

MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

DECOMMISSIONING AND RECLAMATION PLAN

Revision 3
February 2011

Prepared by Minto Explorations Ltd.

Decommissioning and Reclamation Plan

Minto Project, Yukon Territory

Submitted by:

Minto Explorations Ltd.

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CONTEXT OF THIS DOCUMENT

This third revision of the Decommissioning and Reclamation Plan (the "Plan") is presented for review and will be revised by MintoEx to incorporate reviewer comments. This version is an integration of the existing Plan (Revision 2, 2009) and the conceptual Phase IV Decommissioning and Reclamation Plan, with additional detail to further refine the Phase IV concepts to an acceptable level. It is important to understand that activities associated with Phase IV of the Minto Mine have not yet been constructed and as such there may be changes to designs, or situations encountered during infrastructure development, that impact on the information presented in this document.

This Plan is now considered to be Revision 3.

PROJECT CONTACTS

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EXECUTIVE SUMMARY

This closure plan addresses the long-term physical and chemical stability of the site, including reclamation of surface disturbances. A program is presented for site management and monitoring both during implementation of closure and after decommissioning and reclamation measures are completed. Decommissioning and reclamation cost estimates are provided and financial security requirements reviewed.

The Plan has been specifically scoped to fulfill the requirements under the *Yukon Environmental and Socio-economic Assessment Act* (YESAA) for quartz mining projects proposed in the Yukon. The Plan is not intended to address closure of previously permitted infrastructure components which have been addressed in the 2009 Detailed Decommissioning and Closure Plan.

The Minto Project is a copper-gold-silver project located on the west side of the Yukon River approximately 75 km (47 miles) north-northwest of Carmacks, Yukon Territory. The mine site and access road lie within the traditional territory of the SFN and comprises part of land claim settlement parcels R-6A, R-44A (Type A settlement lands) and R-40B. The Company concluded a comprehensive Cooperation Agreement with the SFN on September 16, 1997. This agreement is still in effect but has been amended recently.

The Minto Property is centered at approximately 62°37'N latitude and 137°15'W longitude (NAD 83, UTM Zone 8 coordinates 6945000N, 384000E). The Minto Project consists of 284 claims. There are 120 pending quartz claims, 99 quartz claims and 65 quartz claims under lease. The 100% registered owner of the claims and leases is Minto Explorations Ltd. (The Company). The property is accessible by crossing the Yukon River at Minto Landing. Barge landings have been constructed for ice-free crossing and an ice bridge is used upon freeze-up of the Yukon River.

The following activities are planned as part of Phase IV:

- Development, mining and milling of materials from the proposed Area 2 open pit which contains 3,192 Kt of ore plus 25,980 Kt of waste;
- Development, mining and milling of materials from the proposed Area 118 open pit which contains 88 Kt of ore plus 639 Kt of waste;
- Development, mining and milling of materials from the proposed Area 2 and Area 118 underground areas which contain approximately 1,541 Kt of ore and 341 kt of waste;
- Expansion of the southwest waste rock and reclamation overburden dumps;
- In-Pit deposition of tailings from Phase IV ore feeds (Area 2 and Area 118);
- In-Pit deposition of tailings sourced from Main Pit stockpiled ore following completion of mining in Main Pit;
- Construction of the South Wall buttress in Main Pit;
- Construction of the Mill Valley Fill buttress;

- Extension of the camp pad;
- Operational water management; and
- Decommissioning and reclamation of infrastructure components, as and whenever possible to reduce site liability.

A systematic approach to decommissioning and closure reclamation has been developed for the Minto project. Progressive reclamation measures will be implemented where possible during mine construction and operations. This approach will not only provide valuable reclamation success feedback for use in advanced/final closure, but progressive reclamation will reduce final reclamation liability and costs and shorten the overall reclamation implementation schedule. These progressive efforts will also help reduce slope erosion through physical slope stabilization of revegetation efforts, enhancing ultimate reclamation success.

The primary objectives of the closure and reclamation of Minto Mine are:

- To have a closure planning process that seeks input from the SFN, understands the input received and incorporates the input into closure planning decisions;
- To protect the health of people pursuing traditional activities including hunting, fishing, trapping, camping and collection of plants for food, medicinal or cultural purposes;
- To protect people from safety risks when they are pursuing traditional activities including hunting, fishing, trapping, camping and collection of plants for food, medicinal or cultural purposes;
- To protect the environment (including land, air, water, plants, animals fish and other environmental components and their interrelationships) from long term effects caused by the mine activities and facilities;
- To return the mine site and affected areas to a state similar to surrounding lands so that people can pursue traditional activities the same as they did before mining, including hunting, fishing, trapping, camping and the collection of plants for food, medicinal or cultural purposes;
- To protect the environment from long-term effects caused by post-closure access to the mine area;
- To protect the environment from effects of earthquakes, floods, climate change and other natural events on related mine structures;
- To have effective management and control structures in place during operation, closure and post-closure to provide:
    - Adequate financial resources to carry out all closure activities including plan implementation and long-term activities;
    - Adequate flexibility during closure and post-closure to allow adaptation of activities in order to address unexpected performance and events; and
    - Consideration of the Company's long-term desire to "walk away" from the site under conditions acceptable to SFN and with adequate resources provided to address long term requirements.
- To minimize long term activities by ensuring long term chemical and physical stability of mining components and disturbed areas;

- To confirm the effectiveness of closure measures by monitoring the site after closure;
- To undertake mine planning incorporating progressive reclamation;
- To provide short and long term slope stabilization and erosion control on linear and non-linear disturbances;
- To ensure the long-term chemical stability of residual mining components and their effects on water quality draining the property;
- To ensuring the long-term physical stability of key structures such as the waste dumps and the diversion and drainage ditches; and
- To work towards a passive closure scenario for most or all mine components.

The Company has adopted a toolbox approach to reclamation methods in order to ensure that the reclamation objectives identified in the previous section can be met. The toolbox approach to reclamation involves investigation into the use of different reclamation methods depending on the specific issue being addressed. The reclamation toolbox for the site is primarily focussed towards reducing metal loadings from mine infrastructure and passive treatment of water quality.

The Phase IV expansion is expected to result in approximately 6 years of additional mine life with active mining in the open pits ending in the third quarter of 2013 and underground mining scheduled to finish in January 2014. Following the end of the underground production, mining will be from ore stockpiles that will continue into 2016. Reclamation of the disturbed areas will be done in a phased approach to match the overall mining schedule and after closure to reflect the reclamation and monitoring effort required. This phased approach to reclamation planning will assist the company in achieving the overall objectives of progressive and final reclamation at the site.

The closure phase of the Minto mine will commence with the cessation of economic mining of the open pit and the milling of ores and stockpiles from the ore zone. Once all mineable ore reserves have been processed, the mill and concentrator will be flushed and the tailings management facility will be decommissioned. During the active decommissioning phase which is expected to last approximately 3 years, the number of personnel required will vary depending on site activities; however, it is expected that as major decommissioning and reclamation tasks are completed the number of site personnel required will decline.

Cost estimation for implementation of the proposed closure measures is the basis for establishing the financial security that will be required on the project. The Phase IV closure cost estimate has been prepared based on the final extent of disturbance for each of the infrastructure units described in this report. Progressive reclamation for much of the site will assist in offsetting the maximum site liability that will be incurred during the operations phase but does not negate the need for estimation of the closure costs.

A closure cost range from $14,972,000 to $15,213,000 is estimated for final closure, based on three separate scenarios for road decommissioning.

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1 Introduction

Minto Explorations Ltd. (The Company), a wholly owned subsidiary of Capstone Mining Corporation (Capstone), owns and operates the Minto Project located 240 km (150 miles) northwest of Whitehorse, Yukon. For the purposes of this closure plan, the "Minto Project" means the mining of the Minto deposit as an open-pit mine and related ancillary facilities.

This closure plan addresses the long-term physical and chemical stability of the site, including reclamation of surface disturbances from both existing development and that proposed for the Phase IV Expansion. A program is presented for site management and monitoring both during implementation of closure and after decommissioning and reclamation measures are completed. Decommissioning and reclamation cost estimates are provided.

The Plan is based on the best information available at the present time. A proposed continuation and expansion of the reclamation research program will provide more site-specific information to optimize closure methods. As required in section 14.3 of QML-0001, this plan will be updated again in two years, and submitted to the Chief for review and approval.

1.1 Closure Philosophy

In keeping with its high standards for environmental and social responsibility, the Company intends to implement an environmentally sound and technically feasible decommissioning and reclamation plan for the Minto mine. Closure planning and the implementation of this phase at a mine site must be undertaken with appropriate environmental care while respecting local laws, Selkirk First Nation (SFN) agreements, and the public interest and ensuring that the Company's high environmental standards are achieved. Necessary environmental protection measures have been adopted in the development of this Plan to ensure that a healthy environment exists after mine closure. This approach is consistent with the Company's corporate policies.

A principle tenet of the philosophy followed during the development of this Plan was to work towards an eventual passive closure scenario, with eventual walk-away closure after long term chemical and physical stability of reclaimed mine components has been demonstrated. This involved an assessment of the key mine components that require mitigation based on the current understanding of materials contained within these components. Mitigation measures have been incorporated into elements of the Plan to address public safety issues and environmental concerns with post closure monitoring and inspections planned to ensure that this objective is met. Once the effectiveness of each mitigation measure is assured, then management of the site can be safely reduced to a level that is consistent with closure objectives. It is anticipated that final determination of the effectiveness of closure measures for

passive and eventual walk-away status will be the subject of review and concurrence with regulatory agencies, SFN and the public. Under the Quartz Mining Act (QMA), the company would then apply for a certificate of closure from Yukon Government (YG).

The Company has entered into a Cooperation Agreement (the Agreement) with the SFN. All activities at the site including closure measures are guided by this Agreement. Therefore, a strong working relationship with the SFN forms a foundation for this document. To that end, meetings with SFN related to closure issues have been ongoing since the first version of the Plan, and their comments on closure and other issues raised during ongoing dialogue were considered in the ongoing development of this Plan.

The principle of progressive reclamation is key to the Company's closure philosophy, and reduces the ongoing risk carried by the company by:

- reducing geochemical loading of runoff from mining waste areas,
- stabilizing potential sources of erosion and sediment release;
- initiating slope stability measures to enable reclamation;
- replanting and reseeding disturbed areas not scheduled for rework;
- providing sites for reclamation research trials and serving as an early indicator of reclamation success; and
- reducing the total area requiring reclamation at the end of active mining activities.

Resources required for specific progressive reclamation activities will be incorporated into operational planning, and their completion will be scheduled into yearly operational targets. The schedule for progressive reclamation is dependant upon the progress of mining activities, and is therefore not presented in this closure plan.

To ensure that the overall closure philosophy can be achieved, the following objectives were emphasized during the development of this plan:

- protection of public health and safety;
- implementation of environmental protection measures that prevent adverse environmental impact;
- ensuring land use commensurate with surrounding lands;
- ensuring full consultation with the SFN, so that closure measures are appropriate and supported by the local peoples who are most affected;
- recognize mine start-up and construction in the short term and incorporate long term closure measures;
- progressive reclamation measures implemented during mine operations;

- post closure monitoring of the site to assess effectiveness of closure measures for the long term; and
- passive post closure monitoring and management of the site until the former mine presents evidence of an environmentally benign site, in which case a walk-away closure scenario may be realized.

1.2 Scope of Plan

The Plan has been specifically scoped to fulfill the requirements in section*14.0 Preparation, Approval and Implementation of Closure Plan of the Company's Quartz Mining Licence QML-0001*.

The Plan is intended to address closure of previously permitted infrastructure components which have been addressed most recently in the approved 2009 Detailed Decommissioning and Closure Plan (Revision 2) and closure of the additionally proposed features and disturbances associated with the Phase IV Mine Expansion.

The approach taken in the presentation of this Closure plan is to provide a brief description of each mine component and the closure issues and measures related to that component. Previous work or reports on the project have been referenced without repeating details so that this document is focused on decommissioning and reclamation. An updated list of prior reports on the Minto Mine is presented in Table 1-1.

Table 1-1 Minto Project Information List

Report Title / Topic	Author	Date
Initial Environmental Study of the Minto Project. Prepared for Wright Engineers Ltd.	Division of Applied Biology, B.C. Research	1976
Report to Wright Engineers Ltd. on 1976 Geotechnical Investigations, Minto Project Feasibility Study	Golder and Associates	1976
An Assessment of the Pre-Development Water Quality and Biological Conditions in the Water Shed Around the Minto Orebody	Fisheries and Environment Canada, Environmental Protection Service	1977
The Minto Copper Deposit, Yukon Territory: A Metamorphosed Orebody In The Yukon Crystalline Terrane", An M.Sc. Thesis, Queen's University, Kingston, Ontario, Canada	Pearson, W.N.,	1977
The Minto Copper Deposit, Yukon Territory, A Metamorphosed Orebody in the Yukon Crystalline Terrane. In Economic Geology, Vol. 74, p. 1577-1599	Pearson, W.N., Clark, A.H.	1979
The Minto Project, Yukon, Mineral Inventory Review Minto Explorations Ltd, Vancouver, BC	H.L. Klingmann and J.S. Proc	1994
Minto Project, Initial Environmental Evaluation, Supporting Volume I, Development Plan. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994

Report Title / Topic	Author	Date
Minto Project, Initial Environmental Evaluation, Supporting Volume II, Environmental Setting. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994
Minto Project, Initial Environmental Evaluation, Supporting Volume III, Socioeconomic Description and Impact Assessment. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994
Survey of Firekilled Fuelwood Harvest Potential, Minto Creek, Yukon, Prepared for Minto Explorations Ltd. Vancouver, BC	John Gibson	1994
"Development of the Minto Project Process Design", Project No. 8553-15	Kilborn Engineering Pacific Ltd.	1994
An Impact Assessment of the Minto Project. Memo from the Selkirk First Nations to the Northern Affairs Program.	Magrum	1994
Minto Project Prospectus prepared for Minto Explorations Ltd.	Pearson, Hofman and Assoc. Ltd.	1994
Minto Area Archaeology And History - Final Report of the Minto Archaeological Impact Assessment Project	Sheila Greer, Edmonton	1994
Development of the Minto Project Process Design	Kilborn Engineering Pacific Ltd.	1994
Geotechnical Evaluation – Minto Core. Internal report submitted to Minto Explorations Ltd.	Steffen, Robertson and Kirsten Ltd.	1994
Technical Feasibility Study - Thickened Tailings Disposal System - Minto Project - Phase 1. Laboratory Tailings Characterization Tests, Project 94-608	E.I Robinsky Associates Limited, Consulting Engineers	1995
Geotechnical Design Tailings/Water Dam, Minto Project, Yukon	EBA Engineering Consultants Ltd., Edmonton, Alberta, 0201-95-11509	1995
Metallurgical Test Work And Mill Design Criteria", Minto Project, Yukon	H.L. Klingmann	1995
The Minto Project, Yukon, Feasibility Study – May 1995	H.L. Klingmann & J.S. Proc, Vancouver, BC	1995
Minto Project, Initial Environmental Evaluation, Supporting Volume IV, Environmental Mitigation and Impact Assessment. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1995
Minto Project, Application for Land Use Permit YA5F045. Submitted as reference to the YWB	Minto Explorations Ltd.	1995
Minto Explorations Ltd., Minto Project, Proposed Designs for Big Creek Crossing, Minto Creek Crossing, Yukon River Barge Landings	N.A. Jacobsen, P. Eng., Civil Engineering Consultant Whitehorse, Yukon.	1995
Minto Explorations Ltd., Access Road Design Report	Yukon Engineering Services, Whitehorse, Yukon	1995
Evaluation of Grinding Test work for the Minto Deposit and Recommendations for Grinding Equipment Sizing at 1,500 stpd	Fluor Daniel Wright Ltd.	1995
Environmental Assessment Screening Report and Project Summary: Land Use Permit Application YA5F045 and Water Licence Application MS95-013	Department of Indian Affairs & Northern Development (DIAND) and YWB	1996
Minto Waste Rock Stability Evaluation. EBA File 0201-96-11509	EBA Engineering Consultants Ltd.	1996
Environmental Assessment Screening Report and Project Summary: Land Use Permit Application YA5F045 and Water Licence Application MS95-013	DIAND and Yukon Territory Water Board	1997
Environmental Assessment Screening Report: Minto Explorations Ltd.	DIAND and Regional Environment	1997

Report Title / Topic	Author	Date
Minto Property. Whitehorse, Yukon Territory	Review Committee	
Revised Preliminary Dam Design, Minto Project, YT	EBA Engineering Consultants Ltd., Edmonton, Alberta	1997
Construction Quality Assurance Manual for Waste Dumps, Tailings/Water Dam, Mill Water Pond and Diversion Ditch, Minto Project, Yukon", Project No. 0201-95-11509	EBA Engineering Consultants Ltd., Whitehorse, Yukon	1997
Design Brief Tailings/Water Dam, Minto Project, Yukon Project No. 0201-95-11509	EBA Engineering Consultants Ltd., Whitehorse, Yukon	1997
Minto Project, Application for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	1997
Review of Hydrology for Minto Project	Remi J.P. Allard Rescan Environmental Services Ltd.	1997
Geotechnical Evaluation - Proposed Main Waste Dump - Minto Project - Yukon Territory - 0201-95-11509	EBA Engineering Consultants Ltd., Edmonton, Alberta	1998
Minto Project, Geology, Ore Reserves & Mine Design	H.L. Klingmann and J.S. Proc	1998
Mill Water Pond, Minto Project	H.L. Klingmann and J.S. Proc	1998
Grout Curtain For The Tailings/Water Dam	H.L. Klingmann and J.S. Proc	1998
Minto Explorations Ltd., Minto Project, 6102-01, Design Progress At June 1998. Vancouver, BC	Rescan Engineering Ltd.	1998
Minto Project, Yukon Airborne Geophysics Interpretation, Geological Synthesis and Target Generation	Steffen, Robertson and Kirsten (Canada) Ltd., Bartsch, R.	1999
Cumulative Effects Assessment, Minto Project. Prepared for Minto Explorations Ltd.	Access Consulting Group	1999
Construction Monitoring Report Grout Curtain for Tailings/Water Dam, Minto Project, Yukon. Prepared for Minto Explorations Ltd.	EBA Engineering Consultants Ltd.	1999
Revised Construction Specification Tailings/Water Dam Minto Project, Yukon. Prepared for Minto Explorations Ltd.	EBA Engineering Consultants Ltd.	1999
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	1999
Minto Project, Yukon Airborne Geophysics Interpretation, Geological Synthesis and Target Generation	Steffen, Robertson and Kirsten (Canada) Ltd., Bartsch	1999
Minto Optimisation Study: SAG Milling Throughput Studies for a Two-Stage Grinding Circuit	Fluor Daniel Wright Ltd.	1999
Minto Project, Yukon – Site Inspection & Compilation of Environmental Information. Prepared for DIAND, Renewable Resources Waste Management Program	Access Consulting Group	2000
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	2000
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	2001
Minto Project, Decommissioning and Reclamation Plan	Minto Explorations Ltd.	2001
Metallurgical Test Work & Mill Design	Minto Explorations Ltd.	2001
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	2002

Report Title / Topic	Author	Date
Minto Project Summary	Minto Explorations Ltd.	2003
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2003
Minto Project, Yukon. Care and Maintenance & Interim Closure Plan. Prepared for Minto Explorations Ltd.	Access Consulting Group	2003
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2004
Early Jurassic porphyry (?) copper (-gold) deposits at Minto and Williams Creek, Carmacks Copper Belt, western Yukon. In Yukon Exploration and Geology 2003	Tafti, R. and Mortensen, J.K.	2004
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB	Minto Explorations Ltd.	2005
Technical Report on the Minto Project, for Sherwood Mining Corporation, July 15, 2005	Orequest Consultants, Cavey, G., Gunning, D. LeBel, J.L., and Giroux Consultants Ltd., Giroux, G.	2005
Technical Report on the Carmacks Copper Project, Whitehorse Mining District, Yukon Territory for Western Copper Corp.	Cavey G., Gunning D., Clegg J.	2006
Report on the Geological Exploration Programs, Results and Perspectives, STU Claims, Hoochekoo Creek Area, Whitehorse Mining District. Internal Minto Explorations report.	Rus, John	2006
An Assessment of Metallurgical Response - Global & Variability Composites	G&T Metallurgical	2006
Minto Project: Updated Projections of Mill Throughput with One Additional Ball Mill (ex. Asarco Silverbell)	DJB Consultants, Inc., (June 2005) with Addendum (June 2006)	2006
Geotechnical Design Ice-Rich Overburden Dump Minto Mine, Minto, YT	EBA Engineering Consultants Ltd.	2006
Minto Project, 2005 Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2006
Minto Geotechnical (Open Pit) Feasibility Study. EBA File: 1200173.	EBA Engineering Consultants Ltd.	2006
Detailed Feasibility Study for the Minto Project	Minto Explorations Ltd.	2006
Phase I Water Treatment Contingency Plan	Access Consulting Group	2006
Minto Mine Flow Monitoring Plan	Access Consulting Group	2006
Construction/Operation Plan and CQA Manual, Ice-rich Overburden Dump, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2006
Detailed Decommissioning and Reclamation Plan, Minto Project, YT	Access Consulting Group, Minto Explorations Ltd.	2006
Minto Copper Project – Site Hydrology Update	Clearwater Consultants Ltd.	2006
Geotechnical Design Report, "Dry" Stack Tailings Storage Facility, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2007
Minto Mine Tailings Management Plan	Access Consulting Group	2007
Environmental Status Report, Skagway Ore Terminal, Summary of Previous Environmental Reports with Recommendations for Future Work	Access Consulting Group	2007
Skagway Ore Terminal, Phase II Environmental Baseline Study Report	Access Consulting Group, Gubala, C.P.	2007
Minto Project, 2006 Annual Report for Water Licence QZ96-006 and	Access Consulting Group, Minto	2007

Report Title / Topic	Author	Date
QML-0001. Submitted to the YWB and YG EMR	Explorations Ltd.	
Environmental Effects Monitoring, First Study Design, Minto Project, YT	Access Consulting Group, Minnow Environmental Inc.	2007
Detailed Decommissioning and Reclamation Plan, Rev.1, Minto Project, YT	Access Consulting Group, Minto Explorations Ltd.	2007
Operation, Maintenance and Surveillance Manual, Dry Stack Tailings Storage Facility, Minto Mine, YT	EBA Engineering Consultants, Ltd.	2007
Minto Project, 2007 Annual Report for Water Licence QZ96-006 and QML-0001. Submitted to the YWB and YG EMR	Access Consulting Group, Minto Explorations Ltd.	2008
Project Proposal and QML Amendment Application; Mining and Milling Rate Increase, Minto Project	Access Consulting Group, Minto Explorations Ltd.	2008
Minto Copper Project - Water Balance Model	Clearwater Consultants Ltd.	2008
Geotechnical Design, Proposed Reclamation Overburden Dump, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2008
Preliminary Design, Proposed Southwest Waste Dump, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2008
Geotechnical Design, Proposed Southwest Waste Dump, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2008
Pre-feasibility Geotechnical Evaluation, Phase IV, Minto Mine	Steffen, Robertson and Kirsten (Canada) Ltd.	2009
Tailings Risk Assessment, Minto Project, Yukon Territory	Steffen, Robertson and Kirsten (Canada) Ltd.	2009
Environmental Effects Monitoring, First Interpretive Report, Minto Project, YT	Access Consulting Group, Minnow Environmental Inc.	2009
Evaluation of the Background Water Quality of Minto Creek and Options for the Derivation of Site-Specific Water Quality Objectives	Minnow Environmental Inc.	2009
Minto Copper Project - Water Balance Model	Clearwater Consultants Ltd.	2009
Reclamation Research Program, 2007 Activities	Access Consulting Group	2009
Reclamation Research Program, 2008 Activities	Access Consulting Group	2009
Minto Project, 2008 Annual Report for Water Licence QZ96-006 and QML-0001. Submitted to the YWB and YG EMR	Access Consulting Group, Minto Explorations Ltd.	2009
Phase IV Waste Management Plan, Minto Mine, YT	EBA Engineering Consultants, Ltd.	2010
Phase IV Development Fisheries and Aquatic Baseline Study Summary, Minto Mine, YT	EBA Engineering Consultants, Ltd.	2010
Environmental Baseline Studies Wildlife Report	EBA Engineering Consultants, Ltd.	2010
Environmental Baseline Ecosystems and Vegetation Report	EBA Engineering Consultants, Ltd.	2010
Phase IV Tailings Management Plan, Minto Mine, YT.	EBA Engineering Consultants, Ltd.	2010
Minto Mine – Site Water Balance Update 2010	Clearwater Consultants Ltd.	2010
Minto Mine: Groundwater Baseline Conditions	SRK Consulting Inc.	2010
Minto Project, 2009 Annual Report for Water Licence QZ96-006 and QML-0001. Submitted to the YWB and YG EMR	Access Consulting Group, Minto Explorations Ltd.	2010
Minto Mine Expansion – Phase IV, ML/ARD Assessment and Post-closure Water Quality Prediction	SRK Consulting Inc.	2010

1.3 Statutory and Regulatory Responsibilities

1.3.1 Government Environmental Assessment and Permitting Regime

Versions 1 and 2 of this Plan was developed to meet the regulatory requirements as stipulated in the Company's Water Use Licence and the Quartz Mining Licence. Closure methods and details associated with the Phase IV Expansion have recently been the subject of environmental assessment by Yukon Environmental and Socio-economic Assessment Board as part of the Project Proposal by MintoEx – *Phase IV Mine Expansion, Minto Mine, Yukon Territory, November 2010.* This document is an integration of the closure plans for both the currently approved and Phase IV developments.

The Company has taken a proactive approach towards its regulatory responsibilities by meeting with various government regulatory agencies, boards, and local First Nations. Periodic meetings are held to provide project updates, and consultation with all parties was a key part of the development and review of the Phase IV Expansion proposal. A similar approach is planned for implementation of the Plan.

Prior to implementing the closure measures described in this Plan, meetings will be held with the SFN and the local community to ensure that First Nations and community interests and concerns are addressed and included in the closure planning of the Minto mine. Also prior to plan implementation, the YG, Water Resources Division and Mining Land Use Divisions will be informed of the Company's intentions to implement the Plan. Meetings will also be held with Environment Canada, Environmental Protection, Department of Fisheries and Oceans, Environmental Health, and Government of Yukon departments of Environment and Occupational Health and Safety to apprise regulators of planned site activities. These meetings will ensure that regulatory agencies' concerns with closure implementation are met.

1.4 Regulatory Approvals

Several government agencies and SFN are involved in reviewing, assessing, authorizing and monitoring the Minto Mine. The relevant legal, regulatory and guideline-based instruments include:

- Selkirk First Nation Cooperation Agreement;
- Metal Mining Effluent Regulations to the federal *Fisheries Act*;
- Effluent Characterization;
- Environmental Effects Monitoring;
- Type A Water Use Licence QZ96-006 ("WUL QZ96-006"), issued in April 1998 and including subsequent amendments, and valid until June 30, 2016;
- Type B Water Use Licence MS04-227 ("WUL-B") issued in August 1996 and valid until June 30, 2016;

- Quartz Mining Licence QML-0001 ("QML-0001") issued in October 1999 and subsequent amendments and valid until June 30, 2016;
- Mining Land Use Permit;
- Fish Collection Permits;
- Waste management facility permits:
- Multi-Use Land Treatment Facility Permit;
- Special Waste Permit;
- Commercial Dump Permit; and
- Air Emissions Permit.

In accordance with these instruments, MintoEx has submitted operational and monitoring plans including but not limited to:

- Engineering Plans and a Construction Quality Assurance Manual for the Water Storage Pond dam;
- Spill Contingency Plan;
- Main Waste Rock Dump Design Plan;
- Southwest Waste Dump Design Plan;
- Reclamation Overburden Dump and Ice-Rich Overburden Dump Design Plans;
- Dry Stack Tailings Storage Facility Design and Management Plans;
- Mill Water Pond Design;
- Flow Monitoring Plan;
- Water Treatment Contingency Plan;
- Provisional Designs and Plans supporting Phase IV Development; and
- Decommissioning and Reclamation Plan.

1.5 Document Organization

Section 1 of this document introduces the philosophy and scope for the decommissioning and reclamation plan for the site and the Company's corporate background. Information is provided on the property and its history and a discussion of regulatory responsibilities regarding closure.

Section 2 provides a brief overview of the history of the Minto mine up until the mine opening in addition to a summary of activities associated with the Phase IV expansion.

Section 3 provides a brief summary of the environmental setting for the mine.

Section 4 presents the reclamation strategy for the project, including reclamation objectives and reclamation research planning. The research will focus primarily on revegetation efforts and success.

Section 5 presents the implementation schedule for the plan.

Section 6 outlines the details of the Company's decommissioning and closure plan, and the activities to be followed at closure. The information is presented in a format that briefly describes the mine "reclamation component" and then presents closure issues in the context of physical and chemical stability. Closure measures are then presented in detail and in summary form as the basis for the closure cost estimates.

Section 7 deals with post closure site management plans and activities. This section presents the environmental management measures proposed for the decommissioning and post closure period, and proposes temporary closure issues and measures.

Section 8 provides an updated cost estimate for implementing the closure plan at different times during the life of mine.

Section 9 provides the document closure and signatures.

Section 10 provides report references.

1.6 Acknowledgements

This Plan benefited from input by the following companies:

Access Mining Consultants Ltd. – Developed Revision 1 of this Plan and provided support to Revision 2 including many of the drafting requirements.

Clearwater Consultants Ltd. – provided closure conditions water balance model to support water chemistry predictive modeling for closure conditions.

EBA Engineering Consultants Ltd. – Assisted with development of Revision 2 of this Plan, and developed Phase IV conceptual closure plan which has been incorporated into this revision in addition to providing drafting support and technical feedback on this revision of the report.

Pelly Construction Ltd. – Provided valuable input to unit costing and overall logistics on how closure methods could be implemented.

Selkirk First Nation – Provide ongoing input into the development of closure objectives based on current and potential future use of the project area, and review of all elements of Phase IV closure before and during environmental assessment.

SRK Consulting Ltd. – Provided input into the project description, groundwater hydrologic conditions, geochemical characterization and predictive water chemistry modeling for closure.

2 Project Description

2.1 Project Location and Background

The Minto Project is a copper-gold-silver project located on the west side of the Yukon River approximately 75 km (47 miles) north-northwest of Carmacks, Yukon Territory. The mine site and access road lie within the traditional territory of the SFN and comprises part of land claim settlement parcels R-6A, R-44A (Type A settlement lands) and R-40B. The Company concluded a comprehensive Cooperation Agreement with the SFN on September 16, 1997. This agreement is still in effect, however an amended agreement is being negotiated.

The Minto Property is centered at approximately 62°37'N latitude and 137°15'W longitude (NAD 83, UTM Zone 8 coordinates 6945000N, 384000E). The Minto Project consists of 284 claims. There are 120 pending quartz claims, 99 quartz claims and 65 quartz claims under lease. The 100% registered owner of the claims and leases is MintoEx. The property is accessible by crossing the Yukon River at Minto Landing. Barge landings have been constructed for ice-free crossing and an ice bridge is used upon freeze-up of the Yukon River.

Copper deposits were first discovered in 1970 and claims were staked in 1971. Extensive exploration yielded the first significant drill intersection in July of 1973. The Minto and DEF claims and leases cover an area of approximately 10 square miles. Mineable reserves for the deposit, above a cut-off grade of 0.64% copper, consist of 8,510,000 tonnes at grades of 1.81% copper, 0.57 g/t gold and 7.57 g/t silver.

Preliminary site development was initiated at the property in 1996 and continued during the following decade with the Company commencing operations in October 2007. The ore deposits are mined using conventional open pit truck and loader operations and processed in a mill plant on site. A 200 person camp is presently near capacity with the mine construction management, contractors and support staff.

Figure 2-1 and Figure 2-2 present visual depictions of the general project location within the Yukon and the project area overview.

Table 2-1 provides an overview of the project area and environmental setting information for the study area. This table provides physical project location information, geographic reference, access route, watershed drainage, special designations, and key environmental features within the study area. The information has been extracted from a number of documents, including previous CEAA and YEAA screenings, which are all previously summarized in Table 1-1.

Table 2-1 Project Area Overview and Environmental Setting

Project Area Attribute	Description
Region:	Yukon
Topographic Map Sheet:	NTS 115 I/10, 115 I/11
Geographic Location Name Code:	Minto Project
Latitude:	62° 36' N
Longitude:	137° 15' W
Drainage Region:	Yukon River
Watersheds:	Yukon River, Big Creek, Wolverine Creek, Dark Creek, and Minto Creek.
Nearest Community:	Pelly Crossing, Yukon, approx. 33 km north on Klondike Highway.
Access:	Klondike Highway, Barge crossing on Yukon River at Minto Landing, Minto mine access road. Airstrip on site.
Traditional Territory:	Northern Tutchone, Selkirk First Nation peoples. Traditional use for hunting, trapping and fishing.
Surrounding Land Status:	Selkirk First Nation Settlement Lands and Federal Crown Land.
Special Designations:	Lhutsaw Wetland Habitat Protection Area located approx. 17 km NE of Minto Landing (outside the project area).
Ecoregion:	Yukon Plateau (Central) - Pelly River Ecoregion.
Study Area Elevation:	Rolling hills above mine site at 1131 metres to 600 metres at the Yukon River Valley bottom.
Site Climate:	Temp. ranges from –30.9°C (Jan. 1994) to 15.7°C (July.2007). Mean annual temp. of approximately -5.2°C based on site data from a weather station processed to date. Mean annual precipitation at site is 341mm.
Vegetation Communities:	Riparian, black spruce, white spruce, paper birch, lodgepole pine, buck brush/willow and ericaceous shrubs, feathermoss, sedge, sagewort grassland, mixed, aspen, balsam, and sub-alpine. Discontinuous permafrost is present on site. Site has been subject to recent forest fires.
Wildlife Species:	Moose, caribou, Dall sheep, mule deer, grizzly and black bear, varying hare, beaver, lynx, marten, ermine, deer mouse, fox, mink, wolverine, least weasel, wolf, squirrel, porcupine coyote, muskrat, otter and wood frog. Bird species include: spruce, blue, ruffed, and sharptail grouse, waterfowl, raptors, and a variety of smaller birds.
Fish Species:	In the Yukon River, chinook, coho, and chum salmon, rainbow trout, lake trout, least cisco, bering cisco, round whitefish, lake whitefish, inconnu, arctic grayling, northern pike, burbot, longnose sucker and slimy sculpin; In Big Creek, Chinook and chum salmon, arctic grayling and whitefish species; In Wolverine Creek, chinook salmon, arctic grayling, and slimy sculpins; In Minto Creek and project area watershed (lower reaches only), slimy sculpin, round whitefish, arctic grayling and Chinook salmon. During research in 2010, it was observed that Chinook salmon use the lower reaches of the Creek in a highly transient manner, though it is unlikely that the area is used for spawning or overwintering habitat (further discussion in Phase IV Expansion, Project Proposal).
Known Heritage Resources:	East side of Yukon River in the vicinity of Minto Landing four historic sites designated KdVc-2 (Minto landing), KdVc-3 (Minto Resort), KdVc-4 (Old Tom's Cabin), and KdVD-1 (Minto Creek).

2.2 Current Status

The Minto Mine is currently in full production, but nearing the end of the mining and milling schedule for the Main Pit deposit. Water quality monitoring is conducted in accordance with Water Use Licence QZ96-006. Figure 2-3 presents an overview of current site conditions which generally reflects the site at the completion of Main Deposit mining, and the starting point for Phase IV.

2.3 Planned Phase IV Activities

The following activities are planned as part of Phase IV:

- Development, mining and milling of materials from the proposed Area 2 open pit which contains 3,192 Kt of ore plus 25,980 Kt of waste;
- Development, mining and milling of materials from the proposed Area 118 open pit which contains 88 Kt of ore plus 639 Kt of waste;
- Development, mining and milling of materials from the proposed Area 2 and Area 118 underground areas which contain approximately 1,541 Kt of ore and 341 kt of waste;
- Expansion of the southwest waste rock and reclamation overburden dumps;
- In-Pit deposition of tailings from Phase IV deposits (Area 2 and Area 118);
- In-Pit deposition of tailings sourced from Main Pit stockpiled ore following completion of mining in Main Pit;
- Construction of the South Wall buttress in Main Pit;
- Construction of the Mill Valley Fill buttress;
- Extension of the camp pad;
- Operational water management; and
- Decommissioning and reclamation of infrastructure components, as and whenever possible to reduce site liability.

The open pit mining will be conducted using standard blast and haul open pit mining practices. Milling will be conducted using the existing infrastructure (a conventional crushing, grinding and flotation process plant utilizing standard unit processes and equipment). The plant currently processes 3,600 tpd (metric tonnes per day).

Figures 2-3 through 2-5 show the Phase IV development at Year 0 (Current Conditions), Year 2 (January 2013) and End of Mine life (2017). Additional details and information on the project are contained in the Minto Mine Expansion - Phase IV Project Application submitted to YESAA in August 2010.

3 Environmental Setting

Table 2-1 provides a summary of the key environmental features near the project area. Note that forest fires have affected large parts of the Minto Creek basin and surrounding areas during the past twenty

years, and as recently as the summer of 2010. Baseline environmental reports have been prepared to document and describe the existing environmental setting of the site. These baseline reports are listed in Table 1-1. Readers of this document are referred to those reports should additional information be required.

3.1 Closure Water Quality Predictions

The Company has developed a predictive water chemistry model in order to better understand what the potential water quality discharging from the site would be at closure. The predictive water chemistry model is based on site monitoring data and the ongoing geochemical characterization program which includes humidity cells conducted on appropriate material types. A copy of the results of the predictive water quality model for the site is included in Appendix A of this report for both unmitigated and mitigated scenarios. The geochemical characterization (SRK, 2010a) and baseline water quality reports suggest that without mitigations, at closure there will be seasonally elevated metal concentrations for a number of parameters (aluminum, copper and cadmium) with copper being the primary contaminant of concern.

The initial version of the predictive water quality model was developed to predict closure water quality without any closure mitigations applied. This allowed for an understanding of the potential "worst case" water quality that would be seen discharging from the site and also which mine components contributed to the major metal loadings. The water quality model indicated that approximately 79% of the predicted post closure metal loadings were derived from the Southwest Dump (52%), the Main Waste Dump (14%) and the Dry Stack Tailings Storage Facility (13%). This information has been used in the development of the source control closure measures for these facilities that is described in the next sections of this report.

In order to understand the effects of mitigation, the model was revised to simulate the application of engineered covers to the mine infrastructure with significant metal loadings. The long-term performance of the engineered cover systems was assumed to be on the order of an 80% reduction in metal loadings for benches and a 50% reduction in metal loadings for faces. Passive treatment systems were assumed to be seasonally effective with a performance on the order of 75% reduction in metal loadings during the freshet period. A review of literature on passive and semi-passive treatmentsystems indicates that they can be highly effective at removing metals (>90%) provided they are appropriately designed to address flow fluctuations and potential short-circuiting of the flows (see Section 4.2.2). The assumed performance targets described above are therefore considered achievable based on a review of the available literature on these types of mitigation treatments.

The predictive model shows that the background water chemistry from the undisturbed catchment has the ability to significantly influence seasonal variations in the receiving environment water quality. All of the predicted exceedances of the site water quality objectives are controlled by undisturbed catchment

background water quality concentrations with the exception of cadmium (May and September) and mercury (July). The magnitude of the cadmium concentration predicted for the months of May and September is below the revised Canadian Council of Ministers' of the Environment (CCME) cadmium criteria that are currently being considered for acceptance by that organization. Mercury is not used in the Minto processing and it is believed that any detections of this element are related to naturally occurring sources of mercury. Additional details on the predictive model and the results of the various scenarios considered for this project are contained in Appendix A.

4 Reclamation Planning

This section of the Plan provides reclamation objectives and the overall reclamation strategy for the Minto site. Also provided is information regarding planned reclamation, revegetation research programs and details and observations on reclamation and revegetation to date. The Company is committed to implementation of reclamation methods that will mitigate potential adverse effects to the receiving environment that have been predicted by the water quality model.

A systematic approach to decommissioning and closure reclamation has been developed for the Minto project. Progressive reclamation measures will be implemented where possible during mine construction and operations. This approach will not only provide valuable reclamation success feedback for use in advanced/final closure, but progressive reclamation will reduce final reclamation liability and costs and shorten the overall reclamation implementation schedule. These progressive efforts will also help reduce slope erosion through physical slope stabilization of revegetation efforts, enhancing ultimate reclamation success.

The use of active treatment is discussed at the end of this section. Active treatment is considered a worst-case final fall-back mitigation to potential water quality impacts from the site and should be utilized only if the mitigative measures described in Section 4.2 are not effective in reducing metal loadings to the receiving environment.

4.1 Reclamation Objectives

The primary objectives of the closure and reclamation of Minto Mine are:

- To have a closure planning process that seeks input from the SFN, understands the input received and incorporates the input into closure planning decisions;
- To protect the health of people pursuing traditional activities including hunting, fishing, trapping, camping and collection of plants for food, medicinal or cultural purposes;

- To protect people from safety risks when they are pursuing traditional activities including hunting, fishing, trapping, camping and collection of plants for food, medicinal or cultural purposes;
- To protect the environment (including land, air, water, plants, animals fish and other environmental components and their interrelationships) from long term effects caused by the mine activities and facilities;
- To return the mine site and affected areas to a state similar to surrounding lands so that people can pursue traditional activities the same as they did before mining, including hunting, fishing, trapping, camping and the collection of plants for food, medicinal or cultural purposes;
- To protect the environment from long-term effects caused by post-closure access to the mine area;
- To protect the environment from effects of earthquakes, floods, climate change and other natural events on related mine structures;
- To have effective management and control structures in place during operation, closure and post-closure to provide:
    - Adequate financial resources to carry out all closure activities including plan implementation and long-term activities;
    - Adequate flexibility during closure and post-closure to allow adaptation of activities in order to address unexpected performance and events; and
    - Consideration of Minto Exploration Ltd.'s long-term desire to "walk away" from the site under conditions acceptable to SFN and with adequate resources provided to address long term requirements.
- To minimize long term activities by ensuring long term chemical and physical stability of mining components and disturbed areas;
- To confirm the effectiveness of closure measures by monitoring the site after closure;
- To undertake mine planning incorporating progressive reclamation;
- To provide short and long term slope stabilization and erosion control on linear and non-linear disturbances;
- To ensure the long-term chemical stability of residual mining components and their effects on water quality draining the property;
- To ensuring the long-term physical stability of key structures such as the waste dumps and the diversion and drainage ditches; and

- To work towards a passive closure scenario for most or all mine components.

The overall goal of closure at the Minto site is to leave the area as a self-sustaining ecosystem, ensuring that land use after closure is compatible with the surrounding lands, and that the site vegetation returns to a state as near as possible to that in existence prior to mining activities. Operations phase material characterization programs and the application of passive mitigation treatments such as engineered covers to reduce metal loadings from mine infrastructure components are the primary means by which the Company proposes to achieve this goal.

These closure objectives are reflective of the closure objectives laid out for the licensee to achieve in Schedule B of the Quartz Mining Licence QML-0001 "Terrestrial Reclamation Standards for the Minto Mine". These standards were derived from the YG's Reclamation and Closure Policy as well from a submission from the SFN Lands and Resources Department which represents the interests of SFN members.

4.2 Reclamation Toolbox

The Company has adopted a toolbox approach to reclamation methods in order to ensure that the reclamation objectives identified in the previous section can be met. The toolbox approach to reclamation involves investigation into the use of different reclamation methods depending on the specific issue being addressed. Most of the methods in the reclamation toolbox are standard practice (e.g. recontouring, seed and fertilizer application, scarification of compacted surfaces) and do not require detailed explanation of their application.

The remainder of this section describes toolbox techniques and methods that are specific to addressing potential project effects on water quality. These techniques and methods focus primarily on passive methods of reducing metal loadings to the receiving environment. The design and application of these reclamation measures will be dependent on the results of ongoing reclamation research and field trials that are to be conducted during mine operations.

4.2.1 Source Control

Source control is intended to be the primary control for the reduction of metal loadings to the receiving environment through limiting the access of water to materials known to have metal leaching issues. Source control includes such measures as operational characterization and materials handling programs, sub-aqueous disposal, engineered cover systems and encapsulation. Source control measures that are proposed for Minto Phase IV will primarily be a combination of operational characterization and materials handling programs, sub-aqueous disposal, engineered cover systems and passive water or semi-passive treatment strategies. Many of these strategies will be refined through the reclamation research program, which is further detailed in section 4.6.1.

4.2.1.1 Operational Materials Characterization and Materials Handling Plans

Materials characterization allows mining companies to understand the different ore and waste material types present at a site and develop special handling plans based on any identified environmental concerns associated with each rock type. Minto tests all of its development rock in advance of the materials being removed from the active mining face. The waste rocks are characterized based on the acid rock drainage potential and the contained copper content.

Waste Rock

The use of copper content for the development of the waste rock classification system is supported by the association of increased abundance of copper sulphide mineralalization with increasing mineralization of the deposit. A review of the geologic database indicates that over 90% of the total contained metals within the geological materials at this site occur within materials with a copper content of greater than 0.1%. It should be noted that the lack of a materials characterization and handling program had resulted in potential metal leaching material being placed into the waste rock dumps which have a larger surface area.

Material handling plans are then used to instruct the mining operation crews as to where the different rock classes may be placed. Table 4-1 contains the waste rock material classifications and handling plans that are proposed for use during Phase IV with the exception of the Area 1 pit buttress which is required to be constructed at the start of Phase IV.

Table 4-1 Waste Rock Classifications and Handling Plans

Material	Estimated Volume (Mm^3)	Handling Plan
Water rock with no copper content	8.77	Material to be used for general construction fill at the site. No neutral metal leaching expected to occur.
Waste rock with contained copper content of less than 0.1%	0.36	Material to be placed into the waste rock dump or backfilled into the Area 118 pit. Minor neutral metal leaching may result from this material but is not expected to be significant due to the low metals content
Waste rock with a contained copper content from 0.1% to 0.64%	2.55	Material to be simultaneously disposed with tailings into the Area 1 pit or else stockpiled on the Area 1 pit buttress in the Grade Bin Disposal Area for subsequent sub-aqueous disposal at closure.
Waste rock classified as Potentially Acid Generating based on geochemical characterization program	unknown	Material to be simultaneously disposed with tailings into the Area 1 pit or else stockpiled on the Area 1 pit buttress for subsequent sub-aqueous disposal at closure.

The estimated volume of each waste rock material classification is based on the geologic block model for the site. This information shows that the GBDA will receive 2.55 Mm^3 of the total estimated 2.91 Mm^3 of waste rock with a copper content greater than 0.1%. The implementation of a materials handling program during Phase IV will allow the Company to segregate potential metal leaching material into the GBDA as opposed to the larger southwest waste dump. This will result in a reduced footprint and associated metal loadings during the operations phase.

Overburden

Overburden segregation is required for minesites where there is a need to ensure that waste materials generated by stripping and other development activities are preserved for future reclamation activities. The implementation of source control at the Minto Mine will require a large volume of fine-grained materials for engineered waste cover systems. The reclamation overburden excavated from existing operations at the Minto mine have primarily been a silty sand with some amounts of fine grained materials. Segregation of overburden has only involved disposal of ice-rich material into a designated dump to minimize potential stability issues. No other efforts to segregate overburden have been conducted in the existing ROD. A summary of the grain-size distribution from historical investigations conducted by EBA Engineering Consultants Ltd. (EBA) at the site are included in Appendix B and includes boreholes from the existing ROD.

The results of field investigations conducted in the Area 2 pit footprint show that approximately 50% of the overburden (approximately 1.89 Mm^3) to be stripped during Phase IV will be fine grained (silty or clayey) materials which will be suitable for cover construction. Appendix B contains the borehole logs and grain-size analyses for samples from the holes within the Area 2 pit footprint. Overburden stripped as part of Phase IV will be hauled to the Reclamation Overburden Dump (ROD) and placed into clearly defined sections of the dump based on the observations of the characteristics of materials observed in the digging face. Additional details on the fine-grained and coarse grained sections of the overburden dump are included in the Phase IV Waste Management Plan which is being prepared by EBA.

Supervision of the overburden stripping will be required in order to achieve the required material segregation.

Samples of the material being shipped to the fine grained portion of the ROD will be collected and submitted for grain-size analysis to better characterize the materials for their use in cover construction. The frequency of sampling should be sufficient to provide information on major sources of fine-grained materials placed into this portion of the dump. It is anticipated that the total number of samples required to accomplish this will be from two to three hundred depending on the actual volume of fine-grained materials encountered during stripping.

4.2.1.2 Sub-aqueous Disposal

Sub-aqueous disposal involves the placement of materials underwater in order to their limit exposure to oxygen. This method of source control can be very effective given that the dissolved oxygen content of water is approximately 10,000 times less than for materials that are located above water.

The Company intends to use this method of source control for materials identified in Table 4-1 and also for tailings generated from milling following closure of the Dry Stack Tailings Storage Facility.

Flooding of waste rock in a pit will result in some initial flushing of metals as the materials become wetted but this can be actively treated prior to the water discharging from the pit. Consolidation of the placed tailings will result in pore water once the waste rock has become flooded the movement of water through the flooded materials becomes controlled by diffusive processes which act to limit metal leaching.

Over time, the development of a fine sediment layer on the surface of flooded materials helps to seal off the materials and further limits their ability to contribute to metal loadings.

4.2.1.3 Engineered Cover Systems

Engineered cover systems are designed to reduce water infiltration into materials that are known to have either acid rock drainage or metal leaching potential. The use of cover systems in cold climates is an area of active study by the Mining Environment Neutral Drainage (MEND) program and MEND Report 1.65.1a (MEND, 2009) and 1.65.1b (MEND, 2010) contain considerable background literature on dump design considerations in addition to numerous examples of cover systems. The level of information available for each of these cover system varies and prevents a detailed comparison between these sites and the Minto Mine; however, these types of covers have been shown to work. Acid rock drainage is not considered to be an issue at the site; however, oxidation of sulphidic mineralization present in non-acid generating waste materials can result in increased metal loadings to the receiving environment due to the presence of copper bearing minerals in the waste.

The need for engineered cover systems at the Minto mine are based on the predictive water quality model developed for the site. The predictive model has been developed using conservative assumptions and as such it is considered to provide worst-case water quality predictions for the site at closure. The section describes two different styles of engineered covers that have been successfully applied at minesites and landfills in cold climates.

The infrastructure units that have been considered for source control are identified in Table 4-2 which also contains a summary of the design surface areas for these units at the Minto mine. This table shows that the majority of the surface area of these infrastructure units is associated with benches. The large amount of benches indicates that the application of engineered covers as a means of source control should be effective in reducing metal loadings to the receiving environment. The final surface of the waste rock dump can be controlled to a point through final engineering design during the operations

phase to assist in water management. Select portions of the final dump surface may also be recontoured as required in preparation of the cover placement.

Table 4-2 Minto Mine Waste Dump and Tailings Facility Surface Areas

Area	Total Surface Area (m^2)	Bench Area (m^2)	Dump Face Area (m^2)	Percentage Benches
Dry Stacked Tailings Storage Facility	380,000	310,000	70,000	81.6%
Southwest Waste Dump	740,000	653,000	87,000	88.2%
Main Waste Dump	435,000	278,100	156,900	63.9%
Mill Valley Fill Expansion	102,000	80,100	21,900	78.5%

Store and Release (Evapotranspiration) Covers

Store and release or evapotranspiration (ET) covers have been successfully installed in the Yukon at the former Brewery Creek mine (Blue Dump) and are being tested as part of closure planning at the Faro Mine Complex. Monitoring information for the ET cover installed at the Blue Dump is approximately 7% annual infiltration in the 5 years since the lysimeter was installed.

The design of this type of cover system is based on water being stored in the soil until it can be transpired by vegetation or evaporated from the surface. There are two primary types of these covers:

- Monolithic – a single vegetated soil layer designed to retain water; and
- Capillary – a fine-grained soil layer overlying a coarse grained layer which acts as a capillary break.

The average and calculated precipitation, lake evaporation and evapotranspiration rates for the Minto mine are shown in Table 4-3 (Clearwater, 2010).

Table 4-3 Climatic Information for Cover System Evaluation at the Minto Mine

Parameter	Calculated Average Annual Value	Average 2007 to 2009
Precipitation	341.4 mm	336.6 mm
Lake Evaporation	430.0 mm	440.7 mm
Evapotranspiration	215.0 mm	201.6 mm
Site Precipitation - Evapotranspiration	126.4 mm	135.0 mm

Table 4-4 shows the seasonal distribution of precipitation, evapotranspiration and evaporation for the site. This table shows that rainfall accounts for approximately 197.3 mm of the total precipitation occurring at the site.

Table 4-4 Seasonal Distribution for Relevant Climatic Variables at the Minto Mine

Month	Precipitation (mm)	Snowfall (mm)	Rainfall (mm)	Lake Evaporation (mm)	Evapotranspiration (mm)
April	16.4	13.0	3.4	12.0	6.0
May	24.2	0.0	24.2	83.0	41.5
June	40.0	0.0	40.0	119.0	59.5
July	57.7	0.0	57.7	112.0	56.0
August	41.7	0.0	41.7	80.0	40.0
September	30.1	0.0	30.1	24.0	12.0
October	29.0	29.0	0	0.0	0.0
November	27.0	27.0	0	0.0	0.0
December	23.6	23.6	0	0.0	0.0
January	21.9	21.8	0.1	0.0	0.0
February	16.4	16.4	0	0.0	0.0
March	13.7	13.6	0.1	0.0	0.0
Total	341.7	144.4	197.3	430.0	215.0

This rainfall value for the site is less than the observed evapotranspiration based on the available record which indicates that water stored within the soil should be able to be successfully transpired by vegetation. The presence of frozen ground conditions which occur in this area from approximately October through May of each year further reduces the amount of rainfall that would infiltrate into the soil cover. Based on this review, the climate data supports the choice of a store and release type of cover system as a source control measure option at the Minto mine.

Store and release cover systems have a design thickness determined by the required storage capacity of the soil layer. Higher contents of fine-grained materials within the soil layer increase the water storage capacity of the cover. The thickness of a store and release cover needs to be sufficient to retain moisture within the plant rooting zone but not too deep that the water is not available for evapotranspiration to occur. Reclamation research into vegetation species in the area of the Minto Mine indicates that the rooting depth for ranges from 0.25 to 0.35 m.

For costing purposes it is assumed that a soil cover of approximately 0.5 m will be required for the store and release cover systems. Refining the thickness for the final soil cover requires the previously mentioned additional grain-size information from soils stripped during Phase IV in order to ensure the design provides the necessary cover system performance. Further refinement of the cover system design will be determined through a review of operational trials under the reclamation research program conducted during Phase IV. Additional detail on these trials is provided in Section 4.6.1.

Low Permeability (Barrier) Cover Systems

Low permeability or barrier cover systems make use of a compacted or low permeability layer to minimize infiltration into the underlying media. The former Arctic Gold & Venus minesites are northern examples of these types of cover systems. Water that infiltrates into the cover flows through the soil as shallow groundwater before seeping from the cover system. The construction of these types of cover systems requires an abundant source of clay-rich borrow materials which are not readily available at the Minto Mine. The use of geosynthetics and other synthetic materials is possible for creating low permeability layers in areas where there is insufficient fine-grained borrow materials; however, the use of synthetic materials to create a low permeability cover layer at the site is not considered to be feasible for this site due to:

- The large surface area that could potentially require covering under the source control program;
- Logistic concerns associated with placement of these materials onto the surface of the waste rock dumps;
- Insufficient local volumes of suitable fine grained materials for constructing the low permeability barrier layer; and
- The cost of synthetic liners can range on the order of $12-$15 per square metre of installed liner which is seen as being cost prohibitive.

Construction Compaction of the Waste Rock Dump for Closure Considerations

The surfaces of the waste dumps are already substantially compacted as a result of trafficking by the heavy mining equipment during dump construction. This operational compaction is considered to be favourable for closure in that it will greatly assist in reducing infiltration into the dumps and should enhance the performance of the store and release cover during the initial stages of vegetation development on the covers. The Phase IV WMP (EBA, 2010) contains additional information on the construction specifications for the final surface of the waste rock dumps. These specifications include:

- Construction of the final surface to an approximate grade of 2% to promote shedding of water from the dump surface;
- Maximizing trafficking of the surface of the dump by the mine construction fleet in order to better ensure compaction of the dump surface; and
- Additional compaction will be conducted as required since the proposed materials for the cover system construction are not filter compatible with the waste rock in an uncompacted state.

At closure, the surface layer of the dumps will not be scarified but instead be retained as a compacted layer in order to assist with minimizing infiltration into the dumps. Additional waste rock placement and compaction of dump surfaces in advance of cover system installation will be conducted as required in order to minimize ponding and would be based on physical examination of the dump surface.

4.2.2 Passive Treatment Systems

There are a number of areas at the site where passive treatment systems can be installed to provide tertiary treatment of water draining from the minesite. There are a number of means by which passive treatment can be achieved at the site and these are described in greater detail in the sections below.

4.2.2.1 In-pit Treatment

The Area 1 and Area 2 open pits will be flooded at closure and will act as large sedimentation ponds in the post-closure period. The use of the pits for the removal of suspended solids will act to reduce potential total metal loadings to the receiving environment. The open pits will also allow for some natural attenuation and removal of metals from the water column based on the results of investigations on in-pit lakes at other mine-sites. The potential in-pit treatment of site water has not been included in the current predictive modelling conducted for the closure of the site.

Completely passive mechanisms for water quality improvements in pit settings may include:

- Particle settling to remove suspended solids in runoff waters.
- Oxygenation of constituents in seepage by exposure of collected water to the atmosphere. Oxygenation of iron or manganese contained in waste rock or tailings seepage can lead to precipitation of iron or manganese oxides, which will provide a sorption-based removal mechanism for some trace metals including copper.
- Algal or other photosynthetic microbial sorptive removal of dissolved metals by sorption on organic biomass. Natural pit lakes will develop some photosynthetic biomass, which in a low-productivity catchment such as at Minto will be low nutrients, and consequently this mechanism will be limited unless enhanced by nutrients.
- Use of pits as pretreatment sites for semi-passive treatment vessels could be done especially during the transition from active water treatment to passive closure. Two approaches that make sense and could be combined include:
- Addition of organic reagents and/or alkaline reagents to the pits to create an anaerobic zone in the lake where metal removal in reductive forms, including metal sulphides or reduced metal oxides, is encouraged. Typically a combination of carbon sources is utilized to achieve both rapid formation of reductive conditions (carbon sources such as sugars and alcohols), and sustained maintenance of reductive conditions (carbon sources such as wood chips and other biomass forms).
- Addition of nutrients including nitrogen and/or phosphate will enhance the development of a photosynthetic algal or microbial population in the lake, which will provide both a direct removal by sorption on biomass, as well as sustaining anaerobic conditions in the deeper part of the lake as the photosynthetic biomass decays, acting as a sustainable mechanism for anaerobic conditions in the lake bottom.

Examples of the pre-treatment of pit lakes for metals removal include:

- The Anchor Hill pit at the Gilt Edge Mine in South Dakota, which had ice-covered conditions for more than 5 months of the year, where alkaline reagents and multiple organic sources including wood chips, alcohols and sugar syrups were added. Greater than 90% removal of metals including copper were achieved and sustained for several years.
- The pit lake at the Barite Hill Mine in South Carolina, alkaline reagents and multiple organic sources including wood chips, alcohols and sugar syrups were added. Greater than 99% removal of most metals including copper was achieved.

4.2.2.2 Passive Treatment Wetlands

Treatment wetlands are an effective passive water treatment technology that is used in a number of areas to help improve the water quality of impacted systems. Treatment wetlands act as metals sinks through precipitation or complexing of metals under anaerobic conditions. They also act as a filter for suspended solids or colloidal precipitates which might remain suspended through pit lake settling. Wetlands are not intended to be a permanent "walk-away" solution to water chemistry issues at a site but can provide effective passive treatment on the timeframe of 100 or more years. The Cone Mine, Kendhill, Mount Washington, Silver Queen and McLean Lake are sites where wetland treatment has been shown to be effective reducing metal lead.

Treatment wetlands require a footprint that is dependent on the volume of flow to be treated. A rule of thumb treatment volume of 3.28 to 6.57 m^3/day per square metre of wetland has been found to be acceptable based on a review of documented treatment systems (INAP, 2010). Areas that have been identified as potential locations for construction of passive treatment wetlands include the:

- Area 1 pit discharge area;
- Existing Mill Pond area; and
- Existing Main Water Dam location.

The Area 1 pit will be a shallow lake following backfilling and there is potential to construct a treatment wetland in the discharge channel area. The mill pond area will receive discharge from the Area 1 and Area 2 pits and has sufficient flat ground to allow for construction of a treatment wetland. The existing main water dam is located at the lowest point on Minto Creek and the existing facility could in theory be converted into a treatment wetland, although, there is insufficient footprint at this location to treat all site flows given the sizing guidance presented above. The materials used to form the wetland cells could also include wood chips or a semipassive addition location for soluble carbon sources, to enhance the anaerobic conditions formed in the wetland. The Mike Horse mine in Montana is an example site where alcohol was added to a wetland system to sustain anaerobic removal mechanisms through ice-covered winter conditions.

The predictive model for the site is based on the construction of passive treatment systems at the sites of the existing Mill Pond and the Main Water Dam. There may be better locations downstream of the minesite for the construction of a passive wetland treatment system; however, these have not been included as potential options since they are located outside of the current SFN Lease Agreement.

4.2.2.3 Permeable Reactive Barriers

Permeable reactive barriers (PRB's) are installed vertically in trenches and may involve cut-off walls for funnelling of groundwater to the permeable barrier. PRB's utilize a variety of different media for the reactive barrier (e.g. limestone, municipal wastes, bauxol, zero valent ion, compost and molasses) which can influence the construction cost. The design life of the reactive media in a PRB system is typically on the order of 20-30 years depending on the treatment requirements. Refreshing of the reactive media would then be required in order for the system to continue to provide passive treatment in an effective manner.

4.2.2.4 Biological Reactors

Biological reactors use the degradation of organic materials for the purposes of treatment and often involve installation of the treatment materials into lined trenches or pond systems. These systems have been used in mining applications to treat groundwater discharges from underground workings and also for shallow groundwater systems. Treatment media for biological reactors in the documented studies are often derived from local municipal and industrial waste sources; however, it would be necessary to determine whether these sources exist in the local area or can be sourced and transported to site in a cost effective manner. Wood chips or peat are local products that could be utilized. These systems could also be operated in a semi-passive mode where an alcohol tank can be set up to drip into the influent end of the biological reactor, and only require infrequent refilling.

Construction of a biologic reactor at the portal would also require that the portal discharge is able to be collected and channelled into the treatment system. This would most probably require installation of impermeable barriers and piping to direct flows to the treatment system. A biologic reactor would not be able to effectively treat any deeper groundwater derived from the portal seepage. The design life of biologic reactors is typically on the order of 20 to 30 years at which time the reactive media needs to be refreshed or a semi-passive operational mode could be alternatively operated.

4.3 Active Water Treatment

As per the stated reclamation objectives, the Company is committed to trying to close out the Minto mine in a manner that does not require the long term use of active water treatment to achieve discharge criteria. The application of the source control mitigation measures described in the preceding

sections should be successful in reducing metal loadings from the various infrastructure units at the site; however, it is realized that there will be the need to actively treat water during the immediate post-closure period while revegetation of the cover systems and reclaimed areas becomes established. It is currently estimated that a total of 4 years of active treatment will be required following closure of the site.

The Company currently operates a water treatment plant at the site which has been shown to be successful in reducing metal loads to a level where it is possible to directly discharge the treated water into the receiving environment. The existing water treatment plant may be moved from its current location near the Mill Pond to the Water Storage Pond during the post closure period in order to provide the ability to conduct water treatment as close to the final discharge point as possible. Moving the water treatment plant to this location will also eliminate potential post closure period power requirements associated with pumps and minimize the potential for seasonal disruptions to the operation of the treatment plan as a result of cold temperatures.

4.3.1 Water Treatment Plant

In July, 2009 MintoEx submitted a Water Management Plan to EMR as required under Amendment 5 to the water use licence (QZ96-006). A water treatment plant design accompanied that application and the plant construction was completed in 2010. No issues related to disposal of the sludge have been identified and any sludge generated from this facility during the closure period will be disposed of into an approved disposal facility.

4.4 Reclamation to Date

There has been little opportunity at the site to conduct final reclamation measures at any of the mine components to date due to the discovery of several new ore deposits that have given way to the Phase IV permit application and uncertainty around the final mine footprint. Progressive reclamation has been conducted to address water management and aesthetic objectives. For example, in 2009 MintoEx conducted reclamation activities on exploration roads and drill pads, particularly in erosion-sensitive areas that can potentially impact surface run-off water quality. Reclamation of disturbed areas along the access road and at Big Creek in the vicinity of the Big Creek Bridge was completed between May 6 and May 10, 2000. This reclamation has been successful when compared against the reclamation objectives, as noted in previous annual reports for the Type B Water Use License, submitted by the Company. Revegetation and fertilizer mixtures for this effort are known and the seeded areas are monitored for revegetation success. This information will be used to assist with planned progressive reclamation measures, reclamation research and measures for final closure.

Overall reclamation is therefore expected to be successful with seeding and natural revegetation complimenting each other.

4.5 Natural Revegetation

The project area was first disturbed by the construction of trails and trenching which was done as part of exploration programs on the property from 1971 to 1976. Natural revegetation has been effective in largely covering these disturbed areas in the 35 years since the area was first disturbed. For example, prior to construction activities in 2006, the airstrip was almost completely re-vegetated and required extensive clearing in preparation of re-commissioning. Other areas that have seen significant natural revegetation on the site (some of which are now re-disturbed by current construction activities) include areas adjacent to the water dam centerline, old borrow sources and the cleared right-of-way of the main access road.

The primary colonizing plant species now found around the mine site are willows and graminoids. The extent of recolonization at each location is dependent on local conditions, including soil conditions (type and moisture content) and aspect. Generally, revegetation is occurring more extensively next to undisturbed areas and on linear disturbances.

4.6 Reclamation Research

An important component of the reclamation planning process is ongoing reclamation research with the objective of developing the methods required to implement a successful reclamation program. Reclamation research will focus primarily on the revegetation aspect of reclamation, as the success of this element of a reclamation plan is closely linked to site specific conditions such as soil characteristics, climatic variables and existing vegetation populations. Other aspects of mine site reclamation including recontouring and erosion stabilization techniques are well established and are less reliant upon site-specific research for success.

Documentation of natural revegetation successes is ongoing during current reclamation research activities as documented in the annual reclamation reports. Information developed on site will be supplemented with information obtained from other mine reclamation programs in the Yukon and other northern jurisdictions. Considerable research has been carried out into the reclamation and revegetation of disturbed lands in the Yukon, including operating and abandoned mines, and mineral exploration sites. Much of this information is in the public domain and is well presented in the guidance document *Mine Reclamation in Northwest Territories and Yukon* (INAC, 1992.)

The true benefits of reclamation research will be realized if the information obtained and knowledge gained is incorporated into larger scale reclamation projects as quickly as possible.

4.6.1 Engineered Covers

Engineered cover systems are proposed in order to reduce metal loadings to the receiving environment. Investigations into engineered cover system design for application at the Minto mine will be evaluated using field trials conducted under the reclamation research program. The Main Waste Dump is not scheduled to receive any additional materials during Phase IV and it will be possible to progressively reclaim a portion of this facility during the mine operations phase. The proposed reclamation research on engineered covers will involve the assessment of the cover system thickness, the need for organic amendments and whether a monolithic or multi-layer cover system is required at the site to effectively reduce metal loadings. The results of field trials such as this will be used in developing an appropriate detailed design for cover systems to be installed on other site infrastructure.

The reclamation research program for engineered covers will involve the establishment of field trials at the site to evaluate and refine cover system design. The trials will involve the installation of field lysimeters to monitor infiltration through the different cover systems. At this time the following cover trials are proposed for evaluation of the following possible cover design configurations:

- Monolithic soil cover consisting of fine grained material with a target thicknesses of 0.25 m and 0.5 m;
- Multi-layer soil cover consisting of target thickness of 0.25 m and 0.4 m of fine grained materials over a 0.1 m coarse grained capillary break layer; and
- Multi-layer soil covers consisting of 0.1 m of coarse grained materials overlying a 0.25 m layer of fine grained materials.

The field trials will be constructed during summer 2011 and will be situated on an unused portion of the Main Waste Dump (MWD) in order to ensure that the monitoring of these lysimeters is not interrupted by operational requirements. The use of the MWD also allows for the construction of larger cells than could be achieved in other portions of the site. The final design of the lysimeters will be field fit based on the final location selected for the trials but the following specifications:

- the surface of the dump selected for field trials will be sloped to a grade of approximately 2% which is consistent with the closure information contained in the Phase IV Waste Management Plan;
- the lysimeters will be lined with an impermeable liner to ensure that there are no seepage losses into the dump;
- samples of the materials used to construct the lysimeters will be collected for grain-size analysis;
- the level of compaction of the materials placed into the lysimeters will be measured using a nuclear densometer in order to determine the bulk density of the placed materials;
- a drainage collection system will be installed into the downgradient face of the lysimeter to collect seepage waters;

- the lysimeters shall be seeded in order to establish vegetation and monitor evapotranspiration; and,
- The volume of water collected by the system will be recorded on a weekly basis with additional monitoring of seepage volumes recorded at a higher frequency to understand the effects of precipitation events on cover system performance.

Additional instrumentation will be installed into the lysimeters in order to obtain in-situ measurements on soil moisture within the lysimeters. The monitoring frequency for this instrumentation will be weekly with several periods of daily monitoring conducted following precipitation events to understand the drainage characteristics of the fine-grained layers. Site meteorological information will be used in the interpretation of the monitoring data from the lysimeters.

4.6.2 Growth Media

The natural vegetation found on undisturbed sites around the mine generally indicates the underlying soil properties, including texture, drainage, and pH, and the level of available nutrients that presently occur at the site. A soil sampling program was initially conducted in the project area during 1994 as described in the original environmental assessment report. The results of this program provide the basic information required for reclamation planning. Additional soil sampling on disturbed sites will be completed as part of ongoing reclamation research in order to determine areas of localized nutrient deficiencies.

Plants require, as a minimum, a medium that will allow roots to penetrate, that will retain adequate moisture and that contains levels of nutrients for successful growth. Diamond drilling done in the 1970's indicated that the Area 1 pit is covered by up to 60 m of overburden to the south in an area where permafrost depths are estimated to be approximately 18 m based on borehole logs in the area. The overburden generally consists of silt and fine sand with varying amounts of organic material and occasional layers of peat and gravel. The thickness of overburden required to retain will be confirmed by trial, as the depth of growth media placed will be varied and soil moisture measurements compared with revegetation success on the various plots will suggest an optimum depth of overburden placement for revegetation measures. Annual summaries of reclamation research and related activities are compiled in the Water Use Licence Annual Report submitted to the Yukon Water Board (YWB) on July 31 of each year beginning in 2007.

4.6.3 Revegetation Trials

The revegetation trials are set up in order to ascertain the best methods in restoring the Minto mine site footprint to a functioning and self sustaining ecosystem. Four important components of a revegetation process that are being examined presently or proposed are briefly described below and other related considerations are further discussed.

1. Practical seed mixes - while it is known what seed types have been used at the site previously and what types of plants have been naturally re-vegetating the site, further reviews and investigations are necessary to confirm the appropriate seed mixes that should be used in conjunction with different soil covers. The ultimate seed mixtures will be developed using:

    - knowledge of the naturally occurring vegetation and soil conditions;
    - an inventory of naturally occurring seed sources on site;
    - results from revegetation activities to date;
    - existing literature on regional revegetation science; and
    - information gained from revegetation test plot trials on site (see below).

2. Soil covers - different plant varieties and species, tailings characteristics, cover designs and other environmental conditions are all factors influencing uptake of metals by plant tissues. Sampling of plant tissues from the tailings test plots will be conducted to assist in designing the revegetation program, and existing literature and research regarding plant metal uptake and foraging patterns will be incorporated into the seed mix design.

3. Transplanting and collection of seeds of local plants that have been noted, during monitoring, to have colonizing potential (especially trees, shrubs and nitrogen fixing legumes). The creation of shrub willow islands can also enhance natural succession.
4. Utility of soil amendments - such as peat, wood fibre or mulches need to be investigated for usefulness in areas where soils are deficient or unstable.

The establishment of an initial ground cover of graminoids (all grasses and grass-like plants, including sedges and rushes) has historically been viewed as a desirable objective on most disturbed areas to stabilize slopes and control soil erosion. To date, test plots have been typically small and optimum conditions may apply. The information obtained from test plots will be applied to future reclamation areas 1 ha or larger in size. Overburden soils will be tested, transported and prepared for seeding/planting, all steps and information will be documented. Vegetation growth will be assessed in a standardized way (see revegetation plot survey form) each summer. The successes from the trial plot program will be transferred to more progressive reclamation efforts that will provide a large-scale opportunity for refinement of reclamation and revegetation techniques and measures.

In the larger, more open disturbed areas at the mine site (borrow areas, mill and camp site area), where natural seed sources are less available, the seeding/planting of indigenous shrub species (primarily willows, birch and alders) may be required to encourage the later several stages of plant succession on these sites. Shrub species would be planted concurrently with the revegetation plot trial plantings.

Evidence indicates that revegetation by the seeding of sod-forming grass species will inhibit the invasion of the area's natural colonizing species by competing for space, light, nutrients, sunlight and moisture (Craig, et al., 1998). Seeding predominantly with native species should aid in ensuring that the later successional stages of vegetative cover appear and competition is reduced as local grasses coexist with the other local plants and communities will naturally evolve.

However, even though nutrient uptake by northern native seed varieties on nutrient deficient soil is usually more effective than nutrient uptake by southern agronomic species. Seeding with agronomic species at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species.

The revegetation research work initiated at the Minto Mine during the 2007 season marked the commencement of a multi-year reclamation research program that will provide critical site-specific information to guide successful decommissioning and restoration of the site. The program continued in 2008, 2009 and 2010 as summarized in this report. The following refinements are designed to enhance and expand the reclamation program, and cover both the established revegetation research program, and additional reclamation research areas recently identified.

The revegetation research component of the reclamation research program will continue with some modifications and expanded elements, as described below:

1. Continuation of late summer monitoring of the revegetation test plots and the progressive reclamation sites so future collection of data from test plots is consistent and all necessary information is gathered.

2. During monitoring, aggressive invasive plant species will be identified, documented and removed immediately. Awareness of territorial weed species and control guidelines need to be heightened, so these plants do not become established.

3. In order to further evaluate the soil conditions in the area, soil samples will continue to be collected from each of the revegetation test plots (control and treatments). Soil samples of trial plots will be taken from the centre of each plot. The larger progressive reclamation sites need several soil samples to determine soil variability across site.

4. These soil samples will continue to be analyzed, using the same tests for: soil pH, fertility parameters, metal concentrations and texture, so soil chemical changes can be monitored and easily compared among plots.

5. Soil sampling off site is needed to provide a background mineral profile of the local undisturbed ecosystems. Some of the permanent ecological plots already established can be used for these offsite controls.

6. Reapplication of seed mix with the addition of mulch to the progressive reclamation area on the south side of dam, to test reapplication effectiveness.

7. Shrub species commonly used as wildlife browse, will be analyzed for concentrations of metals that are potentially toxic. As with soil samples, a background profile of metal attenuation will be be determined. So, plant tissue samples will be taken offsite from local, but undisturbed areas to be used as a reference. When shrubs have been established on overburden cover their metal uptake can then be compared to reference data.

The revegetation component of the reclamation research program will be expanded in the following ways:

1. Trial plots will be established on the tailings surface as required in the April 2010 DDRP approval letter (YG EMR) to test cover depths, effectiveness of capillary breaks and other treatments. This will start this spring (2011) once an appropriate area has been developed to final grade, and should incorporate cover design research work being proposed in the 2011 DRP Revision.

2. The inventory of overburden materials underway will include nutrient capacity in any analysis moving forward. This will help in reclamation planning for the type of and depth of soil cover to be used on revegetation areas.

3. Soil cover plots will be tested for revegetation potential at different growth medium depths and cover designs. Evapotranspiration rates can be assessed for different plants as well as their growth success.

4. Any additional trial plots will be established with more distance between treatments and controls to decrease influences and error (i.e. windblown cross-seeding.)

5. Test sites need to be highly visible and signed so they are not destroyed during mining activities. A map of trial plot locations and an explanation of reclamation importance could also be posted on camp bulletin boards.

6. Revegetation research will be expanded beyond grasses to larger, later successional shrub/tree species. Establishment of these species in the revegetation program will enhance the natural succession. This will involve a combination of:

a. Local stock collection and transplanting trials;
b. local seed collection and broadcasting and propagation trials; and
c. live planting for erosion control.
d. preferred aspect and slope conditions for different plants

7. Identify nearby areas for native vegetation seed and stock collection. Areas slated for clearing need to be inspected, so suitable plants can be salvaged. A general inventory of indigenous plant communities in the area was conducted in 2010 as a component to the Minto Mine Ecosystem Mapping program (report pending, Access Consulting Group), this information can be used to locate naturally occurring shrub or tree species that could be used in transplanting /seeding trials. Seed collection and propagation should commence this fall (2011) as part of the expanded revegetation research program.

8. Vegetative erosion control methods will be field tested on site - they can provide a cost effective alternative to synthetic or other manufactured products. Grass seeding of slopes is an immediate step towards stabilizing soils on steep slopes, however live shrub/tree plantings are more effective at reducing soil/cover erosion on steeper slopes and gullies.

9. Nitrogen fixing flora will be included as a critical component of revegetation prescriptions, so soils are not depleted of plant available nitrogen. Native species that are nitrogen-fixing candidates for seed collection are:
   - Arctic lupine (Lupinus arcticus)
   - Yellow locoweed (Oxytropis campestris)
   - Hedysarum alpinum; and
   - Alder (Alnus sp.)

   Agronomic species include alfalfa and clover.

Based on the specific reclamation research results to date, and on a review of other reclamation and trial projects – the following will guide reclamation activites during progressive and final closure:

1. Chemical analysis of soils indicate that the overburden soils are deficient in macronutrients (Nitrogen, Carbon, Phosphate and Potassium), but have adequate micronutrients (Copper, Iron, Manganese, Molybdenum, Zinc). It is recommended that soils be amended with fertilizer and/or mulched to promote grass/plant growth after seeding.

2. The nutrient uptake by northern native seed varieties on nutrient deficient soil is usually more effective than nutrient uptake by southern agronomic species. Seeding with agronomic species over most disturbed at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species.

3. Where additional areas at the mine may be targeted for progressive reclamation, seed and fertilizer treatments should be formulated based on the monitoring results of the revegetation trials to date. Two seed mixes are recommended below:

    - a dry area seed mix, which would be applied to most disturbed sites in the area, and
    - a wet area seed mix for riparian sites.

Dry Area Seed Mix

Species	Botanical Name	Application Rate (kg/ha)	Percentage
Violet Wheatgrass	*Agropyron violaceum*	12	40.0
Sheep Fescue	*Festuca ovina*	7	23.3
Rocky Mountain Fescue	*Festuca saximontana*	7	23.3
Glaucous Bluegrass	*Poa glauca*	4	13.4
Total		**30**	**100**

Wet Area Seed Mix

Species	Botanical Name	Application Rate (kg/ha)	Percentage
Violet Wheatgrass	*Agropyron violaceum*	16	53.3
Fowl Bluegrass	*Poa palustris*	8	26.7
Tufted Hairgrass	*Deschampsia caespitosa*	6	20.0
Total		**30**	**100**

In addition to each grass mix, a nitrogen-fixing plant species will be added. If native species Yellow locoweed (*Oxytropis campestris*) and Arctic lupine (*Lupinus arcticus*) are available they can be applied at 2kg/ha. Agronomical species Medicago sp. (Rambler or Drylander) and Alsike clover at can also be applied at 2kg/ha. Rhizobium inoculant is needed for these legume seeds.

4. Topsoil and logs (coarse woody debris) should be salvaged during stripping and clearing and stockpiled to the side. The topsoil as well as being a seed bank, contains microfauna and fungus necessary for nutrient cycling. The logs are carbon/moisture reservoirs and provide habitat and

preferable re-growth microsites. This material is needed to jump start soil-building processes and to accelerate revegetation growth.

5. Vegetation islands of shrubs, trees and coarse woody debris act as a seed banks, attract wildlife which transport seeds and nutrients into the grassed area and speed up vegetation succession. Vegetation islands should be incorporated into both the revegetation research program and the larger scale progressive reclamation efforts. Retention of islands of vegetation where possible within the Minto Mine future expansion plans will enhance landscape diversity and accelerate vegetation succession after mine closure.

6. Local shrub/tree species can be salvaged and planted on corresponding aspects. Use ecosystem polygons already mapped (see pending Minto Mine Ecosystem Mapping report) to assist in finding local plant stock, and in determining species adapted to particular aspects and conditions.

7. Where rip rap is used, clump planting of shrubs in the interstitial spaces is recommended.

4.6.4 Passive/Semi-passive Water Treatment

Testing of passive and semi-passive water treatment approaches at Minto will have the following objectives and methods:

1. Validation of mass loading reduction by passive systems:

   Test cells of wetlands with anaerobic zones and wetland plant zones are proposed that will determine the potential removal rate of metals as a function of surface area and retention time. The treatment test cells would be constructed to be able to take water pumped from treatment plant influent and pretreat this water prior to be allowed to gravity flow back into the pre-treatment storage pond.

   The treatment cell would have a vegetation zone with wetland species that are common to the Minto area. This would be an upflow cell approximately 1 meter thick with year-round flow. Overflow from this cell would be routed into test cells with mixtures of locally available coarse media (clean gravel) and organic media such as wood chips or peat. These cells would test the anaerobic removal rates as a function of retention time within the media, as confirmed by tracer injection.

2. Evaluation of pit lake pretreatment:

   A deep lined trench or similar open water structure would be filled with mine water and inoculated by sediment from local bogs or wetlands. A carbon source would be added to the pit and annual water exchanges will be allowed in the spring time to mimic freshet inflows. Water would be allowed to exit through a gravel bank (with possible mixed wood chips) which would allow filtration as well as development of sulphate reducing bacterial activity on the surface of the gravel, similar to a biological reactor. Monitoring would be performed to evaluate open water removal rates and removal rates through the gravel bank.

5 Implementation Schedule

The Phase IV expansion is expected to result in approximately 6 years of additional mine life with active mining in the open pits ending in the third quarter of 2013 and underground mining scheduled to finish in January 2014. Following the end of the underground production, mining will be from ore stockpiles that will continue into 2016. Reclamation of the disturbed areas will be done in a phased approach to match the overall mining schedule and after closure to reflect the reclamation and monitoring effort required. This phased approach to reclamation planning will assist the company in achieving the overall objectives of progressive and final reclamation at the site.

Some of the key reclamation events are highlighted in the following timeline:

2011

- Mining of the Area 1 Pit is completed at the end of February and tailings begin to be placed in pit;
- Simultaneous disposal of higher copper content (Grade Bin 0.2 to 0.64) waste material into Area 1 Pit with tailings; and
-

2012 and 2013

- Simultaneous disposal of higher copper content (Grade Bin 0.2 to 0.64) waste material into Area 1 Pit with tailings.
- Dry Stack Tailings Storage Facility will no longer be required for tailings and this facility will be reclaimed. Monitoring of the reclaimed DSTSF will commence to verify effectiveness of closure on reductions in source loadings.

2014

- Commence reclamation of the main waste dump, southwest main dump and the ice rich overburden dump; and

- Commencement of Relocation of Grade Bin Disposal Area materials into Area 1 Pit.

2015

- Continued reclamation of the main waste dump, southwest main dump and the ice rich overburden dump; and
- Continued relocation of Grade Bin Disposal Area materials into Area 1 Pit.

2016

- Processing of stockpiles is completed and reclamation of ore stockpile footprints begins;
- End of Phase IV milling;
- Continued reclamation of the Area 118 Pit, main waste dump, and southwest waste dump; and
- Flooding of the Area 1 and 2 Pits.

2017

- Decommissioning of mill and other site infrastructure not required for closure;
- Construction of passive treatment wetland in the area of the mill pond;
- Ongoing site reclamation activities where still required; and
- Beginning of closure phase active water treatment.

2018

- Reclamation of the Mill Valley Fill;
- Continued closure phase active water treatment.
- Final site discharge channel construction;
- Completion of site reclamation activities; and
- Beginning of post-closure period monitoring program

2019

- Continued closure phase active water treatment.

2020

- Scheduled end of closure period active water treatment

2030

- Scheduled end of post closure period monitoring program

Active water treatment at the site is expected to be required for a period of three months per year for a total of four years post closure. During the period of active treatment, metal levels will be treated in the

plant and settling time will allow TSS levels to decrease further following treatment and prior to discharge. Monitoring would identify potential issues for the following year and a decision would be made at that time as to whether continued treatment is required.

The water treatment plant will remain at the site until it can be shown that no additional active water treatment is required and that the cover and passive treatment systems are operating effectively. The Company believes that its plan of source reduction and passive treatment will be effective in achieving effluent discharge criteria for the project; however, active treatment of water remains as a final fall-back solution should it be deemed necessary.

6 Closure Measures for Site Reclamation Units

This section contains the proposed reclamation methodologies that will be applied to the different reclamation units present at the site. Each sub-section contains a description of the area in addition to discussion of the closure issues that help to govern the closure methodologies chosen for that unit. References to previous reports or supporting documentation are also contained in each sub-section.

Figure 2-3 provides a general arrangement plan for current site conditions to the end of July 2010 while Figure 2-5 presents the overall site plan at the end of the Phase IV expansion project. Figure 2-5 also provides a general summary of the various closure measures proposed for the reclamation units that will be present at the end of mining under the Phase IV application. This figure also identifies the currently proposed timeline for conducting the reclamation works at the site. Figure 6-1 shows the final site water management plan for the site based on the currently proposed closure plan.

The disturbed area has been divided into reclamation units as follows:

- Waste Rock And Overburden Dumps;
- Ore stockpiles;
- Open Pits;
- Underground Workings;
- Dry Stack Tailings Storage Facility and Diversion Structures;
- Haul Roads;
- Main Water Dam;
- Mill and Ancillary Facilities;
- Mill Pond;
- Access Road; and
- Miscellaneous Components.

Table 6-1 contains a summary of the expected site disturbance associated with each reclamation unit at the end of Phase IV mine life. This table lists the reclamation components and sub-components, the total area expected to be disturbed by each unit during the construction and operations phases and the final surface area of the reclamation unit that will require reclamation. The areas to be reclaimed contained in the table are based on three dimensional models of the facilities and as such reflect the actual areas as opposed to the disturbed footprint which does not account for slope.

The access road has been treated in the same fashion as the 2009 Closure Plan since the final reclamation of that unit is subject to ongoing discussion between the Company and SFN. Three different closure scenarios regarding the access road are considered, and each affects the component and total reclamation areas differently, depending upon the final closure option selected. Section 6.10 discusses these scenarios and associated reclamation measures further.

It is estimated that a total of 316.0 hectares will be disturbed by the end of Phase IV mine development. The scheduling of the reclamation activities during Phase IV allows for a significant amount of the site to be progressively reclaimed during the mine operations phase.

Table 6-1 Estimated Area of Disturbance Requiring Reclamation

Reclamation Component	Surface Area Requiring Reclamation (ha)	Area Reclaimed Progressively (ha)	Area Requiring Reclamation at Final Closure (ha)
Main Waste Dump	43.5	0	43.5
South West Dump	74.0	0	74
Ice-Rich Overburden Dump	34.5	1.2	33.3
Reclamation Overburden Dump	30.0	0	30
Ore Stockpile Areas	15.7	0	15.7
Overburden and Waste Rock Dumps	197.7	0	196.5
Open Pit	5	5	**0**
Haul Roads	13.0	0	**13.0**
Portal Area	2.0	0	2
Tailings Area	41.3	10.3	**31**
Main Water Dam (including 4.7 ha impacted by impounded water)	6.0	0	**6.0**
Mill and Ancillary Facilities	7.6	0	**7.6**
Access Road (extent of access road reclamation to be determined with SFN)	26.2	0	**Scenario 1** (No Deactivation)
			Scenario 2 (Deactivation From Mine Site to Minto Creek Crossing)
			Scenario 3 (Complete Access Road Deactivation)
Miscellaneous Components	**8.3**	**0.6**	**7.7**
Mine Camp	2.2	0.6	1.6
Air Strip	n/a	n/a	n/a
Mine Contractor Laydown	2.5	0	2.5
Exploration Sites and Trails	n/a	n/a	n/a
Land Treatment & Solid Waste Facilities	1.0	0	1.0
Explosives Plant Site	2.6	0	2.6
Total	**316.0**	**17.5**	**Scenario 1**
			Scenario 2
			Scenario 3

Table 6-2 contains a summary of the different reclamation components, the identified environmental concern and the mitigation measures that will be applied to the component in order to meet the end land use objectives of the site.

Table 6-2 Summary of Main Reclamation Component Mitigation Measures to Achieve Reclamation Objectives

Component	Environmental Concern	Mitigation Measures	Rationale
Main Waste Dump	Metal leaching and nutrient loadings	Compaction to minimize infiltration Engineered soil cover system for source control	Surface compaction and cover system installation to reduce infiltration and subsequent metal loadings in order to achieve receiving environment water quality objectives.
Southwest Waste Dump	Metal leaching and nutrient loadings	Compaction to minimize infiltration Engineered soil cover system for source control	Surface compaction and cover system installation to reduce infiltration and subsequent metal loadings in order to achieve receiving environment water quality objectives.
Grade Bin Disposal Area	Metal leaching from higher copper content waste rock	Consolidation of high copper content materials into single dump. Sub-aqueous disposal to minimize exposure and reduce metal flux from oxidation of sulphidic mineralization.	Long term metal loadings from these materials associated with oxidation of copper sulphide mineralization. Sub-aqueous disposal will reduce exposure of sulphidic mineralization and prevent increased loadings over the long term.
Ore Stockpiles	Metal leaching	Ore stockpiles to be milled as part of Phase IV milling plan.	Milling of low grade stockpiles eliminates the need for cover systems at these locations.
Dry Stacked Tailings Storage Facility	Metal leaching and nutrient loadings	Engineered soil cover system for source control.	Cover system installation to reduce infiltration and subsequent metal loadings in order to achieve receiving environment water quality objectives.
Mill Valley Fill	Metal leaching and nutrient loadings	Installation of a soil cover to reduce metal loadings.	Cover system installation to reduce infiltration and subsequent metal loadings in order to achieve receiving environment water quality objectives.
Area 1 Pit	Metal leaching	Backfilling with tailings and waste rock. Flooding to reduce metal fluxes. Possible in-pit pretreatment and passive treatment wetlands at outflow areas.	Minimize exposure to oxygen of sulphidic mineralization exposed in pit from mining.
Area 2 Pit	Metal leaching	Backfilling with tailings and flooding to reduce metal fluxes. Possible in-pit pretreatment and passive treatment wetlands at outflow areas.	Minimize exposure to oxygen of sulphidic mineralization exposed in pit from mining.
Area 118 Pit	Metal leaching	Backfilling with waste rock and installation of a	Minimize exposure to oxygen of sulphidic mineralization exposed from mining.

Component	Environmental Concern	Mitigation Measures	Rationale
		vegetated soil cover	
Site Drainage	Metal, TSS and nutrient loadings	Active water treatment for period of 4 years following closure Passive wetland or biologic treatment system construction at location of Mill Pond and Main Water Pond	Active water treatment will be required during initial closure period while cover and passive treatment systems are constructed and commissioned. Passive treatment systems provide additional improvements in water quality while also increasing post closure biodiversity.
Contingency in the event that proposed mitigation measures are not effective			
Site Drainage	Metal, TSS and nutrient loadings	Active water treatment using existing treatment system	Active water treatment system has been shown to be effective at achieving receiving environment water quality objectives. System will remain in place as ultimate site contingency.

6.1 Waste Rock and Overburden Dumps

This section addresses the reclamation of the waste rock and overburden dumps at the site which include the following reclamation units:

- main waste dump;
- southwest waste dump;
- ice-rich overburden dump;
- reclamation overburden dump; and
- Bin 0.1 to 0.64 waste stockpile.

The main waste dump and southwest waste dumps are existing mine infrastructure that contain unclassified waste rock generated during earlier mine development. This material was not segregated by copper content and as a result contains some higher copper content materials with metal leaching concerns. Engineered cover systems to reduce metal loadings from these infrastructure units is proposed based on this factor.

6.1.1 Main Waste Dump

The main waste dump (MWD) is located immediately northwest of the open pit, and has been constructed in sequential lifts as materials are extracted from the Area 1 pit. Figure 6-2 and Figure 6-3 show plan and profiles for the MWD. The MWD has been constructed according to EBA's Geotechnical Evaluation – Proposed Main Waste Dump, Minto Project, Yukon (EBA, 1998) which addresses physical stability design considerations such as maximum credible earthquake criteria so the likelihood of major failure of the facility is deemed to be low. Annual inspections of the MWD have taken place as per

Section 9.3.2 of the Quartz Mining Licence QML-0001 and no physical stability issues have been identified to date. The MWD is not expected to receive any additional waste material as a result of Phase IV.

Waste materials placed into the MWD contain varying copper concentrations (0–0.64%) as the majority of this facility was constructed prior to the development of specific material handling plans based on the copper content. Geochemical characterization of the materials as part of permit requirements has shown that the materials do not present an acid rock drainage concern. The average NP/AP ratio of materials placed into the MWD is 48.5 with an average paste pH of 8.61 (MintoEx, 2009). Neutral metal leaching has been identified as being a potential chemical concern associated with closure of this reclamation unit based on the ongoing geochemical characterization program (SRK, 2010a) for the mine.

The proposed reclamation of the MWD will involve addressing physical stability concerns with geochemical concerns being addressed as part of the site-wide source control program described in Section 4 of this report. The slope of each lift will be reclaimed as per Figure 6-4, which shows typical reclamation measures of a dump slope. Slope crests will be rolled over using a tracked dozer with recontouring conducted in areas where the dump faces are greater than the long term angle of repose.

Geochemical characterization of the waste materials intended to be disposed of in the MWD has shown that the materials do not present an acid rock drainage concern. Neutral pH metal leaching has been identified as being a potential geochemical concern associated with closure of the dump based on the ongoing geochemical characterization program (SRK, 2010) for the mine. Initial estimates from the predictive water quality model suggest that up to 14% of the post closure metal loadings will be associated with the MWD (Appendix A).

Bench surfaces of the MWD will be covered with either a soil cover or an engineered cover with the choice of the final cover being based on the need for source reduction for metal leaching into the environment. Prior closure plans for this unit had proposed a soil cover thicknesses of 0.25 m for placement onto the MWD. The 0.25 m thickness is being re-evaluated based on the results of the predictive closure water quality model and the identified need for implementing source control. The current thickness of the engineered soil cover has been estimated at 0.5 m and will be refined based on reclamation research and operational field trials into the closure cover system.

The surface of the MWD shall not be scarified prior placement of the cover as infiltration into the dump materials is not considered desirable based on the potential for neutral metal leaching of the waste materials. Reclamation overburden will be loaded with an excavator and hauled by trucks from the reclamation overburden dump. Overburden will be placed with the trucks and further spread with a low ground pressure dozer. Compaction of the overburden during spreading will be minimized by the use of low ground pressure equipment, however, areas observed to have compaction will be ripped to reduce compaction effects prior to seed and fertilizer application.

Should portions of the MWD be deemed to not require source control, then these areas will have a growth media layer of approximately 0.25 m thickness applied to cover the waste rock followed by

application of an approved reclamation seed mixture and fertilizer. The faces of the MWD will not be subject to source control and will have a soil cover placed at closure to allow for revegetation. The target thickness of the soil cover on the faces of dumps is 0.25 m, however some slope areas may receive less than 0.25 m due to the operational logistics of spreading soil covers on slopes. The current reclamation seed mixture and fertilizer application rates contained in the 2009 Closure Plan for the Minto mine will be followed unless ongoing reclamation research programs show that changes to these are warranted.

A trial reclamation plot was established on a slope of the main waste dump. Direct application of seed onto a trial plot on the first lift of the MWD already graded to final slope was attempted in fall 2008. The amount of fine material and nutrient levels allowed the establishment of a vegetative cover (80%) suggesting that direct seeding onto parts of the final dump will meet the final revegetation objectives for the facility.

6.1.2 Southwest Waste Dump

The southwest waste dump (SWD) is located to the south of the MWD and was designed by EBA in 2008 in order to optimize operations and provide additional storage areas for waste rock and non ice-rich overburden material. Construction began shortly after the design approval in October 2008 and is currently being developed as per the EBA report entitled Geotechnical Design, Proposed Southwest Waste Dump (EBA, 2008). The Phase IV expansion of the SWD will be constructed in accordance with the Phase IV Waste Management Plan (EBA, 2010a) which outlines the design criteria for this unit. The dump has been constructed in progressive lifts with ongoing monitoring of the stability of the SWD will be conducted as recommended in the design report through a combination of visual inspections, deformation surveys and monitoring instrumentation (piezometers, ground temperature cables and survey hubs).

The majority of waste rock scheduled for surface disposal as a result of Phase IV will be placed into the SWD with the exception of higher copper content waste materials which will be stockpiled on the Area 1 pit buttress or placed in the Area 1 open pit. Figure 6-5 and Figure 6-6 show plan and profiles for the proposed SWD following the end of Phase IV. These sections show that some of the original portions of the SWD constructed as part of the currently approved mine workings are covered over as a result of the expansion of this unit. The covering of the older portions of the SWD which are known to potentially contain higher copper content waste rock materials will help to reduce potential metal loadings from these materials.

The SWD is estimated to receive approximately 6.44 Mm^3 of waste materials with copper content less than 0.1% from the Phase IV development. Waste materials placed into the portions of the SWD constructed prior to Phase IV contain varying concentrations of copper as this portion of the facility was constructed prior to the development of specific material handling plans based on the copper content of the waste. The portions of the SWD constructed as part of Phase IV will only contain waste rock with

less than 0.1% copper content. Segregation and special handling of waste materials with greater than 0.1% copper content will help to reduce and potential geochemical concerns associated with neutral metal leaching.

Geochemical characterization of the waste materials intended to be disposed of into the SWD has shown that the materials do not present an acid rock drainage concern. Neutral pH metal leaching has been identified as being a potential geochemical concern associated with closure of the dump based on the ongoing geochemical characterization program (SRK, 2010a) for the mine, however, exclusion of the higher copper content waste materials will help to reduce the geochemical concerns. Initial estimates from the predictive water quality model suggest that up to 52% of the post closure metal loadings will be associated with the SWD (Appendix A).

Bench surfaces of the SWD will be covered with either a soil cover or an engineered cover with the choice of the final cover being based on the need for source reduction for metal leaching into the environment. Prior closure plans for this unit had proposed a soil cover thicknesses of 0.25 m for placement onto the SWD. The 0.25 m thickness is being re-evaluated based on the results of the predictive closure water quality model and the identified need for implementing source control. The current thickness of the engineered soil cover has been estimated at 0.5 m and will be refined based on reclamation research and operational field trials into the closure cover system.

The surface of the SWD shall not be scarified prior placement of the cover as infiltration into the dump materials is not considered desirable based on the potential for neutral metal leaching of the waste materials. Reclamation overburden will be loaded with an excavator and hauled by trucks from the reclamation overburden dump. Overburden will be placed with the trucks and further spread with a low ground pressure dozer. Compaction of the overburden during spreading will be minimized by the use of low ground pressure equipment, however, areas observed to have compaction will be ripped to reduce compaction effects prior to seed and fertilizer application.

Should it be determined that portions of the SWD do not require source control, then a growth media layer of approximately 0.25 m thickness will be applied to those areas to cover the waste rock followed by application seed and fertilizer. The faces of the SWD will not be subject to source control and will have a soil cover placed at closure to allow for revegetation. The target thickness of the soil cover on the faces of dumps is 0.25 m, however some areas may receive than 0.25 m due to the operational logistics of spreading soil covers on slopes. The current reclamation seed mixture and fertilizer application rates contained in the 2009 Closure Plan for the Minto mine will be followed unless ongoing reclamation research programs show that changes to these are warranted.

6.1.3 Ice-Rich Overburden Dump

The ice-rich overburden dump (IROD) is the furthest west reclamation unit on the site and has been constructed immediately upgradient of the SWD. A toe berm has been constructed from waste rock to

retain the ice-rich overburden and prevent migration of the material downslope as ice in the stockpiled materials melt. The IROD has been constructed according to EBA's Geotechnical Design, Ice-Rich Overburden Dump, Minto Mine, Minto YT (EBA, 2006) and has been inspected since as per the Quartz Mining Licence (QML-0001, Section 9.3.2) with no stability issues identified to date. Physical stability of the IROD is the primary closure concern given the ice-rich nature of the materials placed into this unit.

Materials from the IROD will be used as a source for growth media during reclamation of the SWD. Reclamation of the IROD will involve the placement of a 0.25 m layer of overburden on the toe berm as this unit is not deemed to require source control. This material will cover the uppermost 75% of the slope, leaving the furthest downslope area of the toe berm (where it contacts the original ground surface) uncovered to allow moisture seepage as per the construction design. This will avoid raising the phreatic surface inside the IROD.

Any overburden remaining in the dump after closure and reclamation has been completed will be resloped and revegetated. Revegetation test plots were established on the toe berm in 2007, and the final revegetation seed mixtures and fertilization requirements for the IROD will depend on trial and natural revegetation success in this area.

6.1.4 Reclamation Overburden Dump

The reclamation overburden dump (ROD) is located to the west of the MWD and north of the SWD. The ROD will be expanded as a result of Phase IV in order to stockpile reclamation materials stripped during construction and development of site infrastructure (eg. Area 2 and 118 open pits, Mill Valley Fill). The existing portions of the ROD have been constructed in accordance with EBA's Geotechnical Design, Proposed Reclamation Overburden Dump, Minto Mine, Yukon (EBA, 2008). The proposed expansion of the ROD will be constructed in accordance with the EBA's Phase IV Waste Management Plan (EBA, 2010a) which outlines the design criteria for this unit. It is estimated that a total of 2.78 Mm^3 of overburden will be placed into the ROD as part of the Phase IV development activities.

The overburden materials stockpiled in the ROD will be used as a source for growth media during reclamation of other units at the site. Any overburden remaining in the ROD after closure and reclamation has been completed will be resloped and revegetated.

6.1.5 Grade Bin 0.1 to 0.64 Disposal Area

Materials characterization is used at the site in order to identify high copper content waste rock materials with all materials with less than 0.64% copper being considered as waste. The Grade Bin 0.1-0.64 Disposal Area (GBDA) will contain waste rock with a copper content of from 0.1% to 0.64% and located in the footprint of the Southwest Waste Dump. The GBDA was originally intended to be placed onto the Area 1 pit buttress but stability analyses indicated that this would not be possible. Deisgn work is ongoing to determine the location of this temporary stockpile. Table 6-3 shows a summary of the

expected volumes of waste rock in Grade Bin 0.1-0.64 based on copper content as well as the proposed disposal areas for these materials.

Table 6-3 Grade Bin 0.10 - 0.64 Waste Disposal Location

Grade Bin (% Copper)	Disposal Area	Total Expected Volume (M m^3)
0.10 – 0.20	GBDA	0.44
0.20 – 0.64	GBDA	0.49
0.20 – 0.64	Area 1 Open Pit	1.38
Total		**2.55**

This waste material contains the majority of the copper present within the waste and has been identified as having the potential for neutral metal leaching of copper and other metals. Geochemical characterization of this waste material also indicates that there is some sulphidic mineralization present within the waste and that sub-aqueous disposal of this material would be favourable in order to control its metal leaching potential.

The Phase IV Waste Management Plan (EBA, 2010a) indicates that approximately 1.38 Mm^3 of the Bin 0.1 - 0.64 waste rock will be simultaneously disposed with tailings in the Area 1 Pit. The materials that are simultaneously disposed in the Area 1 pit will be the primarily high copper content waste from Grade Bin 0.2-0.64. Simultaneously disposal of these materials will result in a significant volume of this higher copper content waste being encapsulated within the tailings at this location.

At closure the remainder of the materials in the GBDA will be transported into the Area 1 pit for flooding. Some of the relocation of the materials may involve pushing the materials into the pit, however, there will be a need to transport some of the materials to the pit to ensure they are able to be submerged when the pit floods. The rehandling of the remaining GBDA materials into the Area 1 pit may be conducted during winter months when there is less concern with the trafficking the surface of the deposited tailings due to frozen ground conditions.

The footprint of the GBDA will be closed in a similar fashion as that proposed for the SWD.

6.2 Ore Stockpiles and Pads

The Phase IV mining plan includes the milling of all stockpiled ore prior to final closure. The following stockpiles at the site will be treated in this fashion and therefore are not deemed to be an issue at closure:

- high grade sulphide ore stockpile and pad (located south of the mill); and

- low grade sulphide ore stockpile and oxide ore pad (located between the pit and the MWD).

The low grade sulphide stockpile pad has been constructed from waste rock according to design criteria set out in EBA's Waste Rock Stability Evaluation, Minto Project, Yukon (EBA, 1996). The waste dumps on site are designed in accordance with the recommendations in "Mined Rock and Overburden Piles Investigation and Design Manual" published by the BC Mine Waste Rock Pile Research Committee. In accordance with the above mentioned manual, all waste dumps on site are designed to be stable up to a seismic event which results in peak ground accelerations which have a 10% probability of exceedance in 50 years. The high grade ore stockpile pad has also been constructed on waste rock. The ore stockpiles have been inspected annually as per the Quartz Mining Licence (QML-0001) and there are no issues identified to date that suggest long term stability concerns for these units.

Reclamation of the stockpile pads will be conducted following the completion of milling of stockpiled ore materials. Compacted portions of the pads will not be scarified to promote drainage as the geochemical characterization program indicates that there is potential for neutral metal leaching from these materials. The pads will have a 0.25 m soil layer of growth material applied followed by application of seed and fertilizer.

6.3 Open Pits

Phase IV will involve the development of the Area 2 and Area 118 open pits. The Area 1 open pit, formerly referred to as the Main Pit, will be mined out during 2011 and has been included in this plan based on the planned deposition of tailings and waste rock into this unit. Figure 6-7 and Figure 6-8 show a plan view and section through the Area 1 Pit and Area 2 Pit along with information on waste rock and tailings deposition into these pits.

6.3.1 Area 1 Pit

The Area 1 pit encompasses the original drainage channel for Minto Creek. The Area 1 pit is being excavated according to the Company's Open Pit Design Plans (MintoEx, 2006). The north wall of the pit is benched in competent bedrock while the south wall is composed of bedrock and ice-rich overburden. Instability in the ice-rich overburden of the south wall is currently being monitored. Despite partial covering of the south wall with a thermal insulating medium during operations, slumping of the south wall was observed during summer 2009. Stability monitoring of the pit is part of ongoing mine operations and is not deemed to be relevant to the post closure phase of the project. Acid-base accounting indicates that the open pit wall rocks are net neutral to slightly acid consuming (non-acid generating). Results to date (SRK, 2010a) indicate that the open pit wall geochemistry is consistent with the initial geochemical predictions put forward in the original geochemical characterization report (Mills, 1997).

The open pit is scheduled to be exhausted of ore during late 2010 and the current Phase IV schedule calls for placement of tailings into the Area 1 pit starting in April 2011. A buttress will be constructed to ensure the stability of the southern wall of the pit. The Area 1 pit buttress was designed by SRK Consulting Inc. (SRK, 2009a) and will be constructed from 1.3 Mm^3 of waste rock with copper contents below the 0.64% cut-off grade. Segregation of geological materials to be used in the construction of the buttress is not possible given the need to construct this unit prior to placement of tailings into the Area 1 pit. Figure 6-9 shows a plan of the buttress.

Waste rock materials with copper content from 0.2% to 0.64% will be deposited into the Area 1 Pit simultaneously with the thickened tailings. During the operations period the storage capacity of the flooded pit will be sufficient to accommodate the design storm volume of 700,000 m^3 which is required by current site permitting. Following the end of the simultaneous waste rock and tailings deposition, the Area 1 pit will be backfilled to less than 8 metres below the final spillway invert elevation.

The completion of tailings deposition into the Area 1 pit occurs while the mine is still in operations and construction of a final discharge channel from the pit to Minto Creek will not be possible until the end of milling activities currently scheduled for early 2016. Excess water accumulated in the Area 1 pit prior to the construction of the discharge channel will be either:

- Subject to treatment in the water treatment plant and discharged to the receiving environment; or
- Pumped into the Area 2 pit to accelerate flooding of that unit.

Waste materials from the GBDA will be disposed of in the Area 1 pit following the end of milling activities at the site when it has been determined that the design storm storage capacity is no longer required. The pit will then be allowed to flood in order to cover the deposited tailings and waste rock. Water quality in the Area 1 pit will be monitored during flooding and the water treatment plant will be in place so that water can treated prior to release off-site.

Figure 6-10 shows a plan view identifying the water management plan that will be implemented for drainage of the pits. At closure, approximately 55% (10.6 ha) of the open pit walls will remain exposed above water following flooding of the Area 1 pit. Prior to flooding, any accessible benches in the pit excavated in overburden will be scarified to encourage natural revegetation, but no additional reclamation work will be done on the open pit high walls. Boulders, up to 1 m in size, will be placed on all potential access routes to prevent uncontrolled human access to the pit.

Due to local topography the Area 1 pit will daylight on the east side and the pit discharge channel will be constructed in this area. A wetland complex as described in section 4.2.2.2 will potentially be constructed as part of the outflow area from the pit into the discharge channel. This will act to polish water as it exits the pit, after having been subject to settling in the pit lake water column, and possibly to additional in-pit treatment, as outlined in section 4.2.2.1. The sides of the discharge channel will be constructed to ensure that wildlife are able to avoid becoming trapped. The discharge channel from the

Area 1 pit will be routed to the east through the mill pad and across the MVF. The Area 1 discharge channel will be designed to accommodate the Probable Maximum Flood (PMF) event for the entire catchment area upstream of the Area 1 pit. Figure 6-11 show details on the drainage channels for the Area 1 pit.

6.3.2 Area 2 Pit

The Area 2 Pit is located to the west of the Dry Stack Tailings Storage Facility and does not intersect any existing surface drainage channels. The Area 2 open pit will be constructed using standard drill and blast mining techniques with the proposed excavation occurring in competent bedrock. Some of the upper benches will be excavated into overburden and there is the potential for shallow surficial instability to occur in the overburden unit. Any areas of instability noted during operations will be addressed during subsequent updates of this document. Acid-base accounting indicates that the open pit wall rocks are net neutral to slightly acid consuming (non-acid generating).

The Area 2 pit will be used to store tailings once the Area 1 pit has been filled to its design capacity and the final elevation of the tailings will be approximately 765 m (Figure 6-8). Following the cessation of operations, the Area 2 pit will be flooded until it overflows. The Area 2 pit lake will have an approximate depth of 35 m following flooding.

Due to the limited topography in Area 2 pit it is estimated that approximately 20% of the open pit walls will be exposed following flooding of this unit. The proposed Area 2 pit will spill to the north at an elevation of approximately 801 m. The conceptual spillway invert elevation is estimated to be at approximately 800 m but the final invert elevation will be determined following development of that portion of the pit. Figure 6-10 and Figure 6-12 shows details on the Area 2 pit drainage channels. The Area 2 discharge channel will be designed to accommodate the PMF event for the entire upstream catchment area.

Prior to flooding, any accessible benches in the pit excavated in overburden will be scarified to encourage natural revegetation, but no additional reclamation work will be done on the open pit high walls. Boulders, up to 1 m in size, will be placed on all potential access routes to prevent uncontrolled human access to the pit. A wetland complex as described in section 4.2.2.2 will be constructed as part of the outflow area from the pit into the discharge channel. This will act to polish water as it exits the pit, after having been subject to settling in the pit lake water column, and possibly to additional in-pit treatment, as outlined in section 4.2.2.1.

The existing Southwest Diversion Ditch will be diverted into the Area 2 Pit at closure rather than attempt to maintain the diversion structure required during operations to route flows around the pit. The Company will evaluate whether pumping water into the Area 2 pit is required in order to accelerate the flooding process at closure. Pumping into the Area 2 pit is currently considered as a favourable measure to submerge non-acid generating sulphidic materials that are exposed as a result of the mining

operations in this area. Accelerated flooding of the pit will act to reduce the oxidation of any exposed materials in the pit walls resulting in lower overall metal loadings due to less soluble secondary weathering products being produced from sulphide oxidation.

6.3.3 Area 118 Pit

The Area 118 pit is located upslope to the west of the Area 2 pit and will be mined during 2012. The Area 118 open pit will be constructed using standard drill and blast mining techniques with the proposed excavation occurring in competent bedrock. The upper benches will be excavated into overburden and there is the potential for shallow surficial instability to occur in the overburden unit. Any areas of instability noted during operations will be addressed during subsequent updates of this document. Acid-base accounting indicates that the open pit wall rocks are net neutral to slightly acid consuming (non-acid generating).

The Area 118 pit is intended to be backfilled with approximately 0.3 Mm3 of waste rock sourced from the Area 2 Pit and underground workings during the operations phase of the project. The waste rock for backfilling of this unit will have a copper content from 0.0 – 0.64%. Due to topography only a small portion of the overall pit walls will be exposed at closure following backfilling of this unit. The waste rock will be covered with overburden which will be used as the reclamation growth media to revegetate the pit. A thickness of 0.25 m has chosen for the revegetated overburden cover on the waste rock as this unit does not require source control.

A discharge channel will be constructed from the low point of the Area 118 pit to direct flows into the Area 2 pit during the post closure period in the event that there is discharge from the pit during the post closure period. The need for this channel will be reviewed based on hydrogeologic information collected during the mine operations phase and this component will be addressed in subsequent revisions to this plan.

6.4 Underground Workings

The proposed Phase IV mining plan includes underground mining below the Area 2 and Area 118 open pits. The development of the portal will involve some surface excavation in order to expose bedrock for drilling and blasting (Figure 6-13). The underground mining will involve development of a production ramp on a decline to access the ore resources beneath the Area 2 and Area 118 open pits. The underground mining is expected to result in 1,541 kt of ore and 341 kt of waste being excavated.

All of the waste materials are to be backfilled in the underground workings with the exception of a minor portion of waste materials that will be temporarily stockpiled on surface during development of the production ramp and subsequently deposited back underground workings or into the Area 118 pit based on the results of geochemical characterization.

Geochemical characterization of the underground waste materials from core samples to date has shown that they are similar in nature to the waste rock that will be excavated as a result of the Area 2 and Area 118 open pit mining.

The portal to the underground workings will be sealed at closure to prevent access by people and wildlife to the workings in according with the Yukon Quartz Mining Act. The one ventilation raise associated with the workings will also be sealed to prevent access into the underground. The underground workings will be allowed to flood following the end of underground mining. Hydrogeologic investigations (SRK, 2010b) at the site to date indicate that the groundwater table will not result in water discharging to surface from the underground workings in the post closure period.

The portion of the portal area that is excavated into overburden will have the slopes recontoured to ensure a stable angle followed by application of seed and fertilizer.

6.5 Haul Roads

The haul roads on the site radiate out from the open pit to the mill, the ore stockpiles, the waste rock dumps and the ice-rich overburden dump. Typical road reclamation measures will be employed at final closure. These measures will apply to haul roads, site roads and the main access road alike.

Haul roads will be subject to standard road decommissioning and reclamation measures at closure, including culvert excavation, drainage recontouring, slope stabilization and surface scarification. Regrading/contouring of the roads will ensure that runoff sheds off the road surface and does not become ponded. Site reclamation experience indicates that The road surfaces are not expected to require seeding, only surface scarification in order to encourage natural revegetation. Sediment management measures will be installed where drainage channels have been re-established in order to prevent sediment from entering streams while revegetation occurs. Sediment management measures may include installation of silt fencing and enviro-matting at select sites.

6.6 Dry Stack Tailings Storage Area and Diversion Structures

Currently, the tailings from the Minto milling process undergo a dewatering process using ceramic filters before being conveyed by truck for spreading and compaction in the Dry Stack Tailings Storage Facility (DSTSF). Construction of the facility is in accordance with EBA's Geotechnical Design Report, Dry Stack Tailings Storage Facility, Minto Mine, Yukon (EBA, 2007). Further details on the tailings handling procedures are available in the Company's current Tailings Management Plan (TMP) and the related Operations, Maintenance and Surveillance plan (OMS) for the facility. The proposed reclamation measures for the DSTSF are presented in Figure 6-14.

The DSTSF is located on a bench to the south of the mill and upslope from the Minto Creek channel. The facility is being constructed as per the specifications provided in the TMP and overseen by the Engineer of Record (EBA). A quality control program is in place wherein field compaction is regularly verified using a nuclear densometer. Monitoring of the stability of the stack has been conducted through daily visual inspections and through monitoring the installed instrumentation (piezometers, ground temperature cables and settlement monuments). Regular field visits and an annual geotechnical inspection are conducted by the Engineer of Record as required under the Quartz Mining Licence QML-0001 (Section 9.3.2).

Monitoring of the DSTSF has shown that there has been recent movement of the facility at an rate of between 3 to 4 mm/day. Monitoring of the movement of the facility will be ongoing during the operations phase and potential revisions to the closure methodology for this reclamation unit will be addressed in subsequent updates of this report. The proposed Mill Valley Fill which is described in the next section has been designed to buttress the DSTSF and mitigate movement of this facility.

The Company submitted a risk assessment report on the DSTSF to the Department of Energy Mines and Resources (EMR) in March 2009 (SRK, 2009b). The report evaluated all conceivable failure modes for the facility using the Failure Modes and Effects Analysis (FMEA) method. The report recognizes the lowered physical risks associated with the DSTSF versus a conventional slurried tailings impoundment and noted that the regulatory requirements necessary to mitigate risks are currently in place.

Existing design components (upstream diversion ditches, finger drains and a toe berm) are currently intercepting and diverting surface runoff from upslope and filtering seepage from below the area. Field observations show that the current diversion structures will need to be enhanced at closure to ensure water is successfully captured and routed around the facility.

Geochemical characterization of the tailings has indicated there is no acid-rock drainage potential with the tailings in this reclamation unit, however, neutral metal leaching of copper and other elements has been identified. Closure measures for the DSTSF will focus on reduction of source loadings from the facility in addition to ensuring the physical stability of the facility. Managing water movement in and around the facility is seen as the key factor in the design of closures measures. The compacted tailings have a low permeability due to the mechanical compaction of the tailings following spreading in the facility. Infiltration of precipitation and run-on water is not expected to have a significant influence on the DSTSF and surface grading will be utilized during the closure phase to assist in shedding water from the surface.

The design of an engineered cover for the flat surface of the facility to prevent water infiltration into the tailings surface will be required based on the identified concern over neutral pH metal leaching from this facility. The cover system will be designed to accommodate some run-on water bypassing the diversion structures which are located upgradient of the DSTSF. If required run-on water will be diverted away from the face of the DSTSF by a run-on diversion ditch to minimize the potential for erosion on the face of the DSTSF. The DSTSF will be subject to source control and will have a soil cover of approximately 0.5

m thickness placed during closure of the facility. The thickness of the soil cover on the face of the DSTSF may, in some areas, be less than 0.5 m due to the operational logistics of spreading soil covers on slopes. The current reclamation seed mixture and fertilizer application rates outlined in section 4 will be followed unless ongoing reclamation research programs show that changes to these are warranted.

6.6.1 DSTSF Diversion Structures

The south diversion ditch (SDD) is the primary diversion structure and is used to convey flow from the original tributary channel that previously ran through the DSTSF into the mill water pond. This SDD is presently constructed to convey the calculated 1 in 200 year flood event for the drainage. During closure the SDD will be widened and deepened to ensure that it has adequate flow capacity for the post closure period. The operations Water Management Plan bypass of the SDD around the Area 2 pit will be decommissioned allowing the SDD to spill into the Area 2 pit. This change in closure water management reduces the post closure length of the SDD by approximately 50% compared with the existing ditch length.

The tailings diversion ditch (TDD) is currently constructed as a surface berm with some portions of the ditch being lined in an attempt to minimize underflow and leakage. The surface berm construction methodology for the TDD is based on the presence of permafrost in that portion of the site. Water that bypasses the TDD is designed to be addressed with the finger drains at the base of the DSTSF. The TDD will divert water to the northeast and into a natural drainage that flows down towards the Water Storage Pond..

6.7 Mill Valley Fill

The Mill Valley Fill (MVF) is located immediately downslope of the DSTSF and has been designed to buttress the DSTSF due to stability concerns identified through the instrumentation monitoring program at the site. The MVF will also allow for expansion of the camp pad and establishment of surface laydown areas during the operations phase. The MVF will be constructed from 1.3 Mm^3 of waste materials with Grade Bin 0 waste materials (no copper content) in order to limit the potential for neutral metal leaching into the receiving environment. Figure 6-15 and Figure 6-16 show the design plan and profile for the MVF.

Closure of the MVF will be conducted at the end of Phase IV milling and will involve the removal of any temporary building and materials stored in the laydown areas. The location of the MVF in the main valley of Minto Creek means that it will be necessary to route the main site discharge channel through the footprint of the MVF. Figure 6-17 and 6-18 show details on the drainage channel through the MVF. The main site discharge channel will be designed to accommodate the PMF event for the entire upstream catchment area. Evaluation of the potential for the main site discharge channel to influence the geotechnical stability of the DSTSF will be evaluated during detailed design. The cost of the spillway

design and associated geotechnical stability evaluation has been included in the closure costing for this unit. It is important to understand that the detailed design and associated geotechnical evaluations for this channel are not able to be finalized until after this facility has been constructed so that as-built conditions can be used.

Recontouring of areas of the MVF not required for channel construction will be conducted in order to establish final drainage runoff patterns. The surface of the MVF is currently not expected to require source control so it will be covered with 0.25 metres of growth media prior to application of seed and fertilizer.

6.8 Main Water Dam

The location of the main water dam relative to the other site development is shown in Figure 2-3, and reclamation/decommissioning plans for the Main Water Dam are shown in Figure 6-19. The water dam on Minto Creek provides water retention for mill processes and various site uses during operations and is considered to be the furthest downstream point for discharge control at the site. The original project proposal initially predicted that excess water would meet the Water Use Licence (WUL) effluent criteria and be discharged passively to Lower Minto Creek over the dam spillway. Operational experience based on heavy precipitation and snowpack years has shown that a water treatment plant, as per the current site Water Management Plan, will be required. The treatment plant was installed and operational during the second quarter of 2010 and will remain in operation until WUL criteria can be achieved.

It is now envisioned that the dam will remain in place until such time that the water quality at the site has stabilized to the satisfaction of stakeholders. In the interim it will act as a settling pond where turbid runoff waters will undergo retention, monitoring and treatment if required. The current water treatment plant located near the Mill Pond will be relocated to this area during closure in order to allow for active treatment as required.

Once the water quality in Minto Creek reaches the acceptable effluent criteria, water will be allowed to move into the creek over the dam spillway for the remainder of the open flow season. The dam would then be decommissioned with any sediments in the facility being excavated and hauled to the waste rock dump for disposal.

Predictive water chemistry modeling has identified a need for ongoing treatment of water at the site. This area will be converted into a passive treatment system such as a treatment wetland, permeable reactive barrier or some combination of these two. The hydrologic design standards for modification of the main water dam will be the Q200 flow unless other standards are found to be warranted during detail design of the wetland.

Physical stability of the main water dam in the period prior to decommissioning will be ensured during post closure by regular geotechnical inspections. In the most recent inspection report, the engineer of

record has recommended a review of the surveillance data collected to date in order to assess the dam's performance (EBA, August 2009). It is expected that the dam would be fortified against erosion using rip rap armouring with an annual inspection frequency during the initial post closure period.

6.9 Mill and Ancillary Facilities

This section addresses the decommissioning measures for the mill and the ancillary facilities in the immediate vicinity that support the milling activities. The facilities addressed in this section include:

- Mill building;
- mill reagents;
- concentrate shed;
- filter press building; and
- mill water pond.

Figure 6-20 shows details on the closure measures for these facilities. Physical stability concerns for these structures at closure will be mitigated by their disassembly and removal from the site with the exception of the mill water pond which will require earthworks to mitigate physical stability issues. Environmental concerns for these areas will arise primarily from contamination of surrounding soils by fuel, chemicals or other wastes. Such instances will be documented through an environmental audit, conducted upon the completion of milling activities. Any contaminated soils identified will be remediated on site at the site's approved land treatment facility, and any recyclables and/or special wastes will be removed from the solid waste facility. Closure plans will be submitted to YG Environment prior to the final decommissioning of the land treatment facility and the solid waste facility.

A salvage program will be conducted towards the end of mine life to minimize the volume of scrap generated by the decommissioning of these facilities that will require in-situ disposal. It is expected that removal of these facilities, namely the camp and explosives plant site, will be done by auction or contractor for salvage value.

The reclaim line and all above ground power cables and overhead power line gear will be salvaged. Any buried services such as piping and wiring will remain buried. Concrete footings will be broken down to slightly below grade as required and covered with fill. Recontouring of areas will also be conducted as required in order to establish final drainage runoff patterns. Culverts will be removed and pertinent areas will be covered in approximately 0.5 metres (unless otherwise noted) of growth media prior to application of seed and fertilizer.

6.9.1 Mill Building

Closure measures for this reclamation unit will include the removal of salvageable mill components, such as the ball and SAG mills and other milling-related equipment within the structure. It is anticipated that the building and steel framework will also be salvageable and that there will be minimal materials requiring disposal onsite. Any recyclable materials will be shipped to an appropriate recycling facility and all wastes will be disposed of either in the site solid waste management facility or an approved off site disposal facility.

The concrete foundations and building footprint will be reclaimed in the manner described at the start of this section. The toe slopes of the fill at both the mill and the campsite pads will be recontoured to assume a more rounded slope, limiting erosion as much as possible. The angle and subsequent stabilization/revegetation measures will be contingent upon reclamation research findings from variable slope trial plots.

6.9.2 Generator Buildings

The generator buildings will be removed from the site after the power hook-ups are disassembled. Site reclamation of the area occupied by the generator buildings will be in the same manner described for the camp area.

6.9.3 Concentrate Shed

The concentrate shed will be dismantled and removed for sale or salvage at the end of mine life. The remaining concrete footings will be broken down to slightly below grade and covered in fill material. Recontouring will also be conducted as required in order to establish final drainage runoff patterns and areas being reclaimed will be covered in 0.25 metres of growth media and revegetated using the approved reclamation seed mixture.

The southwest corner of the foundation may require complete demolition to facilitate the excavation of the reclaimed drainage channel for Minto Creek in the vicinity of the mill water pond. This section of the foundation would be broken down and pushed into the interior of the remaining footings area, and all footings will be collapsed inward and buried with fill prior to surface reclamation.

6.9.4 Tailings Filter Building

The tailings filter building and associated tailings handling infrastructure (conveyors, etc.) will be dismantled and removed for sale or salvage at the end of mine life. Any recyclable materials will be shipped to an appropriate recycling facility and all wastes will be disposed of in an appropriate disposal area, either the site solid waste management facility or an approved off site disposal facility.

Concrete footings will be broken down to slightly below grade and covered in fill material. Recontouring will also be conducted as required in order to establish final drainage runoff patterns and areas being reclaimed will be covered in 0.25 metres of growth media prior to application of seed and fertilizer.

6.9.5 Mill Water Pond

The mill water pond is a lined pond, constructed according to EBA's Final Preliminary Design – Mill Water Pond, Minto Property, Yukon Territory (EBA, 1997). Together, the mill water pond and the main dam impoundment retain the water needed for make up process water for milling activities, supplementing water from the pit dewatering wells and mill groundwater well.

The mill pond will be left in place as an interim holding area for water entering the water treatment plant during the initial closure period. Some clean up of the mill pond may be necessary in order to prevent degradation of storm water entering the mill pond from the pit. Current water quality in the mill pond is within federal Metal Mine Effluent Regulations criteria but does not meet the WUL QZ96-006 effluent criteria for discharge.

Figure 6-10 and 6-18 shows the planned reclamation activities for the section of Minto Creek presently entering and exiting the mill water pond. The existing culvert upstream of the mill water pond will be excavated and removed. In order to withstand the Probable Maximum Flood flow, a conveyance channel will be constructed through the present alignment of the mill water pond, with the same approximate dimensions as those utilized for the main water dam spillway construction.

The area of the mill pond will be evaluated to determine whether there is potential for construction of a passive treatment wetland to reduce the potential for water quality effects in the post closure period. The requirement for the passive treatment wetland will be determined based on the results of reclamation research on source control to reduce metal loadings from site infrastructure. Progressive reclamation and post closure monitoring of the DSTSF during Phase IV operations will also be used to help evaluate the need for a passive water treatment facility in this area.

6.9.6 Mill Reagents and Chemicals

Following the end of milling operations any unused mill reagent supplies will be returned to the supplier for credit. It is anticipated that all reagent product at the site will be properly contained/stored so that no product will be considered as special waste. A closure inventory/investigation of reagents and hazardous materials on site will be conducted upon the cessation of milling activities. Should some product's containment be deemed suspect upon the closure inspection, that volume of materials will be added to an inventory of special wastes, stored under the Company's Special Waste Permit # 43-040, and removed from the site for disposal in a permitted facility by a licenced contractor with other special wastes on site.

It is expected that the mine's inventory of hydrocarbon products at the Minto site will be consumed during the closure activities. Fuels and lubricants will be required during the implementation period of the closure plan following the end of milling activities. The inventory remaining on site once all activity has ceased will be removed from the site by one of three methods:

- returned to the original supplier for credit wherever possible;
- sold to a third party user; or
- trucked to an authorized disposal agency to be recycled or destroyed.

It should be noted that the operation of diesel powered vehicles and any electrical generators used on site will provide the Company with a method of reducing remaining inventory of diesel fuel as the mining operations cease. Gasoline will be similarly removed, and any remaining inventories of diesel and gasoline will be returned to suppliers or sold based on wide spread local use.

The propane supplier will remove propane tanks. Associated propane delivery lines at the camp will be removed and disposed of in a manner similar to that of the gasoline and diesel fuels.

Other hydrocarbon products that may be present at the mine site are primarily hydraulic fluids, lubricating oils, greases, antifreeze and solvents packaged in either 1000 litre bulk cubitainers, 205 litre drums or smaller packaging. In most cases the remaining inventory of these materials will be returned to the original suppliers for reuse or sold to other third party users in the local area. In certain circumstances, specialized products may have to be disposed of through a licenced waste disposal firm. It is anticipated that the volume of materials requiring disposal as special waste will be limited.

Any fuel storage areas and refueling stations, once decommissioned, will be assessed for hydrocarbon contamination of the underlying soils. A formal site assessment to identify hydrocarbon contaminated soils in other portions of the site will be conducted as part of the closure program and any soils identified by this assessment will be excavated and transported to the company's permitted Land Treatment Facility (LTF).

It is anticipated that landfarming of soils in the LTF will be required for a period of several years following the completion of decommissioning activities at the site.

6.9.7 Contractor's Shop and Work Area

The mining contractor's area, constructed on site adjacent to the toe of the MWD, will serve as the base of operations for the mining contractor during active mining activities. At closure, the buildings in this area will be dismantled and removed, and any scrap will be hauled to the on site permitted Solid Waste Facility.

Physical stability will not be a concern at closure for this area. This is a low elevation pad that will only require proper erosion control. Environmental concerns for these areas will arise primarily from

contamination of surrounding soils by fuel, chemicals or other wastes. Such instances will be documented through an environmental audit, conducted upon the completion of milling activities. Any contaminated soils identified will be remediated on site at the site's approved land treatment facility, and any recyclables and/or special wastes will be removed from the solid waste facility. Closure plans will be submitted to YG Environment prior to the final decommissioning of the land treatment facility and the solid waste facility.

6.10 Main Access Road

The main access road to the property was constructed in 1996 and 1997. This road was constructed to facilitate traffic from 26-ton ore concentrate trucks. The road was constructed by cut and fill methods with a road width of 8 meters and associated ditch drainage and culvert installations. Figure 2-2 shows the alignment of the main access road. The Company expects that the determination of the extent to which the main access road is deactivated will be made in consultation primarily with SFN and secondarily with local trappers, the community, and government regulators. The closure plan presents three options for road reclamation.

1. No road deactivation;
2. Road deactivation from Minto Creek to the mine site; or
3. Deactivation of the entire road.

In making a final decision about closing the main access road, consideration will also be given to the potential requirement for equipment access. Despite the identified closure timing and schedule, final access road removal (if selected) would only be undertaken once it is concluded that the site is stable and there is no need for heavy equipment access to the site.

The primary consideration for the physical stability of the main access road at closure will be slope stability where culverts have been removed and drainages channels have been established through the road alignments. Siltation of streams could occur during culvert removal and bank stabilization work. The road will be inspected during an environmental audit to take place at the end of mine life to identify any spills or contamination that was not addressed during operations. The results of that audit would be shared with and/or conducted by SFN Lands and Resources Department so that a scope of work for closure could be jointly developed.

Should one of the two options involving deactivation be chosen for the road, then standard road decommissioning and reclamation measures at closure, including culvert excavation, drainage recontouring, slope stabilization and surface scarification will be applied.

Culvert removal work will be conducted in the later summer/early fall when flows are low or non-existent. Culvert removals and bank recontouring works at locations where there is still flow will include pump around or flow diversions to ensure that work is done in the dry and silt loads are not added to

stream systems. Regrading/contouring the roads will ensure that runoff sheds off the road surface. The road surfaces are not expected to require seeding, only surface scarification to encourage natural revegetation.

The removal of culverts at stream crossings which are fish bearing is of primary concern. At these stream crossings, the roadbed would be cut down to the culvert and original streambed elevation with side slopes brought back to 2H:1V. Material removed during culvert removal will be spread loosely on adjacent road surface to promote revegetation. The stream channel would be stabilized and slopes revegetated. The Big Creek bridge and all culverts will be removed once all heavy equipment has been removed from the mine and closure activities have been completed in the upper Minto Creek basin.

The disturbed footprint of the access road occupies only a portion of the cleared right-of way. Site experience shows that vegetation should re-establish itself in the 30 m wide right-of-way during the life of mine and only remedial revegetation work will likely be required. The preferred methodology is to encourage natural revegetation to occur, after first preparing the road surface by recontouring and scarifying. Temporary sediment management measures such as silt fencing will be installed as required in order to minimize sediment transport during establishment of a vegetative cover. Figure 6-21 shows the reclamation measures for the access road.

6.11 Miscellaneous Sites and Facilities

This section addresses the decommissioning measures for miscellaneous facilities and sites around the property. These facilities include:

- mine camp and related infrastructure;
- airstrip,
- exploration sites and trails;
- land treatment facility;
- solid waste facility
- explosives plant site; and
- site roads.

Figure 6-20 shows details on the closure measures for the camp area. Closure measures will focus on long-term physical stability of these areas following closure and ensuring that any areas of contamination are identified and remediated in an appropriate manner. The physical stability of these structures/areas at closure will be mitigated for the most part by either:

- disassembly and removal from the site; and/or
- recontouring and revegetation of the area.

Environmental concerns for these areas will arise primarily from contamination of surrounding soils by fuel, chemicals or other wastes. Such instances will be documented through an environmental audit, conducted upon the completion of milling activities. Any contaminated soils identified will be remediated on site at the site's approved land treatment facility, and any recyclables and/or special wastes will be removed from the solid waste facility. Closure plans will be submitted to YG Environment prior to the final decommissioning of the land treatment facility and the solid waste facility.

A salvage program will be conducted towards the end of mine life to minimize the volume of scrap generated by the decommissioning of these facilities that will require in-situ disposal. It is expected that removal of these facilities, namely the camp and explosives plant site, will be done by auction or contractor for salvage value.

Buried services such as piping and wiring will remain buried. Concrete footings will be broken down to slightly below grade, where required, and covered with fill. Recontouring of areas will also be conducted as required in order to establish final drainage runoff patterns. Culverts will be removed and pertinent areas will be covered in 0.25 metres of growth media and prior to application of seed and fertilizer.

6.11.1 Mine Camp and Related Infrastructure

In 1999 the Company completed construction of a camp for mine staff that included living quarters for 42 persons – a seven-unit accommodation/kitchen/diner/change room complex. In 2006, the camp was expanded by the addition of trailers and other construction to provide capacity for 140 persons, including an office complex. The facility provides a potable water supply (drilled groundwater well, 1998), gas-fired heat, a local power supply, and sewage disposal to two adjacent septic fields. Several structures behind the facility house the fuel supply to the furnaces, relay power from a diesel electrical generator, and pump fresh water. Part of the Phase IV expansion plan is to expand the camp facilities onto the Mill Valley Fill to increase the total camp capacity.

Upon closure the septic tanks would be pumped out and the waste will be hauled to an approved disposal facility, as during operations. The remaining tanks will be crushed and infilled with general fill material before being covered in 0.25 m of overburden and revegetated. The remaining infrastructure (i.e. piping and related materials, including the septic field) for the two systems would remain buried.

Closure measures for the campsite include disassembly of the camp trailers and related infrastructure. All salvageable material will then be removed from the site. The remaining campsite landing will be scarified and recontoured, as required, to establish drainage patterns and the covered with 0.25 m of growth media and revegetated. Seed mixtures and fertilization specifications will be based on both revegetation trials and natural revegetation observations and success.

6.11.2 Airstrip

The airstrip area was noted to be subject to colonization by natural vegetation during a period of project inactivity from 1997 to 2005. Based on these observations reclamation of the airstrip will focus on scarification of compacted surfaces with natural revegetation allowed to occur in order to minimize the introduction of non-native species. Seeding of this reclamation unit is not deemed to be required as there is minimal erosion potential with the airstrip.

6.11.3 Exploration Sites and Trails

Current exploration activities being conducted on the site are operating under a Class III Mining Land Use Authorization, and are subject to specific closure measures by the Company as identified in the Class III Authorization. These measures will be implemented as required by the exploration crew, and are not subject to closure planning in this plan.

6.11.4 Land Treatment Facility

The Minto land treatment facility (LTF) for the site is located near the airstrip in an area originally excavated from bedrock for an equipment laydown area. This facility is permitted by YG, Department of Environment, and Environmental Programs Branch under Permit #24-204 to treat a maximum volume of 700 m3 of hydrocarbon contaminated soil. Contaminated soils from fuel/oil spills during operations will be treated at the site to appropriate levels of remediation before being used as industrial fill as per permit requirements.

The closure of this facility is subject to the submission of a formal Closure Plan to YG, along with sampling results which demonstrate the final concentrations of contaminants in the soil being treated. It is expected that upon final closure of the entire site, dismantling and decommissioning activities may reveal or result in soil contamination requiring the relocation to the LTF and an undetermined number of months of treatment to achieve desired remediation levels. As such, the LTF Closure Plan and final sampling results will be prepared and submitted some time after final closure of the mine site has begun.

Generally, once the desired contaminant levels have been reached in the final volumes of treated soil, and the Closure Plan has been approved by YG, the soils will be spread over the site, recontoured in place and revegetated. If required, additional overburden may be hauled and used as cover material and growth media for revegetation.

6.11.5 Solid Waste Facility

Under Commercial Dump Permit # 81-005, issued to Minto Explorations Ltd. by YG, Department of Environment, Environmental Programs Branch, MintoEx has established a Solid Waste Facility adjacent to the Land Treatment Facility near the airport that includes:

- a burning pit for wood and paper waste;
- construction waste disposal area;
- metal and rubber tire disposal areas; and
- incinerator ash disposal in old exploration trenches.

This solid waste facility will receive construction and operational waste throughout the operation of the mine, as permitted, and will be covered by fill and compacted in 'lifts' as per common landfill practice.

Scrap equipment will be stored in various lay down areas ("bone yards") located on site and along the access road, including primarily scrapped equipment stored to be utilized on the mine site as a source of spare parts or good recyclable scrap material. Salvageable material from these sites will be sold as scrap and removed from the site at closure. Material that has no scrap value will be disposed of in the solid waste facility. Prior to disposal in the landfill, all of this material will be examined to ensure that all hazardous materials have been removed.

Any hazardous materials identified in these areas will be removed and shipped off site to a licenced waste disposal site, along with other stored hazardous or special wastes, permitted under the company's Special Waste Permit # 43-040.

The submission of a formal Closure Plan to YG for the solid waste facility will be required at final closure documenting the conditions and materials at closure. Preceding the final reclamation of this facility, tires and salvageable scrap metal will be hauled off site for salvage/recycling and once the closure plan is approved by YG, the facility will be covered by two compacted layers of 200 mm thick compactable soil material obtained from local borrow sources. The cover material will be graded to prevent pooling of precipitation runoff and to encourage the shedding of water. The site will then be revegetated using a suitable seed mixture.

6.11.6 Explosives Plant Site

The ANFO explosives (ammonium nitrate – fuel oil) production area is comprised of the production plant and AN bag storage and powder magazine storage areas, located near the drainage boundary southwest of the main mine site (see Figure 1-3).

At closure, unused explosives that remain on site will be returned for credit and the explosives magazines and other equipment will be returned to the explosives supplier. The septic system at the site will be pumped of contents, broken down and backfilled. Any fuel-contaminated soils identified at

this location will be excavated and hauled to the land treatment facility for remediation. Disturbed areas will be recontoured as required and covered with 0.25 m of overburden growth media prior to application of seed and fertilizer. Seed mixtures and fertilization specifications will be based on both revegetation trials and natural revegetation observations and success.

6.12 Mine Roads

All mine roads will be subject to standard road reclamation measures previously described in the haul roads and main access road sections of this report.

6.13 Adaptive Management Planning

The Minto project is subject to a number of operational monitoring programs, including but not limited to:

- Water Quality Surveillance for site and receiving waters;
- Physical Stability Monitoring of various site structures;
- ABA Testing;
- Water Monitoring;
- Tailings Stability Monitoring; and
- Geotechnical Inspections.

A significant amount of data has been and will continue to be collected under some of these programs and similar requirements during the operational life of the mine. Section 7.0 of this report proposes the continuation (and progressive scaling back) of the majority of these monitoring initiatives during the period of active reclamation and through the post-closure period when there is minimal site presence.

The closure measures in the previous sections have been developed and proposed based on the most up to date information collected at the site, and the best interpretations of these data with respect to the projected conditions on the site at final closure. Changes to the Plan will be required as conditions continue to change as the site progresses through operations and closure. The periodic revisions to this Plan as per the QML schedule will address these changing conditions moving through operations, but as closure activities progress and monitoring on the site continues, planning mechanisms that can account for and react to changes to the expected conditions governing the closure measures need to be in place.

Adaptive management planning (AMP) is a recognized and effective way to ensure that changing conditions during closure are not subject to static reclamation initiatives, and that closure programs can be adapted to these conditions to achieve desired performance. The Company is committed to AMP in

the context of closure of some of the higher risk features on the site. The Company sees the continued application of AMP for the following mine components/conditions:

- **Tailings Storage Facility** – an operational adaptive management program has been proposed for the Tailings Storage Facility in the Tailings Management Plan, based on data collected through the monitoring initiatives proposed in the same document. The AMP for this facility focuses on the physical and chemical stability of the tailings materials. Current monitoring of the DSTSF indicates that the facility is subject to movement and the Mill Valley Fill (MVF) has been designed as a buttress to address this movement. Additional instrumentation being installed to monitor this movement will be installed during 2010. Monitoring wells to allow for sampling of seepage from the DSTSF will be installed when the MVF is constructed.

The continuation of a monitoring regimen into the post closure period after tailings placement has ceased and closure measures have been applied to the facility will provide further information for the comparison of the closure measures against the expected performance. This evaluation will be used to modify the proposed closure measures for the various site infrastructure.

- **Metals Leachate/Acid Rock Drainage Issues (ML/ARD)** – Acid Base Accounting (ABA) and representative ML testing is currently being conducted under the water license ABA Testing Program. This is a comprehensive testing program that will characterize both the waste rock and tailings materials during the entire mine life. The results of this program will be used to continue to guide the placement of waste materials during operations, ensuring that materials with acid generating or neutral metal leaching potential are not used for general construction materials, unless absolutely necessary, and is confined to the assigned waste placement areas. The Company will specify distinct areas for any such material within the waste storage areas, such that should alternate closure measures be required for this material, they will be readily accessible and accurately delineated. This operational information collected, coupled with the proposed closure monitoring of the waste storage areas, will be used in preparing and implementing an Adaptive Management Plan for ML/ARD issues site wide, to be prepared and ready for implementation at closure.

- **Groundwater** – The monitoring program for groundwater is intended to provide a better understanding of the groundwater flow regime at the site. The results of groundwater monitoring conducted at existing wells will be evaluated to determine whether there is a need for additional monitoring locations to be installed at the site.

General Reclamation Measures

- **Reclamation Cover Material** – The tracking of the volumes of materials excavated and placed – specifically overburden materials – conducted in the course of prudent operational management and required under the Water Use License Physical Monitoring Program will provide a running indication of the quantity of overburden available for reclamation growth medium. The Phase IV development involves excavation of a significant volume of overburden which will be adequate for

reclamation of the different units at the site. If at any time in the closure process the overburden requirements exceed the stockpiled inventory by more than 100,000 cubic metres, the Company will add the cost of mining overburden to the closure liability estimate. In addition, subsequent versions of this report will consider the results of the reclamation research program, which at the time of closure will have provided significant insight into the quality and quantity of growth medium required to achieve the objectives of the revegetation/reclamation planning.

- **Contaminated Soils** – the Land Treatment Facility on the site is permitted for the treatment of soils to remove hydrocarbon contamination. This process is not effective for the removal of metal contamination, and the nature of the site and the confirmed geochemical signature of area surficial soils make it likely that some of the materials treated will have metal contamination that would designate it as special waste. This has been confirmed by recent testing of materials in the LTF. This material, once successfully treated for hydrocarbons, could be placed in one of the waste storage areas (tailings, waste rock or IROD storage areas) and reclaimed in keeping with the implemented measures at that location, as metal concentrations in materials at these locations will likely be similar or higher. This approach has been approved by YG Environmental Programs in the past at closed sites. This adaptive management plan will refine these measures based on remediation success leading up to and after closure.

These adaptive management plans will be developed and refined over the operational life of the mine with the goal of having them finalized for implementation at closure. They will be modelled on accepted AMP features, such as performance monitoring programs, threshold levels for data from the monitoring programs and associated triggers for action items, and response actions for expanding or refining the monitoring initiatives, implementing extended closure measures, and/or conducting further studies to develop mitigation measures for conditions that are divergent from those expected.

7 Post Closure Site Management

The closure phase of the Minto mine will commence with the cessation of economic mining of the open pit and the milling of ores and stockpiles from the ore zone. Once all mineable ore reserves have been processed, the mill and concentrator will be flushed and the tailings management facility will be decommissioned. During the active decommissioning phase which is expected to last approximately 3 years, the number of personnel required will vary depending on site activities; however it is expected that as major decommissioning and reclamation tasks are completed the number of site personnel required will decline.

It is expected that a Water Use Licence will be required for the decommissioning phase of the operation as water use will continue on a limited basis and wastewater will be released from the water dam in a controlled fashion, either treated or passively depending on the monitoring results. Decommissioning of the Big Creek Bridge along the main access road will be subject to community consultation and this activity may also require a Water Use Licence. The continued need for a Water Use Licence following

the decommissioning phase will be dependent on site conditions, performance of closure measures in achieving stated objectives and legislated requirements. Post closure management and monitoring of the site will be guided to some extent by water licence, quartz mining licence or other permit requirements, the performance of physical structures remaining on site and the ability of achieving and demonstrating long-term compliance with existing waste discharge standards.

Once overall closure performance has been demonstrated for all aspects of decommissioning, the necessity of maintaining licences or permits would be re-examined. At that point a Certificate of Closure, under the Quartz Mining Act would be requested. The following section provides a general outline of the site management approach that will be taken at the Minto mine during the closure phase.

7.1 Organization, Site Access & Security

A number of personnel will be required on site to implement the various decommissioning and closure tasks. Generally these tasks entail closure of mine workings, regrading of waste rock and overburden piles, decommissioning of the tailings management facility, removal of the water retaining dam, salvage and removal of infrastructure, equipment and reagents, decommissioning of access roads and reclamation and revegetation of disturbed lands. These activities would be undertaken on a seasonal basis and directed by an onsite manager responsible for decommissioning and reclamation of the Minto mine.

During site decommissioning, it is anticipated that at least a portion of the existing camp accommodations would remain on site to support site personnel. It is anticipated that during the initial post closure phase, site security requirements will continue with a caretaker remaining on site following seasonal closure of the site. A site inspection schedule will continue for the period of closure implementation (3 years) and then move into a post closure monitoring period (12 years) for a total of 15 years. Security personnel will no longer be required once decommissioning and reclamation activities are completed on the property. Once the majority of physical reclamation works are performed on the site, the number of employees or contractors required will be reduced. The Company is committed to having SFN members employed during implementation of the Plan and will continue to work with SFN to optimize long term closure monitoring requirements.

The main access road, barge landings and property security gate will be maintained during implementation of the post closure phase. Site access along the main road, barge support and Big Creek Bridge will be required for personnel and truck haulage requirements to and from the site. The security gate and fencing would be maintained while the main access road is in use. Decommissioning and reclamation of various property haul and site access roads will be completed once closure measures have been completed at each facility and site access is no longer required.

Once decommissioning activities are completed on-site, and following a period of post closure monitoring, a determination will be made about whether to permanently close the main site access

road. This determination will be done in conjunction with SFN as the access road lays within SFN Category "A" settlement lands. Closure of the main access road is expected to be consistent with the plan's closure philosophy; however, it is recognized that the performance of physical reclamation of the site must be assured before a final determination of the main access road closure is made. Government regulators and the local trapper will also be consulted regarding decommissioning plans for the road.

7.2 Supervision and Documentation of Work

All decommissioning and reclamation works will be properly supervised to ensure that works are constructed according to their design and that this work is properly carried out and documented. The project manager or the construction supervisor would supervise all closure works. Daily inspection procedures would be completed to document work progress, deficiencies and completion. Existing plans for spill response or other site internal procedures for fuel handling, waste disposal, fire control and suppression, health and safety and environmental management systems would be used, developed and followed as necessary.

Environmental inspections and tests conducted prior to the implementation of closure measures would be used to confirm areas requiring clean up.

For the water retaining dam and tailings management facility, plans for all earth works and inspections would be prepared and submitted to the YWB and EMR for review prior to construction. These plans would be submitted in a timely manner to facilitate agency review and Board approval prior to implementation. A competent engineer following standard quality control and assurance procedures would inspect and document this construction work. As-built plans and drawings would be completed and the results of the closure work completed on the removed water dam and tailings management facility documented in a final as-built report. This report would be submitted to the YWB and regulatory agencies upon completion of closure activities.

For the Big Creek Bridge removal and Minto Creek culverts, plans for all restorative works would be prepared and submitted to the YWB prior to construction. A competent environmental practitioner following standard quality control and assurance procedures would also design, direct and document this restoration work. A summary report of the works would be prepared. This report would be submitted to the YWB and regulatory agencies upon completion of closure activities.

Upon completion of the decommissioning and reclamation works, a final site plan report (summary text and drawings) would be prepared which would outline the facilities or works remaining on the site following closure. This plan would identify the location of buried concrete structures or scrap and landfill disposal areas. It is expected that this plan would accompany an Application for a Certificate of Closure under the *Yukon Quartz Mining Act*.

7.3 Mine Records

As noted in the previous section, all decommissioning and reclamation works would be documented. Mine records comprising the extent of open pit workings would be retained by the Company. Other site records, files and plans would be archived. Where plans or drawings are required for mine safety reasons, these plans would also be submitted to government mine safety offices. As-built reports for structures completed for closure and the final site closure report would be retained for record and submitted to government agencies and boards.

7.4 Compliance Monitoring and Reporting

Environmental compliance monitoring, internal monitoring of earthworks and independent geotechnical inspections are presently ongoing at the property. The environmental monitoring at the Minto mine employs several types of scheduled periodic inspections to ensure that the facility is meeting environmental performance objectives and complying with appropriate regulatory standards. These inspections entail:

- scheduled inspections of the waste rock and overburden storage areas, tailings management facility, water retaining structures and mine components to monitor environmental performance;
- scheduled water quality sampling and flow measurements of effluent streams and local receiving water streams;
- scheduled receiving water programs for benthic invertebrates, stream sediments and fish to monitor downstream environmental quality;
- scheduled piezometric monitoring of water levels in wells and the spillway structure at the water retaining dam;
- monitoring of other instrumentation installed in the DSTSF as per the Tailings Management Plan (thermistors, survey hubs, etc.);
- annual summer inspections by a qualified geotechnical engineer of tailings management facility, diversion channel, waste rock and overburden storage areas, and water retaining dam for structural stability; and
- scheduled environmental tours and audits of the property by the Company staff to look for environmental hazards and site stability. The Company will endeavor to invite various Government agencies' representatives as part of the environmental inspections.

At present, the site personnel undertake the scheduled environmental monitoring and inspection programs with the exception of the annual geotechnical inspection and the benthic invertebrates,

stream sediment and fish monitoring programs, which are conducted by qualified professionals. All results from the licenced compliance monitoring programs are reported to the YWB, and YG EMR as monthly or annual reports.

During the active closure phase environmental and physical compliance monitoring and inspections will continue according to the present Water Use Licence or Quartz Mining Licence monitoring programs utilizing site-based personnel. A summary of the current monitoring activities under the present environmental and physical compliance and inspection program is shown in Table 7-1 (as the first 5-year period after milling cessation), with monitoring station locations and descriptions. Figure 7-1 provides the current station locations for the environmental and physical monitoring programs.

It is expected that the amount of environmental and physical monitoring and inspection (frequency and quantity) will decline once all closure measures have been implemented. The approach to closure monitoring has been to continue with the present licence monitoring and inspection programs until decommissioning and reclamation measures have been completed and then reduce the frequency of site monitoring and the number of monitoring stations over time as satisfactory closure performance is confirmed. Revisions to the current Water Use Licence requirements will be required upon closure to authorize them.

The schedule for monitoring programs planned for the 15-year period immediately following cessation of active mining and milling operations are presented in Table 7-1. For the first 5 years following the cessation of mining, routine environmental monitoring will be completed to demonstrate the effectiveness of closure measures and their performance. Thereafter (year 6 to 10) monitoring frequencies would be reduced to periodic inspections, with a further reduction of frequency for years 11 to 15. The purpose of these periodic inspections would be to ensure that waste discharges remain compliant, downstream receiving waters meet current CCME Guidelines for the Protection of Freshwater Aquatic Life, and physical structures are performing as designed. Should these inspections identify issues of concern, then plans would be developed to address the concerns.

Based on the results of site monitoring for the 15-year period and in discussion with the SFN and appropriate regulators, the need for and the frequency of additional site monitoring will be determined at that time. If the results from monitoring indicate that the site is stable with acceptable geotechnical and environmental performance, then the Company would propose to decrease the frequency of monitoring further. If the results from monitoring indicate there are concerns with either geotechnical conditions at the site or with environmental issues, then the site would continue to require more frequent monitoring than otherwise proposed and possibly additional remedial work would be required.

As previously mentioned, the Company is interested in having the SFN participate actively in both the closure activities and in post-closure monitoring. The Company will work directly with SFN in this regard.

Environmental monitoring and inspections conducted during the post closure period (years 4-15 after cessation of mining) will be undertaken by periodic visits to the site. Access to the property for post closure monitoring would be via ATV, snowmobile, and/or helicopter if the road is decommissioned.

Table 7-1 Minto Mine – Decommissioning and Reclamation Plan

Site	Description	UTM Location (m) Zome 8		Year 1-5 Frequency						Year 6-10 Frequency					Year 11-15 Frequency				
		Easting	Northing	Surface Water	Ground Water	Sediment	Benthos	Flows	Other	Surface Water	Ground Water	Sediment	Benthos	Other	Surface Water	Ground Water	Sediment	Benthos	Other
Receiving Water Stations																			
W-2	Mainstem Minto Creek directly u/s Access Road Crossing	392616	6948477	W		A	BA	DCR, W		Q		BA	BA		A		A	BA	
W-3	Mainstem Minto Creek 50 m d/s toe of Dam (Final Point of Discharge)	386747	6945682	W		A	BA	DCR, W		M		BA	BA		Q		A	BA	
W-6	Tributary to Minto Creek	387544	6946420	Q		A	BA	Q		Q		BA	BA		A		A	BA	
W-7	Tributary to Minto Creek	387504	6946069	Q		A	BA	Q		Q		BA	BA		A		A	BA	
W-10	Mainstem Minto Creek (south fork at headwaters)	383348	6943654	M				M		Q					A				
Mine Site Stations																			
W-11	Waste Rock Dump Seepage	384106	6944887	M						SA					A				
W-12	Discharge from Open Pit	384819	6944991	M						SA					A				
W-13	Mill Water Pond Discharge	385111	6945061	W2						SA					A				
W-15	Minto Creek, downstream of the overburden dump, just upstream of Open Pit	384286	6944754	M						SA					A				
W-16	Main Water Storage Pond Discharge (or Main Water Storage Pond if not discharging)	386538	6945573	W*							NLA					NLA			
W-17	Main Water Storage Pond Dam Seepage	386615	6945645	M*							NLA					NLA			
W-18	Low-Grade Ore Pad Seepage	386615	6945071	M*						SA*					A*				
W-8	Alternate Tailings Area Seepage/Runoff	384514	6945067	M*						SA*					A*				
W-8A	Tailings Seepage/Runoff	385620	69455071	M*						SA*					A*				
Physical Inspection Elements																			
	Water Dam	-	-						A*					NLA					NLA
	Tailings Area	-	-						A					A					A
	Diversion Ditches	-	-						A					A					A
	Waste Rock Dump	-	-						A					A					A
	Ice-Rich Overburden Dump	-	-						A					A					A
Environmental Inspection Elements																			
	Revegetation Inspection	-	-						A					A					A
	Wildlife Use Survey	-	-						A					A					A

* Unless structure has been decommissioned / reclaimed

Frequency Description

W	Weekly	Q	Quarterly	BA	Bi-annually
W2	Every 2 Weeks	SA	Semi-annually	NLA	No longer active
M	Monthly	A	Annually	DCR	Daily Continuous Record during open season

During the post closure period, reporting on all environmental and inspection programs carried out on the property will continue. These reports will be filed with the YWB, and EMR in accordance with conditions contained in the Water Use Licence, and Quartz Mining Licence and other operating permits and approvals as may be.

Company personnel responsible for the management of the Minto mine would continue to meet with regulatory agencies, Selkirk First Nation, and the community on an as-needed basis to appraise interested parties of decommissioning activities and the results of post closure monitoring.

It is expected that a review of the environmental performance of the mine following closure would be made with EMR and or other interested parties. Once this review is completed, the Company would apply to the Minister of EMR for a Certificate of Closure for the Minto mine under the Yukon Quartz Mining Act Mine Production Regulations. The Certificate of Closure will confirm that the Company has fulfilled their closure obligations for the site.

7.5 Long Term Maintenance

Provisions for maintenance of reclamation tasks such as erosion control and maintenance seeding have been included as part of the long-term closure requirements. Based on physical inspections and monitoring, maintenance works will be planned for and conducted as required to meet closure performance standards and objectives.

7.6 Temporary Closure

Temporary closure is defined in both the Quartz Mining License QML-0001 and the Water Use License QZ96-006 as the status of the project if no ore is processed through the mill for six (6) consecutive months after the start-up date.

Accordingly, the following monitoring and “care and maintenance” planning items are focused on a temporary closure scenario occurring after mill start-up. In the unlikely event that a closure occurs during the Interim Period (as defined in QML-0001 as the intervening time between the license effective date and start-up), these proposed temporary closure plans will still be applied where applicable to maintain the existing site infrastructure in order to enable a timely start-up, as opposed to a resumption of operations.

The Company’s priority during any temporary closure scenario is to ensure that the site remain geochemically and physically stable, and monitored in compliance with applicable licenses and legislation. Generally, this will include both initial stabilization and then ongoing routine monitoring and maintenance of the site infrastructure and facilities. The current Water Use Licence QZ96-006 contains a temporary closure monitoring schedule (Part H – Interim Closure) that forms the foundation for the

proposed temporary closure monitoring plan. It has been augmented to include planning for project elements that were not in place and therefore not subject to the interim closure period monitoring, such as the mill, water dam, water treatment plant and mill water pond, waste dumps, tailings storage area, and the explosives facility.

Table 7-2 provides a summary of the various project components and the inspection and maintenance activities for use during any temporary cessation of mining activities.

Table 7-2 Summary of Care and Maintenance Activities and Surveillance Program during Temporary Cessation of Mining Operations

Project Component		Area of Interest	Care/Maintenance Activities	Monitoring Activities	Monitoring Responsibility	Monitoring Timing/Frequency
Open Pit		Water Management/Treatment Physical Stability	Maintain creek diversion around pit Treat excess pit water and transfer to WSP Restrict access to hazardous areas with physical barriers Maintain perimeter ground interceptor wells if necessary	WUL Physical Monitoring Program	Caretaker	As per WUL
				Water Quality Monitoring for Treatment	Water Treatment Technician	As required
				Geotechnical Inspection of Creek diversion	Engineer	Annual
Ore Stockpiles	High Grade	Physical Stability	Reduce High Grade Stockpile Inventory	n/a	n/a	n/a
		Geochemical Stability	Monitor for seepage	WUL Water Quality Surveillance Program	Caretaker	As per WUL
	Low Grade	Physical Stability	Monitor for stability	WUL Physical Monitoring Program and Annual Geotechnical Inspection	Caretaker	As per WUL
		Geochemical Stability	Monitor for seepage	WUL Water Quality Surveillance Program	Caretaker	As per WUL
Waste Rock and Overburden Dumps		Physical Stability	Runoff/Erosion/Sediment control, as required. (Progressive reclamation will occur during operations)	WUL Physical Monitoring Program	Caretaker	As per WUL
				Geotechnical Inspection	Engineer	Annual
		Geochemical Stability	Monitor for seepage	WUL Water Quality Surveillance Program	Caretaker	As per WUL
Tailings Storage Facility		Physical Stability	Surface water diversion structure repair/maintenance, as required Runoff/Erosion/Sediment control, as required. Dust Control, as required. (Progressive reclamation will occur during operations)	Visual inspection elements of Monitoring Program from Tailings Management Plan (TMP) WUL Physical Monitoring Program	Caretaker	As per TMP
				Geotechnical Inspection from WUL and TMP	Engineer	Annual
		Geochemical Stability	Monitor for seepage and water quality	WUL Water Quality Surveillance Program and TMP Monitoring Elements	Caretaker	As per WUL
Mill and Camp Site		Buildings, Equipment, and Infrastructure Physical Stability	Concentrate removed from site Secure buildings and maintain necessary equipment onsite for resumption of milling Inspect for site stability	Visual inspection periodically for signs of instability	Caretaker	Monthly
				Structural Inspection	Engineer	Twice Annually
		Mill Pond Physical Stability	Maintain pond liner, repair as required. Maintain culverts.	WUL Physical Monitoring Program	Caretaker	As per WUL
Water Dam		Water Management Physical Stability	Maintain spillway and structure as required based on geotechnical inspections. Monitor pond levels and water quality. Maintain spring/early summer pumping drawdown equipment.	WUL Physical Monitoring Program	Caretaker	As per WUL
				Geotechnical Inspection	Engineer	Annual
		Geochemical Stability	Monitor for seepage water quality	WUL Water Quality Surveillance Program	Caretaker	As per WUL
Explosives Facility		Physical Stability	Remove bulk explosives from site. As required, repair and replace infrastructure	Visual inspection periodically for signs of instability.	Caretaker	Monthly
Barge Landing		Access to Yukon River	As required, granular upgrade to landing site.	Visual inspection periodically for signs of instability.	Caretaker	Weekly
Access Road and Surface Drainage		Entire Route	As required, surface grading and granular amendments, ditch and culvert maintenance.	Visual inspection periodically for signs of instability/erosion	Caretaker	Weekly and after heavy precipitation events
Entire Site		Physical Stability	Runoff/Erosion/Sediment control, as required. Road/culvert maintenance as required. (Progressive reclamation will occur during operations)	WUL Physical Monitoring Program	Caretaker	As per WUL
				Geotechnical Inspection	Engineer	Annual
		Water Quality/Management	Retain Water Treatment Plant and Operators Maintain storm water diversion systems Continue seasonal water treatment as required for excess pit and site water	Undertake expanded temporary closure monitoring and submit to the YWB pursuant to Water Use Licence QZ96-006 (see Tables 7-4 and 7-5 for expanded monitoring program sites and schedule.) Continue required monitoring under Metal Mining Effluent Regulations (MMER)	Caretaker	As per WUL and MMER
		Security	Full time site caretaker will check, repair and replace as required: precautionary signage security gate – installed on Access Road at Main Dam	Site Inspection and Security Monitoring of all infrastructure and site elements	Caretaker	Daily: Inspection Sheets included in Annual Reporting
		Miscellaneous Infrastructure	Shut down and winterize camp, except for caretaker facilities Inspect power line	Site Inspection and Security Monitoring of all infrastructure and site elements – report any changes to stability/condition of miscellaneous infrastructure.	Caretaker	Daily: Inspection Sheets included in Annual Reporting
		Reporting	Prepare and submit annual report to the Yukon Water Board pursuant to Water Use Licence QZ96-006, including details of temporary closure activities and monitoring. Prepare and submit annual report to YG Mineral Resources Branch pursuant to the Quartz Mining License QML-0001, including details of temporary closure activities and monitoring. Prepare and submit quarterly monitoring reports to Environment Canada under MMER.		Minto Explorations Ltd.	Annually, by July 30 Quarterly, Online RISS Registry

7.6.1 Physical Stability and Geochemical Stability

Stabilization of site works during any temporary closure will be based on a continuation of efforts during operations to ensure construction and performance of facilities in accordance with their engineered designs. At this early stage in the mine's life, many operational monitoring and research programs are underway to better understand the site and achieve physical and geochemical stabilization through such measures as:

- resloping and crest rolling to reduce slope angles of repose on the waste dumps;
- grading and contouring to direct surface water away from steeper slopes to reduce erosional impacts;
- planting live willows in appropriate places throughout the site to help control erosion and surface runoff water contamination with sediment;
- covering potentially unstable areas in overburden and revegetating to establish a stable cover, again reducing erosional impacts; and
- augmenting revegetation efforts with bioengineering (planting of live cuttings/seedlings) efforts.

Site infrastructure, including buildings and process machinery, will be emptied/drained of hazardous reagents and process fluids where appropriate and stabilized for temporary closure based on recommendations from mechanical and chemical suppliers, contractors and engineers. This includes the removal of all hazardous wastes, including waste hydrocarbons, coolants, lubricants, mill reagents, and process chemicals. The bulk explosives inventory will be removed from site and explosives storage containers and facilities will inspected regularly.

The significant exception to these activities will be water management and treatment infrastructure and reagents, which will remain in place and operational as required to maintain effluent quality compliance during any temporary closure. Water management and treatment activities will be continued in accordance with the existing Water Management Plan (MintoEx, 2009) for the site.

Temporary decommissioning of the rest of the infrastructure will only be conducted to a level whereby the infrastructure and systems are ensured to be stable in the short term (3 years) and whereby mining and milling operations can be resumed in a timely manner should the decision be made to emerge from temporary closure and transition back into operations. This will include:

- the retention of essential equipment/assets onsite to maintain infrastructure; and
- the storage of reagents and other hazardous materials (not waste) in competent primary and secondary containment, to ensure compliance with applicable legislation.

7.6.2 Security and Monitoring

Uncontrolled access to the mine site on the Minto property could pose a risk to the public and to the site assets. As such, a full-time caretaker/monitor (at least 2 individuals trained for cross-shift) will be

housed onsite in a serviced portion of the existing camp. Site equipment and vehicles will be kept onsite for caretaker use in care and maintenance activities. Contingency equipment will also be kept onsite should more intensive earthworks be required during the temporary closure period.

A security gate would be installed on the main access road adjacent to the dam in the event of the site being placed into temporary closure. This is a steep cut and fill location that will prohibit vehicle access around the gate. Snowmobile/ATV access cannot always be controlled, but warning signs will be erected indicating the risk of entry to the site at the main gate and at key locations around the site. Site buildings will be locked and secured.

The main access road will be maintained for caretaker and emergency access with equipment retained on site (grader/loader). Previous periods of inactivity at the site have shown that the access road remains relatively stable and accessible with little maintenance requirements. In winter, contractors will establish the ice road across the Yukon River at Minto Landing, and the barge will be used only on an as needed basis during temporary closure, with a smaller boat being used when required for ferrying caretakers.

The caretaker(s) will be responsible for:

- regular inspections of the site to observe and document the condition of – and note any changes in – site security and public safety measures, infrastructure, mine works, etc., and to document any newly emerging environmental or public health and safety issues.
- conducting routine physical monitoring activities;
- regular water quality and flow monitoring and treatment if necessary (a skilled operator may be necessary);
- submitting inspection and monitoring reports to managers on a regular basis;
- responding to any security/safety issues as required; and
- conducting routine site maintenance and basic repairs to infrastructure and works as required (snow removal, culvert and road maintenance, building maintenance).

Site inspections and monitoring will be conducted by vehicle when seasonally possible. Some sites may only be accessible by snowmobile in winter, as snow removal will not be reasonable at all locations. Inspection results will be documented in an approved format. Any reports of changes in the physical status of any part of the site may warrant a follow-up investigation by managers and/or professional personnel.

The Company's Water Use Licence contains a comprehensive Physical Monitoring Program which the licensee must conduct and report upon on a regular basis. This includes regular visual and seepage inspections of the following structures at different frequencies, varying from daily to annually:

- Main Water Dam;
- Mill Water Pond;

- Waste Rock and Overburden Dumps; and
- Diversion Ditching.

In addition, the Company's Environmental Monitoring Plan further commits to structural monitoring of these elements. These programs will continue in the event of any temporary closure, with results to be included in annual reporting under the water license.

Should temporary closure occur prior to the reclamation of the tailings facility then the monitoring program for the physical stability of the tailings deposit as presented in The Company's Tailings Management Plan will be followed. Without ongoing tailings placement, the visual inspection elements of the stack stability monitoring will be conducted by the site caretaker, with any stability-related issues reported immediately.

Some elements of the monitoring program (geotechnical and structural inspections and non-routine water quality and biological monitoring) will be conducted by appropriate professional personnel, and results of these inspections will be included in the annual reports and other required submissions.

Monitoring stations for the water quality surveillance program during any temporary closure are the same as those required during operations, in Figure 6-2.

7.6.3 Reporting

All monitoring and inspection data collected during a temporary site closure will be compiled and submitted according to the required annual reporting timeframes for both the Water Use Licence and Quartz Mining Licence.

8 Closure Costs

Cost estimation for implementation of the proposed closure measures is the basis for establishing the financial security that will be required on the project. The Phase IV closure cost estimate has been prepared based on the final extent of disturbance for each of the infrastructure units described in this report using a Net Present Value approach. Progressive reclamation for much of the site will assist in offsetting the maximum site liability that will be incurred during the operations phase but does not negate the need for estimation of the closure costs.

The tables of estimated costs to implement the decommissioning and reclamation measures described in this report are presented in Appendix C. The costing has been prepared to provide an estimate of closure plan implementation for 2011 (Year 0), 2013 (Year 2) and End of Mine Life. The salvage value of certain components of the mine is expected to offset some of the costs of implementing this closure plan. A salvage value of 50% has been used for the mill and ancillary facilities.

The calculation of rates for determination of closure costs is based in part on those included in the 2009 Detailed Decommissioning and Reclamation Plan for the site and those calculated specifically for Phase IV.

The costs have been developed using a combination of current unit rates for available Yukon contractors' equipment, and custom unit rates specific to the project. These custom rates were prepared with input from the mine construction heavy equipment contractor and based on their experience on site during the construction activities, considering such factors as:

- haul distance;
- road grade; and
- material handling considerations.

The unit costs have been applied to levels of effort in sufficient detail to allow thorough scrutiny by the reader. As such, equipment rates have been used where the level of effort is well understood, and in other cases, unit area or volume rates have been employed.

An annual inflation rate of 1.5% was applied to the base case unit rates in order to determine the cost of implementing the conceptual closure measures described in this plan. This inflation rate is consistent with the use of a review of published inflation rates for the Yukon.

- Table 8-1 provides a summary of the unit rates used in the calculations;
- Tables 8-2a-c contain a summary of cost estimates prepared for Year 0, Year 2 and End of Mine;
- Tables 8-3 to 8-10a-c provide closure cost estimates for the specific site development reclamation components;
- Tables 8-11a-c provides closure cost estimates reclamation research and revegetation activities;
- Tables 8-12a-c outline costs associated with the site management during closure implementation and presents post closure costs for compliance monitoring and maintenance for the entire projected 15 year active closure and post closure monitoring life; and
- Table 8-13a-c present costs for various supporting studies as outlined in the closure measures Section 6.

The closure measures presented in this plan have been prepared at a conceptual level of engineering. It is recognized that a certain level of detailed engineering will be required for major closure activities including, dam removal, and conveyance or diversion ditches. The approach is to ensure that closure measures are sound and have undergone review before detailed engineering is undertaken. Detailed engineering is planned for major works prior to implementation.

For the purposes of closure costing an estimate of 7% of the capital cost of each closure measure was used for typical project management and engineering costs.

A closure cost range from $10,259,000 to $10,500,000 is estimated for the current site conditions, based on three separate scenarios for road decommissioning. The End of Mine closure cost estimate ranges from $14,972,000 to $15,213,000.

8.1 Financial Security Updates

YG has developed a policy respecting mine site reclamation and closure with one of the stated principles being "adequate security must be provided by the project proponent at each stage of mine development reclamation and closure consistent with the requirements of relevant legislation and Yukon financial security guidelines" (YG, 2006). Typically requirements for mine security bonding are conditions of the Type A Water Use Licence or Yukon Quartz Mining Production Licence. The Company intends to adhere to the principles for mine reclamation and closure and security requirements in accordance with YG's policy which identifies that the security estimate be updated every second year.

The Company and YG will jointly determine a schedule for security payment scheduling.

The Company will discuss road decommissioning requirements with the SFN, which will ultimately refine the final closure costs associated with the access road decommissioning.

9 Limitations of Report

This report has been compiled based on information provided by a number of different sources. The report and its contents are intended for the sole use of Minto Explorations Ltd. (Minto) and their agents. Access Mining Consultants and EBA Engineering Consultants do not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Minto, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user.

10 Closure

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

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MINTO MINE

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FIGURE 2-1
PROJECT LOCATION

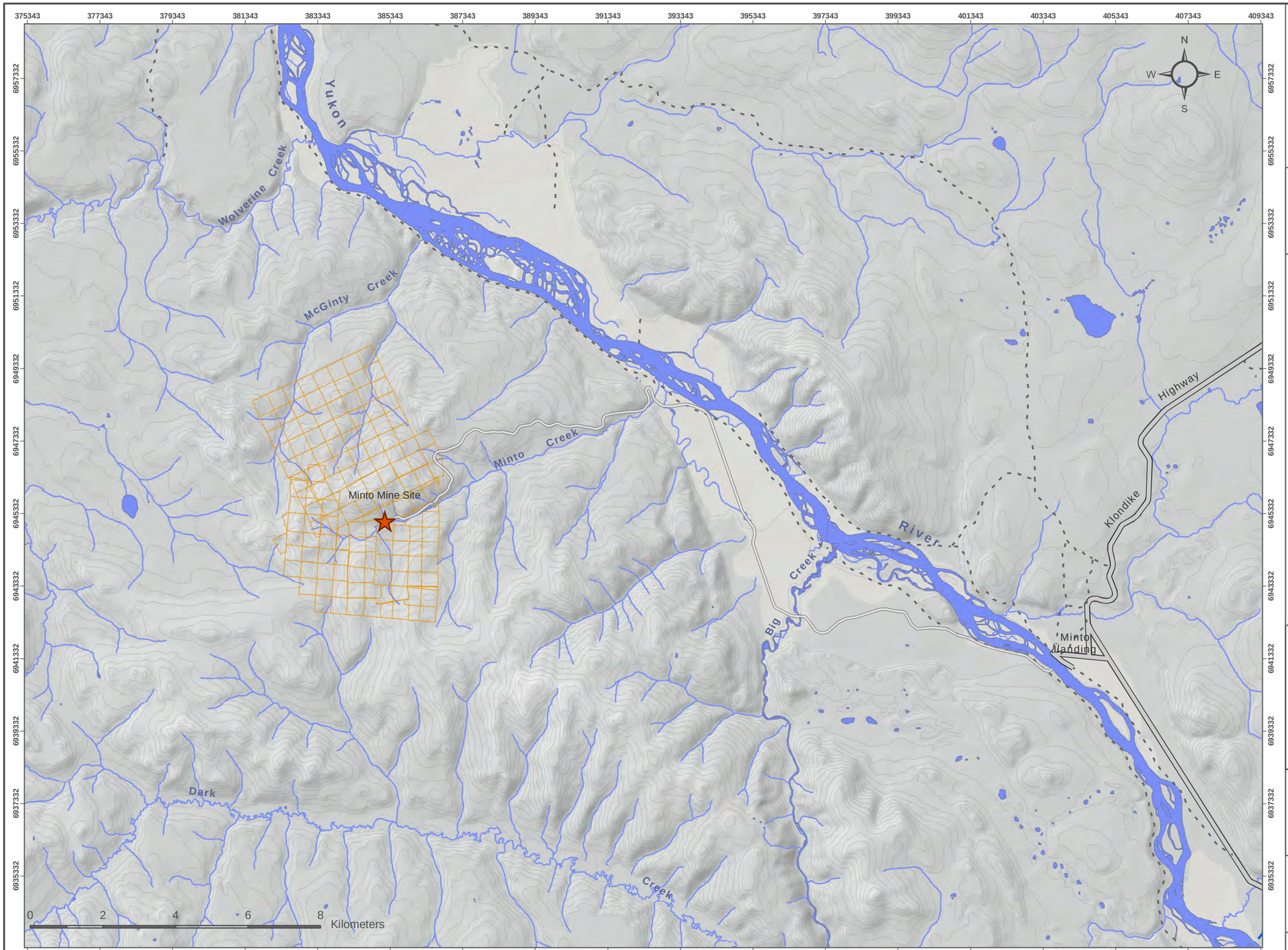
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- Minto Mine Site
- Mine Access Road
- Road
- Trail
- Watercourse
- Contour
- Minto Explorations Ltd. Claims
- Waterbody

National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000.Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.

Quartz claims data obtained from Energy, Mines and Ressources, YTG. Data currrent as of December 4th 2009.

NAD 83 UTM Zone 8N

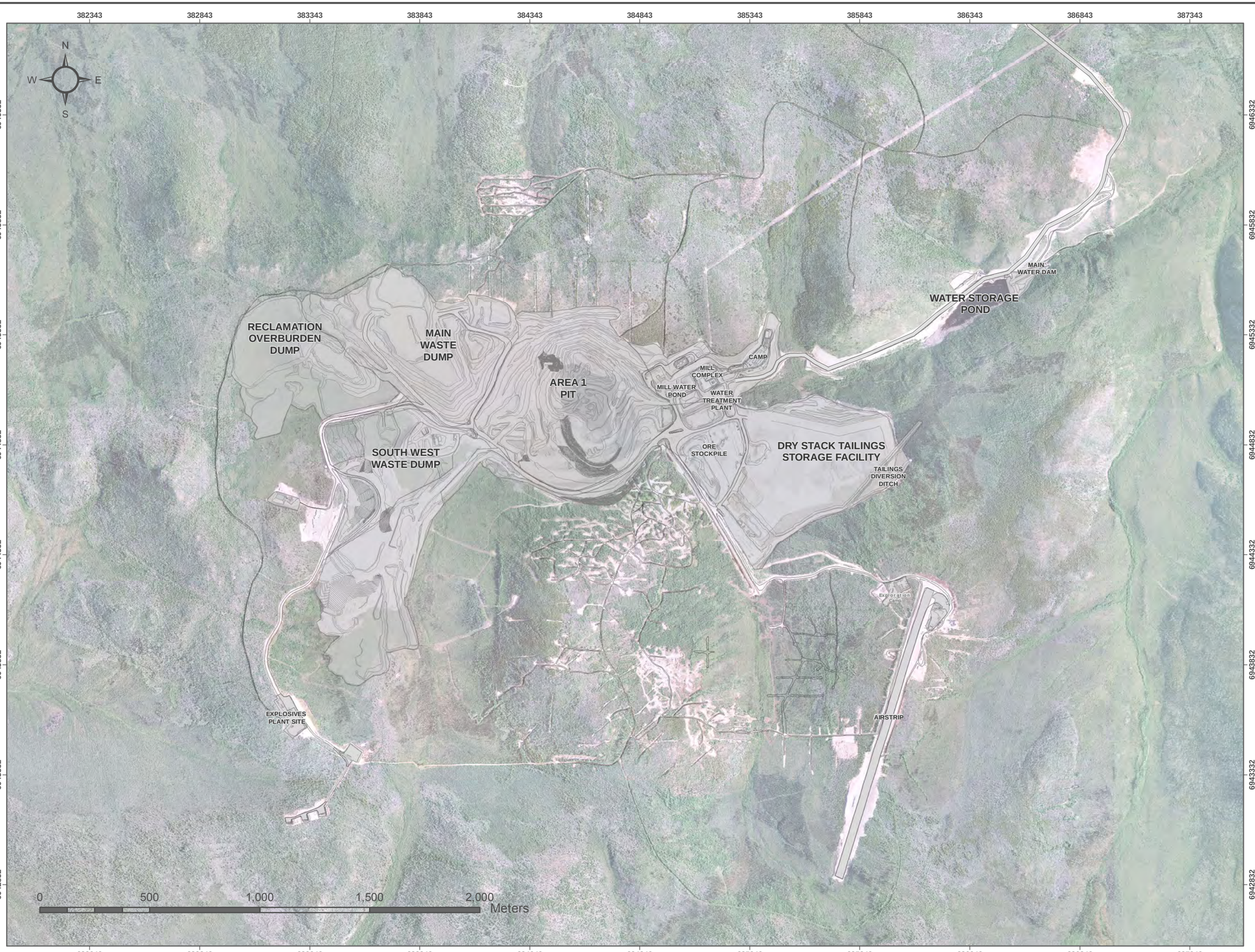
FIGURE 2-2

PROPERTY OVERVIEW

ACCESS Consulting Group

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

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- Access Road
- Mine Site Road
- Site Form Line

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NAD 83 UTM Zone 8N

FIGURE 2-3

SITE PLAN CURRENT CONDITIONS - JANUARY 2011

ACCESS CONSULTING GROUP

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

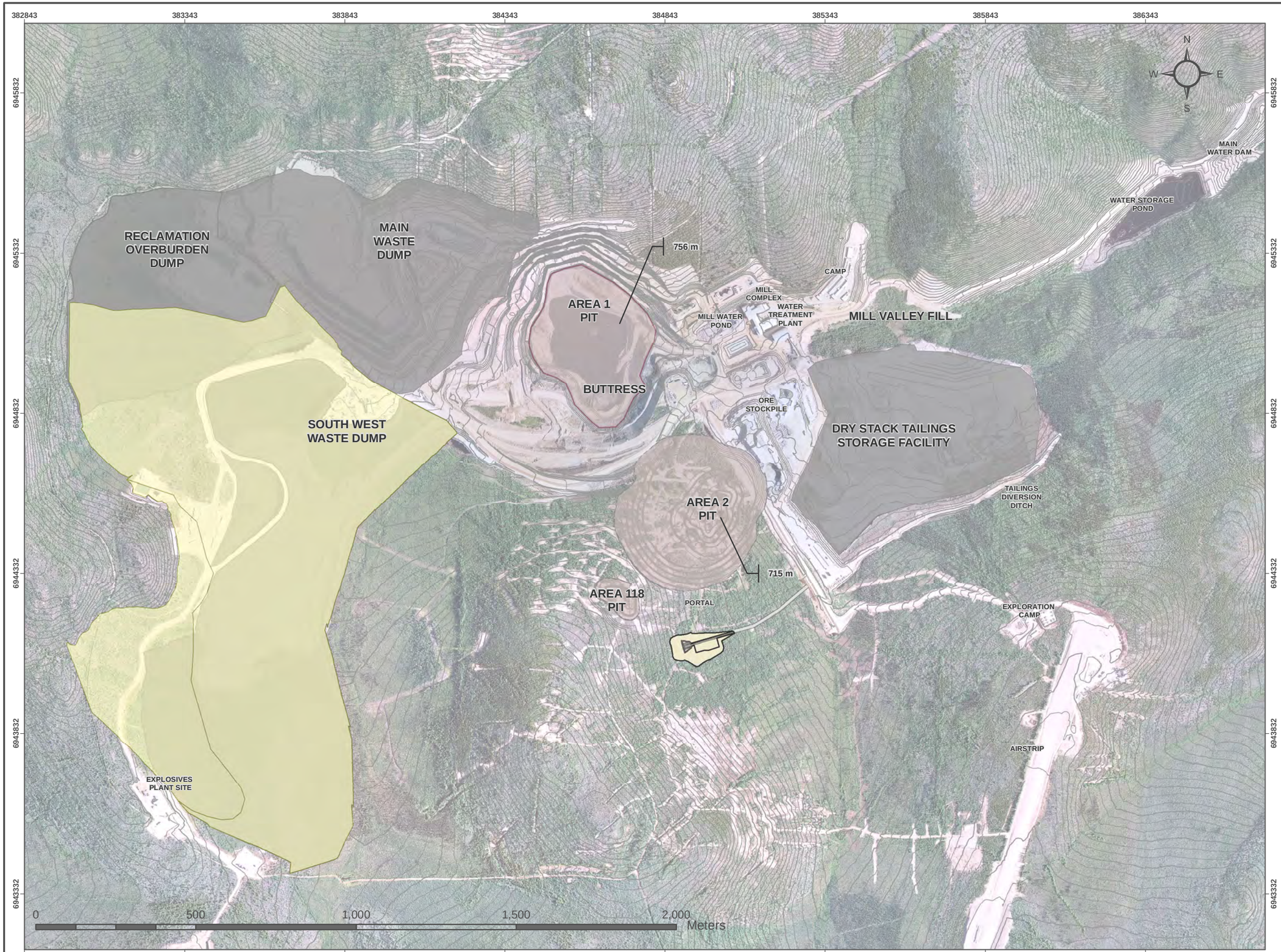
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Mine Feature Footprints

- Completed waste dump development
- Pit Development
- Waste Rock and Tailings Placement
- Previous Waste Dump Footprint

This is not a legal document. Aerial photography flight date: July 13th 2009. Ortho-rectification produced by Challenger Geomatics Ltd. Waste dump footprints provided by EBA (PRELIM PHASE IV WASTE DUMP DEVELOPMENT BY CALENDAR YEAR 2010-07-07.dxf) and W14101068.015 P4W-05 2010-07-07.dxf. Pit Development form lines provided by SRK (PHIV 2010.dxf).

NAD 83 UTM Zone 8N

FIGURE 2-4

SITE PLAN JANUARY 2013

ACCESS CONSULTING GROUP

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

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382843 383343 383843 384343 384843 385343 385843 386343

6945832 6945332 6944832 6944332 6943832 6943332

N W E S

2014-2016:
Install soil cover onto surface and faces in order to revegetate.
Install engineered covers as required to provide source reduction for metal leaching into the receiving environment

2016-2020:
Pit to be flooded to an elevation of 796 m.
In-pit water treatment will be conducted as required to reduce metal and sediment loadings prior to and immediately following beginning of discharge from pit.

2018:
Install soil cover onto surface

2012:
Install engineered cover onto surface in order to provide source reduction for neutral metal leaching to receiving environment

2016-2020:
Flooding will reduce the oxidation of exposed materials in the pit walls resulting in lower overall metal loadings.

2014-2016:
Install soil cover onto surface and faces in order to revegetate.
Install engineered covers, if and where required, to provide source reduction for metal leaching into the receiving environment

2012-2016:
Backfill with Area 2 Pit waste and install growth media cover to revegetate.

2014:
Underground workings bulkheaded and access closed

RECLAMATION OVERBURDEN DUMP

Used for cover and reclemation material as requiered.

MAIN WASTE DUMP

SOUTH WEST WASTE DUMP

AREA 1 PIT

BUTTRESS

AREA 2 PIT

AREA 118 PIT

DRY STACK TAILINGS STORAGE FACILITY

MILL VALLEY FILL

CAMP

MILL COMPLEX

WATER TREATMENT PLANT

MILL WATER POND

ORE STOCKPILE

WATER STORAGE POND

MAIN WATER DAM

TAILINGS DIVERSION DITCH

PORTAL

EXPLORATION CAMP

AIRSTRIP

EXPLOSIVES PLANT SITE

0 500 1,000 1,500 2,000 Meters

Pit Development

Waste Dump Footprint

Previous Waste Dump Disturbance

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NAD 83 UTM Zone 8N

FIGURE 2-5

SITE PLAN JANUARY 2017 RECLAMATION SUMMARY

ACCESS Consulting Group

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

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CONCEPTUAL FLOW PATH (APPROXIMATE LOCATION)

POTENTIAL PASSIVE TREATMENT AREA (IF REQUIRED)

POTENTIAL IN PIT PASSIVE TREATMENT LOCATION

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NAD 83 UTM Zone 8N

FIGURE 6-1

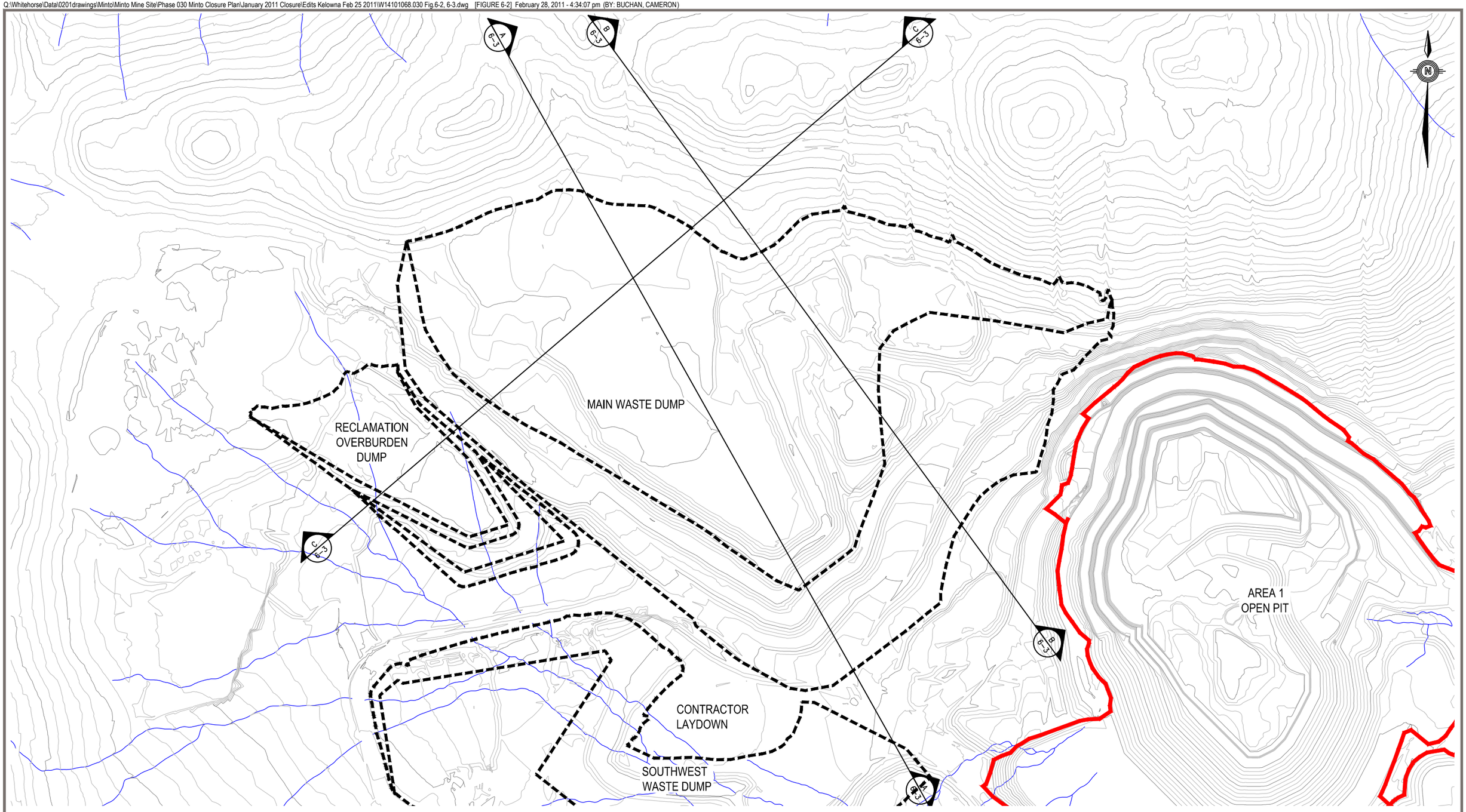
WATER MANAGEMENT PLAN

ACCESS Consulting Group

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

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Q:\Whitehorse\Data\0201drawings\Minto\Minto Mine Site\Phase 030 Minto Closure Plan\January 2011 Closure\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-2, 6-3.dwg [FIGURE 6-2] February 28, 2011 - 4:34:07 pm (BY: BUCHAN, CAMERON)



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Scale: 1: 5 000 (metres)

STATUS
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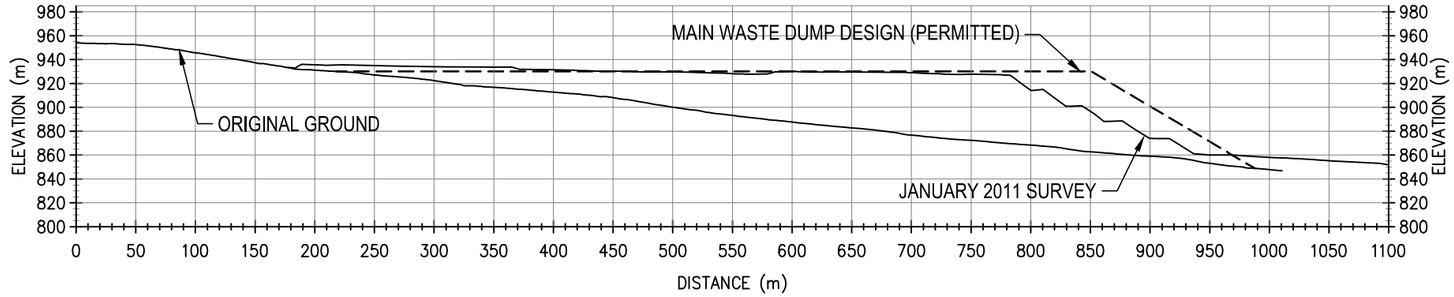
MINTO MAIN WASTE DUMP PLAN

eba
A TETRA TECH COMPANY

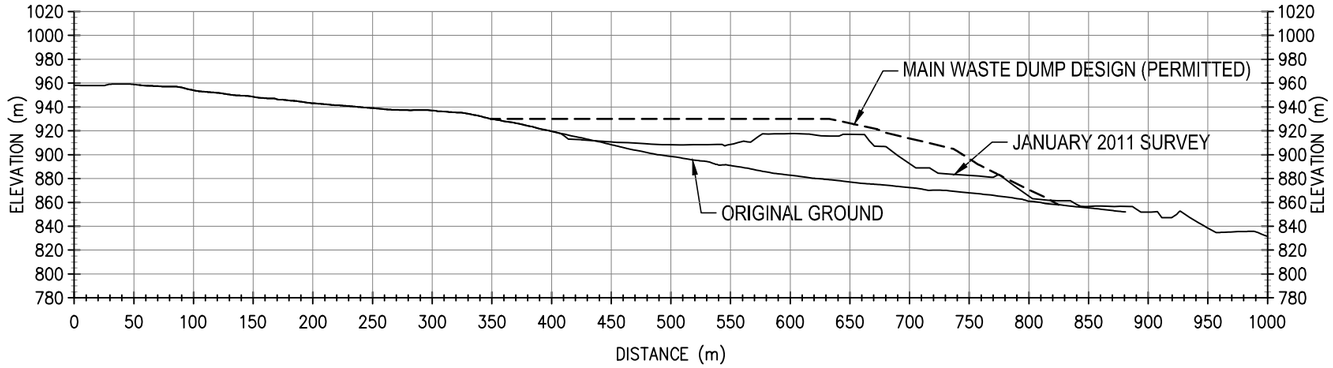
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OFFICE	DATE
EBA-WHSE	February 25, 2011

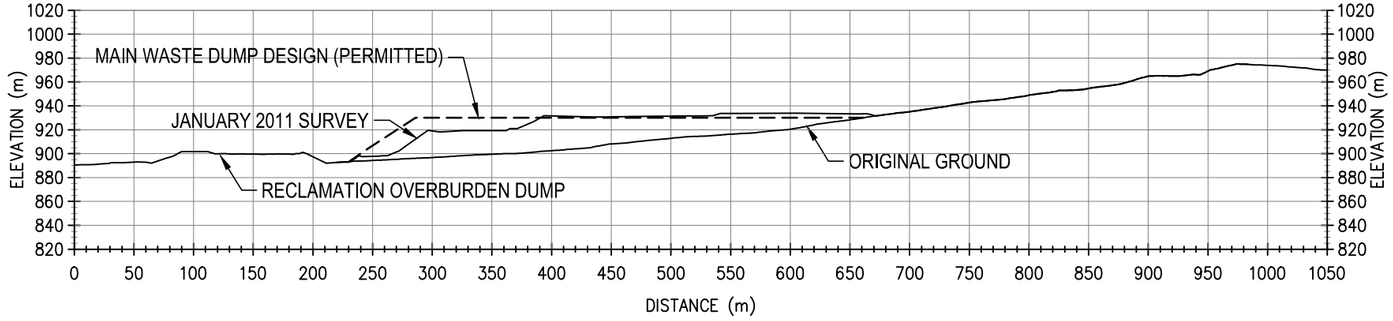
Figure 6-2



A / 6-2 SECTION A
SCALE 1:5,000



B / 6-2 SECTION B
SCALE 1:5,000



C / 6-2 SECTION C
SCALE 1:5,000

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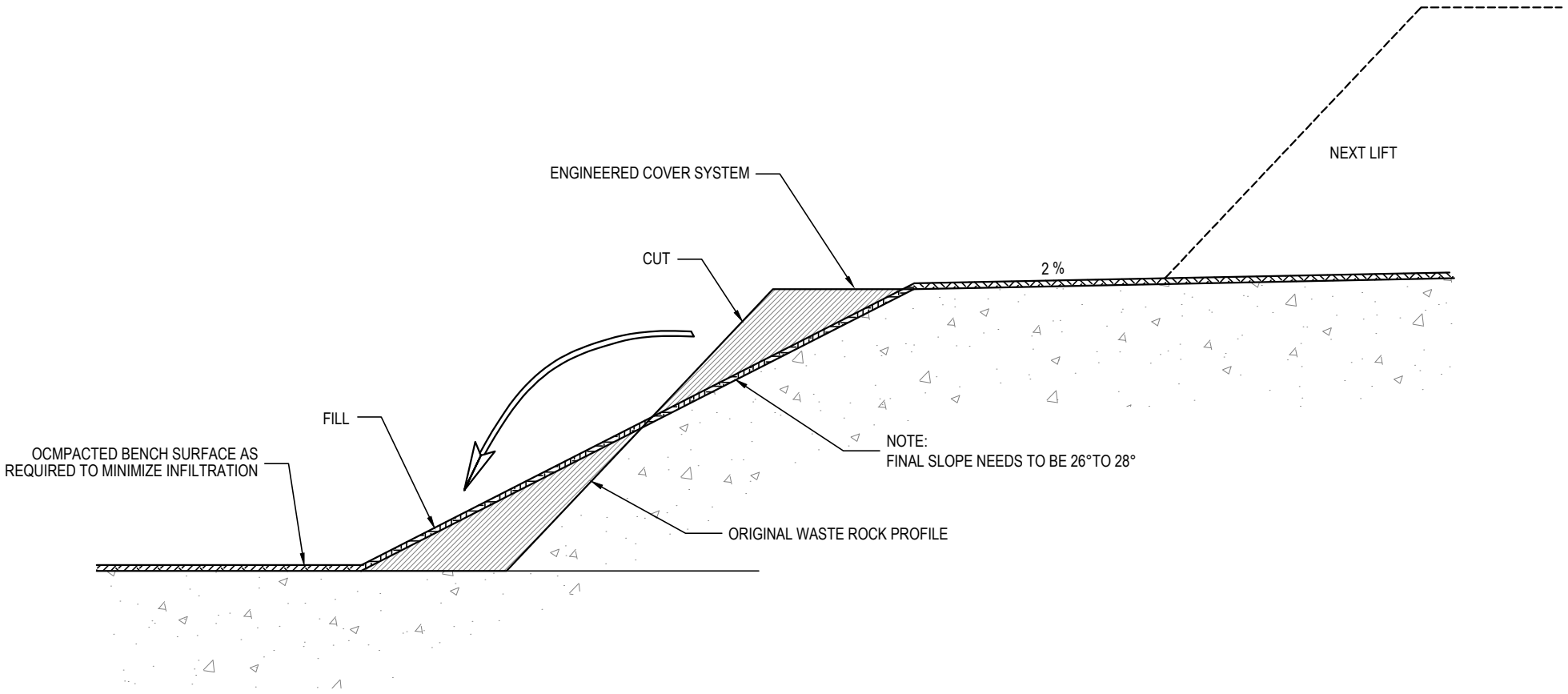
MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

MINTO MAIN WASTE DUMP SECTIONS

A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3
OFFICE: EBA-WHSE	DATE: February 25, 2011		

Figure 6-3



STATUS
ISSUED FOR REVIEW

NOTES

- FINAL DUMP SURFACE TO BE OUTSLOPED APPROXIMATELY 2%
- FINAL LIFT OF DUMP TO BE TRAFFICKED BY MINE HAUL FLEET TO PROMOTE COMPACTION OF BENCH SURFACES
- BENCH SURFACES TO BE COMPACTED AND GRADED AS REQUIRED PRIOR TO COVER INSTALLATION

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MINTO MINE
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TYPICAL RECLAMATION MEASURES FOR WASTE DUMPS

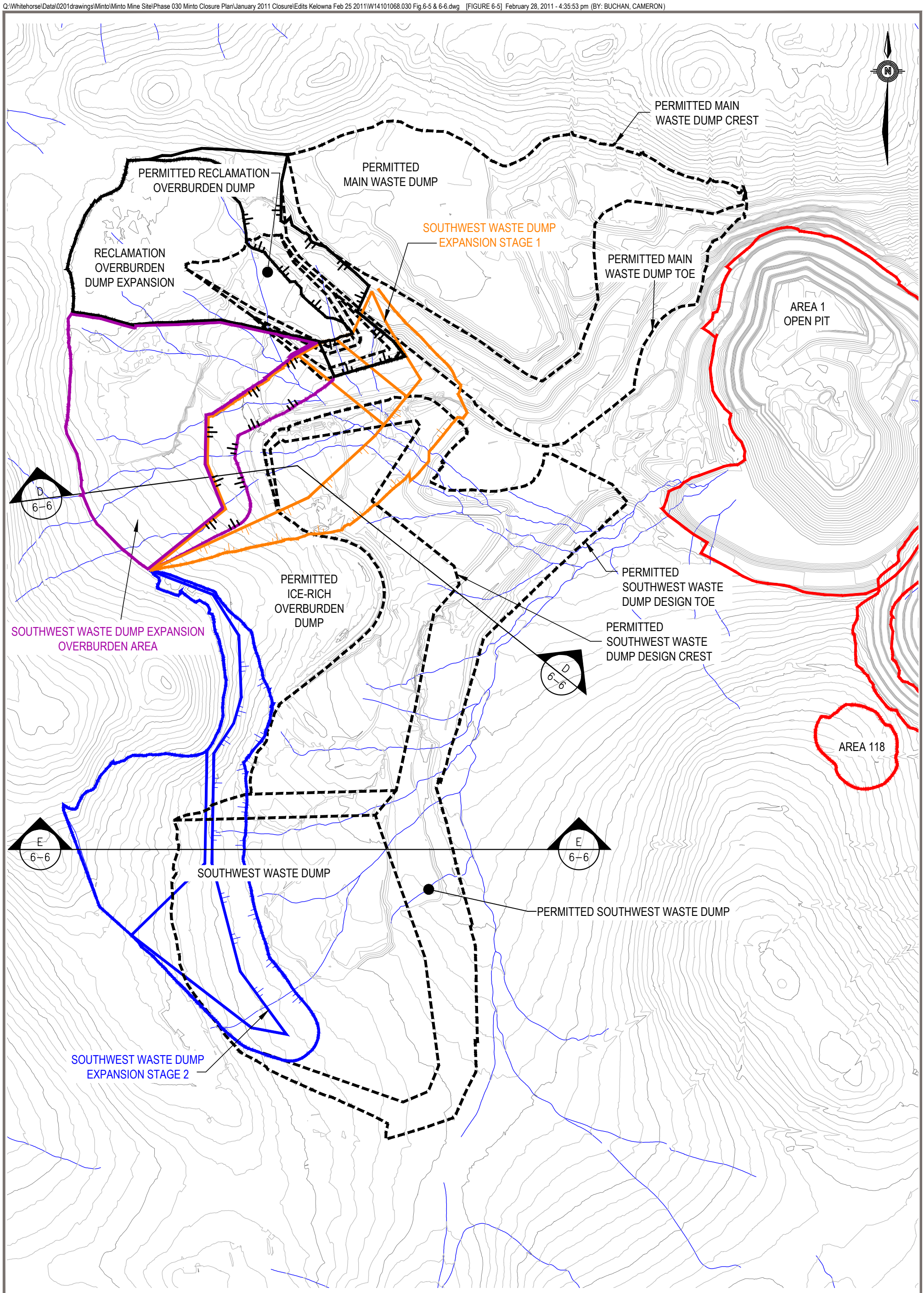
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 25, 2011

Figure 6-4

Q:\Whitehorse\Data\0201drawings\Minto\Minto Mine Site\Phase 030 Minto Closure Plan\January 2011 Closure\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-5 & 6-6.dwg [FIGURE 6-5] February 28, 2011 - 4:35:53 pm (BY: BUCHAN, CAMERON)



NOTES

3 m INTERMEDIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON FEBRUARY 2010 SURVEY DATA PROVIDED BY MINTO.

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Scale: 1: 7 500 (metres)

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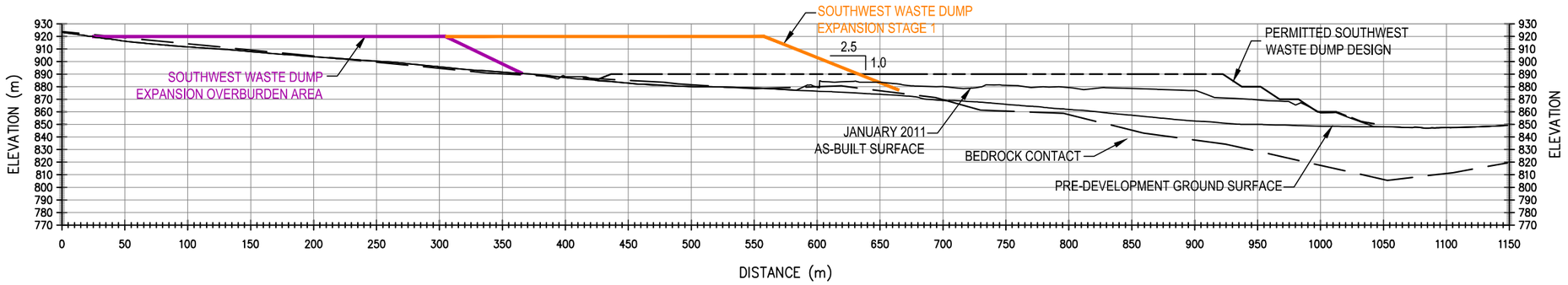
A TETRA TECH COMPANY

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

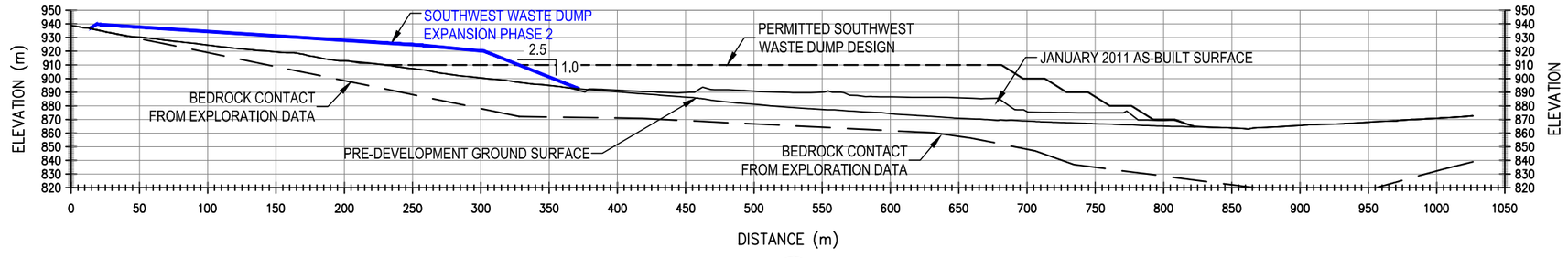
SOUTHWEST WASTE DUMP EXPANSION PLAN

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3
OFFICE: EBA-WHSE	DATE: February 25, 2011		

Figure 6-5



D
6 - 5



E
6 - 5

LEGEND

0 200

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MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

MINTO SOUTHWEST WASTE DUMP SECTIONS

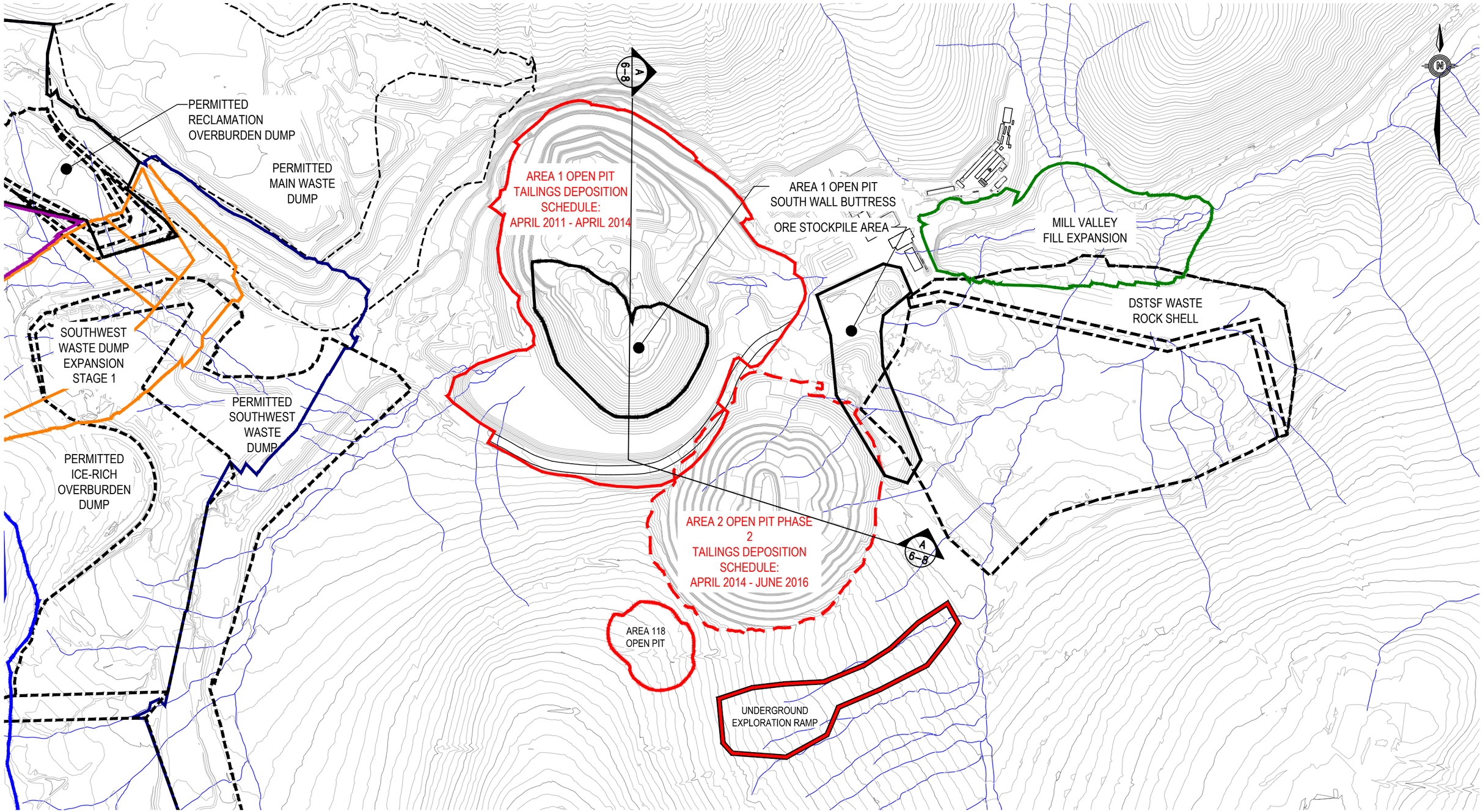
eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 25, 2011

Figure 6-6

Q:\Kelowna\Drafting\W141\W14101068 - Minto\KELOWNA\Phase 030 Minto Closure Plan\January 2011 Closure\January 2011 Closure from Whitehorse\Edits Kelowna Feb 25 2011\W14101068.030 Fig 6-7 and 6-8.dwg [FIGURE 6-7] February 28, 2011 - 5:00:46 pm (BY: HALLEY, RICHARD)



LEGEND

NOTES :

1. 3 m INTERMEDIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON APRIL 2010 SURVEY DATA PROVIDED BY MINTO.
2. TAILINGS MANAGEMENT COMPONENTS SHOWN IN RED, OTHER PHASE IV DEVELOPMENT COMPONENTS SHOWN IN BLACK

0 250
Scale: 1: 7 500 (metres)

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATIONS LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

OPEN PIT LAYOUT

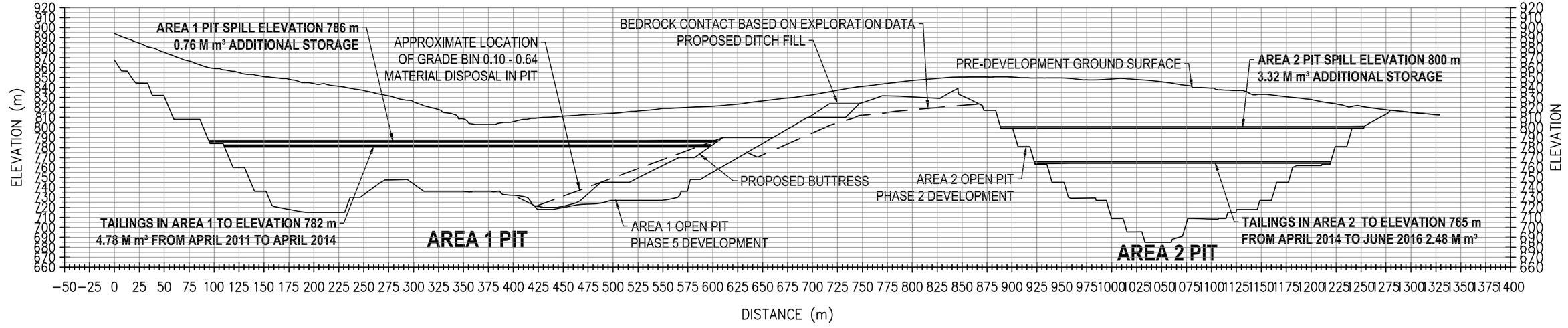
eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE: EBA-WHSE
DATE: February 21, 2011

Figure 6-7

Q:\Kelowna\Drafting\W141\W14101068 - Minto\KELOWNA\Phase 030 Minto Closure Plan\January 2011 Closure\January 2011 Closure from Whitehorse\W14101068.030 Fig.2-1, 2-2.dwg [FIGURE 6-8] February 28, 2011 - 4:08:15 pm (BY: HALLEY, RICHARD)



A
6–7

LEGEND

0 200
Scale: 1: 4 000 (metres)

STATUS
ISSUED FOR REVIEW

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MINTO EXPLORATIONS LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

AREA 1 AND 2 OPEN PIT
TYPICAL SECTION AT END OF PHASE IV

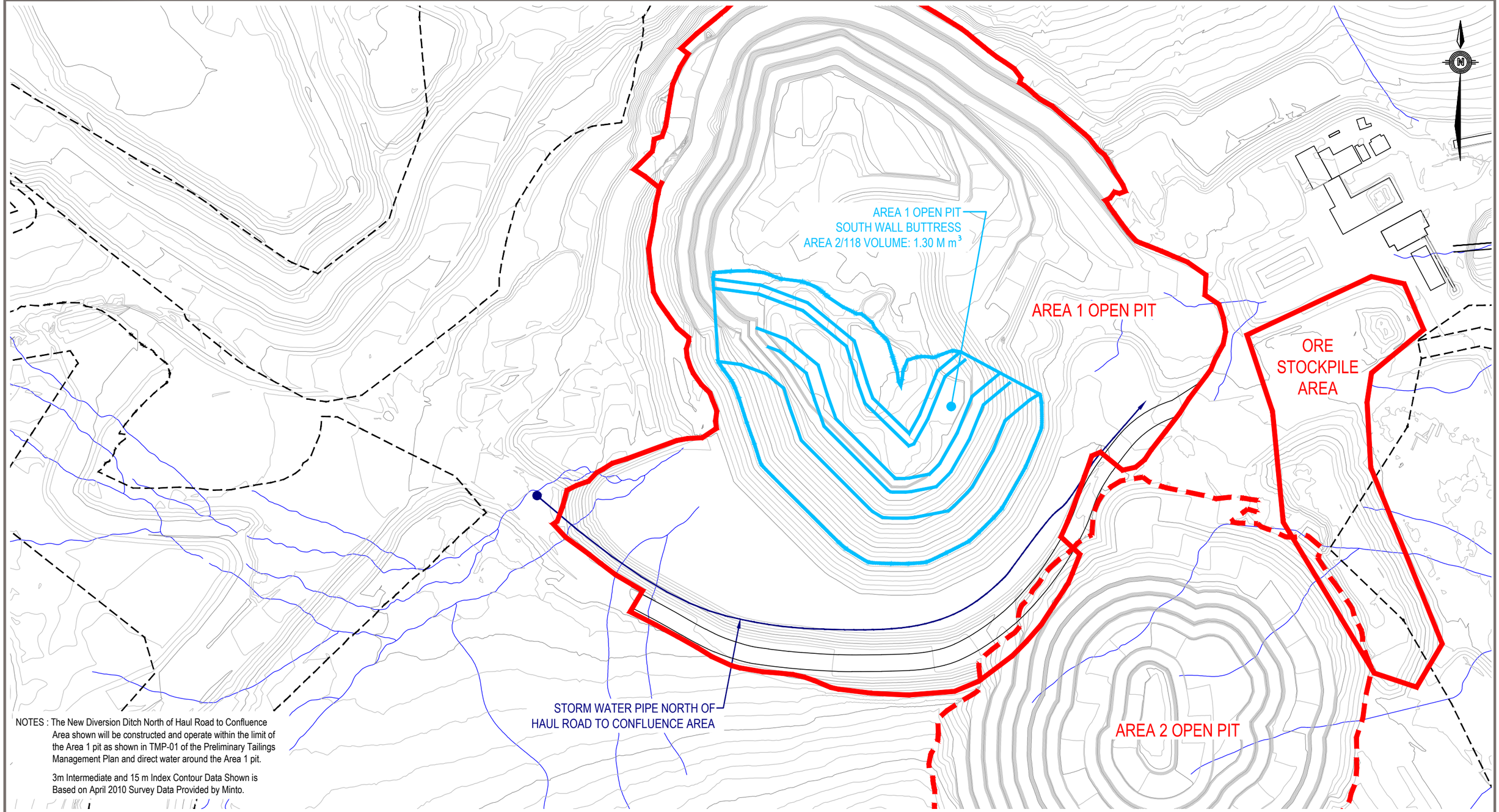
eba
A TETRATECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 21, 2011

Figure 6-8

Q:\Whitehorse\Data\0201drawings\Minto\Minto Mine Site\Phase 030 Minto Closure Plan\January 2011 Closure\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-9, 6-15 & 6-16.dwg [FIGURE 6-9] February 28, 2011 - 4:31:53 pm (BY: BUCHAN, CAMERON)



NOTES : The New Diversion Ditch North of Haul Road to Confluence Area shown will be constructed and operate within the limit of the Area 1 pit as shown in TMP-01 of the Preliminary Tailings Management Plan and direct water around the Area 1 pit.

3m Intermediate and 15 m Index Contour Data Shown is Based on April 2010 Survey Data Provided by Minto.

LEGEND

- SOUTH WALL BUTRESS BOUNDARY

0 200

Scale: 1: 4 000 (metres)

STATUS
ISSUED FOR REVIEW

CLIENT

MINTO EXPLORATIONS LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

AREA 1 OPEN PIT SOUTH WALL BUTTRESS PLAN

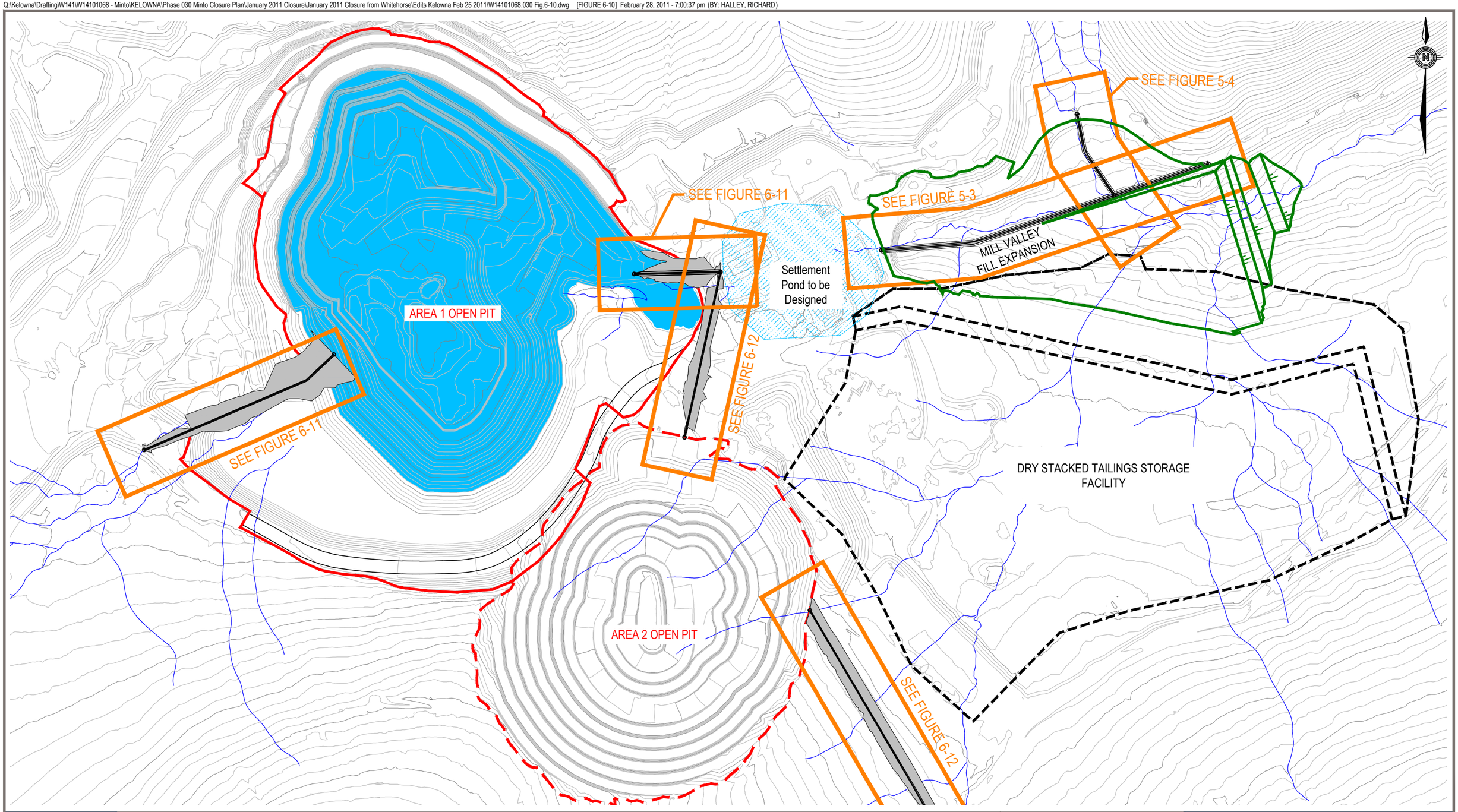
eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 25, 2011

Figure 6-9

Q:\Kelowna\Drafting\W141\W14101068 - Minto\KELOWNA\Phase 030 Minto Closure Plan\January 2011 Closure\January 2011 Closure from Whitehorse\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-10.dwg [FIGURE 6-10] February 28, 2011 - 7:00:37 pm (BY: HALLEY, RICHARD)



LEGEND

NOTE :

3 m INTERMEDIATE AND 15 m INDEX CONTOUR
DATA SHOWN BASED ON JANUARY 2011 SURVEY
DATA PROVIDED BY MINTO.

0 250
Scale: 1: 5 000 (metres)

STATUS
ISSUED FOR REVIEW

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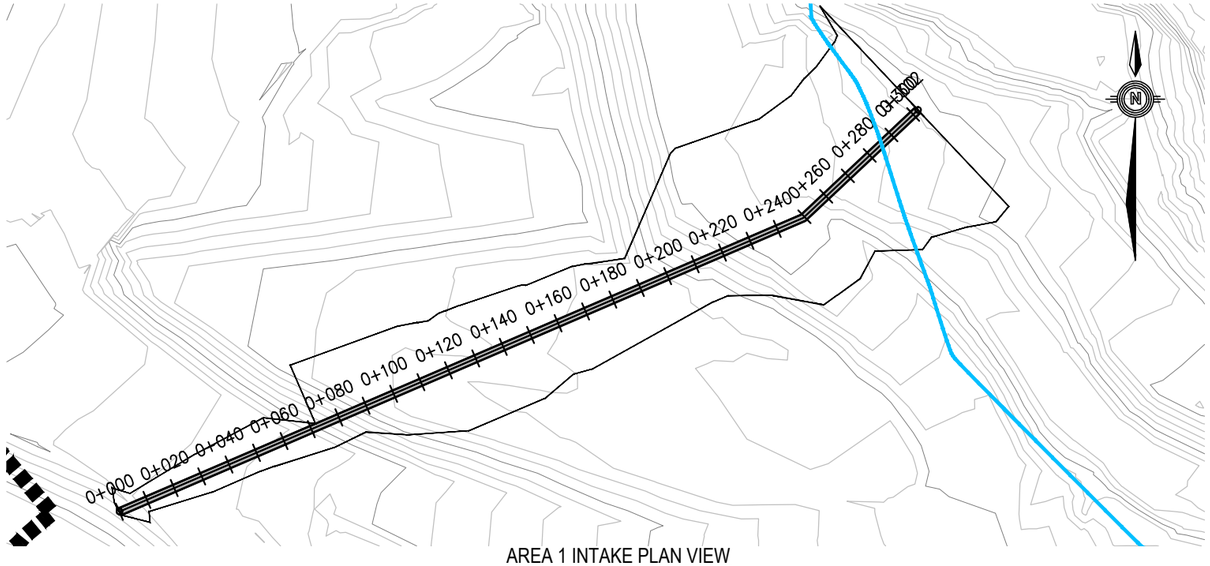
MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

PIT RECLAMATION MEASURES

eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	0
OFFICE: EBA-WHSE	DATE: February 25, 2011		

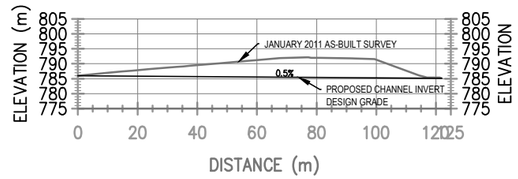
Figure 6-10



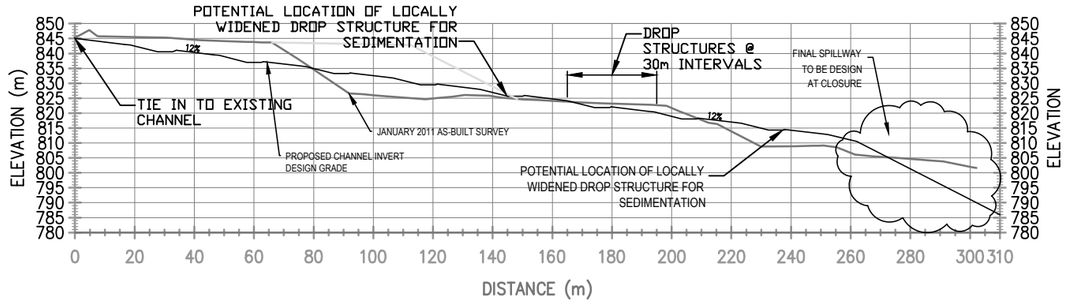
AREA 1 INTAKE PLAN VIEW
SCALE 1:2000



AREA 1 TO SETTLEMENT POND PLAN VIEW
SCALE 1:2000



AREA 1 TO SETTLEMENT POND PROFILE VIEW
SCALE 1:2000



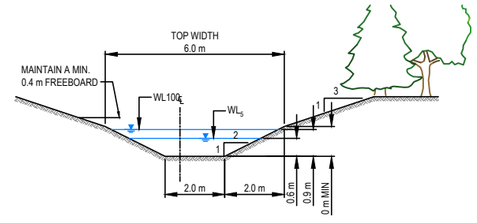
AREA 1 INTAKE PROFILE VIEW
SCALE 1:2000

NOTE:
10kg CLASS RIPRAP

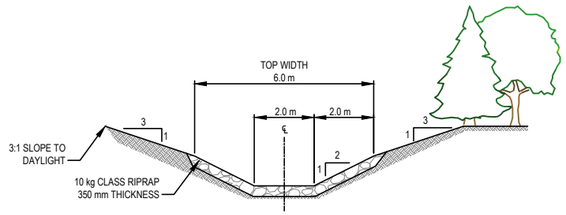
% FINER	NOMINAL SIZE (mm)
100	175-200
85	100-150
50	80-95
15	70-75

NOTE:
100kg CLASS RIPRAP

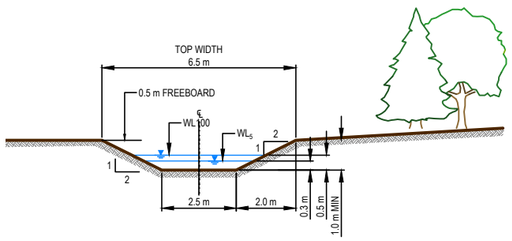
% FINER	NOMINAL SIZE (mm)
100	675-700
85	540-630
50	450-495
15	180-270



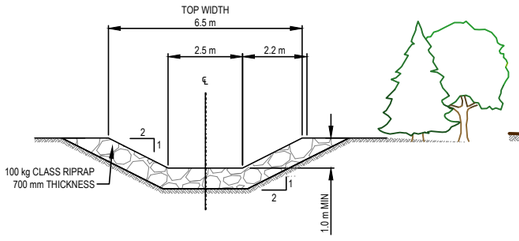
AREA 1 TO SETTLEMENT POND TYPICAL SECTION
SCALE 1:2000



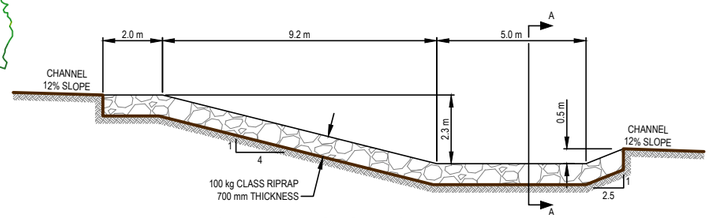
AREA 1 TO SETTLEMENT POND SECTION AND RIP-RAP DETAIL
SCALE 1:2000



AREA 1 INTAKE TYPICAL SECTION
SCALE 1:200



AREA 1 INTAKE SECTION A RIP-RAP DETAIL
SCALE 1:200



AREA 1 INTAKE DROP STRUCTURE RIP-RAP DETAIL
SCALE 1:200

LEGEND

NOTES
3 m INTERMETIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON JANUARY 2011 SURVEY DATA PROVIDED BY MINTO

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATION LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

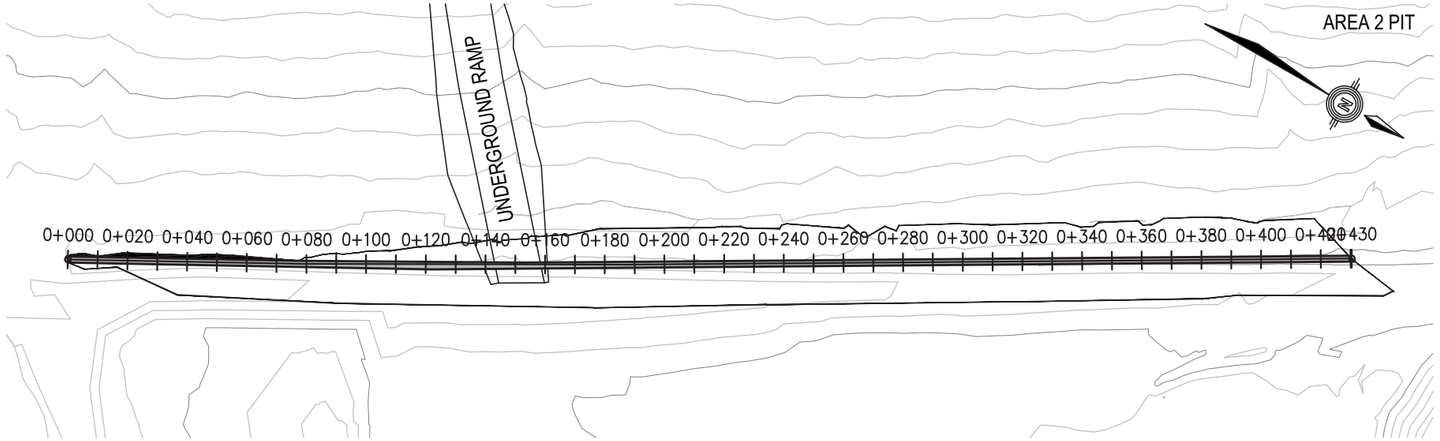
SITE PLAN SHOWING
AREA 1 INTAKES AND PROFILES

A TETRA TECH COMPANY

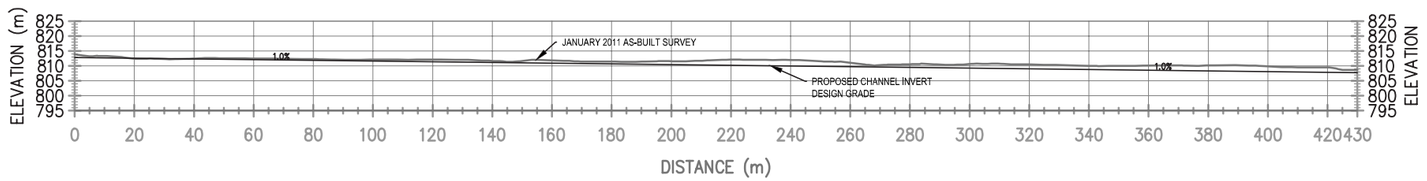
PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	BJC	0

OFFICE: EBA-WHSE
DATE: February 25, 2011

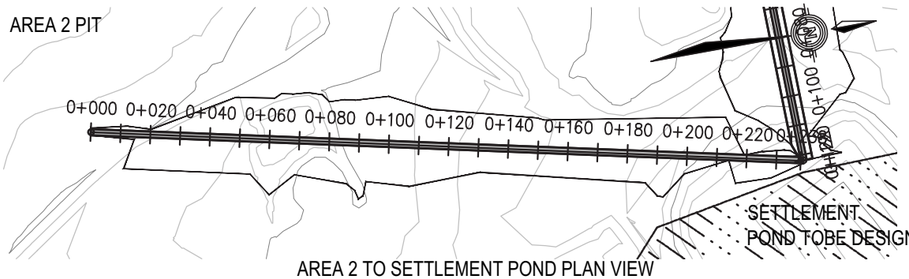
Figure 6.11



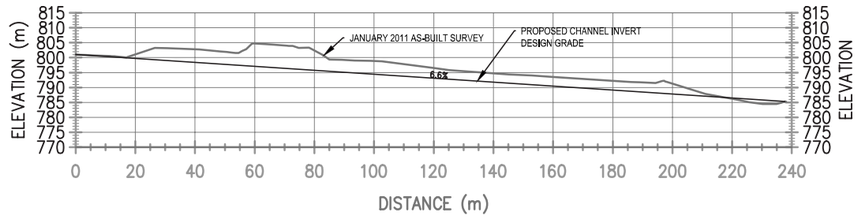
WEST DRAINAGE CHANNEL TO AREA 2 INTAKE PLAN VIEW
SCALE 1:2000



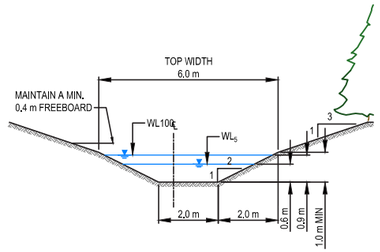
WEST DRAINAGE CHANNEL TO AREA 2 INTAKE PLAN VIEW
SCALE 1:2000



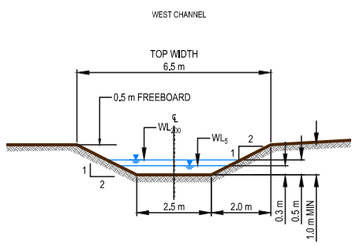
AREA 2 TO SETTLEMENT POND PLAN VIEW
SCALE 1:2000



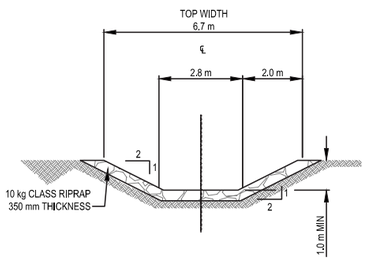
AREA 2 TO SETTLEMENT POND PROFILE VIEW
SCALE 1:2000



AREA 2 TO SETTLEMENT POND TYPICAL SECTION
SCALE 1:2000



AREA 2 INTAKE TYPICAL SECTION
SCALE 1:200



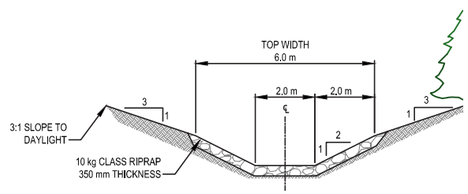
AREA 2 INTAKE SECTION RIP-RAP DETAIL
SCALE 1:200

NOTE:
10kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	175-200
85	100-150
50	80-95
15	70-75

NOTE:
100kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	675-700
85	540-630
50	450-495
15	180-270



AREA 2 TO SETTLEMENT POND SECTION RIP-RAP DETAIL
SCALE 1:2000

LEGEND

NOTES
3 m INTERMETIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON JANUARY 2011 SURVEY DATA PROVIDED BY MINTO

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATION LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

SITE PLAN SHOWING WEST DRAINAGE CHANNEL AND AREA 2 INTAKE SECTIONS

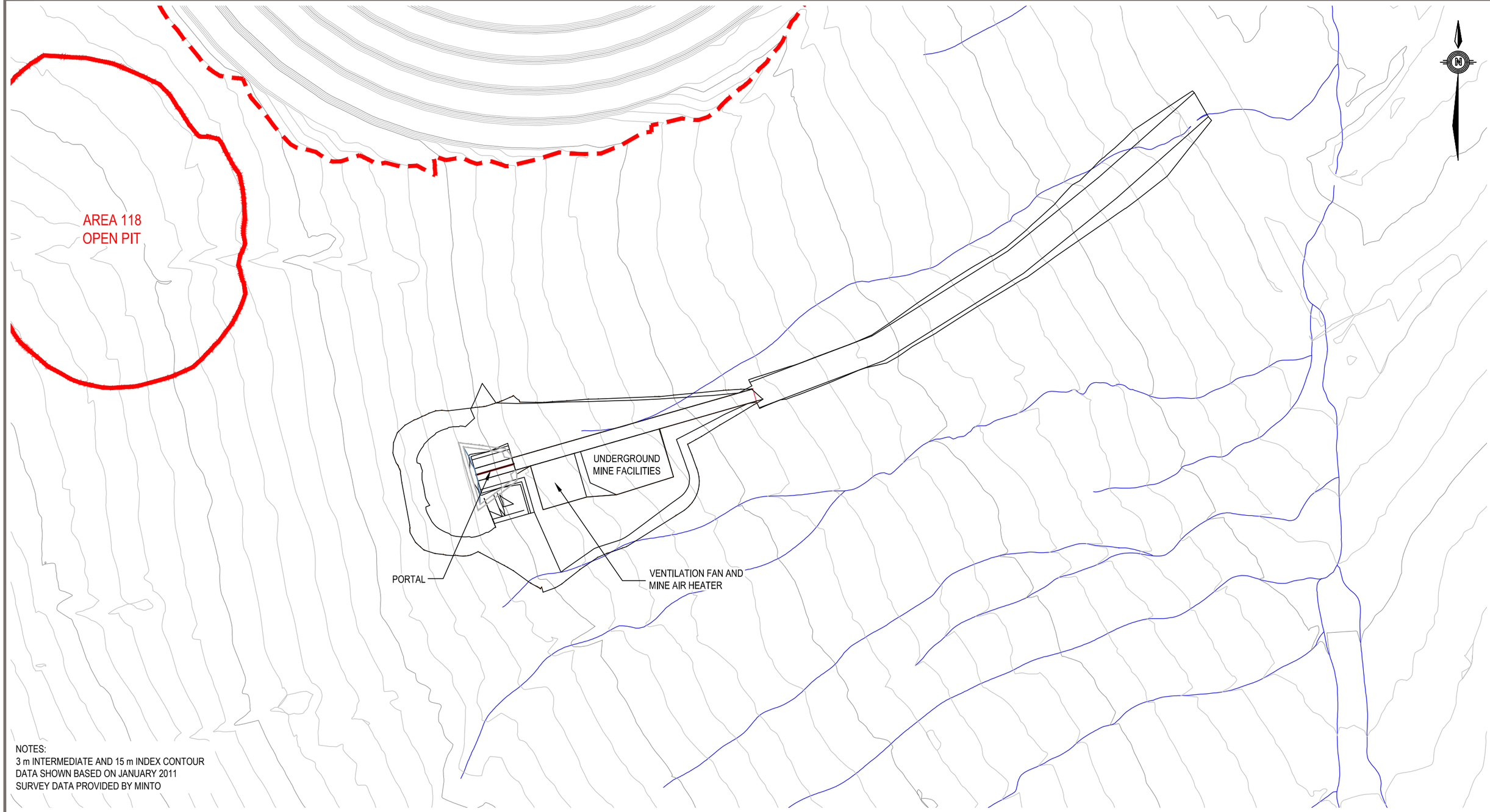
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	RH\CB	BJC	0

OFFICE	DATE
EBA-WHSE	February 25, 2011

Figure 6.12

Q:\Whitehorse\Data\0201drawings\Minto\Minto Mine Site\Phase 030 Minto Closure Plan\January 2011 Closure\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-13.dwg [FIGURE 6-13] February 28, 2011 - 4:31:22 pm (BY: BUCHAN, CAMERON)



NOTES:
3 m INTERMEDIATE AND 15 m INDEX CONTOUR
DATA SHOWN BASED ON JANUARY 2011
SURVEY DATA PROVIDED BY MINTO

LEGEND

0 100
Scale: 1: 2 000 (metres)

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATIONS LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

PORTAL

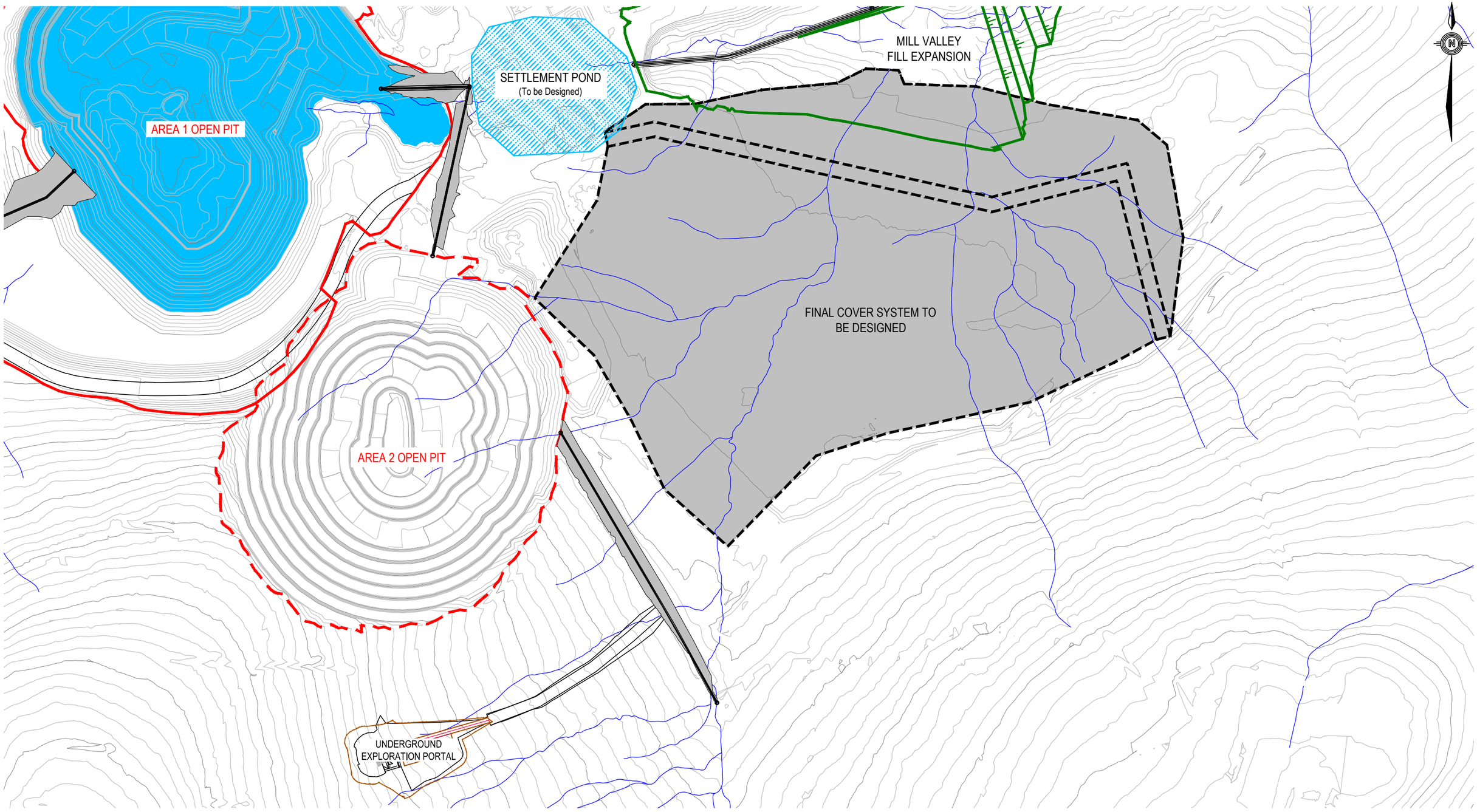
eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 25, 2011

Figure 6-13

Q:\Whitehorse\Data\0201drawings\Minto\Minto Mine Site\Phase 030 Minto Closure Plan\January 2011 Closure\Edits Kelowna Feb 25 2011\W14101068.030 Fig.6-14.dwg [FIGURE 6-14] February 28, 2011 - 5:29:15 pm (BY: BUCHAN, CAMERON)



LEGEND

NOTE :

3 m INTERMEDIATE AND 15 m INDEX CONTOUR
DATA SHOWN BASED ON JANUARY 2011 SURVEY
DATA PROVIDED BY MINTO.

0 250
Scale: 1: 5 000 (metres)

STATUS
ISSUED FOR REVIEW

CLIENT

MINTO EXPLORATIONS LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

RECLAMATION MEASURES
FOR OPEN PIT AND SURFACE WATER

eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE: EBA-WHSE
DATE: February 25, 2011

Figure 6-14

EXISTING CAMP PAD

W-13a SAMPLING PONT
SAMPLING POINT TO BE MOVED
OR ACCESS MAINTAINED THROUGH
MANHOLE OR STANDPIPE

CAMP PAD EXPANSION

MILL VALLEY FILL EXPANSION
SURFACE AREA: 102,000 m²
AREA 2/118 VOLUME: 1.50 M m³

W-13a

W-37

W-8

W-8A

TOE KEY

MILL VALLEY FILL EXTENSION DESIGN CREST

MILL VALLEY FILL EXTENSION DESIGN TOE

DSTSF DESIGN TOE

FRENCH DRAIN FROM END OF
EXISTING CULVERT TO TIE
INTO DRAINAGE BLANKET

EXISTING
CULVERT

DSTSF DESIGN CREST

FRENCH DRAIN FROM
EXISTING SEEP TO TIE
INTO DRAINAGE BLANKET

DRY STACK TAILINGS
STORAGE FACILITY

AREA 1 OPEN PIT

ORE
STOCKPILE
AREA

AREA 2
OPEN PIT

A 6-16

B 6-16

NOTES:
3 m INTERMEDIATE AND 15 m INDEX CONTOUR
DATA SHOWN BASED ON FEBRUARY 2010
SURVEY DATA PROVIDED BY MINTO

LEGEND

- MILL VALLEY FILL CRESTS AND TOES

0 200
Scale: 1: 4 000 (metres)

STATUS
ISSUED FOR REVIEW

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MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

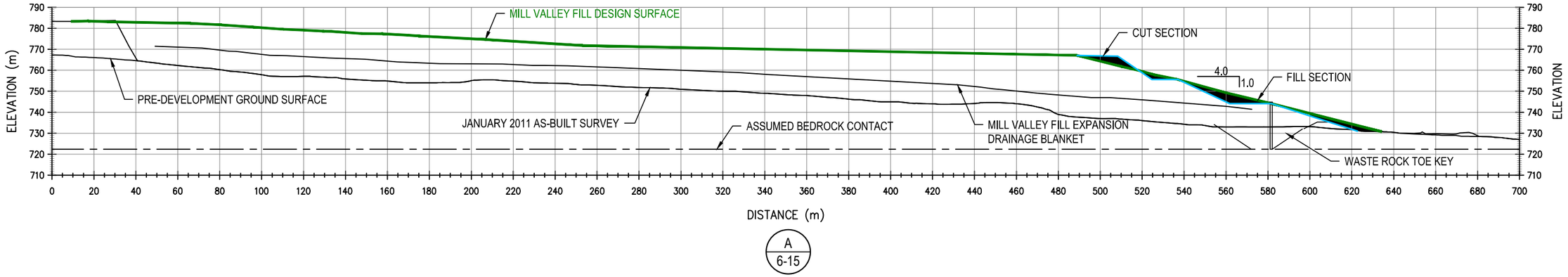
MILL VALLEY FILL EXPANSION PLAN

eba
A TETRATECH COMPANY

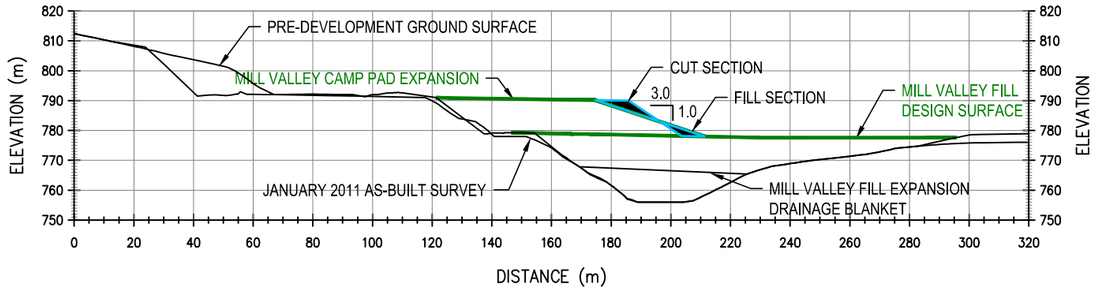
PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE: EBA-WHSE
DATE: February 25, 2011

Figure 6-15



A
6-15



B
6-15

LEGEND

0 100
Scale: 1: 2 000 (metres)

STATUS
ISSUED FOR REVIEW

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MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

MILL VALLEY FILL EXPANSION SECTIONS B AND C

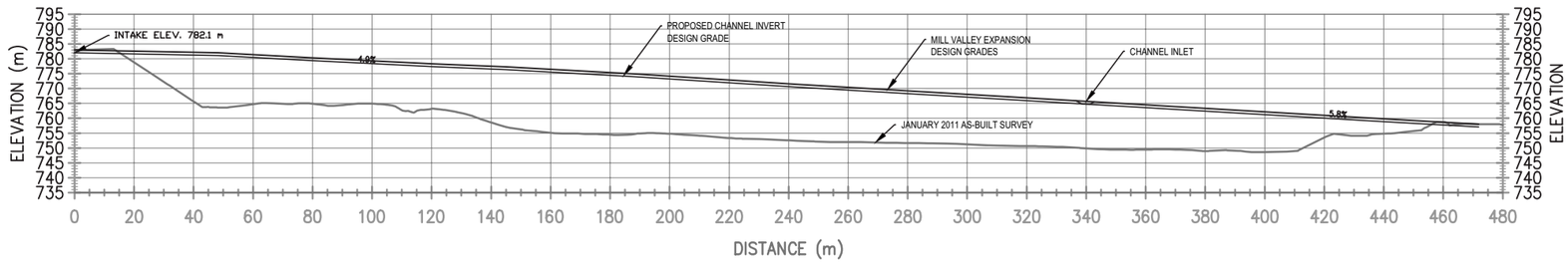
eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3
OFFICE: EBA-WHSE	DATE: February 25, 2011		

Figure 6-16



MILL VALLEY DRAINAGE CHANNEL MILL CREEK PLAN VIEW
SCALE 1:2000



MILL VALLEY DRAINAGE CHANNEL MILL CREEK PLAN VIEW
SCALE 1:2000

NOTE:
10kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	175-200
85	100-150
50	80-95
15	70-75

NOTE:
100kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	675-700
85	540-630
50	450-495
15	180-270

NOTE:
FOR TYPICAL SECTIONS SEE Figure 5-4

LEGEND

0 100
Scale: 1: 2 000 (metres)

NOTES
3 m INTERMETIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON JANUARY 2011 SURVEY DATA PROVIDED BY MINTO

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATION LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

MILL VALLEY DRAINAGE CHANNEL

eba A TETRA TECH COMPANY

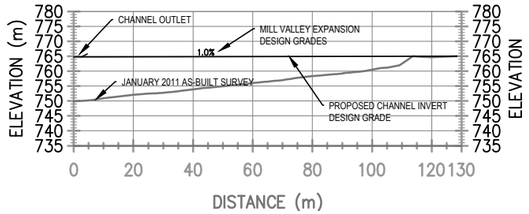
PROJECT NO.	DWN	CKD	REV
W14101068.030	RH\CB	BJC	0

OFFICE: EBA-WHSE
DATE: February 25, 2011

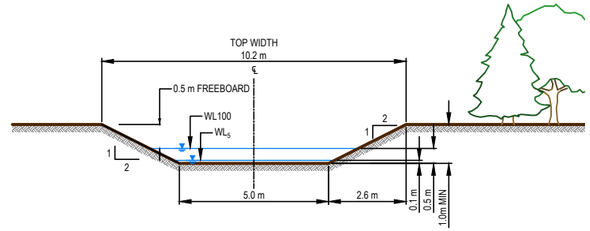
Figure 6.17



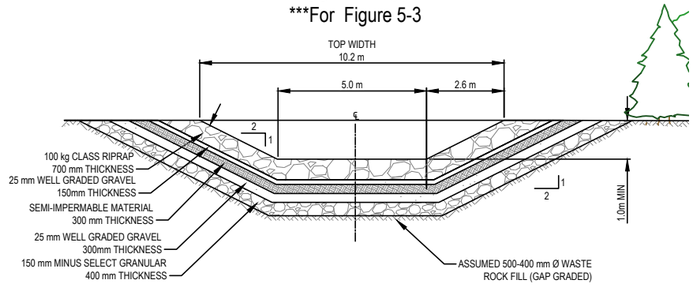
MILL VALLEY NORTH TO SOUTH DRAINAGE CHANNEL PLAN VIEW
SCALE 1:2000



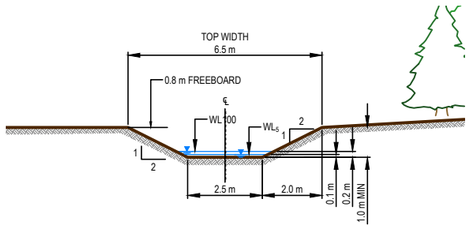
MILL VALLEY NORTH TO SOUTH DRAINAGE CHANNEL PROFILE VIEW
SCALE 1:2000



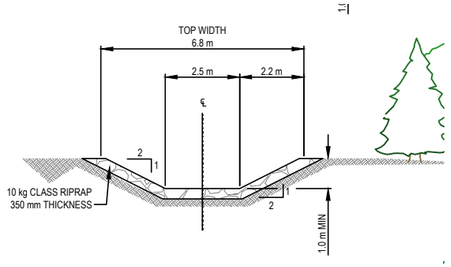
MILL VALLEY FILL DRAINAGE CHANNEL TO MILL CREEK TYPICAL SECTION
SCALE 1:200
***For Figure 5-3



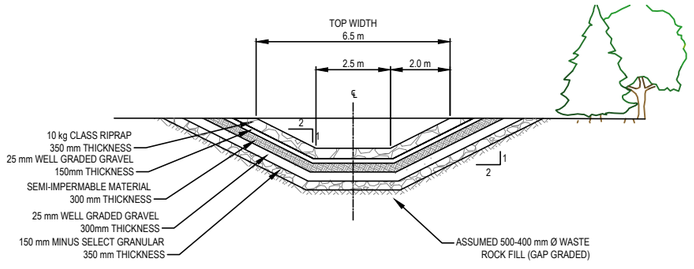
MILL VALLEY FILL DRAINAGE CHANNEL TO MILL CREEK RIP-RAP DETAIL
SCALE 1:200
***For Figure 5-3



MILL VALLEY FILL DRAINAGE CHANNEL TO MILL CREEK TYPICAL SECTION
SCALE 1:200



MILL VALLEY FILL DRAINAGE CHANNEL SECTION B-B' RIP-RAP NATIVE DETAIL
SCALE 1:200



MILL VALLEY FILL DRAINAGE CHANNEL SECTION A-A' RIP-RAP WASTE ROCK FILL DETAIL
SCALE 1:200

NOTE:
10kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	175-200
85	100-150
50	80-95
15	70-75

NOTE:
100kg CLASS RIPRAP

% FINER	NOMINAL SIZE (mm)
100	675-700
85	540-630
50	450-495
15	180-270

LEGEND

NOTES
3 m INTERMETIATE AND 15 m INDEX CONTOUR DATA SHOWN BASED ON JANUARY 2011 SURVEY DATA PROVIDED BY MINTO

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATION LTD.

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

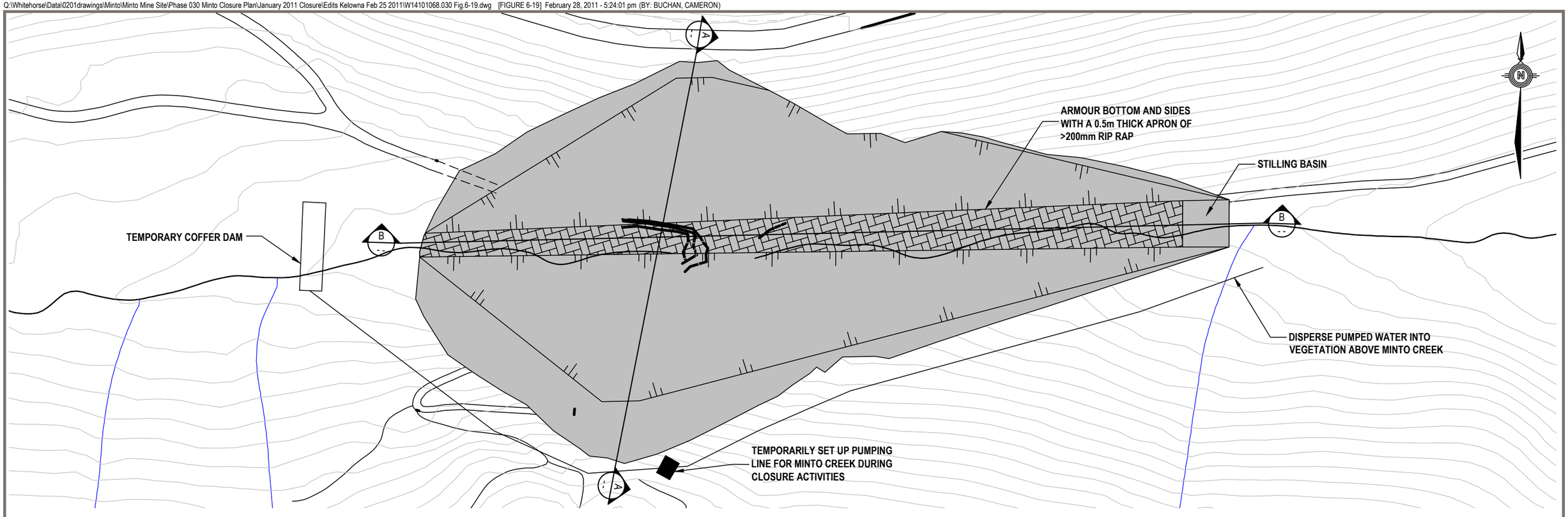
MILL VALLEY FILL DRAINAGE AND DETAILS

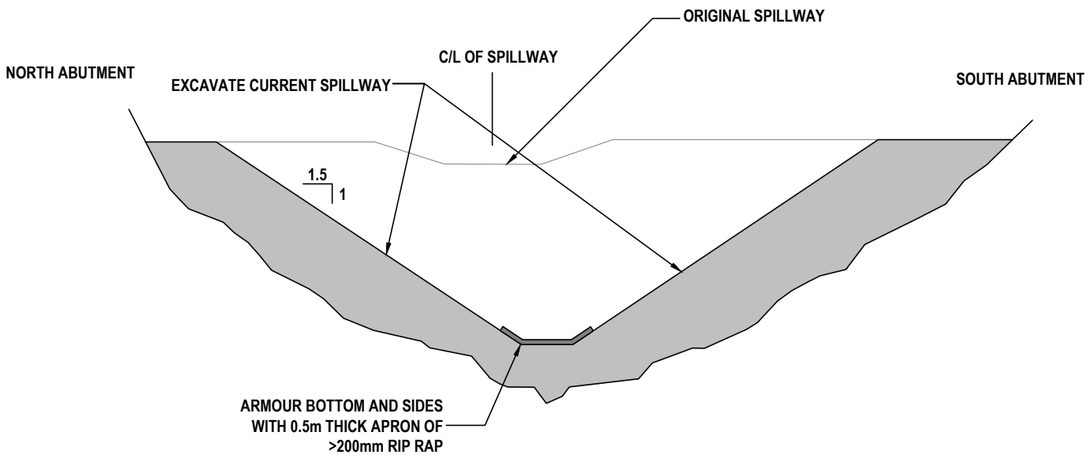
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	BJC	0

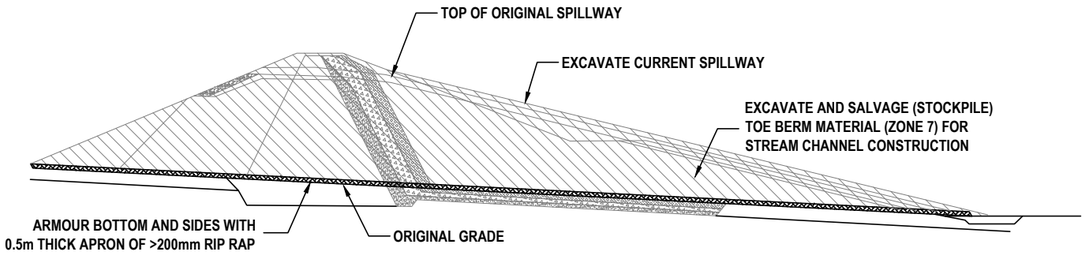
OFFICE: EBA-WHSE
DATE: February 25, 2011

Figure 6.18





A -- SECTION - C/L OF DAM CREST
SCALE 1 : 2500



B -- SPILLWAY SECTION - TO BE REMOVED
SCALE 1 : 4000

LEGEND

0 50
Scale: 1: 1000 (metres)

STATUS
ISSUED FOR REVIEW

CLIENT
MINTO EXPLORATIONS LTD.

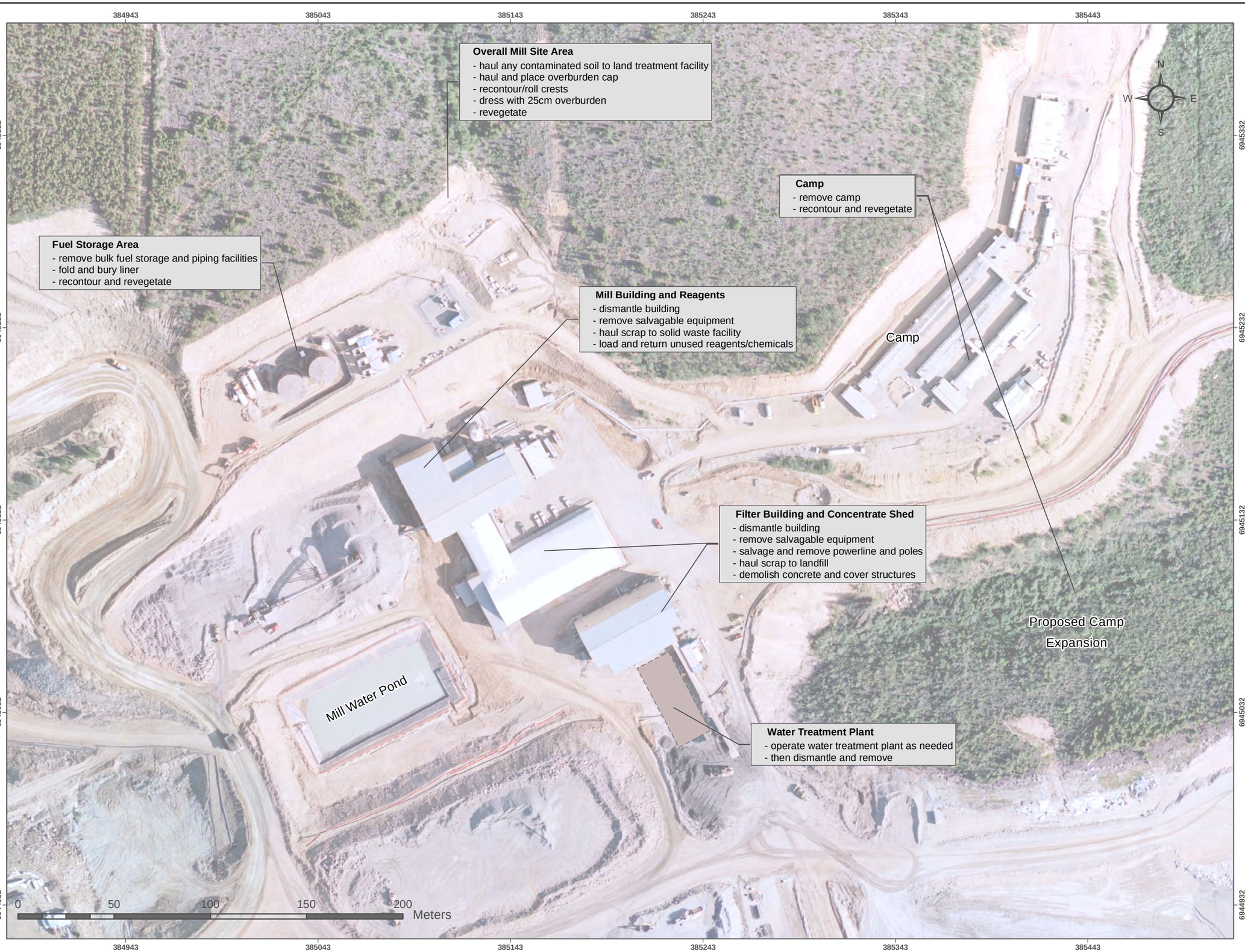
MINTO MINE
DECOMMISSIONING AND RECLAMATION MEASURES

CLOSURE CONDITIONS
FOR WATER STORAGE POND DAM

eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3
OFFICE: EBA-WHSE	DATE: February 25, 2011		

Figure 6-19



MINTO MINE

DECOMMISSIONING AND RECLAMATION PLAN

Rev.3

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

This is not a legal document. Aerial photography flight date: July 13th 2009. Ortho-rectification produced by Challenger Geomatics Ltd.

NAD 83 UTM Zone 8N

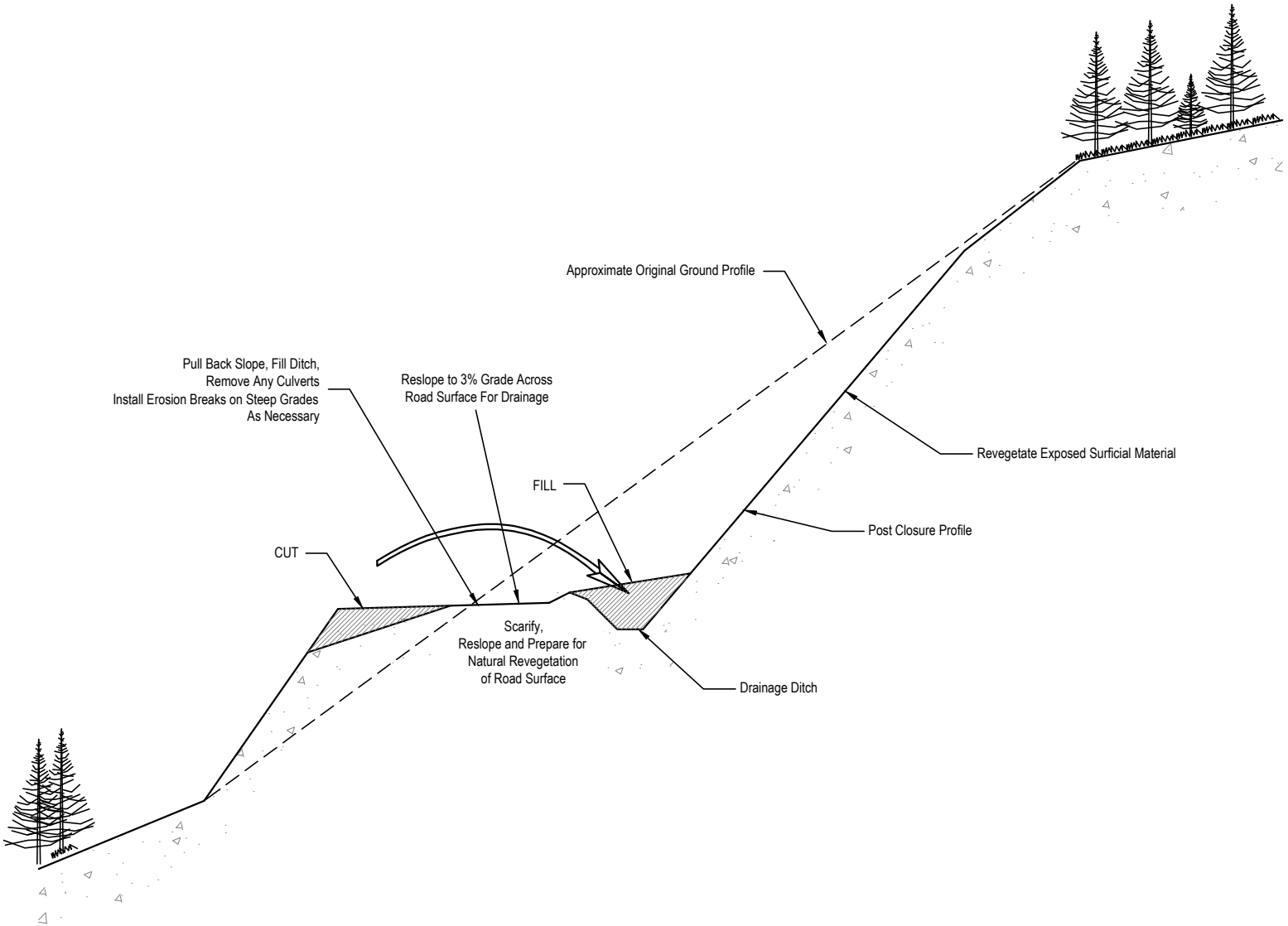
FIGURE 6-20

MILL AND ANCILLARY FACILITIES RECLAMATION MEASURES

ACCESS Consulting Group

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

I:\Minto\gis\mxd\Phase_4\Closure\FEB_2011\6-20_Camps_20110212 3.mxd



STATUS
ISSUED FOR REVIEW

NOTES

Sand & Gravel

Existing Vegetation

0 10

Scale: 1: 250 (metres)

CLIENT

MINTO EXPLORATIONS LTD.

A TETRA TECH COMPANY

MINTO MINE
DECOMMISSIONING AND RECLAMATION PLAN

HAUL ROAD AND SITE ROAD
TYPICAL RECLAMATION CROSS-SECTION

PROJECT NO.	DWN	CKD	REV
W14101068.030	CB	JTP	3

OFFICE	DATE
EBA-WHSE	February 25, 2011

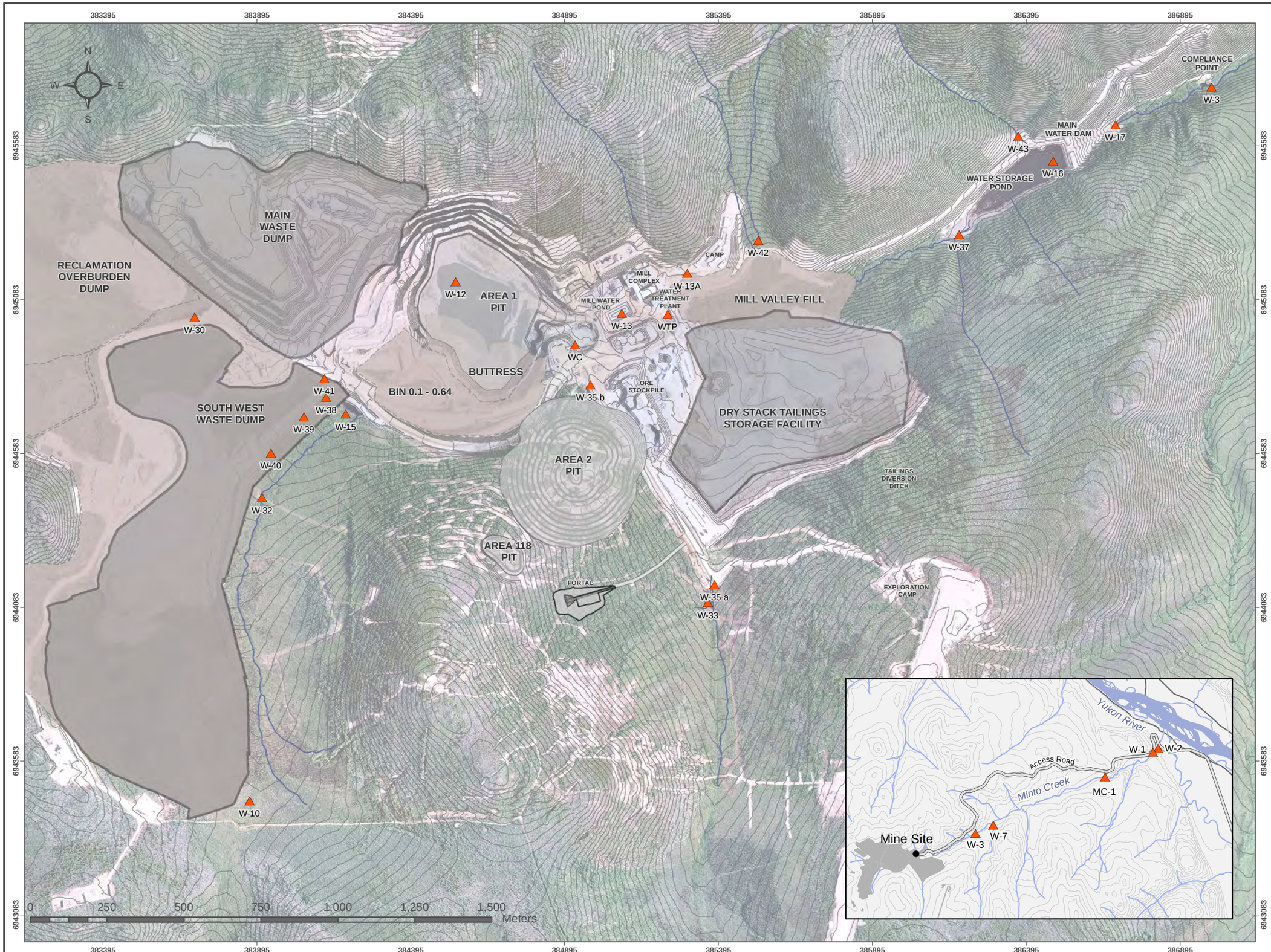
Figure 6-21

MINTO MINE

DECOMMISSIONING AND RECLAMATION PLAN

Rev.3

Minto Explorations Ltd.
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Surface Water Monitoring

Hydrology_Simplified

Pit Development

Waste Dump Footprint

Previous Waste Dump Disturbance

This is not a legal document. Aerial photography flight date: July 13th 2009. Ortho-rectification produced by Challenger Geomatics Ltd. Site hydrology provided by provided by Minto Explorations Ltd, May 2009 and modifed to reflect Phase IV design. Waste dump footprints provided by EBA (PRELIM PHASE IV WASTE DUMP DEVELOPMENT BY CALENDAR YEAR 2010-07-07.dxf) and W14101068.015 P4W-05 2010-07-07.dxf. Pit Development form lines provided by SRK (PHIV 2010.dxf).

Inset Maps: National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000.Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.

NAD 83 UTM Zone 8N

FIGURE 7-1

WATER QUALITY MONITORING STATION LOCATIONS

ACCESS CONSULTING GROUP

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SK

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MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

Decommissioning and Reclamation Plan

Appendix A

Closure Water Quality Predictive Modeling Results

SRK Consulting
Engineers and Scientists

SRK Consulting (Canada) Inc.
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Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
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Tel: 604.681.4196
Fax: 604.687.5532

Memo

To:	Scott Keesey, Scott Davidson (Access Consulting Group)	**Date:**	November 10, 2010
cc:	Anne Labelle (Capstone)	**From:**	Dylan MacGregor
Subject:	Minto Phase IV Application: Response to Adequacy Review Comment 26-27C	**Project #:**	1CM022.001

1 Introduction

As part of Minto's response to agency adequacy review comments, SRK was asked to provide input to the response to Comment 26-27C. This comment is copied below for ease of reference.

> **R26-27C. Provide water quality predictions for the receiving environment. These additional predictions could be reasonably based on expected reduced loads from the various source terms after mitigation. The analysis should include scenarios that predict the effects of individual source term mitigations and scenarios that include multiple source terms mitigations. The analysis should include a clear discussion of limitations and uncertainty and a revised cost analysis.**

Following discussions and subsequent email communication between SRK and Access Consulting, it was agreed that the potential effects of soil covers and passive wetland treatment on post-closure water quality would be evaluated. The following sections describe how this evaluation was carried out and present the results.

2 Approach

2.1 Model update

In advance of carrying out additional model runs to assess load reductions that could reasonably be achieved through various closure measures, a review was carried out of the new water quality monitoring results that had been received since July 2010 (the latest results considered for the initial prediction source terms). The purpose was to ensure that the model source terms for the waste rock and tailings facilities incorporated any new peak concentrations identified during post-July 2010 monitoring. Selenium was the only trace element with post-July 2010 maxima that exceeded previously observed values, and the new maximum dissolved selenium concentrations in DSTF seepage (Station W8- dissolved Se concentration of 0.0146 mg/L) and waste rock seepage (Station W15- dissolved Se concentration of 0.0052 mg/L) have been incorporated into the updated prediction.

2.2 Assessment of potential for load reductions due to mitigation

The potential load reductions from application of two mitigation methods were evaluated. These mitigation methods consisted of 1) application of soil covers to reduce loading through reduction of

infiltration, and 2) the application of soil covers combined with development of a wetland to provide additional load removal. There is a large body of literature of treatment wetlands that shows they can be effective in removing both metal and nutrient loadings in northern environments (S. Davidson, personal communication, 2010/11/09). Reviewers are referred to the Global Acid Rock Drainage (GARD) Guide for further information on passive treatment wetlands. To evaluate the range of load reductions that could be realized, six scenarios were evaluated as summarized below.

1. Soil covers on waste dumps and dry stack tailings
    a. Scenario 1: 60% reduction of infiltration on benches and 50% on faces
    b. Scenario 2: 80% reduction of infiltration on benches and 50% on faces

2. Soil covers on waste dumps and dry stack tailings, with a polishing wetland receiving the discharge from both the Main Pit and the Area 2 Pit (located roughly in the location of the current Mill Water Pond)
    a. Scenario 3: 60% reduction of infiltration on benches and 50% on faces; wetland removing 66% of received loads.
    b. Scenario 4: 80% reduction of infiltration on benches and 50% on faces; wetland removing 75% of received loads.
3. Soil covers on waste dumps and dry stack tailings, with a polishing wetland receiving the discharge from both the Main Pit and the Area 2 Pit (located roughly in the location of the current Mill Water Pond) and a second polishing wetland receiving drainage from all mine elements above Station W3 (located roughly in the current location of the Water Storage Pond)
    a. Scenario 5: 60% reduction of infiltration on benches and 50% on faces; wetland removing 66% of received loads (both wetlands).
    b. Scenario 6: 80% reduction of infiltration on benches and 50% on faces; wetland removing 75% of received loads (both wetlands).

3 Basis for Evaluation

Effects of Soil Covers: The values chosen for the evaluation of load reduction that could be achieved through the use of soil cover represent the effectiveness of a basic soil cover (60% reduction of infiltration on benches) and a high quality soil cover (80% reduction of infiltration on benches). In all scenarios, an infiltration reduction of 50% was applied to the face (sloped) areas of the waste dumps and the tailings stack.

Breakdowns of bench and face areas for the waste dumps and the dry stack tailings were provided in Table 4.2 of the Closure Plan submitted with the application (Appendix M); this table is reproduced below for ease of reference.

TABLE 4-2. MINTO MINE WASTE DUMP AND TAILINGS FACILITY SURFACE AREAS

Area	Total Surface Area (m^2)	Bench Area (m^2)	Dump Face Area (m^2)	Percentage Benches
Dry Stacked Tailings Storage Facility	380,000	310,000	70,000	81.6%
Southwest Waste Dump	740,000	653,000	87,000	88.2%
Main Waste Dump	435,000	278,100	156,900	63.9%
Mill Valley Fill Expansion	102,000	80,100	21,900	78.5%

Effects of Wetlands: The critical performance period for passive treatment wetlands in northern environments tends to be the spring freshet, when high inflow volumes lead to relatively shorter residence times (and attendant lower load removal rates) than are typical of other times of the year.

Evaluating the supplemental effect of passive treatment wetland systems, in addition to installation of soil covers on waste dumps and dry stack tailings, for removing chemical loads from feed water was carried out by running two freshet performance scenarios:

1. Basic soil cover + lower estimate of freshet load removal in wetland;
2. High quality soil cover + higher estimate of freshet load removal in wetland(s).

4 Evaluation of Effects of Mitigation Measures on Water Quality at Station W1

4.1 Unmitigated Condition

Table 1 presents the results of the post-closure water quality model for the unmitigated condition at Station W1. Predicted concentrations were compared with Site Specific Water Quality Objectives (SSWQO) where available, and with Canadian Water Quality Objectives for the Protection of Aquatic Life (CWQO) for those parameters where no SSWQO were available; for the purposes of this discussion, the term 'Water Quality Objectives' (WQO) will refer to the combined SSWQO (where available) and CWQO (where no SSWQO has been developed).

Modelled concentrations for the unmitigated condition exceeded WQO for several parameters in the month of June, and for Al, Cd, Cu, Fe, and Hg for several months.

- June results:
  - The June model results are a reflection of concentrations adopted for June background runoff water quality.
  - The lack of June flow from the upper catchment (above W3) introduces minor artifacts to the model results at W1, as model structure required end of May loads into the beginning of June for computational purposes. These artifacts manifest only in the month of June due to the lack of flow modelled for that month.
  - For this and subsequent discussion of mitigated scenarios, June concentrations that exceed WQO will not be addressed unless exceedances are also modelled to occur in other months.
- Mercury results:
  - Mercury predictions are very challenging, and always end up being very conservative when 'reasonable worst case' source terms are adopted and a mass-balance approach is followed.
  - Mercury is commonly eliminated from surface water through mechanisms such as loss to the atmosphere (volatilization) or sorption onto mineral and organic soils and sediments.
  - These and other mechanisms typically control mercury concentrations to levels below common commercial laboratory detection limits- this is why mercury is rarely detected in surface water quality analyses.
  - Notwithstanding this, the modelled mercury concentrations are less than two times the WQO (except for June- see previous point).
  - Mercury is therefore not considered to be a parameter of particular concern for the Minto Phase IV project, and mercury exceedances will not be discussed in further detail either for the unmitigated case or for the mitigated scenarios.
- Silver results:
  - The total silver concentration modelled for October exceeds the WQO by less than 10%. As silver is highly insoluble in surface waters, this modelled concentration is likely to be highly conservative. Therefore, silver is not considered to be a parameter of concern, and the October silver results will not be discussed further.

4.2 Evaluation of Effects of Soil Covers on Water Quality at Station W1

Tables 2 and 3 present the results of the post-closure water quality model for the cases where the effects of infiltration reduction covers were assessed, with Table 2 reflecting a 60% reduction of

infiltration and chemical load, and with Table 3 reflecting a 80% reduction of infiltration and chemical load.

The following observations can be made:

- If the 'reasonable worst case' predicted concentrations are reflective of actual loadings during the post-closure period, then soil covers alone will not be sufficient to prevent WQOs from being exceeded at W1.
- The cover performance has a modest degree of influence on the modelled concentrations at Station W1.
- Outside of the points raised in the Section 4.1, the remaining parameters of concern appear to be Al, Cd, and Cu.

4.3 Evaluation of Effects of Soil Covers and a Single Polishing Wetland on Water Quality at Station W1

Tables 4 and 5 present the results of model scenarios that include basic covers on waste dumps and tailings, and a wetland located near the current Mill Water Pond. The Table 4 scenario consists of basic covers and 66% removal of intercepted load in the wetland, while the Table 5 scenario consists of higher quality covers and 75% removal of load in the intercepted wetland.

The following observations can be made:

- If the 'reasonable worst case' predicted concentrations are reflective of actual loadings during the post-closure period, then both 'soil covers + 1 wetland' options appear to be capable of reducing loads such that WQOs for copper are met at W1.
- Cadmium remains consistently above WQO for both scenarios.
- Aluminum is modelled to be above the WQO during the freshet period. Modelled concentrations are similar to aluminum concentrations observed in runoff from undisturbed portions of the catchment, and are driven by background loads that are accounted for in the modelling process.

4.4 Evaluation of Effects of Soil Covers and Two Polishing Wetlands on Water Quality at Station W1

Tables 6 and 7 present the results of model scenarios that include basic covers on waste dumps and tailings, a wetland located near the current Mill Water Pond, and a second wetland located near the current location of the Water Storage Pond (just upstream of Station W3). The Table 6 scenario consists of basic covers and 66% removal of intercepted load in the wetlands, while the Table 7 scenario consists of higher quality covers and 75% removal of intercepted load in the wetlands.

The following observations can be made:

- If the 'reasonable worst case' predicted concentrations are reflective of actual loadings during the post-closure period, then both 'soil covers + 2 wetland' options appear to be capable of reducing loads such that WQOs for all parameters except cadmium are met at Station W1.
- Cadmium remains consistently above WQO for both scenarios.
- Cadmium concentrations are near or above the WQO in the background runoff source term for the months of April, May, June, and October. The post-closure cadmium concentrations at Station W1 are unlikely to be lower than background runoff concentrations; when the undisturbed catchment runoff contains concentrations that exceed WQO, it is almost certain that the concentrations at Station W1 will also exceed WQO.
- The maximum modelled Cadmium concentration (October) exceeds the WQO by a factor of about 3.5; the modelled concentrations for all other months is less than 1.5 times the WQO concentration.

5 Conclusions

Based on the modelling results, it appears that a combination of a reduction of infiltration through waste rock and tailings (through installation of soil covers) and of load removal in polishing wetlands will be capable of adequately mitigating chemical loadings from the mine site in the post-closure period.

As site loadings are decreased, background runoff loadings become proportionally more important. In cases where background runoff concentrations are greater than WQOs, it is highly likely that WQOs will be exceeded at Station W1. The model results suggest that cadmium is the parameter that is most likely to exceed WQOs under the mitigation scenarios evaluated, and that this will largely result from load contributions from undisturbed portions of the catchment.

Table 1 W1 Post-closure Water Quality Prediction (Unmitigated Condition)

	Ag mg/L	Al mg/L	As mg/L	Cd mg/L	Cr mg/L	Cu mg/L	Fe mg/L	Hg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	Pb mg/L	Se mg/L	Tl mg/L	Zn mg/L
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000051	0.26	0.00046	0.000077	0.00089	0.018	0.37	0.000013	0.070	0.0013	0.0010	0.00024	0.00039	0.000006	0.0085
May	0.000068	0.83	0.00103	0.000089	0.00162	0.034	1.16	0.000019	0.154	0.0021	0.0036	0.00056	0.00081	0.000093	0.0106
June	0.000050	1.68	0.00105	0.000044	0.00363	0.006	2.48	0.001402	0.108	0.0010	0.0049	0.00077	0.00041	0.000030	0.0091
July	0.000055	0.47	0.00079	0.000046	0.00095	0.025	0.74	0.000074	0.132	0.0018	0.0020	0.00036	0.00057	0.000035	0.0080
August	0.000073	0.30	0.00080	0.000044	0.00090	0.024	0.44	0.000035	0.121	0.0025	0.0018	0.00037	0.00057	0.000041	0.0078
September	0.000106	0.81	0.00104	0.000090	0.00163	0.043	1.21	0.000036	0.198	0.0025	0.0033	0.00061	0.00084	0.000041	0.0144
October	0.000050	0.30	0.00055	0.000156	0.00090	0.014	0.48	0.000023	0.083	0.0015	0.0020	0.00076	0.00069	0.000031	0.0076
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 2 W1 Post-closure Water Quality Prediction- Mitigation Scenario 1: Soil Cover (60% infiltration reduction) on DSTF and Waste Dumps

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000052	0.27	0.00044	0.000077	0.00089	0.016	0.38	0.000014	0.055	0.0013	0.0010	0.00025	0.00040	0.000007	0.0085
May	0.000068	0.75	0.00087	0.000073	0.00149	0.020	1.07	0.000019	0.106	0.0017	0.0032	0.00047	0.00068	0.000091	0.0088
June	0.000050	1.68	0.00104	0.000043	0.00363	0.005	2.47	0.001402	0.106	0.0010	0.0048	0.00077	0.00041	0.000030	0.0090
July	0.000054	0.41	0.00067	0.000034	0.00085	0.014	0.67	0.000072	0.086	0.0015	0.0018	0.00030	0.00047	0.000035	0.0067
August	0.000073	0.24	0.00067	0.000030	0.00081	0.013	0.37	0.000035	0.080	0.0022	0.0016	0.00031	0.00046	0.000041	0.0064
September	0.000105	0.69	0.00083	0.000066	0.00145	0.024	1.07	0.000036	0.136	0.0019	0.0028	0.00049	0.00066	0.000040	0.0117
October	0.000050	0.28	0.00049	0.000148	0.00086	0.009	0.45	0.000023	0.067	0.0014	0.0019	0.00073	0.00064	0.000031	0.0069
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 3 W1 Post-closure Water Quality Prediction- Mitigation Scenario 2: Soil Cover (80% infiltration reduction) on DSTF and Waste Dumps

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000052	0.26	0.00042	0.000075	0.00087	0.014	0.36	0.000014	0.048	0.0013	0.0009	0.00023	0.00036	0.000007	0.0082
May	0.000067	0.72	0.00082	0.000068	0.00145	0.016	1.04	0.000019	0.092	0.0016	0.0031	0.00045	0.00061	0.000090	0.0083
June	0.000050	1.68	0.00104	0.000043	0.00363	0.005	2.47	0.001402	0.106	0.0010	0.0048	0.00077	0.00041	0.000030	0.0090
July	0.000054	0.40	0.00063	0.000031	0.00082	0.011	0.66	0.000072	0.074	0.0014	0.0017	0.00028	0.00042	0.000035	0.0064
August	0.000073	0.23	0.00064	0.000026	0.00078	0.010	0.35	0.000035	0.068	0.0021	0.0015	0.00029	0.00041	0.000041	0.0060
September	0.000105	0.66	0.00077	0.000059	0.00140	0.018	1.03	0.000036	0.118	0.0017	0.0027	0.00046	0.00057	0.000040	0.0109
October	0.000050	0.27	0.00048	0.000147	0.00084	0.008	0.44	0.000023	0.062	0.0013	0.0019	0.00072	0.00062	0.000031	0.0067
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 4 W1 Post-closure Water Quality Prediction- Mitigation Scenario 3: Soil Cover (60% infiltration reduction) on DSTF and Waste Dumps, Wetland for Polishing Pit Discharge Waters (66% load reduction)

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000050	0.24	0.00038	0.000069	0.00082	0.013	0.34	0.000012	0.049	0.0011	0.0008	0.00021	0.00033	0.000006	0.0077
May	0.000064	0.65	0.00071	0.000060	0.00128	0.014	0.96	0.000015	0.092	0.0012	0.0028	0.00039	0.00052	0.000079	0.0075
June	0.000050	1.68	0.00104	0.000043	0.00362	0.005	2.47	0.001402	0.106	0.0010	0.0048	0.00077	0.00040	0.000030	0.0089
July	0.000053	0.36	0.00059	0.000027	0.00074	0.010	0.60	0.000055	0.079	0.0013	0.0016	0.00025	0.00040	0.000032	0.0059
August	0.000071	0.19	0.00060	0.000023	0.00072	0.008	0.31	0.000026	0.072	0.0019	0.0014	0.00026	0.00039	0.000039	0.0055
September	0.000097	0.59	0.00064	0.000052	0.00122	0.015	0.94	0.000025	0.116	0.0013	0.0024	0.00039	0.00048	0.000033	0.0096
October	0.000048	0.25	0.00045	0.000143	0.00080	0.007	0.42	0.000021	0.062	0.0012	0.0018	0.00070	0.00059	0.000029	0.0064
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 5 W1 Post-closure Water Quality Prediction- Mitigation Scenario 4: Soil Cover (80% infiltration reduction) on DSTF and Waste Dumps, Wetland for Polishing Pit Discharge Waters (75% load reduction)

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000049	0.23	0.00036	0.000068	0.00080	0.012	0.34	0.000012	0.043	0.0010	0.0008	0.00020	0.00030	0.000006	0.0075
May	0.000064	0.63	0.00066	0.000057	0.00123	0.011	0.93	0.000014	0.080	0.0011	0.0027	0.00037	0.00046	0.000077	0.0071
June	0.000050	1.68	0.00104	0.000042	0.00362	0.005	2.47	0.001402	0.105	0.0010	0.0048	0.00077	0.00040	0.000030	0.0089
July	0.000052	0.34	0.00056	0.000025	0.00071	0.008	0.59	0.000053	0.067	0.0012	0.0015	0.00024	0.00035	0.000031	0.0057
August	0.000070	0.18	0.00057	0.000021	0.00070	0.006	0.30	0.000024	0.062	0.0018	0.0013	0.00025	0.00034	0.000039	0.0053
September	0.000096	0.56	0.00058	0.000047	0.00117	0.011	0.91	0.000024	0.101	0.0011	0.0023	0.00037	0.00040	0.000032	0.0091
October	0.000047	0.24	0.00043	0.000142	0.00079	0.006	0.41	0.000021	0.058	0.0012	0.0018	0.00069	0.00057	0.000029	0.0063
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 6 W1 Post-closure Water Quality Prediction- Mitigation Scenario 5: Soil Cover (60% infiltration reduction) on DSTF and Waste Dumps, Wetland for Polishing Pit Discharge Waters (66% load reduction) and Additional Wetland for Polishing All Mine Site Drainage

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000048	0.22	0.00034	0.000065	0.00076	0.011	0.33	0.000011	0.039	0.0010	0.0008	0.00019	0.00028	0.000006	0.0073
May	0.000063	0.59	0.00059	0.000053	0.00113	0.009	0.88	0.000013	0.069	0.0010	0.0025	0.00034	0.00038	0.000069	0.0067
June	0.000049	1.68	0.00103	0.000042	0.00361	0.005	2.47	0.001402	0.105	0.0010	0.0048	0.00077	0.00040	0.000029	0.0089
July	0.000052	0.33	0.00053	0.000023	0.00068	0.007	0.57	0.000049	0.059	0.0011	0.0015	0.00023	0.00031	0.000030	0.0055
August	0.000070	0.17	0.00054	0.000019	0.00067	0.005	0.28	0.000022	0.054	0.0018	0.0013	0.00024	0.00031	0.000038	0.0051
September	0.000091	0.53	0.00052	0.000044	0.00107	0.009	0.86	0.000021	0.087	0.0010	0.0021	0.00033	0.00033	0.000029	0.0085
October	0.000046	0.24	0.00041	0.000139	0.00076	0.006	0.40	0.000020	0.054	0.0011	0.0017	0.00067	0.00055	0.000028	0.0061
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

Table 7 W1 Post-closure Water Quality Prediction- Mitigation Scenario 5: Soil Cover (80% infiltration reduction) on DSTF and Waste Dumps, Wetland for Polishing Pit Discharge Waters (75% load reduction) and Additional Wetland for Polishing All Mine Site Drainage (75% load reduction)

	Ag (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Pb (mg/L)	Se (mg/L)	Tl (mg/L)	Zn (mg/L)
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0.000048	0.22	0.00033	0.000064	0.00075	0.010	0.32	0.000011	0.036	0.0009	0.0008	0.00018	0.00026	0.000006	0.0072
May	0.000062	0.58	0.00056	0.000051	0.00110	0.008	0.87	0.000012	0.063	0.0009	0.0024	0.00033	0.00035	0.000067	0.0065
June	0.000049	1.68	0.00103	0.000042	0.00361	0.005	2.47	0.001402	0.105	0.0010	0.0048	0.00077	0.00040	0.000029	0.0089
July	0.000052	0.32	0.00051	0.000022	0.00066	0.006	0.56	0.000048	0.053	0.0011	0.0014	0.00022	0.00029	0.000030	0.0053
August	0.000069	0.16	0.00053	0.000018	0.00066	0.004	0.27	0.000021	0.050	0.0017	0.0013	0.00023	0.00029	0.000038	0.0050
September	0.000090	0.52	0.00048	0.000042	0.00103	0.008	0.84	0.000020	0.079	0.0009	0.0020	0.00032	0.00029	0.000028	0.0082
October	0.000046	0.23	0.00041	0.000138	0.00075	0.005	0.40	0.000020	0.052	0.0011	0.0017	0.00067	0.00054	0.000028	0.0060
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG (mg/L)	0.0001	0.01	0.005	0.00004	0.001	0.003	0.3	0.000026	none	0.073	0.11	0.004	0.001	0.0008	0.03
SSWQO (mg/L)		0.62			0.002	0.017	1.1		1.045						

Source: W:\01_SITES\Minto\!Databases\ML-ARD\WQ_Predictions\Load Balance\V02\[Minto.MitigationPrediction.Tables.CAJ.v02.xlsx]

Notes: Grey cells indicate values exceeding either the proposed site-specific water quality objective (SSWQO) for Station W1 (where developed) or the Canadian Water Quality Guideline values (CWQG) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca).

MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

Decommissioning and Reclamation Plan

Appendix B

Reclamation Material Borehole Logs and Locations

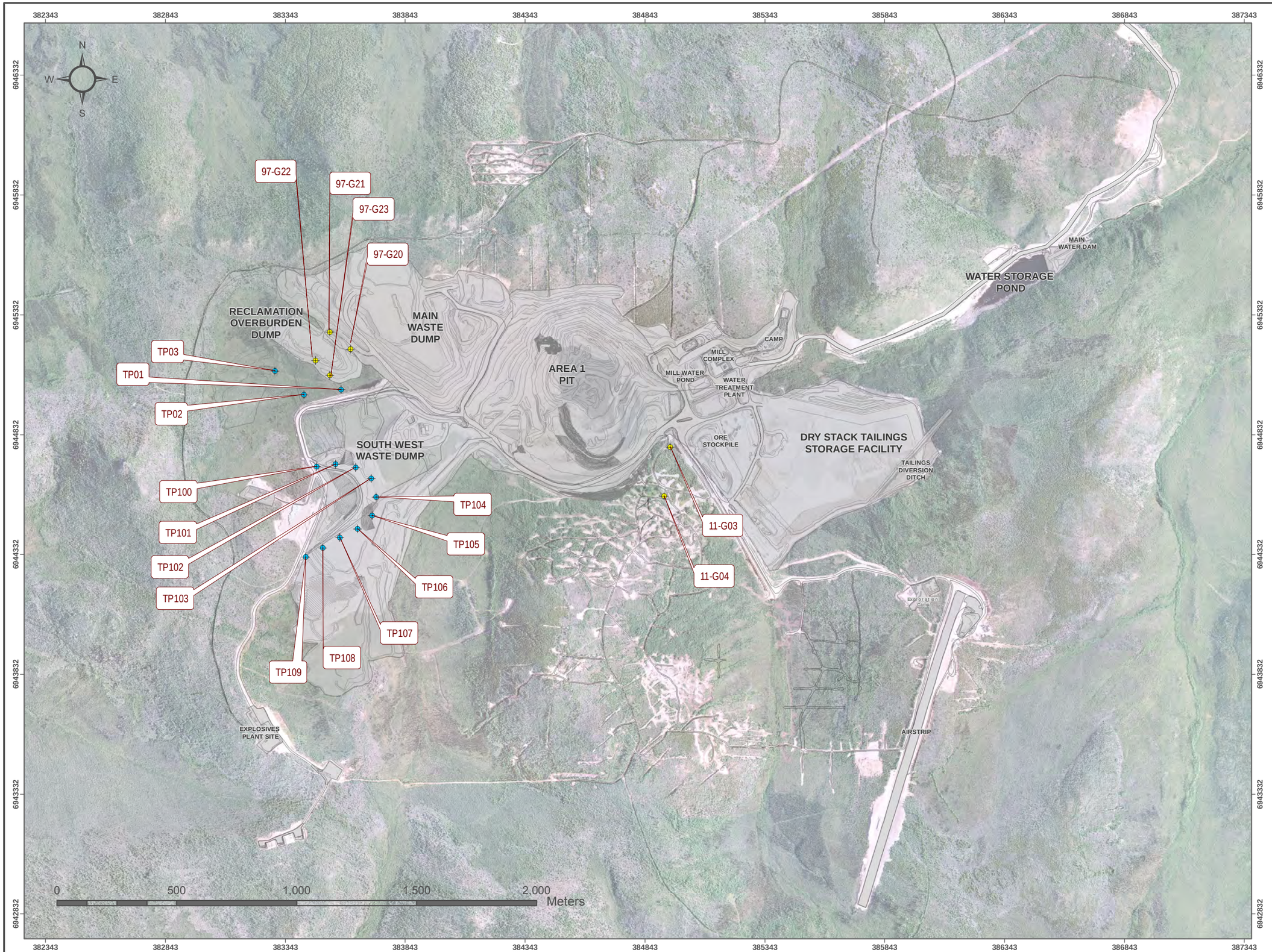
Compilation of reclamation source soils information from investigations conducted at the Minto Mine

MINTO MINE

DECOMMISSIONING AND RECLAMATION PLAN

Rev.3

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.



- Bore Hole
- Test Pit
- Access Road
- Mine Site Road
- Site Form Line

This is not a legal document. Aerial photography flight date: July 13th 2009. Ortho-rectification produced by Challenger Geomatics Ltd. Site layout provided by Minto Exploration Ltd and processed by EBA February 2010. Data current as of January 2011. Instrumentation data provided by EBA, February 2011.

NAD 83 UTM Zone 8N

FIGURE 1

TEST PITS AND BORE HOLE LOCATIONS

ACCESS Consulting Group

DRAWN BY MD	FEBRUARY 2011	VERIFIED BY SD

I:\Minto\gis\mxd\Phase_4\Closure\FEB_2011\D-1_BoreHoles_20110223.mxd

Minto Mine Overburden Investigations

Borehole/ Sample No.	Depth (m)	Clay %	Silt %	Sand %	Gravel %
1200173-042	5.00 - 5.20	0.0	59	40	1
1200173-042	15.00 - 15.20	6.0	37	47	10
1200173-042	24.50 - 24.70	16.0	47	26	11
1200173-042	35.40 - 35.55	8.0	38	41	13
1200173-042	50.00 - 50.30	28.0	19	38	15
1200173-043	7.70 - 7.90	5.0	69	26	0
1200173-043	17.70 - 17.85	6.0	36	42	16
1200173-043	27.90 - 28.10	56.0	41	3	0
1200173-043	46.00 - 46.20	28.0	56	15	1
1200173-043	56.10 - 56.30	1.0	21	41	37
1200173-044	13.10 - 13.30	5.0	22	28	45
1200173-044	23.80 - 24.00	11.0	29	21	39
1200173-044	41.10 - 41.30	11.0	30	47	12
1200173-044	50.60 - 50.80	3.0	64	33	0
1200173-045	8.80 - 9.00	1.0	32	37	30
1200173-045	19.80 - 20.00	0.0	12	63	25
1200173-045	30.10 - 30.30	3.0	57	40	0
1200173-045	41.10 - 41.30	36.0	62	2	0
1200173-045	50.60 - 50.80	17.0	18	22	43
1200173-045B	3.00 - 3.20	2.0	18	49	31
1200173-045B	6.20 - 6.40	6.0	32	27	35
1200173-045B	11.70 - 11.90	20.0	19	36	25
1200173-045B	23.20 - 23.50	14.0	46	40	0
1200173-045B	29.20 - 29.40	35.0	48	15	2
08-ROD-OB01	796	18	30	14	38
08-ROD-OB02	808	8	18	15	59
08-ROD-TP03	1.6 - 1.8	4	37	45	14
08-ROD-TP02	1.4 - 1.5	2	34	40	24
08-ROD-TP01	0.6 - 0.8	8	40	43	9
08-ROD-TP01	3.3 - 3.5	4	18	54	24
TP2(2B)	3.00 - 4.00	21.7	32.9	27.7	17.7
TP2(2A)	3.00 - 4.00	18.6	28.0	25.5	27.9
TP1(1B)	1.00 - 2.00	7.2	31.7	40.4	20.7
TP1(1A)	1.00 - 2.00	8.9	41.4	43.0	6.7
97-TP02	3.30 - 3.50	24.9		50.9	24.2
97-TP01	1.50 - 1.70	6.0		27.4	66.6
97-G21	4.40 - 4.60	24.5		44.8	30.7
97-G20	2.1 - 2.30	19.1		80.9	0.0
97-G19	4.10 - 4.30	13		67.5	19.5
97-G18	2.50 - 2.70	10.3		72.4	17.3
97-G18	7.10 - 7.30	17.3	31.8	42.2	8.7
11-G03	3.38 - 3.58	3	69	25	3
11-G03	12.4 - 12.6	5	30	35	30
11-G03	27.64 - 27.84	21	57	18	4
11-G03	30.6 - 30.8	26	69	5	0
11-G03	37.9 - 38.1	21	63	13	3
11-G04	1.0 - 1.5	7	82	10	0

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G03
Area 2	DRILL: HQ Diamond	PROJECT NO: W14101068.033
Minto Mine, YT	6944782.093N; 384948.312E; Zone 8	ELEVATION: 803.697m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80 / SILT (%) 20 40 60 80 / SAND (%) 20 40 60 80 / GRAVEL (%) 20 40 60 80	Elevation (m)
0	PEAT and ORGANIC SILT - brown		G1				803.0
1	SILT (TILL) - sandy, trace gravel, trace clay, non-plastic, gravel <25 mm, poorly graded, angular to sub-angular, occasional organics		G2	- Vr <2%			
2							802.0
3	- gravel seam - increased gravel <20 mm			- Vs <4%			801.0
4			G3		●	■ ▲ ●	800.0
5			G4				799.0
6							798.0
7			G5				797.0
8			G6				796.0
9	- increased gravel < 30 mm for 0.4 m		G7				795.0
10	- cobble 200 mm - only cobbles and gravel recovered, fines washed out for 100 mm						794.0
11							793.0
12	- only cobbles and gravel recovered, fines washed out for 150 mm - decreased gravel content for 1.4 m		G8	- Vr			792.0
13	SAND: silty, gravelly, trace clay, well to poorly graded, angular to subangular, brownish grey		G9		●H	◆ ■▲	791.0
14							790.0
15	- only gravel recovered, fines washed out for 100 mm		G10				789.0
16	- becomes gravelly, some sand, gravel <50 mm, sand and gravel poorly graded		G11	- Vs <5%			788.0
17							787.0
18			G12	- 35 mm thick ice lens - Vr <10% for 1.8 m			786.0
19							785.0
20							784.0
21			G13				783.0
22	- increased gravel and cobbles for 2.3 m		G14				782.0
23							781.0
24			G15				780.0
25			G16				779.0
26							778.0

DRAFT

EBA Engineering Consultants Ltd.	LOGGED BY: AT & SMC	COMPLETION DEPTH: 50.9m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G03
Area 2	DRILL: HQ Diamond	PROJECT NO: W14101068.033
Minto Mine, YT	6944782.093N; 384948.312E; Zone 8	ELEVATION: 803.697m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80 / SILT (%) 20 40 60 80 / SAND (%) 20 40 60 80 / GRAVEL (%) 20 40 60 80	Elevation (m)
26			G17				777.0
27	CLAY - silty, some sand, trace gravel, medium plastic, gravel <15 mm, poorly graded			- Vr <3%			
28			G18				776.0
	- clay content increases, gravel content decreases, plasticity increases						
29							775.0
			G19				
30							774.0
	- cobble 60 mm, no more gravel						
31			G20				773.0
32	SAND - trace silt, trace gravel, sub-rounded, gravel <10 mm, medium brown		G21				772.0
33	- less gravel, less silt			- Nbn			
			G22				771.0
34	- becomes some gravel						770.0
	- becomes trace gravel			- Vx <5%			
35			G23				769.0
36	- bedded coarse grained sand 45° to horizontal						768.0
	- gravel seam 65 mm						
37							767.0
	CLAY - silty, some sand, trace gravel, medium plastic, grey		G24	- ice lens 40 mm, clear			
38			G25	- horizontal ice lenses for 1.2 m			766.0
39	- becomes laminated, 5 mm thick bands of black clay oriented at 45° to horizontal		G26				765.0
40							764.0
			G27	- ice lens 20 mm, clear			
41	- clay becomes dry, very stiff to hard						763.0
42							762.0
43			G28				761.0
	- increased sand and gravel, sub-angular, set in clay matrix		G29	- unfrozen			
44							760.0
45	- boulder 300 mm						759.0
	SILT - sandy, some gravel, non-plastic, angular to sub-angular, dark brown to grey		G30	- Nbn			
46							758.0
47							757.0
48	BEDROCK - grandiorite						756.0
49							755.0
50							754.0
51	END OF BOREHOLE @ 50.9 m						753.0
52							752.0

DRAFT

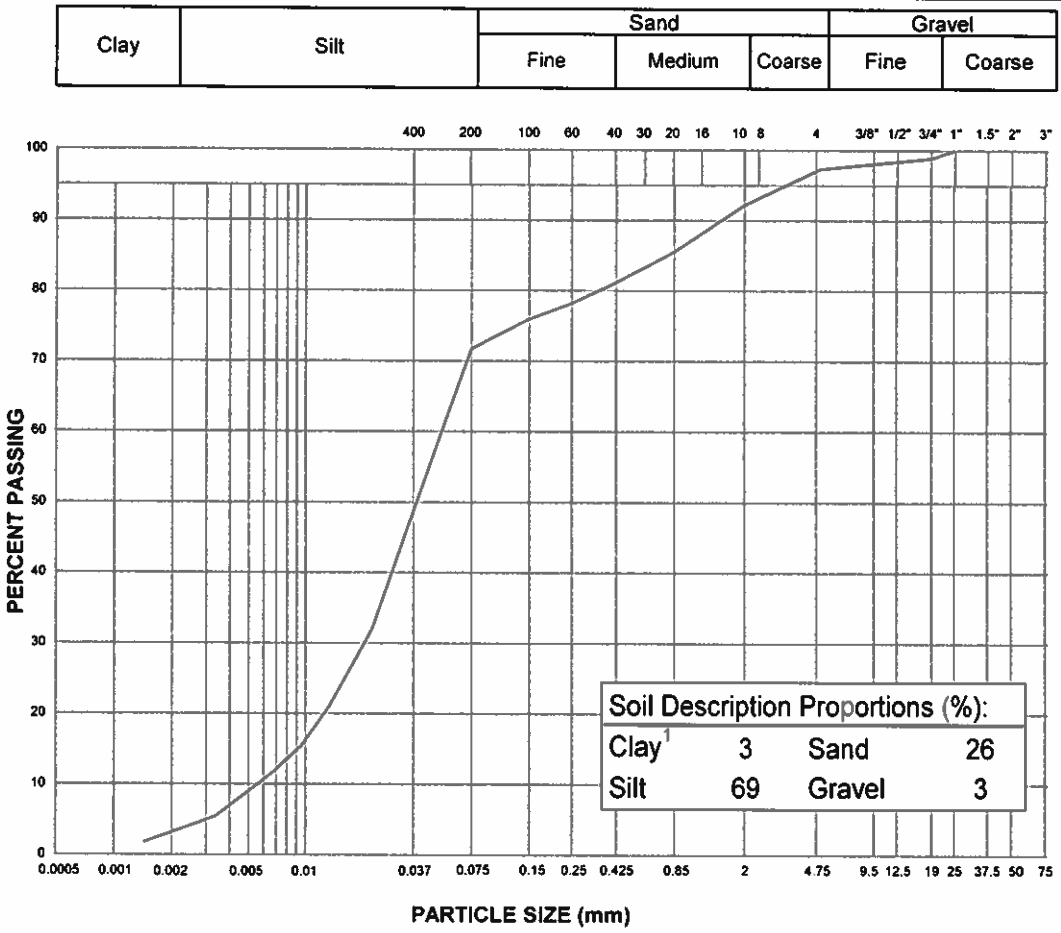
EBA Engineering Consultants Ltd.	LOGGED BY: AT & SMC	COMPLETION DEPTH: 50.9m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 2 of 2

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G3
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G03
Client:	Minto Explorations Ltd.	Sample Depth:	3.38 - 3.58 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SILT - sandy, trace clay, trace gravel	Sampled By:	AT/SC
		USC Classification:	Cu: 9.6
Moisture Content:	26.1%		Cc: 1.3

Particle Size (mm)	Percent Passing
75	
50	
38	
25	100
19	99
12.5	99
10	99
5	97
2	92
0.85	86
0.425	81
0.25	78
0.15	76
0.075	72
0.0336	45.7
0.0223	32.0
0.0133	21.0
0.0096	15.5
0.0069	11.9
0.0034	5.5
0.0014	1.8



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification: _____

Remarks: _____

_____

Reviewed By: _____

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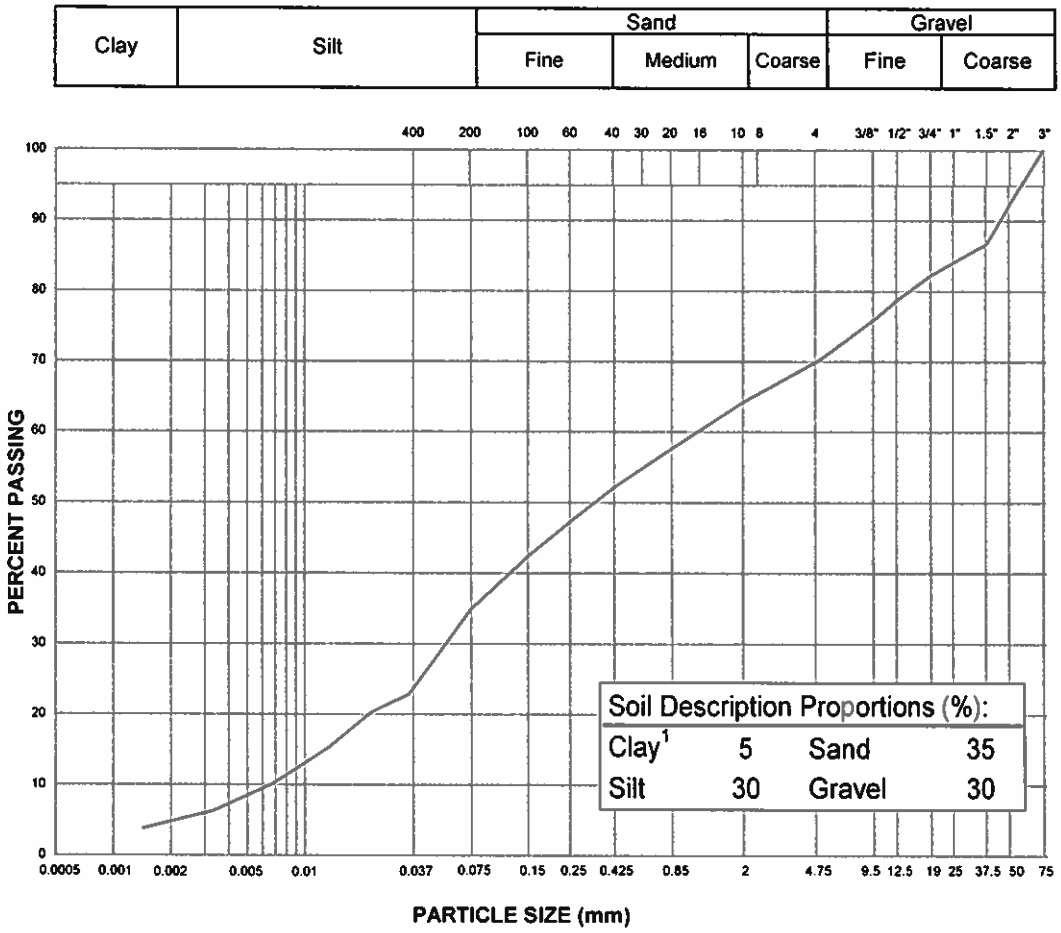
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G9
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G03
Client:	Minto Explorations Ltd.	Sample Depth:	12.4 - 12.6 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SAND - gravelly, silty, trace clay	Sampled By:	AT/SC
		USC Classification:	Cu: 189.2
Moisture Content:	9.7%		Cc: 0.4

Particle Size (mm)	Percent Passing
75	100
50	
38	87
25	87
19	82
12.5	79
10	76
5	70
2	64
0.85	58
0.425	52
0.25	47
0.15	42
0.075	35
0.0351	22.9
0.0225	20.3
0.0133	15.3
0.0095	12.7
0.0068	10.2
0.0033	6.4
0.0014	3.8



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification:

Remarks:

Reviewed By: _____

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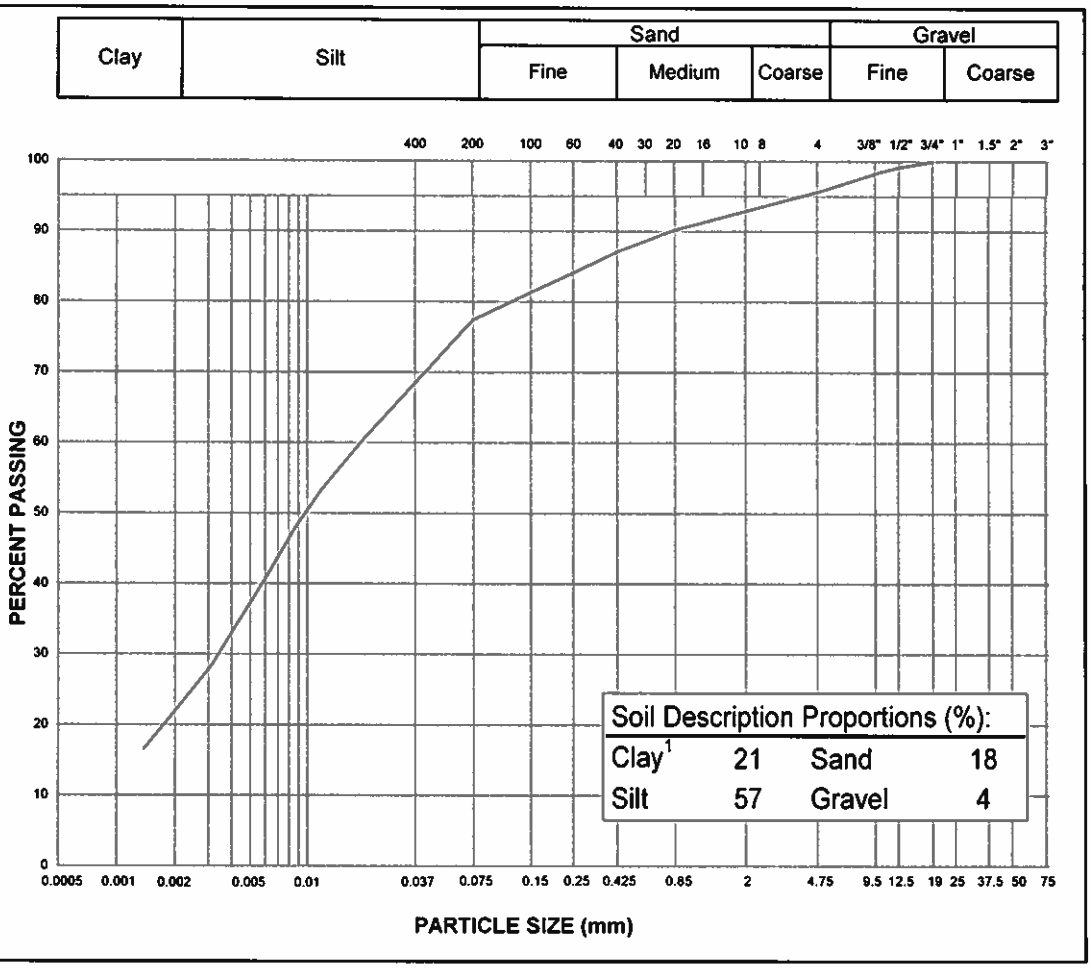
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G18
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G03
Client:	Minto Explorations Ltd.	Sample Depth:	27.64 - 27.84 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SILT - clayey, some sand, trace gravel	Sampled By:	AT/SC
		USC Classification:	Cu:
Moisture Content:	31.0%		Cc:

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	100
12.5	99
10	98
5	96
2	93
0.85	90
0.425	87
0.25	84
0.15	81
0.075	77
0.0310	66.2
0.0201	60.7
0.0119	53.3
0.0086	47.8
0.0062	41.4
0.0032	28.5
0.0014	16.6



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification:

Remarks:

Reviewed By: _____

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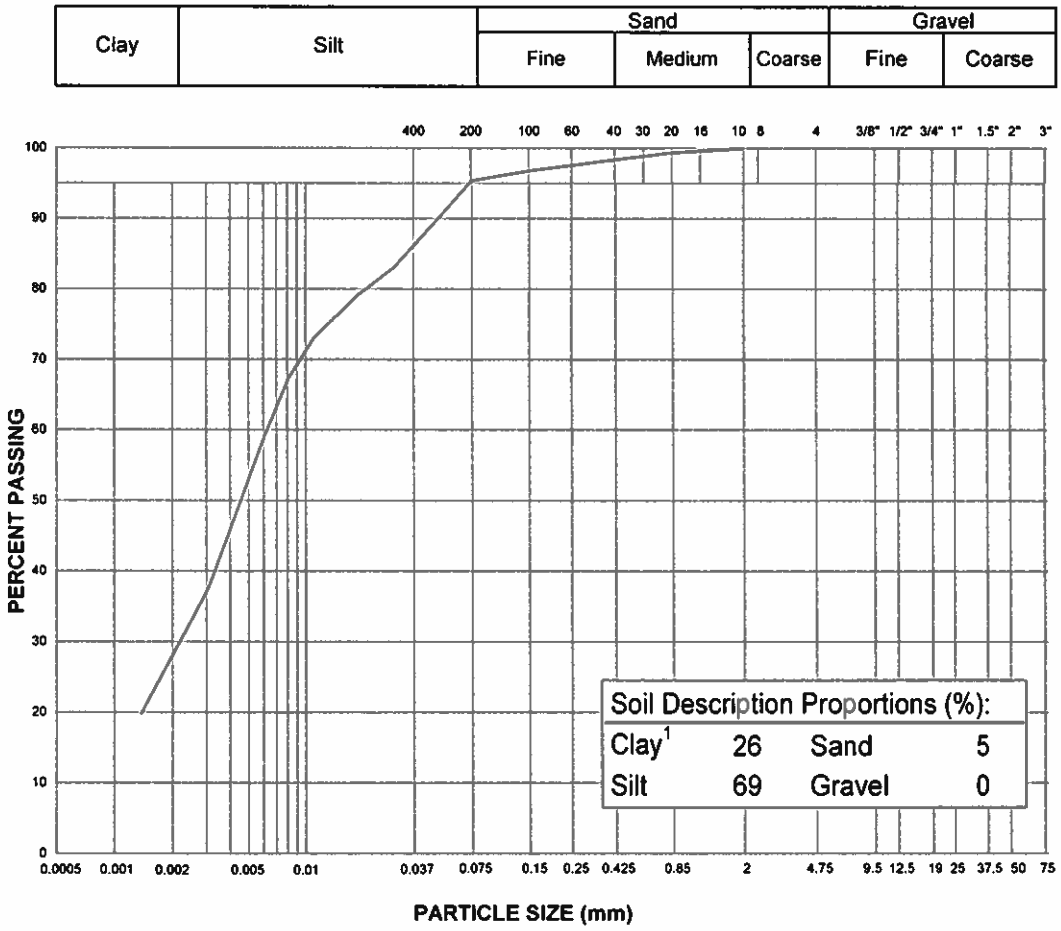
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G20
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G03
Client:	Minto Explorations Ltd.	Sample Depth:	30.6 - 30.8 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SILT - clayey, trace sand	Sampled By:	AT/SC
		USC Classification:	Cu:
Moisture Content:	28.3%		Cc:

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	
12.5	
10	
5	
2	100
0.85	99
0.425	98
0.25	98
0.15	97
0.075	95
0.0295	83.2
0.0190	79.2
0.0112	73.3
0.0081	67.3
0.0059	58.4
0.0031	37.6
0.0014	19.8



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification:

Remarks:

Reviewed By: _____

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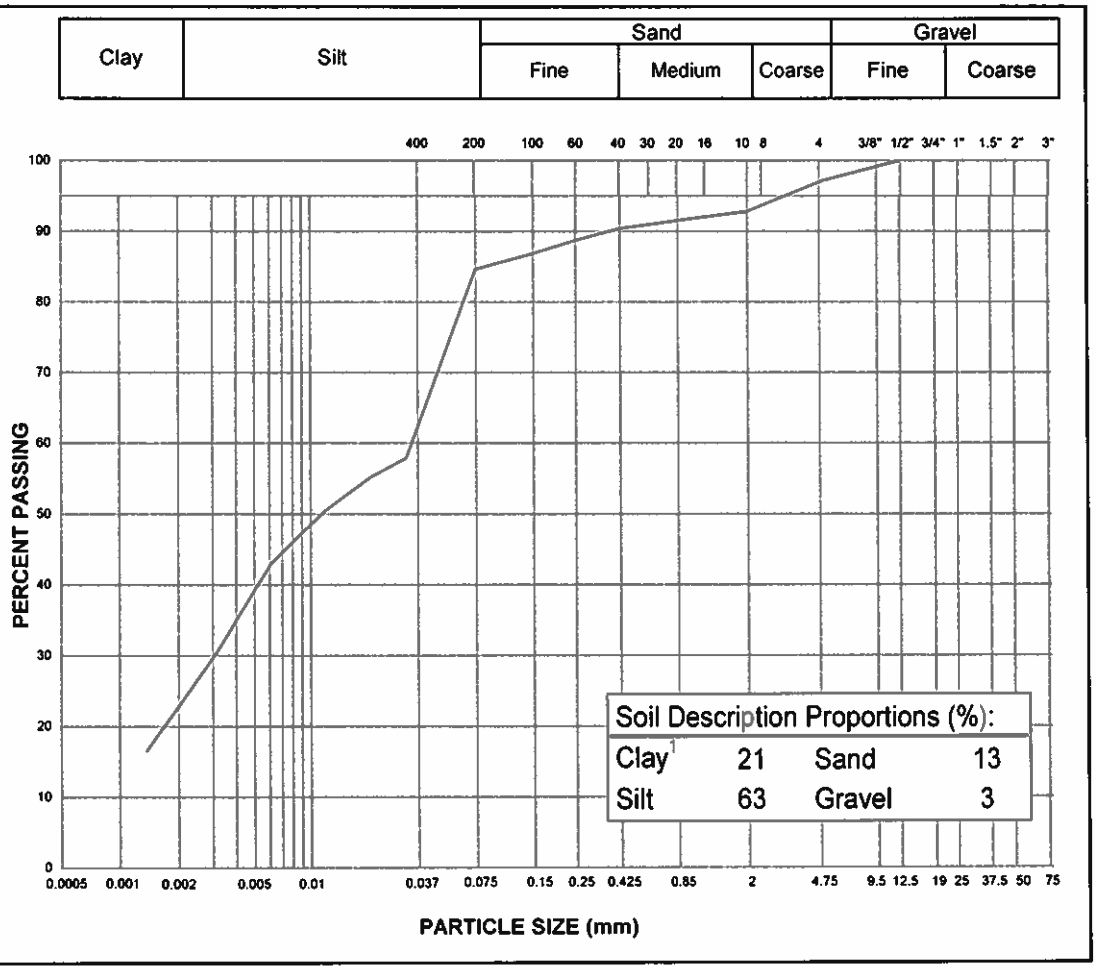
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G25
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G03
Client:	Minto Explorations Ltd.	Sample Depth:	37.9 - 38.1 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SILT - clayey, some sand, trace gravel	Sampled By:	AT/SC
		USC Classification:	Cu:
Moisture Content:	69.7%		Cc:

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	
12.5	100
10	99
5	97
2	93
0.85	92
0.425	90
0.25	89
0.15	87
0.075	85
0.0321	57.9
0.0206	55.2
0.0121	50.6
0.0086	46.9
0.0062	43.2
0.0031	30.3
0.0014	16.6



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification:

Remarks:

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Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G04
Area 2	DRILL: HQ Diamond	PROJECT NO: W14101068.033
Minto Mine, YT	6944576.52N; 384922.911E; Zone 8	ELEVATION: 836.303m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Elevation (m)
0	SAND - silty, some gravel, light brown, organics - organic layer 150 mm			- Vx <15%	836.0
	SILT - some sand, trace clay, faint organic smell				
1			G1	- Nbn	835.0
2				- ice lens 100 mm, cloudy, porous	834.0
	SAND (RESIDUUM) - some silt, some gravel, gravel <20 mm		G2	- Vx <50%	
3					833.0
4			G3		832.0
5	BEDROCK				831.0
6					830.0
7					829.0
8	END OF BOREHOLE @ 8.23 m				828.0
9					827.0
10					

Bulk Density(kg/m³) 20 40 60 80 | PLASTIC M.C. LIQUID 20 40 60 80 | CLAY (%) 20 40 60 80 | SILT (%) 20 40 60 80 | SAND (%) 20 40 60 80 | GRAVEL (%) 20 40 60 80

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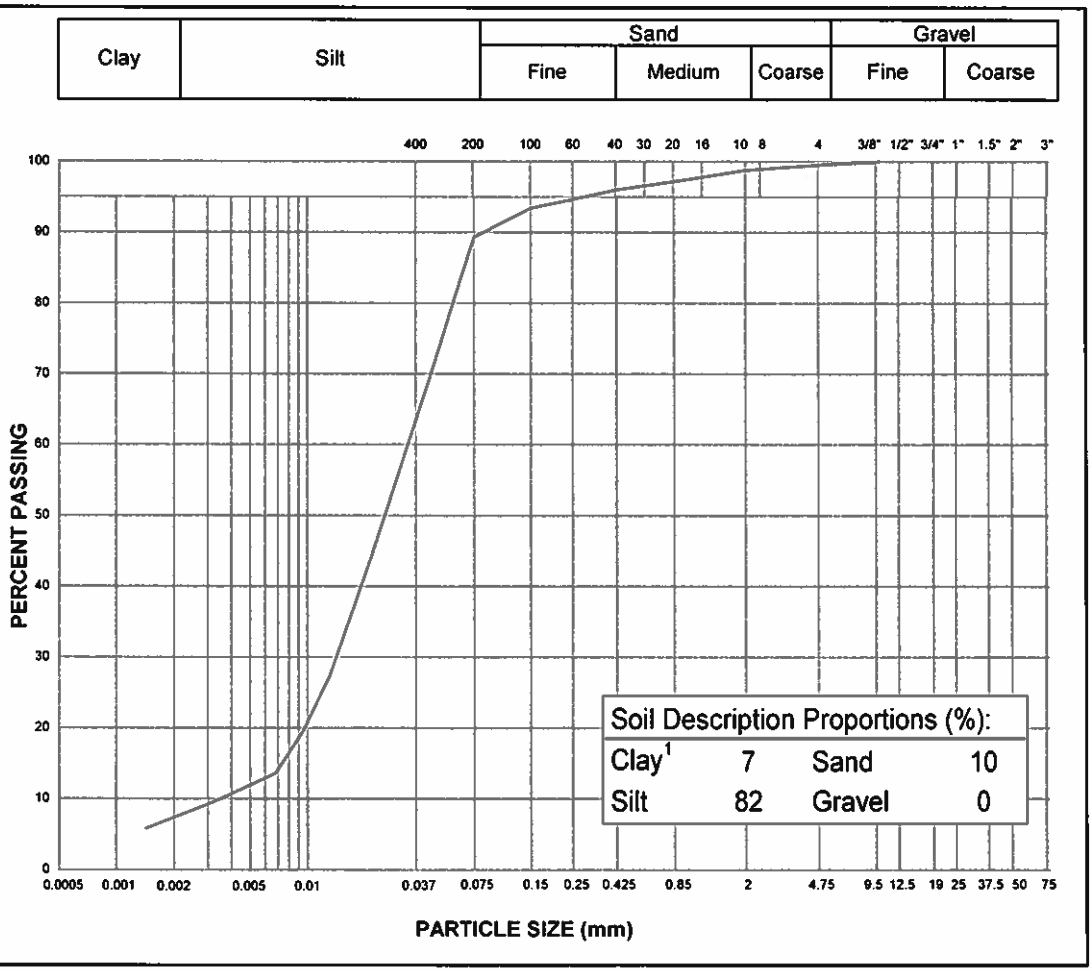
EBA Engineering Consultants Ltd.	LOGGED BY: AT & SMC	COMPLETION DEPTH: 8.23m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422, C136 & C117

Project:	Winter 2011 Geotechnical Drilling	Sample No.:	G1
Project No.:	W14101068.033	Material Type:	
Site:	Minto Mine, YT	Sample Loc.:	11-G04
Client:	Minto Explorations Ltd.	Sample Depth:	1.0 - 1.5 m
Client Rep.:		Sampling Method:	Core Grab
Date Tested:	January 27, 2011 By: SMS/PE	Date sampled:	January 18, 2011
Soil Description[2]:	SILT - trace sand, trace clay	Sampled By:	AT/SC
		USC Classification:	Cu:
Moisture Content:	83.8%		Cc:

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	
12.5	
10	100
5	100
2	99
0.85	97
0.425	96
0.25	95
0.15	93
0.075	89
0.0325	58.7
0.0216	44.0
0.0131	27.4
0.0095	19.6
0.0069	13.7
0.0033	9.8
0.0014	5.9



Notes: [1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is based on the results of grain size testing

Specification: _____

Remarks: _____

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MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

Decommissioning and Reclamation Plan

Appendix C

Closure Cost Estimates, Year 0, Year 2 and End of Mine Life

MINTO MINE CLOSURE COSTING

Table 8.1-1
Minto Mine Closure Unit Rates

Equipment Rates		
Equipment	**Rates/hr**	**Rate/mo**
D9H Dozer	$268	
Haul Truck D250E	$227	
Tandem Haul Truck	$155	
Cat 235 Excavator	$247	
Cat 235 Excavator w hammer	$283	
Cat 16H grader	$227	
988B Loader	$258	
Tractor Trailer (lowbed)	$134	
30 ton Crane	$165	
Hiab Flatdeck truck	$129	
Cat 950 loader	$129	
Vibratory Roller	$120	
Pickup Truck		$2,500
Personnel Rates		
Personnel	**Rates/hr**	**Rate/mo**
Blaster	$62	
General Labourer	$47	
Trades Labourer	$83	
Site Supervisor	$99	
Design Engineer	$135	
Environmental Scientist	$99	
Project Manager		$9,700
Camp Labourer		$4,000
Site Caretaker		$6,100
Environmental Monitor		$5,000
Revegetation Rates		
Revegetation Seed Mix	$13.00	per kg
Revegetation Seed Mix - 50kg/ha	$510.00	per ha
Fertilizer	$1.00	per kg
Fertilizer - 250kg/ha	$250.00	per ha
Tree Seedlings (1,000 seedlings per ha)	$1,750.00	per ha
Seed/Fertilizer Application	$1,500.00	per ha
Erosion Barrier	$3.00	per square m
Revegetation cost per ha. Including application cost	**$2,400.00**	**per ha**
Contractor Unit Rates & Camp Costs		
Load, Haul and place soil cover MWD	$5.08	cu.m
Load, Haul and place soil cover SWD	$3.85	cu.m
Load, Haul & Place rock cover	$6.42	cu.m
Custom Rate A (Load, haul and place from IROD - MWD / LGO)	$5.08	cu.m
Custom Rate B (Load, haul and place IROD - HGO/MainWater Dam)	$5.99	cu.m
Custom Rate C (Load, haul and place IROD - CSA)	$5.05	cu.m
Custom Rate D (Push from TFOD - TF)	$2.15	cu.m
Custom Rate E (Push from MWD - U/S MWD)	$2.15	cu.m
Unit Basis (footing burial)	$5.00	each
Load and Haul Rip Rap	$12.50	cu.m
Place Riprap	$12.50	cu.m
Freight run to Whitehorse	$1,000.00	per load
Camp Cost	$70.00	per day per person
Power and Heat	$5,500.00	per month
Employee Transport Costs	$3,000.00	per month
Barge Operating Cost	$10,000.00	per month

Note:
Custom Unit Rates have been developed specifically for Minto Mine, taking into account such factors as haul distance, grade, machinery required, time required, etc.

MINTO MINE CLOSURE COSTING

Table 8.1-2a

Summary Table of Estimated Closure Costs - 2011 (Year 0)

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$2,715,488
4	**Open Pit and Haul Roads**	$387,410
5	**Tailings Area and Diversion Structures**	$1,514,446
6	**Main Water Dam**	$438,883
7	**Mill and Ancillary Facilities**	$663,229
8	**Mill Pond**	$0
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$121,392
	Scenario 3 - Deactivate Entire Access Road	$222,772
10	**Miscellaneous Sites and Facilities**	$121,200
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$1,048,440
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$1,053,240
	Scenario 3 - Deactivate Entire Access Road	$1,062,840
12	**Post Closure Site Management**	$3,033,300
13	**Supporting Studies**	$316,000

Closure		
	Scenario 1 - No Access Road Deactivation	**$10,240,536**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$10,364,588**
	Scenario 3 - Deactivate Entire Access Road	**$10,475,568**

Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$11,469,401**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$11,608,339**
	Scenario 3 - Deactivate Entire Access Road	**$11,732,637**

Table 8.1-3a
Waste Rock and Overburden Dumps, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	WASTE ROCK AND OVERBURDEN DUMPS						
3.1	**Main Waste Dump (s 5.1.1.2)**						
	Roll crest and recontour	D9H Dozer	hrs	300	$260	$78,000	$78,000
	Additional surface grading/material placement as required		cu.m.	2000	$5	$10,160	$10,160
	Additional compaction as required	Vibratory Roller	hrs	60	$120	$7,200	$7,200
	Haul and place overburden for revegetation	Load, Haul and place soil cover MWD	cu.m.	176000	$5.08	$894,080	$894,080
	Project Management & Engineering	7% of Total Cost	%		7.00%	$69,261	$69,261
	Sub-Total						**$1,058,701**
3.2	**Southwest Dump (s 5.1.1.2)**						
	Roll crest and recontour	D9H Dozer	hrs	168	$260	$43,680	$43,680
	Haul and place overburden for revegetation	Load, Haul and place soil cover SWD	cu.m.	295500	$3.85	########	$1,137,675
	Additional surface grading/material placement as required		cu.m.	5000	$3.85	$19,250	$19,250
	Additional compaction as required	Vibratory Roller	hrs	100	$120.00	$12,000	$12,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$82,695	$82,695
	Sub-Total						**$1,295,300**
3.3	**Ice-Rich Overburden Dump (s 5.1.2.2)**						
	Roll crest of berm and recontour	D9H Dozer	hrs	16	$260.00	$4,160	$4,160
	Project Management & Engineering	7% of Total Cost	%		7.00%	$291	$291
	TOE BERM FROM WASTE ROCK SEE TEXT						
	Sub-Total						**$4,451**
3.4	**Reclamation Overburden Dump**						
	Blade pad after removal of material during reclamation	Cat 16H grader	hrs	6	$220	$1,320	**$1,320**
3.5	**Low Grade Ore Stockpile and Pad (s 5.1.3.2)**						
	Recontour Stockpile and Pad	D9H Dozer	hrs	39.5	$260	$10,270	$10,270
	Haul and place overburden for revegetation	Custom Rate A (Load, haul and place from IROD - MWD / LGO)	cu.m.	16250	$5.08	$82,550	$82,550
	Removal of bottom layer of material, move to pit.	Unit basis)				$5,000	$5,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,497	$6,497
	Sub-Total						**$104,317**
3.6	**High Grade Ore Stockpile Pad (s 5.1.3.2)**						
	Recontour stockpile and pad	D9H Dozer	hrs	54	$260.00	$14,040	$14,040
	Haul and place overburden for revegetation	Custom Rate B (Load, haul and place IROD - HGO/MainWater Dam)	cu.m.	23000	$5.99	$137,770	$137,770
	Removal of bottom layer of material, move to pit.	Unit basis				$7,500	$7,500
	Project Management & Engineering	7% of Total Cost			7.00%	$10,627	$10,627
	Sub-Total						**$169,937**
3.7	**Contractor's Shop and Work Area (s 5.1.4.2)**						
	Remove salvageable equipment	General Labourer	hrs	60	$47	$2,808	
		Haul Truck D250E	hrs	20	$220	$4,400	
		Trades Labourer	hrs	48	$83	$3,994	$11,202
	Dismantle buildings	General Labourer	hrs	60	$47	$2,808	
		30 ton Crane	hrs	10	$160	$1,600	
		Cat 235 Excavator	hrs	30	$240	$7,200	$11,608
	Haul building pieces off site - equipment	Tractor Trailer (lowbed)	hrs	20	$130	$2,600	$2,600
	Scrap haul to site landfill	Haul Truck D250E	hrs	20	$220	$4,400	$4,400
	Bury footings - haul and place fill, locally sourced	Unit basis (footing burial)	each	2500	$5	$12,500	$12,500
	Recontour	D9H Dozer	hrs	15	$260	$3,900	$3,900
	Haul and place overburden for revegetation	Custom Rate C (Load, haul and place IROD - CSA)	cu.m.	5000	$5	$25,250	$25,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,002	$5,002
	Sub-Total						**$76,462**
3.8	**Contaminated Soils - Transport to LTF**	Unit basis		5000		$5,000	**$5,000**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$2,715,488**

Note:

MINTO MINE CLOSURE COSTING

Table 8.1-4a
Open Pit and Haul Roads, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	OPEN PIT AND HAUL ROADS						
4.1	**Ultimate Pit (s 5.2.1.2)**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	80	$47	$3,744	
		Trades Labourer	hrs	20	$83	$1,664	
		Support equipment	l.s.		$1,000	$1,000	
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	$9,200
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	20	$240	$4,800	
	Riprap shoulder exiting pit	Place Riprap	cu.m	50	$13	$625	
	Exit Spillway construction	General Labourer	hrs	10	$47	$468	
		Load and Haul Rip Rap	cu.m	50	$13	$625	$6,518
	Construct Passive Treatment System						$1,718
	Organic carbon source (to site or chipped at site)	Haulage and handling	l.s.		$75,000	$75,000	$76,093
	Clean (< 0.1% Cu) Waste Rock for Construction	Haulage and handling	l.s.		$25,000	$25,000	
	Construction of treatment area	Cat 235 Excavator	hrs	160	$240	$38,400	
		Haul Truck D250E	hrs	160	$220	$35,200	
		General Labourer	hrs	200	$48	$9,600	$183,200
	Project Management & Engineering	7% of Total Cost	%		7.00%	$14,373	$14,373
	Sub-Total						**$291,102**
4.2	**Haul Roads (s 5.2.2.2) (13 ha)**						
	Remove culverts and haul away	General Labourer	hrs	40	$47	$1,872	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	$11,072
	Recontour slopes	D9H Dozer	hrs	150	$260	$39,000	$39,000
	Scarify surfaces	Cat 16H grader	hrs	150	$220	$33,000	
		General Labourer	hrs	20	$47	$936	$33,936
	Stabilize slopes - erosion barriers - material	Unit Cost Basis	sq.m	2,000	$3	$6,000	$6,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,301	$6,301
	Sub-Total						**$96,309**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads							**$387,410**

Note:
Linear disturbances to be scarified / decompacted and allowed to naturally revegetate

Table 8.1-5a

Tailings Area and Diversion Structures, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	TAILINGS AREA						
5.1	**Tailings Deposit - Final Lift**						
	Roll crest of starter bench and recontour	D9H Dozer	hrs	50	$260.00	$13,000	$13,000
	Haul overburden ROD - DSTF	Custom Haul Rate	cu.m	207700	$5.80	$1,204,660	$1,204,660
	Project Management & Engineering	7% of Total Cost	%		7.00%	$85,236	$85,236
	Sub-Total						**$1,302,896**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$260	$13,000	$13,000
		Cat 235 Excavator	hrs	20	$240	$4,800	
	Haul and place riprap	Load and Haul Rip Rap	cu.m	2400	$13	$30,000	
		Place Riprap	cu.m	2400	$13	$30,000	$60,000
	HDPE liner	Unit rate	sq.m	4800	$10	$48,000	$78,000
		General Labourer	hrs	80	$47	$3,744	$51,744
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,806	$8,806
	Sub-Total						**$211,550**
Total Estimated Cost in Reclaiming Tailings Area							**$1,514,446**

Note:

Table 8.1-6a
Main Water Dam, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	WATER DAM						
6.1	**Reclaim System**						
	Remove salvageable equipment - pipeline/pumps	General Labourer	hrs	48	$47	$2,246	
		Trades Labourer	hrs	98	$83	$8,154	
	Remove pipeline	Haul Truck D250E	hrs	100	$220	$22,000	
		Cat 235 Excavator	hrs	100	$240	$24,000	
		General Labourer	hrs	200	$47	$9,360	$55,360
	Dismantle Building	Cat 235 Excavator	hrs	16	$240	$3,840	
		General Labourer	hrs	20	$47	$936	$4,776
	Misc. Supplies & Tools	Misc.	l.s.		$1,000	$1,000	$1,000
	Recontour alignment	D9H Dozer	hrs	16	$260	$4,160	$4,160
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,299	$5,299
	Sub-Total						$0
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	96	$47	$4,493	$4,493
	Misc. Supplies & Tools	Misc.	l.s.		$5,000	$5,000	$5,000
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$10,000	$10,000	$10,000
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	10,000	$10	$100,000	$100,000
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from MWD - U/S MWD)	cu.m	25,000	$2	$53,750	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	31,000	$4.50	$139,500	
		Environmental Scientist	hrs	60	$98.80	$5,928	$199,178
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	1,125	$3	$3,375	
		Unit Cost Basis	cu.m	1,125	$9	$10,125	$13,500
	Haul and place overburden on slopes of new area u/s of MWD	Unit Cost Basis	cu.m	15,000	$2	$30,000	$30,000
	Stabilize slopes with erosion barriers	Unit Rates	per sq. m	15,000	$3	$45,000	$45,000
	Misc. Supplies & Tools	Misc.	l.s.		$3,000	$3,000	$3,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$28,712	$28,712
	Sub-Total						**$438,883**
Total Estimated Cost in Reclaiming Water Dam							**$438,883**

Table 8.1-7a
Mill & Ancillary Facilities, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL AND ANCILLARY FACILITIES						
7.1	**Mill Building**						
	Remove salvageable equipment	General Labourer	hrs	550	$47	$25,740	
		Trades Labourer	hrs	600	$83	$49,920	
		Crane Support	hrs	40	$145	$5,800	$81,460
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$83	$13,312	$13,312
	Dismantle Building	General Labourer	hrs	1000	$47	$46,800	
		Trades Labourer	hrs	600	$83	$49,920	
		Cat 235 Excavator w hammer	hrs	120	$275	$33,000	
		Crane Support	hrs	60	$145	$8,700	$138,420
	Concrete Demolition	Blaster	hrs	30	$62	$1,872	$93,492
		Cat 235 Excavator	hrs	20	$240	$4,800	$48,372
		D9H Dozer	hrs	20	$260	$5,200	$11,872
	Misc. Supplies & Tools	Misc.	l.s.		$11,000	$11,000	$11,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	50	$240	$12,000	
		Haul Truck D250E	hrs	100	$220	$22,000	$34,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$20,304	$20,304
	Subtotal:						**$452,232**
						Subtract 50% for Salvage Value	**$226,116**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$47	$11,232	
		Trades Labourer	hrs	240	$83	$19,968	$31,200
		Crane Support	hrs	24	$145	$3,480	
	Salvage and remove powerline and poles		l.s.		$27,500	$27,500	$30,980
	Dismantle Buildings	General Labourer	hrs	160	$47	$7,488	
		Trades Labourer	hrs	80	$83	$6,656	
		Cat 235 Excavator w hammer	hrs	40	$275	$11,000	
		Crane Support	hrs	30	$145	$4,350	$29,494
	Concrete Demolition	Blaster	hrs	40	$62	$2,496	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,496
	Misc. Supplies & Tools	Misc.	l.s.		$10,000	$10,000	$10,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	10	$240	$2,400	
		Haul Truck D250E	hrs	20	$220	$4,400	$6,800
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,468	$8,468
	Subtotal:						**$129,438**
						Subtract 50% for Salvage Value	**$64,719**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$47	$2,808	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,808
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$47	$4,680	
		Trades Labourer	hrs	120	$83	$9,984	
		Crane Support	hrs	30	$145	$4,350	
		Support Equipment	l.s.		$2,500	$2,500	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		General Labourer	hrs	40	$47	$1,872	
		Tractor Trailer (lowbed)	hrs	30	$130	$3,900	$36,886
	Fold and Bury Liner	Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	100	$260	$26,000	$30,800
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,635	$5,635
	Subtotal:						**$86,129**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$47	$4,680	
		Support Equipment	l.s.		$2,500	$2,500	
		Disposal Cost-bulk materials	l.s.		$5,000	$5,000	
		Disposal Cost-lab-pacs	pallets	2	$2,000	$4,000	$16,180
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,133	$1,133
	Subtotal:						**$17,313**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	35	$99	$3,458	
		Analytical Costs	l.s.		$6,000	$6,000	$9,458
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	15	$240	$3,600	
		Haul Truck D250E	hrs	15	$220	$3,300	$6,900
	Re-contour area and slopes to bury footings and establish drainage	D9H Dozer	hrs	100	$260	$26,000	$26,000
	Haul and place overburden cap	Unit Rate	cu.m	38000	$5.50	$209,000	$209,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$17,595	$17,595
	Subtotal:						**$268,953**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities							**$663,229**

MINTO MINE CLOSURE COSTING

Table 8.1-8a

Mill Water Pond, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL POND						
8.1	**Reclaim Mill Pond**						
	Remove upstream culvert	General Labourer	hrs	10	$47	$468	
		Cat 235 Excavator	hrs	10	$240	$2,400	
	Construct channel	Cat 235 Excavator	hrs	100	$240	$24,000	
		D9H Dozer	hrs	20	$260	$5,200	$29,200
		Load and Haul Rip Rap	cu.m	5,000	$13	$62,500	$62,500
		General Labourer	hrs	20	$47	$936	$936
		Place Riprap	cu.m	5,000	$13	$62,500	$62,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$11,060	$11,060
	Subtotal:						$0
Total Estimated Cost in Reclaiming Mill Pond							$0

Table 8.1-9a
Main Access Road, Estimated Closure Costs - 2011 (Year 0)

Scenario 1 - No Road Deactivation

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.1	**NO ROAD DECOMMISSIONING REQUIRED**						
9.1.1	**Road Surface**						
	Install road barrier at west side of Minto Creek	Misc	l.s.		$2,000	$2,000	$2,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$140	$140
	Subtotal:						
Total Estimated Cost for Access Road Closure (Scenario 1)							**$2,140**

Scenario 2 - Decommission Access Road From Minto Creek to Mine Site (11 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.2	**ACCESS ROAD - 11 KM SECTION**						
9.2.1	**Road Surface**						
	Scarify - 11 km	Cat 16H grader	hrs	70	$220	$15,400	$15,400
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,078	$1,078
	Subtotal:						**$16,478**
9.2.2	**Culverts**						
	Culvert excavation (40 small culverts)	Cat 235 Excavator	hrs	100	$240	$24,000	$24,000
	Culvert removal	General Labourer	hrs	140	$47	$6,552	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,552
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$83	$3,328	
		General Labourer	hrs	75	$47	$3,510	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,438
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$47	$9,360	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3	$1,500	$10,860
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,864	$6,864
	Subtotal:						**$104,914**
Total Estimated Cost for Access Road Closure (Scenario 2)							**$121,392**

Scenario 3 - Decommission Entire Access Road (27 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.3	**ACCESS ROAD - 27 KM SECTION**						
9.3.1	**Road Surface**						
	Scarify - 27 km	Cat 16H grader	hrs	150	$220	$33,000	$33,000
	Recontour slopes and drainage	D9H Dozer	hrs	50	$260	$13,000	$13,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$3,220	$3,220
	Subtotal:						**$49,220**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$47	$2,340	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Tractor Trailer (lowbed)	hrs	20	$130	$2,600	$20,340
	Cut off piles	General Labourer	hrs	50	$47	$2,340	$2,340
	Re-contour	Cat 235 Excavator	hrs	30	$240	$7,200	
		D9H Dozer	hrs	30	$260	$7,800	$15,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,638	$2,638
	Subtotal:						**$40,318**
9.3.3	**Barge Ramps**						
	Remove all gravel	Cat 235 Excavator	hrs	20	$240	$4,800	$4,800
	Re-countour areas and scarify	D9H Dozer	hrs	30	$260	$7,800	$7,800
	Shoreline restoration	Misc.	l.s.		$5,000	$5,000	$5,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,232	$1,232
	Subtotal:						**$18,832**
9.3.4	**Culverts**						
	Culvert excavation (45 small culverts)	Cat 235 Excavator	hrs	115	$240	$27,600	$27,600
	Culvert removal	General Labourer	hrs	150	$47	$7,020	
		Haul Truck D250E	hrs	115	$220	$25,300	$32,320
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$83	$3,328	
		General Labourer	hrs	75	$47	$3,510	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,438
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$47	$9,360	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,360
	Project Management & Engineering	7% of Total Cost	%		7.00%	$7,484	$7,484
	Subtotal:						**$114,402**
Total Estimated Cost for Access Road Closure (Scenario 3)							**$222,772**

Table 8.1-10a
Miscellaneous Sites and Facilities, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MISCELLANEOUS SITES AND FACILITIES						
10.1	**Airstrip**						
	Scarify airstrip	Cat 16H Grader	hrs	20	$220	$4,400	
	Project Management & Engineering	7% of Total Cost	%		7.00%	$308	
	Natural revegetation	n/a	n/a				
	Subtotal:						**$0**
10.2	**Mine Camp and Related Infrastructure**						
	Disconnect Services	Trades Labourer	hrs	80	$83	$6,656	$6,656
	Remove salvageable equipment	General Labourer	hrs	704	$47	$32,947	$32,947
	Dismantle buildings	General Labourer	hrs	1200	$47	$56,160	
		Cat 235 Excavator	hrs	120	$240	$28,800	
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	20	$220	$4,400	
		Cat 235 Excavator	hrs	10	$240	$2,400	$6,800
	Reclaim Septic System	General Labourer	hrs	10	$47	$468	
		Cat 235 Excavator	hrs	2	$240	$480	$948
	Site Clean-Up	General Labourer	hrs	500	$47	$23,400	$23,400
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,434	$10,434
	Subtotal:						**$40,593**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$47	$4,680	
		Trades Labourer	hrs	50	$83	$4,160	$8,840
	Dismantle buildings	General Labourer	hrs	200	$47	$9,360	
		Cat 235 Excavator	hrs	30	$240	$7,200	$16,560
	Disconnect Services	Trades Labourer	hrs	20	$83	$1,664	$8,864
	Crane services	30 ton Crane	hrs	5	$160	$800	$2,464
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	30	$220	$6,600	
		Cat 235 Excavator	hrs	10	$240	$2,400	$9,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,580	$2,580
	Subtotal:						**$24,154**
10.4	**Exploration Sites and Trails**						
	Natural revegetation	n/a	n/a				
	Subtotal:						**$0**
10.5	**Land Treatment Facility**						
	Prepare and submit closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final soil hydrocarbon concentrations	Misc	l.s.		$3,000	$3,000	$3,000
	Recontour	D9H Dozer	hrs	2	$260	$520	$520
	Haul and place overburden cap from nearby	Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	
		D9H Dozer	hrs	6	$260	$1,560	$10,760
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,140	$1,140
	Subtotal:						**$17,420**
10.6	**Solid Waste Facility**						
	Prepare detailed closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final waste area	Misc	l.s.		$2,000	$2,000	$2,000
	Remove recyclables and special waste materials	Tractor Trailer (lowbed)	hrs	40	$130	$5,200	$5,200
	Recontour	D9H Dozer	hrs	2	$260	$520	$520
	Haul and cover with adjacent fill and place overburden cap	Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	
	Compaction of cover	D9H Dozer	hrs	6	$260	$1,560	$10,760
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,434	$1,434
	Subtotal:						**$21,914**
10.7	**Site Roads**						
	Recontour	Cat 235 Excavator	hrs	30	$240	$7,200	$7,200
	Scarify	Cat 16H Grader	hrs	40	$220	$8,800	$8,800
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,120	$1,120
	Subtotal:						**$17,120**
Total Estimated Cost in Reclaiming Miscellaneous Sites and Facilities							**$121,200**

Note:
Land treatment facility is a licensed facility and will be reclaimed as per license terms and conditions

Table 8.1-11a

Reclamation Research and Revegetation, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Units	Quantity	Unit Rates	Cost	Total Adjusted
11.1	**REVEGETATION ACTIVITIES**					
11.1.0	**Determination of Revegetation Plan for Current Site**					
	Issuance of a plan for all site areas for regulatory review and approval	Misc	1		$20,000	$20,000
	Sub-Total					**$20,000**
11.1.1	**Main and Southwest Dumps (total surface area of 94.3 ha)**					
	Seed and fertilize w/ labour	ha	94.3	$2,400	$226,320	
	Re-seed and fertilize (1/2 of total area)	ha	47.2	$2,400	$113,160	
	Re-forest	ha	94.3	$1,750	$165,025	$504,505
	Sub-Total					**$504,505**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,400	$16,560	
	Re-seed and fertilize (1/2 of total area)	ha	3.5	$2,400	$8,280	
	Re-forest	ha	6.9	$1,750	$12,075	$36,915
	Sub-Total					**$36,915**
11.1.3	**Reclamation Overburden Dump (total surface area of 5.5 ha)**					
	Seed and fertilize w/ labour	ha	5.5	$2,400	$13,200	
	Re-seed and fertilize (1/2 of total area)	ha	2.8	$2,400	$6,600	
	Re-forest	ha	5.5	$1,750	$9,625	$29,425
	Sub-Total					**$29,425**
11.1.4	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,400	$37,680	
	Re-seed and fertilize (1/2 of total area)	ha	7.9	$2,400	$18,840	
	Re-forest	ha	15.7	$1,750	$27,475	$83,995
	Sub-Total					**$83,995**
11.1.5	**Contractor's Shop and Office Area (disturbed area of 2.5 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,400	$6,000	
	Re-seed and fertilize (1/2 of total area)	ha	1.3	$2,400	$3,000	
	Re-fertilize only (1/2 total area - re-seed area)	ha	0.0	$1,900	$0	
	Re-forest	ha	2.5	$1,750	$4,375	$13,375
	Sub-Total					**$13,375**
11.1.6	**Tailings Area current disturbed area of 40.3 ha)**					
	Seed and fertilize w/ labour	ha	40.3	$2,400	$96,720	
	Re-seed and fertilize (1/2 of total area)	ha	20.2	$2,400	$48,360	
	Re-forest	ha	40.3	$1,750	$70,525	$215,605
	Sub-Total					**$215,605**
11.1.7	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,400	$7,920	
	Re-seed and fertilize (1/2 of total area)	ha	1.7	$2,400	$3,960	
	Re-forest	ha	3.3	$1,750	$5,775	$17,655
	Sub-Total					**$17,655**
11.1.8	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,400	$18,240	
	Re-seed and fertilize (1/2 of total area)	ha	3.8	$2,400	$9,120	
	Re-forest	ha	7.6	$1,750	$13,300	$40,660
	Subtotal:					**$40,660**
11.1.9	**Haul Road (total surface area of 13 ha)**					
		ha	13.0	$2,400	$31,200	**$31,200**
11.1.10	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,400	$24,720	
	Re-seed and fertilize (1/2 of total area)	ha	5.2	$2,400	$12,360	
	Re-forest	ha	10.3	$1,750	$18,025	$55,105
	Subtotal:					**$55,105**
11.1.11	**Access Road**					
	Scenario 1 - No Deactivation					
	No revegetation					
	Subtotal:					**$0**
	Scenario 2 - Deactivate from Minto Creek to Mine Site					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	2.0	$2,400	$4,800	$4,800
	Subtotal:					**$4,800**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,400	$14,400	$14,400
	Subtotal:					**$14,400**

Total Estimated Cost for Reclamation Research and Revegetation		
	Scenario 1 - No Access Road Deactivation	**$1,048,440**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$1,053,240**
	Scenario 3 - Deactivate Entire Access Road	**$1,062,840**

Table 8.1-12a

Site Management and Monitoring, Estimated Closure Costs - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	SITE MANAGEMENT						
12.1	**Onsite Management**						
	Project Management and Engineering - Included in PME Costs in each Closure Component						
	Pickup truck	Light truck	monthly	50	$2,500	$125,000	
	Sundry equipment maintenance	Unit Cost Basis	yearly	10	$5,000	$50,000	
	Power and heat	Unit Cost Basis	monthly	30	$5,500	$165,000	$165,000
	General Administrative expenses	Unit Cost Basis	monthly	50	$2,000	$100,000	$100,000
	Camp Costs (5 year period)	Unit Cost Basis	man-day	5130	$60	$307,800	$307,800
	Subtotal:						**$572,800**
12.2	**Transport Costs**						
	Employee transport costs	Unit Cost Basis	monthly	50	$3,000	$150,000	
	Barge operating costs	Unit Cost Basis	monthly	20	$10,000	$200,000	
	Subtotal:						**$0**
12.3	**Water Treatment and Compliance Monitoring incl. Reporting**						
	Active - Treatment, operating costs (4 years) incl. staff, reagents		monthly	12	$87,000	$1,044,000	$1,044,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (4 years)		cu.m	1440000	$0	$576,000	$576,000
	Subtotal:						**$1,620,000**
12. 4	**Water Quality Monitoring (Post Mine Closure) (50:50 sampling labour/analyses costs split)**						
	Years 1-5 (monthly during open season)	Misc.	monthly	30	$3,000	$90,000	
	Years 6-10 (quarterly - spring/summer/fall)	Misc.	quarterly	15	$3,000	$45,000	
	Years 11-15 (once annually - post spring freshet)	Misc.	yearly	5	$3,000	$15,000	$150,000
	Disbursements (non-labour/non-analytical)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	LTF Monitoring and Maintenance (years 1-5)	Misc.	yearly	5	$3,500	$17,500	$17,500
	Enhanced Groundwater/Foundation monitoring below TF and Waste Rock Dumps	Misc.	yearly	15	$5,000	$75,000	$75,000
	Geo-technical Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Reclamation Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Biological Monitoring - Closure implementation	Misc.	l.s.		$9,000	$9,000	
	Years 1-5 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 6-10 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 11-15 (Every two years)	Misc.	bi-annual	3	$2,500	$7,500	$46,500
	Subtotal:						**$434,000**
12.5	**Post Closure Maintenance - Main Dam**						
	Monitoring of piezometers, thermistors						
	Years 1-5 (quarterly)	Misc.	quarterly	20	$3,000	$60,000	
	Years 6-10 (bi-annually)	Misc.	bi-annually	8	$3,000	$24,000	
	Years 11-15 (annually)	Misc.	annual	5	$2,500	$12,500	
	Annual Inspection + report	Misc.	annual	15	$3,000	$45,000	
	Carry out inspection recommendations/maintenance	Misc.	annual	15	$10,000	$150,000	$291,500
	Misc. maintenance work related to the site after closure (Yr1-5)	Misc.	yearly	5	$10,000	$50,000	$50,000
	Misc. maintenance work related to the site after closure (Yr6-15)	Misc.	per year	10	$5,000	$50,000	$50,000
	Subtotal:						**$391,500**
12.6	**Ulitmate Removal of wells and instrumentation**	Misc.	unit basis		$15,000		**$15,000**
Total Estimated Cost for Post Closure Site Management							**$3,033,300**

Note:
Camp Costs calculation based on "Table 7-1 Site Decommissioning and Reclamation Seasonal Personnel Requirements" using a 90 day work year

MINTO MINE CLOSURE COSTING

Table 8.1-13a
Supporting Studies - 2011 (Year 0)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
13.1	**Permafrost Foundation Monitoring**						
13.1.1	Enhanced subsurface monitoring program in and below waste rock dumps (WRD)						
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000	
	undertake additional monitoring as per program(covered in T. 12)	Misc.	yearly		$3,500	$3,500	$7,500
	Enhanced Adaptive Management Plan for WRD	Misc.	l.s.	1	$4,000	$4,000	$4,000
13.1.2	Enhanced subsurface monitoring program in and below Tailings Facility (TF)						
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000	
	undertake additional monitoring as per program (covered in T. 12)	Misc.	yearly	1	$3,500	$3,500	$7,500
	Enhanced Adaptive Management Plan for TF	Misc.	l.s.	1	$4,000	$4,000	$4,000
	Sub-Total						**$23,000**
13.2	**Kinetic Tailings Testing**						
13.2.1	Monitoring program and field test to enhance long term water quality prediction related to drystack tailings facility						
	preparing composite sample over several months of production	Misc.	l.s.		$2,500	$2,500	$2,500
	undertaking field test	Misc.	l.s.		$6,000	$6,000	
	initiate parallel laboratory analysis	Misc.	l.s.		$5,000	$5,000	
	monitoring field apparatus (columns)	Misc.	l.s.		$2,000	$2,000	$13,000
	reporting				$2,500	$2,500	$2,500
	Sub-Total						**$18,000**
13.3	**Other Adaptive Management Plans scheduled for Operating Life or Required Only in Early Shutdown**						
	Changes in WTP input water quality or quantity	Misc.				$15,000	$15,000
	Site Testing ML ARD	Misc.				$30,000	$30,000
	Dry Stack Tailings Facility - Confirmation of closure methodology	Misc.				$20,000	$20,000
	Long Term Reclamation of Contaminated Soils	Misc.				$15,000	$15,000
	Physical Monitoring program prior to closure	Misc.				$40,000	$40,000
	Modeling of Pit Lake water quality prior to flooding	Misc.				$15,000	$15,000
	Sub-Total						**$135,000**
13.4	**Closure Specific Studies and Field Trials**						
	Main Site Discharge Channel Geotechnical Design and Stability Evaluation	Engineering/Design	ls.	1	$30,000	$30,000	$30,000
	Passive Treatment Evaluations	Engineering/Design	ls.	1	$60,000	$60,000	$60,000
	Engineered Cover Evaluations	Engineering/Design	ls.	1	$50,000	$50,000	$50,000
	Sub-Total						**$140,000**
Total Estimated Cost for Supporting Studies							**$316,000**

Note:

Table 8-2b
Summary Table of Estimated Closure Costs - 2013 (Year 2)

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$5,079,900
4	**Open Pit, Underground and Haul Roads**	$769,732
5	**Tailings Area and Diversion Structures**	$1,285,627
6	**Main Water Dam**	$523,493
7	**Mill and Ancillary Facilities**	$601,184
8	**Mill Pond**	$184,510
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$125,012
	Scenario 3 - Deactivate Entire Access Road	$229,059
10	**Miscellaneous Sites and Facilities**	$168,620
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$1,400,895
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$1,405,695
	Scenario 3 - Deactivate Entire Access Road	$1,415,295
12	**Post Closure Site Management**	$3,558,300
13	**Supporting Studies**	$296,000
Total Closure Costs		
	Scenario 1 - No Access Road Deactivation	**$13,870,401**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$13,998,073**
	Scenario 3 - Deactivate Entire Access Road	**$14,111,720**
Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$15,534,849**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$15,677,842**
	Scenario 3 - Deactivate Entire Access Road	**$15,805,126**

Table 8-3b

Waste Rock and Overburden Dumps, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Inflated Unit Rates	Cost	Total Adjusted
	WASTE ROCK AND OVERBURDEN DUMPS							
3.1	**Main Waste Dump**							
	Roll crest and recontour	D9H Dozer	hrs	300	$268	$268	$80,358	$80,358
	Additional surface grading/material placement as required		cu.m.	2000	$2.58	$5.16	$10,320	
	Additional compaction as required	Vibratory Roller	hrs	60	$120	$120	$7,200	
	Haul and place overburden for revegetation	Load, Haul and place soil cover MWD	cu.m.	145000	$5.16	$5.16	$747,649	$747,649
	Project Management & Engineering	7% of Total Cost	%	4119	7.00%		$59,187	$59,187
	Sub-Total						**$904,713**	**$887,193**
3.2	**Southwest Dump**							
	Roll crest and recontour	D9H Dozer	hrs	220	$268	$268	$58,929	$58,929
	Additional surface grading/material placement as required		cu.m.	10000	$2.85	$2.85	$28,500	$28,500
	Additional compaction as required	Vibratory Roller	hrs	160	$120	$120.00	$19,200	$19,200
	Haul and place overburden for revegetation	Load, Haul and place soil cover SWD	cu.m.	348250	$5.70	$5.70	$1,985,025	$1,985,025
	Project Management & Engineering	7% of Total Cost	%		7.00%		$146,416	$146,416
	Sub-Total						**$2,238,070**	**$2,238,070**
3.3	**Ice-Rich Overburden Dump**							
	Roll crest of berm and recontour	D9H Dozer	hrs	16	$268	$268	$4,286	$4,286
	Excavate material for placement on berm	Cat 235 Excavator	hrs	40	$247	$247	$9,890	$9,890
	Project Management & Engineering	7% of Total Cost	%		7.00%		$992	$992
	Sub-Total						**$15,168**	**$15,168**
3.4	**Reclamation Overburden Dump**							
	Final Dump Surface Recontouring	Dozer D6LGP	hrs	60	$169	$169	**$10,164**	**$10,164**
3.5	**Grade Bin Disposal Area**							
	Move material to Area 1 Pit	988B Loader	hrs	2100	$258	$258	$540,868	$540,868
		D9H Dozer	hrs	216	$268	$268	$57,857	$57,857
		Haul Truck D250E	hrs	3300	$227	$227	$747,943	$747,943
	Project Management & Engineering	7% of Total Cost	%		7.00%		$37,861	$37,861
	Sub-Total						**$1,384,530**	**$1,384,530**
3.7	**Contractor's Shop and Work Area**							
	Remove salvageable equipment	General Labourer	hrs	60	$48	$48	$2,893	
		Haul Truck D250E	hrs	20	$227	$227	$4,533	
		Trades Labourer	hrs	48	$86	$86	$4,114	$11,540
	Dismantle buildings	General Labourer	hrs	60	$48	$48	$2,893	
		30 ton Crane	hrs	10	$165	$165	$1,648	
		Cat 235 Excavator	hrs	30	$247	$247	$7,418	$11,959
	Haul building pieces off site - equipment	Tractor Trailer (lowbed)	hrs	20	$134	$134	$2,679	$2,679
	Scrap haul to site landfill	Haul Truck D250E	hrs	20	$227	$227	$4,533	$4,533
	Bury footings - haul and place fill, locally sourced	Unit basis (footing burial)	each	2500	$5.08	$5.08	$12,688	$12,688
	Recontour	D9H Dozer	hrs	15	$268	$268	$4,018	$4,018
	Haul and place overburden for revegetation	Custom Rate C (Load, haul and place IROD - CSA)	cu.m.	5000	$5.13	$5.13	$25,629	$25,629
	Project Management & Engineering	7% of Total Cost	%		7.00%		$5,113	$5,113
	Sub-Total						**$78,158**	**$78,158**
3.8	**Contaminated Soils - Transport to LTF**							
		Unit basis	l.s.	1	$5,000	$5,000	**$5,000**	**$5,000**
3.9	**Mill Valley Fill**							
	Roll crest and recontour	D9H Dozer	hrs	30	$268	$268	$8,036	$8,036
	Haul and place overburden for revegetation	Load, Haul and place soil cover MWD	cu.m.	25500	$10.63	$10.63	$271,065	$271,065
	Excavation of spillway channel	Cat 235 Excavator	hrs	120	$240	$240	$28,800	$28,800
		D9H Dozer	hrs	120	$268	$268	$32,143	$32,143
	Provision for placement of rip rap	Rip rap from local area to MVF	cu.m.	5000	$15	$15.00	$75,000	$75,000
	Project Management & Engineering	7% of Total Cost	%		7%		$29,053	$29,053
	Sub-Total						**$444,097**	**$444,097**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$5,079,900**	**$5,062,380**

Note:
The Dozer D6LGP (item 3.4) unit rate was obtained from the Canadian Blue Book value and then inflated by 10% for the Yukon, prior to 8 yrs inflation of 1.5% compounded annually.
Item 3.5 quantities were estimated to move 930,000 t using two haul trucks and 1 loader. The material bordering the pit can be moved solely using the loader.

Table 8-4b

Open Pit, Underground and Haul Roads, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	OPEN PIT, UNDERGROUND AND HAUL ROADS						
4.1	**Area 1 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	80	$48	$3,857	
		Trades Labourer	hrs	20	$86	$1,714	
		Support equipment	l.s.		$1,000	$1,000	$6,571
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	$9,478
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	20	$247	$4,945	
	Riprap shoulder exiting pit	Place Riprap	cu.m	50	$15	$750	
	Exit Spillway construction	General Labourer	hrs	10	$48	$482	
		Load and Haul Rip Rap	cu.m	50	$13	$634	$6,812
	Construct Passive Treatment System						
	Organic carbon source (to site or chipped at site)	Haulage and handling	l.s.		$75,000	$75,000	
	Clean (< 0.1% Cu) Waste Rock for Construction	Haulage and handling	l.s.		$25,000	$25,000	
	Construction of treatment area	Cat 235 Excavator	hrs	160	$247	$39,561	
		Haul Truck D250E	hrs	160	$227	$36,264	
		General Labourer	hrs	200	$48	$9,600	$185,425
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,600	$1,600
	Sub-Total					**$209,886**	**$209,886**
4.2	**Area 2 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	80	$48	$3,857	
		Trades Labourer	hrs	20	$86	$1,714	
		Support equipment	l.s.		$1,000	$1,000	$6,571
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	$9,478
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	40	$247	$9,890	
	Riprap shoulder exiting pit	Place Riprap	cu.m	50	$15	$750	
	Exit Spillway construction	General Labourer	hrs	40	$48	$1,929	
		Load and Haul Rip Rap	cu.m	250	$13	$3,172	$15,741
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,225	$2,225
	Sub-Total					**$34,015**	**$34,015**
4.3	**Area 118 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	60	$48	$2,893	
		Trades Labourer	hrs	15	$86	$1,286	
		Support equipment	l.s.		$750	$750	$4,929
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	15	$247	$3,709	
		Haul Truck D250E	hrs	15	$227	$3,400	$7,109
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	30	$247	$7,418	
	Riprap shoulder exiting pit	Place Riprap	cu.m	37.5	$15	$563	
	Exit Spillway construction	General Labourer	hrs	30	$48	$1,446	
		Load and Haul Rip Rap	cu.m	187.5	$13	$2,379	$11,805
	Haul and place overburden for revegetation	Load, Haul and place soil c	cu.m.	7500	$4.30	$32,250	$32,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,669	$1,669
	Sub-Total					**$57,762**	**$57,762**
4.4	**Haul Roads (15 ha)**						
	Remove culverts and haul away	General Labourer	hrs	55	$48	$2,670	
		Cat 235 Excavator	hrs	28	$247	$6,847	
		Haul Truck D250E	hrs	28	$227	$6,276	$15,794
	Recontour slopes	D9H Dozer	hrs	208	$268	$55,632	$55,632
	Scarify surfaces	Cat 16H grader	hrs	208	$227	$47,073	
		General Labourer	hrs	28	$48	$1,335	$48,409
	Stabilize slopes - erosion barriers - material	Unit Cost Basis	sq.m	2,769	$3	$8,308	$8,308
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,970	$8,970
	Sub-Total					**$137,112**	**$137,112**
4.5	**Underground**						
	Backfill underground waste	Load and haul material	cu.m	70,000	$4.16	**$291,200**	**$291,200**
	Recontour slopes	D9H Dozer	hrs	12	$268	**$3,214**	**$3,214**
	Seal off underground portal		l.s.	1	$10,000	**$10,000**	**$10,000**
	Seal off ventilation raise	Cat 235 Excavator	hrs	12	$247	**$2,967**	**$2,967**
		Haul Truck D250E	hrs	2	$227	**$453**	**$453**
	Rip and scarify road	Cat 16H grader	hrs	8	$227	**$1,813**	**$1,813**
	Project Management & Engineering	7% of Total Cost	%		7.00%	**$21,309**	**$21,309**
	Sub-Total					**$330,957**	**$330,957**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads						**$769,732**	**$769,732**

Note:

Linear disturbances to be scarified / decompacted and allowed to naturally revegetate

Ventilation raise to be sealed by dumping rocks down raise until a bridge is formed and it fills to surface. Portal allowance assumes installation of bulkhead with locked door should access be

Table 8-5b

Tailings Area & Diversion Structures, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	TAILINGS AREA						
5.1	**Tailings Deposit - Final Lift**						
	Roll crest of starter bench and recontour	D9H Dozer	hrs	50	$268	$13,393	$13,393
	Haul overburden ROD - DSTF	Custom Haul Rate	cu.m	191200	$5.80	$1,108,960	$1,108,960
	Project Management & Engineering	7% of Total Cost	%		7.00%	$78,565	$78,565
	Sub-Total					**$1,200,918**	**$1,200,918**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$268	$13,393	$13,393
		Cat 235 Excavator	hrs	20	$247	$4,945	$4,945
	Haul and place riprap	Load and Haul Rip Rap	cu.m	1200	$13	$15,225	
		Place Riprap	cu.m	1200	$15	$18,000	$33,225
	HDPE liner	Unit rate	sq.m	2400	$10	$24,000	$24,000
		General Labourer	hrs	80	$48	$3,857	$3,857
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,289	$5,289
	Sub-Total					**$84,710**	**$84,710**
Total Estimated Cost in Reclaiming Tailings Area						**$1,285,627**	**$1,285,627**

Note:
Material to provide soil cover for the dry stack tailings will be sourced from the Area 2 Pit.

Table 8-6b
Main Water Dam, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	WATER DAM						
6.1	**Reclaim System**						
	Remove salvageable equipment - pipeline/pumps	General Labourer	hrs	48	$48	$2,314	
		Trades Labourer	hrs	98	$86	$8,400	$10,714
	Remove pipeline	Haul Truck D250E	hrs	100	$227	$22,665	
		Cat 235 Excavator	hrs	100	$247	$24,725	
		General Labourer	hrs	200	$48	$9,643	$57,033
	Dismantle Building	Cat 235 Excavator	hrs	16	$247	$3,956	
		General Labourer	hrs	20	$48	$964	$4,920
	Misc. Supplies & Tools	Misc.	l.s.		$1,000	$1,000	$1,000
	Recontour alignment	D9H Dozer	hrs	16	$268	$4,286	$4,286
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,457	$5,457
	Sub-Total					**$83,410**	**$83,410**
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	96	$48	$4,629	$4,629
	Misc. Supplies & Tools	Misc.	l.s.		$5,000	$5,000	$5,000
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$10,000	$10,000	$10,000
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	10,000	$10	$100,000	$100,000
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from MWD - U/S MWD)	cu.m	25,000	$2	$54,556	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	31,000	$4.50	$139,500	
		Environmental Scientist	hrs	60	$101.79	$6,107	$200,163
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	1,125	$3	$3,375	
		Unit Cost Basis	cu.m	1,125	$9	$10,125	$13,500
	Haul and place overburden on slopes of new area u/s of MWD	Unit Cost Basis	cu.m	15,000	$2	$30,000	$30,000
	Stabilize slopes with erosion barriers	Unit Rates	per sq. m	15,000	$3	$45,000	$45,000
	Misc. Supplies & Tools	Misc.	l.s.		$3,000	$3,000	$3,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$28,790	$28,790
	Sub-Total					**$440,082**	**$440,082**
Total Estimated Cost in Reclaiming Water Dam						**$523,493**	**$523,493**

Table 8-7b
Mill &Ancillary Facilities, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL AND ANCILLARY FACILITIES						
7.1	**Mill Building**						
	Remove salvageable equipment	General Labourer	hrs	550	$48	$26,518	
		Trades Labourer	hrs	600	$86	$51,429	
		Crane Support	hrs	40	$145	$5,800	$83,747
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$86	$13,714	$13,714
	Dismantle Building	General Labourer	hrs	1000	$48	$48,215	
		Trades Labourer	hrs	600	$86	$51,429	
		Cat 235 Excavator w hammer	hrs	120	$283	$33,997	
		Crane Support	hrs	60	$145	$8,700	$142,341
	Concrete Demolition	Blaster	hrs	30	$64	$1,929	
		Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	20	$268	$5,357	$12,231
	Misc. Supplies & Tools	Misc.	l.s.		$11,000	$11,000	$11,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	50	$247	$12,363	
		Haul Truck D250E	hrs	100	$227	$22,665	$35,028
	Project Management & Engineering	7% of Total Cost	%		7.00%	$20,864	$20,864
	Subtotal:					**$318,925**	**$318,925**
					Subtract 50% for Salvage Value	**$159,462**	**$159,462**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$48	$11,571	
		Trades Labourer	hrs	240	$86	$20,572	$32,143
		Crane Support	hrs	24	$145	$3,480	
	Salvage and remove powerline and poles		l.s.		$27,500	$27,500	$30,980
	Dismantle Buildings	General Labourer	hrs	160	$48	$7,714	
		Trades Labourer	hrs	80	$86	$6,857	
		Cat 235 Excavator w hammer	hrs	40	$283	$11,332	
		Crane Support	hrs	30	$145	$4,350	$30,254
	Concrete Demolition	Blaster	hrs	40	$64	$2,571	
		Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	20	$268	$5,357	$12,874
	Misc. Supplies & Tools	Misc.	l.s.		$10,000	$10,000	$10,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	10	$247	$2,473	
		Haul Truck D250E	hrs	20	$227	$4,533	$7,006
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,628	$8,628
	Subtotal:					**$131,884**	**$131,884**
					Subtract 50% for Salvage Value	**$65,942**	**$65,942**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$48	$2,893	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,893
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$48	$4,821	
		Trades Labourer	hrs	120	$86	$10,286	
		Crane Support	hrs	30	$145	$4,350	
		Support Equipment	l.s.		$2,500	$2,500	
		Cat 235 Excavator	hrs	40	$247	$9,890	
		General Labourer	hrs	40	$48	$1,929	
		Tractor Trailer (lowbed)	hrs	30	$134	$4,018	$37,794
	Fold and Bury Liner	Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	100	$268	$26,786	$31,731
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,769	$5,769
	Subtotal:					**$88,187**	**$88,187**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$48	$4,821	
		Support Equipment	l.s.		$2,500	$2,500	
		Disposal Cost-bulk materials	l.s.		$5,000	$5,000	
		Disposal Cost-lab-pacs	pallets	2	$2,000	$4,000	$16,321
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,143	$1,143
	Subtotal:					**$17,464**	**$17,464**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	35	$102	$3,563	
		Analytical Costs	l.s.		$6,000	$6,000	$9,563
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	15	$247	$3,709	
		Haul Truck D250E	hrs	15	$227	$3,400	$7,109
	Re-contour area and slopes to bury footings and establish drainage	D9H Dozer	hrs	100	$268	$26,786	$26,786
	Haul and place overburden cap	Unit Rate	cu.m	38000	$5.50	$209,000	$209,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$17,672	$17,672
	Subtotal:					**$270,129**	**$270,129**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities						**$601,184**	**$601,184**

Table 8-8b
Mill Water Pond, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL POND						
8.1	**Reclaim Mill Pond**						
	Remove upstream culvert	General Labourer	hrs	10	$48	$482	
		Cat 235 Excavator	hrs	10	$247	$2,473	$2,955
	Construct channel	Cat 235 Excavator	hrs	100	$247	$24,725	
		D9H Dozer	hrs	20	$268	$5,357	$30,083
		Load and Haul Rip Rap	cu.m	5,000	$13	$63,438	$63,438
		General Labourer	hrs	20	$48	$964	$964
		Place Riprap	cu.m	5,000	$15	$75,000	$75,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$12,071	$12,071
	Subtotal:					**$184,510**	**$184,510**
Total Estimated Cost in Reclaiming Mill Pond						**$184,510**	**$184,510**

Note:

Table 8-9b
Main Access Road, Estimated Closure Costs - 2013 (Year 2)

Scenario 1 - No Road Deactivation

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.1	**NO ROAD DECOMMISSIONING REQUIRED**						
9.1.1	**Road Surface**						
	Install road barrier at west side of Minto Creek	Misc	l.s.		$2,000	$2,000	$2,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$140	$140
	Subtotal:					**$2,140**	**$2,140**
Total Estimated Cost for Access Road Closure (Scenario 1)						**$2,140**	**$2,140**

Scenario 2 - Decommission Access Road From Minto Creek to Mine Site (11 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.2	**ACCESS ROAD - 11 KM SECTION**						
9.2.1	**Road Surface**						
	Scarify - 11 km	Cat 16H grader	hrs	70	$227	$15,865	$15,865
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,111	$1,111
	Subtotal:					**$16,976**	**$16,976**
9.2.2	**Culverts**						
	Culvert excavation (40 small culverts)	Cat 235 Excavator	hrs	100	$247	$24,725	$24,725
	Culvert removal	General Labourer	hrs	140	$48	$6,750	
		Haul Truck D250E	hrs	100	$227	$22,665	$29,415
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$86	$3,429	
		General Labourer	hrs	75	$48	$3,616	
		Cat 235 Excavator	hrs	40	$247	$9,890	$16,935
	Recontour slopes and drainage	D9H Dozer	hrs	70	$268	$18,750	$18,750
	Stabilize slopes	General Labourer	hrs	200	$48	$9,643	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3.00	$1,500	$11,143
	Project Management & Engineering	7% of Total Cost	%		7.00%	$7,068	$7,068
	Subtotal:					**$108,036**	**$108,036**
Total Estimated Cost for Access Road Closure (Scenario 2)						**$125,012**	**$125,012**

Scenario 3 - Decommission Entire Access Road (27 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.3	**ACCESS ROAD - 27 KM SECTION**						
9.3.1	**Road Surface**						
	Scarify - 27 km	Cat 16H grader	hrs	150	$227	$33,997	$33,997
	Recontour slopes and drainage	D9H Dozer	hrs	50	$268	$13,393	$13,393
	Project Management & Engineering	7% of Total Cost	%		7.00%	$3,317	$3,317
	Subtotal:					**$50,708**	**$50,708**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$48	$2,411	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$247	$9,890	
		Tractor Trailer (lowbed)	hrs	20	$134	$2,679	$20,779
	Cut off piles	General Labourer	hrs	50	$48	$2,411	$2,411
	Re-contour	Cat 235 Excavator	hrs	30	$247	$7,418	
		D9H Dozer	hrs	30	$268	$8,036	$15,453
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,705	$2,705
	Subtotal:					**$41,349**	**$41,349**
9.3.3	**Barge Ramps**						
	Remove all gravel	Cat 235 Excavator	hrs	20	$247	$4,945	$4,945
	Re-countour areas and scarify	D9H Dozer	hrs	30	$268	$8,036	$8,036
	Shoreline restoration	Misc.	l.s.		$5,000	$5,000	$5,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,259	$1,259
	Subtotal:					**$19,239**	**$19,239**
9.3.4	**Culverts**						
	Culvert excavation (45 small culverts)	Cat 235 Excavator	hrs	115	$247	$28,434	$28,434
	Culvert removal	General Labourer	hrs	150	$48	$7,232	
		Haul Truck D250E	hrs	115	$227	$26,065	$33,297
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$86	$3,429	
		General Labourer	hrs	75	$48	$3,616	
		Cat 235 Excavator	hrs	40	$247	$9,890	$16,935
	Recontour slopes and drainage	D9H Dozer	hrs	70	$268	$18,750	$18,750
	Stabilize slopes	General Labourer	hrs	200	$48	$9,643	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,643
	Project Management & Engineering	7% of Total Cost	%		7.00%	$7,704	$7,704
	Subtotal:					**$117,763**	**$117,763**
Total Estimated Cost for Access Road Closure (Scenario 3)						**$229,059**	**$229,059**

Note:

Table 8-10b

Miscellaneous Sites and Facilities, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MISCELLANEOUS SITES AND FACILITIES						
10.1	**Airstrip**						
	Scarify airstrip	Cat 16H Grader	hrs	20	$227	$4,533	$4,533
	Project Management & Engineering	7% of Total Cost	%		7.00%	$317	$317
	Natural revegetation	n/a	n/a				
	Subtotal:					**$4,850**	**$4,850**
10.2	**Mine Camp and Related Infrastructure**						
	Disconnect Services	Trades Labourer	hrs	80	$86	$6,857	$6,857
	Remove salvageable equipment	General Labourer	hrs	704	$48	$33,943	$33,943
	Dismantle buildings	General Labourer	hrs	1200	$48	$57,857	
		Cat 235 Excavator	hrs	120	$247	$29,670	$87,528
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	20	$227	$4,533	
		Cat 235 Excavator	hrs	10	$247	$2,473	$7,006
	Reclaim Septic System	General Labourer	hrs	10	$48	$482	
		Cat 235 Excavator	hrs	2	$247	$495	$977
	Site Clean-Up	General Labourer	hrs	500	$48	$24,107	$24,107
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,749	$10,749
	Subtotal:					**$171,167**	**$171,167**
						$85,583	**$85,583**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$48	$4,821	
		Trades Labourer	hrs	50	$86	$4,286	$9,107
	Dismantle buildings	General Labourer	hrs	200	$48	$9,643	
		Cat 235 Excavator	hrs	30	$247	$7,418	$17,061
	Disconnect Services	Trades Labourer	hrs	20	$86	$1,714	$1,714
	Crane services	30 ton Crane	hrs	5	$165	$824	$824
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	30	$227	$6,799	
		Cat 235 Excavator	hrs	10	$247	$2,473	$9,272
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,658	$2,658
	Subtotal:					**$40,637**	**$40,637**
						$20,318	**$20,318**
10.4	**Exploration Sites and Trails**						
	Natural revegetation	n/a	n/a				
	Subtotal:					**$0**	**$0**
10.5	**Land Treatment Facility**						
	Prepare and submit closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final soil hydrocarbon concentrations	Misc	l.s.		$3,000	$3,000	$3,000
	Recontour	D9H Dozer	hrs	2	$268	$536	$536
	Haul and place overburden cap from nearby	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	
		D9H Dozer	hrs	6	$268	$1,607	$11,085
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,163	$1,163
	Subtotal:					**$17,784**	**$17,784**
10.6	**Solid Waste Facility**						
	Prepare detailed closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final waste area	Misc	l.s.		$2,000	$2,000	$2,000
	Remove recyclables and special waste materials	Tractor Trailer (lowbed)	hrs	40	$134	$5,357	$5,357
	Recontour	D9H Dozer	hrs	2	$268	$536	$536
	Haul and cover with adjacent fill and place overburden cap	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	
	Compaction of cover	D9H Dozer	hrs	6	$268	$1,607	$11,085
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,468	$1,468
	Subtotal:					**$22,447**	**$22,447**
10.7	**Site Roads**						
	Recontour	Cat 235 Excavator	hrs	30	$247	$7,418	$7,418
	Scarify	Cat 16H Grader	hrs	40	$227	$9,066	$9,066
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,154	$1,154
	Subtotal:					**$17,637**	**$17,637**
Total Estimated Cost in Reclaiming Miscellaneous Sites and Facilities						**$168,620**	**$168,620**

Note:
Land treatment facility is a licensed facility and will be reclaimed as per license terms and conditions

Table 8-11b

Reclamation Research and Revegetation, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Units	Quantity	Unit Rates	Cost	Total Adjusted
11.1	**REVEGETATION ACTIVITIES**					
11.1.0	**Determination of Revegetation Plan for Current Site**					
	Issuance of a plan for all site areas for regulatory review and approval	Misc	1	$20,000	$20,000	$20,000
	Sub-Total				**$20,000**	**$20,000**
11.1.1	**Main and Southwest Dumps (total surface area of 117.5 ha)**					
	Seed and fertilize w/ labour	ha	117.5	$2,400	$282,000	
	Re-seed and fertilize (1/2 of total area)	ha	58.8	$2,400	$141,000	
	Re-forest	ha	117.5	$1,750	$205,625	$628,625
	Sub-Total				**$628,625**	**$628,625**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,400	$16,560	
	Re-seed and fertilize (1/2 of total area)	ha	3.5	$2,400	$8,280	
	Re-forest	ha	6.9	$1,750	$12,075	$36,915
	Sub-Total				**$36,915**	**$36,915**
11.1.3	**Reclamation Overburden Dump (total surface area of 30 ha)**					
	Seed and fertilize w/ labour	ha	30.0	$2,400	$72,000	
	Re-seed and fertilize (1/2 of total area)	ha	15.0	$2,400	$36,000	
	Re-forest	ha	30.0	$1,750	$52,500	$160,500
	Sub-Total				**$160,500**	**$160,500**
11.1.4	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,400	$37,680	
	Re-seed and fertilize (1/2 of total area)	ha	7.9	$2,400	$18,840	
	Re-forest	ha	15.7	$1,750	$27,475	$83,995
	Sub-Total				**$83,995**	**$83,995**
11.1.5	**Mill Valley Fill (8 ha)**					
	Seed and fertilize w/ labour	ha	8.0	$2,400	$19,200	
	Re-seed and fertilize (1/2 of total area)	ha	4.0	$2,400	$9,600	
	Re-forest	ha	8.0	$1,750	$14,000	$42,800
	Sub-Total				**$42,800**	**$42,800**
11.1.6	**Contractor's Shop and Office Area (disturbed area of 2.5 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,400	$6,000	
	Re-seed and fertilize (1/2 of total area)	ha	1.3	$2,400	$3,000	
	Re-fertilize only (1/2 total area - re-seed area)	ha	0.0	$1,900	$0	
	Re-forest	ha	2.5	$1,750	$0	$9,000
	Sub-Total				**$9,000**	**$9,000**
11.1.7	**Tailings Area current disturbed area of 30.2 ha)**					
	Seed and fertilize w/ labour	ha	30.2	$2,400	$72,480	
	Re-seed and fertilize (1/2 of total area)	ha	15.1	$2,400	$36,240	
	Re-forest	ha	30.2	$1,750	$52,850	$161,570
	Sub-Total				**$161,570**	**$161,570**
11.1.8	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,400	$7,920	
	Re-seed and fertilize (1/2 of total area)	ha	1.7	$2,400	$3,960	
	Re-forest	ha	3.3	$1,750	$5,775	$17,655
	Sub-Total				**$17,655**	**$17,655**
11.1.9	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,400	$18,240	
	Re-seed and fertilize (1/2 of total area)	ha	3.8	$2,400	$9,120	
	Re-forest	ha	7.6	$1,750	$13,300	$40,660
	Subtotal:				**$40,660**	**$40,660**
11.1.10	**Haul Road (total surface area of 15 ha)**					
		ha	15.0	$2,400	**$36,000**	**$36,000**
11.1.11	**Underground (total surface area of 20.2 ha)**					
	Seed and fertilize w/ labour	ha	20.2	$2,400	$48,480	
	Re-seed and fertilize (1/2 of total area)	ha	10.1	$2,400	$24,240	
	Re-forest	ha	20.2	$1,750	$35,350	$108,070
	Subtotal:				**$108,070**	**$108,070**
11.1.12	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,400	$24,720	
	Re-seed and fertilize (1/2 of total area)	ha	5.2	$2,400	$12,360	
	Re-forest	ha	10.3	$1,750	$18,025	$55,105
	Subtotal:				**$55,105**	**$55,105**
11.1.13	**Access Road**					
	Scenario 1 - No Deactivation					
	No revegetation					
	Subtotal:					**$0**
	Scenario 2 - Deactivate from Minto Creek to Mine Site					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	2.0	$2,400	$4,800	$4,800
	Subtotal:				**$4,800**	**$4,800**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,400	$14,400	$14,400
	Subtotal:				**$14,400**	**$14,400**
Total Estimated Cost for Reclamation Research and Revegetation						
	Scenario 1 - No Access Road Deactivation				**$1,400,895**	**$1,400,895**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site				**$1,405,695**	**$1,405,695**
	Scenario 3 - Deactivate Entire Access Road				**$1,415,295**	**$1,415,295**

Table 8-12b
Site Management and Monitoring, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	SITE MANAGEMENT						
12.1	**Onsite Management**						
	Project Management and Engineering - Included in PME Costs in each Closure Component						
	Pickup truck	Light truck	monthly	50	$2,500	$125,000	$125,000
	Sundry equipment maintenance	Unit Cost Basis	yearly	10	$5,000	$50,000	$50,000
	Power and heat	Unit Cost Basis	monthly	30	$5,500	$165,000	$165,000
	General Administrative expenses	Unit Cost Basis	monthly	50	$2,000	$100,000	$100,000
	Camp Costs (5 year period)	Unit Cost Basis	man-day	5130	$60	$307,800	$307,800
	Subtotal:					**$747,800**	**$747,800**
12.2	**Transport Costs**						
	Employee transport costs	Unit Cost Basis	monthly	50	$3,000	$150,000	$150,000
	Barge operating costs	Unit Cost Basis	monthly	20	$10,000	$200,000	$200,000
	Subtotal:					**$350,000**	**$350,000**
12.3	**Water Treatment and Compliance Monitoring incl. Reporting**						
	Active - Treatment, operating costs (4 years) incl. staff, reagents		monthly	12	$87,000	$1,044,000	$1,044,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (4 years)		cu.m	1440000	$0.40	$576,000	$576,000
	Subtotal:					**$1,620,000**	**$1,620,000**
12. 4	**Water Quality Monitoring (Post Mine Closure) (50:50 sampling labour/analyses costs split)**						
	Years 1-5 (monthly during open season)	Misc.	monthly	30	$3,000	$90,000	
	Years 6-10 (quarterly - spring/summer/fall)	Misc.	quarterly	15	$3,000	$45,000	
	Years 11-15 (once annually - post spring freshet)	Misc.	yearly	5	$3,000	$15,000	$150,000
	Disbursements (non-labour/non-analytical)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	LTF Monitoring and Maintenance (years 1-5)	Misc.	yearly	5	$3,500	$17,500	$17,500
	Enhanced Groundwater/Foundation monitoring below TF and Waste Rock Dumps	Misc.	yearly	15	$5,000	$75,000	$75,000
	Geo-technical Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Reclamation Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Biological Monitoring - Closure implementation	Misc.	l.s.	1	$9,000	$9,000	
	Years 1-5 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 6-10 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 11-15 (Every two years)	Misc.	bi-annual	3	$2,500	$7,500	$46,500
	Subtotal:					**$434,000**	**$434,000**
12.5	**Post Closure Maintenance - Main Dam**						
	Monitoring of piezometers, thermistors						
	Years 1-5 (quarterly)	Misc.	quarterly	20	$3,000	$60,000	
	Years 6-10 (bi-annually)	Misc.	bi-annually	8	$3,000	$24,000	
	Years 11-15 (annually)	Misc.	annual	5	$2,500	$12,500	
	Annual Inspection + report	Misc.	annual	15	$3,000	$45,000	
	Carry out inspection recommendations/maintenance	Misc.	annual	15	$10,000	$150,000	$291,500
	Misc. maintenance work related to the site after closure (Yr1-5)	Misc.	yearly	5	$10,000	$50,000	$50,000
	Misc. maintenance work related to the site after closure (Yr6-15)	Misc.	per year	10	$5,000	$50,000	$50,000
	Subtotal:					**$391,500**	**$391,500**
12.6	**Ulitmate Removal of wells and instrumentation**	Misc.	unit basis		$15,000	**$15,000**	**$15,000**
Total Estimated Cost for Post Closure Site Management						**$3,558,300**	**$3,558,300**

Note:
Camp Costs calculation based on "Table 7-1 Site Decommissioning and Reclamation Seasonal Personnel Requirements" using a 90 day work year
Inflation rates vary per subtask depending upon the year expenses are incurred or the average year over which expenses are incurred

Table 8-13b
Supporting Studies, Estimated Closure Costs - 2013 (Year 2)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost
13.1	**Permafrost Foundation Monitoring**					
13.1.1	Enhanced subsurface monitoring program in and below waste rock dumps (WRD)					
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000
	undertake additional monitoring as per program(covered in T. 12)	Misc.	yearly		$3,500	$3,500
	Enhanced Adaptive Management Plan for WRD	Misc.	l.s.	1	$4,000	$4,000
13.1.2	(TF)					
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000
	undertake additional monitoring as per program (covered in T. 12)	Misc.	yearly	1	$3,500	$3,500
	Enhanced Adaptive Management Plan for TF	Misc.	l.s.	1	$4,000	$4,000
	Subtotal:					**$23,000**
13.2	**Kinetic Tailings Testing**					
13.2.1	Monitoring program and field test to enhance long term water quality prediction related to drystack tailings facility					
	preparing composite sample over several months of production	Misc.	l.s.		$2,500	$2,500
	undertaking field test	Misc.	l.s.		$6,000	$6,000
	initiate parallel laboratory analysis	Misc.	l.s.		$5,000	$5,000
	monitoring field apparatus (columns	Misc.	l.s.		$2,000	$2,000
	reporting				$2,500	$2,500
	Subtotal:					**$18,000**
13.3	**Other Adaptive Management Plans scheduled for Operating Life or Required Only in Early Shutdown**					
	Changes in WTP input water quality or quantity	Misc.	l.s.		$15,000	$15,000
	Site Testing ML ARD	Misc.	l.s.		$30,000	$30,000
	Long Term Reclamation of Contaminated Soils	Misc.	l.s.		$15,000	$15,000
	Physical Monitoring program prior to closure	Misc.	l.s.		$40,000	$40,000
	Modeling of Pit Lake water quality prior to flooding	Misc.	l.s.		$15,000	$15,000
	Subtotal:					**$115,000**
13.4	**Closure Specific Studies and Field Trials**					
	Main Site Discharge Channel Geotechnical Design and Stability Evaluation	Engineering/Design	l.s.	1	$30,000	$30,000
	Passive Treatment Evaluations	Engineering/Design	l.s.	1	$60,000	$60,000
	Engineered Cover Evaluations (construction/monitoring)	Engineering/Design	l.s.	1	$50,000	$50,000
	Subtotal:					**$140,000**
Total Estimated Cost for Supporting Studies						**$296,000**

Note:

Table 8-2c
Summary Table of Estimated Closure Costs - End of Mine Life

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$6,177,528
4	**Open Pit, Underground and Haul Roads**	$773,452
5	**Tailings Area and Diversion Structures**	$1,285,627
6	**Main Water Dam**	$523,493
7	**Mill and Ancillary Facilities**	$601,184
8	**Mill Pond**	$184,510
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$125,012
	Scenario 3 - Deactivate Entire Access Road	$229,059
10	**Miscellaneous Sites and Facilities**	$168,620
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$1,400,895
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$1,405,695
	Scenario 3 - Deactivate Entire Access Road	$1,415,295
12	**Post Closure Site Management**	$3,558,300
13	**Supporting Studies**	$296,000
Total Closure Costs		
	Scenario 1 - No Access Road Deactivation	**$14,971,749**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$15,099,421**
	Scenario 3 - Deactivate Entire Access Road	**$15,213,068**
Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$16,768,359**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$16,911,352**
	Scenario 3 - Deactivate Entire Access Road	**$17,038,636**

Table 8-3c
Waste Rock and Overburden Dumps, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Inflated Unit Rates	Cost	Total Adjusted
	WASTE ROCK AND OVERBURDEN DUMPS							
3.1	**Main Waste Dump**							
	Roll crest and recontour	D9H Dozer	hrs	300	$268	$268	$80,358	$80,358
	Additional surface grading/material placement as required		cu.m.	2000	$5.08	$5.08	$10,160	$10,160
	Additional compaction as required	Vibratory Roller	hrs	60	$120	$120.00	$7,200	$7,200
	Haul and place overburden for revegetation	Load, Haul and place soil cover MWD	cu.m.	178275	$5.08	$5.08	$905,637	$905,637
	Project Management & Engineering	7% of Total Cost	%	5065	7.00%		$70,235	$70,235
	Sub-Total						**$1,073,589**	**$1,073,589**
3.2	**Southwest Dump**							
	Roll crest and recontour	D9H Dozer	hrs	240	$268	$268	$64,286	$64,286
	Additional surface grading/material placement as required		cu.m.	10000	$2.85	$2.85	$28,500	$28,500
	Additional compaction as required	Vibratory Roller	hrs	160	$120	$120.00	$19,200	$19,200
	Haul and place overburden for revegetation	Load, Haul and place soil cover SWD	cu.m.	348250	$5.70	$5.70	$1,985,025	$1,985,025
	Project Management & Engineering	7% of Total Cost	%		7.00%		$146,791	$146,791
	Sub-Total						**$2,243,802**	**$2,243,802**
3.3	**Ice-Rich Overburden Dump**							
	Roll crest of berm and recontour	D9H Dozer	hrs	16	$268	$268	$4,286	$4,286
	Excavate material for placement on berm	Cat 235 Excavator	hrs	40	$247	$247	$9,890	$9,890
	Project Management & Engineering	7% of Total Cost	%		7.00%		$992	$992
	Sub-Total						**$15,168**	**$15,168**
3.4	**Reclamation Overburden Dump**							
	Final Dump Surface Recontouring	Dozer D6LGP	hrs	60	$169	$169	**$10,164**	**$10,164**
3.5	**Grade Bin Disposal Area**							
	Move material to Area 1 Pit	988B Loader	hrs	3500	$258	$258	$901,447	$901,447
		D9H Dozer	hrs	360	$268	$268	$96,429	$96,429
		Haul Truck D250E	hrs	5500	$227	$227	$1,246,572	$1,246,572
	Project Management & Engineering	7% of Total Cost	%		7.00%		$63,101	$63,101
	Sub-Total						**$2,307,549**	**$2,307,549**
3.7	**Contractor's Shop and Work Area**							
	Remove salvageable equipment	General Labourer	hrs	60	$48	$48	$2,893	
		Haul Truck D250E	hrs	20	$227	$227	$4,533	
		Trades Labourer	hrs	48	$86	$86	$4,114	$11,540
	Dismantle buildings	General Labourer	hrs	60	$48	$48	$2,893	
		30 ton Crane	hrs	10	$165	$165	$1,648	
		Cat 235 Excavator	hrs	30	$247	$247	$7,418	$11,959
	Haul building pieces off site - equipment	Tractor Trailer (lowbed)	hrs	20	$134	$134	$2,679	$2,679
	Scrap haul to site landfill	Haul Truck D250E	hrs	20	$227	$227	$4,533	$4,533
	Bury footings - haul and place fill, locally sourced	Unit basis (footing burial)	each	2500	$5.08	$5.08	$12,688	$12,688
	Recontour	D9H Dozer	hrs	15	$268	$268	$4,018	$4,018
	Haul and place overburden for revegetation	Custom Rate C (Load, haul and place IROD - CSA)	cu.m.	5000	$5.13	$5.13	$25,629	$25,629
	Project Management & Engineering	7% of Total Cost	%		7.00%		$5,113	$5,113
	Sub-Total						**$78,158**	**$78,158**
3.8	**Contaminated Soils - Transport to LTF**							
		Unit basis	l.s.	1	$5,000	$5,000	**$5,000**	**$5,000**
3.9	**Mill Valley Fill**							
	Roll crest and recontour	D9H Dozer	hrs	30	$268	$268	$8,036	$8,036
	Haul and place overburden for revegetation	Load, Haul and place soil cover MWD	cu.m.	25500	$10.63	$10.63	$271,065	$271,065
	Excavation of spillway channel	Cat 235 Excavator	hrs	120	$240	$240	$28,800	$28,800
		D9H Dozer	hrs	120	$268	$268	$32,143	$32,143
	Provision for placement of rip rap	Rip rap from local area to MVF	cu.m.	5000	$15	$15.00	$75,000	$75,000
	Project Management & Engineering	7% of Total Cost	%		7%		$29,053	$29,053
	Sub-Total						**$444,097**	**$444,097**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$6,177,528**	**$6,177,528**

Note:
The Dozer D6LGP (item 3.4) unit rate was obtained from the Canadian Blue Book value and then inflated by 10% for the Yukon, prior to 8 yrs inflation of 1.5% compounded annually.
Item 3.5 quantities were estimated to move 930,000 t using two haul trucks and 1 loader. The material bordering the pit can be moved solely using the loader.

Table 8-4c
Open Pit, Underground and Haul Roads, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	OPEN PIT, UNDERGROUND AND HAUL ROADS						
4.1	**Area 1 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	80	$48	$3,857	
		Trades Labourer	hrs	20	$86	$1,714	
		Support equipment	l.s.		$1,000	$1,000	$6,571
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	$9,478
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	20	$247	$4,945	
	Riprap shoulder exiting pit	Place Riprap	cu.m	50	$15	$750	
	Exit Spillway construction	General Labourer	hrs	10	$48	$482	
		Load and Haul Rip Rap	cu.m	50	$13	$634	$6,812
	Construct Passive Treatment System						
	Organic carbon source (to site or chipped at site)	Haulage and handling	l.s.		$75,000	$75,000	
	Clean (< 0.1% Cu) Waste Rock for Construction	Haulage and handling	l.s.		$25,000	$25,000	
	Construction of treatment area	Cat 235 Excavator	hrs	160	$247	$39,561	
		Haul Truck D250E	hrs	160	$227	$36,264	
		General Labourer	hrs	200	$48	$9,600	$185,425
	Project Management & Engineering	7% of Total Cost	%		7.00%	$14,580	$14,580
	Sub-Total					**$222,866**	**$222,866**
4.2	**Area 2 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	80	$48	$3,857	
		Trades Labourer	hrs	20	$86	$1,714	
		Support equipment	l.s.		$1,000	$1,000	$6,571
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	$9,478
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	20	$247	$4,945	
	Riprap shoulder exiting pit	Place Riprap	cu.m	50	$15	$750	
	Exit Spillway construction	General Labourer	hrs	40	$48	$1,929	
		Load and Haul Rip Rap	cu.m	250	$13	$3,172	$10,796
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,879	$1,879
	Sub-Total					**$28,724**	**$28,724**
4.3	**Area 118 Pit**						
	Remove pit pumps and pipe column/general cleanup	General Labourer	hrs	60	$48	$2,893	
		Trades Labourer	hrs	15	$86	$1,286	
		Support equipment	l.s.		$750	$750	$4,929
	Secure pit access - boulder placement	Cat 235 Excavator	hrs	15	$247	$3,709	
		Haul Truck D250E	hrs	15	$227	$3,400	$7,109
	Construct exit channel into Mill Pond system	Cat 235 Excavator	hrs	15	$247	$3,709	
	Riprap shoulder exiting pit	Place Riprap	cu.m	37.5	$15	$563	
	Exit Spillway construction	General Labourer	hrs	30	$48	$1,446	
		Load and Haul Rip Rap	cu.m	187.5	$13	$2,379	$8,097
	Haul and place overburden for revegetation	Load, Haul and place soil c	cu.m.	7500	$4.30	$32,250	$32,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,409	$1,409
	Sub-Total					**$53,793**	**$53,793**
4.4	**Haul Roads (15 ha)**						
	Remove culverts and haul away	General Labourer	hrs	55	$48	$2,670	
		Cat 235 Excavator	hrs	28	$247	$6,847	
		Haul Truck D250E	hrs	28	$227	$6,276	$15,794
	Recontour slopes	D9H Dozer	hrs	208	$268	$55,632	$55,632
	Scarify surfaces	Cat 16H grader	hrs	208	$227	$47,073	
		General Labourer	hrs	28	$48	$1,335	$48,409
	Stabilize slopes - erosion barriers - material	Unit Cost Basis	sq.m	2,769	$3	$8,308	$8,308
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,970	$8,970
	Sub-Total					**$137,112**	**$137,112**
4.5	**Underground**						
	Backfill underground waste	Load and haul material	cu.m	70,000	$4.16	**$291,200**	**$291,200**
	Recontour slopes	D9H Dozer	hrs	12	$268	**$3,214**	**$3,214**
	Seal off underground portal		l.s.	1	$10,000	**$10,000**	**$10,000**
	Seal off ventilation raise	Cat 235 Excavator	hrs	12	$247	**$2,967**	**$2,967**
		Haul Truck D250E	hrs	2	$227	**$453**	**$453**
	Rip and scarify road	Cat 16H grader	hrs	8	$227	**$1,813**	**$1,813**
	Project Management & Engineering	7% of Total Cost	%		7.00%	**$21,309**	**$21,309**
	Sub-Total					**$330,957**	**$330,957**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads						**$773,452**	**$773,452**

Note:
Linear disturbances to be scarified / decompacted and allowed to naturally revegetate
Ventilation raise to be sealed by dumping rocks down raise until a bridge is formed and it fills to surface. Portal allowance assumes installation of bulkhead with locked door should access be

Table 8-5c
Tailings Area & Diversion Structures, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	TAILINGS AREA						
5.1	**Tailings Deposit - Final Lift**						
	Roll crest of starter bench and recontour	D9H Dozer	hrs	50	$268	$13,393	$13,393
	Haul overburden ROD - DSTF	Custom Haul Rate	cu.m	191200	$5.80	$1,108,960	$1,108,960
	Project Management & Engineering	7% of Total Cost	%		7.00%	$78,565	$78,565
	Sub-Total					**$1,200,918**	**$1,200,918**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$268	$13,393	$13,393
		Cat 235 Excavator	hrs	20	$247	$4,945	$4,945
	Haul and place riprap	Load and Haul Rip Rap	cu.m	1200	$13	$15,225	
		Place Riprap	cu.m	1200	$15	$18,000	$33,225
	HDPE liner	Unit rate	sq.m	2400	$10	$24,000	$24,000
		General Labourer	hrs	80	$48	$3,857	$3,857
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,289	$5,289
	Sub-Total					**$84,710**	**$84,710**
Total Estimated Cost in Reclaiming Tailings Area						**$1,285,627**	**$1,285,627**

Note:
Material to provide soil cover for the dry stack tailings will be sourced from the Area 2 Pit.

Table 8-6c
Main Water Dam, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	WATER DAM						
6.1	**Reclaim System**						
	Remove salvageable equipment - pipeline/pumps	General Labourer	hrs	48	$48	$2,314	
		Trades Labourer	hrs	98	$86	$8,400	$10,714
	Remove pipeline	Haul Truck D250E	hrs	100	$227	$22,665	
		Cat 235 Excavator	hrs	100	$247	$24,725	
		General Labourer	hrs	200	$48	$9,643	$57,033
	Dismantle Building	Cat 235 Excavator	hrs	16	$247	$3,956	
		General Labourer	hrs	20	$48	$964	$4,920
	Misc. Supplies & Tools	Misc.	l.s.		$1,000	$1,000	$1,000
	Recontour alignment	D9H Dozer	hrs	16	$268	$4,286	$4,286
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,457	$5,457
	Sub-Total					**$83,410**	**$83,410**
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	96	$48	$4,629	$4,629
	Misc. Supplies & Tools	Misc.	l.s.		$5,000	$5,000	$5,000
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$10,000	$10,000	$10,000
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	10,000	$10	$100,000	$100,000
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from MWD - U/S MWD)	cu.m	25,000	$2	$54,556	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	31,000	$4.50	$139,500	
		Environmental Scientist	hrs	60	$101.79	$6,107	$200,163
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	1,125	$3	$3,375	
		Unit Cost Basis	cu.m	1,125	$9	$10,125	$13,500
	Haul and place overburden on slopes of new area u/s of MWD	Unit Cost Basis	cu.m	15,000	$2	$30,000	$30,000
	Stabilize slopes with erosion barriers	Unit Rates	per sq. m	15,000	$3	$45,000	$45,000
	Misc. Supplies & Tools	Misc.	l.s.		$3,000	$3,000	$3,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$28,790	$28,790
	Sub-Total					**$440,082**	**$440,082**
Total Estimated Cost in Reclaiming Water Dam						**$523,493**	**$523,493**

Table 8-7c
Mill &Ancillary Facilities, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL AND ANCILLARY FACILITIES						
7.1	**Mill Building**						
	Remove salvageable equipment	General Labourer	hrs	550	$48	$26,518	
		Trades Labourer	hrs	600	$86	$51,429	
		Crane Support	hrs	40	$145	$5,800	$83,747
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$86	$13,714	$13,714
	Dismantle Building	General Labourer	hrs	1000	$48	$48,215	
		Trades Labourer	hrs	600	$86	$51,429	
		Cat 235 Excavator w hammer	hrs	120	$283	$33,997	
		Crane Support	hrs	60	$145	$8,700	$142,341
	Concrete Demolition	Blaster	hrs	30	$64	$1,929	
		Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	20	$268	$5,357	$12,231
	Misc. Supplies & Tools	Misc.	l.s.		$11,000	$11,000	$11,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	50	$247	$12,363	
		Haul Truck D250E	hrs	100	$227	$22,665	$35,028
	Project Management & Engineering	7% of Total Cost	%		7.00%	$20,864	$20,864
	Subtotal:					**$318,925**	**$318,925**
					Subtract 50% for Salvage Value	**$159,462**	**$159,462**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$48	$11,571	
		Trades Labourer	hrs	240	$86	$20,572	$32,143
		Crane Support	hrs	24	$145	$3,480	
	Salvage and remove powerline and poles		l.s.		$27,500	$27,500	$30,980
	Dismantle Buildings	General Labourer	hrs	160	$48	$7,714	
		Trades Labourer	hrs	80	$86	$6,857	
		Cat 235 Excavator w hammer	hrs	40	$283	$11,332	
		Crane Support	hrs	30	$145	$4,350	$30,254
	Concrete Demolition	Blaster	hrs	40	$64	$2,571	
		Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	20	$268	$5,357	$12,874
	Misc. Supplies & Tools	Misc.	l.s.		$10,000	$10,000	$10,000
	Scrap haul to solid waste facility	Cat 235 Excavator	hrs	10	$247	$2,473	
		Haul Truck D250E	hrs	20	$227	$4,533	$7,006
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,628	$8,628
	Subtotal:					**$131,884**	**$131,884**
					Subtract 50% for Salvage Value	**$65,942**	**$65,942**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$48	$2,893	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,893
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$48	$4,821	
		Trades Labourer	hrs	120	$86	$10,286	
		Crane Support	hrs	30	$145	$4,350	
		Support Equipment	l.s.		$2,500	$2,500	
		Cat 235 Excavator	hrs	40	$247	$9,890	
		General Labourer	hrs	40	$48	$1,929	
		Tractor Trailer (lowbed)	hrs	30	$134	$4,018	$37,794
	Fold and Bury Liner	Cat 235 Excavator	hrs	20	$247	$4,945	
		D9H Dozer	hrs	100	$268	$26,786	$31,731
	Project Management & Engineering	7% of Total Cost	%		7.00%	$5,769	$5,769
	Subtotal:					**$88,187**	**$88,187**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$48	$4,821	
		Support Equipment	l.s.		$2,500	$2,500	
		Disposal Cost-bulk materials	l.s.		$5,000	$5,000	
		Disposal Cost-lab-pacs	pallets	2	$2,000	$4,000	$16,321
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,143	$1,143
	Subtotal:					**$17,464**	**$17,464**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	35	$102	$3,563	
		Analytical Costs	l.s.		$6,000	$6,000	$9,563
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	15	$247	$3,709	
		Haul Truck D250E	hrs	15	$227	$3,400	$7,109
	Re-contour area and slopes to bury footings and establish drainage	D9H Dozer	hrs	100	$268	$26,786	$26,786
	Haul and place overburden cap	Unit Rate	cu.m	38000	$5.50	$209,000	$209,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$17,672	$17,672
	Subtotal:					**$270,129**	**$270,129**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities						**$601,184**	**$601,184**

Table 8-8c
Mill Water Pond, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MILL POND						
8.1	**Reclaim Mill Pond**						
	Remove upstream culvert	General Labourer	hrs	10	$48	$482	
		Cat 235 Excavator	hrs	10	$247	$2,473	$2,955
	Construct channel	Cat 235 Excavator	hrs	100	$247	$24,725	
		D9H Dozer	hrs	20	$268	$5,357	$30,083
		Load and Haul Rip Rap	cu.m	5,000	$13	$63,438	$63,438
		General Labourer	hrs	20	$48	$964	$964
		Place Riprap	cu.m	5,000	$15	$75,000	$75,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$12,071	$12,071
	Subtotal:					**$184,510**	**$184,510**
Total Estimated Cost in Reclaiming Mill Pond						**$184,510**	**$184,510**

Note:

Table 8-9c
Main Access Road, Estimated Closure Costs - End of Mine Life

Scenario 1 - No Road Deactivation

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.1	**NO ROAD DECOMMISSIONING REQUIRED**						
9.1.1	**Road Surface**						
	Install road barrier at west side of Minto Creek	Misc	l.s.		$2,000	$2,000	$2,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$140	$140
	Subtotal:					**$2,140**	**$2,140**
Total Estimated Cost for Access Road Closure (Scenario 1)						**$2,140**	**$2,140**

Scenario 2 - Decommission Access Road From Minto Creek to Mine Site (11 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.2	**ACCESS ROAD - 11 KM SECTION**						
9.2.1	**Road Surface**						
	Scarify - 11 km	Cat 16H grader	hrs	70	$227	$15,865	$15,865
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,111	$1,111
	Subtotal:					**$16,976**	**$16,976**
9.2.2	**Culverts**						
	Culvert excavation (40 small culverts)	Cat 235 Excavator	hrs	100	$247	$24,725	$24,725
	Culvert removal	General Labourer	hrs	140	$48	$6,750	
		Haul Truck D250E	hrs	100	$227	$22,665	$29,415
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$86	$3,429	
		General Labourer	hrs	75	$48	$3,616	
		Cat 235 Excavator	hrs	40	$247	$9,890	$16,935
	Recontour slopes and drainage	D9H Dozer	hrs	70	$268	$18,750	$18,750
	Stabilize slopes	General Labourer	hrs	200	$48	$9,643	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3.00	$1,500	$11,143
	Project Management & Engineering	7% of Total Cost	%		7.00%	$7,068	$7,068
	Subtotal:					**$108,036**	**$108,036**
Total Estimated Cost for Access Road Closure (Scenario 2)						**$125,012**	**$125,012**

Scenario 3 - Decommission Entire Access Road (27 KM)

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
9.3	**ACCESS ROAD - 27 KM SECTION**						
9.3.1	**Road Surface**						
	Scarify - 27 km	Cat 16H grader	hrs	150	$227	$33,997	$33,997
	Recontour slopes and drainage	D9H Dozer	hrs	50	$268	$13,393	$13,393
	Project Management & Engineering	7% of Total Cost	%		7.00%	$3,317	$3,317
	Subtotal:					**$50,708**	**$50,708**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$48	$2,411	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$247	$9,890	
		Tractor Trailer (lowbed)	hrs	20	$134	$2,679	$20,779
	Cut off piles	General Labourer	hrs	50	$48	$2,411	$2,411
	Re-contour	Cat 235 Excavator	hrs	30	$247	$7,418	
		D9H Dozer	hrs	30	$268	$8,036	$15,453
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,705	$2,705
	Subtotal:					**$41,349**	**$41,349**
9.3.3	**Barge Ramps**						
	Remove all gravel	Cat 235 Excavator	hrs	20	$247	$4,945	$4,945
	Re-countour areas and scarify	D9H Dozer	hrs	30	$268	$8,036	$8,036
	Shoreline restoration	Misc.	l.s.		$5,000	$5,000	$5,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,259	$1,259
	Subtotal:					**$19,239**	**$19,239**
9.3.4	**Culverts**						
	Culvert excavation (45 small culverts)	Cat 235 Excavator	hrs	115	$247	$28,434	$28,434
	Culvert removal	General Labourer	hrs	150	$48	$7,232	
		Haul Truck D250E	hrs	115	$227	$26,065	$33,297
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$86	$3,429	
		General Labourer	hrs	75	$48	$3,616	
		Cat 235 Excavator	hrs	40	$247	$9,890	$16,935
	Recontour slopes and drainage	D9H Dozer	hrs	70	$268	$18,750	$18,750
	Stabilize slopes	General Labourer	hrs	200	$48	$9,643	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,643
	Project Management & Engineering	7% of Total Cost	%		7.00%	$7,704	$7,704
	Subtotal:					**$117,763**	**$117,763**
Total Estimated Cost for Access Road Closure (Scenario 3)						**$229,059**	**$229,059**

Note:

Table 8-10c
Miscellaneous Sites and Facilities, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	MISCELLANEOUS SITES AND FACILITIES						
10.1	**Airstrip**						
	Scarify airstrip	Cat 16H Grader	hrs	20	$227	$4,533	$4,533
	Project Management & Engineering	7% of Total Cost	%		7.00%	$317	$317
	Natural revegetation	n/a	n/a				
	Subtotal:					**$4,850**	**$4,850**
10.2	**Mine Camp and Related Infrastructure**						
	Disconnect Services	Trades Labourer	hrs	80	$86	$6,857	$6,857
	Remove salvageable equipment	General Labourer	hrs	704	$48	$33,943	$33,943
	Dismantle buildings	General Labourer	hrs	1200	$48	$57,857	
		Cat 235 Excavator	hrs	120	$247	$29,670	$87,528
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	20	$227	$4,533	
		Cat 235 Excavator	hrs	10	$247	$2,473	$7,006
	Reclaim Septic System	General Labourer	hrs	10	$48	$482	
		Cat 235 Excavator	hrs	2	$247	$495	$977
	Site Clean-Up	General Labourer	hrs	500	$48	$24,107	$24,107
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,749	$10,749
	Subtotal:					**$171,167**	**$171,167**
						$85,583	**$85,583**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$48	$4,821	
		Trades Labourer	hrs	50	$86	$4,286	$9,107
	Dismantle buildings	General Labourer	hrs	200	$48	$9,643	
		Cat 235 Excavator	hrs	30	$247	$7,418	$17,061
	Disconnect Services	Trades Labourer	hrs	20	$86	$1,714	$1,714
	Crane services	30 ton Crane	hrs	5	$165	$824	$824
	Haul scrap to Solid Waste Facility	Haul Truck D250E	hrs	30	$227	$6,799	
		Cat 235 Excavator	hrs	10	$247	$2,473	$9,272
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,658	$2,658
	Subtotal:					**$40,637**	**$40,637**
						$20,318	**$20,318**
10.4	**Exploration Sites and Trails**						
	Natural revegetation	n/a	n/a				
	Subtotal:					**$0**	**$0**
10.5	**Land Treatment Facility**						
	Prepare and submit closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final soil hydrocarbon concentrations	Misc	l.s.		$3,000	$3,000	$3,000
	Recontour	D9H Dozer	hrs	2	$268	$536	$536
	Haul and place overburden cap from nearby	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	
		D9H Dozer	hrs	6	$268	$1,607	$11,085
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,163	$1,163
	Subtotal:					**$17,784**	**$17,784**
10.6	**Solid Waste Facility**						
	Prepare detailed closure plan	Misc	l.s.		$2,000	$2,000	$2,000
	Characterize final waste area	Misc	l.s.		$2,000	$2,000	$2,000
	Remove recyclables and special waste materials	Tractor Trailer (lowbed)	hrs	40	$134	$5,357	$5,357
	Recontour	D9H Dozer	hrs	2	$268	$536	$536
	Haul and cover with adjacent fill and place overburden cap	Cat 235 Excavator	hrs	20	$247	$4,945	
		Haul Truck D250E	hrs	20	$227	$4,533	
	Compaction of cover	D9H Dozer	hrs	6	$268	$1,607	$11,085
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,468	$1,468
	Subtotal:					**$22,447**	**$22,447**
10.7	**Site Roads**						
	Recontour	Cat 235 Excavator	hrs	30	$247	$7,418	$7,418
	Scarify	Cat 16H Grader	hrs	40	$227	$9,066	$9,066
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,154	$1,154
	Subtotal:					**$17,637**	**$17,637**
Total Estimated Cost in Reclaiming Miscellaneous Sites and Facilities						**$168,620**	**$168,620**

Note:
Land treatment facility is a licensed facility and will be reclaimed as per license terms and conditions

Table 8-11c
Reclamation Research and Revegetation, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Units	Quantity	Unit Rates	Cost	Total Adjusted
11.1	**REVEGETATION ACTIVITIES**					
11.1.0	**Determination of Revegetation Plan for Current Site**					
	Issuance of a plan for all site areas for regulatory review and approval	Misc	1	$20,000	$20,000	$20,000
	Sub-Total				**$20,000**	**$20,000**
11.1.1	**Main and Southwest Dumps (total surface area of 117.5 ha)**					
	Seed and fertilize w/ labour	ha	117.5	$2,400	$282,000	
	Re-seed and fertilize (1/2 of total area)	ha	58.8	$2,400	$141,000	
	Re-forest	ha	117.5	$1,750	$205,625	$628,625
	Sub-Total				**$628,625**	**$628,625**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,400	$16,560	
	Re-seed and fertilize (1/2 of total area)	ha	3.5	$2,400	$8,280	
	Re-forest	ha	6.9	$1,750	$12,075	$36,915
	Sub-Total				**$36,915**	**$36,915**
11.1.3	**Reclamation Overburden Dump (total surface area of 30 ha)**					
	Seed and fertilize w/ labour	ha	30.0	$2,400	$72,000	
	Re-seed and fertilize (1/2 of total area)	ha	15.0	$2,400	$36,000	
	Re-forest	ha	30.0	$1,750	$52,500	$160,500
	Sub-Total				**$160,500**	**$160,500**
11.1.4	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,400	$37,680	
	Re-seed and fertilize (1/2 of total area)	ha	7.9	$2,400	$18,840	
	Re-forest	ha	15.7	$1,750	$27,475	$83,995
	Sub-Total				**$83,995**	**$83,995**
11.1.5	**Mill Valley Fill (8 ha)**					
	Seed and fertilize w/ labour	ha	8.0	$2,400	$19,200	
	Re-seed and fertilize (1/2 of total area)	ha	4.0	$2,400	$9,600	
	Re-forest	ha	8.0	$1,750	$14,000	$42,800
	Sub-Total				**$42,800**	**$42,800**
11.1.6	**Contractor's Shop and Office Area (disturbed area of 2.5 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,400	$6,000	
	Re-seed and fertilize (1/2 of total area)	ha	1.3	$2,400	$3,000	
	Re-fertilize only (1/2 total area - re-seed area)	ha	0.0	$1,900	$0	
	Re-forest	ha	2.5	$1,750	$0	$9,000
	Sub-Total				**$9,000**	**$9,000**
11.1.7	**Tailings Area current disturbed area of 30.2 ha)**					
	Seed and fertilize w/ labour	ha	30.2	$2,400	$72,480	
	Re-seed and fertilize (1/2 of total area)	ha	15.1	$2,400	$36,240	
	Re-forest	ha	30.2	$1,750	$52,850	$161,570
	Sub-Total				**$161,570**	**$161,570**
11.1.8	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,400	$7,920	
	Re-seed and fertilize (1/2 of total area)	ha	1.7	$2,400	$3,960	
	Re-forest	ha	3.3	$1,750	$5,775	$17,655
	Sub-Total				**$17,655**	**$17,655**
11.1.9	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,400	$18,240	
	Re-seed and fertilize (1/2 of total area)	ha	3.8	$2,400	$9,120	
	Re-forest	ha	7.6	$1,750	$13,300	$40,660
	Subtotal:				**$40,660**	**$40,660**
11.1.10	**Haul Road (total surface area of 15 ha)**					
		ha	15.0	$2,400	**$36,000**	**$36,000**
11.1.11	**Underground (total surface area of 20.2 ha)**					
	Seed and fertilize w/ labour	ha	20.2	$2,400	$48,480	
	Re-seed and fertilize (1/2 of total area)	ha	10.1	$2,400	$24,240	
	Re-forest	ha	20.2	$1,750	$35,350	$108,070
	Subtotal:				**$108,070**	**$108,070**
11.1.12	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,400	$24,720	
	Re-seed and fertilize (1/2 of total area)	ha	5.2	$2,400	$12,360	
	Re-forest	ha	10.3	$1,750	$18,025	$55,105
	Subtotal:				**$55,105**	**$55,105**
11.1.13	**Access Road**					
	Scenario 1 - No Deactivation					
	No revegetation					
	Subtotal:					**$0**
	Scenario 2 - Deactivate from Minto Creek to Mine Site					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	2.0	$2,400	$4,800	$4,800
	Subtotal:				**$4,800**	**$4,800**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,400	$14,400	$14,400
	Subtotal:				**$14,400**	**$14,400**
Total Estimated Cost for Reclamation Research and Revegetation						
	Scenario 1 - No Access Road Deactivation				**$1,400,895**	**$1,400,895**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site				**$1,405,695**	**$1,405,695**
	Scenario 3 - Deactivate Entire Access Road				**$1,415,295**	**$1,415,295**

Table 8-12c
Site Management and Monitoring, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Cost	Total Adjusted
	SITE MANAGEMENT						
12.1	**Onsite Management**						
	Project Management and Engineering - Included in PME Costs in each Closure Component						
	Pickup truck	Light truck	monthly	50	$2,500	$125,000	$125,000
	Sundry equipment maintenance	Unit Cost Basis	yearly	10	$5,000	$50,000	$50,000
	Power and heat	Unit Cost Basis	monthly	30	$5,500	$165,000	$165,000
	General Administrative expenses	Unit Cost Basis	monthly	50	$2,000	$100,000	$100,000
	Camp Costs (5 year period)	Unit Cost Basis	man-day	5130	$60	$307,800	$307,800
	Subtotal:					**$747,800**	**$747,800**
12.2	**Transport Costs**						
	Employee transport costs	Unit Cost Basis	monthly	50	$3,000	$150,000	$150,000
	Barge operating costs	Unit Cost Basis	monthly	20	$10,000	$200,000	$200,000
	Subtotal:					**$350,000**	**$350,000**
12.3	**Water Treatment and Compliance Monitoring incl. Reporting**						
	Active - Treatment, operating costs (4 years) incl. staff, reagents		monthly	12	$87,000	$1,044,000	$1,044,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (4 years)		cu.m	1440000	$0.40	$576,000	$576,000
	Subtotal:					**$1,620,000**	**$1,620,000**
12. 4	**Water Quality Monitoring (Post Mine Closure) (50:50 sampling labour/analyses costs split)**						
	Years 1-5 (monthly during open season)	Misc.	monthly	30	$3,000	$90,000	
	Years 6-10 (quarterly - spring/summer/fall)	Misc.	quarterly	15	$3,000	$45,000	
	Years 11-15 (once annually - post spring freshet)	Misc.	yearly	5	$3,000	$15,000	$150,000
	Disbursements (non-labour/non-analytical)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	LTF Monitoring and Maintenance (years 1-5)	Misc.	yearly	5	$3,500	$17,500	$17,500
	Enhanced Groundwater/Foundation monitoring below TF and Waste Rock Dumps	Misc.	yearly	15	$5,000	$75,000	$75,000
	Geo-technical Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Reclamation Inspections (annually yrs 1-5, bi-annual yrs 6-15)	Misc.	l.s.	10	$5,000	$50,000	$50,000
	Biological Monitoring - Closure implementation	Misc.	l.s.	1	$9,000	$9,000	
	Years 1-5 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 6-10 (Annually)	Misc.	yearly	5	$3,000	$15,000	
	Years 11-15 (Every two years)	Misc.	bi-annual	3	$2,500	$7,500	$46,500
	Subtotal:					**$434,000**	**$434,000**
12.5	**Post Closure Maintenance - Main Dam**						
	Monitoring of piezometers, thermistors						
	Years 1-5 (quarterly)	Misc.	quarterly	20	$3,000	$60,000	
	Years 6-10 (bi-annually)	Misc.	bi-annually	8	$3,000	$24,000	
	Years 11-15 (annually)	Misc.	annual	5	$2,500	$12,500	
	Annual Inspection + report	Misc.	annual	15	$3,000	$45,000	
	Carry out inspection recommendations/maintenance	Misc.	annual	15	$10,000	$150,000	$291,500
	Misc. maintenance work related to the site after closure (Yr1-5)	Misc.	yearly	5	$10,000	$50,000	$50,000
	Misc. maintenance work related to the site after closure (Yr6-15)	Misc.	per year	10	$5,000	$50,000	$50,000
	Subtotal:					**$391,500**	**$391,500**
12.6	**Ulitmate Removal of wells and instrumentation**	Misc.	unit basis		$15,000	**$15,000**	**$15,000**
Total Estimated Cost for Post Closure Site Management						**$3,558,300**	**$3,558,300**

Note:
Camp Costs calculation based on "Table 7-1 Site Decommissioning and Reclamation Seasonal Personnel Requirements" using a 90 day work year
Inflation rates vary per subtask depending upon the year expenses are incurred or the average year over which expenses are incurred

Table 8-13c
Supporting Studies, Estimated Closure Costs - End of Mine Life

Item No.	Work Item Description	Equipment / Labour	Units	Quantity	Unit Rates	Inflated Unit Rates	Cost	Total Adjusted
13.1	**Permafrost Foundation Monitoring**							
13.1.1	Enhanced subsurface monitoring program in and below waste rock dumps (WRD)							
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000	$4,000	
	undertake additional monitoring as per program(covered in T. 12)	Misc.	yearly		$3,500	$3,500	$3,500	$7,500
	Enhanced Adaptive Management Plan for WRD	Misc.	l.s.	1	$4,000	$4,000	$4,000	$4,000
13.1.2	(TF)							
	preparing detailed monitoring program	Misc.	l.s.		$4,000	$4,000	$4,000	
	undertake additional monitoring as per program (covered in T. 12)	Misc.	yearly	1	$3,500	$3,500	$3,500	$7,500
	Enhanced Adaptive Management Plan for TF	Misc.	l.s.	1	$4,000	$4,000	$4,000	$4,000
	Subtotal:						**$23,000**	**$23,000**
13.2	**Kinetic Tailings Testing**							
13.2.1	Monitoring program and field test to enhance long term water quality prediction related to drystack tailings facility							
	preparing composite sample over several months of production	Misc.	l.s.		$2,500	$2,500	$2,500	$2,500
	undertaking field test	Misc.	l.s.		$6,000	$6,000	$6,000	
	initiate parallel laboratory analysis	Misc.	l.s.		$5,000	$5,000	$5,000	
	monitoring field apparatus (columns	Misc.	l.s.		$2,000	$2,000	$2,000	$13,000
	reporting				$2,500	$2,500	$2,500	$2,500
	Subtotal:						**$18,000**	**$18,000**
13.3	**Other Adaptive Management Plans scheduled for Operating Life or Required Only in Early Shutdown**							
	Changes in WTP input water quality or quantity	Misc.	l.s.		$15,000	$15,000	$15,000	$15,000
	Site Testing ML ARD	Misc.	l.s.		$30,000	$30,000	$30,000	$30,000
	Long Term Reclamation of Contaminated Soils	Misc.	l.s.		$15,000	$15,000	$15,000	$15,000
	Physical Monitoring program prior to closure	Misc.	l.s.		$40,000	$40,000	$40,000	$40,000
	Modeling of Pit Lake water quality prior to flooding	Misc.	l.s.		$15,000	$15,000	$15,000	$15,000
	Subtotal:						**$115,000**	**$115,000**
13.4	**Closure Specific Studies and Field Trials**							
	Main Site Discharge Channel Geotechnical Design and Stability Evaluation	Engineering/Design	l.s.	1	$30,000	$30,000	$30,000	$30,000
	Passive Treatment Evaluations	Engineering/Design	l.s.	1	$60,000	$60,000	$60,000	$60,000
	Engineered Cover Evaluations	Engineering/Design	l.s.	1	$50,000	$50,000	$50,000	$50,000
	Subtotal:						**$140,000**	**$140,000**
Total Estimated Cost for Supporting Studies							**$296,000**	**$296,000**

Note: