Doris North Mine Closure and Reclamation Plan for Amendment 1 DRAFT

Prepared for

TMAC Resources

Prepared by

SRK Consulting (Canada) Inc.
1CT022.001
April 2014

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DRAFT

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Project No: 1CT022.001

File Name: DorisCamp_Amendment1_ClosurePlan_DRAFT_Report_1CT022.001_20141010.docx

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Table of Contents

List of Tables

List of Figures

Appendices

1 Introduction

1.1 Background

The Doris North Project (also referred to as Doris North Mine) is owned and operated by TMAC Resources Inc. (TMAC). The project is located on Inuit Owned Land administered by the Kitikmeot Inuit Association (KIA), in the West Kitikmeot Region of Nunavut, approximately 120 km southwest of Cambridge Bay (Figure 1).

The project involves the construction, operation and closure of a small underground gold mine and mill with an average throughput of 800 tonnes per day. Closure of the mine will be undertaken upon completion of mining and milling of the ore. The mill, crushing plant, fuel tank farm, camp, office complex, workshops, power generation plant, sewage treatment plant and all other operational mine infrastructure is located in a central location adjacent to the underground mine portal. Processing of the ore will take place on-site with the gold being shipped by air to an off-site refinery. The mill tailings produced will pass through a cyanide destruction circuit prior to being deposited into Tail Lake approximately 5 km from the mill site. The overall footprint of the project is approximately 209 hectares and is authorized under the Nunavut Water Board (NWB) Type A Water License 2AM-DOH1323 (NWB 2013).

Since the issuance of the project's initial Type A Water License (2AM-DOH0713) the ownership of the Project has changed three times. Construction of the project began in June 2007 by the original owner Miramar Mining Corp. (Miramar) under its subsidiary Miramar Hope Bay Mining Ltd. (MHBL). In March 2008, Newmont Mining Corporation (NMC) purchased the project and continued its construction under their wholly owned subsidiary Hope Bay Mining Limited (HBML). NMC however ceased construction in January 2012 and placed the project in Care & Maintenance. In January 2013 NMC sold the project to TMAC who subsequently recommenced exploration activities in June 2013 and will continue construction with the aim of putting the project into production by 2016.

This document reflects the changes to the Project proposed in Amendment 1 to Water License 2AM-DOH1323. These changes include plans to expand the footprint of the laydown areas at Roberts Bay, as well as constructing new ore and waste rock pads near Doris North Camp and a new vent raise pad and associated facilities at Doris Central. The post-closure water management plan also changes to include discharge from the Tailings Impoundment Area (TIA) through an under-sea fallout structure in Roberts Bay.

1.2 Closure and Reclamation Plan History

This document presents the closure obligations and the plan for closing all facilities, and demonstrates how the closure obligations will be met.

The first Closure and Reclamation Plan for the site was prepared by AMEC and submitted as a supporting document for the Final Environmental Impact Statement (EIS).The AMEC Closure Plan (AMEC 2005) described closure of the Doris North Project had it produced and milled ore in accordance with the 2005 Miramar EIS. Subsequent to this original closure plan a number of amendments and modifications to the original Type A Water License 2AM-DOH0713 were

submitted to the water board for review and approval. These amendments and modifications also required revisions to the project's Closure and Reclamation Plan.

In 2012 a new Closure and Reclamation Plan was submitted by the new owners, Hope Bay Mining Ltd., when the site was placed into Care & Maintenance. The SRK plan (SRK 2012a) differed from the AMEC plan with respect to the following key areas:

- The project never advanced to the production stage and was only an advanced exploration program with a decline that ended in ore;
- The mill was not constructed and tailings were not produced; and
- The underground bulk sampling program at Doris North produced waste rock and ore which were located on dedicated rock pads.

Given TMAC's intention of advancing the project through to production, this plan is similar to the Closure Plan submitted by MHBL in 2005 (AMEC 2005) and focuses on the closure of the site in accordance with the existing Type A Water License 2AM-DOH1323.

A chronological account of these revisions is provided in Table 1-1.

Table 1-1: Closure and Remediation Plan Revision History

Document Title	Author	Release Date	Key Changes
Preliminary Mine Closure and Reclamation Plan Doris North Project - Hope Bay Belt Nunavut, Canada	Miramar Hope Bay Ltd. (Written by AMEC)	October 2005	Initial version of plan submitted in support of Final Environmental Impact Statement Report
Mine Closure and Reclamation Plan Doris North Project, Nunavut	Miramar Hope Bay Ltd.	April 2007	Submitted in support of Water License Application
Doris North Closure and Reclamation Plan	Newmont, Hope Bay Mining Ltd. (Written by SRK)	August 2012	Project entered Care & maintenance phase. Closure and Reclamation of existing advanced exploration facilities (no operating mine was constructed) in accordance with Type A Water License 2AM-DOH0713
Doris North Mine Closure and Reclamation Plan	TMAC Resources Ltd. (Written by SRK)	March 2014	Transfer of ownership and re-activation of construction activities. Revised Plan in accordance with Type A Water License 2AM-DOH1323
Doris North Mine Closure and Reclamation Plan Amendment	TMAC Resources Ltd. (Written by SRK)	April 2014	Expand existing laydown areas or build new ones; changes to post-closure water management

1.3 Water License Requirements

The Doris North Camp and adjacent facilities are operated in accordance with Water License No. 2AM-DOH1323. Table 1-2 below provides a summary of the requirements for closure, as set forth in this Water License, and how this document addresses each of these requirements.

Table 1-2: Table of Concordance with Type A Water License 2AM-DOH1323

License Ref.	License Conditions (2AM-DOH1323)	Closure Plan Ref	Closure Plan Response/Specification
Part L. 1	Notification in writing will be submitted to the Board at least 60 (sixty) days prior any intent to achieve Recognized Closed Mine status	n/a	Compliance with license condition will be met.
Part L. 2	Notification to the board as soon as practically possible of any intent to enter a Care & Maintenance Phase	n/a	Compliance with license condition will be met.
Part L. 3	The Licensee shall, upon providing notice to the Board as per Part L, Item 2, review all operational plans and submit revised Plans to reflect the Care & Maintenance status, to the Board for approval in writing, within three (3) months of providing notice	n/a	Compliance with license condition will be met.
Part L. 4	The Licensee shall provide to the Board, at least thirty (30) days advanced notification in writing, of the initial start or change of Operations. Notification maybe provided separately or in accordance with monthly monitoring report as per PART J, Item 21	n/a	Compliance with license condition will be met.
Part L. 5	The Licensee shall submit to the Board for review, within sixty (60) days of approval of the License, a revised closure plan, addressing the technical comments received and based on the response submission of the Applicant on February 14, 2013	all	This document satisfies this license condition.
Part L. 6	Submit to the Board for approval within six (6) months of the start of ore processing, an Interim Closure and Reclamation Plan prepared in accordance with the Mine Site Reclamation Guidelines for the Northwest Territories, 2007 and consistent with INAC Mine Site Reclamation Policy for Nunavut, 2002	all	It is TMAC's intent that this document will also satisfy this license condition unless otherwise advised by the NWB.
Part L. 6.a	Detailed description, including maps and other visual representations, of the pre-construction conditions for each site, accompanied by a detailed description of the proposed final landscape, with emphasis on the reclamation of surface drainage over the restored area	Figures 2 through 13; Sections 2, 3 and 4	Addressed in this report.

License Ref.	License Conditions (2AM-DOH1323)	Closure Plan Ref	Closure Plan Response/Specification
Part L. 6.b	A description of how progressive reclamation will be employed and monitored throughout the life of the mine, plus reclamation scheduling and coordination of activities with the overall sequence of the project; details of the reclamation scheduling and procedures for coordinating reclamation activities within the overall mining sequence and materials balance	Sections 1.4 and 4.3.2	All efforts will be made during mine operations to implement progressive reclamation, such as backfilling with waste rock.
Part L. 6.c	Implications of any water quality model re-calibration results on the Tailings Impoundment Area (TIA) discharge strategy and any adaptive management measures that may be required	n/a	Compliance with license conditions will be met.
Part L. 6. d	An evaluation of closure and reclamation measures for each mine component including the goals, objectives, closure criteria and the rationale for selection of the preferred measures	Section 1.4, 3 and 4	See referenced sections
Part L. 6. e	A comprehensive assessment of materials suitability, including geochemical and physical characterization, and schedule of availability for reclamation needs, with attention to cover materials, including maps where appropriate, showing sources and stockpile locations of all reclamation construction material and any water related mitigation required during implementation	Section 3.1, Figures 6 and 7	See referenced sections and figures
Part L. 6. f	An assessment and description of any required post-closure treatment for drainage water that is not acceptable for discharge from any of the reclaimed mine components	Section 5	No impacted water is expected from the reclaimed components. However, observations resulting from annual monitoring will be used to augment closure activities if necessary and the seepage from all reclaimed areas will be monitored post closure.
Part L. 6.g	Contingency measures for all reclamation components including action thresholds that are linked to the monitoring programs	Section 5	See referenced section.
Part L. 6.h	Monitoring programs to assess reclamation performance and environmental conditions including monitoring locations for surface water and groundwater, parameters, schedules and overall timeframes	Section 5	See referenced section.

License Ref.	License Conditions (2AM-DOH1323)	Closure Plan Ref	Closure Plan Response/Specification
Part L. 6.i	Quality Assurance and Quality Control (QA/QC) procedures for managing the demolition landfill and other waste disposal areas	Sections 3 and 4	No waste disposal area will be constructed on-site. All waste will be disposed of in licensed facilities off-site or burned in accordance with approved procedures.
Part L. 6.j	The requirement that all Waste Rock classified as mineralized in accordance with the approved Waste Rock and Ore Management Plan as submitted under Part G Item 14 be returned underground as backfill through progressive reclamation procedures, unless otherwise approved by the Board in writing	Section 3.7, 4.6.6, 4.6.8	See referenced sections
Part L. 6.k	Underground mine plans and sections, including areas of backfill, the type of material placed and volumes should also be included	n/a	Underground mine plans and sections including areas backfilled will form part of the final Closure and Reclamation Plan and the Reclamation Completion Report.
Part L. 6.l	Protocol for the disposal of any contaminated soil into the underground mine at closure	Section 3.4 and 4.1.10	No contaminated soils will be disposed of underground.
Part L. 6.m	An assessment of the long-term physical stability of all remaining project components including the north and south dams	Section 5	See referenced section.
Part L. 6.n	Detailed criteria for the final breaching of the North Dam	Section 4.7.1	The breach will be in accordance with the approved design and subsequent NWB approval.
Part L. 6.o	A revised closure and reclamation cost estimate	Section 6, Appendices A and B	See referenced sections.
Part L. 6.p	A detailed implementation schedule for completion of reclamation work	Section 7, Appendix C	See referenced sections.
Part L. 7	Submit to the Board for approval within eighteen (18) months of the start of ore processing, a Final Mine Closure and Reclamation Plan prepared in accordance with the Mine Site Reclamation Guidelines for the Northwest Territories, 2007 and consistent with INAC Mine Site Reclamation Policy for Nunavut, 2002. The Final Plan shall incorporate revisions, which reflect the pending closed status of the mine, and include the following:	n/a	Compliance with license condition will be met.
Part L. 7. a	Soil Quality Remediation Objectives along with Canadian Council of Ministers of the Environment (CCME) Guidelines and the Government of Nunavut Environmental Guideline for Site Remediation	Section 4.1.10	Compliance with license condition will be met.

License Ref.	License Conditions (2AM-DOH1323)	Closure Plan Ref	Closure Plan Response/Specification
Part L. 7. b	Environmental Site Assessment plans in accordance with Canadian Standards Association (CSA) criteria	n/a	Compliance with license condition will be met.
Part L. 7. c	Evaluation of the Human Health Ecological Risk Assessment	n/a	Compliance with license condition will be met.
Part L. 8	If not approved by the Board, revised Plan must be resubmitted to the Board for approval within thirty (30) days of receiving notification of the Board's decision	n/a	Compliance with license condition will be met.
Part L. 9	Complete all reclamation work in accordance with the Plan(s) referred to in this Part as and when approved by the Board in writing	n/a	Compliance with license condition will be met.
Part L. 10	The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations	4.3.2 and 4.11.3	See referenced section.
Part L. 11	All roads and airstrip, if any, shall be re-graded to match natural contour to reduce erosion	Section 3.2, 3.3, and 4	See referenced sections.
Part L. 12	The Licensee shall remove any culverts and restore the drainage to match the natural channel. Measures shall be implemented to minimize erosion and sedimentation	Sections 3 and 4	See referenced sections
Part L. 13	In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography	Sections 3, 4.1.7 and 4.1.11	See referenced sections.
Part L. 14	Areas that have been contaminated by hydrocarbons from normal fuel transfer procedures shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, 2010. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector	Sections 3.4 and 4.1.10	See referenced sections.
Part L. 15	The Licensee shall contour and stabilize all disturbed areas to a pre-disturbed state upon completion of work	Sections 1.4 and 3	See referenced sections.

License Ref.	License Conditions (2AM-DOH1323)	Closure Plan Ref	Closure Plan Response/Specification
Part L. 16	The Licensee shall consult traditional land users, land owners, and other stakeholders on the proposed post-closure land use criteria. Particularly, the proposal to leave certain facilities in place and confirm the soil quality remediation objectives	Section 1.4	See referenced section.

1.4 Closure Objectives

The site has been designed with closure in mind and throughout operations every effort to apply progressive reclamation will be evaluated and implemented where practical to do so.

With the above in mind the overall objectives of this closure and reclamation plan are to establish stable chemical and physical conditions and ensure the future use and aesthetics of the site following reclamation meet the requirements of Aboriginal, Federal and Territorial governments, landowners, local communities and regulatory authorities. These objectives and the closure and reclamation criteria and strategies presented in this report have been developed in accordance with the Nunavut Mine Site Reclamation Policy (DIAND 2002) and the 2007 Northwest Territories Mine Site Reclamation Guidelines (INAC 2007).

In terms of future land use, some infrastructure at the site is a substantial contribution to the development of Nunavut and could be left in place after closure following consultation with all interested parties. For example, the fuel storage, airstrip, port/jetty, roads and rock pads can be used as a base for other projects in the area. However, for the purposes of this report it has been assumed these structures and facilities will all be removed and/or reclaimed to acceptable standards. Closure and reclamation of these facilities is also accounted for in the supporting cost estimate.

2 Description of Existing Facilities

Figure 1 shows the geographic location of the Doris North Project. The Doris North facilities have been grouped by “work areas” in a work breakdown structure (WBS) shown in Figures 2 through 13. The designated work areas are as follows:

- Roberts Bay Area,
- Airstrip Area,
- Reagent Pads Area,
- Waste Management Area,
- Quarry #2 Area,
- Doris North Camp,
- North Dam Area,
- South Dam Area,
- Quarry #3 Area,
- Doris North Vent Raise Area,
- Doris Central Vent Raise Area,
- Doris-Windy Road Area,
- Secondary Road Area,
- Doris Mountain, and
- Tail Lake Area.

These work areas are described below. The facilities found in each of these work areas have been numerically labeled and listed in Table 2-1. These work areas, the facilities and their alpha-numerical codes were used to organize the closure and remediation cost estimates provided in Appendix B.

2.1 Roberts Bay Area

The Roberts Bay area is shown on Figure 4 and 5 and includes the port and associated facilities for the Project. A rock fill jetty was constructed for barging operations. Two bulk fuel storage facilities are located at Roberts Bay, one containing a single 5 million liter fuel tank, and a second one that can house up to four 5 million liter fuel tanks as well as one 1 million liter jet fuel tank. A mechanical shop, vehicle repair complex, a waste management facility, laydown and vehicle parking areas are also located at Roberts Bay. A sandy beach area located approximately 1.5 km west of the jetty is used for explosives off-loading and storage. All structures and facilities were built on bedrock or rock fill pads. The individual facilities found in this area are listed in Table 2-1.

A discharge pipeline will be built from the Doris North mill to Roberts Bay to allow water discharge from TIA through a sub-sea diffuser. The sub-sea diffuser will be constructed about 2.4 km from the shore, in 40 m deep water. The new pipeline will be laid along the existing road from the Doris North mill building to Roberts Bay, extending underwater from the jetty to the diffuser.

2.2 Airstrip Area

The center of the Airstrip area is approximately 1.5 km south of Roberts Bay and is shown in Figures 2 and 3. The area contains the main airstrip, the north and south aprons, and the Explosives Mixing Facility pad. Each of these facilities is constructed on non-acid generating rock bases.

2.3 Reagent Pads Area

The Upper and Lower Reagent Pads are shown on Figures 2 and 3 and consist of two large pads for reagent storage as well as an equipment and materials laydown area. The storage areas were constructed with non-acid generating rock bases and rock berms, and geosynthetic liners were used for containment purposes. The individual facilities are listed in Table 2-1.

2.4 Waste Management Area

The Waste Management area is located on the northwest corner of Doris Camp and consists of the Landfarm, the Batch Plant and the Burn Pan as shown on Figures 6 and 7.

2.5 Quarry #2 Area

The Quarry #2 work area is located on the northwest corner of Doris Camp and consists of the Rock Quarry, the Overburden Dump, and the treated sewage discharge area as shown on Figures 6 and 7.

2.6 Doris North Camp

The Doris North Camp is shown on Figures 6 and 7 and is located approximately 5 km south of Roberts Bay. The facilities that comprise the Doris North Camp are listed in Table 2-1.

All buildings and structures are located on non-acid generating rock pads to protect permafrost. The rock pads were constructed to ensure positive drainage and prevent permanent ponding.

The area upstream of the camp also contains a diversion berm incorporating a geosynthetic liner to divert non-contact runoff from Doris Mountain. The underground decline and portal are located in the Doris North Camp area.

Currently, all waste rock and ore from the bulk sampling program is stockpiled on rock pads east of the camp complex. New dedicated pads will be built for ore and waste rock, together with a new Pollution Control Pond to service the new Waste Rock Pile.

2.7 North Dam Area

The area is located east of Doris North Camp and contains the North Dam, Frozen Core Plant pad and Tail Lake Access Road North as shown on Figures 2 and 3. The North Dam is located at the north end of Tails Lake.

2.8 South Dam Area

The South Dam area contains the future South Dam and Tail Lake Access Road South and is located at the south end of Tail Lake as shown on Figures 2 and 3. The South Dam will be constructed in a similar fashion to the North Dam.

2.9 Quarry #3 Area

The Quarry #3 area is located off the Secondary Road between the North and the South Dams and will be the quarry source for the construction of the South Dam. The approved location of the quarry and the access road are shown on Figure 10.

2.10 Vent Raise Area

Two vent raises from the underground workings will exist at the end of the project. One is located at the east end of the Doris North Camp, which has already been constructed, while the second one will be located south of the camp, as shown on Figures 6 and 7.

2.11 Doris-Windy Road Area

This area contains the all-weather road providing access to the old and new Windy Camp as well as three quarries and the construction phase explosives storage facility constructed on non-acid generating quarry rock pads. As shown of Figure 2 and 3, the area is located south of Doris North Camp.

2.12 Secondary Road Area

The Secondary Road is located on the east side of Tail Lake and connects the Doris North Camp area to Tail Lake, as well as North Dam to the South Dam as shown on Figures 2 and 3. Two roads are branching off the Secondary Road in the Tail Lake area, one near the North Dam and a second one near the South Dam. These are named Tail Lake Access Road North and Tail Lake Access Road South respectively, and serve as access to Tail Lake for deployment of the reclaim barges and pipelines.

2.13 Tailings and Reclaim Water Pipelines

The tailings and reclaim water pipelines have not yet been constructed, however following their construction they will run approximately 4.3 km from the mill (Doris North Camp area) to Tail Lake. These facilities are shown on Figures 10 and 11.

2.14 Emergency Catch Basins

The Emergency Catch Basins will be constructed with non-acid generating rock and will consist of a base and berms covered with a geotextile liner. There will be eight of them located at strategically identified topographic low points along the tailings and reclaim water pipelines, as shown in Figure 10.

2.15 Doris Mountain

Doris Mountain is located approximately 400 m north of Doris North Camp as shown on Figures 2 and 3. The area consists of two steel girder communications towers and associated communication equipment in a steel shack. All facilities are based on and anchored into the barren rock.

2.16 Tail Lake Area

The Tail Lake area is located approximately 1 km east of Doris Camp. Tail Lake will be used to store the mill tailings following start-up of the mill. The facility will be operated under a water cover. The facility will be closed by retaining a water cover on the tailings. This area is shown on Figures 10 and 11.

Table 2-1: Work Breakdown Structure

Work Area	Facility	WBS Code
Roberts Bay	Jetty	RB-001
	20 ML Roberts Bay Fuel Tank Farm	RB-002
	5 ML Quarry 1 Fuel Tank Farm	RB-003
	Mechanical Shop Complex	RB-004
	Waste Management Facility	RB-005
	Laydown Area	RB-006
	Overburden Dump	RB-007
	Fuel Transfer Access Road	RB-008
	Communications Tower	RB-009
	Beach Laydown Area	RB-010
	Laydown Area Expansion	RB-011
Airstrip	Airstrip	AS-001
	South Apron	AS-002
	North Apron	AS-003
	Explosives Mixing Facility Pad	AS-004
Reagent Pads	Equipment Laydown Area	RP-001
	Materials Laydown Area	RP-002
	Ammonium Nitrate Storage Area	RP-003
	Exploration Drilling Support Shop	RP-004
	Reagent and Cyanide Storage Facility	RP-005
	Lubricant Storage Facility	RP-006
Waste Management Area	Land Farm	WM-001
	Batch Plant Pad	WM-002
	Burn Pan	WM-003
Quarry #2	Overburden Dump	Q2-001
	Treated Sewage Discharge Areas	Q2-002
Doris Camp	Accommodation Complex	DC-001
	Doris North Fuel Tank Farm	DC-002
	Permanent Power Generator	DC-003
	Backup Power Generator	DC-004
	Sewage Treatment Plant	DC-005
	Fire Water Storage Tank	DC-006
	Muster Station	DC-007
	Warehouse/ Core Shack	DC-008
	Offices & Mine Dry Complex	DC-009
	Crushing and Milling Plant	DC-010
	Portal and Underground Works	DC-011

Work Area	Facility	WBS Code
	Underground Wash Bay	DC-012
	Underground Drilling Support Shop	DC-013
	Water Intake Structure and Pumping Facility	DC-014
	Sedimentation/Pollution Control Pond	DC-015
	Underground Support Mechanical Shop	DC-016
	Fresh Water Pipelines	DC-017
	Helicopter Support Facilities	DC-018
	Waste Rock Pile	DC-019
	Runoff Diversion Berm	DC-020
	Sewage Discharge Line	DC-021
	Sedimentation Berm	DC-022
	Sumps	DC-023
	Drainage Channel	DC-024
	New Ore Pad (Pad T)	DC-025
	New Waste Rock pad (Pad U)	DC-026
North Dam	North Dam	ND-001
	Tail Lake Access Road North	ND-002
South Dam	South Dam	SD-001
	Explosives Facility	SD-002
	Tail Lake Access Road South	SD-003
Quarry #3	Quarry #3	Q3-001
	Quarry #3 Access Road	Q3-002
Doris North Vent Raise	Vent Raise	VR-001
	Ventilation and Heating Facilities	VR-002
	Fuel Storage Area	VR-003
Doris Central Vent Raise	Vent Raise	VR-004
	Ventilation and Heating Facilities	VR-005
	Fuel Storage Area	VR-006
	Access Road	VR-007
	Overburden Dump	VR-008
Doris Windy Road	All-Weather Road	DW-001
	Quarry A	DW-002
	Quarry B	DW-003
	Quarry D	DW-004
	Explosives Storage Facility	DW-005
Secondary Road	Secondary Road	SR-001
	Tailings and Reclaim Water Pipelines	SR-002
	Emergency Catch Basins	SR-003
Doris Mountain	Communications Towers	DM-001

3 Facility Closure and Reclamation Strategies

In accordance with the Nunavut Mine Site Reclamation Policy (DIAND 2002) and the 2007 Northwest Territories Mine Site Reclamation Guidelines (INAC 2007) the following closure and reclamation strategies will be used throughout the implementation of the closure activities described in Section 4.

3.1 Cover Materials

All material used for reclamation will be sourced from existing stockpiles. Stockpiled Run-of-Quarry and crushed rock are from Quarry #2 and Quarry #3. A detailed geochemical characterization of quarry rock was previously performed, submitted and approved by NWB (SRK 2007). Where overburden soils will be used for reclamation, a sampling and testing program will be carried out to ensure no chemical or hydrocarbon contamination exist within the stockpiles. The Canadian Council for Ministers of the Environment soil quality guidelines (CCME soil quality guidelines) and the Nunavut Environmental Guidelines, Industrial Land Use, Coarse-Grained Soils (Government of Nunavut 2009) will provide guidance to the acceptability of the material for reclamation covers.

3.2 Rock Fill Pads

The reclamation objective is to ensure long-term physical stability and to protect the permafrost. Reclamation of the rock fill pads will be limited to regrading to ensure positive drainage and prevent ponding. Since construction, the permafrost will have migrated into the rock pads resulting in the death of the underlying vegetation. Removal of the pads is not practical because it would accelerate permafrost degradation due to lack of well-established vegetation. Revegetation of the pads is not practical because the rock pads cannot support vegetation.

3.3 Airstrip and All-Weather Roads

The airstrip and all-weather roads built using rock fill will be left in place as a permafrost protection measure, as described in section 3.2. The surface will be crowned or graded to prevent permanent ponding. The bridges and the arch culvert will be removed for safety and to restore natural drainage. Roads will be breached in areas where their presence has blocked natural drainage allowing the natural drainage paths to be re-established.

3.4 Fuel Storage Areas

The bulk fuel storage facilities at Roberts Bay (20 ML Roberts Bay Fuel Tank Farm and the 5 ML Quarry #1 Fuel Tank Farm) and at Doris North Camp (Doris North Fuel Tank Farm) will be decommissioned and the tanks dismantled. The temporary fuel storage facilities (aviation fuel, day tanks, etc.) will be decommissioned and removed from site for reuse or disposal in a licensed facility.

The granular protective cover will be tested for the presence of unacceptable levels of hydrocarbons. If required, this material will be remediated or removed off-site for remediation. The geosynthetic liners will be removed and the containment berms levelled to conform to the original topography as much as possible, and to prevent permanent ponding.

3.5 Buildings and Facilities

All buildings will be dismantled or demolished and the debris will either be burned or removed from site for disposal in a licensed facility. All facilities will be decommissioned, demolished, levelled, and processed for off-site shipment.

3.6 Water Management Structures

Existing water management structures will be maintained at Doris North until post-closure water quality objectives are met. Impacted runoff at the Doris North Camp will be collected and pumped to Tail Lake. Once the runoff water from the Doris Camp pads meets the water quality objectives, the collection sumps and the pipeline to Tail Lake will be decommissioned. The Sedimentation and the Pollution Control ponds will be breached to re-establish the natural drainage path.

In summary, when post-closure water quality objectives are met, all water management structures will be decommissioned, breached, or removed to restore the natural drainage paths where possible. Where the natural drainage path cannot be restored, measures will be taken to prevent accumulation and permanent ponding in order to prevent permafrost degradation. Erosion protection and sediment control measures will be installed where necessary.

3.7 Waste Rock

Where possible the remaining waste rock on surface will be used to assist the closure and remediation activities. Any waste rock remaining on surface following the completion of the closure and reclamation activities would only be done so after its acid rock drainage and metal leaching potential was confirmed to be acceptable. Any permanent closure activity incorporating surface placement would require NWB approval.

3.8 Tailings

Tailings will be left in Tail Lake under the proposed water cover as per the facilities design.

4 Closure Activities

The overall closure activities to be undertaken in the fulfillment of closure obligations are summarized in this section. The activities are described by geographic location of the various facilities following the WBS presented in Section 2.

4.1 Roberts Bay Area

4.1.1 Salvage

Reusable equipment and supplies will be salvaged from the Roberts Bay site prior to demolition and prepared for shipping off-site to a point of sale.

4.1.2 Demolition

All utilities to structures and facilities will be dismantled and the structures emptied prior to demolition. Buildings will be demolished and the waste material segregated into burnable and non-burnable waste and disposed of as described in Section 4.1.8. No salvage value was credited in the cost estimate. Structures and facilities to be demolished include the Mechanical Shop Complex, the Waste Management Facility, and the Communications Tower.

The concrete floor of the main Mechanical Shop will be broken up and covered in place. All seacan containers will be removed.

4.1.3 Decommissioning and Reclamation of Fuel Tank Farms

Both the 20 ML Roberts Bay Fuel Tank Farm and the 5 ML Quarry #1 Fuel Tank Farm will be decommissioned and shipped off-site.

4.1.4 Jetty

The rock fill jetty will be partially removed, to an elevation 0.3 m below the Low Low Water Level (LLWL). The rock fill will be placed into the surrounding water. The mooring points and buoys will be removed from site.

The surface of the jetty extending onto the shore, as well as the jetty access road and nearby laydown will be regraded and crowned to ensure positive drainage.

4.1.5 Overburden Dump and Sedimentation Berm

The Roberts Bay Overburden Dump is comprised mainly of oversize rock from the excavation of the 20 ML Roberts Bay Fuel Tank Farm and pockets of overburden soils. The top of the Overburden Dump was covered with a layer of crushed rock and was used as overflow dry parking area, meaning all vehicles and equipment were drained of fuels and lubricants before being parked here. The 2H:1V side slopes are constructed of oversize rock and are stable.

All materials and waste will be collected and disposed of as appropriate. The safety berms will be breached to allow free drainage. The top surface will be regraded to ensure positive drainage.

The sedimentation berm will be breached to the original ground level to restore natural flow paths.

4.1.6 Laydown Area and Laydown Area Expansion

The overhead electrical cables will be decommissioned and the posts removed. All waste and materials will be collected and disposed of as appropriate. The surface will be regraded for positive drainage and to prevent permanent ponding.

4.1.7 Beach Laydown Area

The beach laydown area was used to land barges and store explosives. The magazines will be removed and the area scarified where necessary to promote revegetation.

4.1.8 Collection and Disposal of Demolition Debris and Non-Hazardous Waste

All structures will be demolished and non-hazardous demolition waste will be segregated in two piles: wood waste and other non-hazardous waste.

Wood waste will either be chipped or burned. Wood waste suitable for burning may be transported to an approved burn pan location. Prior to on-site burning, appropriate approvals and permissions will be obtained from the Nunavut Water Board. Chipped wood may be used for reclamation purposes such as being mixed with drill cuttings, overburden or other material and used to fill depressions.

All remaining non-hazardous waste will be loaded in seacans to be shipped off-site. Materials shipped off-site will be disposed of in a licensed facility in accordance with appropriate Federal, Provincial, Territorial, or Municipal non-hazardous waste regulations.

4.1.9 Collection and Disposal of Hazardous Waste

Hazardous wastes and chemicals remaining on-site will be collected and stored in suitable sealed containers and/or empty drums. This includes any remaining fuel, hydraulic oil, antifreeze, batteries, and other lubricating fluids and/or chemicals. Reusable items will be shipped off-site to a third party destination. Unusable items will be packaged and manifested at the Waste Management Facility for transport to a licensed facility in accordance with appropriate Federal, Provincial, Territorial, or Municipal hazardous waste regulations.

4.1.10 Remediation of Hydrocarbon Contaminated Soils

Field investigations will be completed prior to site closure by qualified personnel to define the extent of contamination. An assessment of remediation options will be conducted once the full extent and nature of the contamination is determined. Localized areas with limited soil contamination will be bioremediated in situ. If large contiguous areas of contaminated soil are found, excavation and off-site removal, of the soil, will be considered. Excavations will be backfilled with rock, overburden, drill cuttings, wood chips and/or a mixture of these to prevent surface water ponding and ensure permafrost preservation.

The option to encapsulate contaminated soils, in place, is also considered should it be demonstrated that the hydrocarbon risk is minimal and/or other remediation methods are ineffective or inappropriate for a given area.

The Nunavut Environmental Guidelines, Industrial Land Use, Coarse-Grained Soils (Government of Nunavut, 2009) will be used for determining if soil remediation is required.

4.1.11 Drainage Control

Rock pads will be regraded to blend into the original terrain and prevent permanent ponding of water after the structures have been removed and the area has been cleared of all debris. In the summer prior to regrading, the areas should be staked to be easily identified during the winter reclamation work.

No new disturbance will be created during this regrading effort. Any remaining depressions which cannot be regraded will be backfilled with suitable fill. All tracks and trails on the tundra associated with the existing Roberts Bay facilities will be ripped and/or scarified to promote natural revegetation, reduce erosion potential, and ensure the restoration of natural drainage pathways. Where there is sufficient soil substrate to support vegetation, the area will be revegetated as appropriate.

4.2 Airstrip Area

4.2.1 Salvage

Reusable equipment and supplies will be salvaged from the airstrip prior to demolition and be prepared for shipping off-site to a third party destination or point of sale. This may include airstrip lighting, approach lighting, generator, communication equipment, mobile equipment, etc.
No salvage value has been accounted for in the closure cost estimate for reusable equipment.

4.2.2 Demolition

Structures on the North Apron will be demolished and non-hazardous demolition waste will be disposed of as detailed in Section 4.1.8. All hazardous waste will be collected and disposed of as detailed in Section 4.1.9.

4.2.3 Drainage Control

The surface of the Airstrip, Aprons, and Temporary Explosive Mixing Facility pad and Access Road will be regraded to ensure positive drainage.

4.3 Reagent Pads Area

4.3.1 Reagent Pads

Reusable vehicles, equipment, and supplies will be salvaged from both the Upper and Lower Reagent Pads and shipped off-site to a third party destination or point of sale. Unusable items will be disposed of as appropriate for non-hazardous or hazardous waste, as detailed in sections 4.1.8 and 4.1.9 respectively. All empty containers will be used for shipping materials and waste off-site.

The surface of the pads will be regraded to ensure positive drainage.

4.3.2 Ammonium Nitrate Storage Area

Prior to construction of the Explosives Facility near South Dam the ammonium nitrate containers were stored on a lined pad in the southwest corner of the Upper Reagent Pad. This lined pad will either be reclaimed as part of the progressive reclamation efforts, or be repurposed for storage of other materials requiring secondary containment.

At final reclamation, the pad liner will be removed, cut into pieces and disposed of as construction debris, while the containment berm will be regraded to prevent permanent ponding of water.

4.3.3 Reagent and Cyanide Storage Facility

All Reagent and Cyanide storage containers remaining on-site at closure will be shipped off-site to a third party destination or point of sale. The geosynthetic liner will be removed, sectioned, and disposed of as detailed in Section 4.1.8. The containment berms will be levelled and the area regraded to ensure positive drainage.

4.3.4 Lubricant Storage Facility

The Lubricant Storage Facility will be reclaimed in a similar fashion as the Reagent and Cyanide Storage Facility. Any remaining lubricants and other fuels will be shipped off-site, while the geosynthetic liner will be removed and disposed of. The berms will be regraded to prevent permanent ponding.

4.3.5 Exploration Drilling Support Shops

The tent buildings will be demolished and the waste will be disposed of as appropriate. The area will be graded for positive drainage. The footprint of the shop and the immediate vicinity will be tested for hydrocarbons and other contaminants and appropriate actions will be taken based on the test results.

4.4 Landfarm and Burn Pan Area

The general area of the waste management area will be regraded to ensure positive drainage. The core boxes stored on the south end of the pad will remain in place.

4.4.1 Landfarm

The solid waste contained within the Landfarm ponds will be tested for contaminants. If it exceeds the appropriate remediation criteria, it will be loaded into megabags and shipped off-site for disposal in an appropriate disposal facility. The contaminated water contained within the ponds will be tested, treated as appropriate, and discharged when water quality criteria are met.

The liner of the Landfarm will be removed, cleaned, cut in pieces and disposed of as non-hazardous waste.

The protective cover layer will be removed, tested, and if it meets the appropriate reclamation criteria will be used as backfill. If the testing program finds that the cover material is contaminated, it will be placed into megabags and shipped to an off-site facility licensed to dispose of such contaminants.

The containment berm will be levelled and the area regraded to ensure positive drainage.

4.4.2 Batch Plant Pad

All waste remaining on the Batch Plant Pad will be collected and placed into appropriate containers for disposal, as detailed in sections 4.1.8 and 4.1.9. The pad area will be regraded to ensure positive drainage.

4.4.3 Burn Pan

The Burn Pan will be demolished and the debris disposed of as non-hazardous waste. The residual ashes will be placed in suitable sealed containers and disposed of as appropriate. The area will be regraded to prevent permanent ponding.

4.5 Quarry #2 Area

4.5.1 Quarry #2

All vertical faces in the quarry will be scaled. Safety berms will be left in place but breached for drainage. The area will be inspected by a qualified inspector, to ensure no loaded holes remain on-site.

4.5.2 Overburden Dump

The side slopes of the overburden dump will be regraded to 3H:1V and contoured for drainage control. Erosion protection measures will be installed as appropriate. The dump will be revegetated. The culvert in the dump access road will be removed and a swale established to restore natural drainage.

The sedimentation berm downstream of the dump will be breached to restore the natural drainage path.

4.5.3 Treated Sewage Discharge Areas

Areas where vegetation has died and permafrost degraded at the Sewage Treatment Plant discharge point will be backfilled with a suitable fill material to prevent permanent ponding. Areas with minor vegetation degradation will be revegetated. The Sewage Discharge Pipeline will be removed and disposed of as appropriate.

4.6 Doris North Camp Area

4.6.1 Salvage

Reusable equipment and supplies will be salvaged from the camp buildings and facilities prior to demolition and prepared for shipping off-site to a third party destination or point of sale.

4.6.2 Demolition

All utilities will be dismantled and the structures emptied prior to demolition. Non-hazardous and hazardous waste will be segregated as discussed in Section 4.1.8. Fuel tanks used for heating fuel will be drained, removed, and temporarily placed within the lined area of the Doris North Fuel Tank Farm. If possible and/or if needed, furniture, utilities, and structures will be salvaged. Where possible, salvageable structures will be moved intact, or they will be carefully dismantled and catalogued for re-assembly. Unusable or unwanted buildings will be demolished. The resulting waste material will be segregated into burnable and non-burnable waste and disposed of as described in Section 4.1.8. For the purposes of cost estimating none of these items are assumed to have salvage value. The following structures and facilities will be demolished:

- Accommodation Complex,
- Permanent Power Generator,
- Backup Power Generator,
- Doris North Fuel Tank Farm
- Sewage Treatment Plant,
- Fire Water Tank,
- Muster Station,
- Warehouse / Core Shack,
- Office and Mine Dry Complex,
- Crusher and Mill Complex,
- Underground Wash Bay,
- Underground Drilling Mechanical Shop,
- Underground Support Mechanical Shop,
- Water Intake Structure and Pumping Facility, and
- Helicopter Support Facilities.

4.6.3 Doris North Fuel Tank Farm

The Doris North Fuel Tank Farm will be decommissioned and the piping disconnected. The tanks will be drained, steam-washed, cut into manageable pieces and prepared for shipping to an off-site facility for disposal. The resulting wash water will be directed to an oil-water separator to remove the residual fuel.

The geosynthetic liner will be removed, cleaned, cut into pieces, and shipped off-site for disposal. The berms will be regraded to prevent permanent ponding.

4.6.4 Crusher, Mill, and Process Plant

The facilities directly associated with the ore beneficiation (Crusher, Mill, and Process Plant) will be cleaned of all remaining chemicals and process reagents and the resulting hazardous waste disposed of as described in Section 4.1.9.

The residual ground ore and ore dust will be removed by flushing the equipment and/or washing with high pressure water. The collected solids will be slurried and pumped to the TIA.

The steel frame building will be disassembled and disposed of as demolition waste, as described in Section 4.1.8. The concrete bases will be broken up and covered in place using rock fill. The crusher's well on the east end of Pad D will be backfilled with clean quarried rock reclaimed from the adjacent Pad Q or the crest of Pad D fill.

The milling and processing equipment will be decommissioned, cleaned, and prepared for shipping off-site. No salvage value is assumed for this equipment.

The Mechanically Stabilised Earth (MSE) Wall supporting the crusher loading platform on Pad Q will be deconstructed and the near-vertical rock fill re-sloped to 2.5H:1V. The excess fill will be used to backfill the crusher excavation. The resulting debris of wire mesh and anchors will be disposed of as appropriate.

4.6.5 Water Management Structures

The water management structures are as follows:

- Sedimentation Pond,
- Pollution Control Ponds,
- Drainage Channel,
- Sumps #1 & #2, and
- Doris North Diversion Berm.

The ponds will be breached to be free draining. The sumps will be decommissioned and backfilled with crushed rock or soil from the Overburden Dump. The liner of the Sedimentation Pond will be entirely removed and disposed of as non-hazardous waste. The liner in the downstream berm of the Pollution Control Pond will be left in place outside of the breach.

The Doris North Diversion Berm will be left in place and reshaped to blend in with the natural topography. Removal or breaching it would increase the volume of water that could potentially be ponding upstream of the Ore Pad. The Doris North Diversion Berm was designed for free drainage, and removing the culvert at the west end would render it maintenance-free.

To eliminate the risk of water ponding upstream of the Ore Pad (Pad Q), a drainage channel will be cut through the rock fill of the pads to convey runoff onto the tundra south of the camp pads. The proposed alignment is shown in Figures 6 and 7.

4.6.6 Portal and Underground Works

All underground utilities and installations will be removed and disposed of as appropriate. The entrance of the underground portal will be sealed with a 15 m thick rockfill plug, according to regulations. The pad in front of the portal will be regraded to promote positive drainage, aaway from the portal, and prevent permanent ponding.

4.6.7 Pipelines

The heat traced pipelines for potable water and sewage discharge will be sectioned and disposed of as non-hazardous waste. The heat tracing cables and controllers will be removed and disposed of as appropriate.

4.6.8 Waste Rock and Ore Piles

Minimal to no waste rock will be left on surface at the end of the mine. If available, part of the waste rock will be used for sealing the underground workings. Appropriate management options will be assessed for the remaining material. One option is consolidating all remaining waste rock at surface, contouring and covering the Waste Rock Pile with an impermeable liner and a 0.3 m thick protective layer of crushed rock. Other options include depositing the remaining waste rock in Tail Lake for sub-aqueous disposal, or leaving the waste rock in place. Additional options may also be considered. All above ground waste rock storage options are subject to approval. A design and/or description of the final waste rock disposal or storage alternative will be included in the application for approval.

It is assumed that all ore will have been processed at the end of the mine. The top layer of the rock fill of the Ore Pad will be removed and disposed of in Tail Lake or underground. The remaining clean rock will be regraded to prevent permanent ponding of water.

4.7 North Dam Area

4.7.1 North Dam

The North Dam will be breached once the water quality in Tail Lake returns to levels below the CCME guidelines for the protection of aquatic life (anticipated at 7 years after process plant closure). The water level in Tail Lake will be lowered to (or below) the natural water level (28.3 masl) to facilitate the dam breach. The breach will be a 20 m wide cut down to the original ground elevation (of 28.3 masl) with 4H:1V side slopes. The breach in the dam will be clad in rip-rap for erosion protection. All instrumentation will be removed and salvaged or disposed of, as appropriate. The thermosyphon radiators will be dismantled, and the support superstructure cut and removed. The evaporator pipes of the thermosyphons and the ad-freeze piles of the support structures will be left in place.

4.7.2 Tail Lake Access Road North

The road surface will be crowned to ensure positive drainage.

4.7.3 Shoreline Erosion Protection

An area of about 3 hectares (AMEC 2005) was identified as highly susceptible to erosion due to permafrost degradation following the rise of the water level in Tail Lake. This area will be protected against erosion by constructing a 0.5 m thick riprap blanket underlain by geotextile. Rock from the North Dam breach, Quarry #3, or approved waste rock will be used.

4.7.4 TIA Water Management

Water quality in Tail Lake will continue to be monitored after completion of the mining and milling activities. Fresh water will be pumped from Doris Lake to Tail Lake seasonally, for 61 days during the open water months, to maintain discharge water quality in the lake through dilution. To manage the water level in Tail Lake, supernatant tailings water satisfying the quality criteria will be discharged into Roberts Bay through an undersea diffuser during the 152 day open water season each year.

According to the water quality model (SRK 2011) the water quality in Tail Lake should satisfy the discharge requirements after seven years of active management, however at that time the water level will still be above the natural lake level. Based on the maximum ocean discharge rate of 120 L/sec, a further two years of active water management will be necessary to return the water level to 28.3 masl, required to breach the dam.

Site presence and active water management is therefore required for a nine year period. In year 10 the North Dam will be breached and natural discharge from Tail Lake re-established.

Under the adaptive management approach the quality of the tailings supernatant will be continuously monitored and the predictive models refined during mine operations. This will allow contingencies to be put in place if predictions are not valid.

4.8 South Dam Area

4.8.1 South Dam

Due to the fact that the South Dam will be constructed on the water divide between Tail Lake and Ogama Lake, it will not be impounding any water once the North Dam is breached. The dam will be left in place as no breaching or other deconstruction is required. The monitoring equipment and thermosyphones will be reclaimed in a similar manner as detailed for the North Dam.

4.8.2 Explosives Facility

The magazines will be emptied and hauled to Roberts Bay for shipping off-site. The AN/FO mixing plant will be decommissioned, the building demolished and the equipment and debris disposed of as appropriate. The containers remaining in the Ammonium Nitrate storage area will be hauled to Roberts Bay for shipping off-site, while the impermeable liner will be removed, cut into manageable pieces and disposed of as demolition debris. The containment berms will be regraded to prevent permanent ponding.

4.8.3 Tail Lake Access Road South

The road surface will be crowned to ensure positive drainage.

4.9 Quarry #3 Area

4.9.1 Quarry #3

This quarry is the source of the rock fill and crushed aggregates for the construction of the South Dam. Once the dam is complete, the quarry will be abandoned and become the site of progressive reclamation. All vertical faces in the quarry will be scaled. Safety berms will be left in place but breached for drainage. The area will be inspected by a qualified inspector, to ensure no loaded holes remain on-site.

4.9.2 Quarry Access Road

The road surface will be crowned to ensure positive drainage.

4.10 Vent Raise Areas

4.10.1 Salvage

All reusable equipment will be salvaged and prepared for shipping to a point of sale off-site. For the purpose of the cost estimate, no salvage value is credited to the equipment.

4.10.2 Demolition

All structures will be demolished and the waste will be disposed of as appropriate, according to Section 4.1.8.

4.10.3 Vent Raise

Ducts, pipes, and cables entering the vent raise will be removed. A 0.5 m thick reinforced concrete plug will be installed to seal the vent raise.

4.10.4 Fuel Storage Area

The EnviroTank will be decommissioned, drained, and hauled to Roberts Bay for shipping off-site. The liner of the secondary containment area will be cleaned, removed, cut into pieces, and disposed of as non-hazardous waste. The area will be backfilled and regraded to prevent permanent ponding.

4.10.5 Doris Central Access Road

The access road to Doris Central Vent Raise will be graded to prevent permanent ponding.

4.10.6 Overburden Dump

The overburden dump at the Doris Central Vent Raise will be reclaimed as described in Section 4.5.2.

4.11 Doris-Windy Road Area

Although the Doris-Windy Road Area is not covered under the Doris North Type A Water License 2AM-DOH1323 closure and reclamation of these facilities has been included in this closure and remediation plan and cost estimate, given the spatial relationship these facilities have to the Doris North Project.

4.11.1 Doris-Windy All-Weather Road (AWR)

The rock fill of the AWR will be left in place and crowned to prevent ponding. The bridges and arch culvert will be removed.

4.11.2 Rock Quarries

Other than the first 1.5 km, the AWR was built with rock sourced from three quarries along the road alignment: Quarry A, Quarry B, and Quarry D. The quarries will be decommissioned and reclaimed. All vertical faces in the quarries will be scaled. Safety berms will be left in place. The area of each quarry will be inspected by a qualified inspector, to ensure there are no loaded blast holes remaining on-site.

4.11.3 Old Explosives Storage Facility (Quarry A)

The explosives magazines will have been moved to the new Explosives Facility located in the South Dam Area, thus no explosives are to be at this location. Any equipment or materials stored in this area will be removed and disposed of as appropriate while the pads will be graded for positive drainage.

4.12 Secondary Road Area

4.12.1 Secondary Road

The bridge over Doris Creek will be removed, as well as the pipe culvert east of the bridge. The crest of the road will be crowned for positive drainage.

4.12.2 Tailings and Reclaim Water Pipelines

The tailings and reclaim water pipelines will be flushed with water and then cut into manageable pieces and disposed of as appropriate. The heat tracing lines and controllers will be removed and disposed of in an approved manner.

4.12.3 Emergency Catch Basins

Any residual tailings within the catch basins will be removed and placed into Tail Lake. The impermeable liner of the basins will be cleaned, removed, cut into manageable pieces and disposed of as non-hazardous waste. The berms of the basins will be collapsed inward and recontoured to prevent any permanent ponding.

4.12.4 Discharge Pipeline Access Road

The road will be crowned and graded to promote run-off. The discharge pipeline will be removed, cut into pieces, and disposed of as appropriate.

4.13 Doris Mountain Communication Towers

The Doris Mountain communication towers will be decommissioned, dismantled, and hauled to Roberts Bay for shipping off-site. The reusable communication equipment will be dismantled and salvaged. All other waste will be disposed of as appropriate. The concrete foundation blocks and the guy wire anchor blocks will be left in place.

5 Post Closure Monitoring and Maintenance

Post closure monitoring will take place at the site until such time that the objectives of the closure and remediation activities have been met to the satisfaction of the regulatory authorities and all affected parties. The exact extent of this duration may vary given that the mine has been designed with closure in mind. Coupled with the proper implementation of best practice closure and remediation activities as described in this report, the following post closure monitoring will be required to ensure the closure and remediation objectives are met:

- The site should be visually inspected by a Professional Engineer annually for three consecutive years to ensure that permafrost degradation areas have stabilized.
- Post-closure monitoring of all covers will be performed every two years for a ten year period or until it is confirmed the areas are physically stable. These inspections will be completed by a qualified inspector to ensure the physical integrity of the cover is maintained. Maintenance will be performed on areas that monitoring identifies as needing repairs.
- The site should be inspected by an arctic vegetation specialist to confirm suitability of the revegetation efforts. Inspections should be completed at the following intervals, unless otherwise recommended by the vegetation expert: Year 2, Year 4, Year 8 and Year 11 post closure.
- The annual seep sampling program carried out in accordance with Type A Water License 2AM-DOH1323 will be continued to detect any changes in the leachate chemistry downstream of the remediated areas for a period of five years or until the leachate is confirmed to be chemically stable and consistent with the site specific closure criteria.
- As per section 4.7.4 Supernatant from Tail Lake will be released to Roberts Bay for approximately 152 days during the open water season from year 1 through year 9 or until such time that the water quality is such that the north dam can be breached as per section 4.7.1.

The post closure monitoring requirements may require additional activities following the implementation of the project's final closure and remediation plan and the subsequent Reclamation Completion Report.

In addition the monitoring requirements may again change as a result of the Performance Assessment Report which will be prepared and submitted to the NWB for their review following the initial post closure monitoring period which will be defined in consultation with NWB as part of the Final Closure and Remediation Plan.

6 Cost Estimate

Appendix A provides a basis of estimate for the closure costs and Appendix B details the estimated costs for closure of the Doris North Mine.

The estimated closure cost for the Doris North Camp is $28.1 million in undiscounted 2013 Canadian Dollars ($). This represents an overall cost increase of about $6.6 million due to the amendment in the project plan.

These costs were developed using an NWB approved spreadsheet based cost estimating process that is consistent with the principles of RECLAIM6.1 (SRK 2012b).

7 Schedule

Closure of the Doris North Mine site will occur upon completion of mining and milling of ore. It is anticipated that all decommissioning and closure activities can be completed in one construction season. These activities will be initiated in the first construction season following the completion of milling. If possible all components to be removed from site will be done so prior to freeze up in year 1 as well.

Water management activities will start in the first year following closure and continue until water quality criteria are met. Decommissioning of water management structures will require an additional construction season and it is expected that these activities cannot take place until year 10.

Year 2 will be the initial year of the post closure monitoring and maintenance period and as discussed above will require approximately 10 years. This schedule is attached as Appendix C.

This report, ***"Doris North Mine Closure and Reclamation Plan for Amendment 1 DRAFT"*** has been prepared by SRK Consulting (Canada) Inc.

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Disclaimer

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8 References

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Figures

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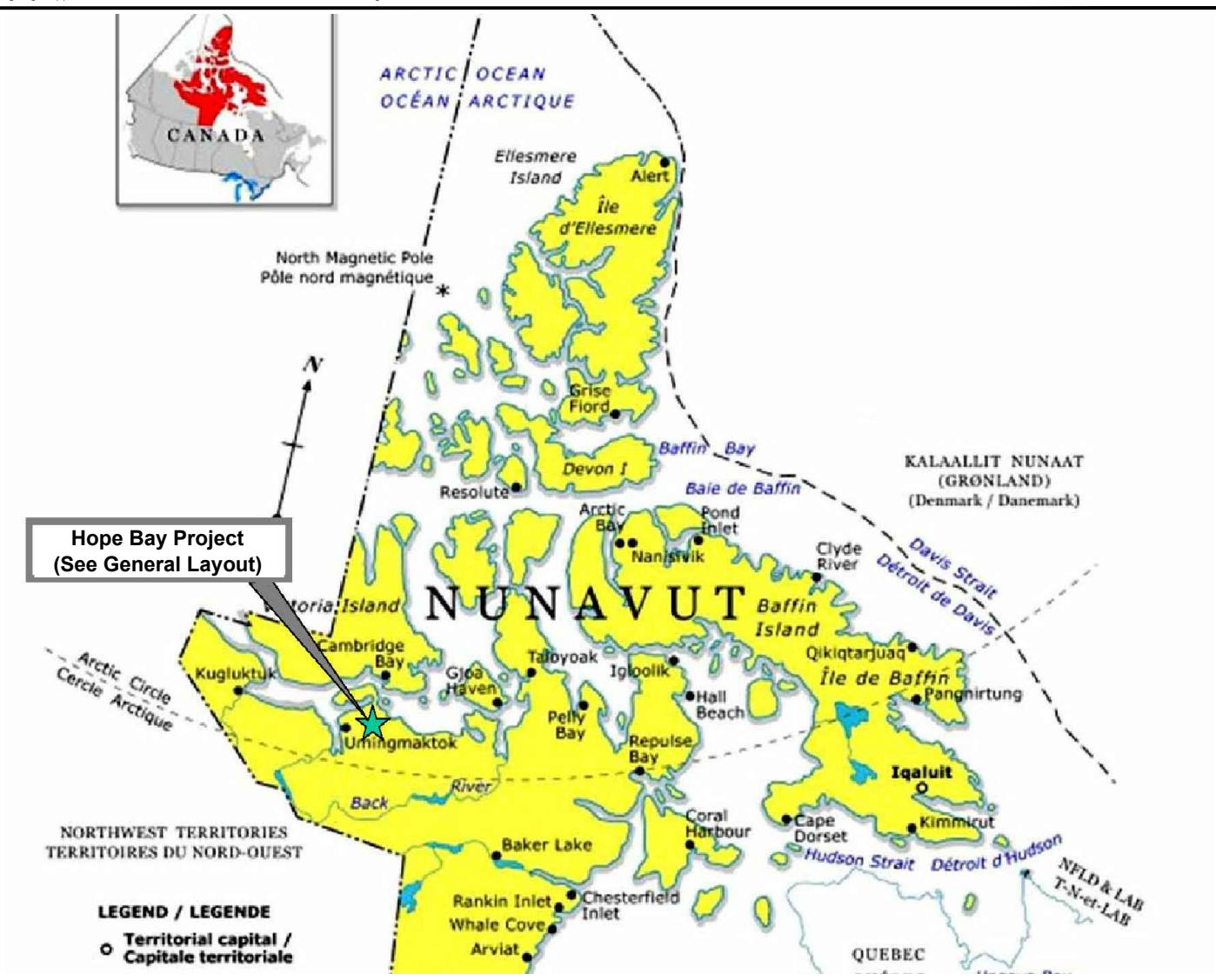
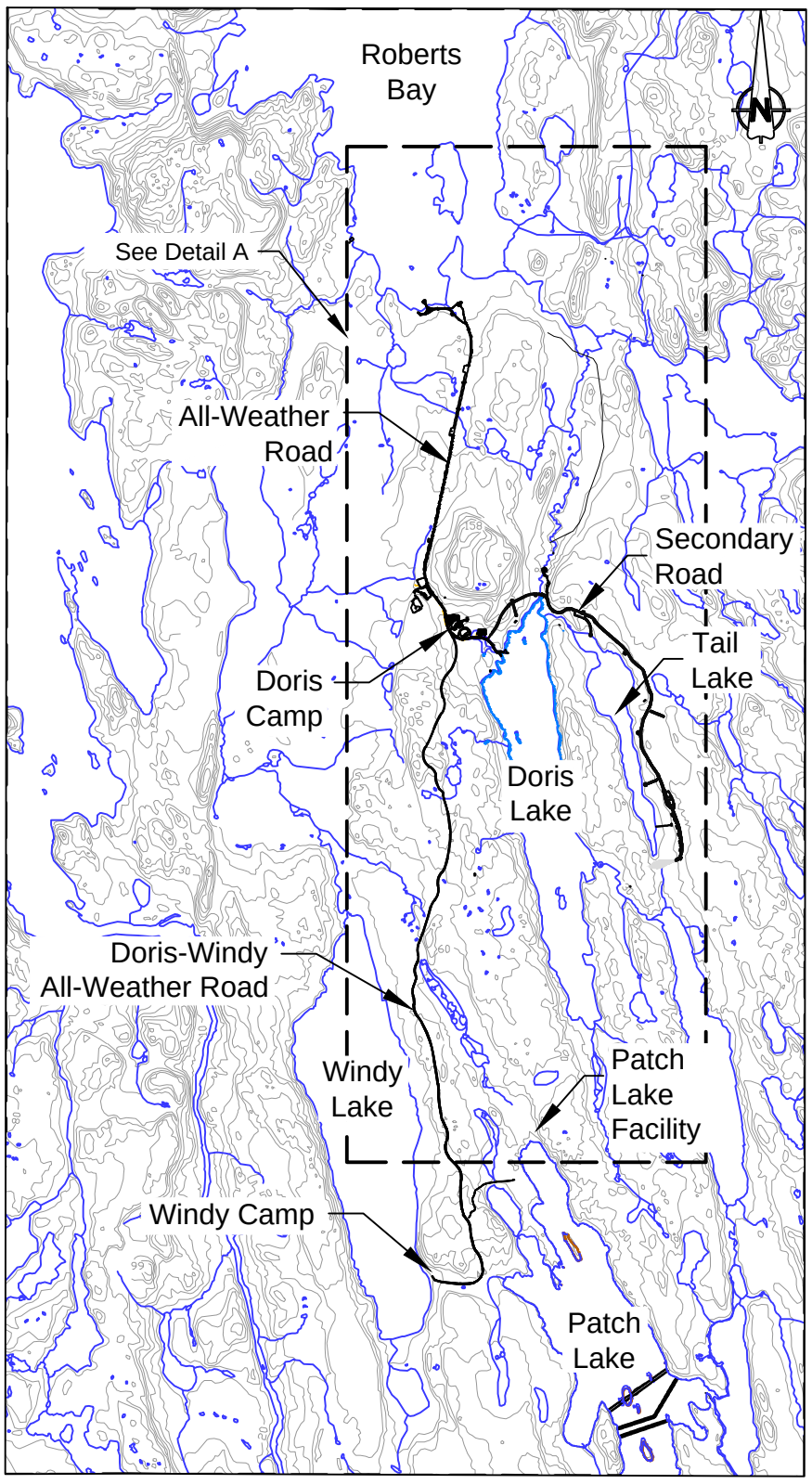


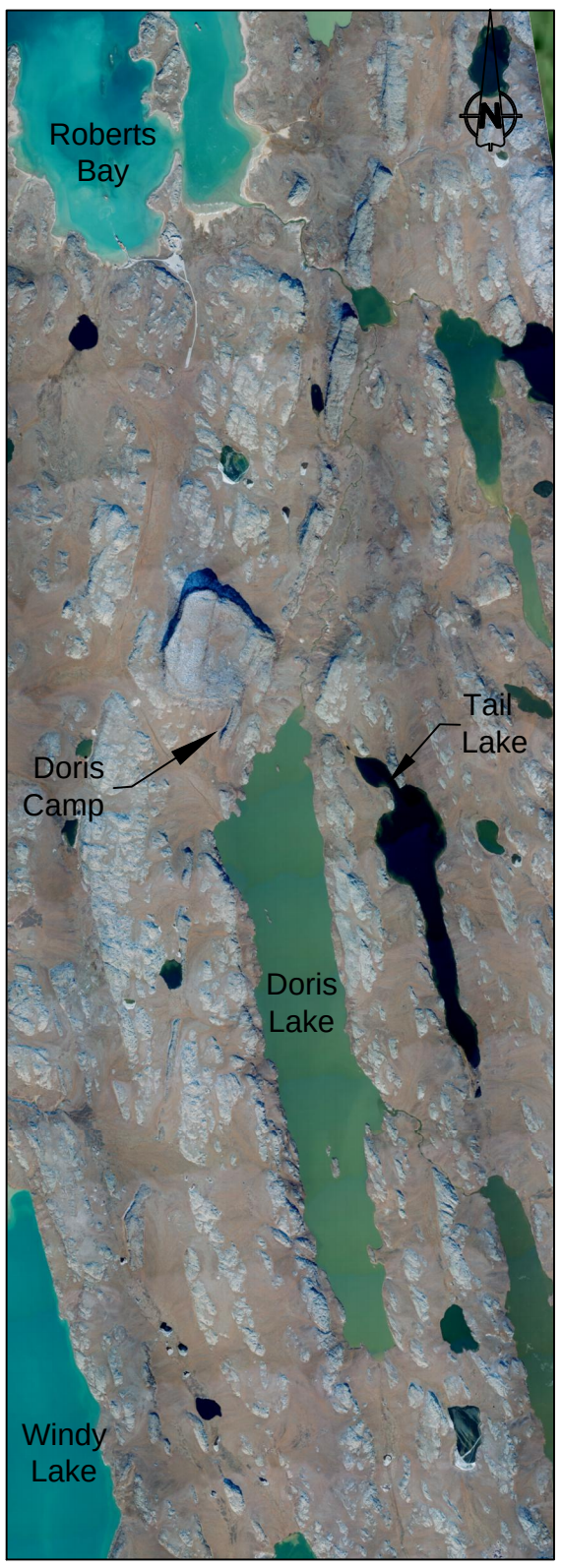
LOCATION MAP



GENERAL LAYOUT

0 1 2 3 4 5

Scale in Kilometres



DETAIL A

0 500 1000 1500 2000 2500

Scale in Metres

1. Topographic contour data for the terrain moedel were provided by Hope Bay Mining, and is based on 2007 Aerial Photography.
2. The coordinate system is UTM NAD 83, Zone 13

srk consulting

SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_GeneralLocation_Rev0.dwg

TMAC RESOURCES

TMAC Resources Inc.

DORIS NORTH PROJECT AMENDMENT

Doris North Closure Plan Location Map

DATE:	APPROVED:	FIGURE:
April 2014	IM	1

Roberts Bay

Roberts Bay

AS - 003

AS - 001

AS - 002

AS - 004

Airstrip

0 80 160 240 320 400

Scale in Metres

RP - 001

RP - 004

RP - 003

RP - 005

RP - 006

RP - 002

Upper & Lower Reagent Pads

0 50 100 150 200 250

Scale in Metres

DM - 001

Doris Camp

Q3-002

Tail Lake

Q3-001

SR-001

ND - 002

ND - 001

Doris Lake

North Dam

0 50 100 150 200 250

Scale in Metres

ND-003

Tail Lake

Quarry A

0 20 40 60 80 100

Scale in Metres

DW - 002

DW - 005

DW - 001

Doris Lake

DW - 003

DW - 001

Tail Lake

SD-004

SD - 003

SD - 002

SD - 001

South Dam

0 80 160 240 320 400

Scale in Metres

Doris Central Vent Raise

0 100 200 300 400 500

Scale in Metres

Windy Lake

DW - 004

WINDY CAMP

Patch Lake

Work Area	Facility	WBS Code
Airstrip	Airstrip	AS-001
	South Apron	AS-002
	North Apron	AS-003
	Explosives Mixing Facility Pad	AS-004
Reagent Pads	Equipment Laydown Area	RP-001
	Materials Laydown Area	RP-002
	Ammonium Nitrate Storage Area	RP-003
	Exploration Drilling Support Shop	RP-004
	Reagent and Cyanide Storage Facility	RP-005
	Lubricant Storage Facility	RP-006
North Dam	North Dam	ND-001
	North Tail Lake Access Road	ND-002
	Reclaim Pipeline	ND-003
South Dam	South Dam	SD-001
	Explosives Facility	SD-002
	South Tail Lake Access Road	SD-003
	Tailings Discharge Pipeline	SD-004
Doris Windy Road	All-Weather Road	DW-001
	Quarry A	DW-002
	Quarry B	DW-003
	Quarry D	DW-004
	Explosives Storage Facility	DW-005
Secondary Road	Secondary Road	SR-001
Doris Mountain	Communications Towers	DM-001
Quarry #3	Quarry #3	Q3-001
	Quarry #3 Access Road	Q3-002

OVERALL SITE PLAN

0 200 400 600 800 1000

Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_Doris_N_ClosurePlan_Rev2.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
General Layout
Work Breakdown Structure

DATE:	APPROVED:	FIGURE:
April 2014	IM	2

J:\01_SITES\Hope.Bay\1CT022.000_2013 Hope Bay Ongoing Support\!040_AutoCAD\1CT022.000_Doris_N_ClosurePlan_Rev2.dwg

Roberts Bay

Upper & Lower Reagent Pad
0 50 100 150 200 250
Scale in Metres

Airstrip
0 80 160 240 320 400
Scale in Metres

Doris Camp

Tail Lake

Doris Lake

Quarry A
0 20 40 60 80 100
Scale in Metres

Doris Lake
North Dam
0 50 100 150 200 250
Scale in Metres
Tail Lake

Quarry I

Doris Central Vent Raise
0 100 200 300 400 500
Scale in Metres

Tail Lake

Windy Lake

South Dam
0 80 160 240 320 400
Scale in Metres

Windy Camp

Patch Lake

OVERALL SITE PLAN

0 200 400 600 800 1000
Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_Doris_N_ClosurePlan_Rev2.dwg

TMAC RESOURCES

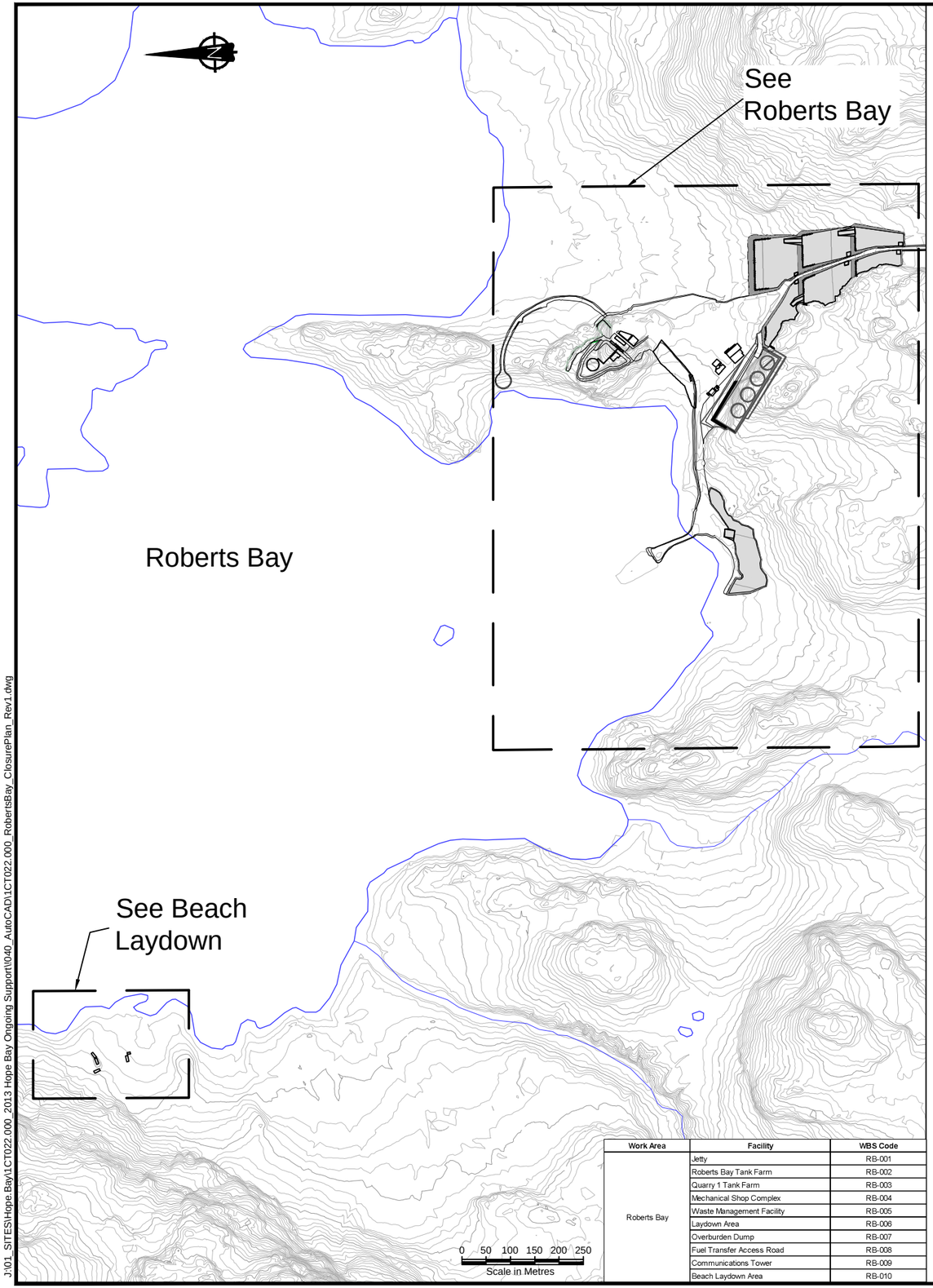
TMAC Resources Inc.

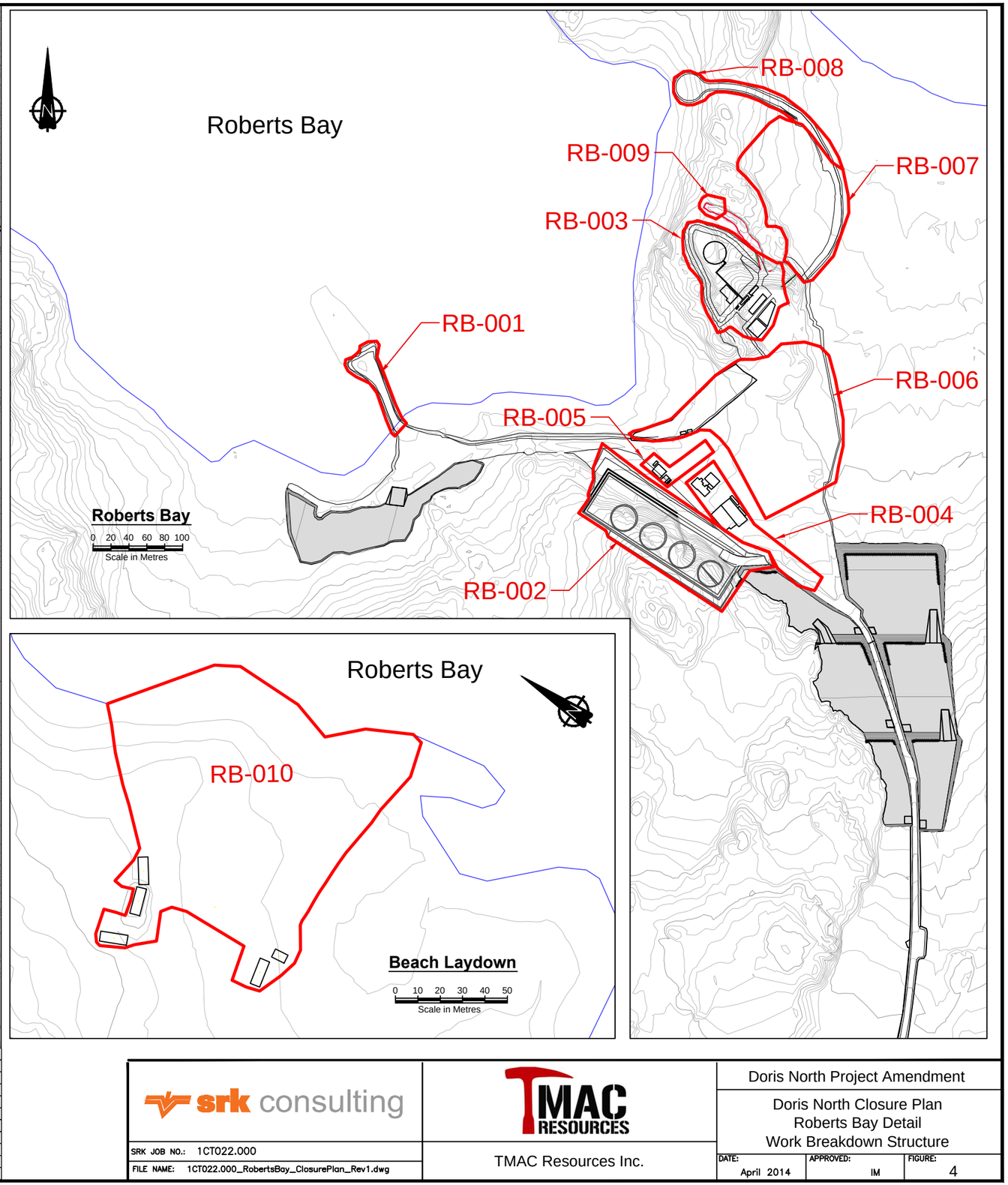
Doris North Project Amendment

Doris North Closure Plan
General Layout
Terrain Configuration Before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	3

J:\01_SITES\Hope.Bay\1CT022.000_2013 Hope Bay Ongoing Support\!040_AutoCAD\1CT022.000_Doris_N_ClosurePlan_Rev2.dwg





Work Area	Facility	WBS Code
Roberts Bay	Jetty	RB-001
	Roberts Bay Tank Farm	RB-002
	Quarry 1 Tank Farm	RB-003
	Mechanical Shop Complex	RB-004
	Waste Management Facility	RB-005
	Laydown Area	RB-006
	Overburden Dump	RB-007
	Fuel Transfer Access Road	RB-008
	Communications Tower	RB-009
	Beach Laydown Area	RB-010

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FILE NAME: 1CT022.000_RobertsBay_ClosurePlan_Rev1.dwg

TMAC RESOURCES

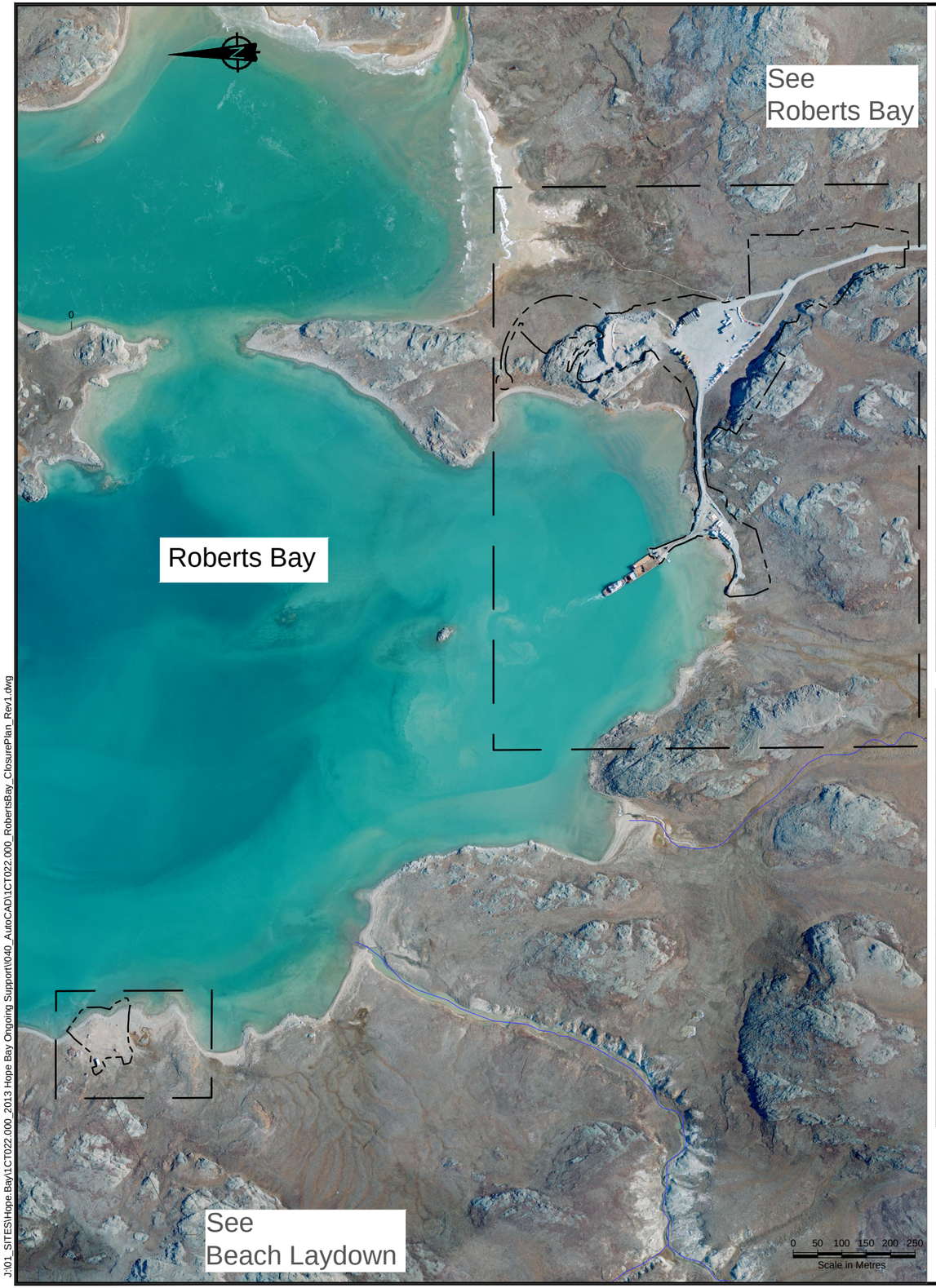
TMAC Resources Inc.

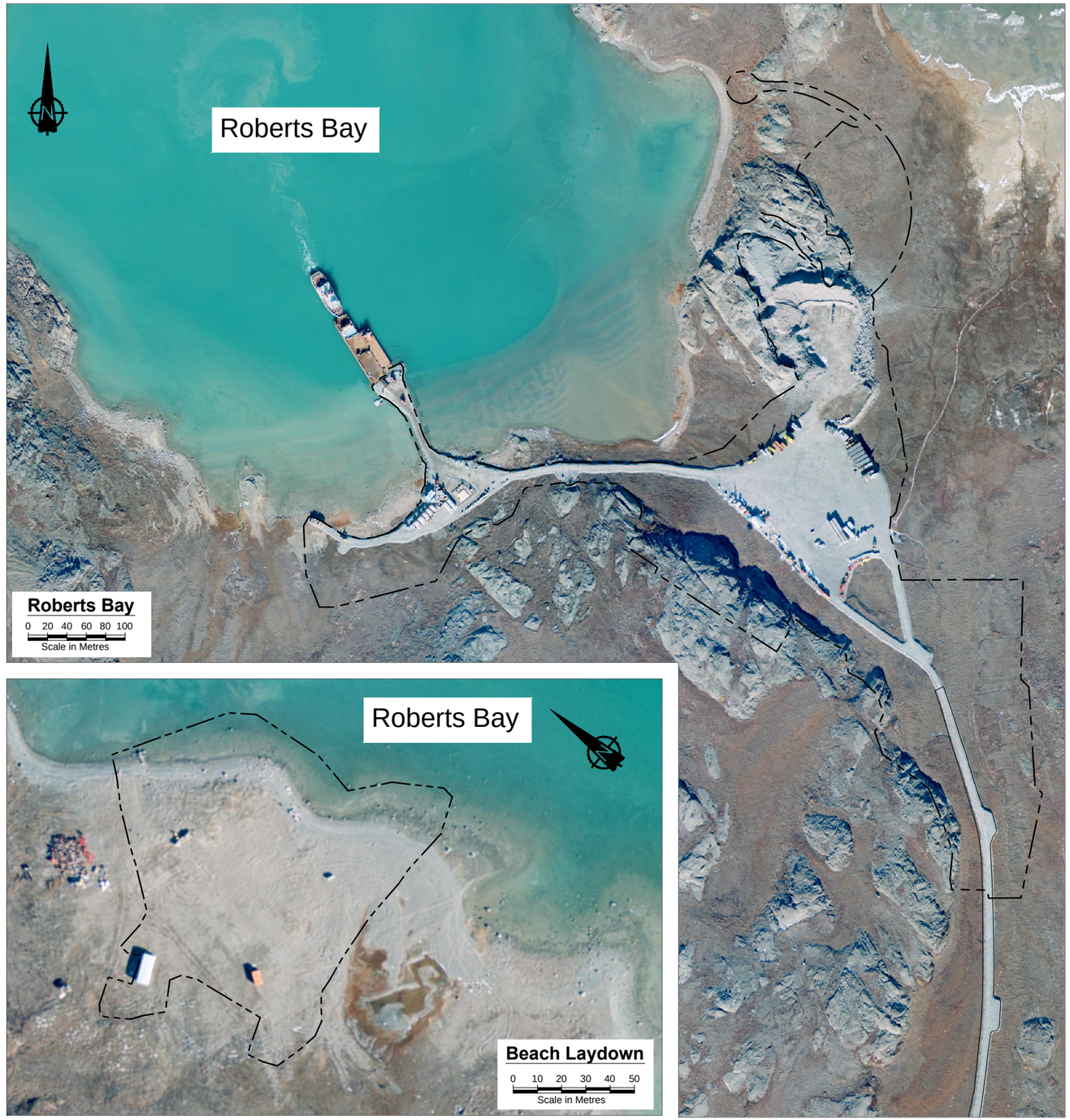
Doris North Project Amendment

Doris North Closure Plan
Roberts Bay Detail
Work Breakdown Structure

DATE:	APPROVED:	FIGURE:
April 2014	IM	4

J:\01_SITES\Hope.Bay\1CT022.000_2013 Hope Bay Ongoing Support\040_AutoCAD\1CT022.000_RobertsBay_ClosurePlan_Rev1.dwg





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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_RobertsBay_ClosurePlan_Rev1.dwg

TMAC RESOURCES

TMAC Resouces Inc.

Doris North Project Amendment

Doris North Closure Plan
Roberts Bay Detail
Terrain Configuration before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	5

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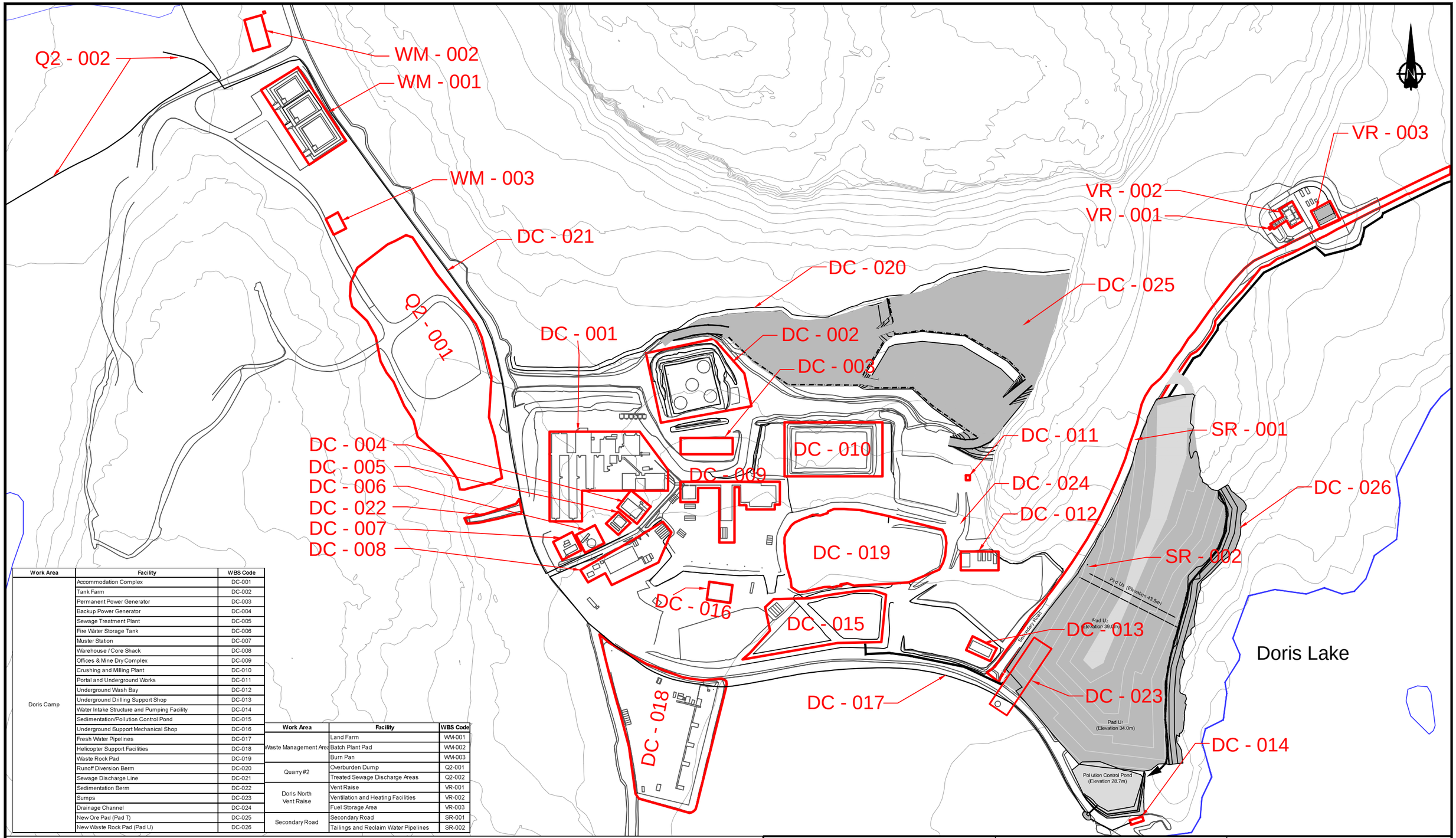

Work Area	Facility	WBS Code
Doris Camp	Accommodation Complex	DC-001
	Tank Farm	DC-002
	Permanent Power Generator	DC-003
	Backup Power Generator	DC-004
	Sewage Treatment Plant	DC-005
	Fire Water Storage Tank	DC-006
	Muster Station	DC-007
	Warehouse / Core Shack	DC-008
	Offices & Mine Dry Complex	DC-009
	Crushing and Milling Plant	DC-010
	Portal and Underground Works	DC-011
	Underground Wash Bay	DC-012
	Underground Drilling Support Shop	DC-013
	Water Intake Structure and Pumping Facility	DC-014
	Sedimentation/Pollution Control Pond	DC-015
	Underground Support Mechanical Shop	DC-016
	Fresh Water Pipelines	DC-017
	Helicopter Support Facilities	DC-018
	Waste Rock Pad	DC-019
	Runoff Diversion Berm	DC-020
	Sewage Discharge Line	DC-021
	Sedimentation Berm	DC-022
	Sumps	DC-023
	Drainage Channel	DC-024
	New Ore Pad (Pad T)	DC-025
	New Waste Rock Pad (Pad U)	DC-026

Work Area	Facility	WBS Code
Waste Management Area	Land Farm	WM-001
	Batch Plant Pad	WM-002
	Burn Pan	WM-003
Quarry #2	Overburden Dump	Q2-001
	Treated Sewage Discharge Areas	Q2-002
Doris North Vent Raise	Vent Raise	VR-001
	Ventilation and Heating Facilities	VR-002
	Fuel Storage Area	VR-003
Secondary Road	Secondary Road	SR-001
	Tailings and Reclaim Water Pipelines	SR-002

0 20 40 60 80 100
Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_DoricCamp_ClosurePlan_Rev1.dwg

TMAC RESOURCES

TMAC Resouces Inc.

Doris North Project Amendment

Doris North Closure Plan
Doris Camp Detail
Work Breakdown Structure

DATE:	APPROVED:	FIGURE:
April 2014	IM	6

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0 20 40 60 80 100
Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_DoricCamp_ClosurePlan_Rev1.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Doris Camp Detail
Terrain Configuration Before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	7

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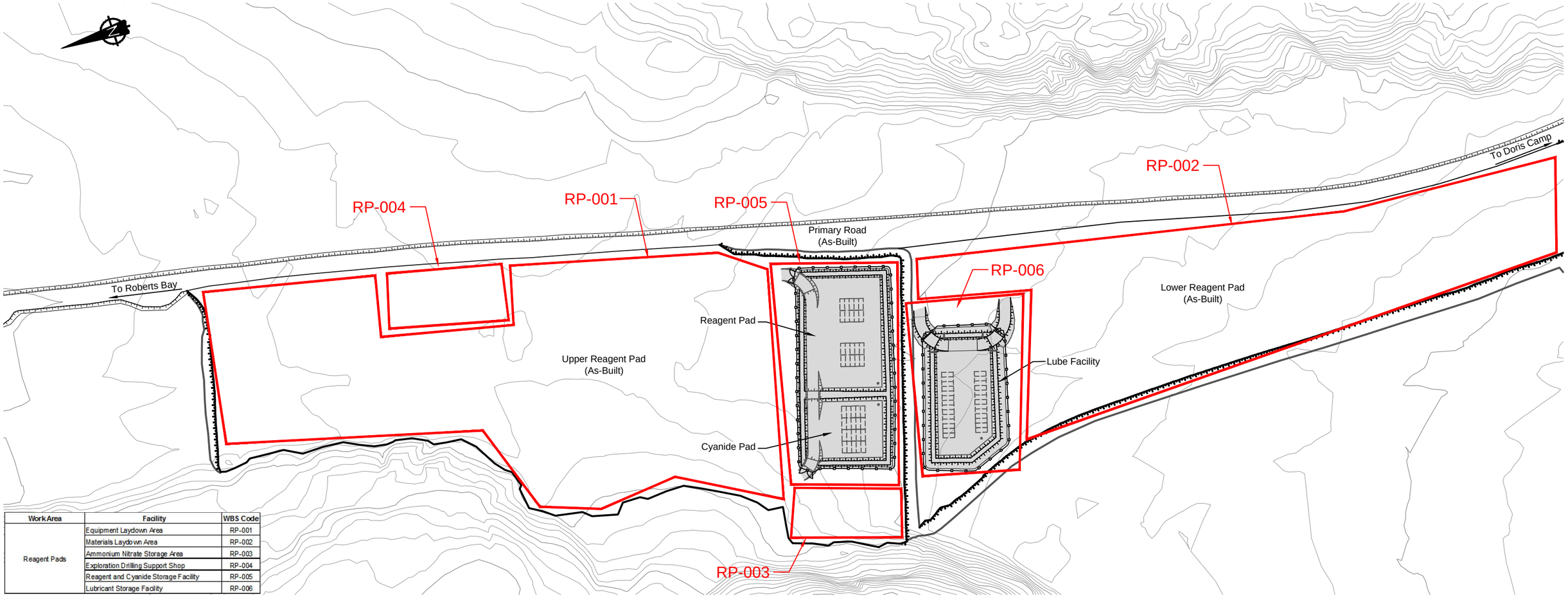

Work Area	Facility	WBS Code
Reagent Pads	Equipment Laydown Area	RP-001
	Materials Laydown Area	RP-002
	Ammonium Nitrate Storage Area	RP-003
	Exploration Drilling Support Shop	RP-004
	Reagent and Cyanide Storage Facility	RP-005
	Lubricant Storage Facility	RP-006

PLAN VIEW
GENERAL ARRANGEMENT

0 10 20 30 40 50
Scale in Metres

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SRK JOB NO.: 1CT022.000
FILE NAME: 1CT022.000_ReagentStorage_Rev0.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Reagent Pads Detail
Work Breakdown Structure

DATE:	APPROVED:	FIGURE:
April 2014	IM	8

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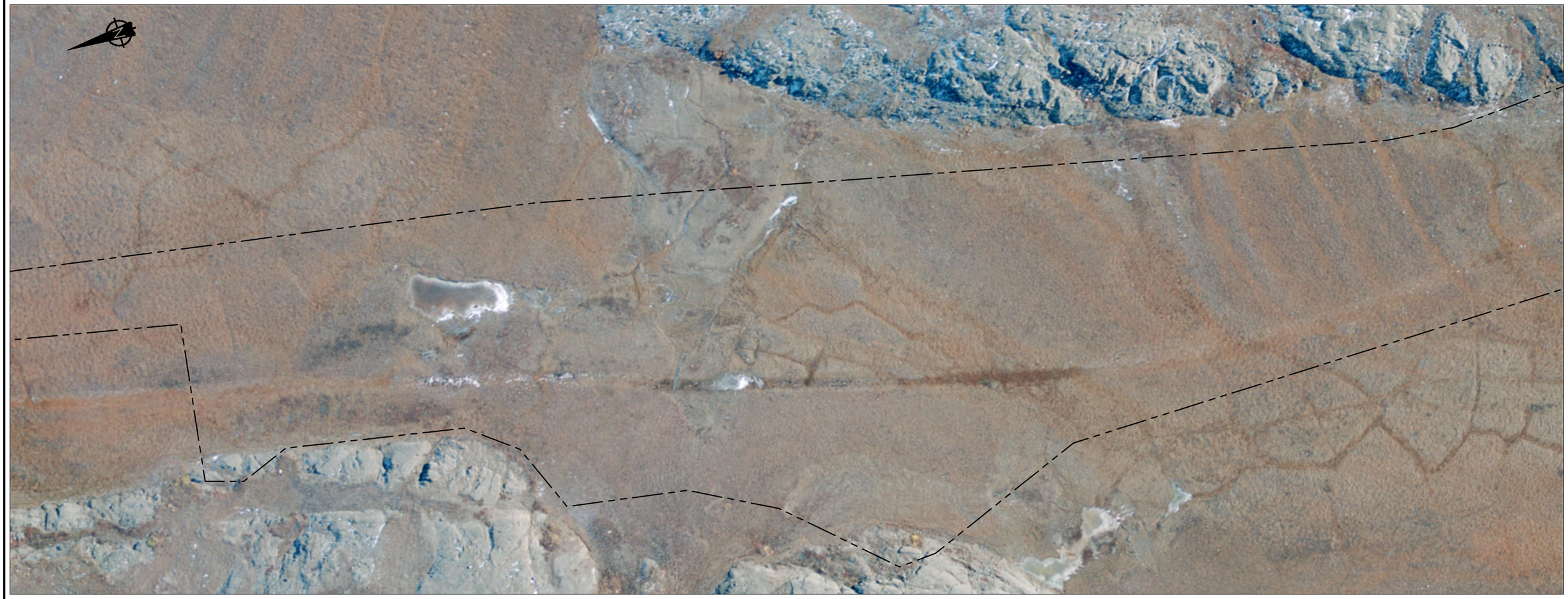

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_ReagentStorage_Rev0.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Reagent Pads Detail
Terrain Configuration before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	9

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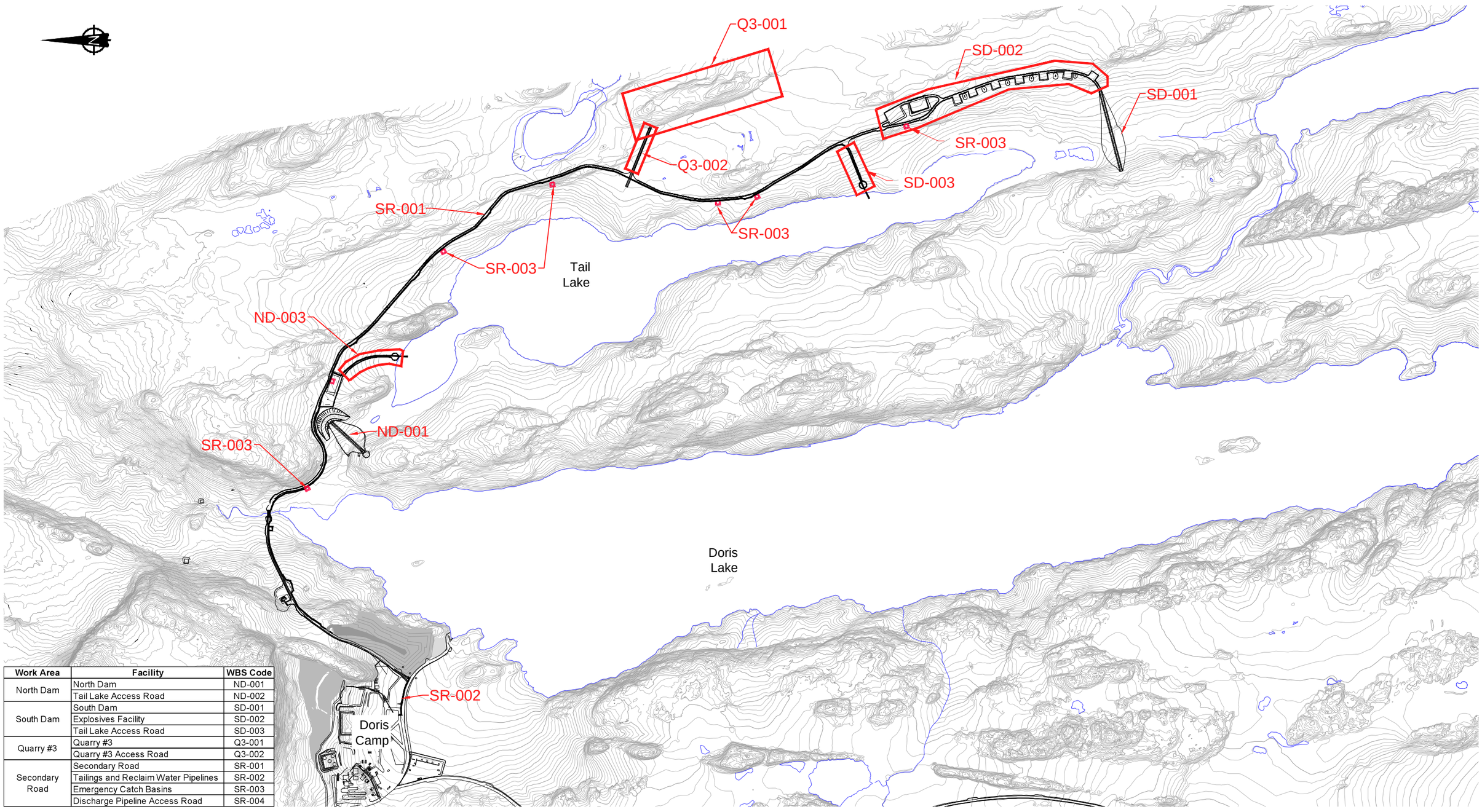

Work Area	Facility	WBS Code
North Dam	North Dam	ND-001
	Tail Lake Access Road	ND-002
South Dam	South Dam	SD-001
	Explosives Facility	SD-002
	Tail Lake Access Road	SD-003
Quarry #3	Quarry #3	Q3-001
	Quarry #3 Access Road	Q3-002
Secondary Road	Secondary Road	SR-001
	Tailings and Reclaim Water Pipelines	SR-002
	Emergency Catch Basins	SR-003
	Discharge Pipeline Access Road	SR-004

0 100 200 300 400 500
Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_TailLake_Rev1.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Secondary Road Detail
Work Breakdown Schedule

DATE:	APPROVED:	FIGURE:
April 2014	IM	10

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Tail Lake

Doris Lake

Doris Camp

0 100 200 300 400 500

Scale in Metres

srk consulting

SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_TailLake_Rev1.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Secondary Road Detail
Terrain Configuration Before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	11

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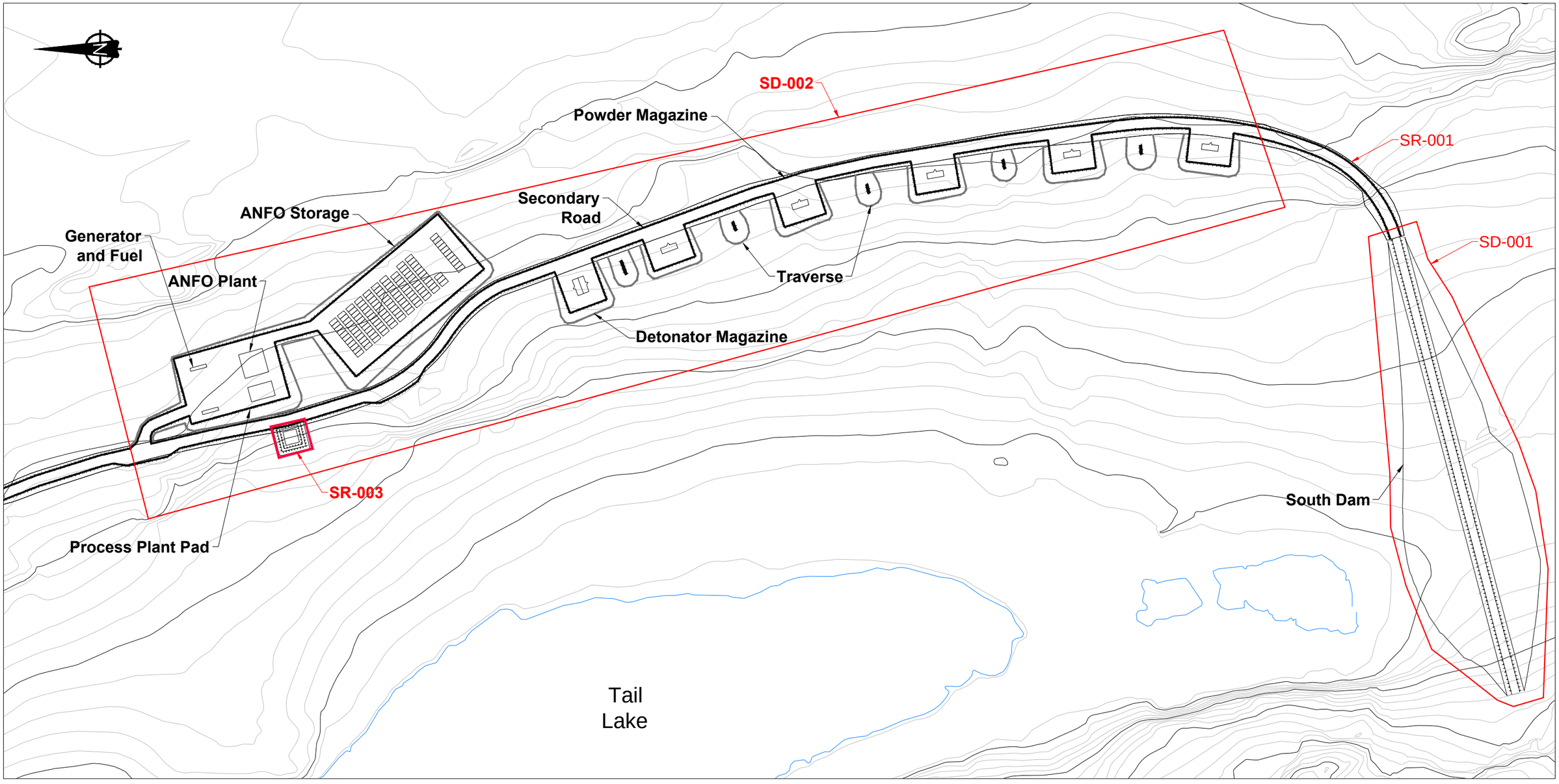

Work Area	Facility	WBS Code
South Dam	South Dam	SD-001
	Explosives Facility	SD-002
Secondary Road	Secondary Road	SR-001
	Emergency Catchment Basins	SR-003

0 20 40 60 80 100
Scale in Metres

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SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_ExplosiveFacility_Rev1.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Explosive Facility Detail
Work Breakdown Structure

DATE:	APPROVED:	FIGURE:
April 2014	IM	12

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0 20 40 60 80 100

Scale in Metres

srk consulting

SRK JOB NO.: 1CT022.000

FILE NAME: 1CT022.000_ExplosiveFacility_Rev1.dwg

TMAC RESOURCES

TMAC Resources Inc.

Doris North Project Amendment

Doris North Closure Plan
Explosive Facility Detail
Terrain Configuration Before Construction

DATE:	APPROVED:	FIGURE:
April 2014	IM	13

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Appendix A: Costing Assumptions Summary

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Memo

To:	Lea-Marie Bowes-Lyon, TMAC Katsky Venter, TMAC	**Client:**	TMAC Resources Inc.
From:	Iozsef Miskolczi	**Project No:**	1CT022.001
Cc:	Maritz Rykaart, SRK	**Date:**	April 7, 2014
Subject:	Costing Assumptions Summary for Doris North Mine Closure and Reclamation Plan Amendment		

1 Introduction

SRK was retained by TMAC Resources Inc. (TMAC) to amend the Closure and Reclamation Plan (the Plan) for the Doris North Mine at the Hope Bay site. The amendment represents the areas of the project to be further developed, including the following items:

- Expansion of the Roberts Bay laydown area;
- Construction of new ore and waste rock pads at the Doris North Camp;
- Construction of a new vent raise and related infrastructure by Doris Central;
- Provisions for water management and pipeline reclamation for the undersea discharge of tailings water.

The cost estimate was prepared using an Excel workbook and the estimating inputs are all included in supporting worksheets. This memorandum documents the assumptions and inputs that form the basis of the estimated costs.

2 Cost Estimate Basis

2.1 Third Party Contractor

The cost estimate assumes that all work is carried out by and independent qualified third party contractor. All labour, equipment and materials required to execute the works are supplied by the contractor.

2.2 Quantities

Quantity estimates needed as input to the cost estimates were derived using standard engineering calculations based on topographic maps, as-built surveys and aerial photographs. All buildings and facilities reclaimed at closure were included, as detailed in the Closure Plan. Most of the calculations are straight forward and the details of the quantity estimates are provided in the “Structures” and “Reclamation Areas” worksheets respectively.

2.3 Unit Costs

2.3.1 Equipment Rates

Equipment rates were provided in 2012 by the independent on-site construction contractor (Nuna Logistics). These rates were updated to 2013 CAD dollars by applying the same ratio as between the 2011 and 2012 (rates provided by the contractor for both years). The rates included ownership, overhead and profit, but excludes maintenance labor which is included as a line item elsewhere in the estimate.

2.3.2 Labour Rates

Labor rates provided in 2012 by the construction contractor (Nuna Logistics) were indexed to 2013 rates (similarly to the equipment rates) and include overhead and profit. The labour rates do not include the costs of camp accommodation or travel to and from site, which are included as indirect costs.

2.3.3 Material Costs

Estimates of material costs were obtained from the following sources:

- Specific vendor quotes;
- Specific costs from third party consultants;
- Cost Mine 2011 (InfoMine 2011);
- “Environmental Remediation Cost Data – Unit price” 11th Annual Edition, (Martin et al 2004); and
- Recent SRK experience on other projects.

Older material quotes were adjusted to 2013 dollars based on the seasonally adjusted Consumer Price Index listed on the Bank of Canada website. Material costs were factored up by 15% to include freight and shipping to site.

2.3.4 Task Unit Costs

The Task Unit Rate worksheet calculates the cost per unit quantity based on the labour, equipment and materials required to complete the task. The productivity for each task was obtained from the following sources:

- Equipment specifications obtained from manufacturer’s data, in this case the Caterpillar Handbook;
- “Environmental Remediation Cost Data – Unit Price” 11th Annual Edition, (Martin et al 2004); and
- Recent SRK experience on other projects.

2.3.5 Relocation Unit Costs

The relocation unit costs consist of the transport of materials from the various reclamation areas to Roberts Bay over all-weather roads. The equipment used was chosen to match equipment used on site during the construction phase. Regular haul trucks or 20 foot cargo containers on a trailer were assumed to be used for hauling waste or equipment to Roberts Bay. The trailer and the tractor head would be mobilized from off-site.

Details of the calculations are provided in the “Relocation Unit Cost” worksheet. Costs for loading and unloading the Seacans were included elsewhere in the estimate.

2.4 Indirect Costs

Indirect costs were defined as any costs that cannot be directly associated with individual tasks.

Many of the indirect costs depend on the project duration. The project duration was estimated as the summation of the individual task quantities (Units) divided by the task productivity (Units/hr). The work was assumed to occur over a 10 hour work day.

2.4.1 Mobilization and Demobilization

The mob-demob costs were included as a lump sum in the cost estimate. The details of the costs are provided in the “MobDemob” worksheet.

Mobilized equipment was assumed to originate from Edmonton, AB. Equipment is hauled by truck to Hay River, NT, and shipped by barge to Roberts Bay. A lump sum cost is included for the trucking, while the barging costs were calculated based on the footprint area for each piece of equipment.

Stand-by costs were included where appropriate, representing the cost for the period of time the equipment is idle waiting for demobilization by the sealift after completion of reclamation work. This assumes that sealift is possible once every year, within a narrow window of a few of weeks in September.

2.4.2 General and Administration Costs

Labour benefits were included in the labour unit costs.

Travel allowance of $750 per person per flight or $10,000 per charter flight (for crews larger than 12) was included in the estimate.

Camp costs were included at a rate of $150 per day per person in addition to a camp management rate of $677 per day for the duration of the project. The camp rental of $400,000 per year was also included, based on supplier quotes for a 20-man self-sufficient camp. For years when water management is the only activity on site, the camp management costs were accounted for under the Water Management task.

2.4.3 Field Support

It was assumed that a supervisor would be on site throughout the project duration. An allowance for equipment maintenance support was included, with a mechanic assumed to be on-site for 10% of the project duration.

Helicopter support be used for the Doris Mountain demolition work was assumed to be required for 6 hours per day at a rate of $2,163/hour.

2.4.4 Engineering and Consultants Services

The costs associated with site visits, sample analysis, and reporting are included in this category.

2.4.5 Contingency

A contingency of 20% of direct costs (excluding the cost of shipping and disposing of the demolition waste off site) was added to the estimate.

2.4.6 Post-closure Monitoring

Lump sums were included for each of the various post-closure monitoring items, according to the schedule showing the required frequency and duration.

3 Compatibility with Reclaim

The Canadian Government liability estimate is required by Aboriginal Affairs and Northern Development Canada (AANDC), formerly Indian and Northern Affairs Canada. AANDC requires that a spreadsheet model (RECLAIM) be used to estimate closure costs.

The RECLAIM model is a spreadsheet model originally developed by SRK in 1992, and subsequently modified and updated by Brodie Consulting. The model has pre-set sheets that can be expanded to describe a specific project. The model template includes a default list of unit costs for most tasks and materials used in closure work. Typical low and high equipment and labor unit rates are suggested, but the user is encouraged to apply known unit rates instead of the default rates wherever possible. Some indirect costs are estimated as user-specified percentage of direct costs (Engineering and Project Management). Mobilization/ Demobilization costs are calculated based on unit rates.

The methods used by SRK and RECLAIM to estimate costs are similar. Both models are based on the same facilities, use the same quantities, unit rates and indirect costs. The methods differ by how this information is organized within the spreadsheets. The cost information is summarized similarly. Because of this, the SRK cost estimate is at minimum an adequate alternative to RECLAIM.

Closure costs are apportioned to water or land to reflect the portion of the closure liability that is accounted for under the Nunavut Water Board Water licences or the land lease agreements with the Kitikmeot Inuit Association. The split between land and water closure liability is open to interpretation.

Regards,
SRK Consulting (Canada) Inc.

Iozsef Miskolczi, PEng
Senior Consultant

Reviewed by

Maritz Rykaart, PhD, PEng
Principal Consultant

Disclaimer

4 References

InfoMine 2011. Cost Mine Mining Cost Services Section SU Supplies and Miscellaneous Items. Accessed May 11, 2011.

Martin, S., Rast, J., Rast, R., Eds. 2004. Environmental Remediation Unit Cost Book; 11th Annual Edition; R.S. Means Company Inc.

Appendix B: Doris North Closure and Reclamation Cost Estimate

Table 1: Summary of Costs

Work task	WBS Code	Cost (rounded to the nearest thousand)	
		By task	By work Area
Direct Cost Items			
Roberts Bay			**$744,000**
Jetty	RB-001	$11,000	
RBTF	RB-002	$439,000	
Q1TF	RB-003	$169,000	
Mechanical Shop Complex	RB-004	$47,000	
Waste Management Facility	RB-005	$16,000	
Laydown Area	RB-006	$7,000	
Overburden Dump RB	RB-007	$27,000	
Fuel Transfer Access Road	RB-008	$1,000	
Communications Tower	RB-009	$20,000	
Beach Laydown Area	RB-010	$2,000	
Laydown Area Expansion	RB-011	$6,000	
Airstrip			**$12,000**
All-weather Airstrip	AS-001	$4,000	
South Apron	AS-002	$1,000	
North Apron	AS-003	$6,000	
Explosives Mixing Facility	AS-004	$1,000	
Reagent Pads			**$43,000**
Equipment Laydown Area	RP-001	$3,000	
Material Laydown Area	RP-002	$5,000	
Ammonium Nitrate Storage Area	RP-003	$6,000	
Exploration Drilling Support Shop	RP-004	$3,000	
Reagent and Cyanide Storage Facility	RP-005	$17,000	
Lubricant Storage Facility	RP-006	$9,000	
Waste Management Area			**$30,000**
Land Farm	WM-001	$28,000	
Batch Plant Pad	WM-002	$1,000	
Burn Pan	WM-003	$1,000	
Quarry 2			**$107,000**
Overburden Dump Q2	Q2-002	$106,000	
Treated Sewage Discharge Areas	Q2-003	$2,000	
Doris Camp			**$2,199,000**
Accommodation Complex	DC-001	$141,000	
Tank Farm	DC-002	$377,000	
Permanent Power Generator	DC-003	$37,000	
Temporary Power Generator	DC-004	$6,000	
Sewage Treatment Plant	DC-005	$21,000	
Fire Water Storage Tank	DC-006	$42,000	
Muster Station	DC-007	$3,000	
Warehouse/Core Shack	DC-008	$11,000	
Offices & Mine Dry Complex	DC-009	$60,000	
Crusher and Process Plant	DC-010	$1,325,000	
Portal and Underground Works	DC-011	$27,000	
Underground Wash Bay	DC-012	$9,000	
Swick Shop	DC-013	$10,000	
Water Intake Structure and Pumping Facility	DC-014	$7,000	
Sedimentation/Pollution Control Pond	DC-015	$17,000	
Underground Support Mechanical Shop	DC-016	$35,000	
Fresh Water Pipelines	DC-017	$12,000	
Helicopter Support Facilities	DC-018	$10,000	
Waste Rock Pile	DC-019	$1,000	
Run-off Diversion Berm	DC-020	$1,000	
Sewage Discharge Line	DC-021	$14,000	
Sedimentation Berm	DC-022	$1,000	
Sumps	DC-023	$7,000	
Drainage channel	DC-024	$16,000	
Waste Rock Expansion Area (Pad U)	DC-025	$3,000	
Ore Storage Expansion Area (Pad T)	DC-026	$5,000	
North Dam Area			**$1,676,000**
Frozen Core Dam	ND-001	$582,000	
Tail Lake Access Road	ND-002	$2,000	
TIA shoreline protection	ND-003	$1,027,000	
Water discharge line to Roberts Bay	ND-004	$65,000	
South Dam Area			**$33,000**
Explosives Facility	SD-001	$31,000	
Tail Lake Access Road	SD-002	$1,000	
Quarry 3	Q3-001	$1,000	**$1,000**

Table 1: Summary of Costs

Work task	WBS Code	Cost (rounded to the nearest thousand)	
		By task	By work Area
Doris North Vent Raise Area			**$37,000**
Vent Raise	VR-001	$23,000	
Ventilation and Heating Facilities	VR-002	$4,000	
Fuel Storage Area	VR-003	$11,000	
Doris Central Vent Raise			**$111,000**
Vent raise	VR-004	$23,000	
Ventilation and Heating Facilities	VR-005	$4,000	
Fuel Storage Area	VR-006	$11,000	
Access road	VR-007	$1,000	
Overburden Dump	VR-008	$73,000	
Doris Windy Road Area			**$260,000**
Doris Windy Road	DW-001	$260,000	
Explosives Storage Facility	DW-005	$1,000	
Secondary Road Area			**$142,000**
Tail Lake Road	SR-001	$135,000	
Emergency catch basins	SR-003	$7,000	
Doris Mountain Communication Tower	DM-001	$55,000	**$55,000**
Off-site Shipping for Disposal	DN-001	$7,160,000	**$7,160,000**
Off-Site Disposal Fees	DN-002	$176,000	**$176,000**
Water Management	WM-001	$6,234,000	**$6,234,000**
TOTAL DIRECT COSTS		**$**	**19,020,000**
Indirect Cost Items			
Contingency		$2,335,000	**$2,335,000**
Mobilization & Demobilization		$712,000	**$712,000**
General and Administration costs		$4,704,000	**$4,704,000**
Field support		$137,000	**$137,000**
Hydrocarbon decontamination		$150,000	**$150,000**
Post-closure Monitoring		$1,060,000	**$1,060,000**
Subtotal Indirect Costs		**$**	**9,098,000**
CLOSURE COSTS - TOTAL		**$**	**28,118,000**

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
DIRECT COSTS												
Roberts Bay											**$743,462**	
RB-001	1	1	1	Jetty	Remove rock fill to 0.3 m below LLWL	1,013.8	m3	C.5.05	$2.45	$ 2,483.46		
	1	1	2		Remove on-shore mooring points	1.0	LS		$1,200.00	$ 1,200.00		
	1	1	3		Remove mooring buoy	1.0	LS		$2,500.00	$ 2,500.00		
	1	1	4		Crown jetty for positive drainage	1,900.0	m2	C.5.05	$2.45	$ 4,654.15		
RB-002	1	2	1	RBTF	Drain tanks into portable fuel storage (EnviroTanks)	4.0	each	C.2.03	$234.68	$ 938.72		
	1	2	2		Decommission fuel transfer facilities	1.0	Each	C.1.03	$1,201.25	$ 1,201.25		
	1	2	3		Wash tanks	4.0	each	C.2.04	$804.19	$ 3,216.75		
	1	2	4		Operate oil/water separator	4.5	m3	C.2.08	$28.38	$ 127.54		
	1	2	5		Disconnect piping and controls	4.0	each	C.1.02	$410.32	$ 1,641.28		
	1	2	6		Dismantle tanks and cut into manageable pieces	4.0	each	LS	$100,000.00	$ 400,000.00		assumed 20% of cost of building each tank
	1	2	7		Prepare pieces for transportation	45.5	m3	C.4.01	$8.40	$ 381.95		
	1	2	8		Haul cut metal to Roberts Bay laydown	51.4	m3	C.4.11	$1.74	$ 89.66		
	1	2	9		Remove and stockpile liner protection cover	9,400.0	m3	C.5.04	$2.64	$ 24,816.94		
	1	2	10		Clean liner	10,300.0	m2	C.2.10	$0.36	$ 3,681.39		
	1	2	11		Remove and cut liner into manageable pieces	10,300.0	m2	C.3.02	$0.15	$ 1,510.75		
	1	2	12		Load waste into containers for shipping off-site	92.7	m3	C.4.01	$8.40	$ 778.65		
	1	2	13		Haul containers to Roberts Bay laydown	92.7	m3	C.4.11	$1.74	$ 161.66		
	1	2	14		Level containment berms	231.3	m2	C.5.05	$2.45	$ 566.53		
	1	2	15		Regrade area for positive drainage	11,530.0	m2	C.5.18	$0.01	$ 130.70		
RB-003	1	3	1	Q1TF	Drain tanks into portable fuel storage (EnviroTanks)	2.0	each	C.2.03	$234.68	$ 469.36		
	1	3	2		Decommission fuel transfer facilities	1.0	each	C.1.02	$410.32	$ 410.32		
	1	3	3		Wash tanks	2.0	each	C.2.04	$804.19	$ 1,608.38		
	1	3	4		Operate oil/water separator	2.2	m3	C.2.08	$28.38	$ 63.77		
	1	3	5		Disconnect piping and controls	2.0	each	C.1.02	$410.32	$ 820.64		
	1	3	6		Dismantle 5ML diesel fuel tank and cut into manageable pieces	1.0	each	LS	$100,000.00	$ 100,000.00		assumed 20% of cost of building the tank
	2	3	7		Dismantle 1ML jet fuel tank and cut into manageable pieces	1.0	each	LS	$50,000.00	$ 50,000.00		assumed 20% of cost of building the tank
	1	3	7		Prepare pieces for transportation	20.0	m3	C.4.01	$8.40	$ 167.76		
	1	3	8		Haul cut metal to Roberts Bay laydown	20.0	m3	C.4.11	$1.74	$ 34.83		
	1	3	9		Remove and stockpile liner protection cover	2,190.0	m3	C.5.04	$2.64	$ 5,781.82		
	1	3	10		Clean liner	6,521.0	m2	C.2.10	$0.36	$ 2,330.71		
	1	3	11		Remove and cut liner into manageable pieces	6,521.0	m2	C.3.02	$0.15	$ 956.47		
	1	3	12		Drain and wash empty fuel drums	150.0	each	C.2.05	$16.84	$ 2,526.63		
	1	3	13		Crush empty fuel drums	150.0	each	C.3.01	$15.61	$ 2,341.78		
	1	3	14		Load waste into containers for shipping off-site	68.2	m3	C.4.01	$8.40	$ 573.12		
	1	3	15		Level containment berms	279.3	m2	C.5.05	$2.45	$ 684.13		
	1	3	16		Regrade area for positive drainage	3,650.0	m2	C.5.18	$0.01	$ 41.38		
RB-004	1	4	1	Mechanical Shop Complex	Decommission electrical, mechanical, heating (including connections to generator house & transformer)	7.0	each	C.1.05	$585.96	$ 4,101.72		
	1	4	2		Demolish (steel modular structure)	2,402.4	m3	C.3.05	$10.93	$ 26,254.27		
	1	4	3		Demolish wood structures (warehouse roof, crew lounge)	283.2	m3	C.3.05	$10.93	$ 3,094.86		
	1	4	4		Demolish tent structure (light vehicle shop)	460.3	m3	C.3.05	$10.93	$ 5,030.30		
	1	4	5		Collect Debris	685.8	m2	C.3.10	$0.13	$ 90.64		
	1	4	6		Load waste into containers for shipping off-site	867.1	m3	C.4.01	$8.40	$ 7,283.17		
	1	4	7		Haul debris to Roberts Bay laydown	867.1	m3	C.4.11	$1.74	$ 1,512.08		
RB-005	1	5	1	Waste Management Facility	Collect ashes and place in containers	0.5	m3	C.2.07	$551.14	$ 275.57		
	1	5	2		Dismantle (welding crew)	2.0	each	C.3.08	$460.33	$ 920.67		
	1	5	3		Demolish wood structures (roof, entryway, etc.)	76.2	m3	C.3.05	$10.93	$ 833.23		
	1	5	4		Disconnect containers and prep for shipping off-site	11.0	each	C.1.08	$1,075.50	$ 11,830.48		
	1	5	5		Collect all debris	128.7	m2	C.3.10	$0.13	$ 17.00		
	1	5	6		Load waste into containers for shipping off-site	152.5	m3	C.4.01	$8.40	$ 1,280.88		
	1	5	7		Haul debris to Roberts Bay laydown	152.5	m3	C.4.04	$2.51	$ 382.11		
RB-006	1	6	1	Laydown Area	Decommission vehicle plug system	1.0	each	C.1.05	$585.96	$ 585.96		
	1	6	2		Remove cables and posts	8.0	each	C.3.14	$381.35	$ 3,050.80		Estimated # of posts
	1	6	3		Collect all debris	24,491.6	m2	C.3.10	$0.13	$ 3,236.87		
	1	6	4		Load waste into containers for shipping off-site	10.0	m3	C.4.01	$8.40	$ 84.00		
	1	6	5		Haul debris to Roberts Bay laydown	10.0	m3	C.4.11	$1.74	$ 17.44		
	1	6	6		Regrade area for positive drainage	24,491.6	m2	C.5.18	$0.01	$ 277.63		

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
RB-007	1	7	1	Overburden Dump	Collect all debris	10,448.0	m2	C.3.10	$0.13	$ 1,380.83		
	1	7	2		Load waste into containers for shipping off-site	10.0	m3	C.4.01	$8.40	$ 84.00		
	1	7	3		Grade for positive drainage	10,448.0	m2	C.5.05	$2.45	$ 25,592.90		
RB-008	1	8	1	Fuel Transfer Access Road	Crown road for positive drainage	3,378.0	m2	C.5.18	$0.01	$ 38.29		
RB-009	1	9	1	Communications Tower	Decommission Tower	1.0	Each	C.1.05	$585.96	$ 585.96		
	1	9	2		Remove communication equipment	4.0	each	C.1.07	$322.50	$ 1,290.00		
	1	9	3		Dismantle towers	1.0	each	C.3.11	$14,500.08	$ 14,500.08		
	1	9	4		Prep tower sections for shipping off-site	8.0	m	C.3.12	$433.80	$ 3,470.38		
	1	9	5		Collect all debris	1.4	m2	C.3.10	$0.13	$ 0.19		
	1	9	6		Load waste into containers for shipping off-site	5.0	m3	C.4.01	$8.40	$ 42.00		
	1	9	7		Haul containers to Roberts Bay laydown	10.5	m3	C.4.11	$1.74	$ 18.37		
RB-010	1	10	1	Beach Laydown Area	Relocate all magazines and containers to Roberts Bay laydown (to be done in the winter)	5.0	each	C.4.06	$204.13	$ 1,020.65		Change the destination to Roberts Bay Laydown
	1	10	2		Scarify surface to encourage vegetation	273.8	m2	C.5.05	$2.45	$ 670.75		
	1	10	3		Collect all debris	273.8	m2	C.3.10	$0.13	$ 36.19		
	1	10	4		Load waste into containers for shipping off-site	1.0	m3	C.4.01	$8.40	$ 8.40		
	1	10	5		Haul containers to Roberts Bay laydown	1.0	m3	C.4.11	$1.74	$ 1.74		
RB-011	1	11	1	Laydown Area Expansion	Decommission vehicle plug system	-	each	C.1.05	$585.96	$ -		
	1	11	2		Remove cables and posts	-	each	C.3.14	$381.35	$ -		
	1	11	3		Collect all debris	38,800.0	m2	C.3.10	$0.13	$ 5,127.91		
	1	11	4		Load waste into containers for shipping off-site	10.0	m3	C.4.01	$8.40	$ 84.00		
	1	11	5		Haul debris to Roberts Bay laydown	10.0	m3	C.4.11	$1.74	$ 17.44		
	1	11	6		Regrade area for positive drainage	38,800.0	m2	C.5.18	$0.01	$ 439.83		
Airstrip		1									**$10,100**	
AS-001	2	1	1	Airstrip	Decomission Airstrip	2.0	Each	C.1.09	$284.68	$ 569.36		
	2	1	2		Remove lighting fixtures (airstrip lighting, approach lights)	70.0	each	C.1.10	$36.62	$ 2,563.58		
	2	1	3		collect all debris	2,850.0	m2	C.3.10	$0.13	$ 376.66		1.5 m width
	2	1	4		load waste into containers for shipping off-site	1.2	m^3	C.4.01	$8.40	$ 9.97		
	2	1	5		haul containers to Roberts Bay laydown	1.2	m^3	C.4.10	$1.98	$ 2.35		
	2	1	6		crown airstrip and airstrip expansion for positive drainage	42,000.0	m2	C.5.18	$0.01	$ 476.11		regrade the expansion part only
AS-002	2	2	1	South Apron	crown for positive drainage	5,517.2	m2	C.5.18	$0.01	$ 62.54		
AS-003	2	3	1	North Apron	Decommission electrical, and heating from traffic control tower	1.0	each	C.1.07	$322.50	$ 322.50		
	2	3	2		demolish control tower structure (wood shack)	11.7	m3	C.3.05	$10.93	$ 128.08		
	2	3	3		disconnect containers and prep for shipping off-site	5.0	each	C.1.08	$1,075.50	$ 5,377.49		
	2	3	4		collect all debris	12.2	m2	C.3.10	$0.13	$ 1.61		
	2	3	5		load waste into containers for shipping off-site	17.6	m3	C.4.01	$8.40	$ 147.67		
	2	3	6		haul containers to Roberts Bay laydown	17.6	m3	C.4.10	$1.98	$ 34.82		
AS-004	2	4	1	Explosives Mixing Facility Pad	regrade pad and access road for positive drainage	2,411.0	m2	C.5.18	$0.01	$ 27.33		
Reagent Pads		1									**$42,751**	
RP-001	3	1	1	Equipment Laydown Area	collect all debris	21,870.0	m2	C.3.10	$0.13	$ 2,890.39		
	3	1	2		load waste into containers for shipping off-site	20.0	m3	C.4.01	$8.40	$ 167.99		
	3	1	3		regrade area for positive drainage	21,870.0	m2	C.5.18	$0.01	$ 247.92		
	3	1	4		haul waste to Roberts Bay	20.0	m3	C.4.09	$2.23	$ 44.70		
RP-002	3	2	1	Materials Laydown Area	collect all debris	33,839.8	m2	C.3.10	$0.13	$ 4,472.35		
	3	2	2		load waste into containers for shipping off-site	20.0	m3	C.4.01	$8.40	$ 167.99		
	3	2	3		regrade area for positive drainage	33,839.8	m^2	C.5.18	$0.01	$ 383.60		
	3	2	4		haul waste to Roberts Bay	20.0	m3	C.4.09	$2.23	$ 44.70		
RP-003	3	3	1	Ammonium Nitrate Storage Area	remove and stockpile liner protection cover	1,504.6	m3	C.5.04	$2.64	$ 3,972.35		
	3	3	2		clean liner	2,800.0	m^2	C.2.10	$0.36	$ 1,000.77		
	3	3	3		remove and cut liner into manageable pieces	2,800.0	m^2	C.3.02	$0.15	$ 410.69		
	3	3	4		load waste into containers for shipping off-site	25.2	m3	C.4.01	$8.40	$ 211.67		
	3	3	5		haul containers to Roberts Bay laydown	25.2	m3	C.4.09	$2.23	$ 56.32		
	3	3	6		level containment berms	31.7	m^2	C.5.05	$2.45	$ 77.65		
	3	3	7		regrade area for positive drainage	3,858.0	m^2	C.5.18	$0.01	$ 43.73		
RP-004	3	4	1	Exploration Drilling Support Shop	Decommission electrical, mechanical, heating	2.0	each	C.1.05	$585.96	$ 1,171.92		
	3	4	2		demolish building (tent structure)	149.6	m3	C.3.05	$10.93	$ 1,635.06		
	3	4	3		collect all debris	335.2	m^2	C.3.10	$0.13	$ 44.30		
	3	4	4		load waste into containers for shipping off-site	12.4	m3	C.4.01	$8.40	$ 104.18		
	3	4	5		haul containers to Roberts Bay laydown	12.4	m3	C.4.09	$2.23	$ 27.72		

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
RP-005	3	5	1	Reagent and Cyanide Storage Facility	remove and stockpile liner protection cover	5,200.0	m3	C.5.04	$2.64	$ 13,728.52		
	3	5	2		clean liner	5,134.0	m^2	C.2.10	$0.36	$ 1,834.98		
	3	5	3		remove and cut liner into manageable pieces	5,134.0	m^2	C.3.02	$0.15	$ 753.03		
	3	5	4		load waste into containers for shipping off-site	46.2	m3	C.4.01	$8.40	$ 388.11		
	3	5	5		haul containers to Roberts Bay laydown	46.2	m3	C.4.09	$2.23	$ 103.26		
	3	5	6		regrade area for positive drainage	5,000.0	m^2	C.5.18	$0.01	$ 56.68		
RP-006	3	6	1	Lubricant Storage Facility	remove and stockpile liner protection cover	2,697.6	m3	C.5.04	$2.64	$ 7,121.93		
	3	6	2		clean liner	2,585.0	m^2	C.2.10	$0.36	$ 923.92		
	3	6	3		remove and cut liner into manageable pieces	2,585.0	m^2	C.3.02	$0.15	$ 379.15		
	3	6	4		load waste into containers for shipping off-site	23.3	m3	C.4.01	$8.40	$ 195.42		
	3	6	5		haul containers to Roberts Bay laydown	23.3	m3	C.4.09	$2.23	$ 51.99		
	3	6	6		regrade area for positive drainage	3,372.0	m^2	C.5.18	$0.01	$ 38.22		
Waste Management Area											**$28,499**	
WM-001	4	1	1	Land Farm	load contained contaminated soils into megabags for shipping off-site	100.0	m3	C.4.12	$67.72	$ 6,771.94		
	4	1	2		haul megabags to Roberts Bay laydown	100.0	m3	C.4.04	$2.51	$ 250.58		
	4	1	3		treat contained water and discharge	1.0	LS	-	$5,000.00	$ 5,000.00		According to Iozsef's estimate
	4	1	4		remove and stockpile liner protection cover	1,366.0	m3	C.5.04	$2.64	$ 3,606.38		
	4	1	5		clean liner	4,384.0	m^2	C.2.10	$0.36	$ 1,566.91		
	4	1	6		remove and cut liner into manageable pieces	13,152.0	m^2	C.3.02	$0.15	$ 1,929.07		liner and geotextile
	4	1	7		load waste into containers for shipping off-site	118.4	m3	C.4.01	$8.40	$ 994.25		Does not include the liner protection cover
	4	1	8		haul containers to Roberts Bay laydown	118.4	m3	C.4.04	$2.51	$ 296.60		
	4	1	9		level containment berms	3,011.2	m^2	C.5.05	$2.45	$ 7,376.08		
	4	1	10		regrade area for positive drainage	4,384.0	m^2	C.5.18	$0.01	$ 49.70		
WM-002	4	2	1	Batch Plant Pad	collect all debris	740.3	m^2	C.3.10	$0.13	$ 97.84		
	4	2	2		load waste into containers for shipping off-site	3.0	m3	C.4.01	$8.40	$ 25.20		
	4	2	3		haul containers to Roberts Bay laydown	3.0	m3	C.4.04	$2.51	$ 7.52		
	4	2	4		regrade area for positive drainage	740.3	m^2	C.5.18	$0.01	$ 8.39		
WM-003	4	3	1	Burn Pan	Collect ashes and place in containers	0.1	m3	C.2.07	$551.14	$ 55.11		
	4	3	2		Dismantle (welding crew)	1.0		C.3.08	$460.33	$ 460.33		
	4	3	3		load waste into containers for shipping off-site	0.2	m3	C.4.01	$8.40	$ 2.07		
	4	3	4		haul containers to Roberts Bay laydown	0.2	m3	C.4.04	$2.51	$ 0.62		
Quarry #2											**$107,269**	
Q2-001	5	1	1	Overburden Dump	reslope to 3H:1V	8,781.3	m3	C.5.06	$3.27	$ 28,680.42		assumed 30% of entire footprint
	5	1	2		grade top for positive drainage	18,440.8	m^2	C.5.05	$2.45	$ 45,171.66		assumed 60% of entire footprint
	5	1	3		install erosion protection measures (coconut matting)	2,634.4	m^2	C.5.08	$4.12	$ 10,856.48		asumed 10% of entire surface area
	5	1	4		re-vegetate	26,344.0	m^2	C.5.13	$0.80	$ 21,055.59		entire footprint area
Q2-002	5	2	1	Treated Sewage Discharge Areas	Fill in low-lying areas (assumed sourced within 0.5km)	69.1	m3	C.5.02	$17.99	$ 1,243.58		
	5	2	2		Revegetate: Supply and place cocoa matting	53.2	m^2	C.5.08	$4.12	$ 219.13		
	5	2	3		Revegetate: Seed/Fertilize, by hand, high application rate	53.2	m^2	C.5.13	$0.80	$ 42.50		
Doris Camp											**$2,195,899**	
DC-001	6	1	1	Accommodation Complex	Decommision (electrical, mechanical, plumbing)	18.0	each	C.1.05	$585.96	$ 10,547.28		
	6	1	2		disconnect trailers and prep for moving (remove boards/piping, etc.; wrap in plastic)	65.0	each	C.1.08	$1,075.50	$ 69,907.37		
	6	1	3		haul trailers to Roberts Bay for shipping off-site	2,755.6	m3	C.4.04	$2.51	$ 6,904.90		
	6	1	4		demolish cabins	319.1	m3	C.3.05	$10.93	$ 3,486.92		
	6	1	5		demolish cribbing, stairs, entryways, etc.	250.3	m3	C.3.05	$10.93	$ 2,735.48		smoke tent, hallway, and storage room
	6	1	6		demolish arctic corridor	132.5	m3	C.3.05	$10.93	$ 1,447.99		
	6	1	7		collect all debris	380.9	m2	C.3.10	$0.13	$ 50.34		
	6	1	8		load waste into containers for shipping off-site	623.1	m3	C.4.01	$8.40	$ 5,233.88		
	6	1	9		haul containers to Roberts Bay laydown	623.1	m3	C.4.04	$2.51	$ 1,561.36		
	6	1	10		regrade area for positive drainage	21,050.0	m^2	C.5.18	$0.01	$ 238.62		
	6	1	11		regrade pads to blend in with topography	15204.4	m^2	C.5.05	$2.45	$ 37,243.94		
	6	1	12		regrade surface to prevent ponding	152044	m^2	C.5.18	$0.01	$ 1,723.56		

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
DC-002	6	2	1	Tank Farm	Drain tanks into portable fuel storage (EnviroTanks)	5.0	each	C.2.03	$234.68	$ 1,173.40		
	6	2	2		Decommision Fuel Transfer Fascilities	5.0	each	C.1.02	$410.32	$ 2,051.60		
	6	2	3		Wash tanks	5.0	each	C.2.04	$804.19	$ 4,020.94		
	6	2	4		Operate oil/water separator	1.9	m3	C.2.08	$28.38	$ 54.03		
	6	2	5		Disconnect piping and controls	5.0	each	C.1.02	$410.32	$ 2,051.60		
	6	2	6		Dismantle tanks and cut into manageable pieces	7.0	each	LS	$50,000.00	$ 350,000.00		assumed cost proportional to 5 ML tanks
	6	2	7		prepare pieces for transportation	22.8	m3	C.4.01	$8.40	$ 191.27		
	6	2	8		haul cut metal to Roberts Bay laydown	22.8	m3	C.4.04	$2.51	$ 57.06		
	6	2	9		remove and stockpile liner protection cover	3,360.0	m3	C.5.04	$2.64	$ 8,870.74		
	6	2	10		clean liner	5,500.0	m3	C.2.10	$0.36	$ 1,965.79		
	6	2	11		remove and cut liner into manageable pieces	16,500.0	m3	C.3.02	$0.15	$ 2,420.14		liner and geotextile
	6	2	12		load waste into containers for shipping off-site	176.6	m3	C.4.01	$8.40	$ 1,483.36		Liners, geotextile and pipes
	6	2	13		haul containers to Roberts Bay laydown	176.6	m3	C.4.04	$2.51	$ 442.51		
	6	2	14		level containment berms	962.0	m^2	C.5.05	$2.45	$ 2,356.47		
	6	2	15		regrade area for positive drainage	4,927.7	m^2	C.5.18	$0.01	$ 55.86		
DC-003	6	3	1	Permanent Power Generator	Decommission (electrical)	8.0	each	C.1.06	$617.99	$ 4,943.90		
	6	3	2		Disconnect containers and prep for shipping off-site	8.0	each	C.1.08	$1,075.50	$ 8,603.98		
	6	3	3		haul containers to Roberts Bay laydown	265.6	m3	C.4.04	$2.51	$ 665.53		
	6	3	4		dismantle stacks	40.0	m	C.3.13	$117.34	$ 4,693.60		2, 20m stacks: two in each container 2m high = 5 containers
	6	3	5		prep stacks for shipping off-site	40.0	m	C.3.12	$433.80	$ 17,351.92		
	6	3	6		haul stack sections to Roberts Bay laydown	166.0	m3	C.4.04	$2.51	$ 415.96		
	6	3	7		collect all debris	2,103.0	m2	C.3.10	$0.13	$ 277.94		
	6	3	8		load waste into containers for shipping off-site	2.0	m3	C.4.01	$8.40	$ 16.80		
	6	3	9		haul containers to Roberts Bay laydown	2.0	m3	C.4.04	$2.51	$ 5.01		
DC-004	6	4	1	Backup Power generator	Decommission (electrical)	4.0	each	C.1.05	$585.96	$ 2,343.84		
	6	4	2		Disconnect generator units and prep for shipping off-site	2.0	each	C.1.06	$617.99	$ 1,235.98		
	6	4	3		haul units to Roberts Bay laydown	67.6	m3	C.4.04	$2.51	$ 169.39		
	6	4	4		demolish tent housing structure	94.1	m3	C.3.05	$10.93	$ 1,028.59		
	6	4	5		collect all debris	259.3	m^2	C.3.10	$0.13	$ 34.27		
	6	4	6		load waste into containers for shipping off-site	122.4	m3	C.4.01	$8.40	$ 1,027.78		
	6	4	7		haul containers to Roberts Bay laydown	122.4	m3	C.4.04	$2.51	$ 306.61		
DC-005	6	5	1	Sewage Treatment Plant	Flush and remove sewage plumbing, collect sewage sludge/waste water in 55 gallon drums	9.0	each	C.2.06	$519.46	$ 4,675.15		
	6	5	2		Decommission (electrical)	9.0	each	C.1.05	$585.96	$ 5,273.64		
	6	5	3		Disconnect containers and prep for shipping off-site	9.0	each	C.1.08	$1,075.50	$ 9,679.48		40 ' containers
	6	5	4		haul containers to Roberts Bay laydown	597.6	m3	C.4.04	$2.51	$ 1,497.45		
	6	5	5		Collect Debris	29.8	m^2	C.3.10	$0.13	$ 3.94		
	6	5	6		Load debris into containers for transport (to Roberts Bay)	23.8	m3	C.4.01	$8.40	$ 199.89		
	6	5	7		Haul debris to Roberts Bay	23.8	m3	C.4.04	$2.51	$ 59.63		

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
DC-006	7	6	1	Fire Water Storage Tank	decommission and disconnect electrical and plumbing	3.0	each	C.1.03	$1,201.25	$ 3,603.75		
	8	6	2		disconnect and remove container housing the pumps and controls, and prep for shipping	1.0	each	C.1.08	$1,075.50	$ 1,075.50		
	6	6	3		haul container to Roberts Bay laydown	66.4	m3	C.4.04	$2.51	$ 166.38		
	6	6	4		remove tank insulation	53.0	m3	C.3.15	$666.14	$ 35,290.84		
	6	6	5		Dismantle tanks and cut into manageable pieces (includes water tank for Boston)	2.9	m3	C.3.07	$250.21	$ 735.64		
	6	6	6		prepare pieces for transportation (includes water tank for Boston)	8.8	m3	C.4.01	$8.40	$ 74.09		
	6	6	7		haul cut metal to Roberts Bay laydown (includes water tank for Boston)	8.8	m3	C.4.04	$2.51	$ 22.10		
	6	6	8		Collect Debris	73.2	m^2	C.3.10	$0.13	$ 9.67		
	6	6	9		Load debris into containers for transport (to Roberts Bay)	78.3	m3	C.4.01	$8.40	$ 657.46		
	6	6	10		Haul debris to Roberts Bay	78.3	m3	C.4.04	$2.51	$ 196.13		
DC-007	6	7	1	Muster Station	demolish tent structure	227.3	m3	C.3.05	$10.93	$ 2,484.02		
	6	7	2		dismantle wood flooring	27.3	m3	C.3.05	$10.93	$ 298.08		
	6	7	3		Collect Debris	90.9	m^2	C.3.10	$0.13	$ 12.02		
	6	7	4		Load debris into containers for transport (to Roberts Bay)	42.7	m3	C.4.01	$8.40	$ 358.91		
	6	7	5		Haul debris to Roberts Bay	42.7	m3	C.4.04	$2.51	$ 107.07		
DC-008	6	8	1	Warehouse / Core Shack	demolish tent structure	269.5	m3	C.3.05	$10.93	$ 2,944.85		
	6	8	2		dismantle wood flooring, shelving, and lofts	186.2	m3	C.3.05	$10.93	$ 2,034.92		
	6	8	3		Collect Debris	720.1	m^2	C.3.10	$0.13	$ 95.16		
	6	8	4		Load debris into containers for transport (to Roberts Bay)	350.3	m3	C.4.01	$8.40	$ 2,942.53		
	6	8	5		Haul debris to Roberts Bay	350.3	m3	C.4.04	$2.51	$ 877.81		
	6	8	6		haul all warehouse containers to Roberts Bay	796.8	m3	C.4.04	$2.51	$ 1,996.60		
DC-009	6	9	1	Offices & Mine Dry Complex	Decommission (electrical, mechanical, plumbing)	3.0	each	C.1.05	$585.96	$ 1,757.88		
	6	9	2		disconnect trailers and prep for moving (remove boards, cladding, etc.; wrap in plastic)	17.0	each	C.1.08	$1,075.50	$ 18,283.47		
	6	9	3		haul trailers to Roberts Bay for shipping off-site	564.4	m3	C.4.04	$2.51	$ 1,414.26		
	6	9	4		demolish arctic corridor	219.5	m3	C.3.05	$10.93	$ 2,398.48		
												Demolish Office Builidng, Minedry, and
	6	9	5		demolish cribbing, stairs, entryways, etc.	998.2	m3	C.3.05	$10.93	$ 10,908.38		Admin Builidng
	6	9	6		collect all debris	1,981.2	m^2	C.3.10	$0.13	$ 261.84		
	6	9	7		load waste into containers for shipping off-site	2,325.6	m3	C.4.01	$8.40	$ 19,534.18		
	6	9	8		haul containers to Roberts Bay laydown	2,325.6	m3	C.4.04	$2.51	$ 5,827.39		
	6	9	9		regrade area for positive drainage	6,910.0	m^2	C.5.18	$0.01	$ 78.33		
DC-010	6	10	1	Crusher and Process Plant	decommission crusher, milling, and process plants	1	each	LS	$100,000.00	$ 100,000.00		
	6	10	2		disassemble equipment	1	each	LS	$200,000.00	$ 200,000.00		
	6	10	3		prepare equipment for shipping off-site	1	each	LS	$50,000.00	$ 50,000.00		
	6	10	4		demolish / dismantle mill building	83246.08	m^3	C.3.05	$10.93	$ 909,728.87		
	6	10	5		backfill crusher pit	5190	m^3	C.5.06	$3.27	$ 16,950.10		
	6	10	6		Collect Debris	3664	m^2	C.3.10	$0.13	$ 484.24		
	6	10	7		Load waste into containers for shipping off-site	4395.20	m^3	C.4.01	$8.40	$ 36,918.19		
	6	10	8		Haul debris to Roberts Bay laydown	4395.20	m^3	C.4.04	$2.51	$ 11,013.36		
DC-011	6	11	1	Portal and Underground Works	remove ducts, pipes, electrical cables	100.0	lm	C.3.16	$102.58	$ 10,258.00		assuming 100m length?
	6	11	2		construct portal plug	706.8	m3	C.5.03	$23.99	$ 16,954.15		
	6	11	3		regrade area for positive drainage	1,446.0	m2	C.5.18	$0.01	$ 16.39		
DC-012	6	12	1	Underground Wash Bay	demolish tent structure	776.9	m3	C.3.05	$10.93	$ 8,489.89		
	6	12	2		Collect Debris	155.4	m^2	C.3.10	$0.13	$ 20.53		
	6	12	3		Load debris into containers for transport (to Roberts Bay)	15.5	m3	C.4.01	$8.40	$ 130.12		
	6	12	4		Haul debris to Roberts Bay	15.5	m3	C.4.04	$2.51	$ 38.82		
DC-013	6	13	1	Underground Drilling Support Shop	demolish tent structure	859.2	m3	C.3.05	$10.93	$ 9,389.10		
	6	13	2		Collect Debris	229.1	m^2	C.3.10	$0.13	$ 30.28		
	6	13	3		Load debris into containers for transport (to Roberts Bay)	17.7	m3	C.4.01	$8.40	$ 148.27		
	6	13	4		Haul debris to Roberts Bay	17.7	m3	C.4.04	$2.51	$ 44.23		
DC-014	6	14	1	Water Intake Structure and Pumping Facility	remove water intake line from Doris Lake	25.0	lm	C.3.03	$10.07	$ 251.87		
	6	14	2		decommission pumping facility (remove electrical)	2.0	each	C.1.03	$1,201.25	$ 2,402.50		
	6	14	3		prep containers for shipping off-site	2.0	each	C.1.08	$1,075.50	$ 2,151.00		
	6	14	4		disconnect and remove generator fuel tank (place in Doris tank farm for cleaning)	1.0	each	C.1.01	$68.89	$ 68.89		
	6	14	5		clean TidyTank and prep for shipping off-site	1.0	each	C.2.02	$21.45	$ 21.45		Assumed there is only one tank
	6	14	6		run oil-water separator	1.0	each	C.2.08	$28.38	$ 28.38		
	6	14	7		prep generator container for shipping off-site	1.0	each	C.1.08	$1,075.50	$ 1,075.50		
	6	14	8		haul containers to Roberts Bay laydown	66.4	m3	C.4.04	$2.51	$ 166.38		
	6	14	9		Collect Debris	2,226.2	m^2	C.3.10	$0.13	$ 294.22		
	6	14	10		Load debris into containers for transport (to Roberts Bay)	20.0	m3	C.4.01	$8.40	$ 167.99		
	6	14	11		Haul debris to Roberts Bay	20.0	m3	C.4.04	$2.51	$ 50.12		

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Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
DC-015	6	15	1	Sedimentation/Pollution Control Pond	disconnect piping and electrical wiring, remove sump pumps	2.0	each	C.1.05	$585.96	$ 1,171.92		
	6	15	2		remove and cut liner into manageable pieces (Sedimentation Pond only)	10,200.0	m^2	C.3.02	$0.15	$ 1,496.09		Liner+Geotextile
	6	15	3		load waste into containers for shipping off-site	30.6	m3	C.4.01	$8.40	$ 257.03		Liner+Geotextile
	6	15	4		haul containers to Roberts Bay laydown	30.6	m3	C.4.04	$2.51	$ 76.68		
	6	15	5		breach Pollution Control pond and Sedimentation Pond containment berms	2,608.2	m^2	C.5.05	$2.45	$ 6,388.92		
	6	15	6		rip-rap breach for erosion protection	13.8	m3	C.5.03	$23.99	$ 331.02		
	6	15	7		decommission RO plant	4.0	each	C.1.05	$585.96	$ 2,343.84		
	6	15	8		disconnect RO plant containers and prep for shipping off-site	4.0	each	C.1.08	$1,075.50	$ 4,301.99		
	6	15	9		haul RO plant containers to Roberts Bay laydown	132.8	m3	C.4.04	$2.51	$ 332.77		
DC-016	6	16	1	Underground Support Mechanical Shop	Decommission electrical, mechanical (including connections to generator house & transformer)	3.0	each	C.1.05	$585.96	$ 1,757.88		
	6	16	2		demolish building	2,281.6	m3	C.3.05	$10.93	$ 24,933.25		
	8	16	3		Collect Debris	456.3	m^2	C.3.10	$0.13	$ 60.31		
	6	16	4		load waste into containers for shipping off-site	756.8	m3	C.4.01	$8.40	$ 6,356.77		
	6	16	5		Haul debris to Roberts Bay laydown	756.8	m3	C.4.04	$2.51	$ 1,896.34		
DC-017	6	17	1	Fresh Water Pipelines	Cut pipelines into manageable pieces	830.0	lm	C.3.03	$10.07	$ 8,362.05		
	6	17	2		decommission electrical (heat tracing)	4.0	each	C.1.05	$585.96	$ 2,343.84		
	6	17	3		collect electrical cables and controllers and prep for shipping off-site	1,600.0	m^2	C.3.10	$0.13	$ 211.46		
	6	17	4		Load debris into containers for transport (to Roberts Bay)	63.4	m3	C.4.01	$8.40	$ 532.23		
	6	17	5		Haul debris to Roberts Bay	63.4	m3	C.4.04	$2.51	$ 158.77		
DC-018	6	18	1	Helicopter Support Facilities	dismantle helicopter pads and walkway	15.0	m3	C.3.06	$2.89	$ 43.42		
	6	18	2		demolish helishack	84.6	m^3	C.3.05	$10.93	$ 924.06		Heli Office
	6	18	3		decommission washcar and other facilities	225.9	m^3	C.3.05	$10.93	$ 2,468.77		
	6	18	4		Collect Debris	154.2	m^2	C.3.10	$0.13	$ 20.38		
	6	18	5		Load debris into containers for transport (to Roberts Bay)	635.9	m^3	C.4.01	$8.40	$ 5,341.71		
	6	18	6		Haul debris to Roberts Bay	635.9	m^3	C.4.04	$2.51	$ 1,593.53		
	6	18	7		Regrade surface for positive drainage	1,582.4	m^2	C.5.18	$0.01	$ 17.94		
DC-019	6	19	1	Waste Rock Pile	Regrade top surface for positive drainage	-	m^2	C.5.05	$2.45	$ -		no waste rock left on surface
	6	19	2		Cover entire dump with HDPE liner,	-	m^2	C.5.01	$31.78	$ -		
	6	19	3		Place 0.3 m thick liner protection layer of crushed rock	-	m^3	C.5.03	$23.99	$ -		
DC-020	6	20	1	Run-off Diversion Berm	Breach the berm to original ground in several locations (4 locations) to restore natural flow path	33.6	m^2	C.5.05	$2.45	$ 82.30		
	6	20	2		Remove cut liners and place in containers for shipping off-site and disposal	33.6	m^2	C.3.02	$0.15	$ 4.93		
	6	20	3		Haul containers to Roberts Bay	0.3	m^3	C.4.04	$2.51	$ 0.76		
DC-021	6	21	1	Sewage Discharge Line	Flush pipeline prior to decommissioning	1.0	Each	C.2.06	$519.46	$ 519.46		
	6	21	2		Cut pipelines into manageable pieces and place in containers for shipping off-site	1,190.0	m	C.3.03	$10.07	$ 11,988.97		
	6	21	3		Remove electrical cables and controllers	1.0	each	C.1.05	$585.96	$ 585.96		
	6	21	4		Load debris into containers for shipping off-site	90.8	m^3	C.4.01	$8.40	$ 763.07		
	6	21	5		Haul containers to Roberts Bay	90.8	m^3	C.4.04	$2.51	$ 227.64		
DC-022	6	22	1	Sedimentation Berm	Breach the berm to restore a free drainage path	24.0	m^2	C.5.05	$2.45	$ 58.79		
	6	22	2		rip-rap breach for erosion protection	3.6	m^3	C.5.03	$23.99	$ 86.35		
DC-023	6	23	1	Sumps	decommision sumps	2.0	each	C.1.05	$585.96	$ 1,171.92		
	6	23	2		remove pumps, pipes, cables, culverts	2.0	LS		$2,500.00	$ 5,000.00		
	6	23	3		backfill sump excavation	28.3	m^3	C.5.02	$17.99	$ 508.67		
DC-024	6	24	1	Drainage channel	excavate channel	881.8	m^3	C.5.04	$2.64	$ 2,328.06		
	6	24	2		rip-rap for erosion protection	590.0	m^2	C.5.03	$23.99	$ 14,152.45		
DC-025	6	25	1	Waste Rock Expansion Area (Pad U)	remove pumps, pipes, cables, culverts	1	LS	--	$2,000.00	$ 2,000.00		
	6	25	2		breach Pollution Control pond and Sedimentation Pond containment berms	120.0	m^3	C.5.04	$2.64	$ 316.81		
	6	25	3		load waste into containers for shipping off-site	61.7	m3	C.4.01	$8.40	$ 518.65		
	6	25	4		haul containers to Roberts Bay laydown	61.7	m3	C.4.04	$2.51	$ 154.72		
DC-026	6	26	1	Ore Storage Expansion Area (Pad T)	Collect all debris	35,333.0	m2	C.3.10	$0.13	$ 4,669.70		
	6	26	2		Load waste into containers for shipping off-site	10.0	m3	C.4.01	$8.40	$ 84.00		
	6	26	3		Haul debris to Roberts Bay laydown	10.0	m3	C.4.04	$2.51	$ 25.06		
	6	26	4		Regrade area for positive drainage	35,333.0	m2	C.5.18	$0.01	$ 400.53		
North Dam											**$1,676,107**	
ND-001	7	1	1	Frozen Core Dam	Breach the dam by cutting a 20 m slot down to original ground (drill and blast)	7,028.0	m^3	C.5.09	$42.58	$ 299,274.13		
	7	1	2		Load and haul material	31,021.1	m^3	C.5.16	$8.57	$ 265,738.98		
	7	1	3		Remove thermosyphon radiators and superstructure	12.0	each	C.3.08	$460.33	$ 5,524.02		
	7	1	4		Clad the cut core faces for thermal protection	614.2	m^3	C.5.02	$17.99	$ 11,050.42		
ND-002	7	2	1	Tail Lake Access Road	Crown road for positive drainage	0.25	km	C.5.17	$987.34	$ 246.84		
	7	2	2		Remove floating dock and bridge	132.0	m^3	C.3.06	$2.89	$ 381.74		
	7	2	3		Load all debris and waste into containers and haul containers to Roberts Bay	132.0	m^3	C.4.01	$8.40	$ 1,108.76		

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Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
ND-003	7	3	1	TIA shoreline protection	Install separation geotextile	33,660.0	m^2	M.02	$26.63	$ 896,365.80		
	7	3	2		Haul and place riprap to prevent erosion	15,300.0	m^3	C.5.16	$8.57	$ 131,065.92		
ND-004	7	4	1	Water discharge line to Roberts Bay	Cut pipeline in pieces	5,500.0	m	C.3.03	$10.07	$ 55,411.21		
	7	4	2		Strap together or load pipe sections in containers for shipping off-site	880.0	m^3	C.4.01	$8.40	$ 7,391.71		
	7	4	3		Haul pipe sections to Roberts Bay	880.0	m^3	C.4.08	$2.90	$ 2,547.76		
South Dam											**$31,338**	
SD-001	8	1	1	Explosives Facility	Remove all explosive magazines	265.6	m^3	C.4.13	$3.57	$ 948.83		
	8	1	2		Demolish entry gates	1.0	ea	LS	$1,000.00	$ 1,000.00		
	8	1	3		remove and stockpile liner protection cover	3031	m^3	C.5.04	$2.64	$ 8,002.14		
	8	1	4		clean liner	4442	m^2	C.2.10	$0.36	$ 1,587.64		
	8	1	5		remove and cut liner into manageable pieces	4442	m^2	C.3.02	$0.15	$ 651.53		
	8	1	6		load waste into containers for shipping off-site	199.89		C.4.01	$8.40	$ 1,679.01		
	8	1	7		Decommission electrical, and heating from traffic control tower	2.0	ea	C.1.05	$585.96	$ 1,171.92		
	8	1	8		Demolish building (tent structure)	429.6	m^3	C.3.05	$10.93	$ 4,694.38		
	8	1	9		disconnect containers and prep for shipping off-site	2.0	ea	C.1.08	$1,075.50	$ 2,151.00		
	8	1	10		load waste into containers for shipping off-site	41.5	m3	C.4.01	$8.40	$ 348.59		
	8	1	11		collect all debris	18,558.0	m^2	C.3.10	$0.13	$ 2,452.67		
	8	1	12		Load all waste and debris and waste into containers	3.71	m^3	C.4.01	$8.40	$ 31.18		
	8	1	13		Haul waste to Roberts Bay	245.1	m^3	C.4.13	$3.57	$ 875.61		
	8	1	14		Regrade pad area for positive drainage	18,558.0	m^2	C.5.18	$0.01	$ 210.37		
	8	1	15		Recontour berms to blend in with topography	2,166.0	m^2	C.5.05	$2.45	$ 5,305.73		
SD-002	8	2	1	Tail Lake Access Road	Crown road for positive drainage	0.23	km	C.5.17	$987.34	$ 227.09		
Quarry #3											**$202**	
Q3-001	9	1	1	Q3 Access Road	Crown road for positive drainage	0.2	km	C.5.17	$987.34	$ 202.41		
Doris North Vent Raise											**$36,955**	
VR-001	10	1	1	Vent raise	Remove ducks, pipes, and cables	100.0	lm	C.3.16	$102.58	$ 10,258.00		
	10	1	2		Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top	1.0	each	C.6.03	$12,362.99	$ 12,362.99		
VR-002	10	2	1	Ventilation and Heating Facilities	Decommission and dismantle all ventilation and heating facilities	4.0	each	C.1.05	$585.96	$ 2,343.84		
	10	2	2		Prepare units for shipping off-site	1.0	each	C.1.08	$1,075.50	$ 1,075.50		
	10	2	3		Haul units to Roberts Bay	33.2	each	C.4.04	$2.51	$ 83.19		
	10	2	4		Regrade pads for positive drainage	4,150.0	m^2	C.5.18	$0.01	$ 47.04		
VR-003	10	3	1	Fuel Storage Area	Drain and decommission Enviro Tank	1.0	each	C.2.03	$234.68	$ 234.68		
	10	3	2		Haul Enviro Tank to Roberts Bay	33.2	m^3	C.4.04	$2.51	$ 83.19		
	10	3	3		Remove liner and cut into manageable pieces	1,230.0	m^2	C.3.02	$0.15	$ 180.41		
	10	3	4		Load all debris and waste into containers and	11.1	m^3	C.4.01	$8.40	$ 92.98		
	10	3	5		Haul containers to Roberts Bay	11.1	m^3	C.4.04	$2.51	$ 27.74		
	10	3	6		Backfill area to prevent permanent ponding	4,150.0	m^2	C.5.05	$2.45	$ 10,165.63		
Doris Central Vent Raise											**$111,068**	
VR-004	10	1	1	Vent raise	Remove ducks, pipes, and cables	100.0	lm	C.3.16	$102.58	$ 10,258.00		
	10	1	2		Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top	1.0	each	C.6.03	$12,362.99	$ 12,362.99		
VR-005	10	2	1	Ventilation and Heating Facilities	Decommission and dismantle all ventilation and heating facilities	4.0	each	C.1.05	$585.96	$ 2,343.84		
	10	2	2		Prepare units for shipping off-site	1.0	each	C.1.08	$1,075.50	$ 1,075.50		
	10	2	3		Haul units to Roberts Bay	33.2	each	C.4.04	$2.51	$ 83.19		
	10	2	4		Regrade pads for positive drainage	13,252.0	m^2	C.5.18	$0.01	$ 150.22		
VR-006	10	3	1	Fuel Storage Area	Drain and decommission Enviro Tank	1.0	each	C.2.03	$234.68	$ 234.68		
	10	3	2		Haul Enviro Tank to Roberts Bay	33.2	m^3	C.4.04	$2.51	$ 83.19		
	10	3	3		Remove liner and cut into manageable pieces	1,230.0	m^2	C.3.02	$0.15	$ 180.41		
	10	3	4		Load all debris and waste into containers and	11.1	m^3	C.4.01	$8.40	$ 92.98		
	10	3	5		Haul containers to Roberts Bay	11.1	m^3	C.4.04	$2.51	$ 27.74		
	10	3	6		Backfill area to prevent permanent ponding	4,150.0	m^2	C.5.05	$2.45	$ 10,165.63		
VR-007	10	4	1	Access road	Crown road for positive drainage	1.0	km	C.5.17	$987.34	$ 937.98		
VR-008	10	5	1	Overburden Dump	reslope to 3H:1V	5,988.0	m3	C.5.06	$3.27	$ 19,557.21		assumed 30% of entire footprint
	10	5	2		grade top for positive drainage	11,976.0	m^2	C.5.05	$2.45	$ 29,335.81		assumed 70% of entire footprint
	10	5	3		install erosion protection measures (coconut matting)	1,996.0	m^2	C.5.08	$4.12	$ 8,225.61		asumed 10% of entire surface area
	10	5	4		re-vegetate	19,960.0	m^2	C.5.13	$0.80	$ 15,953.15		entire footprint area
Doris Windy Road		3									**$260,389**	
DW-001	11	1	1	AWR	Remove bridges	3.0	each	LS	$50,000.00	$ 150,000.00		
					Remove Arched Culvert	1.0	each	LS	$100,000.00	$ 100,000.00		
					Crown road for positive drainage	10.0	km	C.5.17	$987.34	$ 9,873.44		
DW-002	11	2	1	Quarry A	No Closure activities are required			-				
DW-003	11	3	1	Quarry B	No Closure activities are required			-				
DW-004	11	4	1	Quarry D	No Closure activities are required			-				

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
DW-005	11	5	1	Explosives Storage Facility	Remove all explosive magazines	66.4	m^3	C.4.08	$2.90	$ 192.24		
	11	5	2		Demolish entry gates	0.5	m^3	C.3.05	$10.93	$ 4.92		
	11	5	3		Load all debris and waste into containers	25.4	m^3	C.4.01	$8.40	$ 213.35		
	11	5	4		Haul containers to Roberts Bay	25.4	m^3	C.4.08	$2.90	$ 73.54		
	11	5	5		Regrade area for positive drainage	2,805.8	m^2	C.5.18	$0.01	$ 31.81		Including the AWR
Secondary Road		5									**$142,102**	
SR-001	12	1	1	Tail Lake Road	Remove Doris Creek bridge	1.0	LS		$50,000.00	$ 50,000.00		Remove
	12	1	2		Cut tailings line running alongside the road into manageable pieces	5,445.0	m	C.3.03	$10.07	$ 54,857.10		Assuming the diameter is 0.4 m and the pipeline runs on the side of the road
	12	1	3		Strap together or load pipe sections in containers for shipping off-site	2,613.6	m^3	C.4.01	$8.40	$ 21,953.37		(have the same length)
	12	1	4		Haul pipe sections to Roberts Bay	2,613.6	m^3	C.4.04	$2.51	$ 6,549.08		
	12	1	5		Remove pipe culvert east of the bridge	18.8	lm	C.5.15	$89.77	$ 1,687.68		
SR-003	12	2	1	Emergency catch basins	excavate overliner	165.4	m^3	C.5.04	$7.92	$ 1,309.72		correction factor of 3 applied for non-cont
	12	2	2		haul contaminate overliner to Tail Lake	165.4	m^3	C.5.16	$8.57	$ 1,416.56		
	12	2	3		clean liner	551.2	m^2	C.2.10	$0.36	$ 197.01		
	12	2	4		cut into manageable pieces	551.2	m^2	C.3.02	$0.15	$ 80.85		
	12	2	5		Regrade area for positive drainage	551.2	m^2	C.5.05	$7.35	$ 4,050.63		correction factor of 3 applied for non-cont
Doris Mountain											**$54,557**	
DM-001	13	1	1	Communications Towers	Remove communications equipment	12.0	each	C.1.07	$322.50	$ 3,870.00		
	13	1	2		Dismantle the communications towers and prepare for shipping off-site	2.0	each	C.3.11	$14,500.08	$ 29,000.16		
	13	1	3		Demolish equipment housing shack	6.0	m^3	C.3.05	$10.93	$ 65.37		
	13	1	4		Remove electrical and fiber optics cables	12.0	each	C.1.05	$585.96	$ 7,031.52		
	13	1	5		Remove all equipment, material, and waste from Doris Mountain,	6.0	m^2	C.3.17	$2,415.34	$ 14,492.04		
	13	1	6		Place all waste in containers for shipping off-site	9.0	m^3	C.4.01	$8.40	$ 75.36		
	13	1	7		Ship Containers to Roberts Bay	9.0	m^3	C.4.04	$2.51	$ 22.48		
Off-site Shipping for Disposal											**$7,159,928**	
DN-001	14	1	1	Ship off-site for disposal by barge	Hazardous waste	118.4	m^3	S.02	$200.00	$ 23,674.18		
	14	1	2		Non-Hazardous waste and demolition debris	27,445.69	m^3	S.03	$200.00	$ 5,489,138.85		
	14	1	3		Hydrocarbon contaminated soils	0.0	m^3	S.01	$989.00	$ -		
DN-002	14	2	1	Shipping warehouse inventory off-site for disposal	Warehouse inventory in seacan containers or loose materials	215.0	each	S.04	$7,661.00	$ 1,647,115.00		
Off-Site Disposal Fees											**$176,179**	
DN-001	15	1	1	Disposal fees in licensed facility	Hazardous waste	1.0	LS		$25,000.00	$ 25,000.00		
	15	1	2		Non-hazardous waste and demolition debris	27445.7	m^3	M.10	$5.51	$ 151,178.65		
	15	1	3		Disposal fees at Hay River	0.0	t	H.05	$100.00	$ -		
Water Management											**$6,234,440**	
WM-001	16	1	1	Operate and maintain water management system	Pump technician	1580	day	day rate	$ 1,890	$ 2,986,200.00		
	16	1	2		Support person (camp, etc.)	1216	day	day rate	$ 1,890	$ 2,298,240.00		
	16	1	3		Site Services Support &Maintenance	10.4	-	LS	$ 50,000	$ 520,000.00		90 day seasons assumed for each year of
	16	1	4		Spare Parts & Consumables	10.4	-	LS	$ 20,000	$ 208,000.00		post-closure water management
	16	1	5		Pumps and piping (undersea discharge to Roberts Bay)	1.0	each	LS	$222,000.00	$ 222,000.00		
TOTAL DIRECT COSTS											**$19,011,246**	
INDIRECT CLOSURE COSTS												
Contingency											**$2,335,028**	
-	1	1	-	Contingency	20% of direct costs	20%	%	x	$11,675,139	$2,335,027.86		
Mobilization & Demobilization											**$ 711,993**	
-	2	1	1	Camp demolition	Mob/Demob	1.0	ls	x	$ 427,514.83	$427,515		Equipment mobilised from Edmonton
	2	2	1	Dam breach	Mob/Demob	1.0	ls	x	$ 284,478.30	$284,478		Equipment demobilised to Edmonton
General and Administration costs											**$ 4,703,880**	
-	3	1	-	Travel allowance		1	LS	x	$465,500.00	$465,500		Charter Yellowknife-Doris and return
-	3	2	-	Camp Management		90.0	day	OC.01	$677.00	$60,930		
-	3	3	-	Camp Operations		1,183.0	person-days	OC.02	$150.00	$177,450		
-	3	4	-	Camp Rental		10	year	OC.03	$400,000.00	$4,000,000		
Field support											**$ 136,536**	
-	4	1	-	Supervision		49	days	x	$ 1,208	$59,051		
-	4	2	-	Equipment maintenance support - Mechanic		49	days	x	$ 1,054	$51,529		
-	4	3		Helicopter Support		3.0	days	x	$ 8,652	$25,956		minimum of 4 hr per day (Doris Mountain towers)
Hydrocarbon decontamination											**$ 150,000**	
-	5	1	-	Engineering Design		1.0	LS	x	$ 50,000	$50,000		
-	5	2	-	Confirmatory Sampling and Analysis		1.0	LS	x	$ 100,000	$100,000		

Worksheet 1: Detailed Cost Estimate

Work Area Code	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Cost Code	Unit Cost	Activity Total	Subtotals	Source / Comments
Post-closure Monitoring											**$ 1,060,000**	
	6	1	1	Covers Monitoring	Bi-annual for 10 years	5	LS	x	$ 70,000	$350,000		
	6	1	2	Geotechnical Inspection (including Permafrost Monitoring)	Annual for 3 consecutive years	3	LS	x	$ 70,000	$210,000		
	6	1	3	Vegetation Survey	Years 1, 3, 7, and 10 after closure	4	LS	x	$ 50,000	$200,000		
	6	1	4	Water Quality Monitoring	Yearly for 5 years	5	LS	x	$ 60,000	$300,000		
Other												
												included in equipment unit rates and POH (i.e. Production Overhead) labor cost
-	9	1	-	Contractor profit	% of direct and other indirect costs (excluding contingency)	-	%	of	$ 24,713,655	$0.00		
-	9	2	-	Contractor Bonding	% of direct cost	-	%	of	$ 19,011,246	$0		
Subtotal Indirect Costs				Subtotal Indirect Costs							**$9,097,437**	
CLOSURE COSTS - TOTAL											**$28,108,683**	

Worksheet 2: Indirect Cost Calculations

Mob/Demob Costs

Crew mobilization costs included in loaded labour rates.
The barging fee for equipment is calculated on a square foot basis.

No. of units	Description	Units	Quantity	Unit cost	Task cost	Notes
Camp Demolition	Construction equipment	Footprint				
1	Bobcat	m^2	11.0	$ 332.96	$ 3,657.90	From Hay River to Roberts Bay
1	Loader	m^2	10.2	$ 332.96	$ 3,400.45	From Hay River to Roberts Bay
1	Dozer	m^2	20.3	$ 332.96	$ 6,750.26	From Hay River to Roberts Bay
1	Excavator	m^2	38.1	$ 332.96	$ 12,687.55	From Hay River to Roberts Bay
1	small equipment	m^2	24.1	$ 332.96	$ 8,025.01	From Hay River to Roberts Bay
1	Trucks (CAT 735)	m^2	41.6	$ 332.96	$ 13,860.35	From Hay River to Roberts Bay
1	Tractor trailer	m^2	86.8	$ 332.96	$ 28,907.95	From Hay River to Roberts Bay
1	Crewcab pickup (Ford F35(	m^2	33.8	$ 332.96	$ 11,254.35	From Hay River to Roberts Bay
8	Haul equipment to Shipping	each	8	$ 15,000.00	$ 120,000.00	hauling 8 trailers from Edmonton to Hay River / source: Doris cost estimate
Subtotal Mobilisation					**$ 208,544**	
Subtotal Demobilisation					**$ 218,971**	Assumes same cost as mobilisation, updated by 5%
Total					***$ 427,515***	
Dam Breach	Construction equipment	Footprint				
0	Bobcat	m^2	11.0	$ 364.67	$ -	From Hay River to Roberts Bay
1	Loader	m^2	10.2	$ 364.67	$ 3,724.30	From Hay River to Roberts Bay
1	Dozer	m^2	20.3	$ 364.67	$ 7,393.14	From Hay River to Roberts Bay
1	Excavator	m^2	38.1	$ 364.67	$ 13,895.89	From Hay River to Roberts Bay
0	small equipment	m^2	24.1	$ 364.67	$ -	From Hay River to Roberts Bay
1	Trucks (CAT 735)	m^2	41.6	$ 364.67	$ 15,180.38	From Hay River to Roberts Bay
0	Tractor trailer	m^2	86.8	$ 364.67	$ -	From Hay River to Roberts Bay
1	Crewcab pickup (Ford F35(	m^2	33.8	$ 364.67	$ 12,326.20	From Hay River to Roberts Bay
5	Haul equipment to Shipping	each	5	$ 17,250.00	$ 86,250.00	hauling 8 trailers from Edmonton to Hay River / source: Doris cost estimate
Subtotal Mobilisation					**$ 138,770**	
Subtotal Demobilisation					**$ 145,708**	Assumes same cost as mobilisation, updated by 5%
Total					***$ 284,478***	

Camp Cost

Description	Units	Cost Code	Unit Cost	Quantity										Total	Task Cost	Notes
				Year 1 (Camp Demolition+ Water Management)	Year 2 (Water Management)	Year 3 (Water Management)	Year 4 (Water Management)	Year 5 (Water Management)	Year 6 (Water Management)	Year 7 (Water Management)	Year 8 (Water Management)	Year 9 (Water Management)	Year 10 (Water Management + Dam Breach)			
Camp Management	day	OC.01	$677.00	0	152	152	152	152	152	152	152	152	90	90	$60,930	
Camp Operations	per day per person	OC.02	$150.00	733.4446567	760	760	760	760	760	760	760	760	450	1183	$177,450	the cost accrued for water management is account for under the WM section; 15 person crew for 82 days and 5 person crew for 70 days
Camp Rental	year	OC.03	$400,000.00	1	1	1	1	1	1	1	1	1	1	10	$4,000,000	
Travel allowance	charter flights	OC.05	$10,000.00	4	0	1	1	1	1	1	1	1	0	11	$110,000	charter flights for 15 person crews
	commercial flights	OC.04	$750.00	44	48	48	48	48	48	48	48	48	46	474	$355,500	4 person crew for water management; 8 person crew for dam breach, including engineer/surveyor 10 days to breach the dam
				$ 583,016.70	**$ 652,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 662,904.00**	**$ 562,930.00**	**$ 4,703,880.00**	**$4,703,880**	

Worksheet 3: Unit Rates

Cost Code	Item	Unit rate	Unit	Comment	Source
Equipment					
E.01	Dozer (CAT D7)	$ 171.50	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.02	Dozer (CAT D4)	$ 89.20	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.03	Dozer (CAT D4) w/ Tiller	$ 105.66	hr	15% added for tiller attachment	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.04	Truck (CAT 730)	$ 142.86	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.05	Excavator (CAT 330 CL)	$ 190.55	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.06	Loader (CAT IT38/930)	$ 84.77	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.07	Skidder (CAT Bobcat)	$ 82.50	hr	hourly equipment rate (less operator)	Nuna 2012 equipment rates; increased by 3% to 2013 cost
E.08	Helicopter	$ 2,163.00	hr	fuel surcharge applies	IMiskolczi (from Angela Holtzapfel@HBML ESR)
E.09	Welding Equipment	$ 54.16	day	300 Amps, gas/diesel driven	2009 BC Blue Book + 10% Northern Allowance, 10% fuel factor
E.10	Power washer	$ 113.30	day	Hot water pressure washer - 3000 PSI	www.abtoolrentals.com/equipment.asp?action=category&category=190&key=190%2D0079
E.11	Drum crusher	$ 36.67	hr	30 tones, mobile	2012 cost plus 3% rate increase to 2013
E.12	Oil-water separator	$ 28.33	hr	10 GPM, underground	2012 cost plus 3% rate increase to 2013
E.13	Air Track Drill	$ 302.50	hr	200 cfm compressor, 196 HP diesel engine	2013-2014 BC Blue Book + 10% Northern Allowance+10% fuel factor
E.14	Tractor Trailer (6 axle lowbed+booster)	$ 81.73	hr	hourly equipment rate (less operator)	2013-2014 BC Blue Book + 10% Northern Allowance
E.15	Flatbed truck (6x4, 5 tonne)	$ 23.05	hr	hourly equipment rate (less operator)	2013-2014 BC Blue Book + 10% Northern Allowance
E.13	Clemro Crusher	$ 811.02	hr	200 tons/hr (less operator)	Nuna 2012 Equipment Rates updated by 3% to 2013
E.14	Motor Grader CAT 16M	$ 164.59	hr	hourly equipment rate (less operator)	Nuna 2012 Equipment Rates updated by 3% to 2013
Materials					
M.01	Liner - HDPE	$ 28.93	m^2	supply and install	from JDS (Surface Water Management Options Analysis)
M.02	Liner - geotextile	$ 26.63	m^2	supply and install	from JDS (Surface Water Management Options Analysis)
M.03	Fuel (Diesel)	$ 1.17	L	2008 Landed fuel cost at Hope Bay	Maritz (from Jeff Reinson @ Newmont)
M.04	Explosives	$ 62.46	lbs	15% freight cost added	costmine 2012; updated by 3% to 2013 cost
M.05	Silt Fencing	$ 1.32	m	15% freight cost added	Cost Mine 2011; original price quoted in linear ft
M.06	Coco-matting	$ 1.79	m^2	15% freight cost added	Cost Mine 2011; original price quoted in sq. yards
M.07	Seed/Fertilizer	$ 16.61	kg	15% freight cost added	Arctic Alpine seed mix+ fertilizer (2009 increase by 6% to 2013 based on inflation)
M.08	Winter road	$ 17,175.25	km	open and maintain for 2 months	NUNA Logistics (from Court Smith) + 18% cost increase to 2013
M.09	Hazardous Waste Disposal fee	$ 10,000.00	m^3	Disposal + handling and cleaning fee	SRK estimate
M.10	Demolition Debris Disposal Fee (@Hay River)	$ 5.51	m^3	Disposal + handling fee	Personal communication with Rob Jamieson@Hay River Disposals Ltd.
M.12	Bentonite chips	$ 570.96	m^3	In 50 pound bags, 15% freight cost added	Holly North Production Supplies Limited
M.13	Plastic wrapping	$ 1.00	m^2	in 14 ft wide rolls	web search; shrinkit-inc.com accessed June15, 2012
Labour					
L.01	Labour general	$ 58.67	hr		Nuna Blended 2012 rate, POH included; increased by 3% to 2013 cost
L.02	Labour - Trades	$ 87.82	hr	Electrician, Welder, plumber etc.	Nuna Blended 2012 rate, POH included; increased by 3% to 2013 cost
L.05	Supervision	$ 100.64	hr		Nuna Blended 2012 rate, POH included; increased by 3% to 2013 cost
L.06	Truck Drivers	$ 67.79	hr	Heavy Equipment	Nuna Blended 2012 rate, POH included; increased by 3% to 2013 cost
L.07	Heavy Equipment Operator	$ 73.46	hr	Light equipment	Nuna Blended 2012 rate, POH included; increased by 3% to 2013 cost
L.08	Technician (Consultant)	$ 135.00	hr	Staff Consultant	SRK-Estimate (all inclusive)
L.09	Note: Loading Rate includes allowances for (EI, CPP, MSP/Benefits/Travel/OT)				
Shipping					
S.01	Outbound Shipping - Soils	$ 989.00	m^3	1.7 t/m^3 bulk density	(7.75 m^3/seacan based on 29,000 lbs limit per seacan, seacan is 38.5 m^3) - from NTCL 17APR 12
S.02	Outbound Shipping - Haz Waste	$ 200.00	m^3	1.0 t/m^3 bulk density	(7.75 m^3/seacan based on 29,000 lbs limit per seacan, seacan is 38.5 m^3) - from NTCL 17APR 12
S.03	Outbound Shipping - Demolition	$ 200.00	m^3	0.733 t/m^3 bulk density	$7661/seacan (seacan is 38.5 m^3) - from NTCL 17APR 12
S.04	Shipping cost per seacan	$ 7,661.00	each		NTCL 17Apr 2012
Hydrocarbon Soils and Haz Waste					
H.01	Excavate impacted soil	$ 19.18	m^3		WESA estimate say reference
H.02	Low temperature thermal desorption	$ 100.00	m^3		WESA estimate say reference
H.03	Rehydrate and backfill	$ 10.69	m^3		WESA estimate say reference
H.04	Regrade and reshape	$ 2.38	m^2		WESA estimate say reference
H.05	Tipping Fee for HC Soils at Hay River	$ 100.00	tonne		Communication with Hay River Landfill Tsharp 18APR12
Owner's cost					
OC.01	Camp management	$ 677.00	day		Newmont
OC.02	Camp operations	$ 150.00	day	includes food and camp maintenance	Newmont
OC.03	Camp rental	$ 400,000.00	year	25 man mobile camp	Newmont
OC.04	Commercial flight	$ 750.00	person	flight from Yellowknife to Cambridge Bay and return	
OC.05	Charter flight	$ 10,000.00	flight	Return from Yellowknife	

Worksheet 4: Task Unit Rate Calculations

Cost Code	Item	Unit	Productivity (Unit/hr)	Unit Rates: Total Unit Cost	Unit Rates: Material Unit Rate	Unit Rates: Labour Unit Rate	Unit Rates: Equipment Unit Rate	Labour: General Labour $ 58.67	Labour: Trades - Electrical $ 87.82	Labour: Trades - Mechanic $ 87.82	Labour: Trades - Plumbing $ 87.82	Labour: Engineer/ Technician $ 135.00	Labour: Light Equipment Operator $ 67.79	Equipment: Heavy Equipment Operator $ 73.46	Equipment: Dozer - CAT D7 $ 171.50	Equipment: Excavator - Cat 330 $ 190.55	Equipment: Loader - CAT 966 $ 84.77	Equipment: Motor grader CAT 14M $ 164.59	Equipment: Skidder CAT 242 $ 82.50	Equipment: Truck - CAT 730 $ 142.86	Equipment: Tractor Trailer $ 81.73	Equipment: Flatbed truck (5 tonne) $ 23.05	Equipment: Helicopter $ 2,163.00	Equipment: Drill $ 302.50	Drum crusher 36.668	Power washer 11.33	Welding Equipment 54.1574	Crusher 811.022	Note / Source
Decomissioning																													
C.1.01	Decomission and remove all heating fuel tanks and place into lined facility	each	4.00	$ 68.89	$ -	$ 47.70	$ 21.19	2						1			1												Disconnect and remove all fuel drums and disconnect all Tidy Tanks from all structures
C.1.02	Decomission above ground storage tanks	each	0.5	$ 410.32	$ -	$ 410.32	$ -	2	1																				Disconnect all fuel lines and electrical parts
C.1.03	Decomission potable water supply	each	0.25	$ 1,201.25	$ -	$ 1,010.70	$ 190.55	1	1		1			0.25		0.25													Disconnect all electrical and plumbing (intake and distribution)
C.1.04	Decomission waste incinerator	each	0.17	$ 1,116.28	$ -	$ 989.13	$ 127.15	1		1				0.25			0.25												Disconnect and remove fuel storage
C.1.05	Decommission Main Camp Facility electricity	each	0.25	$ 585.96	$ -	$ 585.96	$ -	1	1																				De-energise main electrical board, disconnect auxiliary power (if exists)
C.1.06	Decommission electrical generators	each	0.46	$ 617.99	$ -	$ 525.85	$ 92.14	2	1					0.5			0.5												De-energise main breaker board, disconnect external fuel tanks (if needed) / loader used for lifting; source - RSMeans (260505252100)
C.1.07	Dismantle Satelite/Comunication Equipment	each	0.5	$ 322.50	$ -	$ 322.50	$ -	2	0.5																				source - SRK estimate
C.1.08	Prep portable trailers for moving (remove cladding, apply shrinkwrap etc.)	each	0.25	$ 1,075.50	$ 55.00	$ 850.96	$ 169.54	3						0.5			0.5												
C.1.09	Decommision Airstip - Place large X's at each end of strip	each	0.5	$ 284.68	$ 50.00	$ 234.68	$ -	2																					Assumed material cost for a high density plastic, nails and sandbags.
C.1.10	Dismantle airstip approach lights	each	4	$ 36.62		$ 36.62	$ -	1	1																				
C.1.11	Dismantle Hoper, Crusher	each	0.05	$ 2,929.80		$ 2,929.80	$ -	1	1																				
Decontamination																													
C.2.01	Collect hazardous chemical waste and place in suitable containers	m3	0.17	$ 2,005.43	$ -	$ 1,496.82	$ 508.61	3						1			1												Includes all chemicals on site / jm_Estimate
C.2.02	Drain and power-wash heating fuel tanks (Tidy Tanks)	each	6.00	$ 21.45	$ -	$ 19.56	$ 1.89	2																		1			Drain fuel from tanks and wash exterior with hot water (collect water for treatment)
C.2.03	Drain above ground fuel storage tank	each	0.5	$ 234.68	$ -	$ 234.68	$ -	2																					Drain fuel /source - SRK estimate
C.2.04	Pressure wash above ground fuel tank	each	0.16	$ 804.19	$ -	$ 733.38	$ 70.81	2																		1			
C.2.05	Drain and power-wash empty fuel drums	each	12	$ 16.84	$ -	$ 15.90	$ 0.94	2						1												1			Drain fuel and tripple-rinse drum (collect water for treatment)
C.2.06	Flush sewage treatment unit and collect sewage sludge	each	0.4	$ 519.46	$ -	$ 385.18	$ 134.29	2						0.5			0.5									1			Flush treatment unit with water (collect water for treatment)/source - SRK estimate
C.2.07	Empty incinerator and collect ashes	m3	0.25	$ 551.14	$ -	$ 381.60	$ 169.54	1						0.5			0.5												Place ashes and unburned contents into containers / see C.6.04
C.2.08	Operate oil/water separator	m3	6.60	$ 28.38	$ -	$ 26.67	$ 1.72	3																		1			Collect skimmed oil from seperator and place in suitable container - 15 minutes per 55 gal. drum
C.2.09	Empty soil from 45 gallon drums	each	4	$ 95.34	$ -	$ 47.70	$ 47.64	2						1		1													
C.2.10	Liner pressure wash cleaning	m2	360	$ 0.36	$ -	$ 0.33	$ 0.03	2																		1			
Demolition																													
C.3.01	Crush empty fuel drums	each	20.00	$ 15.61	$ -	$ 9.54	$ 6.07	2						1			1								1				
C.3.02	Cut Tank Farm geomembrane to manageable size	sq. m	1200.00	$ 0.15	$ -	$ 0.15	$ -	3																					source - SRK estimate
C.3.03	Remove intake hoses and cut to manegeable size	Lm	100	$ 10.07	$ -	$ 1.54	$ 8.53	2						0.5			0.5											1	source - SRK estimate
C.3.04	Dismantle pollution control berm	each	0.50	$ 234.68	$ -	$ 234.68	$ -	2																					
C.3.05	Demolish office buildings/ shop structures/ living quarters	m3	53.00	$ 10.93	$ -	$ 6.09	$ 4.84	3						2	1		1												Demolish empty wood structures (offices, shacks, etc.)/ source - ECHOS
C.3.06	Demolish helipads/ float plane dock	m3	75	$ 2.89	$ -	$ 1.76	$ 1.13	1						1			1												Demolish wood structure / source - SRK estimate
C.3.07	Demolish Above ground storage tanks	m3	5	$ 250.21	$ -	$ 49.89	$ 200.31	3						1		1												1	
C.3.08	Dismantle Old Equipment (torch)	each	0.5	$ 460.33	$ -	$ 352.02	$ 108.31	3																			1		
C.3.08	Cut off top of drill casings	each	2.00	$ 56.41	$ -	$ 29.34	$ 27.08	1																			1		
C.3.10	Clean up debris from site	m2	2529	$ 0.13	$ -	$ 0.10	$ 0.03	3						1			1												source - SRK estimate
C.3.11	Dismantle radio tower	each	0.04	$ 14,500.08	$ -	$ 9,926.88	$ 4,573.20	2	1			1		1		1													source - SRK estimate
C.3.12	Prep stacks for shipping	m	0.50	$ 433.80	$ -	$ 264.26	$ 169.54	1						1			1												Estimate
C.3.13	Dismantle Power Generator Stacks	m	0.50	$ 117.34	$ -	$ 117.34	$ -	1																					
C.3.14	Removing Cables and Posts	each	1.00	$ 381.35	$ -	$ 190.80	$ 190.55	2						1		1													
C.3.15	Remove Tank Insullation	each	0.30	$ 666.14	$ -	$ 391.13	$ 275.01	2											1										
C.3.16	Remove pipes, ducts, and electrical cables	m	2.00	$ 102.58	$ -	$ 102.58	$ -	2	1																				
C.3.17	Remove waste from Doris Mountain (helicopter support)	m3	1.00	$ 2,415.34		$ 252.34	$ 2,163.00	2				1											1						
Material Relocations																													
C.4.01	Load demolition debris/solid waste in containers	m3	48.00	$ 8.40	$ -	$ 3.06	$ 5.34							2	1		1												source - SRK calculated from first principles
C.4.02	Empty Seacan of debris at the landfill	each	5.7	$ 89.15	$ -	$ 25.73	$ 63.41							2	1	1													
C.4.04	Haul waste to Roberts Bay jetty in 20 ft container (33.2 m3/container)	m^3	59.67	$ 2.51	$ -	$ 1.14	$ 1.37						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.06	Haul Containers on skids from beach laydown to Roberts Bay Jetty	each	1.20	$ 204.13	$ -	$ 61.22	$ 142.91							1	1														
C.4.07	Haul Material From Doris Windy Road to Roberts Bay	m^3	36.31	$ 4.12	$ -	$ 1.87	$ 2.25						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.08	Haul Material From North Dam To Roberts Bay	m^3	51.64	$ 2.90	$ -	$ 1.31	$ 1.58						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.09	Haul Material From Reagent Pad To Roberts Bay	m^3	66.90	$ 2.23	$ -	$ 1.01	$ 1.22						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.10	Haul Mateiral From Airstrip to Roberts Bay	m^3	75.48	$ 1.98	$ -	$ 0.90	$ 1.08						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.11	Haul Mateiral to Jetty (Roberts Bay)	m^3	85.74	$ 1.74	$ -	$ 0.79	$ 0.95						1								1								Productivity calculation shown on 'Relocation Unit Cost' Worksheet
C.4.12	Load soils into megabags	m^3	4.00	$ 67.72	$ -	$ 46.28	$ 21.44	2					1			0.45													
C.4.13	Haul Material From South Dam to Roberts Bay	m^3	41.85	$ 3.57		$ 1.62	$ 1.95						1								1								
Earth works																													
C.5.01	Install HDPE Liner	m^2	175	$ 31.78	$ 28.93	$ 1.76	$ 1.09	4						1		1													
C.5.02	Load, haul, dump, place: 1 truck with <0.5 km haul distance	m^2	40	$ 17.99	$ -	$ 5.37	$ 12.62						1	2	1	1				1									
C.5.03	Load, haul, dump, place: 1 truck with <1.0 km haul distance	m^2	30	$ 23.99	$ -	$ 7.16	$ 16.83						1	2	1	1				1									
C.5.04	Excavate: Spoil locally, no trucks	m^3	100	$ 2.64	$ -	$ 0.73	$ 1.91							1		1													
C.5.05	Regrade surface - rough grading, D7	m^2	100	$ 2.45	$ -	$ 0.73	$ 1.71							1	1														
C.5.06	Reslope Stockpiles - D7	m^2	75	$ 3.27	$ -	$ 0.98	$ 2.29							1	1														
C.5.07	Relocate core box pallet (<0.5 km)	ea	6	$ 36.15	$ -	$ 22.02	$ 14.13	1						1			1												
C.5.08	Install soil stabilization measures (straw/coconut matting)	m^2	269	$ 4.12	$ 1.79	$ 1.31	$ 1.02	3.5						2		1	1												
C.5.09	Drill, blast Quarry	m^3	65	$ 42.58	$ 33.73	$ 4.20	$ 4.65	1				0.5		2										1					
C.5.10	Trackpack using loaded rock truck	m^2	100	$ 2.11		$ 0.68	$ 1.43						1							1									
C.5.11	Scaling (loose rock)	hr	1	$ 264.01	$ -	$ 73.46	$ 190.55							1		1													
C.5.12	Load, haul, dump place: 2 trucks with <1.0km haul distance	m^2	75	$ 12.40	$ -	$ 3.77	$ 8.64						2	2	1	1				2									
C.5.13	Seeding/Fertilizing: By hand, high application rate	m^2	320	$ 0.80	$ 0.25	$ 0.55	$ -	3					0																
C.5.14	Summer identification of low-lying areas	day	0.08	$ 6,836.56	$ 100.00	$ 2,324.04	$ 4,412.52	1				1											0.17						
C.5.15	Remove culvert and create swale	lm	5	$ 89.77	$ -	$ 51.66	$ 38.11	2				0.5		1		1													
C.5.16	Load, haul, dump, 2 trucks<0.5 km haul distance	m^2	80	$ 8.57	$ -	$ 2.61	$ 5.95						2	1		1				2									
C.5.17	Crown road	km	0.25	$ 987.34	$ -	$ 328.97	$ 658.38			0.1				1				1											
C.5.18	Road grading (use grader)	m2	21000	$ 0.011	$ -	$ 0.00	$ 0.01							1				1											
C.5.19	Ripping and scarifying roads and pads	m2	5000	$ 0.048	$ -	$ 0.01	$ 0.03							1				1											
Other																													
C.6.01	Sample HC contaminated soils / confirmatory samples	each	2	$ 96.84	$ -	$ 96.84	$ -	1				1																	
C.6.02	Band together core pallets	each	12	$ 9.78	$ -	$ 9.78	$ -	2			0		0		0														
C.6.03	Construction of Vent Raise Seal	each	0.042	$ 12,362.99	$ 3,000.00	$ 8,345.76	$ 1,017.23	3				1		0.5			0.5												

Worksheet 5: Relocation Unit Cost Calculations

Hauling Distance to Roberts Bay			
Doris Camp	5.3	km	One Way
Windy Camp	14.82	km	One Way
North Dam	7.6	km	One Way
Reagent Pads	3.7	km	One-Way
Airstrip	2.2	km	One-Way

C.4.03 - Productivity of hauling bulk materials on skids at Roberts Bay			
By Skid - SnowCAT (equivalent to D7)			Note: Cost of winter road not included
Equipment Cost	$ 171.50	per hr	Includes fuel
Labour Cost	$ 73.46	per hr	
Average speed	9	km/hr	Sleds assumed as being available on site
Hauling capacity	2	skids	One container per skid
Load	1	container	
Distance:	1.5	km	
Time Required 1 round trip:	**0.83**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**1.20**	**skid/hr**	

C.4.04 - Productivity of hauling bulk materials from Doris North to Roberts Bay			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	5.3	km	
Time Required 1 round trip:	**0.78**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**59.67**	**m^3/hr**	

C.4.07 - Productivity of hauling bulk materials from Doris Windy Road to Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	14.82	km	
Time Required 1 round trip:	**1.28**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**36.31**	**m^3/hr**	

C.4.08 - Productivity of hauling bulk materials from North Dam to Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	7.6	km	
Time Required 1 round trip:	**0.90**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**51.64**	**m^3/hr**	

C.4.9 - Productivity of hauling bulk materials from Reagent Pad to Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	3.7	km	
Time Required 1 round trip:	**0.69**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**66.90**	**m^3/hr**	

Worksheet 5: Relocation Unit Cost Calculations

C.4.10 - Productivity of hauling bulk materials Airstrip to Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	2.2	km	
Time Required 1 round trip:	**0.62**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**75.48**	**m^3/hr**	

C.4.11 - Productivity of hauling bulk materials in Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	0.8	km	
Time Required 1 round trip:	**0.54**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**85.74**	**m^3/hr**	

C.4.12 - Productivity of hauling bulk materials South Dam to Roberts Bay			
Tractor trailer with Lowboy, 2x20 ft seacans per trip			
Equipment Cost	$ 81.73	per hr	Includes fuel
Labour Cost	$ 87.82	per hr	
Average speed	38	km/hr	Sleds assumed as being available on site
Hauling capacity	2	Containers	One container per skid
Cargo capacity	33.2	m^3	Standard 20 ft container
Space utilization ratio	0.7		
Load	46.48	m^3	CargoCapacity x #ofContainers x SpaceUtilizationRatio
Distance:	11.6	km	
Time Required 1 round trip:	**1.11**	**hrs**	**Includes 0.5hr unloading time**
Productivity:	**41.85**	**m^3/hr**	

Worksheet 6: Structure Quantities

Demolition Bulking Factors	
Tents - Empty	1.3
Wood Structures - Empty	1.5
Wood Structures - w/ Interior Wall Allowance	2
Steel Structures - Empty	1.5
Steel Structures - w/ Interior Wall Allowance	2
Mechanical Equipment	1.1
Liners	3
Pipelines	3

Structure Volumes

Area	Structure	Quantity	Length (m)	Width/Dia. (m)	Footprint Area (m^2)	Avg Height (m)	Wall thickness (m)	Floor Thickness (m)	Roof Length (m)	Roof Thickness (m)	Wall Volume (m^3)	Floor Volume (m^3)	Roof Volume (m^3)	Total Collapse Volume (m3)	Loose Volume (m^3)	Standing Volume (m^3)	Surface area (m^2)	Source
Accomodation Complex	Portable Trailers	64	17.6	3.1	54.6	2.5	0.15	0.3	3.1	0.16	15.525	16.4	8.7	2600		**136.4**		As built ACAD, height/wall/roof thickness est. from design doc
	Building A to B Corridor	2	71.4	3.1	221.3	2.5	0.15	0.3	3.1	0.16	0	66.4	35.4	204	**305.45**	**553.4**		As built ACAD, height/wall/roof thickness est. from design doc
	Arctic Corridor	1	26.5	2	53.0	2.5	0.15	0.3	2	0.16	21.4	15.9	8.5	46	**68.63**	**132.5**		As built ACAD, height/wall/roof thickness est. from photo
	Cabins	7	4.27	4.27	18.2	2.5	0.15	0.3	4.27	0.3	6.4	5.5	5.5	121	**242.83**	**45.6**		As built ACAD, height/wall/roof thickness est. from photo
	Smoke Shack Tent	1	7.42	3.78	28.0	2.5	0.01	0.1	3.78	0.05	0.6	2.8	1.4	5	**6.20**	**70.1**		As built ACAD, height/wall/roof thickness est. from photo
	Sea-can 20'	1	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	1	**2.17**	**37.2**		As built ACAD, height/wall/roof thickness est. from photo
	Storage Sea-can	1	12.3	4.9	60.3	2.75	0.15	0.3	4.9	0.16	14.2	18.1	9.6	42	**83.83**	**165.7**		As built ACAD, height/wall/roof thickness est. from photo
Crusher, Mill, and Process Plant	Mill Building	1	80	45.8	3664.0	22.72	0.203	0	45.8	0.483	1160.4	0.0	1769.7	2930	**4395.20**	**83,246.08**		
	Crusher	1																
Tank Farm	Fuel Tanks	5	-	14.6	167.4	9.9	0.006	0.005		0.005	1.4	0.8	0.8	15	**22.77**	**1657.4**	**1903.5**	As built ACAD,thickness est. from design doc
	Geotextile	1			11000.0			0.003			0.0	33.0	0.0	33	**99.00**	**0.0**		Fuel Tank Farm design doc
	Liner	1			5500.0			0.003			0.0	16.5	0.0	17	**49.50**	**0.0**		Fuel Tank Farm design doc
	Pipes (Tanks to Fuel Station)	1	265	0.15	0.018									5	**14.05**	**0.0**		Rough Length Estimate based on Judgement (3'' pipes)
	Pipes (Fire Suspension to Tanks)	1	265	0.15	0.018									5	**14.05**	**0.0**		Rough Length Estimate based on Judgement (3'' pipes)
	Containment Berm	1	278	5	962.000											**0.0**		As built Acad
Permanent Power Generator	Extent of the Area	1	35.54	59.19	2103.0						0.0	0.0	0.0	0		**0.0**		As built Acad, height thickness est. from photo
Temporary Power Generator	Tent	1	21.61	12	259.3	5	0.01	0.3	12.0	0.05	3.4	77.8	13.0	94	**122.36**	**1296.6**		As built ACAD, thickness est. from photo
Sewage Treatment Plant	Sewage Sea-cans 40'	9	12.23	2.44	29.8	2.5	0.15	0.3	2.44	0.16	11.0	9.0	4.8	223		**74.6**		As built ACAD, est from photo
	Sewage Pipes	1	200	0.1	0.01									2	**4.71**	**0.0**		Length est. from Piping As Built Doc, Diameter from Pipe Design Spec
	Fresh Water Pipes	1	360	0.15	0.02									6	**19.09**	**0.0**		Length est. from Piping As Built Doc, Diameter from Pipe Design Spec
Fire Water Storage Tank	Fire Water Tank	1	-	9.65	73.1	7.32	0.006	0.006		0.005	0.7	0.4	0.4	1	**4.41**	**535.4**	**176.6**	As built AutoCad, height thickness est. from design doc
	Fire Water Pipes	1	260	0.2032	0.03									8	**25.29**	**0.0**		Length est. from Piping As Built Doc, Diameter from Pipe Design Spec
	Pump House Sea-can	1	12.2	2.44	29.8	2.5	0.15	0.3	2.44	0.16	11.0	8.9	4.8	25		**74.4**		As built Acad, height/thickness est. from photo
Muster Station	Tent	1	14.76	6.16	90.9	2.5	0.01	0	6.16	0.05	1.0	0.0	4.5	6	**7.27**	**227.3**		As built Acad, height/thickness est. from photo
	Wood flooring	1	14.76	6.16	90.9			0.3			0.0	27.3	0.0	27	**35.46**			
	Sea-Can 20'	2	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	3		**37.2**		As built Acad, height/thickness est. from photo
Warehouse/Core Shack	Tent	1	36.15	17.17	620.7	5	0.01	0.3	17.17	0.05	5.3	186.2	31.0	223	**289.35**	**3103.5**		As built Acad, height/thickness est. from photo
	Bent. Shack Tent	1	7.21	4.94	35.6	2.5	0.01	0.3	4.94	0.05	0.6	10.7	1.8	13	**17.00**	**89.0**		As built Acad, height/thickness est. from photo
	Core Log Tent	1	7.21	4.94	35.6	2.5	0.01	0.3	4.94	0.05	0.6	10.7	1.8	13	**17.00**	**89.0**		As built Acad, height/thickness est. from photo
	wood flooring, shelving, and lofts	1			310.3	0.3								93	**186.21**	**93.1**		Estimated
	Orbit Trailer	1	12.26	3.7	45.4	2.5	0.15	0.3	3.7	0.16	12.0	13.6	7.3	33		**113.4**		As built Acad, height/thickness est. from photo
	Sea-can 20'	12	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	17		**37.2**		As built Acad, height/thickness est. from photo
	Sea-can 40''	5	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	13		**74.6**		As built Acad, height/thickness est. from photo
	Geotech Trailer	1	12.26	3.7	45.4	2.5	0.15	0.3	3.7	0.16	12.0	13.6	7.3	33		**113.4**		As built Acad, height/thickness est. from photo
	Contractor Tents	2	5.18	5.43	28.1	2.5	0.01	0.3	5.43	0.05	0.5	8.4	1.4	21	**26.98**	**70.3**		As built Acad, height/thickness est. from photo
Offices/Mine Dry Complex	Arctic Corridor	1	112.32	2.58	289.8	2.5	0.15	0.3	2.58	0.16	86.2	86.9	46.4	219	**329.21**	**724.5**		As built Acad, height/thickness est. from photo
	Mine Dry	1	40	23.92	956.8	5	0.15	0.3	23.92	0.16	95.9	287.0	153.1	536	**1072.02**	**4784.0**		As built Acad, height/thickness est. from photo
	Admin	1	40.44	12.72	514.4	5	0.15	0.3	12.72	0.16	79.7	154.3	82.3	316	**632.73**	**2572.0**		As built Acad, height/thickness est. from photo
	Office	1	14.96	14.72	220.2	5	0.15	0.3	14.72	0.16	44.5	66.1	35.2	146	**291.63**	**1101.1**		As built Acad, height/thickness est. from photo
	Sea-can 20''	11	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	16		**37.2**		As built Acad, height/thickness est. from photo
	Sea-can 40''	3	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	8		**74.6**		As built Acad, height/thickness est. from photo
Temporary Water Management Pond	Fluid	1			3307.0	2					0.0	0.0	0.0	6614		**6614.0**		
	Liner	1			5617.0			0.003				16.9		17	**50.55**	**0.0**		
	Containment Berm Volume	1	294	3.65	1073.1	2.07										**2221.3**		
Portal & UG Works	Extent	1			1446.0											**0.0**		
	Plug	1	15	7.6	114.0	6.2								707	**918.84**	**706.8**		Estimated
Underground Wash Bay	Tent	1	15.6	9.96	155.4	5	0.01	0	12	0.05	2.6	0.0	9.4	12	**15.49**	**776.9**		est. from photo
	Sea-cans 20''	24	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	35		**37.2**		est. from photo
	Sea-can 40''	3	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	8		**74.6**		est. from photo
Swick Shop	Tent	1	24.53	9.34	229.1	3.75	0.01	0	9	0.05	2.5	0.0	11.0	14	**17.65**	**859.2**		est. from photo
Water Intake Structure and Pumping Facilitiy					0.0						0.0	0.0	0.0	0	**3.00**	**0.0**		Estimate
Sedimentation Pollution Control Pond	Geotextile	1			8200.0			0.003						25	**0.00**	**0.0**		
	Liner	1			2000.0			0.003						6	**0.00**	**0.0**		Design Documents
	RO plant Sea-can 40''	4	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	11		**74.6**		As built Acad, height/thickness est. from photo
	Sedimentation Pond Backfill				1293.0	1										**1293.0**		1 m thick thermal cover
	Breach Volume (Sedimentation)	1	23	18	414.0	3.4										**1407.6**	**13.8**	
	Breach Volume (Pollution)	1	23	18	414.0	2.9										**1200.6**	**13.8**	
UG Mechanical Shop	Shop building	1	24.84	18.37	456.3	5	0.15	0.3	12.72	0.16	64.8	136.9	50.6	252	**756.79**	**2281.6**		est. from photo
	Sea-can 20''	10	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	14		**37.2**		est. from photo
	Sea-can 40''	6	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	16		**74.6**		est. from photo
Helipads	Helipads	6	7.27	4.13	30.0	0.5					0.0	0.0	0.0	15	**15.01**	**15.0**		Foot Print AutoCad, height thickness est. from photo
	Heli Building 1	1	8	5.11	40.9	2.5	0.15	0.4	5.11	0.16	9.8	16.4	6.5	102	**204.40**	**102.2**		As built Acad, height/thickness est. from photo
	Heli Building 2	1	5.05	2.95	14.9	2.5	0.15	0.4	2.95	0.16	6.0	6.0	2.4	37	**74.49**	**37.2**		As built Acad, height/thickness est. from photo
	Office	1	7.45	4.54	33.8	2.5	0.15	0.4	4.54	0.16	9.0	13.5	5.4	85	**169.12**	**84.6**		As built Acad, height/thickness est. from photo
	Lift Station	1	5.89	2.45	14.4	2.5	0.15	0.4	4.54	0.16	6.3	5.8	4.3	36	**72.15**	**36.1**		As built Acad, height/thickness est. from photo
	Washcar	1	3.23	6.24	20.2	2.5	0.15	0.4	6.24	0.16	7.1	8.1	3.2	50	**100.78**	**50.4**		As built Acad, height/thickness est. from photo
	Sea-cans 20''	10	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	37		**37.2**		

Worksheet 6: Structure Quantities

Demolition Bulking Factors	
Tents - Empty	1.3
Wood Structures - Empty	1.5
Wood Structures - w/ Interior Wall Allowance	2
Steel Structures - Empty	1.5
Steel Structures - w/ Interior Wall Allowance	2
Mechanical Equipment	1.1
Liners	3
Pipelines	3

Fresh Water Pipelines	Piping	1	830	0.18	0.03									21	**63.36**	**0.0**		As built Acad
Waste Rock Pile	Pile	1			13396.88											**0.0**		
	Liner Cover	1	278	13.42	17127.64	0.3								5138		**5138.3**		As built Acad
Ore Pile	Extent	1	74.5	47.2	3516.40											**0.0**		As built Acad
	Liner Cover	1	236	8.9	5616.80													
Sewage Discharge Pipelines	Piping	1	1190	0.18	0.03									30	**90.85**	**0.0**		As built Acad
Sedimentation Berm	Berm	1	77	8	617.00	1										**24.0**	**3.6**	As built Acad
Run-off Diversion Berm	Breach (Berm)	4	10	6.3	63.00	1.5										**378.0**		
	Cutt-off Sections	4	2	4.2	33.60											**0.0**		Estimate
	Liner	4	2	4.2	33.60			0.003						0.10	**0.30**	**0.0**		Estimate
Sumps	Sump 1 & 2	2		3	7.07	2										**28.3**		
Drainage channel		1	295	2												**881.8**	**590.0**	from Global Mapper Cut/Fill volumes
Camp Pads		1			152044.00												**152044.0**	from Interim Water Management Plan
Roberts Bay																**0.0**		
Jetty	Rock fill removal	1	39	26.8	1045.2	0.97										**1013.8**		Jetty As-built estimate
RB Tank Farm	Fuel Tanks	4	-	25.76	521.2	9.75	0.006	0.005		0.005	2.4	2.6	2.6	30	**45.47**	**5081.4**	**4493.1**	Fuel Tank Farm design doc/ photos
	Geotextile	1			20600.0			0.003						62	**185.40**			
	Liner	1			10300.0			0.003						31	**92.70**	**0.0**		Nuna As built Acad est
	Pipes (Tanks to Fuel Station)	1	110	0.15	0.018									2	**5.94**	**0.0**		Nuna As built Acad est
	Containment Berm (breach)	1	11.8	19.6	231.280	2.9										**670.7**		As Built drawing
Q1 Tank Farm (old)	Fuel tank	1	-	25.76	521.2	9.75	0.006	0.005		0.005	2.4	2.6	2.6	8	**11.37**	**5081.4**	**1123.3**	As built Acad, height/thickness est. from photo
	Geotextile	1			13042.0			0.003						39	**117.38**			
	Liner	1			6521.0			0.003						20	**58.69**	**0.0**		estimated from As built Acad
	Pipes (Tank to Fuel Station)	1	75	0.15	0.018									1	**4.05**	**0.0**		As built Acad, est. from photo
	Empty fuel drums	150		0.6	0.283	0.15								0.04	**0.06**			
	Sea-cans 20"	40	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	58		**37.2**		As built Acad, est. from photo
	Fuel Transfer Facitility Trailers	2	12.24	3.4	41.6	2.5	0.15	0.3	3.4	0.16	11.7	12.5	6.7	62		**104.0**		As built Acad, est. from photo
	Containment Berm (breach)	1	25.86	10.8	279.3	1.8										**502.7**		
Mechanical Shop Complex	Nuna Shop	1	15.58	30.84	480.5	5	0.15	0.3	31	0.16	69.6	144.1	77.3	291	**582.11**	**2402.4**		Nuna As built Acad est, height/thickness Photo Est.
	Tent	1	11.58	7.95	92.1	5	0.15	0.3	31	0.16	29.3	27.6	57.4	114	**148.66**	**460.3**		Nuna As built Acad est, height/thickness Photo Est.
	Trailers	3	12.09	2.4	29.0	2.5	0.15	0.3	2.4	0.16	10.9	8.7	4.6	73		**72.5**		Nuna As built Acad est, height/thickness Photo Est.
	Site Service Shack	1	11.8	9.6	113.3	2.5	0.15	0.3	9.6	0.16	16.1	34.0	18.1	68	**136.32**	**283.2**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 20"	28	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	41		**37.2**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 40"	12	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	32		**74.6**		Nuna As built Acad est, height/thickness Photo Est.
Waste Management Facility	Facility	1	12.23	10.52	128.7	2.5	0.15	0.3	10.52	0.16	17.1	38.6	20.6	76	**152.49**	**321.6**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 20"	11	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	16		**37.2**		Nuna As built Acad est, height/thickness Photo Est.
Laydown Area	Pad				24491.6											**0.0**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 20"	11	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	16		**37.2**		Nuna As built Acad est, height/thickness Photo Est.
Overburden Dump					10448.0											**0.0**		
Fuel Transfer Road	Road	1			3378.0											**0.0**		
Communication Tower	Tower	1	1.7	1.7	1.4	10	0.05	0.05	1.70	0.05	3.4	0.1	0.1	4	**5.53**	**14.5**		Nuna As built Acad est, height/thickness Photo Est.
	Shack																	
Beach Laydown Area	Magazines	5	12.17	4.5	54.8						0.0	0.0	0.0	0		**0.0**		Nuna As built Acad est, Photo Est.
Orbit Drill Shop	Shop Tent	1	9.26	15.23	141.0	5	0.01	0.1	15.2	0.05	2.4	14.1	7.1	24	**30.68**	**705.1**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 20"	12	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	17		**37.2**		Nuna As built Acad est, height/thickness Photo Est.
	Sea-can 40"	2	12.23	2.44	29.8	2.5	0.02	0.02	2.44	0.02	1.5	0.6	0.6	5		**74.6**		Nuna As built Acad est, height/thickness Photo Est.
Airstrip		1														**0.0**		
Airstrip					68475.0											**0.0**		Nuna As built Acad, photo est
	Ground Lighting fixtures	1	1900	0.025	47.5	0.025										**1.2**		Nuna As built Acad, photo est
South Apron		1			5517.2											**0.0**		
North Apron	Wood Shack	1	5	2.44	12.2	2.5	0.15	0.3	3.1	0.16	5.6	3.7	2.5	12	**17.58**	**30.5**		Nuna As built Acad, photo est
	Portable Trailers	1	8	3.1	24.8	2.5	0.15	0.3	3.1	0.16	8.3	7.4	4.0	20		**62.0**		Nuna As built Acad, photo est
	Sea-can 20"	1	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	1		**37.2**		Nuna As built Acad, photo est
Explosives Mixing Facility	Prill Tent	1	9.41	9.13	85.9	5	0.01	0.3	9.1	0.05	1.9	25.8	4.3	32	**41.50**	**429.6**		Nuna As built Acad, photo est
	Washbay	1	9.31	5.05	47.0	5	0.16	0.3	5.1	0.16	23.0	14.1	7.5	45	**66.90**	**235.1**		Nuna As built Acad, photo est
	Shed	1	1.78	2.54	4.5	2.5	0.15	0.3	2.5	0.16	3.2	1.4	0.7	5	**7.98**	**11.3**		Nuna As built Acad, photo est
	Sea-can 20"	6	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	9		**37.2**		Nuna As built Acad, photo est
																0.0		
Reagent Pads																**0.0**		
Equipment Laydown					21870.0											**0.0**		Nuna As built Acad, photo est
Material Laydown					33839.8											**0.0**		Nuna As built Acad, photo est
Ammonium Nitrate Storage Area	Extent				3858.0			0.3						1157	**1504.62**	**0.0**		Nuna As built Acad, photo est
	Liner	1			2800.0			0.003						8	**25.20**	**0.0**		Nuna As built Acad, photo est
	Containment Berm	1	63.4	0.5	31.7	0.3										**9.5**		length=19.5x12.2 (8x2 22' seacans)
Geotech Drill Shop	Drill Shop	1	15.24	9.3	141.7	5	0.01	0	9.3	0.05	2.5	0.0	7.1	10	**12.40**	**149.6**		Nuna As built Acad, photo est
	Sea-can 20"	13	6.1	2.44	14.9	2.5	0.02	0.02	2.44	0.02	0.9	0.3	0.3	19		**37.2**		Nuna As built Acad, photo est
Reagent and Cyanide Storage Area	Extent				5000.0			0.8						4000	**5200.00**	**0.0**		SRK design drawings DN-CRSF-02
	Liner	1			5134.0			0.003						15	**46.21**	**0.0**		SRK design drawings DN-CRSF-02
	Containment Berm	1	285	0.5	5134.0	0.3										**1540.2**		SRK design drawings DN-CRSF-02
Lubricant Storage Area	Extent				3372.0			0.8						2698	**3506.88**	**0.0**		SRK design drawings DN-LSF-02
	Liner	1			2585.0			0.003						8	**23.27**	**0.0**		SRK design drawings DN-LSF-02
	Containment Berm	1	185	0.5	2585.0	0.3										**775.5**		SRK design drawings DN-LSF-02
Waste Management Area																**0.0**		
Land Farm	Liner	1			4384.0			0.003						13	**39.46**	**0.0**		Nuna As built Acad, design document est
	Non-woven Geotextile	1			8768.0			0.003						26	**78.91**	**0.0**		Nuna As built Acad, design document est
	Containment Berm	1	89.3	33.72	3011.2											**0.0**		
Batch Plant Pad	Tent	1	36.65	20.2	740.3	5	0.01	0.3	11.7	0.05	5.7	222.1	21.4	249	**323.94**	**3701.7**		Nuna As built Acad, photo est
Purn Pan	Burn Pan	1	3.29	2.71	8.9	2	0.005	0.005			0.1	0.0		0	**0.25**	**17.8**		

Worksheet 6: Structure Quantities

Demolition Bulking Factors	
Tents - Empty	1.3
Wood Structures - Empty	1.5
Wood Structures - w/ Interior Wall Allowance	2
Steel Structures - Empty	1.5
Steel Structures - w/ Interior Wall Allowance	2
Mechanical Equipment	1.1
Liners	3
Pipelines	3

Quarry #2																**0.0**		
Crusher	Regrade area	1	82.4	32.4	2668											**0.0**		Nuna as built ACAD estimated
Overburden Drump	Regrade area	1			26344											**0.0**		Nuna as built ACAD estimated
Treated Sewage Discharge Areas	Extent	2	6.63	4.01	27	1								53	**69.12**	**0.0**		
North Dam																**0.0**		
Tail Lake Access	Bridge	1	30	2	60.0			0.3				18.0		18	**27.00**	**0.0**		Nuna As built Acad, photo est
	Dock	1	10	7	70.0			1				70.0		70	**105.00**	**0.0**		Nuna As built Acad, photo est
	Breach Volume (Core Material)	1	17.6	53.6	943.4	7.45										**7028.0**	**614.2**	
Dam	Breach Volume	1	65.5	62	3844.0	8.07										**31,021**	**2367.2**	
Cover Surface Area	East Side	1	23.8	8	190.4													
	West Side	1	23.9	8	191.2													
	Base	1	30.6	20	612.0													
	Total				**993.6**													
Discharge Line to Roberts Bay	PVC pipe, 6 inch (150 mm)	1	5500	0.4	0.13	0.4								880	**880.00**	**0.1**		
South Dam																		
Explosives Facility	AN storage area				5926.0													SRK Design Drawings TL-EXP-02
	AN storage liner area				4442.0			0.003						13	**39.98**	**0.0**		SRK Design Drawings TL-EXP-03
	AN storage geotextile area				17768			0.003						53	**159.91**	**0.0**		SRK Design Drawings TL-EXP-03
	overliner volume				3031.0													SRK Design Drawings TL-EXP-03
	AN/FO mixing plant pad area				4708.0													SRK Design Drawings TL-EXP-02
	Magazine pad footprint				7924.0													SRK Design Drawings TL-EXP-02
	Berm footprint				2166.0													SRK Design Drawings TL-EXP-02
	magazines	8	13.4	3.6														SRK Design Drawings TL-EXP-02
Vent Raise																**0.0**		
Ventilation and Heating Facilities	Air Heaters															**0.0**		
Fuel Storage Area	Enviro Tank	1														**0.0**		
	Liner	1			410.0			0.003						1	**3.69**	**0.0**		Vent Raise Design document est
	Geotextiles	1			820.0			0.003						2	**7.38**	**0.0**		Vent Raise Design document est
Doris Windy Road																**0.0**		
AWR					101334.9											**0.0**		
Quarry A					5130.3											**0.0**		
Quarry B					5178.9											**0.0**		
Quarry D					12661.9											**0.0**		
Explosives Storage Facility	magazines	2	13.4	3.6	2805.8											**0.0**		Nuna As built Acad, photo est
	Gate	1	12	0.2	0.3	1.5								4	**5.40**	**0.5**		Estimate
Secondary Road																**0.0**		
Secondary Road	Road	1	5445		16674.5											**0.0**		Nuna As built Acad, photo est
Tail Lake Road	bridge deck	1	32	4.79	153.3			0.3			0.0	46.0	0.0	46	**91.97**	**0.0**		Nuna As built Acad, photo est
	Girders	4	30	0.3	9.0	1.5								14	**13.50**			
	Tailings Pipes	1	5445	0.4	0.1	0.4								871	**2613.60**	**0.1**		
	Culvert	1	18.8													**0.0**		Estimate -From asbuilt drawings
Doris Mountain																**0.0**		
Communication Tower	Tower	2	1.7	1.7	1.4	10	0.05	0.05	1.70	0.05	3.4	0.1	0.1	7	**11.07**	**14.5**		Nuna As built Acad est
	Equipment Shack	1	3.17	3.03	4.8	2.5	0.1	0.2	3.03	0.1	3.1	1.9	1.0	6	**8.97**	**12.0**		Nuna As built Acad est
TOTAL:						**64.445**	**0.755**								27445.69			

Waste Volume Summary

Item	Destination	Qnty	Unit	Trips Required
Hazardous Waste			L	1
Sludge/Solid Waste	to Doris treatment plant	0.303	m^3	1

Worksheet 6: Structure Quantities

Demolition Bulking Factors	
Tents - Empty	1.3
Wood Structures - Empty	1.5
Wood Structures - w/ Interior Wall Allowance	2
Steel Structures - Empty	1.5
Steel Structures - w/ Interior Wall Allowance	2
Mechanical Equipment	1.1
Liners	3
Pipelines	3

Demolition Preparation

			Decommision										
Area	**Structure**	**# of Units**	**Electrical**	**Heating System**	**Plumbing System**	**Total**	**Heating Tanks**	**Hazardous Material Vol Estimate (L)**	**Total Hazardous Volume (L)**	**Special Item**	**Special Item Description**		**Source**
Doris Camp													
Accomodation Complex	Trailer Camp	1	1	1	1	3	1		**0**				Accomodation Design Doc, as built ACAD
	Cabins	5	1	1	1	15	1		**0**				As built ACAD
Fuel Tank Farm	Fuel Transfer Facility	1	1			1			**0**				Accomodation Design Doc, as built ACAD
	Piping and Controls	1				0			**0**				As built ACAD
	Above Ground Tanks	5				0		5,022	**25,112**		Residual Fuel (in each)		As built ACAD
Permanent Power Generator	Debris								**500**		Debris		
Temporary Power Generator	Power House	1	1	1		2	1		**0**				Estimated from ACAD
	Mobile Generator	1				0			**0**				Estimated from ACAD
	Fuel Unit	2				0			**0**				As built ACAD
Sewage Treatment Plant	Sewage Treatment Facility	1	1	1	1	3	1		**0**				Estimated from ACAD
	Sludge Storage Tank	1				0		1000	**1000**		Sludge/Solid Waste		Estimate from Sewage Treament Plant Specs
	Chemical Tank	1				0		1000	**1000**		Chemical		Estimate from Sewage Treament Plant Specs
Fire Water Storage Tank	Pump House	1	1		1	2			**0**				Estimated from ACAD
Muster Station	Fuel Unit	1				0			**0**				Estimated from ACAD
	Muster Tent	1	1	1		2	1		**0**				Estimated from ACAD
Warehouse/Core Shack	Fuel Unit	1				0			**0**				Estimated from ACAD
	CoreShack/Warehouse	1	1			1	1	5000	**5000**				
	Contractor Tents	2	1	1		4	1		**0**				Estimated from ACAD
UG Mechanical Shop	Maintenance Shop	1	1	1	1	3	1	200	**200**		Chemicals/Grease/Waste		Estimated from ACAD
Office/Mine Dry	Office/Admin/Mine Dry	3	1	1	1	9	1		**0**				Estimated from ACAD
Portal and Underground WorksWater Treatment	Undeground Works	1	1			1			**0**				Estimated from ACAD
Underground washbay	generators	4				0			**0**				Estimated from ACAD
	Washbay	1	1	1	1	3	1		**0**				Estimated from ACAD
Swick Shop	Shop Tent	1	1	1		2	1		**0**				Estimated from ACAD
Water Intake/Pumping Facility	pumping facitility sea-can	1	1		1	2			**20**		Debris		Estimated from ACAD
	Generator Fuel Tank	1				0			**0**				Estimated from ACAD
Sedimentation Pollution Control Pond	Piping & Wiring	1	1			1			**0**				Estimated from aerial photo
	RO plant	1	1	1		2	1	200	**200**		Sludge		Estimated from ACAD
Fresh Water Pipelines	Pipelines	1	1			1			**0**				Estimated from ACAD
Heli Pad	Offices/Buildings	3	1	1	1	9	1		**200**		Grease		Estimated from ACAD
Sewage Discharge Pipelines	Pipelines	1	1			1			**0**				Estimated from ACAD
Robert's Bay						0			**0**				
New Tank Farm	Fuel Transfer Facility	1	1			1			**0**				As built ACAD
	Above Ground Tanks	4				0		15,635	**62,541**		Residual Fuel (in each)		As built ACAD
Old Tank Farm	Fuel Transfer Facility	1	1			1			**0**				As built ACAD
	Above Ground Tanks	1				0		15,635	**15,635**		Residual Fuel (in each)		As built ACAD
Mechanical Shop Complex	Nuna Shop	1	1	1	1	3	1	1000	**1000**		Grease/Waste		Nuna as built ACAD
	Tent	1	1	1		2	1		**0**				Nuna as built ACAD
	Site Service Shack	1	1	1		2	1		**0**				Nuna as built ACAD
Waste Management Facility	Facility	1	1	1	1	3	1	500	**500**		Waste (ashe)		Nuna as built ACAD, waste est
Laydown Area	Electric System	1	1			1		5000	**5000**		Debris		Nuna as built ACAD, Photo Est.
Overburden Area	Pad								**10**		Debris		
Beach Laydown	Laydown Area	0	0	0	0	0			**1**		Debris		
Orbit Drill Shop	Shop	1	1	1	1	3	1	50	**50**		Grease		Nuna as built ACAD, Photo Est.
Air Strip						0			**0**				
North Apron	Traffic Control Tower	1	1			1			**0**				Nuna as built ACAD, Photo Est.
Explosive Mixing Facility	Facilities	1	1	1		2	1	100	**100**		Dye		Nuna as built ACAD, Photo Est.
						0			**0**				
Reagent Pads						0			**0**				
Equipment Laydown Area									**20**		Debris		
Material Laydown Area									**20**		Debris		
Geotech Drill Shop	Drill Shop	1	1	1		2	1	50	**50**		Grease		Nuna as built ACAD, Photo Est.
Westarc Drill Shop	Drill Shop	1	1	1		2	1	50	**50**		Grease		Nuna as built ACAD, Photo Est.
Waste Management Area						0			**0**				
Landfarm	Soil Pond	1				0			**34**		Contaminated Soil		Nuna as built ACAD,
Burn Pan	Ashe	1				0		100	**100**		Ashe		Nuna as built ACAD, Photo Est.
Quarry 2	Debris								**2.668**		Debris		Estimate
Frozen Core Plant	Plant	1	1	1		2	1		**0**				Nuna as built ACAD, Photo Est.
Vent Raise	Vent Rise Facility	1		1	1	2			**0**				Estimate
Doris Mountain						0			**0**				
communication tower	equipment	1				0			**0**				Nuna as built ACAD, Photo Est.

118.3708831

Worksheet 7: Earthwork Quantities

Earthwork Volumes/Quantities

Bulking Factors	
Soil/Rock Pad	1.2
Cover shrinkage factor	1.1

Reclamation Areas

Work Area	Location	Total Area (m^2)	Area Scarified (m^2)	Area Regraded (m^2)	Area Requiring Fill (m^2)	Coconut-matting Area (m^2)	Seeding Area (m^2)	Source/Comment
Roberts Bay	Beach Laydown Area		11,830					Nuna ACAD, Photo Est.
	Beach Laydown Area Expansion		0	12,200				Dwg. RB-LE-01 (ammendment 3 appendix 17)
	Southeast Laydown Area			8,133				Dwg. RB-LE-01 (ammendment 3 appendix 17)
	Southwest Laydown Area			18,467				Dwg. RB-LE-01 (ammendment 3 appendix 17)
Quarry #2	Overburden Dump					7,600	7,600	Nuna ACAD, Photo Est.
	Sewage Discharge Area				20	400	400	Estimated 2x(10mx20m)

Earthwork Areas

Work Area	Item	Qnty	Length (m)	Width (m)	Height (m)	Side Slope (percent)	Area (m^2)	In-situ Volume (m^3)	Loose Volume (m^3)	Source / Comments
Doris Camp										
Accomodation Area (Pad X)	Regrade area					1	21,050			as built ACAD estimated
Tank Farm (Pad R)	Excavate crush material							2800	3360	Fuel Tank Farm Design Docs
	Regrade area		80.65	61.1		1	4,928			Fuel Tank Farm Design Docs
Warehouse (Pad Y)	Regrade area					1	8,440			as built ACAD estimated
(Pad B)	Regrade area					1	6,910			as built ACAD estimated
Mine Dry (Pad C)	Regrade area					1	13,030			as built ACAD estimated
Pad D	Regrade area					1	5,943			est from Nuna As built ACAD
Pad E/P (UG Maintentance)	Regrade area					1	11,000			as built ACAD estimated
Portal Area	Regrade area					1	1,800			as built ACAD estimated
Pad I - Waste Rock	Regrade area					1	11,500			as built ACAD estimated
Pad G	Regrade area					1	5,340			Nuna as built ACAD estimated
Pad F (washbay area)	Regrade area					1	8,750			Nuna as built ACAD estimated
Pad Q/ J/H (ore pile)	Regrade area					1	9,870			as built ACAD estimated
Pad D (Crusher pit)	Backfill excavation		61.2	21.2	4		1,297	5190		Mill Building design drawings (Hatch 2011)
Pad T (ore storage; includes all 3 tiers)	Regrade area						35,333			Dwg. DN-DMC-T1 (ammendment 3, appendix 18)
Pad U (waste rock storage)	Regrade area						57,305			Dwg. DN-WRE-02 (ammendment 3, appendix 19)
Pad U (waste rock storage)	Breach berm	1	4	15	2			120		
Pad U (waste rock storage)	Cut liner	1	4.2		3			13		
Water Intake/Pumping Facility	Regrade area					1	2,226			as built ACAD estimated
Roberts Bay										
Jetty	Escavate rock fill				1.3		1900	2470		as built ACAD estimated
	Regrade area					1	1900			as built ACAD estimated
NewTank Farm	Regrade area					1	11530			as built ACAD estimated
	Excavate crush material				0.6			9400		Tank Farm Design Documents
Old Tank Farm	Regrade area					1	3650			as built ACAD estimated
	Excavate crush material				0.6			2190		as built ACAD estimated
Mechanical Shop Complex	Regrade area					1	4780			Nuna as built ACAD estimated

Worksheet 7: Earthwork Quantities

Earthwork Volumes/Quantities

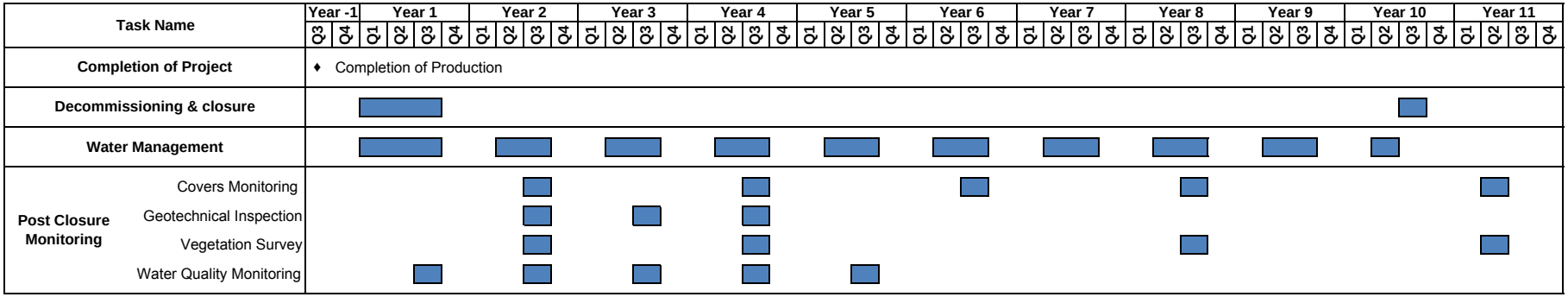
Bulking Factors	
Soil/Rock Pad	1.2
Cover shrinkage factor	1.1

Waste Management Facility	Regrade area					1	3050			Nuna as built ACAD estimated
Laydown Area	Regrade area					1	15530			Nuna as built ACAD estimated
Overburden Dump	Regrade area/side slope					18	11530			Nuna as built ACAD estimated
Fuel Transfer Access Road	Crown road					1	3375			Nuna as built ACAD estimated
Airstrip										
Airstrip/Aprons	Regrade area					1	81945			existing + expand (upto explosive facility) ACAD Estimated
Explosive mixing facility pad	regrade area					1	2411			pad + access road ACAD as-built
Reagent Pads										
Upper and Lower Pads	Regrade area					1	75550			as built ACAD estimated
Waste Management Area										
Land Farm	Excavate crush/surfacing material							1366		Landfarm Design Documents estimated.
	Contamitated Soil							100	Contaminated soil	Estimated
	Regrade area					1	26750			Nuna as built ACAD estimated
Batch Plant Pad	Regrade area					1	12130			Nuna as built ACAD estimated
Quarry #2										
Crusher	Regrade area					1	25630			Nuna as built ACAD estimated
Overburden Drump	Regrade area					1	28420			Nuna as built ACAD estimated
North Dam										
Tail Lake Access Road	Crown Road					1	3429			Nuna as built ACAD estimated
Frozen Core Plant	Regrade area					1	7510			Nuna as built ACAD estimated
TIA (Tailings Impondment Area)	Erosion area						30600			AMEC Closure Plan (2005)
Vent Raise										
Fuel Storage Area	Excavate crush material							123		Design Document estimated
	Regrade area (Doris North)					1	4150			Nuna as built ACAD estimated
	Regrade area (Doris Central)						13252			dwg. DC-01 (ammendment 3, appendix 16)
	Regrade area (Doris x)						13252			assumed same as above
	Overburden Dump footprint (Doris Central)						19960			dwg. DC-01 (ammendment 3, appendix 16)
Doris Windy Road										
Explosives Storage Facility	Regrade area					1	2050			Nuna as built ACAD estimated
Secondary Road										
Tail Lake Road	Regrade area					1	17500			Nuna as built ACAD estimated

Worksheet 8: Water Management

Activity	Task	Unit	Cost Code	Unit Cost	Quantity											Activity Total	Source / Comments
					Year 1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Total		
Operate and maintain wa	Pump technician	day	day rate	$ 1,890	274	152	152	152	152	152	152	152	152	90	1580	$ 2,986,200	152 days of operations season; first season accounted for under general closure
	Support person (camp, etc.)	day	day rate	$ 1,890	0	152	152	152	152	152	152	152	152	0	1216	$ 2,298,240	camp costs in year 10 accounted for under dam breach
	Site Services Support &Maintenance	LS	--	$ 50,000	1.3	1.3	1.3	1	1	1	1	1	1	0.5	10.4	$ 520,000	
	Spare Parts & Consumables	LS	--	$ 20,000	1.3	1.3	1.3	1	1	1	1	1	1	0.5	10.4	$ 208,000	
TOTAL																**$ 6,012,440**	

Appendix C: Proposed Closure Schedule


Task Name
Year -1
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
Year 11
Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4
Completion of Project
♦ Completion of Production
Decommissioning & closure
Water Management
Post Closure Monitoring
Covers Monitoring
Geotechnical Inspection
Vegetation Survey
Water Quality Monitoring