the success of re-vegetation activities. Opportunities to support the maintenance of vegetation cover until it becomes self-sustaining will be assessed.

5.2.2 Open Pit

Water level, slope, safe slope access, and fill stability will be monitored to ensure that all aspects of the Open Pit rehabilitation are stable.

5.2.3 Waste Rock and Overburden Stockpiles

Slopes and surface drainage features related to the Waste Rock and Overburden Stockpiles will be examined for evidence of sloughing, excessive erosion, and siltation.

5.2.4 Tailings Management Facility

Once the effluent treatment cycle is completed, TMF rehabilitation will include the activities listed under section 4.5.

A long term care and maintenance program for the TMF dam structure will be developed as part of the final rehabilitation and post-closure monitoring plan. The program will include regular inspections and maintenance, if and when required, to ensure the structures remain stable and operate in accordance with their design. The inspection program will be developed from the detailed inspections carried out during operations and based on the CDA Dam Guidelines.

Specific inspection procedures and schedules for the long term maintenance program will be developed and will include the use of any existing monitoring instrumentation (monitor wells). Accurate inspection and maintenance records will be maintained from the operational stage through the post-closure monitoring program.

5.2.5 General

The general physical aspects of the rehabilitated mine site including drainage patterns, slope and embankment stability, soil surface stability, and re-vegetated areas will be monitored to ensure that all rehabilitation work is performing as designed.

5.3 Chemical Monitoring

It is not anticipated that any significant chemistry will be present in the water discharging from the site upon mine closure. Sampling and analysis will be conducted for surface water quality at the location of the outlets established. If poor water quality is detected, additional samples will be collected upstream to identify the source area. If the poor water quality is a result of mining activity at the site, the problem will be investigated and appropriate measures taken to mitigate the issue.

5.4 Reporting

In accordance with the requirements of the *Mining Act*, reports will be submitted on an annual basis to the Department of Natural Resources, Mineral Development Division. The reports will define the work to be carried out in the next period, the rehabilitation and closure work that was completed in the past period and the results of monitoring.

5.5 Schedule and Cost

The schedule for the post-closure monitoring program will be developed prior to mine closure and will be integrated with the operational monitoring program and adapted for the requirements of the rehabilitation and post-closure periods. Based on the current mine development and operational plans, it is anticipated that a five (5) year, post-closure monitoring program will be sufficient to determine the effectiveness of the rehabilitation program. If post-closure monitoring indicates instabilities in the physical or chemical aspects of the rehabilitation works, the monitoring program will be continued to the extent required in cooperation with the appropriate regulatory agencies.

Post-closure environmental monitoring costs will be allocated to cover the costs associated with monitoring waste water discharge over the five (5) year study and assessment period. This will include costs associated with inspection and minor maintenance of earthen embankments and re-vegetation support. The estimates of cost for this item will be reviewed and revised as required during the scheduled Plan reviews during mine operations.

6.0 COST ESTIMATE FOR CLOSURE

Stantec's cost estimate to complete the Kami Iron Ore Mine Rehabilitation and Closure program based on the level of detail available for the Project at the time of writing is approximately \$48 million. A breakdown of this cost estimate is provided under separate cover.

For the purpose of this document the term "Cost Estimate" is taken to mean Stantec's "opinion of probable cost". It is recognized that neither the Client nor Stantec has control over the costs of labor, equipment or materials, or over the contractor's methods of determining prices or time. The opinions of probable costs or project duration are based on Stantec's reasonable judgment and experience and do not constitute a warranty, express or implied, that the contractors' bids, project schedules, or the negotiated price of the work or schedule will not vary from the client's budget or schedule or from any opinion of probable cost or project schedule prepared by Stantec. The actual final cost of the Rehabilitation and Closure program will be determined through the bidding and construction process.

The cost estimates have been developed from information that is between the Conceptual and Development Level of detail, and therefore, a contingency of $\pm 30\%$ has been applied to the subtotal (not including engineering and project management estimated costs). All extraction of quantities and detail of the structures are limited by the level of detail available in the information provided at the time of writing of this report.

Financial Assurance

As per the *Mining Act*, a lessee shall provide financial assurance as part of a Rehabilitation and Closure Plan. The financial assurance is based on the cost estimate for closure presented in the Rehabilitation and Closure Plan. Financial assurance of the project may be proportioned and deferred to later years considering the stages of development and the associated rehabilitation and closure requirements. The financial assurance shall be in a form acceptable to the minister including: a) cash; b) a letter of credit from a bank named in Schedule I of the *Bank Act* (Canada); c) a bond; d) an annual contribution to a financial assurance fund established for the project; or e) another form of security acceptable to the minister.

7.0 CLOSURE

This Plan has been prepared on behalf of, and for the exclusive use of, Alderon Iron Ore Corp and its representatives, for the Kami Iron Ore Project. This Plan only represents the information and literature available at the time of its preparation. The recommendations presented herein represent the best judgment of Stantec Consulting Ltd. based on current knowledge and standards. Stantec attests that to the best of our knowledge, the information presented in this report is accurate.

Respectfully Submitted,

STANTEC CONSULTING LTD.

Amy Copeland, P.Eng.
Task Manager – Mine Rehab and Closure

8.0 REFERENCES

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APPENDIX A

Mining Act Guidance Document

Mining Act Guidelines

Requirements for Development Plan, Rehabilitation & Closure Plan,
Operational Plan, Annual Report and Financial Assurance

July 28, 2010

Summary of Mining Act Compliance Requirements:

- 1. Developmental Plan*
- 2. Rehabilitation & Closure Plan*
- 3. Operational Plan*
- 4. Annual Report*
- 5. Financial Assurance*
- 6. Mill License*

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Appendices:

- A Major Areas of a Project to be addressed in Rehabilitation and Closure Plan
- B Sample of Standard Mine Rehabilitation and Closure Performance Bond
- C Pro Forma Suggested Purpose, Documentation, and Conditions for Inclusion with Standard Financial Assurance Security
- C-a Standard Format Irrevocable Letter of Credit
- D Assignment of Security
- E Application for Mill Licence

1. **DEVELOPMENT PLAN REQUIREMENTS:**

The following is an outline of the information that is required in a Development Plan as per Section 4 of the Regulations to the *Mining Act*, which states that: “*A development plan shall be in the form prescribed in the guidelines...*”. The Minister may request other information as per section **6.(1) (c)** of the *Mining Act*.

A Development Plan must be prepared with Rehabilitation and Closure in mind, and should include, but not be limited to:

a. **Project description:**

- (i) **A Project Description** including:
 - a) Anticipated time lines for completion of and the duration of all stages of the project:
 - (1) Development;
 - (2) Operation;
 - (3) Rehabilitation and closure;
 - b) A description of the geographical location and access;
 - c) List of all leases (*mining, quarry, other*), and surface leases in tabular format reporting area in hectares (*ha's*),
- (ii) **A Site Boundary Plan**, showing:
 - a) The entire area of the lease, and,
 - b) Outline all known mineral resources on the lease, projected to surface;
- (iii) **A Site Plan**, showing in detail all areas of project activities, including:
 - a) The mine area showing:
 - (1) Ore, waste, topsoil and overburden stockpiles, and dumps;
 - (2) Sedimentation pond/s; and,
 - (3) Explosives magazines (*powder and caps*), and explosive plant;
 - b) For an underground operation:
 - (1) Shafts;
 - (2) Portals;
 - (3) Ramps;
 - (4) Ventilation and service raises to surface; and,
 - (5) Main ventilation fans;
 - c) For an open pit operation:
 - (1) Access and haulage ramps;
 - (2) Pit outline;
 - (3) Diversion ditches around pit, and de-watering facilities; and,
 - (4) Power distribution;
 - d) Mill complex showing:
 - (1) Crusher;
 - (2) Concentrate/beneficiation facilities;
 - (3) Ore storage bins/areas;
 - (4) Conveyors;
 - (5) Concentrate handling facilities; and,

- (6) Ancillary facilities;
- e) Tailings Facilities:
 - (1) Dams and spillways;
 - (2) Pipelines;
 - (3) Discharge points; and,
 - (4) Reclaim water lines;
- f) Effluent treatment plant;
- g) Site infrastructure:
 - (1) Roads showing water crossing infrastructures (**bridges, culverts**);
 - (2) Railways;
 - (3) Port facilities;
 - (4) Airstrip and helicopter pad;
 - (5) Backfill plant;
 - (6) Quarries;
 - (7) Power generating stations, transmission lines, substations;
 - (8) Cables and pipelines;
 - (9) Accommodation facilities;
 - (10) Warehouses;
 - (11) Maintenance facilities;
 - (12) Water and sewerage facilities;
 - (13) Communication towers and ancillary facilities;
 - (14) Explosives plant;
 - (15) Fuel storage tank;
 - (16) Hazardous materials facilities; and,
 - (17) Any other installations;
- h) Measures to deal with environmental issues, including:
 - (1) Handling of potentially acid generating material;
 - (2) A water balance for the project;
 - (3) A spreadsheet listing all required permits, responsible agency and the status of the permit; and,
 - (4) Overburden and topsoil stockpiles (*stockpiled separately for use in rehabilitation and closure*).

b. **Acceptable surface plan:**

- (i) Surface Plan showing, where applicable:
 - (1) All natural topographical features in the project watershed area, including:
 - (a) Water bodies (*lakes, streams, etc.*); and,
 - (b) Terrestrial features (*hills, forested areas, etc.*);
 - (2) All non-natural structures or features in the project area as per the site plan.

c. Resource Management Issues Addressed:

- (i) Geological description of the mineral resource or orebody including geological drawings that:
 - (1) Show geological sections and plans with all relevant diamond drill holes, collared from surface or from underground; and,
 - (2) Show the outline of the orebody with all relevant diamond drill holes, collared from surface or from underground.
- (ii) A description of planned delineation and exploration drilling and other exploration work.
- (iii) A mineral resource/ore reserve statement detailing the tonnage and grades by category, and giving the name of the qualified person as per National Instrument 43-101 of the Canadian Securities Administrators, including:
 - (1) Economic cutoff grades used;
 - (2) The method of calculation;
 - (3) The plans and sections used in the calculations;
 - (4) The ore/mineral resource blocks shown on vertical longitudinal sections; and,
 - (5) A spreadsheet which allows for reconciliations of resources/reserves as the project advances.

d. Mill License Application Status:

- (i) List the mill license details (*issue date, expiry date*) under which the project is to operate.
- (ii) If a mill license application has been made, provide the current status of the application.
- (iii) A mill license will issued only after a Development Plan and Rehab & Closure Plan have been submitted and accepted.

e. Mining Process:

Description of the Mining Process, including:

- (i) Details of all relevant infrastructures as noted on the site plan with the corresponding dimensions, capacities, throughputs, etc.;
- (ii) A mine plan (*minimum 5 years*), showing annual production, to include:
 - (1) Mine production tonnage and grades;
 - (2) Plans and sections showing the mining sequence corresponding to the mine plan (*minimum 5 years*);
 - (3) Dilution and recovery factors (*used to determine mineable reserves*) and how they were derived;
 - (4) Mill feed tonnage and grades;
 - (5) Areas to be mined and corresponding reduction in ore reserves, including plans and sections where required;
 - (6) For an underground mine, a description of the mining method including:
 - (a) Stope and pillar design;
 - (b) Backfilling method; and,
 - (c) Level plans and longitudinal sections showing, where applicable:
 - (i) Shafts;

- (ii) Access and haulage ramps;
- (iii) Main drifts and crosscuts; and,
- (iv) Active stopes, mined out stopes and backfilled stopes;
- (7) For an open pit mine or quarry, the bench plans, longitudinal sections, cross sections showing, where applicable:
 - (a) Access and haulage ramps;
 - (b) Bench heights and number of benches;
 - (c) Sequencing;
 - (d) Roadways;
 - (e) Berms, trees and vegetation screening;
 - (f) Overburden, top soil, and waste rock piles; and,
 - (g) The pit development plans and the ultimate pit development plan based on current mineable reserves;
- (8) For an open pit, the waste to ore ratio with details on how this ratio was calculated, and,
- (9) A list of the major mining equipment.

f. **Milling Process:**

Description of the Milling Process, including:

- (i) Details of all relevant infrastructures as noted on the site plan with the corresponding dimensions, capacities, throughputs, etc.;
- (ii) mill flow sheet;
- (iii) The mill feed rate, head grade, grade and tonnage of all concentrates, metal recoveries; and tails tonnage and grades;
- (iv) A metallurgical balance sheet;
- (v) A description of any arrangements for mill tailings to be re-introduced to the mine for backfill, consolidated or unconsolidated, with waste rock or without waste rock;
- (vi) The milling method and expected operating life at the planned milling rate; and,
- (vii) A description of concentrate handling.

g. **Tailings Process:**

Description of the tailings disposal facilities, including:

- (i) Description of tailings impoundment area, showing:
 - (1) total volume available for disposal; and,
 - (2) anticipated active life of the area;
- (ii) Approved engineering design drawings (*construction plans and sections*) for all dams and spillways;
- (iii) Approved as-built drawings upon completion;
- (iv) A description of all effluent treatment methods;
- (v) A description of planned closure method (*permanent water cover, breach dams, cover and tailings revegetation*); and,
- (vi) A statement on adherence to Canadian Dam Association's Dam Safety Guidelines.

h. **Other Information:**

- (i) A detailed listing, by year, of all major capital and operating expenditures for the project. Provide a breakdown of expenditures into sub-categories, where appropriate.
- (ii) Cash-flow sheet/s for the project including:
 - (1) Commodity price;
 - (2) Exchange rate; and,
 - (3) Discount rate assumptions.
- (iii) Provide a breakdown of annual employment by major project activity and a listing of occupations according to National Occupation Classification 2001.
- (iv) A description of possible changes to the Development Plan.
- (v) The measures the lessee will undertake to ensure that the project conforms to prudent resource management.
- (vi) A Metal Leaching / Acid Rock Drainage program report which conforms to the *“Prediction Manual For Drainage Chemistry from Sulphidic Geological Materials*, Mend Report 1.20.0, December 2009”.

2. **REHABILITATION & CLOSURE PLAN REQUIREMENTS:**

The following is an outline of the information that is required in a Rehabilitation and Closure Plan as per the requirements of Sections **(8)**, **(9)** and **(10)** of the *Mining Act* and Section 7 of its Regulations. Section 7.(1) states: *“The rehabilitation and closure plan shall be in the form prescribed in the guidelines.”*

A Rehabilitation and Closure Plan must be divided into 3 main parts as follows:

- (a) Background Information
- (b) Initial Site Closure Plan
- (c) Cost Estimate.

a. **Background Information**

- (i) Provide a brief description of the facilities, closure planning goals and objectives, the scope of closure plans, a review of statutory and corporate criteria, and a review of stakeholder and community expectations.

(ii) **Common Closure Planning Objectives:**

- (1) To restore affected landscapes to a physically and chemically stable and safe environment, in order to protect public health and safety.
- (2) To reduce or eliminate potential adverse environmental effects associated with each phase of the project.
- (3) To decommission and rehabilitate the project site to a land use similar to its original use.
- (4) To return the property to the Crown after monitoring demonstrates closure objectives have been met.

(iii) **Intended Future Land Use Statement**

The site closure must contain a statement setting out the intended use of the project land after completion of closure activities. The Intended Use statement will include detailed inventories of facilities, an assessment of key hazards and liabilities, a review of the options for closure, and the selection of a preferred closure strategy in consideration of proposed future land use, costs, social and ecological impacts, and statutory and internal best practices criteria.

b. **Initial Site Closure Plan**

The major areas of a new project to be addressed in the Rehabilitation and Closure Plan are listed in Appendix A.

The following outline is based upon utilizing closure planning from the beginning:

(i) **Progressive Rehabilitation Plan**

- (1) An annual schedule for the first five years minimum of:
 - (a) Progressive rehabilitation work and expenditures (*tailings area re-vegetation*);
 - (b) Site specific test work (*native species versus agronomic species; or, dump/stockpile slope stability analysis*) should be utilized to minimize current environmental impacts, and reduce financial assurance;
 - (c) Provide solutions for implementation during the decommissioning and rehabilitation on final closure; and,
 - (d) Include remediation measures in all proposals where ARD problems continue;
- (2) A Progressive Rehabilitation Plan once a work area is deemed no longer required for a production or active support function. All mobile and stationary equipment, and storage tanks, (*all pipelines, power lines and sewage treatment facilities, as well as buildings and their foundations*) will be cleaned and removed from the site.
- (3) A closure option analysis, modified based upon site operating experience;
- (4) The number and type of closure options for evaluation based upon proponent criteria;
- (5) The final Rehabilitation and Closure Plan will evolve from the initial Plan.

(ii) **Decommissioning and Rehabilitation Phase - Implementation Schedule**

In preparation for final closure, determine the timing and work schedule to perform the required work to decommission and rehabilitate the project site; and compute the associated third party cost to complete the project.

(1) Rehabilitation

- (a) Plans are to be based upon statutory requirements of the *Mining Act*, specific closure requirements as contained in operating permits and Certificates of Approval, MMER, and internal corporate policy.
- (b) Rehabilitate all tailings impoundments, waste rock areas and stockpiles, as well as all landfill sites, and other waste management areas.
- (c) Backfill all underground mine openings, or cap with reinforced concrete if backfilling is impractical.
- (d) Rehabilitate all open pits or quarries to the satisfaction of the *Minister* considering the following factors:
 - (i) Extent of the pit;
 - (ii) Rock quality designation (*RQD*) and stability;
 - (iii) Adjacent land use and topography;
 - (iv) Proximity to residential and recreational areas;
 - (v) Surface water elevations and ground water characteristics: and,
 - (vi) The status of waste rock dumps / stockpiles from the open pit.
- (e) Reclaim all roadways, airstrips, and other civil works to the satisfaction of the *Minister*.
- (f) Assess the long term stability of all surface and underground workings.

(iii) Environmental Monitoring, Inspection and Maintenance

Usually there are several levels of environmental monitoring, inspection and maintenance programs after mine / concentrator closure, as follows:

- (1) Continuation of some of the programs initiated during the operations phase, such as treating discharge water quality from the tailings pond, and or sedimentation pond;
- (2) Completion in the short term (*within 10 years of mine closure*):
 - (a) Sampling and analysis for petroleum hydrocarbon indicator parameters in remediate areas; and,
 - (b) Investigation to determine the appropriate chemicals of concern around bulk chemical products storage and hazardous materials storage facilities; and install monitor wells down-gradient from stockpiles / explosive plant to monitor for effects on groundwater;
- (3) Implementation of programs conducted over the long term (*starting 10 years after the mine closure, and continuing into the long term [> 30 years after closure]*):
 - (4) Leachate testing from the closed on-site landfills; and,
 - (5) Groundwater monitoring wells down-gradient of petroleum hydrocarbon contaminated soil or other chemical contaminated soil.

c. **Cost Estimate**

Based upon the Development Plan, a work schedule of progressive decommissioning and rehabilitation work and their associated cost estimate has to be developed and accepted before the operations phase of the Project commences, and should contain:

- (i) A comprehensive third party cost estimate covering decommissioning and rehabilitation costs after the closure of the open pit/underground mine, concentrator and associated facilities plus the progressive decommissioning and Rehabilitation cost and all the post-closure monitoring, inspection and maintenance costs, combined into a Sub-Total; and,
- (ii) Lump sum estimates for Project Management (*7% of Sub-Total*), Engineering (*3% of Sub-Total*), and a Contingency Allowance (*15% of Sub-Total*) are added to the Sub-Total to provide a best estimate of Total Closure Costs.

d. **Financial Assurance Proposal**

Based upon a reasonable and supportable cost estimate of Closure Costs (*certified by a qualified person*), a description of the means to fund the Closure Cost under section **10.(1) to 10.(9)** of the *Mining Act* to the *Minister of Natural Resources* as part of an acceptable Rehabilitation and Closure Plan.

e. **Comments on Estimate**

- (i) All cost estimates must be third party costs (*not in-house costs*). The use of salvage values is disallowed.
- (ii) All costs should be in Canadian funds for labour, material and equipment, and not include the HST.
- (iii) All costs should be in current year dollars, with no allowance made for escalation.
- (iv) The cost estimate is to be based upon the schedule of work in the Rehabilitation and Closure Plan, and the selected closure option in the accepted Rehabilitation and Closure Plan (*term of pit water treatment after closure*).

e. **General Comments**

It is expected that numbered tables and digital format drawings will be utilized within the body of the Rehabilitation and Closure Plan to clarify work areas in relation to one another. Use of the same base plan is helpful to illustrate work progress over a time span. (*Tailings area should be revegetated every 3 years*).

3. **OPERATIONAL PLAN:**

The *Mining Act*, Section 6.4 states the requirement to file an operational plan on an annual basis. Section 5.(2) of the Mining Regulations to the *Mining Act*, states: “*An operational plan shall be in the form prescribed by the guidelines...*“. Section **5.(1)** requires that the operational plan be submitted no later than one month before the start of the lessee’s operating year, while Section **5.(2)** refers to the content.

In addition to the 9 sub-title headings of section **5.(2)** of the *Mining Regulations*, some proponents add an Introduction section, and sub-divide item (b) into two parts; Infill Diamond Drilling; and, Exploration, hence 11 sections.

a. **Introduction**

- (i) For seasonal operations, state date of start-up and shut down within the reporting period, and other significant dates (*interruptions*), if any.
- (ii) List significant contributors to the report, and the responsible person.
- (iii) In tabular format, provide listing of Mining Leases and associated Areas (*in ha's*) covered by report.
- (iv) Provide a plan (*in digital format*) showing Claim Licenses within Mine Lease, possibly from the Development Plan.

b. **Statement on Mineral Resources and Reserves**

- (i) CIM definitions and guidelines must be used for reporting Mineral Resources and Mineral Reserves in Canada. Provide name of qualified person responsible for ore reserves.
- (ii) This statement should detail the tonnage and grades by category including:
 - (1) Definitions of each category;
 - (2) The economic cut-off grades used; and,
 - (3) The method of calculation.
- (iii) The use of 2 separate Tables for Resources and Reserves is acceptable.
- (iv) One method to compare annual changes in Resources and Reserves is to use bar charts to illustrate year over year changes keeping explanations to the basic facts, and no longer than 2.5 pages in length as follows:
 - (1) Use logical reasons for annual variances, (*production tonnes*);
 - (2) Note changes in economic model, revised expected metal prices, etc.;
- (v) Display data in tabular/graphical format. Use digital format drawings to illustrate locations.

c. **Infill Diamond Drilling Program**

- (i) This section forms a part of section **5.(2) (b)** of the Regulations.
- (ii) State the objectives of the drill program (*ore reserve, contacts, stability, ARD, etc.*)
- (iii) List length of program (*metres*), # of holes and locations.
- (iv) Include digital format maps to illustrate drill hole locations relative to physical surroundings.

d. **Exploration Program**

- (i) This section forms a part of section **5.(2) (b)** of the Regulations.
- (ii) State the purpose of the program, and describe the planned work per target.

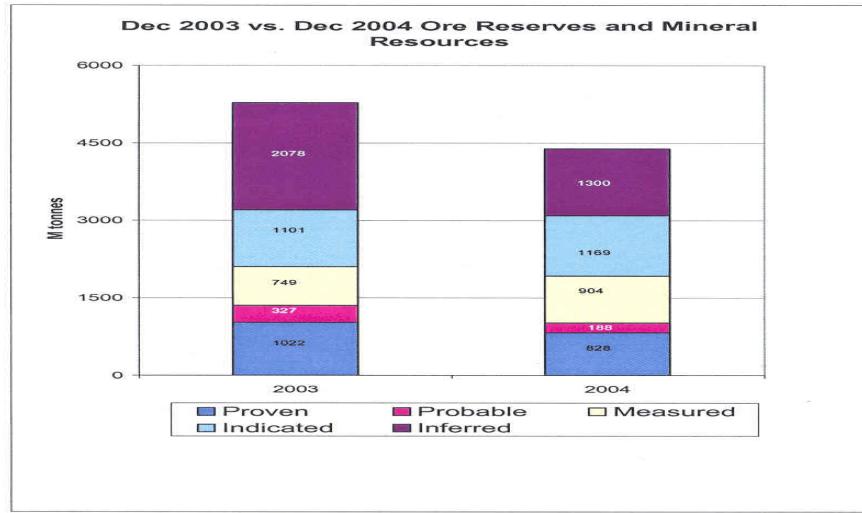


Table 3: Dec 2003 vs. Dec 2004 Ore Reserves and Mineral Resources

- (iii) Summarize the estimated program cost in tabular format.
- (iv) Include a digital format map to illustrate work locations.

e. Progressive Rehabilitation Program

- (i) Detail the planned progressive rehabilitation work to be completed during the year, using a schedule of work by area and an accompanying cost estimate.
- (ii) Include a digital format map illustrating the planned work areas for the coming year.
- (iii) Progressive rehabilitation work shall conform in principle to the progressive rehabilitation outlined in the Rehabilitation and Closure Plan submitted to the *Minister*.
- (iv) Use a tabular format with a running total by year, as follows:

Net Area Disturbed (Beginning of Yr.)	[less] Area Rehabilitated (Current Yr.)	[plus] Area Disturbed (Current Yr.)	[equals] Net Area Disturbed (End of Yr.)

f. Mine Plan - Development & Mining Tonnage

- (i) Detail the location and quantity; quality of ore; waste (*rock and glacial*); ARD (*Acid Rock Drainage*) material, mine benches and location in a summarized tabular format.
- (ii) Delineate broken material inventory (*ore and waste*) at year end.
- (iii) Illustrate work areas on a digital format map suitable for use in sections 3.g and 3.h.

g. Waste Dump Plan

- (i) Detail the planned quantity of waste (*as tonnes and m³*) by disposition in tabular format.
- (ii) Briefly describe the disposition locations, and show the locations on a digital format map.

- (iii) If in doubt, seek clarification if disposition of waste material may be interpreted as rehabilitation work.
- (iv) Detail quantity and disposal location of any ARD waste material.

h. **Production Schedule-Mine / Concentrator (In tabular format)**

- (i) Detail the monthly planned production schedule of the Mine and Concentrator using tonnage and grades of ore milled, along with recoveries.
- (ii) Detail contained metals produced in concentrates with respective tonnage and grades.

i. **Tailings and Effluent Management**

- (i) Briefly describe the current tailings management system and any planned significant changes.
- (ii) Detail the volume, tonnage and location of tailings discharged.
- (iii) Detail the volume, tonnage and location of ARD material disposed in the tailings pond.

j. **Planned Major Capital and Operational Expenditures**

- (i) State the planned capital and operational expenditures (*relative to the size of the project, or >\$C 1M*) for the current Operational period.
- (ii) In tabular format, detail the planned major (*relative to the size of the project, or >\$C 1M*) capital expenditures by location, and major project area (*mine, concentrator, load-out, etc*).
- (iii) In tabular format, detail mine operating direct and indirect costs, and processing direct and indirect costs.
- (iv) Include the project completion status (*4Qs, Year*).
- (v) Combine minor projects (*infrastructure, dewatering*) to report all dollars.

k. **Employee Summary**

- (i) Detail planned onsite workforce as described in section 1.h(iii) of the Development Plan section. For example:

Description	Operational Plan	Development Plan	Explanation
Mine Hourly	100		
Maintenance Hourly	120		
Concentrator Hourly	54		
Site Services Hourly	39		
Warehouse / First Aid	10		
Railway Hourly	10		
Administration	47		
TOTAL	380		

- (ii) Provide a brief comparison of the previous year's year-end personnel numbers with planned numbers from the Development Plan with an explanation of significant differences.

ANNUAL REPORT:

The *Mining Act*, Section 7.(1) states the requirement to file an annual report on operations for the preceding year. The Mining Regulations under the *Mining Act*, Section 6.(1) refers to submitting the annual report no later than two months after the end of the lessee's operating year, and to be in a form prescribed in the guidelines. Section 6.(2) refers to the content.

In general, the Annual Report should compare the plans outlined in the Development Plan with the results outlined in the Operational Plan and explain any significant differences.

a. **Introduction**

- (i) For seasonal operations, state date of start-up and shut down within the reporting period, and other significant dates (*interruptions*), if any.
- (ii) List significant contributors to the report, and the responsible person.
- (iii) In tabular format, provide listing of mining leases and associated areas (*in ha's*) covered by the report.
- (iv) Provide a plan (*in digital format*) showing claim licenses within mine lease, possibly from the development plan.

b. **Statement on Mineral Resources and Reserves**

- (i) CIM definitions and guidelines must be used for reporting Mineral Resources and Mineral Reserves in Canada. Provide name of qualified person responsible for ore reserves.
- (ii) This statement should detail the tonnage and grades by category including:
 - (1) Definitions of each category;
 - (2) The economic cutoff grades used;
 - (3) The method of calculation;
 - (4) One comparative method is to use 2 separate Tables for Resources and Reserves;
 - (5) One method to compare annual changes in Resources and Reserves is to use bar charts to illustrate year over year changes, keeping explanations to the basic facts, and no longer than 2.5 pages in length as follows: (*See Section 3, Operational Plan*); Use logical reasons for annual variances, (*production tonnes*); Note changes in the economic model, revised expected metal prices, etc.;
 - (6)
 - (7)
 - (8)
 - (9) For data in tabular/graphical format, see identical Table in section 3, Operational Plan.

c. **Infill Diamond Drilling Program**

- (i) Define the main goal of the program. Describe the drill program in total depth, # of holes, size, and analysis requirements.
- (ii) Summarize drill hole results in tabular format.
- (iii) Provide a statement of program costs compared to budget.
- (iv) Accompany description with a location map in digital format.

d. **Exploration Program**

- (i) Define the program objective (*to evaluate the economic potential within the claims areas*).
- (ii) Define prospective targets by specific work programs.
- (iii) Use a tabular format to list the license number, claim units, and area of work.
- (iv) Use an accompanying plan in digital format to show target locations.
- (v) Detail actual exploration expenditures in a tabular format.
- (vi) Briefly describe program results.

e. **Progressive Rehabilitation Program**

- (i) Detail the progressive rehabilitation work completed during the year by work area (*tailings disposal stockpile area, mine area*).
- (ii) Provide a tabular summary of actual cost versus the Rehabilitation & Closure Plan cost estimate.
- (iii) Provide a digital format map illustrating the actual work areas for the past year.
- (iv) Summarize conclusions / results of rehabilitation studies for use as a guideline for future work.
- (v) Digital photos of work progress can be provided in an appendix or on a CD.
- (vi) Progressive rehabilitation work shall conform in principle to the progressive rehabilitation outlined in the Rehabilitation and Closure Plan submitted to the Minister.
- (vii) Use a tabular format with a running total by year, as follows:

Net Area Disturbed (Beginning of Yr.)	[less] Area Rehabilitated (Current Yr.)	[plus] Area Disturbed (Current Yr.)	[equals] Net Area Disturbed (End of Yr.)

f. **Mine Plan - Development & Mining Tonnage**

- (i) Detail and summarize in tabular format the location and quantity; quality of ore; waste (*rock and glacial*); ARD material; mine benches; and, location.
- (ii) Delineate broken material inventory (*ore and waste*) at year end.
- (iii) Illustrate work areas on a digital format map suitable for use in sections 4.g and 4.h.

g. **Waste Dump Report**

- (i) Detail the actual quantity of waste (*in tonnes and m³*) by disposition in tabular format.
- (ii) Describe the disposition locations, and illustrate the respective locations on a digital format map.
- (iii) Detail quantity and disposal location of any waste ARD material.
- (iv) If in doubt, seek clarification if disposition of waste material may be interpreted as Rehabilitation work.

h. **Production Report - Mine / Concentrator**

- (i) Detail the monthly production schedule of the Mine and Concentrator using tonnage and grades of ore milled, along with recoveries.
- (ii) Detail contained metals produced in concentrates with respective tonnage and grades, and year end actual with Operational Plan.

i. **Tailings and Effluent Discharge Report**

- (i) Briefly describe the current tailings management system and related key components, the existing effluent flow rates, and tailings treatment.
- (ii) Detail the volume, tonnage, and location of tailings discharged.
- (iii) Detail the volume, tonnage, and location of ARD material disposed in the tailings pond.
- (iv) Illustrate the discharge / disposal locations on an appropriate digital format map.
- (v) Display the average monthly flow rates in a tabular format for the actual Operational period.
- (vi) Include results / reports of tailings dam inspections.

j. **Major Capital and Operational Expenditures**

- (i) State the actual capital and operational expenditures versus the planned for the current Operational period.
- (ii) In tabular format, detail the actual major (*relative to the size of the project, or >\$C IM*) capital expenditures by location, and major project area (*mine, concentrator*) along with the project completion status (*4Qs, Year*).
- (iii) In tabular format, detail the actual major mine operating direct and indirect costs, and processing direct and indirect costs.
- (iv) Include the project completion status (*4Qs, Year*).
- (v) Combine minor projects (*dewatering*) to report all dollars.

k. **Employee Summary**

- (i) Detail actual versus planned on site workforce as described in Section 1.h(iii) of the Development Plan section, as illustrated in Section 3.k(i) of the Operational Plan.

Description	Planned	Actual	Explanation
Mine Hourly	4		
Maintenance Hourly	112		
Concentrator	104		
Services Hourly	61		
Warehouse & First Aid	11		
Railway Hourly	69		
Administration Hourly	23		
TOTAL	384		

- (ii) Provide a discussion / comparison of actual year's year-end personnel numbers with numbers from the Operational Plan.

5 **FINANCIAL ASSURANCE:**

a. **Introduction - Issues Related to Financial Assurance**

The Financial Assurance provisions are set out in Section **10** of the *Mining Act* and are addressed in Section **8** of the Regulations to the *Mining Act*. These guidelines address issues related to those provisions.

There are four essential issues to be discussed, which are:

- (i) Activities And Events The Assurance Covers;
- (ii) Amount Of The Assurance;
- (iii) Forms Which Financial Assurance May Take; and,
- (iv) Conditions under Which the Financial Assurance Security May Be Released.

(i) **Activities And Events The Assurance Covers:**

Section **10.(1)** of the *Mining Act* and Section **8.(2)** Mining Regulations under the *Mining Act* require that financial assurance be included as part of a Rehabilitation and Closure Plan (*Section 10.(1) Mining Act*) and be included with the Development Plan and, Rehabilitation and Closure Plan (*Section 8.(2) Mining Regulations under the Mining Act*). The “regulations” go on to state that “the financial assurance proposal...shall include costs for ongoing monitoring and site maintenance”.

From these sections it is clear that all events associated with activities included in the Development Plan, the Rehabilitation and Closure Plan, as well as those activities required for ongoing site monitoring and maintenance are to be included in financial assurance coverage.

Since such activities are subject to annual review and possible adjustment, any substantial increase in “exposure” must be covered by a corresponding adjustment in the financial assurance coverage.

The specific inclusion of cost / activities related to rehabilitation and closure are discussed in the “Rehabilitation and Closure Cost Requirements” section.

(ii) **Amount of the Assurance:**

Financial assurance must be sufficient to cover all costs associated with those activities identified in item (1) above. Section **10.(2)** of the *Mining Act* states that “a qualified person” must “provide a statement...that the estimate of the cost of completing the work set out in the rehabilitation and closure plan is a reasonable one”.

The amount and the method of calculation must be in conformity with the Rehabilitation and Closure Plan section of these guidelines.

The amount of financial assurance will have to be adjusted where any or all of the following situations occur:

- (1) There is a substantial increase in the estimated cost of the rehabilitation and closure costs.
- (2) There is a substantial and long term reduction in the market value of the financial assurance assets.
- (3) On completion of progressive rehabilitation.

The amount of financial assurance required cannot be reduced by the inclusion of salvage costs.

(iii) **Forms The Assurance May Take:**

Sub Sections **10.(3)(a)... (e)** of the *Mining Act* list the acceptable forms of financial assurance. These include:

- (1) Cash;
- (2) A letter of credit from a bank named in Schedule 1 of the Bank Act (Canada);
- (3) A bond;
- (4) An annual contribution to a financial assurance fund established for the project; or
- (5) Another form of security acceptable to the *Minister*.

Except for item (5) the list is self-explanatory. Item (5) has been established to address those unusual situations where the imposition of any of the other options would constitute an onerous financial burden upon the lessee or would be inconsistent with the public good. However, under no circumstances would “self-assurance” be considered as “acceptable security”.

Financial Assurance funds must be paid either directly to the Province, assigned to the Province, or must designate the Province as the beneficiary of a surety bond as the case may be for the asset(s) provided. It is not acceptable for a lessee to merely set aside funds or to pay to a third party funds designated to cover the lessee’s financial assurance liability. (See section “**c. Descriptions of Acceptable Financial Assurance Instruments**” below for specific details concerning acceptable financial assurance instruments)

Financial assurance may be comprised of a combination of all five acceptable instruments itemized above.

(iv) **Conditions under Which the Financial Assurance Is To Be Released:**

Sub-Sections **10.(4)... (9)** set out the conditions under which the *Minister* may realize upon the financial assurance security and / or release financial assurance assets.

These sub-sections set out four situations which can give rise to these actions, namely:

- (1) Non-performance According to Rehabilitation and Closure Plan
- (2) Reduction in Estimated Rehabilitation Costs

- (3) Excess Funds on Completion of Rehabilitation and Closure
- (4) On Surrender of Lease

(1) Non-performance According to Rehabilitation and Closure Plan:

Individual lessees are required by the *Mining Act* to undertake all rehabilitation and closure efforts set out in their accepted Rehabilitation and Closure Plan. When lessees fail to do so the *Minister* can order the lessee to comply. The *Minister* only requires “reasonable grounds” to so order. However, the *Minister* must allow the lessee 45 days to comply.

If after the 45 days notice period the *Minister* has “reasonable grounds” to “believe” that no rehabilitation and closure activities have been undertaken the financial assurance assets can be realized and applied against any costs incurred by the province to complete the rehabilitation and closure activities.

It should be noted that no court order or procedures are required of the *Minister* to act. All that is required for *Ministerial* action, is the existence of “reasonable grounds” for the “belief” on the part of the *Minister* that the lessee has not commenced rehabilitation and closure activities.

(2) Reduction in Estimated Rehabilitation and Closure Costs

The lessee is required to submit an Operational Plan and an Annual Report of operations on an annual basis. As a result of this annual review there may be a reduction of the estimated costs to be incurred to close the operation. In this event the lessee has the right to petition the *Minister* for a reduction of the financial assurance fund. The lessee is responsible for initiating the reduction request. The *Minister* will not initiate the reduction in the financial assurance fund.

It is also important to understand that the *Minister* is not required to grant the reduction. The *Minister*’s decision to reduce the financial assurance level is based upon a number of factors including, but not limited to, the amount of work already completed.

(3) Excess Funds on Completion of Rehabilitation and Closure Work:

The *Minister* must refund any residual balance left in the financial assurance fund on completion of the rehabilitation and closure of the mining operation. Usually this will occur after the department has accepted that the closure work has been completed in accordance with the accepted Rehabilitation and Closure Plan.

(4) On Surrender of Lease:

Where a lease has been surrendered by a lessee and the financial assurance is no longer required the *Minister* must return the financial assurance assets.

However, the property must be rehabilitated in accordance with an accepted Rehabilitation and Closure Plan. If no disturbance has occurred the full amount of the financial assurance will be returned. Even if there has been preliminary site disturbance at the time of lease surrender the effects caused by this disturbance would have to be rehabilitated prior to the refund of assurance.

b. Financial Assurance Details

The financial assurance submission must include information specific to the type and value of the financial assurance instrument. The submission should include, as a minimum, the following information:

- (i) Security Description;
- (ii) Security Value (*at cost*); and
- (iii) Security Value (*at market value*).

c. Descriptions of Acceptable Financial Assurance Instruments:

(i) Surety Bonds. (See Appendix B)

A surety bond is an indemnity agreement in a specific and fixed amount executed by a surety insurer licensed to do business in the Province of Newfoundland and Labrador.

Surety bonds are issued for a specific period of time and cannot be cancelled until new financial assurances are approved by the *Minister*. In addition, bonds must include a clause requiring the written notice of cancellation to the *Minister* a minimum of 3 calendar months prior to any such cancellation.

(ii) Trust Funds.

Trust funds are cash or cash certain financial instruments put up by the mine operator. They may take the form of:

- (1) A cash account deposited in one or more federally insured accounts;
- (2) Negotiable bonds, "held in escrow", of Canada, a province of Canada, a county, or municipality, endorsed by the mine operator, and rated "A" or better by a nationally recognized bond rating organization (*"zero coupon bonds" including "savings bonds" and some types of coupon municipal bonds may be used at their current market value as determined annually, but may not be used at their value at maturity before maturity occurs*);
- (3) Negotiable certificates of deposit in one or more federally insured depositories. The Department and the bank holding the funds should maintain a record of the approved trust fund. Interest earned is not part of the financial assurance, unless otherwise stipulated by the accepted financial assurance fund, and should be payable to the mining operator at his or her discretion.

(iii) **Irrevocable Letters of Credit (See Appendix C)**

A letter of credit is a letter from any bank listed in Schedule I of *The Bank Act (Canada)* and authorized to do business in the Province of Newfoundland and Labrador granting credit on behalf of the mine operator.

Letters of credit should be for a specific period of time and must not be revocable by the mining operator until rehabilitation is completed pursuant to the accepted Rehabilitation and Closure Plan and the *Minister*, and any other beneficiaries have issued a notice of release to the operator, or the letter of credit is replaced with another acceptable financial assurance mechanism.

d. The Period of Liability for the Operator

The mine operator is required to maintain adequate financial assurance continuously throughout the life of the mining operation, (*including idle periods and extended monitoring periods*), until the rehabilitation is completed pursuant to the accepted Rehabilitation and Closure Plan and verified by the Department, and after any other beneficiary agencies have approved the release of the financial assurances.

e. Financial Assurance Transition Rules When a Mining Operation Is Sold or Operatorship Otherwise Is Transferred

When a mining operation is sold, or operatorship otherwise is transferred, the original operator's financial assurance must remain in effect until the *Minister* has approved, following Department review, the replacement assurances provided by the successor operator. The prior operator's financial assurance will be released only upon the approval by the *Minister*. A replacement financial assurance must be approved in the same manner as the existing financial assurance.

6. MILL LICENSE

A Mill License is a legal document required to operate a mill, under the authority of Section 5 of the *Mining Act*, which:

- (a) Is issued to a holder of a Mining Lease;
- (b) Defines the capacity and method of beneficiation of the ore;
- (c) Defines the source of ore to be processed;
- (d) Ties the mill location to a surface lease;
- (e) Has a minimum 5 year term;
- (f) Limits the transfer of the License; and
- (g) Does not limit the requirements to obtain other permits or approvals.

The following outlines the information that is required in an application for a Mill License as per the requirements of Section 5.(2) of the *Mining Act*. The details of the mill described in an application for a Mill License must include, but not be limited to: (*see Appendix E*)

- (i) *The ore feed:*
 - (1) Size and metallurgy of ROM ore; and
 - (2) Instrument conveying mineral rights to the ore.
- (ii) *The primary and secondary metals to be concentrated;*
- (iii) *The beneficiation process:*
 - (1) Flow sheet;
 - (2) Metallurgical balance;
 - (3) Water balance;
 - (4) Plant layout drawings; and,
 - (5) Specifications and capacities of equipment;
- (iv) *The location:*
 - (1) Geographic location tied to nearest municipality or region;
 - (2) Surface Lease on which mill will be located;
 - (3) Mill site plan showing buildings, roads and associated infrastructure;
 - (4) Site Boundary Plan; and,
 - (5) Surface Plans.

The application in **Appendix E** must be completed and submitted.

Appendix A

Major Areas of a Project to Be Addressed in Rehabilitation & Closure Plan

For a project involving an underground mine or combination of open pit and underground, repeat the format for area (2).

(1) Buildings and Infrastructure

- (A) Port Buildings and Permanent Wharf**
- (B) Mill Complex**
- (C) Explosives Plant**
- (D) Airstrip**
- (E) Services**
 - (1) Roads
 - (2) Power Distribution Lines
 - (3) Pipelines and Pump-houses
 - (4) Potable Water
 - (5) Dams, Dykes and Embankments
 - (6) Sedimentation Ponds / Diversion Channels Facilities
 - (7) Water Treatment
 - (8) Landfills
 - (9) Incinerators
 - (10) Petroleum Impacted Soil Treatment Pad
 - (11) Sewage Treatment and Disposal Systems
 - (12) Petroleum Products Storage
 - (13) Chemical and Hazardous Materials Storage Facilities

(2) Open Pit Mine or Underground Mine (as applicable)

- (A) Closure Options**
 - (1) Pit Lake
 - (2) Waste Backfill
 - (3) Tailings Backfill
 - (4) Other
- (B) Review Options**
 - (1) Capital Costs
 - (2) Operating Costs
 - (3) Total Costs
 - (4) Post Closure Care & Maintenance
 - (5) Surface and Ground Water Quality Effects
 - (6) Future Land Use
 - (7) Public Safety

(C) Selection of Closure Option

(D) Potential Risks and Remedial Measures

(E) Future Studies

(3) Non-Acid Stockpiles: (i) Overburden
(ii) Non-mineralized Rock
(iii) Topsoil

(A) Closure Options

- (1) Vegetate
- (2) Reslope and vegetate
- (3) Relocate

(B) Review Options

- (1) Capital Costs
- (2) Post Closure Care & Maintenance
- (3) Future Land Use
- (4) Aesthetics

(C) Selection of Stockpile Closure Option

(D) Potential Risks and Remedial Measures

(E) Future Studies

(4) Tailings / Potential Acid Generating (PAG) Rock Storage Pond

(A) Closure Options

- (1) Shallow Water
- (2) Shallow Water with an Engineered Barrier
- (3) Dry Cover with Elevated Water Table

(B) Review Options

- (1) Capital Costs
- (2) Operating Costs
- (3) Post Closure Care & Maintenance
- (4) Surface and Ground Water Quality Effects
- (5) Future Land Use

(C) Selection of Tailings Pond Closure Option

(D) Potential Risks and Remedial Measures

- (1) Open pit - primary concerns:
 - (a) PAG Vs non-PAG rock

- (i) in pit water quality, requiring treatment and pumping.
- (b) Pit Lake or Dry Cover
 - (i) in pit water quality, requiring treatment.
- (c) Public Safety
 - (i) rock berms, slope stability, resloping, vegetation, signage, fencing, backfill / cap underground openings to surface, and culvert removal.

(2) Overburden stockpile - primary concerns:

- (a) Wind and water erosion
 - (i) stabilize stockpile surface, reslope
 - (ii) rock cladding and vegetation.
- (b) Aesthetics - recontour and vegetate.

(3) Non-mineralized Rock Stockpile / Dump - primary concerns:

- (a) Contaminated run-off water quality, requiring monitoring & treatment.
- (b) Aesthetics (treat, capping, or relocate).

(4) Tailings Pond / PAG Rock Storage - primary concerns:

- (a) Water quality
 - (i) monitor & treat before discharge
 - (ii) may need long term treatment
- (b) Dams
 - (i) designed as stable, long term, low maintenance structure
 - (ii) inspections.

(E) Future Studies

Appendix B

Sample of Standard Mine Rehabilitation and Closure Performance Bond

MINE REHABILITATION AND CLOSURE PERFORMANCE BOND

Bond # _____

Amount: _____

KNOW ALL PERSONS by these presents that [*name of company*] (hereinafter called the Principal) whose place of business is at [company address] and The [*name of insurance company*] (hereinafter called the Surety) are held and firmly bound unto Her Majesty the Queen in Right of Newfoundland and Labrador as represented by the Minister of Natural Resources, its heirs, and successors (hereinafter called the Obligee) whose place of business is at 50 Elizabeth Avenue, P.O. Box 8700, St. John's, Newfoundland, A1B 4J6 in the penal sum of [*amount of bond*] lawful money of Canada for the payment of which we bind ourselves, our heirs, administrators and successors, and assigns firmly by these presents.

WHEREAS, the Principal will operate/operates a [*mining activity*] located at [*legal property description*] (locally known as _____) accordance with a Rehabilitation and Closure Plan approved by the Minister's letter dated _____, which is attached hereto.

NOW, THEREFORE, the condition of this obligation is such that, if the Principal shall comply with the terms of the Rehabilitation and Closure Plan then this obligation shall be void; otherwise it shall remain in full force and effect, subject to the following conditions:

1. Whenever the Principal shall be in default and declared by the Obligee to be in default of the terms of the Closure Plan, the Obligee shall send a registered letter to both the Principal and Surety, stating in substantial detail the facts leading to the default.
2. That the Surety's obligation to the Obligee shall only be to pay such amounts demanded by the Obligee and this bond will be totally exonerated by remitting to the Obligee such amounts in default, provided however, the total liability of the Surety shall in no event exceed the penal sum of the Surety.
3. The term of this bond shall remain in full force and effect to the time of release of the bond by the Minister of Natural Resources, or replaced by a form of financial assurance acceptable to the Minister of Natural Resources.
4. Provided that, if the Surety at any time gives at least three calendar months notice in writing to the Obligee and to the Principal of its intention to terminate this obligation, then this obligation shall be deemed to be terminated on the date stated in the notice, which date shall not be less than three calendar months after the date of the receipt of the notice by the said Obligee or by the said Principal, whichever is the later date of receipt, provided that, should the Principal fail, within two calendar months of the above referred to later date of receipt,

to provide a financial assurance in at least the same amount as this bond in a form acceptable to the Obligee, the Surety shall automatically and immediately pay the full amount of the bond to the Obligee.

5. Any suit or action on this bond against the Surety must be commenced by the Obligee within 120 days from the date of notice of default mentioned in clause #1 above.
6. In the event the Surety becomes unable to fulfill its obligations under the bond for any reason, notice shall be given immediately, by registered mail, to the Principal and the Obligee. Upon Obligee's receipt of Surety's notification or upon the incapacity of the Surety by reason of bankruptcy, insolvency, or suspension or revocation of its license, the Principal shall be deemed to be without bond coverage and will be required to submit alternate financial assurance, subject to the approval of the Obligee and as required by Section 10. (1) of the Mining Act, within 30 days.
7. The Surety is duly registered to carry on the business of surety in the Province of Newfoundland and Labrador.
8. Upon partial completion of the rehabilitation and closure of the site, and the submission by the Principal of a written application under Section 10. (7) of the Mining Act including technical supports and relevant information, the Minister of Natural Resources at their discretion may reduce the amount of the bond to an amount consistent with the financial requirements of the rehabilitation work left to be completed.
9. This bond will be valid for the term of *[date bond sealed]* to *[date 1 year hence]* and shall be automatically renewed, without further documentation from year to year thereafter unless terminated as aforesaid, provided that the Surety may, if it wishes, issue certificates evidencing such renewal.

Sealed with the respective seals of the Principal and of the Surety the ____ day of _____, 20__.

SEALED, SIGNED AND DELIVERED

[NAME, ADDRESS, &
TELEPHONE NO. OF COMPANY]

In the presence of

[NAME, ADDRESS, & TELEPHONE NO. OF
SURETY]

Appendix C –

Pro Forma Suggested Purpose, Documentation, and Conditions for Inclusion with Standard Financial Assurance Security

The condition of this obligation is such that, if the Principal shall comply with the terms of the Rehabilitation and Closure Plan then this obligation shall be void; otherwise it shall remain in full force and effect, subject to the following conditions:

1. Whenever the Principal shall be in default and declared by the Obligee to be in default of the terms of the Closure Plan, the Obligee shall send a registered letter to both the Principal and *(name of institution)*, stating in substantial detail the facts leading to the default.
2. That the *(name of institution's)* obligation to the Obligee shall only be to pay such amounts demanded by the Obligee and this irrevocable letter of credit will be totally exonerated by remitting to the Obligee such amounts in default, provided however, the total liability of the *(name of institution)* shall in no event exceed the sum of the irrevocable letter of credit .
3. The term of this irrevocable letter of credit shall remain in full force and effect to the time of release of the bond by the Minister of Natural Resources, or replaced by a form of financial assurance acceptable to the Minister of Natural Resources.
4. Provided that, if the *(name of institution)* at any time gives at least three calendar months notice in writing to the Obligee and to the Principal of its intention to terminate this obligation, then this obligation shall be deemed to be terminated on the date stated in the notice, which date shall not be less than three calendar months after the date of the receipt of the notice by the said Obligee or by the said Principal, whichever is the later date of receipt, provided that, should the Principal fail, within two calendar months of the above referred to later date of receipt, to provide a substitute irrevocable letter of credit in at least the same amount as this irrevocable letter of credit in a form acceptable to the Obligee, the *(name of institution)* shall automatically and immediately pay the full amount of the irrevocable letter of credit to the Obligee.
5. Any suit or action on this irrevocable letter of credit against the *(name of institution)* must be commenced by the Obligee within 120 days from the date of notice of default mentioned in clause #1 above.
6. In the event the *(name of institution)* becomes unable to fulfill its obligations under the irrevocable letter of credit for any reason, notice shall be given immediately, by registered mail, to the Principal and the Obligee. Upon Obligee's receipt of *(name of institution)*'s notification or upon the incapacity of the *(name of institution)* by reason of bankruptcy, insolvency, or suspension or revocation of its license, the Principal shall be deemed to be without financial assurance coverage and will be required to submit alternate financial assurance, subject to the approval of the Obligee and as required by Section 10. (1) of the Mining Act, within 30 days.

7. The (*name of institution*) is duly registered to carry on the business of contracting irrevocable letters of credit in the Province of Newfoundland and Labrador.
8. Upon partial completion of the rehabilitation and closure of the site, and the submission by the Principal of a written application under Section 10. (7) of the Mining Act including technical supports and relevant information, the Minister of Natural Resources at his/her discretion may reduce the amount of the irrevocable letter of credit to an amount consistent with the financial requirements of the rehabilitation work left to be completed.
9. This irrevocable letter of credit will be valid for the term of [*date bond sealed*] to / [*date 1 year hence*] and shall be automatically renewed, without further documentation from year to year thereafter unless terminated as aforesaid, provided that the (*name of institution*) may, if it wishes, issue certificates evidencing such renewal.

Appendix C-a

Standard Format Irrevocable Letter of Credit

Financial Institution Letterhead

Date of Issue: *[date]*

Beneficiary: Government of Newfoundland and Labrador
Department of Natural Resources
P.O. Box 8700
St. John's, NL A1B 4J6

IRREVOCABLE STANDBY LETTER OF CREDIT NO. *[number]*

At the request of *[company name, address]* (hereinafter called "customer") we, *[name of financial institution]*, hereby establish our Irrevocable Standby Letter of Credit No. *[number]* (hereinafter called "Letter of Credit") in your favour for an amount not exceeding CAD $[\$ \$ \$. \$ \$]$ (*[written out xx]/100* Canadian Dollars) available to you against presentation of the original documents mentioned hereinafter:

I. Your dated and written declaration referring to *[name of financial institution]* Standby Letter of Credit No. *[number]* purportedly signed by an authorized officer, stating the amount claimed and certifying that the amount claimed is due to you by the customer for either one of the following reasons:

A. The customer is in default of payment of his debt to you with reference to the Rehabilitation measures under its Rehabilitation and Closure Plan, submitted and accepted under the Mining Act, SNL 1999 C.M.-15.1, for the rehabilitation of operations under the terms of Mineral Lands Lease No. *[number]* more commonly known as the *[subject property description]*; or

B. You have received a notice from *[name of financial institution]* of its election not to extend its Irrevocable Standby Letter of Credit No. *[number]* and as of the date of the present demand for payment, you have not received substitute financial assurance acceptable to you.

2. The present original Letter of Credit.

Any claims made by you under this Letter of Credit must be presented to us on or before *[date]* (the expiry date). It is a condition of this Letter of Credit that it shall be deemed to be automatically extended without amendment on our part for one year from its present expiry date or from any future expiry date unless thirty (30) days prior to any such expiry date we shall notify you by courier that we elect not to consider this Letter of Credit extended for any such additional period. In case of non extension, you shall have the right to draw upon this Letter of Credit up to the full amount then outstanding upon presentation of the original of the present

Letter of Credit and your written declaration in the fashion described in 1.B above.

This Letter of Credit is neither transferable or assignable.

Partial drawings are permitted.

In the event of any partial drawing we will note the amount of the drawing on the original of this Letter of Credit and immediately return directly to you the original of this Letter of Credit.

We hereby undertake that any drawing made by you on us under this Letter of Credit will be duly honoured on presentation provided that all above-mentioned terms and conditions have been complied with.

All correspondence and/or demand shall be addressed to *[full legal address of financial institution]* and shall refer to our Letter of Credit No. *[number]*.

This Letter of Credit is subject to the Uniform Customs and Practice For Documentary Credits 2007 Revision, I.C.C., Publication Number 600.

[financial institution]

Authorized Signature *[name]*

Authorized Signature *[name]*

The present document consists of 2 pages.

Appendix E

Application for Mill Licence

Application is hereby made for a Mill Licence for the purpose of processing _____
taken from Mining Lease No./Quarry Lease No./under Act/under Grant No./
upon that certain area located at or near _____ in
Newfoundland/Labrador.

Mill/Machinery - describe process, design, specifications, capacities, etc.
(If not sufficient space attach separate page)

A Location Map of the mill site showing buildings, roads and associated facilities, and a flowsheet of the process must be attached.

Company name _____

Company address _____

Mining Lease No. _____

dated _____

Quarry Lease No. _____

dated _____

Other _____

dated _____

Dated at _____ in _____ on this ____ day of _____
20____

Name of Applicant _____ Phone No. _____

Signature of Applicant _____

Note: If the applicant is not a resident of Newfoundland and Labrador, the name and post office address of a person resident in Newfoundland and Labrador who has agreed to accept service on behalf of the applicant must be given as follows: Service may be made upon _____, who resides at Tel. No. _____.

