MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

DETAILED DECOMMISSIONING & RECLAMATION PLAN

Revision 2

September 2009

Prepared by Minto Explorations Ltd.

Detailed Decommissioning and Reclamation Plan

Minto Project, Yukon Territory

Submitted by:

Minto Explorations Ltd.

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CONTEXT OF THIS DOCUMENT

This second revision of the Detailed Decommissioning and Reclamation Plan (the "Plan") is presented for review and will be revised by MintoEx to incorporate reviewer comments.

The following changes are noted since Revision 1 of this report was issued:

- The Southwest Dump was permitted in October 2008;
- The milling rate was increased to 3200 tpd from 2400 tpd in July 2008;
- Water management challenges at the site have prompted the construction of a water treatment plant currently in progress.

This Plan is now considered to be Revision 2. Most sections have been updated since Revision 1 and changes/comments will be tracked going forward.

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1.0 INTRODUCTION

Minto Explorations Ltd. (MintoEx), 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 Report, the "Minto Project" means the mining of the Minto deposit as an open-pit mine and related ancillary facilities.

Revision 1 of this report, approved in 2007, forms the basis of this Detailed Decommissioning and Reclamation Plan (the "Plan"), the submission of which is required under the Quartz Mining Production Licence QML-0001, Section 14.3.

This 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 is based on the best information available at the present time. 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 no later than every second anniversary of the startup date.

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, First Nations 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, with eventual walk-away closure after long term chemical

and physical stability has been demonstrated. This involved an assessment of the key mine components that should be properly mitigated. 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. 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, First Nations 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 (Agreement) with the Selkirk First Nation (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, preliminary meetings with SFN were held, and their comments on closure and other issues raised during ongoing dialogue were considered in the 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:

- 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 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; it 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.

Various closure options were assessed to ensure that closure objectives were met for each mine component. A meeting was held between the company's consultants and SFN to review the closure philosophy and approach and methods to optimize the Plan prior to the development of Revision 1. Since this time, the company has entered into ongoing dialogue with SFN members and staff to address issues related to the Co operation agreement, permits currently in place with SFN's Department of Lands and Resources and day to day operation of the mine.

The approach taken in the presentation of this 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.

Table 1.2-1 Global Information List

(List of Reports Related to and/or Prepared for the Minto Project)

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, B.C.,	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
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, B.C.	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

Report Title / Topic	Author	Date
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

Report Title / Topic	Author	Date
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. Minto Property. Whitehorse, Yukon Territory.	DIAND and Regional Environment Review Committee	1997
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
Brief to the YWB, re. Water Licence Application QZ96-006 Minto Explorations Ltd.	Environment Canada and Fisheries and Oceans Canada	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, B.C.	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

Report Title / Topic	Author	Date
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
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

Report Title / Topic	Author	Date
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

Report Title / Topic	Author	Date
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 QML-0001. Submitted to the YWB and YG EMR	Access Consulting Group, Minto Explorations Ltd.	2007
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

Report Title / Topic	Author	Date
Geotechnical Design, Proposed Southwest Waste Dump, Minto Mine, Yukon	EBA Engineering Consultants, Ltd.	2008
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

1.3 STATUTORY AND REGULATORY RESPONSIBILITIES

1.3.1. Government Environmental Assessment and Permitting Regime

This Plan was developed to meet the regulatory requirements as stipulated in the Company's Water Use Licence and the Quartz Mining Licence.

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. 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.

1.3.2. Initial Project Assessment and Licensing

Minto has completed extensive environmental and permitting work for the Minto Project. In December 1994, a four volume Initial Environmental Evaluation (IEE) was submitted under EARPGO to DIAND for review. The IEE prepared by Hallam Knight Piesold, encompassed:

- Volume I – Development Plan providing a general overview of the Minto Project;
- Volume II – Environmental Setting which described the local environmental conditions and studies undertaken at the site since the 1970's;
- Volume III – Socio-Economic Description and Impact Assessment describing socio-economic conditions and archaeological evaluation and impact assessment for the Minto Project; and

- Volume IV of the IEE – Environmental Mitigation and Impact Assessment was submitted in May 1995 and summarized the results of overburden and waste characterization studies.

The assessment indicated no acid generation potential as tailings solids and effluent test work indicated very low levels of metals present and showed solids that were strongly acid consuming. Subsequent correspondence and information was exchanged with DIAND regulators to address issues raised during the review. Public consultation was carried out with interested members of the public, stakeholder groups and First Nations. DIAND issued an EARPGO screening report decision on April 7, 1997, indicating that potentially adverse environmental effects that may be caused by the project are mitigable using known technology and that the project could proceed.

Type A Water Use License

In February 1997, MintoEx submitted a Type A Water Use Licence application (QZ96-006). The YWB convened a public hearing into the application in May 1997 and after deliberations by the YWB, the Type A Water Use Licence was subsequently issued in April 1998. The Type A Licence was supported by the SFN and contained typical licence terms and conditions to ensure that mitigation measures identified during the environmental assessment are implemented.

Type B Water Use Licence

A Type B Water Use Licence application was filed with the YWB in August 1995 for construction of the Yukon River barge landing sites, the Big Creek Bridge and Minto Creek road culvert installations. In October, 1995 a land use and quarry permit application for the access road construction were filed with DIAND Land Resources. An integrated CEAA screening of the Type B and land use applications was completed and a positive determination was made in August 1996. Type B Water Use Licence MS95-013 and Land and Quarry Permit YA5F045 were issued in August 1996 and the initial 16 km of the Minto project access road, barge landings and Big Creek Bridge were installed in September and October 1996.

Yukon Quartz Mining Production Licence

In 1999, the YQMA was amended and section 139 of the YQMA required that all development and production activities related to quartz mining in the Yukon be carried out in accordance with a licence issued by the Minister. In June 1999, Minto filed an application with DIAND Minerals for a Yukon Quartz Mining Production Licence, which included a cumulative effects assessment for the project to ensure that the provisions of CEAA were met. DIAND issued Yukon Quartz Mining Production Licence QLM-9902 in October 1999.

1.3.3. Existing Permits and Licences

As the Type A Water Use Licence (QZ96-006), Type B Water Use Licence (MS95-013) and Yukon Quartz Mining Licence (QLM-9902) were set to expiry in June 2006 and in recognition of the changing nature of the environmental assessment regime in Yukon, licence amendment applications were filed with the YWB and YG Department of EMR in October 2004.

The YWB completed a YEAA screening of the Type B application and subsequently issued the amended Type B Water Use Licence (MS04-227) in February 2005. YG Development Assessment Branch completed a YEAA screening of the Type A Water Use Licence and Yukon Quartz Mining Licence using the previous EARPGO screening and issued their screening report in March 2005. The YWB issued the amended Type A Water Use Licence (QZ04-064) in September 2005 and YG Energy Mines and Resources ("EMR") issued amendments to the Yukon Quartz Mining Licence QLM-0001, in December 2005 and October 2006. A further amendment to the WUL (QZ96-006) was made in July 2008 to change the mill rate to 3, 200 t/day.

Generally, the amended licences contain similar terms and conditions as the original licences and are typical of other Yukon mining licences. All of the above noted licences have an expiry date of June 30, 2016.

In addition, the Federal MMER (Metal Mining Effluent Regulations) under the Fisheries Act currently applies to the Minto mine. This regulation is a law of general application and the requirements of this legislation will be the responsibility of the company. Generally, the Type A Water Use Licence is considered more restrictive that the MMER, however separate reporting

for effluent discharge and receiving water monitoring is required by the Federal Department of Environment Canada.

1.3.4. Remaining Permitting Schedule

Upon final decommissioning and reclamation, the Company will apply for a closure certificate under the YQMA legislation at the conclusion of the implementation of the final closure measures to seek government approval of conditions at the site.

As part of implementing the Plan, the Company would ensure that the various other licences and/or permits that are required for undertaking various closure measures are secured and followed.

1.4 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 project description, including a brief overview of the current status of the Minto mine and the Company's plans for eventual mine opening.

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 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 6 presents the implementation schedule for the plan.

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.

1.5 ACKNOWLEDGEMENTS

This report benefited from input by the following companies:

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

Selkirk First Nation – Provide ongoing input into the development of closure objectives based on current and potential future use of the project area.

EBA Engineering Consultants Ltd. - Provided base data for conceptual design drawings and contributed to the technical review of closure design elements and cost estimates.

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

2.0 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND AND LOCATION

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.

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 0.50% copper, consist of 8,510,000 tonnes at grades of 1.81% copper, 0.57 g/t gold and 7.57 g/t silver. Current project design parameters are based upon 8,850,800 t at grades of 1.68% copper, 0.60 g/t gold and 6.9 g/t silver.

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.

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.

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


N
Alaska (United States of America)
Northwest Territories
British Columbia
PROJECT LOCATION
Old Crow
Eagle Plains
Dawson
Elsa
Keno
Mayo
Stewart Crossing
Pelly Crossing
Beaver Creek
Carmacks
Faro
Ross River
Burwash Landing
Destruction Bay
Haines Junction
Whitehorse
Johnson's Crossing
Teslin
Carcross
Tagish
Watson Lake
Firth River
Old Crow River
Porcupine River
Eagle River
Peel River
Ogilvie River
Blackstone River
Wind River
Yukon River
Beaver River
Stewart River
McQuesten
Mayo Lake
Hess River
MacMillan River
White River
Pelly River
Drury Lake
Little Salmon Lake
Big Salmon River
Klaane River
Aishihik Lake
Kluane Lake
Lake Lebarge
Frances Lake
Quiet Lake
Liard River
Hyland River
Coal River
Beaver River
Alsek River
Dezadeash Lake
Kusawa Lake
Wolf Lake
Teslin Lake
MINTO MINE
Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.
Detailed Decommissioning and Reclamation Plan
Figure 1-1 Project Location
ACCESS CONSULTING GROUP
Drawn By: HD/MD
Checked By: SK
September 2009
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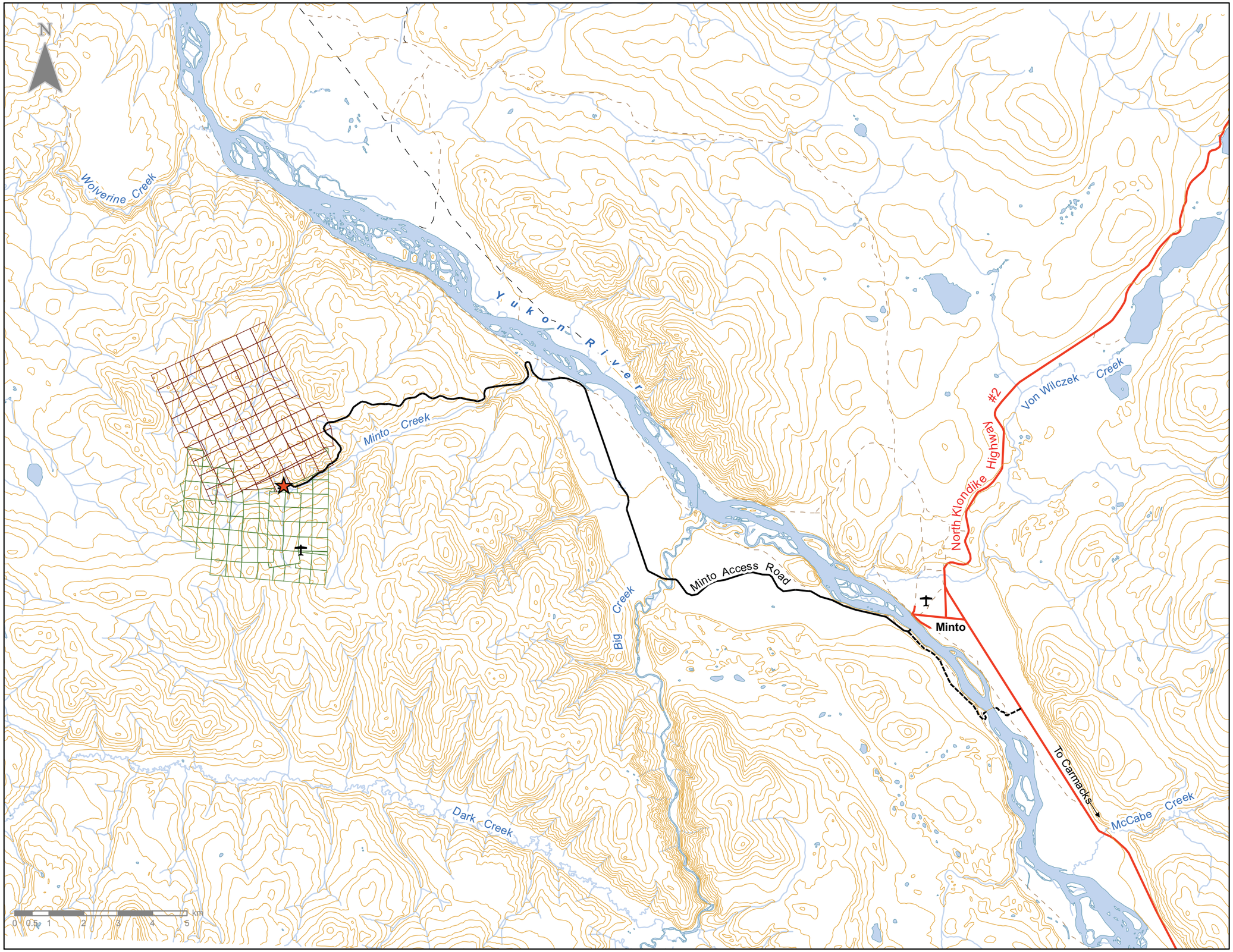

MINTO MINE

Detailled Decommissioning and Reclamation Plan

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

- Mine Site
- Airstrip
- Road
- Mine Access Road
- Trail
- Minto Claim -DEF
- Minto Claim - Minto

Contour and hydrology data obtained from National Topographic Data Base (NTDB) compiled by Natural Resources Canada at scale of 1:50 000.
NTS Sheet 115I/10 and 115I/11

Projection : UTM Zone 8N
Datum: NAD 83

FIGURE 1-2

AREA OVERVIEW

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September 2009	Drawn by: MD	Checked by: SK

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Preliminary site development was initiated at the property in 1996 and continued during the following decade with the Company commencing operations in October 2007.

Table 2-1 provides on 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 summarized in Table 1-1.

Table 2-1 Project Area Overview and Environmental Setting

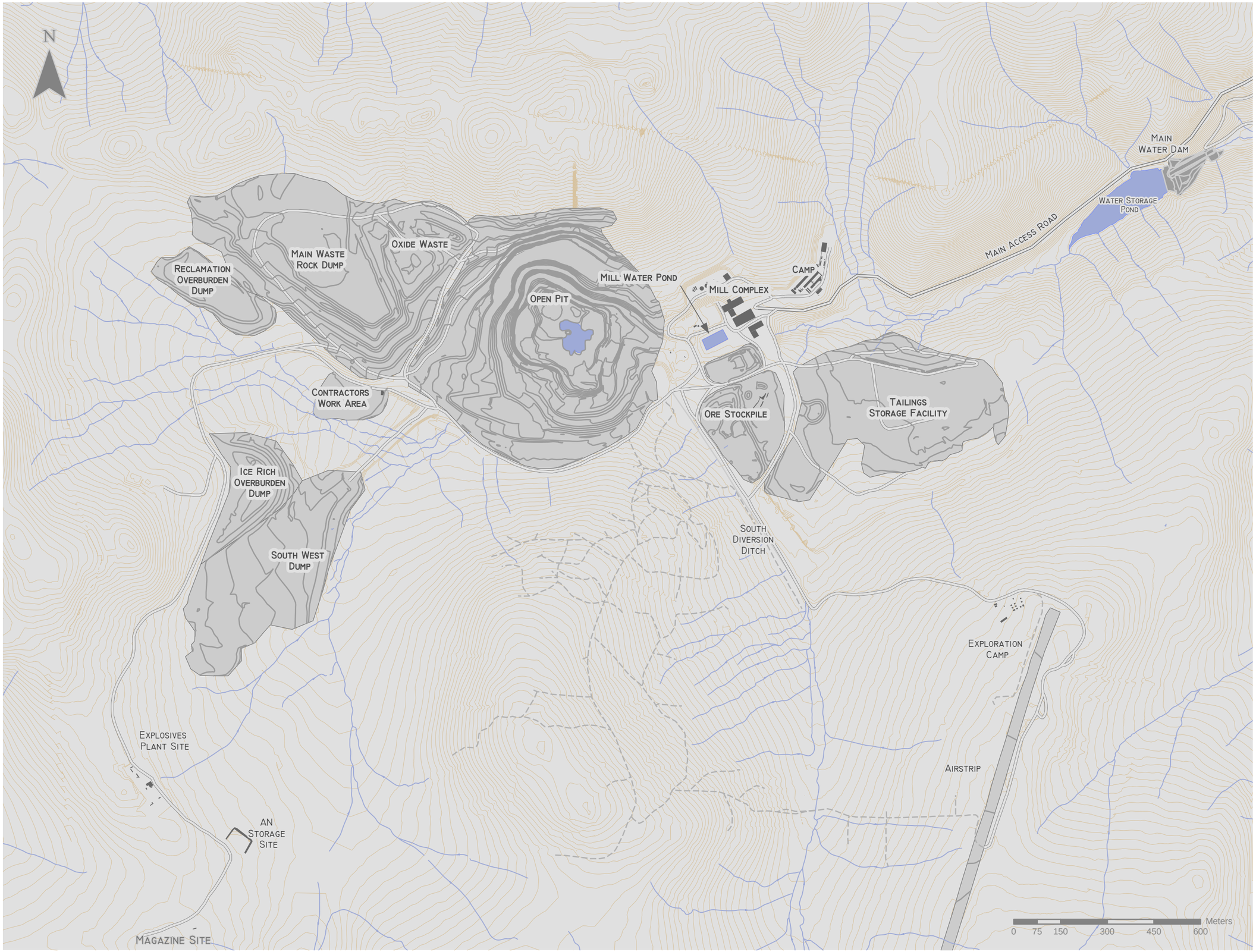
Project Area Attribute	Description
Region:	Yukon
Topographic Map Sheet:	NTS 115 I/10, 115 I/11
Geographic Location Name Code:	Minto Project
Latitude:	62° 36' N
Longitude:	137° 15' W
Drainage Region:	Yukon River
Watersheds:	Yukon River, Big Creek, Wolverine Creek, Dark Creek, and Minto Creek.
Nearest 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 12.1°C (July.1994). Mean annual temp. of -7.3°C. Mean annual precipitation is 378mm.
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.
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).

Note: Information summary drawn from various sources, including several Minto project reports and the CEAA screening report.

2.2 CURRENT STATUS

The Minto mine is currently in full production. Water quality monitoring is conducted in accordance with Water Use Licence QZ96-006.

Figure 2-3 presents an overview of current site conditions.



MINTO MINE

DETAILLED DECOMMISSIONING RECLAMATION PLAN

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD

- Footprint_Contours_Aug_2009
- Mine Access Road
- Mine Road
- Trail/Explaration
- Mine Operation Footprint

Hydrology data provided by
Minto Explorations Ltd, May 2009.
Site Layout and contour data provided by
Minto Explorations Ltd, September 2009.

Projection : UTM Zone 8N
Datum: NAD 83

FIGURE 2-3

CURRENT SITE CONDITIONS SEPT 2009

ACCESS CONSULTING GROUP

Sept 2009	Drawn by: MD	Checked by: SK

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2.3 PLANNED MINING OPERATIONS

Along with standard blast and haul open pit mining practices, a conventional crushing, grinding and flotation process plant is in use at Minto mine utilizing standard unit processes and equipment. The plant currently processes 3200 tpd (metric tons per day).

The Minto plant was designed to process ore containing copper, gold and silver to produce a copper concentrate. The plant consists of the following main unit operations:

- primary crushing;
- coarse ore conveying;
- two stage grinding circuits;
- additional Ball Mill circuit;
- copper flotation;
- concentrate thickening and pumping;
- concentrate filtration;
- concentrate storage (on-site);
- tailings handling; and
- water reclaim.

3.0 ENVIRONMENTAL SETTING

Table 2-1 provides a summary of the key environmental features near the project area. Note that forest fires have repeatedly swept large parts of the Minto Creek basin and surrounding areas during the past twenty years. The original information on the project area submitted in the IEE is still relevant. In addition, a detailed description of the environmental setting of the project area has been excerpted from a report prepared previously for this project on behalf of DIAND. The relevant section of that document is included here as Appendix A.

Further characterization of the site water quality, specifically of Minto Creek, is submitted to the Yukon Water Board in the company's Type A Water Use License reports. Hydrology on the site was characterized and submitted under the Mine Flow Monitoring Plan (2006).

4.0 RECLAMATION PLANNING

A systematic approach to decommissioning and closing reclamation is required for the Minto project. This section of the Plan provides reclamation objectives and the overall reclamation strategy for the Minto site. Also provided is information regarding planned reclamation and revegetation research programs, and details and observations on reclamation and revegetation to date. Section 5.0 then addresses specific closure measures proposed for the discrete mine components.

The Company will implement progressive reclamation measures 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.

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 Selkirk First Nation (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;
    - 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; and
- 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-supporting 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.

These closure objectives are reflective of the closure objectives laid out for the licensee to achieve in Schedule B of the Quartz Mining License 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.

MintoEx wishes to acknowledge in this report that a permit application is forthcoming with respect to further mining at the Minto site within the next three to six months. This permit has been discussed informally with stakeholders, but the process of developing the submission is still in progress. In keeping with the principles of designing for closure, MintoEx is already considering a subsequent edition of a closure and reclamation plan that will reflect the full scope of mining envisioned at Minto Mine. MintoEx intends to work closely with SFN on the development of this application and will make a concerted effort to host meaningful community events leading up to the permit application submission. It was proposed by MintoEx that a more considerate use of SFN members' time would be to plan an event in conjunction with SFN staff when the entire scope of planned activities (including closure and reclamation) could be presented.

4.2 RECLAMATION TO DATE

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.

4.3 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.

4.4 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.

The reclamation research builds on the information obtained during the baseline studies program. Indigenous species of plants were catalogued and soils were characterized. These conditions are documented in the IEE, and are summarized in the attached excerpt in Appendix A.

Documentation of natural revegetation successes is ongoing during current reclamation research activities as documented in the annual reclamation reports (Appendix B). 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.

4.4.1. Growth Media

The natural vegetation found on undisturbed sites around the mine generally indicate the underlying soil properties, including texture, drainage, and pH, and the level of available nutrients.

A program of sampling and analysis of soils in the project area was done in 1994 as described in the environmental assessment, which provides the basic information required for reclamation planning. Additional soil sampling on disturbed sites will be completed in order to determine areas of localized nutrient deficiencies. Soils in the upper Minto Creek basin support growth but soil cover is relatively thin and not enough surface soils can be stockpiled to cover all disturbed areas for closing reclamation.

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. It will therefore be important to determine the characteristics of the overburden from the southern portion of the open pit as this overburden will be the only material readily available to cover the waste rock dumps, the thickened tailings and possibly other areas and thus provide a growth medium.

Diamond drilling done in the 1970's indicated that the orebody is covered by up to 60 m of overburden to the south in an area where permafrost is expected to depths of 18 m. This overburden 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 moisture is expected to be 25 cm. This 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. This

work is ongoing and described in more detail in Appendix B. Further reclamation research took place in 2009 which will be documented in subsequent revisions of this Plan.

4.4.2. Revegetation Trials

Key to long term reclamation success is site-specific revegetation research. In order to establish a successful revegetation program, the Company has initiates a methodical program to assess and provide:

a) a further inventory of available soils around the site (particularly the overburden material) and their physical characteristics;

b) the nutrients in the available soils - while fertilizers will likely be necessary to encourage quick initial establishment of healthy growth, the plant mixtures used must be capable of sustaining long term growth without the aid of artificial fertilizers;

c) 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 revegetating the site, further reviews and investigations are necessary to confirm the appropriate seed mixes that should be used. 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.

d) the effect of slope and aspect on revegetation success, and if necessary the subsequent effect of erosion control measures; and

e) the potential for metals uptake by the plants on the growth media over the tailings - 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.

Different seed mixes are being grown on test plots to develop optimum seed compositions. Initial recommended seed mixes have been developed (see Table 4.4-1 for the seed mixes proposed for specific disturbances.) Results from the test plot trials will also confirm:

- optimum seeding times;
- optimum growth media (overburden) covering depth;
- utility of techniques such as snow seeding;
- fertilizer requirements to amend nutrient content of the overburden; and
- utility of soil amendments such as lime, wood fibre or mulches.

Test plots are typically small and optimum conditions may apply. The information obtained from test plots will therefore be applied in further reclamation trials to areas 1 ha or larger in size which began in September 2009. Overburden will be hauled by truck to the selected sites and will be spread with a dozer or grader. Successes and failures will provide valuable information on alternative approaches to closing reclamation.

The establishment of an initial ground cover of graminoids has historically been viewed as a desirable objective on most disturbed areas to stabilize slopes and control soil erosion. Graminoids are all grasses and grass-like plants, including sedges and rushes. Reclamation and revegetation efforts on site will ensure that this objective is achieved; however, the establishment of existing or natural vegetative communities and species is also another desirable objective. Based on recent reclamation research, it is noted that there is typically an abundance of natural seed or reproductive seed material available from local surroundings, and that these naturally occurring seed sources should be considered as part of any reclamation programs (Craig, et al., 1998).

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. The creation of shrub willow islands can also enhance natural succession.

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 at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species. A local seed collection program has been proposed and is planned for spring 2010.

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.

The initiation of progressive reclamation measures that see the covering of areas with overburden (toe berm of ice-rich overburden dump, toe of first lift of waste rock dump and toe of starter bench for tailings deposit) will provide areas of different aspect/exposure for the establishment of initial revegetation trial plots. The trial plot locations, design, implementation and monitoring schedule for the revegetation trial program is described in appended reclamation summary reports (Appendix B).

The successes from the trial plot program will be transferred to the progressive reclamation efforts that will provide a large-scale opportunity for refinement of reclamation and revegetation techniques and measures.

Table 4.4-1 Selected Seed Mixture for Initial Revegetation Trials

Native Species	Mix #1 Willow / Sedge kg/ha	Mix #2 Black Spruce kg/ha	Mix #3 Mixed Deciduous / Coniferous kg/ha	Mix #4 Sand / Gravel Cut slopes kg/ha
Yukon wheatgrass			2	4
Violet wheatgrass			6	6
Northern fescue			2	
Arctic lupine			2	
Yellow locoweed				1
Glaucous bluegrass			2	3
Meadow foxtail	3	5		
Tufted hairgrass	4	4		
Polargrass		1		
Bluejoint reedgrass	1	1		
Altai fescue		6		
Fowl bluegrass	8			
Sheep fescue			2	5
Showy locoweed				
Sweetgrass			1	
Total (kg/ha)	**16**	**17**	**17**	**19**

Native species may be substituted with agronomic species; however, native species are recommended and require approximately one half the weight in seed as the agronomic species (adapted from Kennedy 1993.)

The program was initiated in the spring of 2007, with the establishment and planting of test plots at the ice-rich overburden dump, waste rock dump and borrow area locations. Planting of the test plot on the tailings facility starter bench was conducted in the fall of 2007 and the tailings surface plot will be established in the fall of 2009 when an area of tails at final grade is available.

Monitoring of the plots takes place annually in summer or fall by a vegetation specialist. The following parameters will be monitored at each plot during the annual inspections:

- established photo hubs are documented photographically and growth success and species present will be documented;
- vegetation samples are collected from the plots for ICP metals scan to assess metals uptake; and
- soil samples are collected from plots and analyzed for ICP metals, available nutrients and general parameters such as soil pH and alkalinity.

In addition, natural revegetation success at other locations on the site are tracked and incorporated into the final reclamation revegetation plan.

5.0 CLOSURE MEASURES FOR RECLAMATION COMPONENTS

This section presents a discussion of the closure issues and measures associated with the various components slated for reclamation (reclamation components) on the Minto property. The approach to each subsection is to present a description of each area so that readers are familiar with the existing facility and do not have to refer back to previous reports or information. Planned closure measures are then presented. Each section is supported with detailed figures and tables as required. Where needed, references are made to previous reports or supporting documentation.

Figure 2-3 provides a general arrangement plan for current conditions at the site as of September 2009, and Figure 5-1 presents the ultimate overall site plan as proposed at the end of mine life. Figure 5-2 to Figure 5-8 provide summaries of the various closure measures for features or groups of features on the general arrangement plan.

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

- Waste Rock And Overburden Dumps including the southwest dump (permitted in 2008);
- Open Pit and Haul Roads;
- Tailings Area and Diversion Structures;
- Main Water Dam;
- Mill and Ancillary Facilities;
- Mill Pond;
- Access Road; and
- Miscellaneous Components.

Minto Mine Project

Detailed Decommissioning and Reclamation Plan

Minto Explorations Ltd.

A SUBSIDIARY OF CAPSTONE MINING LTD.

N

Main Waste Dump

Oxide Pad for Low-grade Ore Stockpile

Reclamation Overburden Dump

Open Pit

Camp

Mill Site

Mill Pond

High Grade Ore Stockpile Pad

Main Water Dam

Impounded Water Surface

Access Road and Power Tansmission Line

Creek

Minto

Finger Drains

Finger Drains

Dry Stack Tailings Storage Facility

Diversion Berms

South Diversion Ditch

Ice-rich Overburden Dump

South West Dump

Explosives Yard

Solid Waste Facility

Land Treatment Facility

Airstrip

- Access Road
- Road
- Exploration Road/Trail
- PowerLine
- Watercourse
- Contour
- Areas of Construction

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 5-1

Ultimate Overall Site Plan

Scale: 0 50 100 200 300 400 m

ACCESS CONSULTING GROUP

Drawn by: HD/MD	Verified by: SK	September 2009

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlanSept2009

Table 4.4-3 provides a summary of the project area disturbance at the end of mine life. This table lists the reclamation components and sub-components, the area disturbed by each component during construction and operations, the area slated for progressive reclamation and the area requiring reclamation at final closure. Of note is that the area disturbed is the "footprint" of the disturbance, where the reclamation areas refer, where applicable, to the entire (slope compensated) surface area of the reclamation component. An example of this would be the increased surface area of the final waste rock dump compared with the actual footprint of the area disturbed.

In addition, 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 5.6 discusses these scenarios and associated reclamation measures further.

In total, it is estimated that 335.7 hectares will be disturbed as a result of the mine development with approximately 250.7 hectares requiring reclamation at the end of mine life. Figure 5-9 provides a summary of planned closure activities for various mine components.

Table 4.4-3 Estimated Area of Disturbance – End of Mine Life (7 years)

Overburden and Waste Rock Dumps	**145.1**	**148.3**	**0**	148.3	
Main Waste Dump	32	35.2	0	35.2	
South West Dump	85	85	0	85	
Ice-Rich Overburden Dump	6.9	6.9	1.2	5.7	
Ore Stockpile Areas	15.7	15.7	0	15.7	
Open Pit	55.6	5	5	**0**	
Haul Roads	13	13.0	0	**13.0**	
Tailings Area	40.3	41.3	10.3	**31**	
Main Water Dam (including 4.7 ha impacted by impounded water)	6.0	6.0	0	**6.0**	
Mill and Ancillary Facilities	7.6	7.6	0	**7.6**	
Access Road (extent of access road reclamation to be determined with SFN)	19	26.2	0	**Scenario 1** (No Deactivation)	**0**
				Scenario 2 (Deactivation From Mine Site to Minto Creek Crossing)	**8.8**
				Scenario 3 (Complete Access Road Deactivation)	**26.2**
Miscellaneous Components	**49.1**	**8.3**	**0.6**	**7.7**	
Mine Camp	2.4	2.2	0.6	1.6	
Air Strip	5.3	n/a	n/a	n/a	
Mine contractor Laydown	2.5	2.5	0	2.5	
Exploration Sites and Trails	35.3	n/a	n/a	n/a	
Land Treatment & Solid Waste Facilities	1.0	1.0	0	1.0	
Explosives Plant Site	2.6	2.6	0	2.6	
Total	**335.7**	**250.7**	**17.5**	**Scenario 1**	**213.6**
				Scenario 2	**222.4**
				Scenario 3	**239.8**

5.1 WASTE ROCK AND OVERBURDEN DUMPS

Figure 5-1 shows the locations and layouts of the main waste dump, ice-rich overburden dump, the southwest dump, ore stockpile pads and contractor's shop and work area at the end of mine life. The southwest dump was permitted in 2008 and will be described in section 5.1.2. Figure 5-2 summarizes the reclamation measures for each component. Revision 1 of this Plan called for progressive reclamation of lifts prior to the placement of subsequent lifts. However, new resources were discovered through various exploration drilling programs and since MintoEx intends to seek permits to mine these resources and place waste from future resources in the main waste dump, it was decided that the reclamation of the dumps would be postponed until the end of active mining in the main pit, when the stockpiles are targeted as the main feed source for the mill. At this time, the methodology for reclaiming the waste dumps proposed in Revision 1 of this plan will apply as discussed below.

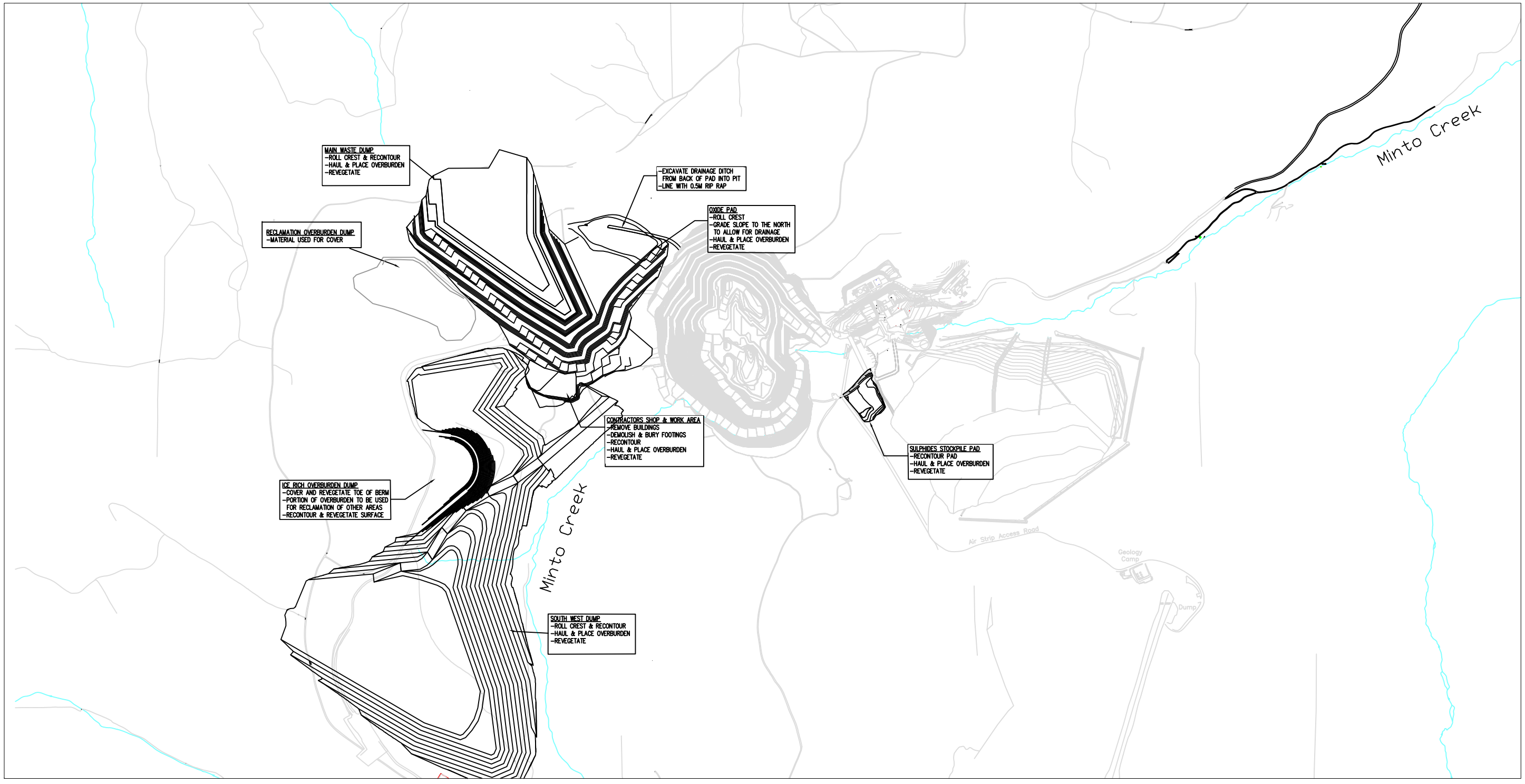
5.1.1. Main Waste Dump

5.1.1.1. Closure Issues

The main waste dump (MWD), located immediately northwest of the open pit, is being established in sequential lifts as extracted from the pit. The slope of each lift will be reclaimed as per Figure 5-3, which shows typical reclamation measures of a dump slope. Slope crests will be rolled over and the slope and bench surfaces will be covered with a layer of overburden 25 cm thick. A trial reclamation plot was established on a slope of the main waste dump as described in Section 4. The ultimate revegetation seed mixtures and fertilization requirements for the main waste dump will depend on trial and natural revegetation success.

Physical stability of the MWD is of primary concern in a closure scenario. The MWD is being constructed according to EBA's Geotechnical Evaluation – Proposed Main Waste Dump, Minto Project, Yukon (April 1998) which addresses physical stability design considerations such as maximum credible earthquake criteria, therefore the likelihood of failure will be low. In the unlikely event of a dump failure, the consequences would be minor as there are no public facilities downslope of the dump and the open pit would effectively act as a settlement basin for any sediment load within runoff water before it is introduced to Minto Creek. Annual inspections

of the main waste dump MWD have taken place as per the Quartz Mining Licence QML-0001 (section 9.3.2) and there are no physical stability issues identified to date.



Data (Fig_Overall_PLan.dwg) provided by Minto Explorations Ltd.
September 2009

TITLE	FIGURE 5-2: RECLAMATION MEASURES FOR WASTE ROCK AND OVERBURDEN DUMPS
PROJECT	MINTO MINE
DATE: September 2009	ACCESS JOB NO. MIN-05-01
DWN. CSF/MD	CHKD. / REVISION NO.: 1

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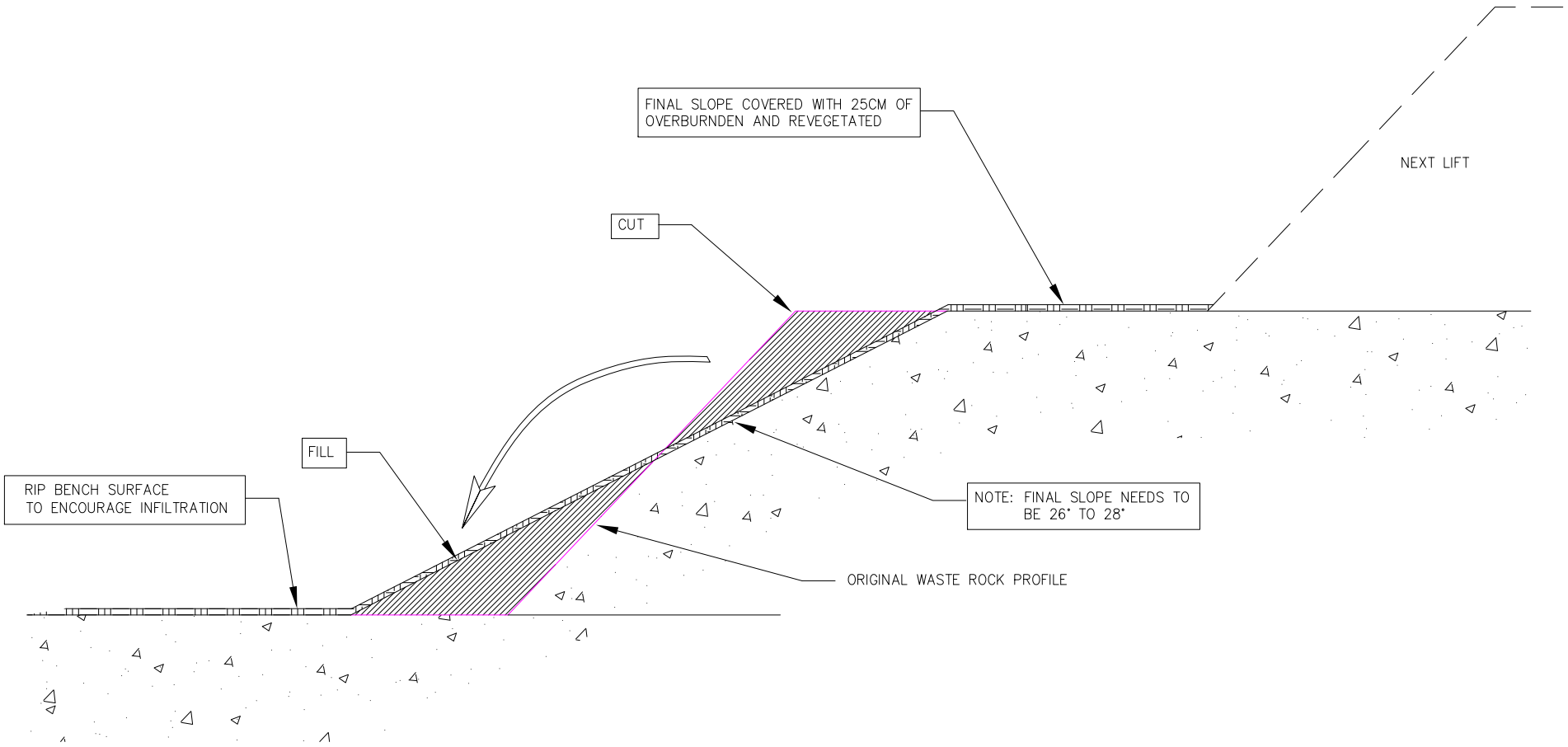

FIGURE 5-3: TYPICAL SLOPE RECLAMATION MEASURES

MINTO MINE

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Geochemically, runoff from the MWD would contribute a minor metal (primarily copper) load to the already high background metal concentrations of Minto Creek (IEE). Previous acid-base accounting test work and assessment on waste rock materials overlying the orebody indicates that there is a very low potential for acid generation and metal leaching (Mills, 1997.) Samples from each waste rock blast are collected and tested as part of an acid base accounting program required under the WUL (QZ96-006, Appendix 6). An operational monitoring program for acid base accounting is ongoing and results to date are consistent with the Mills report. Analyses of 235 waste rock samples (collection and testing ongoing) have been received to date. Of these samples, the average NP/AP ratio is 48.5. The average paste pH to date is 8.61. A more in depth discussion of the ABA sample results received to date is presented in the 2009 Annual Quartz Mining Licence QML-0001 Report (Access, 2009).

Operational experience to date, in viewing the MWD from a closure perspective, suggests that the physical and chemical stability issues will be addressed using the closure methods presented here. 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 may be sufficient in addressing the physical stability/erosional control concerns. This closure method is subject to further observations in the field (continued reclamation research and continued acid base accounting monitoring during operations) and refinement of closure objectives with stakeholders. A more robust cover (25 cm overburden) is assumed for the purposes of closure costing as discussed in Section 8.

5.1.1.2. Closure Measures

Final reclamation measures will be required for the entire surface area of the MWD. This will see all lifts recontoured, covered with growth media and seeded as per successful techniques and mixtures established during progressive reclamation activities. Overburden will be loaded with an excavator and hauled by trucks initially from the pit area after removal, and later from the overburden dump. Overburden can be spread with the trucks and further spread with a dozer equipped with wide tracks. Compaction of the overburden during spreading will be minimized.

The following section lists the closure measures related to both physical stability and geochemical stability that are planned for the MWD. It is presented as an itemized list for ease of reference, as this will form the basis for the costing and scheduling.

Physical Stability

i. Roll crests of final waste rock lift and recontour.
   - *Dozer x 300 hrs for area of 35.2 ha based on perimeter of bottom lift*

ii. Haul and place overburden on surface and prepare for seeding.
   - *Custom Unit Rate A = $5.08 x 88,000 m3 (35.2 ha x .25 m cap = 88,000 m3)*
   - *Custom unit rate based on site specific factors: haul distance, grade, machinery required, time required, etc.*

iii. Revegetate based on success of test plots.
   - *35.2 ha for seeding/fertilizing, re-seeding 18 ha, plant seedlings on 35.2 ha*

Chemical Stability

i. Continued acid-base accounting test work as per Water Use Licence and Quartz Mining Licence requirements during operations.
   - *Ongoing operational cost, not included in closure costing.*

ii. Monitor dump seeps below dump to check on loading from dump.
   - *Dump seep survey, monitoring based on findings*

5.1.2. Southwest Dump

The southwest dump (SWD) 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 (September 2008).

5.1.2.1. Closure Issues

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). During operations, the monitoring data will be collected monthly and compared with threshold levels defined in the southwest dump design. Monitoring will be conducted monthly during active closure and for the first 5 years after closure, and reduced to semi-annual and annual monitoring thereafter if approved by the project engineer. Four ground temperature cables are installed to date in the vicinity of the dump along with six piezometers.

5.1.2.2. Closure Measures

Reclamation measures will commence at the end of active mining in the pit when stockpiles are targeted as the feed source for the mill. With the current mine life the reclamation of waste dumps is set to begin in October 2011. The methodology for reclaiming the MWD will apply, i.e. the slope of each lift will be reclaimed as per Figure 5-3, which shows typical reclamation measures of a dump slope. Slope crests will be rolled over and the slope and bench surfaces will be covered with a layer of overburden 25 cm thick (subject to further reclamation research and stakeholder input to closure objectives). All lifts will be recontoured, covered with growth media and seeded as per successful techniques and mixtures established during progressive reclamation activities. Overburden will be loaded with an excavator and hauled by trucks

initially from the pit area after removal, and later from the overburden dump. Overburden can be spread with the trucks and further spread with a dozer equipped with wide tracks. Compaction of the overburden during spreading will be minimized.

Geochemically, runoff from the SWD would contribute only a minor metal (primarily copper) load to the already high background metal concentrations of Minto Creek (IEE). Previous acid-base accounting test work and assessment on waste rock materials overlying the orebody indicates that there is a very low potential for acid generation and metal leaching (Mills, 1997.) An operational monitoring program for acid base accounting is ongoing and results to date are consistent with the Mills report.

The following section lists the closure measures related to both physical stability and geochemical stability that are planned for the SWD. It is presented as an itemized list for ease of reference, as this will form the basis for the costing and scheduling.

Physical Stability

iv. Roll crests of final waste rock lift and recontour.
- *Dozer x 420 hrs for area of 85 ha*

v. Haul and place overburden on surface and prepare for seeding.
- *Load, haul place soil cover SWD = $3.85 x 212, 500 m3 (85 ha x .25 m cap = 212, 500 m3)*
- *Custom unit rate based on site specific factors: haul distance, grade, machinery required, time required, etc.*

vi. Revegetate based on success of test plots.
- *85 ha for seeding/fertilizing, re-seeding 43 ha, plant seedlings on 85 ha*

Chemical Stability

iii. Continued acid-base accounting test work as per Water Use and Quartz Mining Licence requirements during operations.
   - *Ongoing operational cost, not included in closure costing.*

iv. Monitor dump seeps below dump to check on loading from dump.
   - *Dump seep survey, monitoring based on findings*

Thermal Stability

v. Continued monitoring of permafrost conditions

5.1.3. Ice-Rich Overburden Dump

The ice-rich overburden dump (IROD) is the furthest west reclamation unit on the site. A toe berm constructed from waste rock will retain the ice-rich overburden and prevent migration of the material downslope. The IROD will now be surrounded by the SWD.

Overburden material from the IROD will be used as a growth media cover for both progressive and final reclamation of various units including the tailings disposal area, waste rock dumps, mill and plant area, water dam and access roads. Any overburden remaining in the dump after closure and reclamation has been completed will be resloped and revegetated.

5.1.3.1. Closure Issues

Physical stability of the IROD is the primary concern for closure. It was constructed according to EBA's Geotechnical Design, Ice-Rich Overburden Dump, Minto Mine, Minto YT (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. Much of the overburden material that will be placed in the IROD will be removed from the dump for closure measures on other site components. Therefore the likelihood of failure will be low. As with the MWD and SWD, the consequence of failure of the dump would be minor as the SWD is now directly downstream of the IROD and prevents the migration of material in the IROD downstream. The open pit would effectively act as a settlement basin for any sediment load within runoff water before it is introduced to Minto Creek.

Chemical stability of the IROD is not a concern for closure. Seepage from the IROD is expected (by design) to flow through the toe of the waste rock berm, but the organic/clay nature of the overburden material is not expected to contribute a significant chemical load to this seepage.

5.1.3.2. Closure Measures

Initial reclamation of the IROD will involve the placement of a 25 cm layer of overburden on the toe berm. 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.

Revegetation test plots were established on the toe berm in 2007, and ultimate revegetation seed mixtures and fertilization requirements for the IROD will depend on trial and natural revegetation success.

Materials from the IROD will be utilized as a growth medium on other sites at closure, with the remaining materials in the IROD will be subject to in situ closure methods. The following section lists the closure measures related to both physical stability and geochemical stability that are planned for this portion of the IROD. It is presented as an itemized list for ease of reference, as this will form the basis for the costing and scheduling.

Physical Stability

i. Recontour overburden surface after reclamation activities completed on other sites
   - *Dozer x 16 hrs*

ii. Revegetate based on success of test plots.
   - *6.9 ha for seeding/fertilizing, re-seeding 3.5 ha, plant seedlings on 6.9 ha*

Chemical Stability

No specific closure measures required.

5.1.4. Ore Stockpiles and Pads

Ore to be milled will be stockpiled on constructed pads in various locations on the site during active mining activities. More surface area at the mine site is occupied by ore stockpiles than initially envisioned (an increase from 8.6 to 15.7 ha). This has been reflected in the accompanying figures and closure costing scenarios presented in Section 8 Specific stockpiles and pads (see Figure 5-2) will include:

- 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 stockpiles will be milled prior to final closure, beginning with the high grade ore following cessation of mining activities in the pie (expected fourth quarter 2011). Mill re-orientation and re-tooling will be required for the milling of the low grade ore. Should economic conditions warrant consideration of not milling the low grade ore, the ML/ARD potential of the low grade ore (as determined by the results of the Water License ABA Test Program during operations) will be factored into the decision-making process. Should the decision be taken not to mill this material, the closure measures and area will be the same as those identified below for the reclamation of the low grade ore pad. Monitoring of the seepage/runoff from the reclaimed stockpile, already proposed and underway during operations (described in Section 7), will serve to identify any emerging geochemical concerns during the post closure period. None have been identified to date based on ABA sampling of material placed in the stockpiles. Section 5.9 further presents adaptive management planning measures to deal with emerging conditions including ML/ARD concerns.

Both pads will require reclamation (recontouring, cover and revegetation) at final closure.

5.1.4.1. Closure Issues

Physical stability of the ore stockpile pads is the primary concern for closure. 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 (1996) which addresses physical stability design considerations such as maximum credible earthquake criteria, therefore the likelihood of failure will be low. As well the ore stockpiles have been inspected annually as per the Quartz Mining Licence (QML-0001, Section 9.3.2) and there are no issues identified to date that suggest long term stability concerns.

Geochemically, runoff from the low grade sulphide pad (constructed from oxidized materials) would have the potential to carry a minor metal (primarily copper) load. Acid-base accounting test work to date on oxidized waste rock materials overlying the orebody indicates that there is a very low potential for acid generation and metal leaching (Mills, 1997 and Access, 2009.)

5.1.4.2. Closure Measures

Progressive reclamation measures will not apply to these stockpile pads, as they will typically see material handling activities throughout the entire mine life. All stockpile pads will be recontoured, covered with overburden and seeded upon final reclamation. To discourage runoff from compromising the physical stability of downslope reclamation efforts (overburden placement and revegetation), the 6.5 hectare area of the low grade ore pad adjacent to the main dump will be graded slightly to the north (towards the hillside) prior to covering and a rip rap lined collection ditch will be constructed to convey this runoff over the high wall and into the pit.

The following section lists the closure measures related to both physical stability and geochemical stability that are planned for the ore stockpile pads. It is presented as an itemized list for ease of reference, as this will form the basis for the costing and scheduling.

Physical Stability

vii. Roll crests of pads and recontour.
- *Dozer x 147 hrs for area of 15.7 ha*

viii. Construct runoff collection ditch for low-grade ore pad.
- *Dozer x 10 hrs, Hoe x 16 hrs*
- *Haul and place rip rap, 275 m x 3 m x 0.5m = 415 m3 x $12.36 /m3*

ix. Haul and place overburden on surface and prepare for seeding.
- *Custom Unit Rate (A)+(B) = ($5.08 x 13,000 m3)+($5.99 x 8500 m3) * (15.7 ha x 0.25 m cap = 39,250 m3)*

x. Revegetate based on success of test plots.
- *15.7 ha x $2260/ha for seeding/fertilizing, re-seeding 8 ha, plant seedlings on 15.7 ha*

Chemical Stability

vi. Continued acid-base accounting test work as per Water Use Licence and Quartz Mining Licence requirements during operations.
- *Ongoing operational cost, not included in closure costing.*

vii. Monitor pad seeps below to check on loading from pad seepage.
- *Pad seep survey, monitoring based on findings*

viii. Continued Groundwater Monitoring Program as per Water Use License requirements during operations.

- *Cost included in monitoring activities*

5.1.5. 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.

5.1.5.1. Closure Issues

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. The chemical stability of the remaining soils will be ensured through an investigation for contaminated soils during the environmental site assessment at closure, and any contaminated materials will be hauled to the on site Land Treatment Facility.

5.1.5.2. Closure Measures

The following section lists the closure measures related to both physical aspects and geochemical stability that are planned for the contractor's shop and work area. It is presented as an itemized list for ease of reference, as this will form the basis for the costing and scheduling.

<u>Physical Stability</u>

i. Remove salvageable equipment and dismantle buildings; haul off site
   - *General labourer x 60 hrs for area of 2 ha*
   - *Trades labourer x 48 hrs*
   - *Tractor Trailer and lowbed x 20 hrs*

ii. Dismantle Buildings
   - *General labourer x 60 hrs*
   - *Hoe X 20 hrs*

iii. Haul building pieces off site – equipment
   - *Tractor Trailer and lowbed x 20 hrs*

iv. Haul scrap to site waste management facility

- *Haul truck x 20 hrs*

v. Footings pushed in and buried with fill

- *0.25 ha x 1 m deep = 2,500 m3*

vi. Recontour and cover in 0.25 m overburden for seeding

- *Dozer x 15 hrs, Custom Unit Rate C = $5.05 x 5,000 m3 (2 ha x 0.25 m cap = 5,000 m3)*

vii. *Revegetate based on trial success*

- *2 ha x $2,260/ha for seeding/fertilizing, re-seeding 1ha, plant seedlings on 2 ha*

Chemical Stability

i. Site will be assessed for contaminated soils

- *Part of environmental site assessment at closure*

ii. Contaminated soils moved to land treatment facility on site

- *Cost based on volumes at closure, estimate 25 m^3*

5.2 OPEN PIT AND HAUL ROADS

Figure 5-1 shows the location and layout of the open pit and haul roads at the end of mine life. Figure 5-4 summarizes the reclamation measures for each of these components, and the specific measures are discussed in greater detail below.

5.2.1. Open Pit

The open pit encompasses the drainage channel for Minto Creek. During freshet 2009, MintoEx stored more than 700 000 cubic metres of water in the pit and received two amendments to the Water Use Licence QZ96-006 which allowed for the removal of water to the downstream environment with modified effluent criteria and increased monitoring requirements. A new water management plan was submitted to the Yukon Water Board on July 31, 2009 as required under Amendment 5. Engineered designs for a water treatment plant form part of the water management plan and it is expected to be operational in the second quarter of 2010 at a capacity of 4000 cubic metres per day. As such, the water treatment plant is considered an operational expense and will remain on site through closure and function to address the quality of waters accumulating in the pit if required.

Closure Issues

The pit is being excavated according to MintoEx's Open Pit Design Plans (2006). With respect to physical stability of the pit, at closure the north wall of the pit will be benched in competent bedrock and the south wall will be a continuous slope composed of ice-rich permafrost. Instability along the ice-rich permafrost 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 occurred during summer 2009. The monitoring data currently being collected will inform a plan for mining the south wall.

It is expected that water will be stored in the pit after closure. Water quality will be monitored and a treatment plant will be in place so that water can be pumped to the plant, treated and released downstream. See Section 7 of this report for further detail related to monitoring locations and scheduling.

Acid-base accounting indicates that the open pit wall rocks are slightly acid consuming or neutral and this is being confirmed by work done during operations through the Water Use

License ABA Test Program. Results to date indicate that the open pit wall geochemistry is consistent with the predictions put forward in the Mills report (Mills, 1997).

N

Main Waste Dump

Reclamation Overburden Dump

South West Dump

Ice-rich Overburden Dump

Haul Roads
Recontour as per figure 14

Open Pit
- Flood Pit to 791.5 M Level

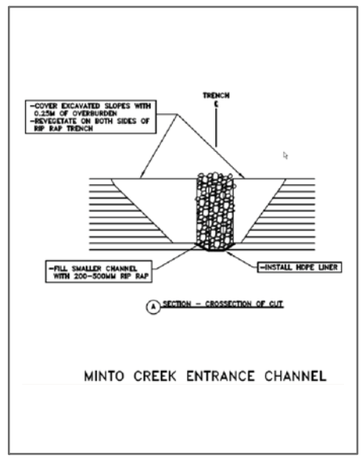
Open Pit

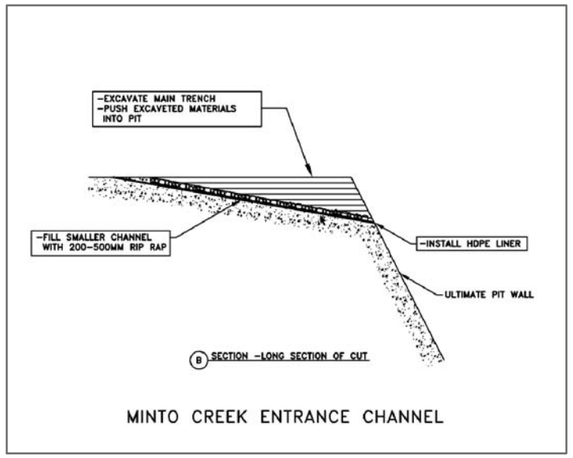
Remove CMP Flume Ditch

Redirect Minto Creek into Southwest wall of pit via lined channel after pit fills to 791.5

A

B





Minto Mine Project

Detailed Decommissioning and Reclamation Plan

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

Road
Contour
Site Feature Profile Contour
Water Course

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 5-4

Reclamation Measures For Open Pit and Haul Roads

Scale: 0 25 50 100 150 m

ebo ACCESS CONSULTING GROUP

Drawn by: HD/MD | Checked by: SK | September 2009

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5.2.1.1. Closure Measures

Prior to flooding, any accessible benches in the pit will be scarified to encourage natural revegetation, but no 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 access to the pit.

At closure, run off water from Minto Creek will report to the pit through an engineered channel. This channel will be excavated in an area of continuous permafrost. The channel will be excavated to a slope of approximately 5.5 to 1, and will terminate at the 791.5 m elevation. The main channel will be armoured with 1 metre of rip rap, and the excavation slopes will be covered in 25 cm of overburden and vegetated with willows to stabilize the future riparian zone. Entrainment of Minto Creek into the pit via the constructed channel will not occur until these slopes are sufficiently stabilized and revegetated and the pit is completely flooded.

The open pit will be flooded to the 791.5 m elevation at the end of the life of the mine. Any water above this level will be treated if necessary and discharged to the Water Storage Pond (WSP). A schedule for monitoring water quality in the pit and throughout the site is presented in Section 7 and costs related to operation of the water treatment plant post-closure are considered in Section 8. Water quality in the pit will be monitored and once effluent criteria can be consistently met throughout the year, the channel will be established and water will overflow at the low spot on the final access ramp to the mill pond and then Minto Creek. Approximately *55* % (10.6 ha) of the open pit walls will remain exposed above water.

The following section summarizes the closure measures related to both physical stability and geochemical stability that are planned for the open pit. This will form the basis for the costing and scheduling.

<u>Physical Stability</u>

i. Remove pumping/piping systems, general cleanup
   - *Labour x 90 hrs, support equipment $1,500*

ii. Secure pit access – boulder placement
   - *Hoe x 25 hrs*
   - *Haul truck x 25 hrs*

iii. Construct creek entrance channel into pit

- *Hoe x 20 hrs*
- *Haul and place rip rap , 50 m3*

Chemical Stability

i. Continued acid-base accounting test work as per Water Use Licence and Quartz Mining Licence requirements during operations.
   - *Ongoing operational cost, not included in closure costing.*

ii. Monitor pit discharge water quality as part of post closure monitoring program
   - *Monthly during active closure, semi-annually to annually in post-closure.*

5.2.2. 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. Figure 5-5 shows typical road reclamation measures that will be employed at final closure. These measures will apply to haul roads, site roads and the main access road alike.

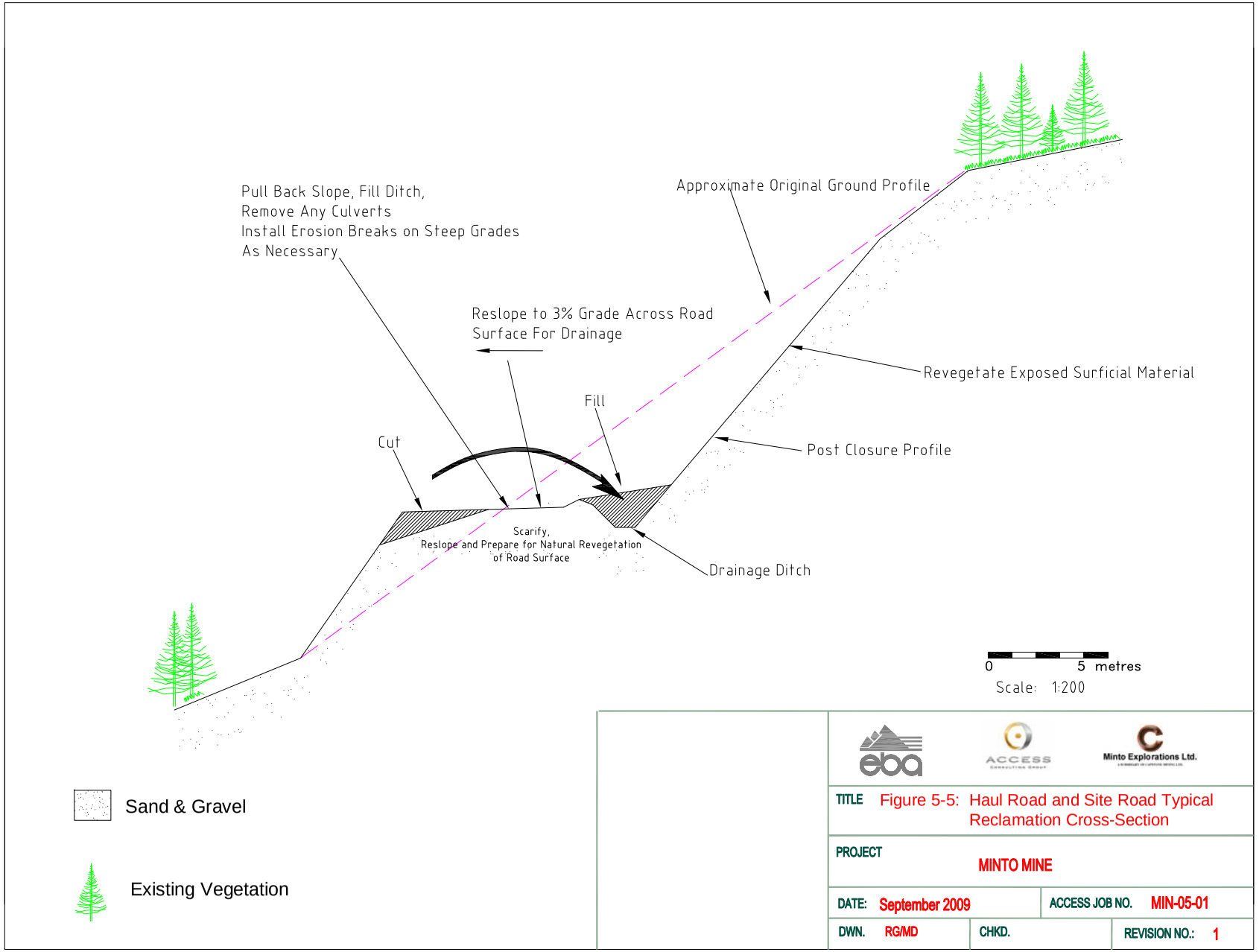
5.2.2.1. Closure Issues

The primary consideration for the physical stability of the haul roads at closure will be slope stability where culverts have been removed and drainage channels have been established through the road alignments.

Geochemically, the road materials have not been observed to contribute to chemical loading of runoff, but the understanding of this potential will be refined through adaptive management during operational water quality monitoring. To date, any materials used for construction throughout the site are subject to a pre-construction testing for purpose and monitoring. Physical stabilization measures such as erosion control and revegetation of the haul roads will contribute to the mitigation of any potential geochemical concerns at closure.

5.2.2.2. Closure Measures

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 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. Should runoff from haul road bed materials present a geochemical concern, seeding and fertilization may be required.



TITLE	Figure 5-5: Haul Road and Site Road Typical Reclamation Cross-Section
PROJECT	MINTO MINE
DATE: September 2009	ACCESS JOB NO. MIN-05-01
DWN. RG/MD	CHKD.
REVISION NO.: 1	

The following section summarizes the closure measures related to both physical stability and geochemical stability that are planned for the haul roads. This will form the basis for the costing and scheduling.

Physical Stability

i. Remove culverts and haul away
   - *Labour x 40 hrs, hoe x 20 hrs, haul truck x 20 hrs*

ii. Recontour slopes and surfaces
   - *Dozer at 150 hrs*

iii. Scarify road surfaces
   - *Dozer x 150 hrs*

iv. Stabilize slopes
   - *Erosion barriers: 5 x 400 m^2 = 2000 m^2*

Chemical Stability

i. Continued testing and monitoring of runoff quality
   - *Ongoing operational cost, not included in closure costing.*

5.3 TAILINGS AREA AND DIVERSION STRUCTURES

The tailings from the Minto milling process undergo a dewatering process using ceramic filters before being conveyed to the tailings deposit area for spreading and compaction into a drystack tailings facility. The Company's Tailings Management Plan and related Operations, Maintenance and Surveillance plan (OMS) provides further detail on the tailings handling procedures. The general location of the tailings area and diversion structures is shown in Figure 5-1 and proposed reclamation measures for the tailings area and diversion structures are presented in Figure 5-6.

The Minto tailings deposit is located on a bench opposite (to the south) of the mill and upslope from the Minto Creek channel. It is being constructed as per the specifications provided in the Tailings Management Plan and overseen by the engineer of record for the facility (EBA). A quality control program is in place wherein compaction levels are regularly verified in the field 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). Data collected to date indicates that the conditions encountered in the field are consistent with those anticipated in the design.

MintoEx submitted a risk assessment report on the tailings facility to the Department of Energy Mines and Resources (EMR) in March 2009. The report was prepared by consultants to MintoEx who 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 drystack tailings facility versus a conventional slurried tailings impoundment and noted that the regulatory requirements necessary to mitigate risks are currently in place (SRK, 2009). Further information related to this report is discussed below in Section 5.3.1 – geochemical stability.

Operation of the tailings facility to date has provided valuable field experience with respect to the management of water in and around the facility. This information is being documented by field staff and forms input to OMS plan updates provided regularly by the engineer of record for the facility.

5.3.1. Closure Issues

Closure issues at the drystack tailings facility are centred around managing water movement in and around the facility. As well, the closure plan must address water quality if it is negatively impacted by the tailings.

After tailings are filtered, mechanically spread and compacted, the compacted tailings will have a low permeability factor. Infiltration of precipitation is not expected, as the deposit will effectively 'shed' direct precipitation. Progressively reclaimed (covered and revegetated) areas of the tailings deposit will further prevent infiltration of meteoric water on the deposit. Design components (upstream diversion ditches, finger drains and a toe berm) are intercepting and diverting surface runoff from upslope and filtering seepage from below the deposit.

Post-closure, seepage through the tailings will be monitored and pumped to the water treatment plant if necessary as proposed in the Water Management Plan (MintoEx, 2009)). A better understanding of the anticipated seepage quality is being acquired through regular monitoring of surveillance stations downstream of the tailings toe berm, identified as W8 and W8A in the Water Management Plan (MintoEx, 2009). These stations represent drainage through the two main finger drains beneath the tailings facility. Finger drain seepage results to date suggest elevated metal levels during spring runoff events, likely attributable to an initial flushing of material through the drains. Further monitoring is required to confirm this theory. At the time of this revision to the DDRP, it is possible that some collection and treatment of the water may be necessary at closure. Field investigations to understand and improve the functioning of the drystack tailings facility are ongoing.

In addition to field observations and water testing as per the WUL QZ96-006, MintoEx has developed a kinetic test program for tailings that will include both field and laboratory scale column tests. Composite tailings samples will be collected over the winter months of 2009-2010 and kept frozen until spring at which time the field scale tests will begin. Simultaneously, a laboratory scale test will be undertaken on a split of the sample being collected for the field test (humidity cell and columnar tests). The purpose of the tests will be to assist long term prediction of water quality off of the drystack tailings facility. Reporting on this initiative will be incorporated into the ABA program biannual reports. In addition, MintoEx has begun a monthly characterization of composite tailings samples which provides valuable information on the metal

levels present in the tailings. Costs associated with the proposed kinetic testing are identified in Table 8.1-13 Supporting Studies.

Previous test work has indicated no acid-rock drainage/metal leaching (ML/ARD) potential within the tailings (Mills, 1997) and there are no expected geochemical concerns with the tailings area.

Daily tailings samples are collected, forming a monthly composite sample, and tested as part of an acid base accounting monitoring program required under the WUL (QZ96-006, Appendix 6). To date, analyses have been received for approximately 20 samples. Of these samples, the average NP/AP ratio is 9.6. The average paste pH to date is 8.2. A more in depth discussion of the ABA sample results received to date is presented in the 2009 Annual Quartz Mining Licence Report (Access, 2009). See Section 5.9 Adaptive Management Planning for further discussion regarding ML/ARD mitigation.

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 construction of the plant is underway. Currently, test work is underway on a sample of water treatment sludge which was collected following some in-pit treatment that occurred throughout the summer of 2009 in order to determine whether or not the sludge can be processed with the tailings fraction of mill feed and deposited with the tailings. The test work to date has examined the properties of the sludge and whether or not it was suitable for the tailings circuit currently in place. Samples have also been sent to an accredited laboratory to undergo a Toxic Characteristic Leaching Procedure (TCLP). This sludge is thought to be representative of the sludge that will form in the water treatment plant since many of the same techniques and reagents will be used in future treatment of water. Having used similar reagents and treatment methods elsewhere, MintoEx's contracted designer/operator of the treatment plant (BioteQ Environmental Technologies Inc.) no issues related to disposal of the sludge are anticipated. Samples of sludge will also be incorporated into the kinetic testing of tailings to ensure its addition does not have a negative effect on tailings' geochemical stability.

Minto Mine Project

Detailed Decommissioning and Reclamation Plan

Minto Explorations Ltd.
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Mill Site

Minto Creek

High-Grade Ore Stockpile Pad

Dry StackTailings Storage Facility

Tailings Area Surface (75%)
- recontoured if necessary
- cover engineering to be determined
- revegetated based on trial plots

South Diversion Ditch

A'

A

Surface Water Diversion Berm

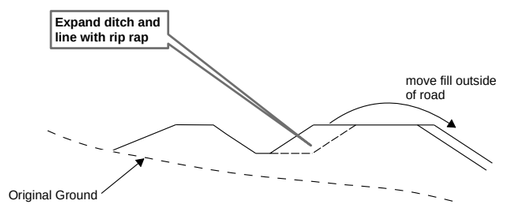
South Diversion Ditch
- south diversion ditch widened
- lined with 0.5m thick >200mm rip rap

Road

Exploration Road/Trail

Tailings Surface

ProgessiveReclaimedTailings (25% of Tailings Surface)



A-A' Diversion Ditch

NTS

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 5-6

Reclamation Measures for Tailings Area and Diversion Structures

Scale: 0 25 50 100 150 m

ebo ACCESS Consulting Group

Drawn by: HD/MD | Checked by: SK | September 2009

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlanSept09\

5.3.2. Closure Measures

Reclamation measures at the drystack tailings facility will focus on erosion control of the tailings surface. The facility will be sloped to limit precipitation infiltration into the tailings and some channelling and resloping prior to cover placement may be necessary. As well, the design of an engineered cover to prevent erosion of the tailings surface will be required.

In the first revision of this Plan, a cover of overburden with a thickness 0.5 m to be seeded and revegetated was suggested to accomplish the closure objectives. Costing related to closure methods will utilize this same approach for the purposes of this report. However, a more detailed tailings cover design study is underway as part of the ongoing reclamation research plan (see Section 4) and will be investigated to determine an optimum design. Once an acceptable cover design is established, progressive reclamation can begin (expected Year 4). It is expected that 25% of the the disturbed area requiring reclamation can be addressed prior to the end of mine life given the current timelines for research related to cover design and mine life.

At final closure, approximately 75% of the total deposit surface area will require reclamation, with the balance having been previously reclaimed during operations. Little recontouring of the thickened tailings material will be required as the repose will be approximately 1:40. The remaining surface of the tailings deposit will be covered with overburden growth media 50 cm thick and seeded (or an alternative optimum cover will be installed, depending on the outcome of reclamation research).

Reclamation of the filter building is covered in Section 5.5 under Mill and Ancillary Facilities reclamation measures.

The main diversion structure – the south diversion ditch – conveys the flow from the main tributary channel previously running through the area of the future tailings deposit into the mill water pond. This ditch is presently constructed to convey a 1 in 200 year flood event, so will require widening at closure to accommodate Probable Maximum Flood (PMF) calculated flows.

The following section summarizes the closure measures related to both physical stability and geochemical stability that are planned for the tailings facility and diversion structures. This will form the basis for the costing and scheduling.

Physical Stability

i. Haul and place overburden cover, 0.5 m thickness
   - *30.2 ha x 10,000 m2/ha x 0.5 m thick = 78, 000 m3*

ii. Revegetate based on trial success
   - *30.2 ha for seeding/fertilizing, re-seeding 16 ha, plant seedlings on 30.2 ha*

iii. Widen south diversion ditch and re-line and armour
   - *Hoe x 50 hrs*
   - *Supply install HDPE liner, 800 m x 6 m = 4800 m2*
   - *Haul and place rip rap, 800 m x 6 m x 0.5 m deep = 2400 m3*

Chemical Stability

i. Monitor diverted seepage and runoff water quality as part of post closure monitoring program
   - *Monthly during active closure, monthly to semi-annually in post-closure.*
   - *Supporting studies on tailings kinetics to take place during operational life of mine.*

5.4 MAIN WATER DAM

The location of the main water dam relative to the other site development is shown in Figure 5-1. The water dam on Minto Creek provides water retention for mill processes and various site uses during operations. It was initially predicted that excess water would meet the Water Use Licence effluent criteria and be discharged passively to Lower Minto Creek over the dam spillway. Two years of operational experience and heavy precipitation events in 2008 followed by a high snowpack in winter 2008-2009 has brought about a plan to install a water treatment plant as per the Water Management Plan (Access, 2009). The plant will be operational in 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 into the foreseeable future in order to provide a settling pond where turbid runoff waters will undergo retention, monitoring and treatment if required. Once active treatment is able to stabilize the water quality in Minto Creek such that acceptable effluent criteria exists in the pond, water will be allowed to move into the creek over the dam spillway.

5.4.1. Closure Issues

Physical stability of the main water dam will be ensured during operations and 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). Minto intends to implement such a review in 2010.

5.4.2. Closure Measures

Physical stability inspections during mine operations will serve to inform a detailed maintenance plan for post-closure. It is expected that the dam would be fortified against erosion using rip rap armouring on a maintenance schedule yet to be determined. Regular inspections will be required and will be timed to track site performance during major run off events including freshet and late summer rain events. Monitoring requirements are addressed in tables 8.1-12, 8.2-12 and 8.3-12 – Site Management and Monitoring – Estimated Final Costs.

Physical Stability

i. Dismantle and remove reclaim system, including pumps, buildings and pipeline (lines already in place during operation for water treatment purposes).
    - *Labourer x 268 hrs, Trades labourer x 98*
    - *Hoe x 120 hrs, haul trucks x 100 hrs*

ii. Recontour pipeline alignment
    - *Dozer x 16 hrs*

Chemical Stability

i. Water quality will continue to be monitored as required for post closure monitoring (Section 7.4.)

5.5 MILL AND ANCILLARY FACILITIES

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

- mill and mill reagents;
- concentrate shed;
- filter building;
- mill water pond

The general location of the milling area is shown in Figure 5-1, and general closure issues and measures are presented for these facilities and are shown in Figure 5-7. Specific decommissioning activities are also outlined in sections 5.5.3 to 5.5.8 for the mill and the ancillary structures.

5.5.1. Closure Issues

Concern regarding physical stability of these structures at closure will be mitigated for the most part by their disassembly and removal from the site. Of these facilities, only the mill water pond closure measures require significant engineering design and earthworks to mitigate physical stability issues.

Chemical stability issues for this area and facilities would arise primarily from contamination of surrounding soils by fuel, chemicals or concentrates. Such instances will be documented through an environmental audit, conducted upon the completion of milling activities.

N

Fuel Storage Area
- remove bulk fuel storage and piping facilities
- fold and bury liner
- recontour and revegetate

Overall Mill Site Area
- haul any contaminated soil to land treatment facility
- haul and place overburden cap
- recontour/roll crests
- dress with 25cm overburden
- revegetate

Camp
- remove camp
- recontour and revegetate

Camp

Mill Building and Reagents
- dismantle building
- remove salvagable equipment
- haul scrap to solid waste facility
- load and return unused reagents/chemicals

Filter Building and Concentrate Shed
- dismantle building
- remove salvagable equipment
- salvage and remove powerline and poles
- haul scrap to landfill
- demolish concrete and cover structures

Minto Creek

Water Treatment Plant
- operate water treatment plant as needed
- then dismantle and remove

Mill Water Pond

(See Figure 5-9)

Minto Creek

Minto Mine Project

Detailed Decommissioning and Reclamation Plan

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- Access Road
- Road
- Exploration Road / Trail
- Transmission Line
- Contour
- Site Feature Profile Contour
- Water Course
- Areas of Construction

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 5-7

Reclamation Measures for Mill and Ancillary Facilities

Scale: 0 25 50 m

Drawn by: HD/MD	Checked by: SK	September 2006

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlanSept2009

5.5.2. Closure Measures

A salvage program will be employed before the end of mine life to minimize in-situ final disposal of mill and ancillary facility scrap. It is expected that removal of the mill and ancillary facilities will be done by auction or contractor for salvage value.

Contaminated soil will be remediated on site at the site's approved Land Treatment Facility, and mill reagents and chemicals will be removed from site. Propane storage tanks and hardware items will be returned to the supplier.

The reclaim line and all above ground power cables and overhead power line gear will be salvaged. Buried services such as piping and wiring will remain buried. Concrete footings will be semi-demolished by drilling and blasting as required and will be covered with fill and recontoured to establish final drainage runoff patterns. Culverts will be removed and the entire area will be covered in 1 metre of overburden and revegetated. Non-salvageable materials will be buried in waste rock in the waste rock dumps.

The following section summarizes the closure measures related to both physical stability and geochemical stability that are planned for the mill and ancillary facilities. This will form the basis for the closure costing and scheduling.

<u>Physical Stability</u>

i. Remove salvageable equipment from mill, filter building, generators and concentrate shed,
   - *Labour x 790 hrs, trades labourer x 840 hrs*
   - *Crane support x 64 hrs*

ii. Decontaminate Building – hosing and clean-up
   - *Labourer x 160 hrs*

iii. Dismantle buildings
   - *Labour x 1160 hrs, trades labourer x 680*
   - *Hoe x 160 hrs, crane support x 90 hrs*

iv. Concrete demolition
   - *Blaster x 80 hrs, hoe x 40 hrs, dozer x 40 hrs*

v. Scrap haul to solid waste facility
   - *Hoe x 60 hrs, haul trucks x 120 hrs*

vi. Test soils for contamination and haul to land treatment facility
- *Environmental scientist x 35 hrs*
- *Hoe x 15 hrs, haul truck x 15 hrs*

vii. Fold and bury liner for fuel storage area
- *Hoe x 20 hrs, dozer x 100 hrs*

viii. Re-contour area and slopes to bury footings and establish drainage
- *Dozer x 100 hrs*

ix. Haul and place 1 m deep overburden cap and contour for seeding
- *5.0 ha x 1 m depth = 50,000 m^3*

x. Revegetate based on trial success
- *5.0 ha for seeding/fertilizing, re-seeding 2.5 ha, plant seedlings/shrubs on 4.0 ha*

Chemical Stability

i. Environmental audit/site assessment prior to closure activities to identify contamination sources
- *Conducted by consultant, sampling and reporting included*

ii. Mill reagents returned to suppliers or removed as waste as appropriate, based on storage condition
- *Costs dependant upon stock/condition at closure*

iii. Contaminated soils excavated/removed to land treatment facility based on findings of environmental investigation
- *Costs dependant upon findings*

iv. Water quality will continue to be monitored at the mill water pond channel outlet as required for post closure monitoring (see section 7.4 Compliance Monitoring and Reporting)

5.5.3. Mill Building

Closure measures for this site include removal of the salvageable mill components, such as the ball and SAG mill and milling-related equipment stored here. 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. The concrete mill foundations will then be partially demolished and pushed in, covered with fill and overburden and revegetated.

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.

5.5.4. Generator Buildings

The generator buildings will be removed from the site after the power hookups are disassembled. Site reclamation after the building removal is covered in section 5.5.8.

5.5.5. 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 partially demolished by blasting. 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 (see section 5.5.7 Mill Water Pond). This section of the foundation would be pushed into the interior of the remaining footings area, and all footings will be collapsed inward and buried with fill prior to surface reclamation.

5.5.6. 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.

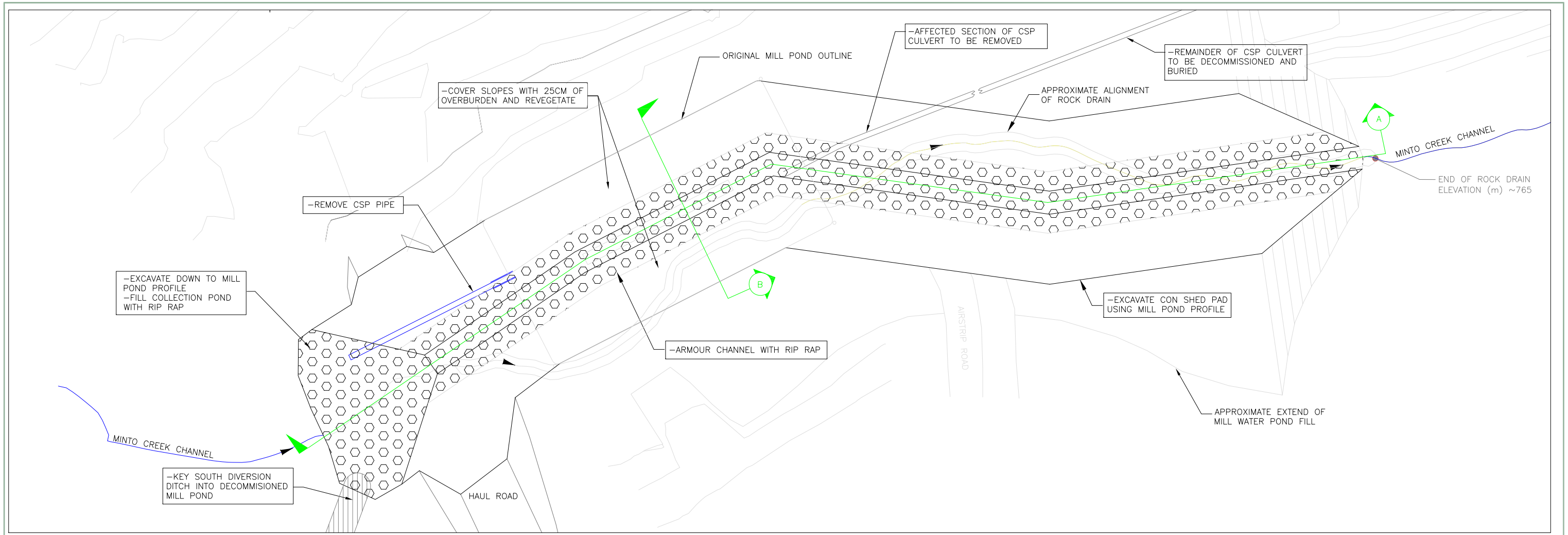
5.5.7. Mill Water Pond

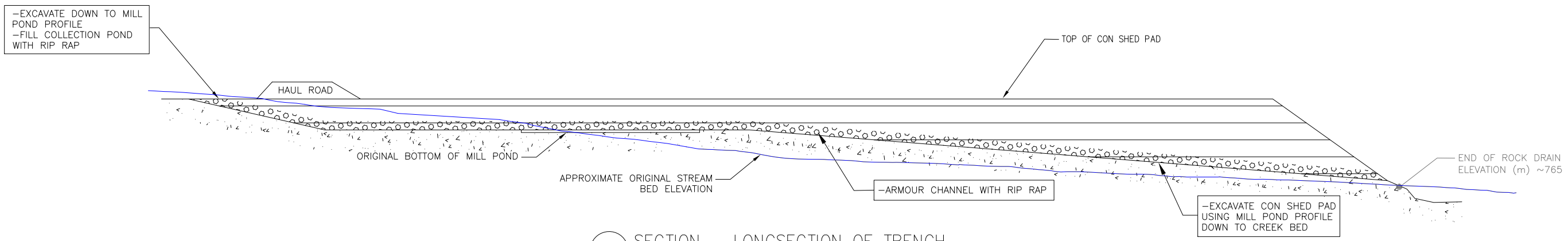
The mill water pond is a lined pond, constructed according to EBA's Final Preliminary Design – Mill Water Pond, Minto Property, Yukon Territory (1997). Together, the mill water pond and the main dam impoundment retain the water needed for make up process water for milling activities, supplementing water 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. 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 5-8 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 dimensions as those utilized for the main dam spillway construction.

Water quality will be monitored at the mill water pond discharge as required. See Section 7.4 for the post closure monitoring schedule.





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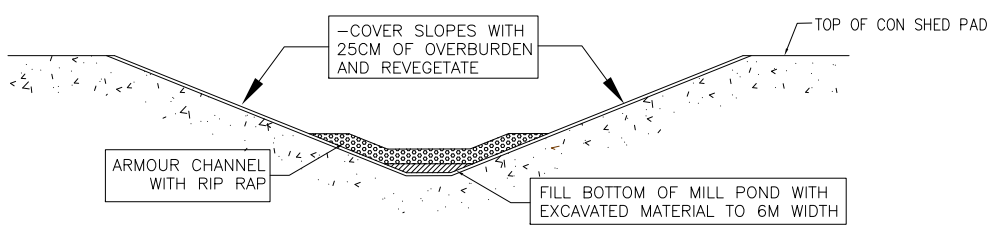

MILL POND SECTION B

Data (Fig–Overall_Plan.dwg) provided by Minto Exploration Ltd., September 2009

eba ACCESS CONSULTING GROUP Minto Explorations Ltd.

TITLE	FIGURE 5-8: RECLAMATION MEASURES FOR MILL WATER POND
PROJECT	MINTO MINE
DATE: September 2009	ACCESS JOB NO. MIN-05-01
DWN. CSF	CHKD.
	REVISION NO.: 1

L:\dwg\ClosurePlan_2009\Fig5_9_Mill Pond 2 CSF.dwg [FIGURE MP1] October 01, 2009 - 2:04pm mdutcharme

5.5.8. Mill Reagents and Chemicals

Unused mill reagent supplies will be returned for credit once the mill has been shut down. It is anticipated that all reagent product will be properly contained/stored so that no product will be considered special waste. A closure inventory/investigation of reagents and hazardous materials on site will be conducted upon the cessation of mining activities and the implementation of the closure plan. 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 inventory of hydrocarbon products at the Minto site will be consumed as part of the interim closure. Fuels and lubricants will be required during the two-year period for implementation of the interim closure measures after mine shutdown. 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 fuel 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 cubes, 200 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 such material will be small in volume.

During the final site assessment, petrochemical contaminated soils will be identified and processed for remediation. Any fuel storage areas and refueling stations, once decommissioned, will then be assessed for soil contamination. The affected soils will be treated at the company's permitted Land Treatment Facility.

5.6 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 Project Area Overview shows the alignment of the main access road.

5.6.1. Closure Issues

The Company expects that the determination of the closure fate of the main access road will be made in consultation primarily with the Selkirk First Nation 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.

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 Selkirk First Nation Lands and Resources Department so that a scope of work for closure could be jointly developed. To date, there are no chemical stability concerns associated with the main access road.

5.6.2. Closure Measures

Should a deactivation option be selected for the road, it will be subject to standard road decommissioning and reclamation measures at closure, including culvert excavation, drainage recontouring, slope stabilization and surface scarification. This will include conducting culvert removal work 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 the 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.

Closure objectives for the site access roads include slope and drainage stabilization, erosion prevention and revegetation. Actual decommissioning measures will include recontouring, scarification, and removal of stream culverts. On steeper slopes, erosion barriers will be placed at frequent intervals to ensure stability.

A number of culverts will be removed upon final closure of the road. Of key importance is the removal of culverts at stream crossings which are fish bearing. At these stream crossings, the roadbed would be cut down to the culvert and original streambed elevation with side slopes brought back to 2:1. 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 closing reclamation has essentially been completed in the upper Minto Creek basin.

Experience shows that vegetation should re-establish itself in the 30 m wide cleared 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.

Figure 5-5 depicts the typical treatment of the access road for final closure. The following section summarizes the closure measures related to physical stability that are planned for the main access road, assuming entire deactivation. This will form the basis for the costing and scheduling.

Physical Stability

i. Excavate and remove culverts
   - *Labour x 415 hrs, tradesmen x 40 hrs*
   - *Hoe x 140 hrs, haul truck x 100 hrs*

ii. Recontour and stabilize slopes and re-establish drainages
   - *Dozer x 70 hrs, 1000 m^2 erosion control blanketing*

iii. Revegetate slopes in drainage areas
   - 2 ha *for seeding/fertilizing, re-seeding 1.0 ha, plant seedlings/shrubs on 1.0 ha*

iv. Scarify road surface
   - *Grader x 150 hrs*

v. Remove Big Creek bridge
   - *Remove decking and span: labour x 50 hrs, crane x 40 hrs, hoe x 40 hrs, lowbed truck x 20 hrs*
   - *Cut off piles: labour x 50 hrs*
   - *Recontour banks if necessary: hoe x 30 hrs, dozer x 30 hrs*

vi. Reclaim barge ramps
   - *Remove gravels and recontour and scarify areas: hoe x 20 hrs, dozer x 30 hrs*

Chemical Stability

Chemical stability is not a concern for the reclamation of this component.

5.7 MISCELLANEOUS SITES AND FACILITIES

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

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

General closure issues and measures are presented for these areas and closure measures are shown in Figure 5-9 Summary of Reclamation Measures. Specific decommissioning activities are also outlined in sections 5.7.3 to 5.7.8.

5.7.1. Closure Issues

Any concern that may exist regarding the physical stability of these structures/areas at closure will be mitigated for the most part by either:

a) disassembly and removal from the site; and/or
b) recontouring and revegetation of the area.

Chemical stability issues for this area and facilities would 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.

5.7.2. Closure Measures

The salvage program before the end of mine life will minimize in-situ final disposal of any scrap generated in the decommissioning of these facilities. 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.

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.

Buried services such as piping and wiring will remain buried. Concrete footings will be semi-demolished by drilling and blasting as required and will be covered with fill and recontoured to establish final drainage runoff patterns. Culverts will be removed and pertinent areas will be covered in 0.25 metres of overburden and revegetated.

The following section summarizes the closure measures related to both physical stability and geochemical stability that are planned for these miscellaneous sites and facilities. This will form the basis for the closure costing and scheduling.

Physical Stability

i. Remove salvageable equipment from camp and explosives plant area
   - *Labour x 804 hrs, tradesmen x 50 hrs*
   - *support equipment*
ii. Dismantle buildings
   - *Labour x 1400 hrs, hoe x 150 hrs*
iii. Site clean-up
   - *Labourer x 500 hrs*
iv. Scrap haul to solid waste facility
   - *Hoe x 20 hrs, haul trucks x 50 hrs*
v. Reclaim septic system
   - *Labour x 10 hrs, hoe x 2 hrs*
vi. Scarify airstrip to promote natural revegetation
   - *Grader x 20 hrs*
vii. Reclaim solid waste facility and land treatment facility
   - *Tractor trailer x 40 hrs, dozer x 16 hrs, hoe x 40 hrs, haul truck x 40 hrs*
viii. Recontour areas and site roads, cover in overburden 0.25 m thick
   - *5.2 ha x 0.25 m = 13,000 m^3*
ix. Revegetate based on trial success
   - *5.2 ha for seeding/fertilizing, re-seeding 2.5 ha, plant seedlings/shrubs on 4.0 ha*

Chemical Stability

i. Environmental audit/site assessment prior to closure activities to identify contamination sources
   - *Conducted by consultant, sampling and reporting included*

ii. Contaminated soils excavated/removed to land treatment facility based on findings of environmental investigation
   - *Costs dependant upon findings*

iii. Closure plans submitted for waste facilities
   - *2 plans prepared by consultant*

iv. Special wastes and recyclables removed from site
   - *Costs based on materials stored at facilities at closure*

5.7.3. 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/changehouse 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.

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 recontoured for erosion stabilization, covered in 0.25 m overburden, and revegetated.

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 covered with local soils. The remaining infrastructure (i.e. piping and related materials, including the septic field) for the two systems would remain buried.

5.7.4. Airstrip

During the period of inactivity (1997-2005) the airstrip saw substantial colonization by natural vegetation. Upon final closure, the airstrip will be scarified and allowed to revegetate naturally. Seeding will not be required, as there is minimal erosion potential with the airstrip. The airstrip makes up approximately 2.4 ha of the total 29.2 ha area of all the miscellaneous sites.

5.7.5. 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 Minto Explorations Ltd. These measures will be implemented as required by the exploration crew, and are not subject to closure planning in this plan.

An old exploration trail system exists around the height of land surrounding the general mine area. These trails primarily follow the local ridges navigating the highest elevations of the Minto Creek catchment basin. These trails have provided access for mineral exploration activities and are characterized by intermittent trenching lines, drilling pads, and various forms of non-hazardous debris related to these exploration activities. The trail system is also used by a local trapper who has a small cabin along the ridge immediately to the north of the mill and campsite.

The exploration trails are outside of the immediate mine site and have seen only minimal use in recent years. The trails are narrower than the main access road and generally follow topographic contours (i.e. were not constructed using cut and fill techniques). They will be left to allow for natural vegetation to continue, which should be successful due to the proximity of the seed source and the minimal compaction during original construction and subsequent use. Some recontouring and stabilization may be required in a few locations where potential erosion is a concern. A number of areas were identified in Fall 2009 for erosion control measures that will include the installation of swales and water bars .

5.7.6. Land Treatment Facility

The 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 m^3 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 the 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.

5.7.7. 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 facility will receive construction and operational waste throughout the operation of the mine, as permitted by the authorization, 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 (known as "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. At mine closure, salvageable material from these sites will be sold as scrap and removed from the site. 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.

Hazardous materials so removed will be 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.

At final closure, the submission to YG of a formal Closure Plan for the solid waste facility will be required, documenting the conditions and materials at closure. Preceding the final facility reclamation, 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.

5.7.8. 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 5-1).

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 and decommissioned (destroyed) by excavator. Any fuel-contaminated soils will be excavated and hauled to the land treatment facility for treatment. The disturbed areas will be recontoured if necessary and covered with overburden growth media and revegetated. Seed mixtures and fertilization specifications will be based on both revegetation trials and natural revegetation observations and success.

5.7.9. Mine Roads

All mine roads will be subject to typical road reclamation measures, as per haul roads and main access road. These measures are laid out in Figure 5-5.

5.8 SUMMARY OF CLOSURE METHODOLOGY

Figure 5-9 presents an overview of the closure and reclamation measures for the all mine development components over the entire site.

Minto Mine Project

Detailed Decommissioning and Reclamation Plan

Minto Explorations Ltd.
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Main Waste Rock Dump
- crests rolled, surfaces covered with 25cm of overburden
- revegetate based on trial plots

Reclamation Overburden Dump
- Materials used for reclamation/cover

Open Pit
- pump system removed
- diversions rerouted to fill pit
- pit flooded to the 791.5m elevation

Mill and Ancillary Facilities
- equipment and buildings removed
- fuel storage and propane tanks and lines removed
- foundations buried
- unused mill reagent supplies returned
- site recontoured and revegetated

Main Water Dam
- retain dam for settling capacity

Mine Camp and Related Infrastructure
- disassemble camp trailers and infrastructure
- remove salvageable materials and trailers
- septic tanks pumped out, crushed
- recontour and revegetate

Main Waste Dump

Oxide Pad for Low-Grade Ore Stockpile

Reclamation Overburden Dump

Mill Site

Open Pit

Main Access Road and Powerline
- slope and drainage stablilization
- erosion prevention
- recontour, scarify and remove stream culverts
- stabilize stream channels and revegetate slopes
- natural revegetation

Haul Roads
- scarified
- natural revegetataion

High-Grade Ore Stockpile Pad

Tailings Area
- recontoured if necessary
- 25cm overburden cover added
- haul and place overburden
- revegetated based on trial plots

Ice-Rich Overburden Dump
- overburden used as growth media cover for other areas of reclamation
- reslope and revegetate remaining overburden
- revegetation seed mixtures to be determined from test plots

Ice-Rich Overburden Dump

Contractor's Shop and Work Area
- buildings dismantled and removed
- recontoured
- 25cm overburden and revegetate

Mill Pond
- upstream culvert removed
- liner removed
- construct armoured channel through mill pad

Dry StackTailings Storage Facility

Ore Stockpile Pads
- stockpile pads covered with overburden and seeded

Solid Waste Management Facility
- salvagable or recyclable material removed from site
- cover site with 25 cm overburden
- revegetate

South Diversion Ditch
- south diversion ditch widened
- lined with HDPE 0.5m deep >200mm rip rap

South Wesr Dump
- crests rolled, surfaces covered with 25cm of overburden
- revegetate based on trial plots

South West Dump

Airstrip
- natural revegetation

Airstrip

Land Treatment Facility
- dismantle and decommission
- site recontoured
- soils spread over site, recontoured and revegetated, overburden added if necessary

Explosives Plant Site
- remove unused explosives from site
- remove magazines
- dismantle and remove silos and buildings
- recontour, revegetate

Access Road
Road
Exploration Road/Trail
Transmission Line
Site Feature Profile Contour
Watercourse
Contour Line
Area of Construction

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 5-9

Summary of Reclamation Measures

Scale: 0 50 100 200 300 400 m

ebo ACCESS CONSULTING GROUP

Drawn by: HD/MD | Checked by: SK | September 2006

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlanSept2009

5.9 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 Post Closure Management, proposes the continuation (and progressive scaling back) of the majority of these monitoring initiatives during the active closure and post-closure period.

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. As noted in Section 5 when compared with the 2007 Plan, 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. MintoEx is committed to AMP in the context of closure of some of the higher risk features on the site. MintoEx sees the application of AMP for the following mine component/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. These data have guided tailings placement, and will inform revisions of the closure plans. Currently, an updated version of the OMS plan for the drystack tailings is underway (expected submission date October 31, 2009). At this time, a number of adaptive actions have taken place within the framework of existing operations protocols including:
    - Daily oversight by mine staff;
    - Continual dialogue with the engineer of record;
    - Regular field visits by the engineer of record;
    - Collection of monitoring equipment data (e.g. piezometers, thermistors);
    - QA/QC checks on compaction; and
    - Annual geotechnical inspections by the engineer of record

  The following actions were taken in accordance with the adaptive management plan for the drystack tailings facility already in place:
    - In spring 2008, run off water was pooling upstream of drystack tailings. Based on field observations, a decision was made to widen the finger drain to accommodate the run off paths. The run off paths as noted in the field were incorporated into the design of future finger drains;
    - Finger drain material placement inspected in the field by the engineer of record to ensure it is placed to design; occasionally non-spec material is identified and replaced;
    - When “murky” water was noted at the toe of the finger drains during the 2007-2008 annual inspection (EBA, 2008), advice was provided to mine staff on how to place tailings so that they do not erode into the flowpath of the finger drains; and
    - In response to surface runoff observed during freshet 2008, tailings were graded to avoid pooling in advance of freshet 2009 and snow was removed from the tailings and placed upstream to allow for a slower melting time and increased chance of water being channelled as per the drystack tailings design.

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.

An Adaptive Management Plan for the long term closure of the Tailings Storage Facility is being developed with each season of operational expertise gained. The proposed kinetic tailings testing will add an important geochemical angle to the information already acquired. Drafts of a long term tailings monitoring plan will be presented in future revisions of this DDRP as operational monitoring data further clarifies the picture of physical, thermal and geochemical stability.

- **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, and all results to date have indicated that there is no ML/ARD concern with materials extracted. This will continue to guide the placement of waste materials during operations, ensuring that any materials with acid generating potential is not used for construction and is confined to the assigned waste placement areas. Furthermore, 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.

- **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. Current data indicates that there is a deficiency of overburden (57,000 cubic metres) when compared to the current

footprint and using the methodologies described above. However, Preliminary drilling core results indicate that there is sufficient material available for the planned closure initiatives within the claims that will be accessible in the proposed next phase of mining. An updated inventory of overburden material versus conceptual closure methods for the next phase of mining will be included in the associated permit application. If at any time in the closure process the needs exceed the inventory by more than 100,000 cubic metres, the Company will have in place an adaptive management plan for ensuring that sufficient growth media is available for the required reclamation. This plan will also 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 and departmental correspondence leading up to and after closure.

These adaptive management plans will be developed 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.

6.0 IMPLEMENTATION SCHEDULE

The mine life is expected to be approximately 6 years with active mining ending in the third quarter of 2013 given current permitted mineable reserves. Reclamation of the disturbed areas will be done in phases, initially 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.

Year 3 to Year 6 - Operations

Phase II of the reclamation program was initiated with the mine in full production and will continue until the end of the life of the mine. A moving three-year plan will be formulated each year outlining progressive reclamation objectives and refining reclamation studies. This will include:

- the area of disturbed land at the beginning of the period;
- the area of additional lands to be disturbed during the period;
- the area of disturbed land to be prepared, seeded and/or planted and fertilized;
- the area of remaining disturbed land at the end of the period;
- ongoing progressive reclamation of waste rock dumps, tailings area, overburden dump and fill slopes;
- ongoing evaluation of test plots and reclamation trials;
- the initiation of additional reclamation research as required;
- the undertaking of larger scale progressive reclamation of abandoned or phased out areas; and
- ongoing monitoring results and analysis.

Currently, the commitments to progressive reclamation have been scaled back because of the impending application to mine further reserves on the Minto claims. As such, a number of changes will be proposed, including use of the MWD for future waste storage and potential capacity expansion of the drystack tails. As such, the schedule below may be improved upon and more progressive reclamation included addressing components of the mine for which their

active use is known in more detail. The schedule below was developed on the assumption that permitting of further mining does not occur.

Table 6-1 Schedule for Progressive Reclamation Activities during Mine Operations

Mine Component	Total Area for Reclamation (Progressive and Final - Hectares)	Reclamation Category	Total Area for Progressive Reclamation (Hectares)	Operational Year					
				1	2	3	4	5	6
waste Dumps (20% reclamation after active mining)	120.2	Earthworks	24	0	0	0	0	0	24
		Revegetation	24	1	2	0	0	0	24
Ice-Rich Overburden Dump (Toe Berm)	6.9	Earthworks	1.2	0.25		-	-	-	0.95
		Revegetation	0.95	-		-	-	-	0.95
Tailings Area	41.3	Earthworks	10.3	-	-	-	-	5	5.3
		Revegetation	10.3	-	1	-	-	4	5.3
Test Plots and Reclamation Trials	4	Earthworks	-	-	-	-	-	-	-
		Revegetation	TBD	1	1	1	1	-	-

This table provides the approximate schedule for progressive reclamation (earthworks and revegetation) for the 6 year mine life. The work is scheduled by mine component on a hectare basis. Costs associated with these activities are presented in section 8, Table 8-13.

Year 6 – Mine Closure and Commencement of Reclamation

Final preparation for closure will be done in the end of year 5 and closing reclamation will commence in the second half of year 6, the final year of production. Much of the reclamation of the waste dumps will be ongoing (expected 20% complete) as reclamation activities will commence once active mining in the pit ends and stockpiles are being depleted. No ore will remain on the mill stockpile or on the low grade sulphide stockpile by the third quarter, 2013. All concentrate spills around the concentrate storage area will be recovered and blended into the mill feed with no further cleanup required after the mill has been shut down. Levels of fuel, reagents, explosives and other operating supplies stored on site will be reduced to minimum levels. Water treatment and monitoring will be ongoing.

Year 7-9 – Active Decommissioning

It is anticipated that 3 years will be required to fully implement and complete all aspects of the decommissioning and reclamation works. The work would be conducted seasonally during the ice-free period (May-September). During the first year of closure, the majority of site decommissioning works would be initiated.

As one of the first steps in decommissioning the site, an environmental site assessment/audit will be done to identify any closure issues not addressed at the time of writing this plan.

Decommissioning and final closure of the main property access road will be the last closure measure to be fully completed.

Water treatment is expected to take place for three months during the seventh year and a further three months during year eight in order to stabilize water quality in the Minto Valley. 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 treatment is necessary.

Year 11-22 – Closure Monitoring

A program of post closure monitoring and inspection will be carried out during the implementation of closure measures and for a 12-year period following closure. The details of the post closure-monitoring program are discussed in Section 7.4. The program would continue until it is demonstrated that closure objectives have been met and performance in the long term is assured.

7.0 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 the 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. Table 7.1 provides a summary of the personnel requirements by year for decommissioning and reclamation works. 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 Selkirk First Nation members employed during implementation of the Plan and will continue to work with Selkirk to optimize long term closure monitoring requirements.

Prior to undertaking closure activities, as part of a comprehensive environmental site assessment, areas of suspected oil, chemical, or other contaminant spills will be tested to confirm locations and quantities requiring clean-up. This site assessment will review previous operational reports and procedures and identify areas of potential concern or contamination. Follow-up testing would be undertaken and plans refined for remediation.

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 Selkirk First Nation. 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.

The level of access road decommissioning will be discussed first with the Selkirk First Nation as the access road lays within SFN Category "A" settlement lands. Government regulators and the local trapper will also be consulted regarding decommissioning plans for the road.

Table 7.1 Site Decommissioning and Reclamation Seasonal Personnel Requirements

Personnel	Closure Period Year 1	Closure Period Year 2	Closure Period Year 3	Post Closure Year 4 to 15
Project Manager	1	1	1	
Construction Supervisor/Engineer	1	1	1	
Environmental Monitoring * incl water treatment operators	3	3	3	2
Equipment Operators	12	4	2	
Equipment Mechanics/Welders/ Fabricators/Electricians	5	5	1	
General Labourers	5	3	2	
Catering Staff	2	1		
Total Seasonal Personnel	27	16	8	1
Part Time Off Season Site Security/Caretaker *	1	1	1	1

Note: Some personnel may be contractors.

* Denotes Selkirk First Nation Band member

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, detailed plans for all earth works and inspections would be prepared and submitted to the YWB and YG Energy Mines and Resources 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 Yukon Water Board 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 Minto Ex. 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 dam 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 Tailings Storage Facility 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 MintoEx staff to look for environmental hazards and site stability. MintoEx 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 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 effective 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 MintoEx 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. MintoEx will work directly with SFN in this regard.

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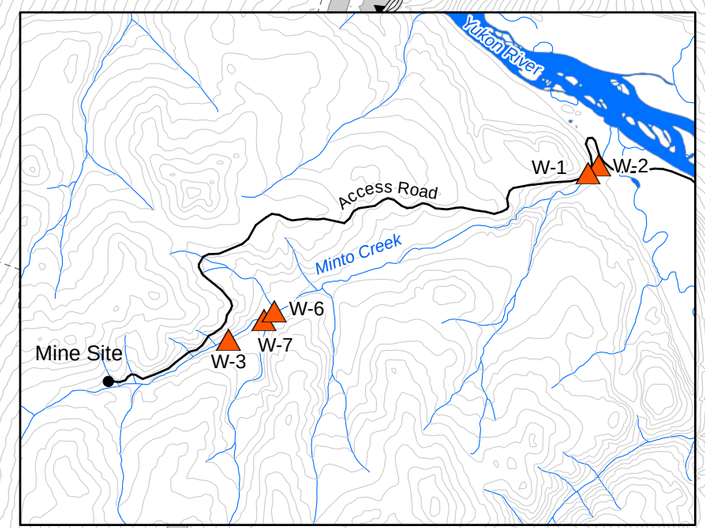
Main Waste Dump
Oxide Pad for Low-grade Ore Stockpile
Reclamation Overburden Dump
Ice-rich Overburden Dump
South West Dump
Explosives Yard
Open Pit
Mill Site
Camp
Mill Pond
High-Grade Ore Stockpile Pad
Dry Stack Tailings Storage facility
Main Water Dam
Impounded Water Surface
Access Road and Power Transmission Line
Minto Creek
South Diversion Ditch
Diversion Berms
Solid Waste Facility

W-10
W-11
W-12A
W-13
W-15
W-16
W-17
W-18
W-19
W-8
W-8A



- Water Quality Sampling Station
- Access Road
- Road
- Exploration Road / Trail
- Transmission Line
- Contour
- Site Feature Profile Contour
- Water Course
- Intermittent Water Course
- Areas of Construction

Data used to create this map (Fig_Overall_Plan.dwg) obtained from Minto Exploration Ltd., September 2009.

UTM Zone 8N NAD83

Figure 7-1

Monitoring Station Locations

Scale: 0 50 100 200 300 400 m

ACCESS CONSULTING GROUP

Drawn by: MD	Checked by: SK	September 2009

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlan_2009

Minto Mine Project

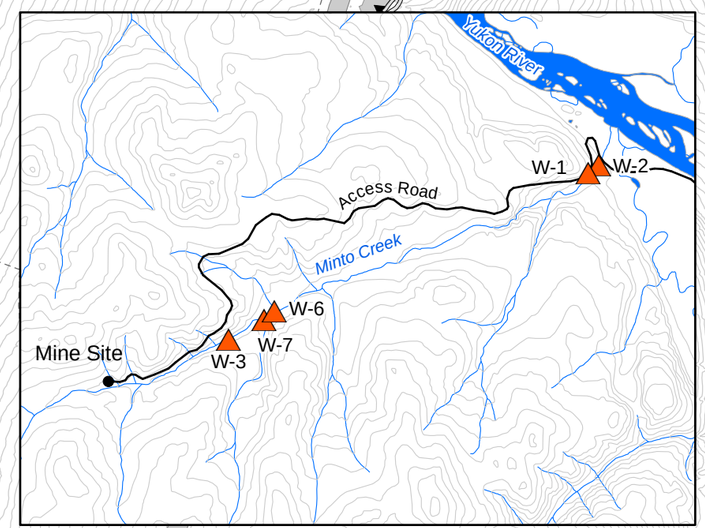
Detailed Decommissioning and Reclamation Plan

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

N

Main Waste Dump
Oxide Pad for Low-grade Ore Stockpile
Reclamation Overburden Dump
Ice-rich Overburden Dump
South West Dump
Explosives Yard
Open Pit
Mill Site
Camp
Mill Pond
High-Grade Ore Stockpile Pad
Dry Stack Tailings Storage facility
Main Water Dam
Impounded Water Surface
Access Road and Power Transmission Line
Minto Creek
South Diversion Ditch
Diversion Berms
Solid Waste Facility

W-10
W-11
W-12A
W-13
W-15
W-16
W-17
W-18
W-19
W-8
W-8A



- Water Quality Sampling Station
- Access Road
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UTM Zone 8N NAD83

Figure 7-1

Monitoring Station Locations

Scale: 0 50 100 200 300 400 m

ACCESS CONSULTING GROUP

Drawn by: MD	Checked by: SK	September 2009

Our File: D:\Project\AllProjects\Minto\gis\mxd\ClosurePlan_2009

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.

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 YG EMR in accordance with conditions contained in the Water Use Licence, and Quartz Mining Licence and other operating permits and approvals as may be.

Minto Ex 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 YG EMR and or other interested parties. Once this review is completed, Minto Ex would apply to the Minister of YG 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 Minto Ex 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.

MintoEx's priority during any temporary closure scenario is to ensure that the site remain geochemically and physically stable, secure and safe, monitored and in compliance with applicable licenses and legislation. Generally speaking, this will include both initial stabilization and then ongoing routine monitoring and maintenance of the site infrastructure and facilities. 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 7-3 provides a summary of the various project components and the inspection and maintenance activities for use during any temporary cessation of mining activities.

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 run off 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.

Conducted during operations on an ongoing basis, these measures are intended to devise an effective reclamation program as soon as operationally possible, to reduce both financial and operational liability.

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 Water Management Plan (MintoEx, 2009).

This 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.

Upon the move into temporary closure, a security gate will be installed on the main access road adjacent to the dam. This is a steep cut and fill location that will prohibit vehicle access around the gate. Snowmobile/ATV access can not 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 on a form as presented in Table 7-6. Submitted to management on a regular basis, any reports of changes in physical status of any part of the site may warrant a follow-up investigation by managers and/or professional personnel.

MintoEx'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 Dam;
- Mill Water Pond;
- Waste Rock and Overburden Dumps; and
- Diversion Ditch (es).

In addition, the Company's Environmental Monitoring Plan further commits to structural monitoring of these elements. Tables 7-7 and 7-8 are the inspection sheets developed for documenting the results of these inspections. These programs will continue in the event of any temporary closure, with results to be included in annual reporting under the water license.

The monitoring program for the physical stability of the tailings deposit is presented in MintoEx's Tailings Management Plan (January 2007) which was approved in April 2007. 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 shown in Figure 7-1.

7.6.3 Reporting

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

8.0 CLOSURE COSTS

Costing of the proposed closure measures is the basis for the security provision schedule. As such, cost estimates have been prepared for three distinct instances in the life of the mine:

- Year 2 (third quarter, 2009) in Section 8.1 (Tables 8.1-1 through 8.1-13);
- Year 4 in section 8.2 (Tables 8.2-1 through 8.2-13); and
- End of Mine Life (after Year 6) in section 8.3 (Tables 8.3-1 through 8.3-12).

These cost estimates for Year 0 and Year 2 will be reviewed by EMR through a third party and amended accordingly. These estimates once approved by EMR will form the foundation for the estimates for implementing the closure measures at the end of mine life.

The estimated costs to implement the decommissioning and reclamation measures described in this report are presented in Tables 8.1-1 through 8.1-13 (Section 8.1) for Year 0, Tables 8.2-1 through 8.2-13 for Year 2 (Section 8.2) and Tables 8.3-1 through 8.3-12 for Final Closure (Section 8.3). Table 8.x-1 in each section presents the summary of cost estimates for various mine components including:

- Waste Rock And Overburden Dumps;
- Open Pit and Haul Roads;
- Tailings Area and Diversion Structures;
- Main Water Dam;
- Mill and Ancillary Facilities;
- Mill Pond;
- Access Road;
- Miscellaneous Components;
- Reclamation Research and Revegetation;
- Post Closure Management and Monitoring; and
- Supporting Studies (Years 0 and 2 only – these will be conducted during mine operational life.)

The salvage value of certain components of the mine is expected to offset some of the costs of implementing this closure plan, but only at Year 2. A salvage value of 50% has been agreed upon for the mill and ancillary facilities for the Year 2 cost estimates. Progressive reclamation will account for a lesser part of the reclamation effort (for reasons discussed above) and expenditure for the project.

As shown in Table 8.3-1, a closure cost range of **$8,397,432** to **$8,634,053** is estimated for final closure, based on three separate scenarios for road decommissioning. All costs are in constant 2009 Canadian dollars.

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.

In each of the sections, the same table numbering scenario has been employed to present the following:

- Table 8-1 provides a summary of all cost estimates;
- Table 8-2 sets out unit rates used in the calculations;
- Tables 8-3 to 8-10 provide closure cost estimates for the specific site development reclamation components;
- Table 8-11 provides closure cost estimates reclamation research and revegetation activities;

- Table 8-12 outlines 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:
- Table 8-13 presents costs for various supporting studies as outlined in the closure measures Section 5 (Section 8.1 and 8.2 only); and

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. In addition, a 12% contingency allowance has been added to the overall closure cost estimate.

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.1-1

Summary Table of Estimated Closure Costs for Year 2 (Current)

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$1,557,746
4	**Open Pit and Haul Roads**	$115,793
5	**Tailings Area and Diversion Structures**	$577,628
6	**Main Water Dam**	$163,603
7	**Mill and Ancillary Facilities**	$597,290
8	**Mill Pond**	$100,420
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$120,455
	Scenario 3 - Deactivate Entire Access Road	$199,849
10	**Miscellaneous Sites and Facilities**	$156,611
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$950,504
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$955,024
	Scenario 3 - Deactivate Entire Access Road	$964,064
12	**Post Closure Site Management**	$2,971,300
13	**Supporting Studies**	$34,500

Total Closure Costs		
	Scenario 1 - No Access Road Deactivation	**$7,227,534**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$7,350,369**
	Scenario 3 - Deactivate Entire Access Road	**$7,438,803**

Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$8,094,838**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$8,232,414**
	Scenario 3 - Deactivate Entire Access Road	**$8,331,460**

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.1-2
Minto Mine Closure Unit Rates for Year 2 (Current)

Equipment Rates		
Equipment	**Rates/hr**	**Rate/mo**
D9H Dozer	$260	
Haul Truck D250E	$220	
Tandem Haul Truck	$150	
Cat 235 Excavator	$240	
Cat 16H grader	$220	
988B Loader	$250	
Tractor Trailer (lowbed)	$130	
30 ton Crane	$160	
Hiab Flatdeck truck	$125	
Cat 950 loader	$125	
Pickup Truck		$2,500
Personnel Rates		
Personnel	**Rates/hr**	**Rate/mo**
Blaster	$60	
General Labourer	$45	
Trades Labourer	$80	
Site Supervisor	$95	
Design Engineer	$130	
Environmental Scientist	$95	
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	**$2,260.00**	**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	$8.99	cu.m
Place Riprap	$3.37	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.

Table 8.1-3

Waste Rock and Overburden Dumps, Estimated Closure Costs for Year 2 (Current)

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
	Haul and place overburden for revegetation	Load, Haul and place soil cov	cu.m.	88000	$5.08	$447,040	$447,040
	Project Management & Engineering	7% of Total Cost	%		7.00%	$36,753	$36,753
	Sub-Total						**$561,793**
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 cov	cu.m.	147750	$3.85	$568,838	$568,838
	Project Management & Engineering	7% of Total Cost	%		7.00%	$42,876	$42,876
	Sub-Total						**$655,394**
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
	Sub-Total						**$4,451**
3.3	**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 a	cu.m.	16250	$5.08	$82,550	$82,550
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,497	$6,497
	Sub-Total						**$99,317**
3.4	**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 a	cu.m.	23000	$5.99	$137,770	$137,770
	Project Management & Engineering	7% of Total Cost			7.00%	$10,627	$10,627
	Sub-Total						**$162,437**
3.5	**Contractor's Shop and Work Area (s 5.1.4.2)**						
	Remove salvageable equipment	General Labourer	hrs	60	$45	$2,700	
		Haul Truck D250E	hrs	20	$220	$4,400	
		Trades Labourer	hrs	48	$80	$3,840	$10,940
	Dismantle buildings	General Labourer	hrs	60	$45	$2,700	
		Cat 235 Excavator	hrs	30	$240	$7,200	$9,900
	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 a	cu.m.	5000	$5	$25,250	$25,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$4,864	$4,864
	Sub-Total						**$74,354**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$1,557,746**

Note:
Costing incorporates progressive reclamation during production phase

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.1-4

Open Pit and Haul Roads, Estimated Closure Costs for Year 2 (Current)

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	$45	$3,600	
		Support equipment	l.s.		$1,000	$1,000	$4,600
	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	$3	$169	
		Load and Haul Rip Rap	cu.m	50	$9	$450	$5,418
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,345	$1,345
	Sub-Total						**$20,563**
4.2	**Haul Roads (s 5.2.2.2)**						
	Remove culverts and haul away	General Labourer	hrs	40	$45	$1,800	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	$11,000
	Recontour slopes	D9H Dozer	hrs	150	$260	$39,000	$39,000
	Scarify surfaces	Cat 16H grader	hrs	150	$220	$33,000	$33,000
	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%	$6,230	$6,230
	Sub-Total						**$95,230**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads							**$115,793**

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

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.1-5

Tailings Area and Diversion Structures, Estimated Closure Costs for Year 2 (Current)

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	20	$260.00	$5,200	$5,200
	Push overburden from TFOD-TF	Custom Rate D (Push from TFOD - TF)	cu.m	206500	$2.15	$443,975	$443,975
	Project Management & Engineering	7% of Total Cost	%		7.00%	$31,442	$31,442
	Sub-Total						**$480,617**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$260	$13,000	$13,000
	Haul and place riprap	Load and Haul Rip Rap	cu.m	2400	$9	$21,576	
		Place Riprap	cu.m	2400	$3	$8,088	$29,664
	HDPE liner	Unit rate	sq.m	4800	$10	$48,000	$48,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,346	$6,346
	Sub-Total						**$97,010**
Total Estimated Cost in Reclaiming Tailings Area							**$577,628**

Note:
Costing assumes stockpiling overburden along downhill slope of south diversion ditch during production phase. Down slope tailings perimeter rip rap blanket will be advanced as tailings facility accumulates during production phase.

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.1-6
Main Water Dam, Estimated Closure Costs for Year 2 (Current)

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	$45	$2,160	
		Trades Labourer	hrs	98	$80	$7,840	$10,000
	Remove pipeline	Haul Truck D250E	hrs	100	$220	$22,000	
		Cat 235 Excavator	hrs	100	$240	$24,000	
		General Labourer	hrs	200	$45	$9,000	$55,000
	Dismantle Building	Cat 235 Excavator	hrs	16	$240	$3,840	
		General Labourer	hrs	20	$45	$900	$4,740
	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%	$5,243	$5,243
	Sub-Total						**$80,143**
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	0	$45	$0	$0
	Misc. Supplies & Tools	Misc.	l.s.		$0	$0	$0
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$0	$0	$0
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	0	$10	$0	$0
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from	cu.m	0	$2	$0	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	0	$4.50	$0	$0
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	0	$3	$0	
		Unit Cost Basis	cu.m	0	$9	$0	$0
	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%	$5,460	$5,460
	Sub-Total						**$83,460**
Total Estimated Cost in Reclaiming Water Dam							**$163,603**

Table 8.1-7
Mill & Ancillary Facilities, Estimated Closure Costs for Year2 (Current)

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	$45	$24,750	
		Trades Labourer	hrs	600	$80	$48,000	
		Crane Support	hrs	40	$145	$5,800	$78,550
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$80	$12,800	$12,800
	Dismantle Building	General Labourer	hrs	1000	$45	$45,000	
		Trades Labourer	hrs	600	$80	$48,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	
		Crane Support	hrs	60	$145	$8,700	$130,500
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$19,548	$19,548
	Subtotal:						**$298,798**
						Subtract 50% for Salvage Value	**$149,399**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$45	$10,800	
		Trades Labourer	hrs	240	$80	$19,200	$30,000
		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	$45	$7,200	
		Trades Labourer	hrs	80	$80	$6,400	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Crane Support	hrs	30	$145	$4,350	$27,550
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$8,241	$8,241
	Subtotal:						**$125,971**
						Subtract 50% for Salvage Value	**$62,986**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$45	$2,700	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,700
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	120	$80	$9,600	
		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	$45	$1,800	
		Tractor Trailer (lowbed)	hrs	30	$130	$3,900	$36,250
	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%	$5,583	$5,583
	Subtotal:						**$85,333**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$45	$4,500	
		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	$16,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,120	$1,120
	Subtotal:						**$17,120**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	25	$95	$2,375	
		Analytical Costs	l.s.		$6,000	$6,000	$8,375
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	10	$240	$2,400	
		Haul Truck D250E	hrs	10	$220	$2,200	$4,600
	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	50000	$4.50	$225,000	$225,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$18,478	$18,478
	Subtotal:						**$282,453**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities							**$597,290**

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Table 8.1-8

Mill Water Pond, Estimated Closure Costs for Year 2 (Current)

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	$45	$450	
		Cat 235 Excavator	hrs	10	$240	$2,400	$2,850
	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	$9	$44,950	$44,950
		Place Riprap	cu.m	5,000	$3	$16,850	$16,850
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,570	$6,570
	Subtotal:						**$100,420**
Total Estimated Cost in Reclaiming Mill Pond							**$100,420**

Table 8.1-9
Main Access Road, Estimated Closure Costs for Year 2 (Current)

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	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3	$1,500	$10,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,802	$6,802
	Subtotal:						**$103,977**
Total Estimated Cost for Access Road Closure (Scenario 2)							**$120,455**

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
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,310	$2,310
	Subtotal:						**$35,310**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$45	$2,250	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Tractor Trailer (lowbed)	hrs	20	$130	$2,600	$20,250
	Cut off piles	General Labourer	hrs	50	$45	$2,250	$2,250
	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%	$2,625	$2,625
	Subtotal:						**$40,125**
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 (40 small culverts)	Cat 235 Excavator	hrs	100	$240	$24,000	$24,000
	Culvert removal	General Labourer	hrs	140	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,907	$6,907
	Subtotal:						**$105,582**
Total Estimated Cost for Access Road Closure (Scenario 3)							**$199,849**

Table 8.1-10
Miscellaneous Sites and Facilities, Estimated Closure Costs for Year 2 (Current)

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	$4,400
	Project Management & Engineering	7% of Total Cost	%		7.00%	$308	$308
	Natural revegetation	n/a	n/a				
	Subtotal:						**$4,708**
10.2	**Mine Camp and Related Infrastructure**						
	Remove salvageable equipment	General Labourer	hrs	704	$45	$31,680	$31,680
	Dismantle buildings	General Labourer	hrs	1200	$45	$54,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	$82,800
	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	$45	$450	
		Cat 235 Excavator	hrs	2	$240	$480	$930
	Site Clean-Up	General Labourer	hrs	500	$45	$22,500	$22,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,130	$10,130
	Subtotal:						**$77,420**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	50	$80	$4,000	$8,500
	Dismantle buildings	General Labourer	hrs	200	$45	$9,000	
		Cat 235 Excavator	hrs	30	$240	$7,200	$16,200
	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%	$2,359	$2,359
	Subtotal:						**$18,030**
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							**$156,611**

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

Table 8.1-11
Reclamation Research and Revegetation, Estimated Closure Costs for Year 2 (Current)

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	$2,260	$213,118	
	Re-seed	ha	47.2	$2,260	$106,559	
	Re-forest	ha	94.3	$1,750	$165,025	$484,702
	Sub-Total					**$484,702**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,260	$15,594	
	Re-seed	ha	3.5	$2,260	$7,910	
	Re-forest	ha	6.9	$1,750	$12,075	$35,579
	Sub-Total					**$35,579**
11.1.3	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,260	$35,482	
	Re-seed	ha	7.9	$2,260	$17,854	
	Re-forest	ha	15.7	$1,750	$27,475	$80,811
	Sub-Total					**$80,811**
11.1.4	**Contractor's Shop and Office Area (disturbed area of 2.5 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,260	$5,650	
	Re-seed	ha	1.3	$2,260	$2,938	
	Re-forest	ha	2.5	$1,750	$4,375	$12,963
	Sub-Total					**$12,963**
11.1.5	**Tailings Area current disturbed area of 40.3 ha)**					
	Seed and fertilize w/ labour	ha	40.3	$2,260	$91,078	
	Re-seed	ha	20.2	$2,260	$45,652	
	Re-forest	ha	40.3	$1,750	$70,525	$207,255
	Sub-Total					**$207,255**
11.1.6	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,260	$7,458	
	Re-seed	ha	1.7	$2,260	$3,842	
	Re-forest	ha	3.3	$1,750	$5,775	$17,075
	Sub-Total					**$17,075**
11.1.7	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,260	$17,176	
	Re-seed	ha	3.8	$2,260	$8,588	
	Re-forest	ha	7.6	$1,750	$13,300	$39,064
	Subtotal:					**$39,064**
11.1.8	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,260	$23,278	
	Re-seed	ha	5.2	$2,260	$11,752	
	Re-forest	ha	10.3	$1,750	$18,025	$53,055
	Subtotal:					**$53,055**
11.1.9	**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	$2,260	$4,520	$4,520
	Subtotal:					**$4,520**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,260	$13,560	$13,560
	Subtotal:					**$13,560**

Total Estimated Cost for Reclamation Research and Revegetation		
	Scenario 1 - No Access Road Deactivation	**$950,504**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$955,024**
	Scenario 3 - Deactivate Entire Access Road	**$964,064**

Table 8.1-12

Site Management and Monitoring, Estimated Closure Costs for Year 2 (Current)

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	manday	5130	$60	$307,800	$307,800
	Subtotal:						**$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**
12.3	**Water Treatment and Compliance Monitoring incl. Reporting**						
	Active - Treatment, operating costs (2 years) incl. staff, reagents		monthly	6	$135,000	$810,000	$810,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (2 years)		cu.m	720000	$0.40	$288,000	$288,000
	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	$2,000	$30,000	$30,000
	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 1-15)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	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:						**$1,482,000**
12.4	**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**
Total Estimated Cost for Post Closure Site Management							**$2,971,300**

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 - YEAR 0

Table 8.1-13

Supporting Studies for Year 2 (Current)

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.		$2,000	$2,000	
	undertake additional monitoring as per program(covered in T. 12)	Misc.	yearly		$2,000	$2,000	$4,000
	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.		$2,000	$2,000	
	undertake additional monitoring as per program (covered in T. 12)	Misc.	yearly	1	$2,000	$2,000	$4,000
	Enhanced Adaptive Management Plan for TF	Misc.	l.s.	1	$4,000	$4,000	$4,000
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	$13,500
	reporting				$2,500	$2,500	$2,500
	Subtotal:						**$34,500**
Total Estimated Cost for Supporting Studies							**$34,500**

Note:

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-1

Summary Table of Estimated Closure Costs for Year 4

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$1,768,234
4	**Open Pit and Haul Roads**	$115,793
5	**Tailings Area and Diversion Structures**	$577,628
6	**Main Water Dam**	$163,603
7	**Mill and Ancillary Facilities**	$746,689
8	**Mill Pond**	$100,420
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$120,455
	Scenario 3 - Deactivate Entire Access Road	$199,849
10	**Miscellaneous Sites and Facilities**	$156,611
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$1,032,230
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$1,036,750
	Scenario 3 - Deactivate Entire Access Road	$1,045,790
12	**Post Closure Site Management**	$2,633,800
13	**Supporting Studies**	$16,000

Total Closure Costs		
	Scenario 1 - No Access Road Deactivation	**$7,313,147**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$7,435,982**
	Scenario 3 - Deactivate Entire Access Road	**$7,524,416**

Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$8,190,724**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$8,328,300**
	Scenario 3 - Deactivate Entire Access Road	**$8,427,346**

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-2
Minto Mine Closure Unit Rates for Year 4

Equipment Rates		
Equipment	**Rates/hr**	**Rate/mo**
D9H Dozer	$260	
Haul Truck D250E	$220	
Tandem Haul Truck	$150	
Cat 235 Excavator	$240	
Cat 16H grader	$220	
988B Loader	$250	
Tractor Trailer (lowbed)	$130	
30 ton Crane	$160	
Hiab Flatdeck truck	$125	
Cat 950 loader	$125	
Pickup Truck		$2,500
Personnel Rates		
Personnel	**Rates/hr**	**Rate/mo**
Blaster	$60	
General Labourer	$45	
Trades Labourer	$80	
Site Supervisor	$95	
Design Engineer	$130	
Environmental Scientist	$95	
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	**$2,260.00**	**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	$8.99	cu.m
Place Riprap	$3.37	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.

Table 8.2-3

Waste Rock and Overburden Dumps, Estimated Closure Costs for Year 4

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
	Haul and place overburden for revegetation	Load, Haul and place soil cov	cu.m.	88000	$5.08	$447,040	$447,040
	Project Management & Engineering	7% of Total Cost	%		7.00%	$36,753	$36,753
	Sub-Total						**$561,793**
3.2	**Southwest Dump (s 5.1.1.2)**						
	Roll crest and recontour	D9H Dozer	hrs	336	$260	$87,360	$87,360
	Haul and place overburden for revegetation	Load, Haul and place soil cov	cu.m.	187500	$3.85	$721,875	$721,875
	Project Management & Engineering	7% of Total Cost	%		7.00%	$56,646	$56,646
	Sub-Total						**$865,881**
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
	Sub-Total						**$4,451**
3.3	**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 a	cu.m.	16250	$5.08	$82,550	$82,550
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,497	$6,497
	Sub-Total						**$99,317**
3.4	**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 a	cu.m.	23000	$5.99	$137,770	$137,770
	Project Management & Engineering	7% of Total Cost			7.00%	$10,627	$10,627
	Sub-Total						**$162,437**
3.5	**Contractor's Shop and Work Area (s 5.1.4.2)**						
	Remove salvageable equipment	General Labourer	hrs	60	$45	$2,700	
		Haul Truck D250E	hrs	20	$220	$4,400	
		Trades Labourer	hrs	48	$80	$3,840	$10,940
	Dismantle buildings	General Labourer	hrs	60	$45	$2,700	
		Cat 235 Excavator	hrs	30	$240	$7,200	$9,900
	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 a	cu.m.	5000	$5	$25,250	$25,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$4,864	$4,864
	Sub-Total						**$74,354**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$1,768,234**

Note:
Costing incorporates progressive reclamation during production phase

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-4

Open Pit and Haul Roads, Estimated Closure Costs for Year 4

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	$45	$3,600	
		Support equipment	l.s.		$1,000	$1,000	$4,600
	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	$3	$169	
		Load and Haul Rip Rap	cu.m	50	$9	$450	$5,418
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,345	$1,345
	Sub-Total						**$20,563**
4.2	**Haul Roads (s 5.2.2.2)**						
	Remove culverts and haul away	General Labourer	hrs	40	$45	$1,800	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	$11,000
	Recontour slopes	D9H Dozer	hrs	150	$260	$39,000	$39,000
	Scarify surfaces	Cat 16H grader	hrs	150	$220	$33,000	$33,000
	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%	$6,230	$6,230
	Sub-Total						**$95,230**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads							**$115,793**

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

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-5

Tailings Area and Diversion Structures, Estimated Closure Costs for Year 4

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	20	$260.00	$5,200	$5,200
	Push overburden from TFOD-TF	Custom Rate D (Push from TFOD - TF)	cu.m	206500	$2.15	$443,975	$443,975
	Project Management & Engineering	7% of Total Cost	%		7.00%	$31,442	$31,442
	Sub-Total						**$480,617**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$260	$13,000	$13,000
	Haul and place riprap	Load and Haul Rip Rap	cu.m	2400	$9	$21,576	
		Place Riprap	cu.m	2400	$3	$8,088	$29,664
	HDPE liner	Unit rate	sq.m	4800	$10	$48,000	$48,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,346	$6,346
	Sub-Total						**$97,010**
Total Estimated Cost in Reclaiming Tailings Area							**$577,628**

Note:
Costing assumes stockpiling overburden along downhill slope of south diversion ditch during production phase. Down slope tailings perimeter rip rap blanket will be advanced as tailings facility accumulates during production phase.

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-6
Main Water Dam, Estimated Closure Costs for Year 4

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	$45	$2,160	
		Trades Labourer	hrs	98	$80	$7,840	$10,000
	Remove pipeline	Haul Truck D250E	hrs	100	$220	$22,000	
		Cat 235 Excavator	hrs	100	$240	$24,000	
		General Labourer	hrs	200	$45	$9,000	$55,000
	Dismantle Building	Cat 235 Excavator	hrs	16	$240	$3,840	
		General Labourer	hrs	20	$45	$900	$4,740
	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%	$5,243	$5,243
	Sub-Total						**$80,143**
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	0	$45	$0	$0
	Misc. Supplies & Tools	Misc.	l.s.		$0	$0	$0
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$0	$0	$0
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	0	$10	$0	$0
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from	cu.m	0	$2	$0	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	0	$4.50	$0	$0
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	0	$3	$0	
		Unit Cost Basis	cu.m	0	$9	$0	$0
	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%	$5,460	$5,460
	Sub-Total						**$83,460**
Total Estimated Cost in Reclaiming Water Dam							**$163,603**

Table 8.2-7
Mill & Ancillary Facilities, Estimated Closure Costs for Year 4

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	$45	$24,750	
		Trades Labourer	hrs	600	$80	$48,000	
		Crane Support	hrs	40	$145	$5,800	$78,550
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$80	$12,800	$12,800
	Dismantle Building	General Labourer	hrs	1000	$45	$45,000	
		Trades Labourer	hrs	600	$80	$48,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	
		Crane Support	hrs	60	$145	$8,700	$130,500
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$19,548	$19,548
	Subtotal:						**$298,798**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$45	$10,800	
		Trades Labourer	hrs	240	$80	$19,200	$30,000
		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	$45	$7,200	
		Trades Labourer	hrs	80	$80	$6,400	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Crane Support	hrs	30	$145	$4,350	$27,550
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$8,241	$8,241
	Subtotal:						**$125,971**
						Subtract 50% for Salvage Value	**$62,986**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$45	$2,700	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,700
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	120	$80	$9,600	
		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	$45	$1,800	
		Tractor Trailer (lowbed)	hrs	30	$130	$3,900	$36,250
	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%	$5,583	$5,583
	Subtotal:						**$85,333**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$45	$4,500	
		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	$16,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,120	$1,120
	Subtotal:						**$17,120**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	25	$95	$2,375	
		Analytical Costs	l.s.		$6,000	$6,000	$8,375
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	10	$240	$2,400	
		Haul Truck D250E	hrs	10	$220	$2,200	$4,600
	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	50000	$4.50	$225,000	$225,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$18,478	$18,478
	Subtotal:						**$282,453**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities							**$746,689**

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.2-8

Mill Water Pond, Estimated Closure Costs for Year 4

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	$45	$450	
		Cat 235 Excavator	hrs	10	$240	$2,400	$2,850
	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	$9	$44,950	$44,950
		Place Riprap	cu.m	5,000	$3	$16,850	$16,850
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,570	$6,570
	Subtotal:						**$100,420**
Total Estimated Cost in Reclaiming Mill Pond							**$100,420**

Table 8.2-9
Main Access Road, Estimated Closure Costs for Year 4

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	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3	$1,500	$10,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,802	$6,802
	Subtotal:						**$103,977**
Total Estimated Cost for Access Road Closure (Scenario 2)							**$120,455**

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
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,310	$2,310
	Subtotal:						**$35,310**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$45	$2,250	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Tractor Trailer (lowbed)	hrs	20	$130	$2,600	$20,250
	Cut off piles	General Labourer	hrs	50	$45	$2,250	$2,250
	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%	$2,625	$2,625
	Subtotal:						**$40,125**
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 (40 small culverts)	Cat 235 Excavator	hrs	100	$240	$24,000	$24,000
	Culvert removal	General Labourer	hrs	140	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,907	$6,907
	Subtotal:						**$105,582**
Total Estimated Cost for Access Road Closure (Scenario 3)							**$199,849**

Table 8.2-10
Miscellaneous Sites and Facilities, Estimated Closure Costs for Year 4

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	$4,400
	Project Management & Engineering	7% of Total Cost	%		7.00%	$308	$308
	Natural revegetation	n/a	n/a				
	Subtotal:						**$4,708**
10.2	**Mine Camp and Related Infrastructure**						
	Remove salvageable equipment	General Labourer	hrs	704	$45	$31,680	$31,680
	Dismantle buildings	General Labourer	hrs	1200	$45	$54,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	$82,800
	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	$45	$450	
		Cat 235 Excavator	hrs	2	$240	$480	$930
	Site Clean-Up	General Labourer	hrs	500	$45	$22,500	$22,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,130	$10,130
	Subtotal:						**$77,420**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	50	$80	$4,000	$8,500
	Dismantle buildings	General Labourer	hrs	200	$45	$9,000	
		Cat 235 Excavator	hrs	30	$240	$7,200	$16,200
	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%	$2,359	$2,359
	Subtotal:						**$18,030**
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							**$156,611**

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

Table 8.2-11
Reclamation Research and Revegetation, Estimated Closure Costs for Year 4

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 Dump (total surface area of 110.2 ha)**					
	Seed and fertilize w/ labour	ha	110.2	$2,260	$249,052	
	Re-seed	ha	55.1	$2,260	$124,526	
	Re-forest	ha	110.2	$1,750	$192,850	$566,428
	Sub-Total					**$566,428**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,260	$15,594	
	Re-seed	ha	3.5	$2,260	$7,910	
	Re-forest	ha	6.9	$1,750	$12,075	$35,579
	Sub-Total					**$35,579**
11.1.3	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,260	$35,482	
	Re-seed	ha	7.9	$2,260	$17,854	
	Re-forest	ha	15.7	$1,750	$27,475	$80,811
	Sub-Total					**$80,811**
11.1.4	**Contractor's Shop and Office Area (disturbed area of 2.5 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,260	$5,650	
	Re-seed	ha	1.3	$2,260	$2,938	
	Re-forest	ha	2.5	$1,750	$4,375	$12,963
	Sub-Total					**$12,963**
11.1.5	**Tailings Area current disturbed area of 40.3 ha)**					
	Seed and fertilize w/ labour	ha	40.3	$2,260	$91,078	
	Re-seed	ha	20.2	$2,260	$45,652	
	Re-forest	ha	40.3	$1,750	$70,525	$207,255
	Sub-Total					**$207,255**
11.1.6	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,260	$7,458	
	Re-seed	ha	1.7	$2,260	$3,842	
	Re-forest	ha	3.3	$1,750	$5,775	$17,075
	Sub-Total					**$17,075**
11.1.7	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,260	$17,176	
	Re-seed	ha	3.8	$2,260	$8,588	
	Re-forest	ha	7.6	$1,750	$13,300	$39,064
	Subtotal:					**$39,064**
11.1.8	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,260	$23,278	
	Re-seed	ha	5.2	$2,260	$11,752	
	Re-forest	ha	10.3	$1,750	$18,025	$53,055
	Subtotal:					**$53,055**
11.1.9	**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	$2,260	$4,520	$4,520
	Subtotal:					**$4,520**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,260	$13,560	$13,560
	Subtotal:					**$13,560**

Total Estimated Cost for Reclamation Research and Revegetation		
	Scenario 1 - No Access Road Deactivation	**$1,032,230**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$1,036,750**
	Scenario 3 - Deactivate Entire Access Road	**$1,045,790**

Table 8.2-12
Site Management and Monitoring, Estimated Closure Costs for Year 4

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	30	$2,500	$75,000	$75,000
	Sundry equipment maintenance	Unit Cost Basis	yearly	5	$5,000	$25,000	$25,000
	Power and heat	Unit Cost Basis	monthly	15	$5,500	$82,500	$82,500
	General Administrative expenses	Unit Cost Basis	monthly	30	$2,000	$60,000	$60,000
	Camp Costs (5 year period)	Unit Cost Basis	manday	5130	$60	$307,800	$307,800
	Subtotal:						**$550,300**
12.2	**Transport Costs**						
	Employee transport costs	Unit Cost Basis	monthly	30	$3,000	$90,000	$90,000
	Barge operating costs	Unit Cost Basis	monthly	12	$10,000	$120,000	$120,000
	Subtotal:						**$210,000**
12.3	**Water Treatment and Compliance Monitoring and Reporting**						
	Active - Treatment, operating costs (2 years) incl. staff, reagents		monthly	6	$135,000	$810,000	$810,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (2 years)		cu.m	720000	$0.40	$288,000	$288,000
	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	$2,000	$30,000	$30,000
	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 1-15)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	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:						**$1,482,000**
12.4	**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**
Total Estimated Cost for Post Closure Site Management							**$2,633,800**

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 - YEAR 0

Table 8.2-13

Supporting Studies for Year 4

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.		$2,000	$2,000	
	undertake additional monitoring as per program(covered in T. 12)	Misc.	yearly		$2,000	$2,000	$4,000
	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.		$2,000	$2,000	
	undertake additional monitoring as per program (covered in T. 12)	Misc.	yearly	1	$2,000	$2,000	$4,000
	Enhanced Adaptive Management Plan for TF	Misc.	l.s.	1	$4,000	$4,000	$4,000
	Subtotal:						**$16,000**
Total Estimated Cost for Supporting Studies							**$16,000**

Note: Ongoing costs, still apply from Revision 1 in order to better understand permafrost engineering

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-1

Summary Table of Estimated Final Closure Costs

Table #	Description	Total Cost
3	**Overburden & Waste Rock Dumps**	$1,877,898
4	**Open Pit and Haul Roads**	$115,793
5	**Tailings Area and Diversion Structures**	$458,864
6	**Main Water Dam**	$163,603
7	**Mill and Ancillary Facilities**	$809,674
8	**Mill Pond**	$100,420
9	**Main Access Road**	
	Scenario 1 - No Access Road Deactivation	$2,140
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$120,455
	Scenario 3 - Deactivate Entire Access Road	$199,849
10	**Miscellaneous Sites and Facilities**	$252,060
11	**Reclamation Research and Revegetation**	
	Scenario 1 - No Access Road Deactivation	$1,083,455
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	$1,087,975
	Scenario 3 - Deactivate Entire Access Road	$1,097,015
12	**Post Closure Site Management**	$2,633,800
13	**Supporting Studies**	$0

Total Closure Costs		
	Scenario 1 - No Access Road Deactivation	**$7,497,707**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$7,620,542**
	Scenario 3 - Deactivate Entire Access Road	**$7,708,976**

Total Closure Costs (Including Percentage Contingency Allowance on Above Elements)		**12%**
	Scenario 1 - No Access Road Deactivation	**$8,397,432**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$8,535,007**
	Scenario 3 - Deactivate Entire Access Road	**$8,634,053**

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-2
Minto Mine Final Closure Unit Rates

Equipment Rates		
Equipment	**Rates/hr**	**Rate/mo**
D9H Dozer	$260	
Haul Truck D250E	$220	
Tandem Haul Truck	$150	
Cat 235 Excavator	$240	
Cat 16H grader	$220	
988B Loader	$250	
Tractor Trailer (lowbed)	$130	
30 ton Crane	$160	
Hiab Flatdeck truck	$125	
Cat 950 loader	$125	
Pickup Truck		$2,500
Personnel Rates		
Personnel	**Rates/hr**	**Rate/mo**
Blaster	$60	
General Labourer	$45	
Trades Labourer	$80	
Site Supervisor	$95	
Design Engineer	$130	
Environmental Scientist	$95	
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	**$2,260.00**	**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	$8.99	cu.m
Place Riprap	$3.37	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.

Table 8.3-3
Waste Rock and Overburden Dumps, Estimated Final Closure Costs

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	240	$260	$62,400	$62,400
	Haul and place overburden for revegetation	Load, Haul and place soil cov	cu.m.	88000	$5.08	$447,040	$447,040
	Project Management & Engineering	7% of Total Cost	%		7.00%	$35,661	$35,661
	Sub-Total						**$545,101**
3.2	**Southwest Dump (s 5.1.1.2)**						
	Roll crest and recontour	D9H Dozer	hrs	336	$260	$87,360	$87,360
	Haul and place overburden for revegetation	Load, Haul and place soil cov	cu.m.	212500	$3.85	$818,125	$818,125
	Project Management & Engineering	7% of Total Cost	%		7.00%	$63,384	$63,384
	Sub-Total						**$968,869**
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
	Sub-Total						**$4,451**
3.3	**Low Grade Ore Stockpile and Pad (s 5.1.3.2)**						
	Recontour Stockpile and Pad	D9H Dozer	hrs	79	$260	$20,540	$20,540
	Construct runoff collection ditch, divert water to open pit	D9H Dozer	hrs	10	$260	$2,600	
		Cat 235 Excavator	hrs	16	$240	$3,840	
	Haul and place rip rap	Load and Haul Rip Rap	cu.m.	415	$9	$3,731	
		Place Riprap	cu.m.	415	$3	$1,399	$11,569
	Haul and place overburden for revegetation	Custom Rate A (Load, haul a	cu.m.	16250	$5.08	$82,550	$82,550
	Project Management & Engineering	7% of Total Cost	%		7.00%	$8,026	$8,026
	Sub-Total						**$122,686**
3.4	**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 a	cu.m.	23000	$5.99	$137,770	$137,770
	Project Management & Engineering	7% of Total Cost			7.00%	$10,627	$10,627
	Sub-Total						**$162,437**
3.5	**Contractor's Shop and Work Area (s 5.1.4.2)**						
	Remove salvageable equipment	General Labourer	hrs	60	$45	$2,700	
		Haul Truck D250E	hrs	20	$220	$4,400	
		Trades Labourer	hrs	48	$80	$3,840	$10,940
	Dismantle buildings	General Labourer	hrs	60	$45	$2,700	
		Cat 235 Excavator	hrs	30	$240	$7,200	$9,900
	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 a	cu.m.	5000	$5	$25,250	$25,250
	Project Management & Engineering	7% of Total Cost	%		7.00%	$4,864	$4,864
	Sub-Total						**$74,354**
Total Estimated Cost in Reclaiming Overburden and Waste Rock Dumps							**$1,877,898**

Note:
Costing incorporates progressive reclamation during production phase

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-4

Open Pit and Haul Roads, Estimated Final Closure Costs

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	$45	$3,600	
		Support equipment	l.s.		$1,000	$1,000	$4,600
	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	$3	$169	
		Load and Haul Rip Rap	cu.m	50	$9	$450	$5,418
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,345	$1,345
	Sub-Total						**$20,563**
4.2	**Haul Roads (s 5.2.2.2)**						
	Remove culverts and haul away	General Labourer	hrs	40	$45	$1,800	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		Haul Truck D250E	hrs	20	$220	$4,400	$11,000
	Recontour slopes	D9H Dozer	hrs	150	$260	$39,000	$39,000
	Scarify surfaces	Cat 16H grader	hrs	150	$220	$33,000	$33,000
	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%	$6,230	$6,230
	Sub-Total						**$95,230**
Total Estimated Cost in Reclaiming Open Pit and Haul Roads							**$115,793**

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

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-5

Tailings Area and Diversion Structures, Estimated Final Closure Costs

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	20	$260.00	$5,200	$5,200
	Push overburden from TFOD-TF	Custom Rate D (Push from TFOD - TF)	cu.m	154875	$2.15	$332,981	$332,981
	Project Management & Engineering	7% of Total Cost	%		7.00%	$23,673	$23,673
	Sub-Total						**$361,854**
5.2	**South Diversion Ditch**						
	Widen south diversion ditch	D9H Dozer	hrs	50	$260	$13,000	$13,000
	Haul and place riprap	Load and Haul Rip Rap	cu.m	2400	$9	$21,576	
		Place Riprap	cu.m	2400	$3	$8,088	$29,664
	HDPE liner	Unit rate	sq.m	4800	$10	$48,000	$48,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,346	$6,346
	Sub-Total						**$97,010**
Total Estimated Cost in Reclaiming Tailings Area							**$458,864**

Note:
Costing assumes stockpiling overburden along downhill slope of south diversion ditch during production phase. Down slope tailings perimeter rip rap blanket will be advanced as tailings facility accumulates during production phase.

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-6
Main Water Dam, Estimated Final Closure Costs

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	$45	$2,160	
		Trades Labourer	hrs	98	$80	$7,840	$10,000
	Remove pipeline	Haul Truck D250E	hrs	100	$220	$22,000	
		Cat 235 Excavator	hrs	100	$240	$24,000	
		General Labourer	hrs	200	$45	$9,000	$55,000
	Dismantle Building	Cat 235 Excavator	hrs	16	$240	$3,840	
		General Labourer	hrs	20	$45	$900	$4,740
	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%	$5,243	$5,243
	Sub-Total						**$80,143**
6.2	**Main Dam**						
	Pump down impounded water, over spillway (using reclaim pumps)	General Labourer	hrs	0	$45	$0	$0
	Misc. Supplies & Tools	Misc.	l.s.		$0	$0	$0
	Build coffer dam and install pump-around system Operate system until new structure is ready	Misc.	l.s.		$0	$0	$0
	Stockpile rip rap from downstream shell	Unit Cost Basis	cu.m	0	$10	$0	$0
	Breach Dam: push material using dozer into new areas	Custom Rate E (Push from	cu.m	0	$2	$0	
	and load, haul & dump and contour material in new area	Unit Cost Basis	cu.m	0	$4.50	$0	$0
	Construct stream channel at original grade - haul and place rip rap	Unit Cost Basis	cu.m	0	$3	$0	
		Unit Cost Basis	cu.m	0	$9	$0	$0
	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%	$5,460	$5,460
	Sub-Total						**$83,460**
Total Estimated Cost in Reclaiming Water Dam							**$163,603**

Table 8.3-7
Mill & Ancillary Facilities, Estimated Final Closure Costs

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	$45	$24,750	
		Trades Labourer	hrs	600	$80	$48,000	
		Crane Support	hrs	40	$145	$5,800	$78,550
	Decontaminate Building-hosing and clean-up	Trades Labourer	hrs	160	$80	$12,800	$12,800
	Dismantle Building	General Labourer	hrs	1000	$45	$45,000	
		Trades Labourer	hrs	600	$80	$48,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	
		Crane Support	hrs	60	$145	$8,700	$130,500
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$19,548	$19,548
	Subtotal:						**$298,798**
7.2	**Generator & Filter Buildings & Concentrate Shed**						
	Remove salvageable equipment	General Labourer	hrs	240	$45	$10,800	
		Trades Labourer	hrs	240	$80	$19,200	$30,000
		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	$45	$7,200	
		Trades Labourer	hrs	80	$80	$6,400	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Crane Support	hrs	30	$145	$4,350	$27,550
	Concrete Demolition	Blaster	hrs	40	$60	$2,400	
		Cat 235 Excavator	hrs	20	$240	$4,800	
		D9H Dozer	hrs	20	$260	$5,200	$12,400
	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%	$8,241	$8,241
	Subtotal:						**$125,971**
7.3	**Fuel Storage Area**						
	Cleanout tanks-remove sludge, pressure wash	General Labourer	hrs	60	$45	$2,700	
		Removal to Licensed facility	l.s.		$10,000	$10,000	$12,700
	Remove bulk fuel storage and piping facilities	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	120	$80	$9,600	
		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	$45	$1,800	
		Tractor Trailer (lowbed)	hrs	30	$130	$3,900	$36,250
	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%	$5,583	$5,583
	Subtotal:						**$85,333**
7.4	**Mill Reagents**						
	Load and return extra reagents/chemicals	General Labourer	hrs	100	$45	$4,500	
		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	$16,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$1,120	$1,120
	Subtotal:						**$17,120**
7.5	**Reclaim Entire Mill Site Area**						
	Test soils for contamination	Environmental Scientist	hrs	25	$95	$2,375	
		Analytical Costs	l.s.		$6,000	$6,000	$8,375
	Haul any contaminated soils to Land Treatment Facility	Cat 235 Excavator	hrs	10	$240	$2,400	
		Haul Truck D250E	hrs	10	$220	$2,200	$4,600
	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	50000	$4.50	$225,000	$225,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$18,478	$18,478
	Subtotal:						**$282,453**
Total Estimated Cost in Reclaiming Mill and Ancillary Facilities							**$809,674**

MINTO MINE CLOSURE COSTING - YEAR 0

Table 8.3-8

Mill Water Pond, Estimated Final Closure Costs

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	$45	$450	
		Cat 235 Excavator	hrs	10	$240	$2,400	$2,850
	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	$9	$44,950	$44,950
		Place Riprap	cu.m	5,000	$3	$16,850	$16,850
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,570	$6,570
	Subtotal:						**$100,420**
Total Estimated Cost in Reclaiming Mill Pond							**$100,420**

Table 8.3-9
Main Access Road, Estimated Final Closure Costs

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	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m	500	$3	$1,500	$10,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,802	$6,802
	Subtotal:						**$103,977**
Total Estimated Cost for Access Road Closure (Scenario 2)							**$120,455**

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
	Project Management & Engineering	7% of Total Cost	%		7.00%	$2,310	$2,310
	Subtotal:						**$35,310**
9.3.2	**Big Creek Bridge**						
	Remove bridge decking and span	General Labourer	hrs	50	$45	$2,250	
		Crane	hrs	40	$145	$5,800	
		Cat 235 Excavator	hrs	40	$240	$9,600	
		Tractor Trailer (lowbed)	hrs	20	$130	$2,600	$20,250
	Cut off piles	General Labourer	hrs	50	$45	$2,250	$2,250
	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%	$2,625	$2,625
	Subtotal:						**$40,125**
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 (40 small culverts)	Cat 235 Excavator	hrs	100	$240	$24,000	$24,000
	Culvert removal	General Labourer	hrs	140	$45	$6,300	
		Haul Truck D250E	hrs	100	$220	$22,000	$28,300
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labourer	hrs	40	$80	$3,200	
		General Labourer	hrs	75	$45	$3,375	
		Cat 235 Excavator	hrs	40	$240	$9,600	$16,175
	Recontour slopes and drainage	D9H Dozer	hrs	70	$260	$18,200	$18,200
	Stabilize slopes	General Labourer	hrs	200	$45	$9,000	
	Erosion barriers	Unit Cost Basis	per sq. m.	1,000	$3	$3,000	$12,000
	Project Management & Engineering	7% of Total Cost	%		7.00%	$6,907	$6,907
	Subtotal:						**$105,582**
Total Estimated Cost for Access Road Closure (Scenario 3)							**$199,849**

Table 8.3-10
Miscellaneous Sites and Facilities, Estimated Final Closure Costs

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	$4,400
	Project Management & Engineering	7% of Total Cost	%		7.00%	$308	$308
	Natural revegetation	n/a	n/a				
	Subtotal:						**$4,708**
10.2	**Mine Camp and Related Infrastructure**						
	Remove salvageable equipment	General Labourer	hrs	704	$45	$31,680	$31,680
	Dismantle buildings	General Labourer	hrs	1200	$45	$54,000	
		Cat 235 Excavator	hrs	120	$240	$28,800	$82,800
	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	$45	$450	
		Cat 235 Excavator	hrs	2	$240	$480	$930
	Site Clean-Up	General Labourer	hrs	500	$45	$22,500	$22,500
	Project Management & Engineering	7% of Total Cost	%		7.00%	$10,130	$10,130
	Subtotal:						**$154,840**
10.3	**Explosives Plant Site**						
	Remove salvageable equipment	General Labourer	hrs	100	$45	$4,500	
		Trades Labourer	hrs	50	$80	$4,000	$8,500
	Dismantle buildings	General Labourer	hrs	200	$45	$9,000	
		Cat 235 Excavator	hrs	30	$240	$7,200	$16,200
	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%	$2,359	$2,359
	Subtotal:						**$36,059**
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							**$252,060**

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

Table 8.3-11
Reclamation Research and Revegetation, Estimated Final Costs

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 120.2 ha)**					
	Seed and fertilize w/ labour	ha	120.2	$2,260	$271,652	
	Re-seed	ha	60.1	$2,260	$135,826	
	Re-forest	ha	120.2	$1,750	$210,350	$617,828
	Sub-Total					**$617,828**
11.1.2	**Ice-Rich Overburden Dump (toe berm surface area of 6.9ha)**					
	Seed and fertilize w/ labour	ha	6.9	$2,260	$15,594	
	Re-seed	ha	3.5	$2,260	$7,910	
	Re-forest	ha	6.9	$1,750	$12,075	$35,579
	Sub-Total					**$35,579**
11.1.3	**Ore Stockpiles and Pads (final total surface area of 15.7 ha)**					
	Seed and fertilize w/ labour	ha	15.7	$2,260	$35,482	
	Re-seed	ha	7.9	$2,260	$17,854	
	Re-forest	ha	15.7	$1,750	$27,475	$80,811
	Sub-Total					**$80,811**
11.1.4	**Contractor's Shop and Office Area (disturbed area of 8.6 ha)**					
	Seed and fertilize w/ labour	ha	2.5	$2,260	$5,650	
	Re-seed	ha	1.3	$2,260	$2,938	
	Re-forest	ha	2.5	$1,750	$4,375	$12,963
	Sub-Total					**$12,963**
11.1.5	**Tailings Area current disturbed area of 40.3 ha)**					
	Seed and fertilize w/ labour	ha	40.3	$2,260	$91,078	
	Re-seed	ha	20.2	$2,260	$45,652	
	Re-forest	ha	40.3	$1,750	$70,525	$207,255
	Sub-Total					**$207,255**
11.1.6	**Main Water Dam (total dam surface area 3.3 ha)**					
	Seed and fertilize w/ labour	ha	3.3	$2,260	$7,458	
	Re-seed	ha	1.7	$2,260	$3,842	
	Re-forest	ha	3.3	$1,750	$5,775	$17,075
	Sub-Total					**$17,075**
11.1.7	**Mill Area (total surface area of 7.6 ha)**					
	Seed and Fertilize w/ labour	ha	7.6	$2,260	$17,176	
	Re-seed	ha	3.8	$2,260	$8,588	
	Re-forest	ha	7.6	$1,750	$13,300	$39,064
	Subtotal:					**$39,064**
11.1.8	**Miscellaneous Sites - Camp, Airstrip, Waste Facilities, Explosives Site (area for reclamation of 10.3 ha)**					
	Seed and fertilize w/ labour	ha	10.3	$2,260	$23,278	
	Re-seed	ha	5.2	$2,260	$11,752	
	Re-forest	ha	10.2	$1,750	$17,850	$52,880
	Subtotal:					**$52,880**
11.1.9	**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	$2,260	$4,520	$4,520
	Subtotal:					**$4,520**
	Scenario 3 - Deactivate Entire Road					
	Revegetate and fertilize banks at culvert excavations, including labour	ha	6.0	$2,260	$13,560	$13,560
	Subtotal:					**$13,560**

Total Estimated Cost for Reclamation Research and Revegetation		
	Scenario 1 - No Access Road Deactivation	**$1,083,455**
	Scenario 2 - Deactivate Access Road from Minto Creek to Mine Site	**$1,087,975**
	Scenario 3 - Deactivate Entire Access Road	**$1,097,015**

Table 8.3-12
Site Management and Monitoring, Estimated Final Closure Costs

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	30	$2,500	$75,000	$75,000
	Sundry equipment maintenance	Unit Cost Basis	yearly	5	$5,000	$25,000	$25,000
	Power and heat	Unit Cost Basis	monthly	15	$5,500	$82,500	$82,500
	General Administrative expenses	Unit Cost Basis	monthly	30	$2,000	$60,000	$60,000
	Camp Costs (5 year period)	Unit Cost Basis	manday	5130	$60	$307,800	$307,800
	Subtotal:						**$550,300**
12.2	**Transport Costs**						
	Employee transport costs	Unit Cost Basis	monthly	30	$3,000	$90,000	$90,000
	Barge operating costs	Unit Cost Basis	monthly	12	$10,000	$120,000	$120,000
	Subtotal:						**$210,000**
12.3	**Water Treatment and Compliance Monitoring and Reporting**						
	Active - Treatment, operating costs (2 years) incl. staff, reagents		monthly	6	$135,000	$810,000	$810,000
	Cost per cubic metre of compliant water (0.01 ppm Cu) (2 years)		cu.m	720000	$0.40	$288,000	$288,000
	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	$2,000	$30,000	$30,000
	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 1-15)	Misc.	l.s.	15	$3,000	$45,000	$45,000
	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:						**$1,482,000**
12.4	**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**
Total Estimated Cost for Post Closure Site Management							**$2,633,800**

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

Notes:

12.1	
12.2	360
12.3	88
12.4	312
Total	760

8.4 UPDATED FINANCIAL SECURITY

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 Mine Reclamation and Closure Policy, 2005). Typically requirements for mine security bonding are conditions of the Type A Water Use Licence or Yukon Quartz Mining Production Licence. Minto intends to adhere to the principles for mine reclamation and closure and security requirements in accordance with YG's policy.

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.

9.0 CLOSURE

This plan has been prepared in accordance with Section 14.0 of Quartz Mining License QLM-9902 and Section 78 of Water Use License QZ96-006, in accordance with normal scientific and engineering principles.

Please contact the undersigned if you have any questions at (867604) 684-8894.

Respectfully Submitted,

Colleen Roche, B. Eng., M.Eng.
Environment Manager – Minto Mine

10.0 REFERENCES

Craig, D.B., Craig, J.E., Pelletier, K., Emond, D. and Copland, H., 1998. "*Reclamation Practices and Research on Mineral Exploration Properties in the Yukon Territory".* Mineral Resources Directorate, Yukon Region, Indian & Northern Affairs Canada, 36 p.

Grapel, C. and S. Hebert. 2006. *Lakebed Revegetation after the Partial Removal of the Hamilton Lake Dam on Vancouver Island, B.C.* Canadian Dam Association Bulletin, Vol. 17., No. 4. Fall 2006.

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Kennedy, C.E., Editor. 1993. *Guidelines for Reclamation/Revegetation in the Yukon*. Department of Renewable Resources, Government of Yukon, Whitehorse, Yukon.

Mills, C. 1997. *An Assessment Of The Acid Base Accounting (ABA) And Mineralogical Test Work On Eight Samples From The Proposed Minto Project, Yukon Territory. Vancouver, BC. February 1997.*

Note: Other documents reviewed include those listed in Table 1-1 Global Information List.

MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

Minto Project, Yukon

Detailed Decommissioning and Reclamation Plan

Appendix A

Environmental Setting

Excerpt from:

Minto Project, Yukon *Site Inspection & Compilation of Environmental Information* Prepared by Access Mining Consultants Ltd. For DIAND, Renewable Resources Waste Management Program

March 2000

4.0 ENVIRONMENTAL COMPONENTS

The following section presents a summary of environmental biophysical information for the project area. Where available, additional data has been used and incorporated to present the current knowledge of the area.

4.1 CLIMATE

A basic meteorological station was established at the mine site in 1993 (elevation: 884 m, 2900 ft). Only intermittent temperature and precipitation data is available (September–October 1993 and June-August 1994). Meteorological information for the Project area was collected manually and consisted of snow surveys and a weather station that measured precipitation and temperature. Due to the paucity of site specific climatic information, long-term synthetic data for various parameters was generated using regional information from the Pelly Ranch (Fort Selkirk) monitoring station. This information is presented in greater detail in Volume II of the Initial Environmental Evaluation prepared by Hallam Knight Piesold, (HKP, 1994).

Temperatures at the mine site are typical of northern inland climates, having low average temperatures and seasonal extreme low temperatures. Precipitation levels are described as moderate. The meteorological database for the Project area is limited. Table 1 presents a summary of key meteorological information for the Project area.

Table 1 Minto Project Area Meteorological Information

Site Elevation	716 to 793 (m)
Regional Station Used To Generate Synthetic Data	Pelly Ranch
Distance to Carmacks Climate Station [Elevation of 525 m]	80 km southeast
Distance to Pelly Ranch (Fort Selkirk) Climate Station [Elevation of 454 m]	20 km northwest
Mean Monthly Temperature Range	-30.9°C to 12.1°C
Annual Mean Temperature	-7.3°C
Orographic Factors	Long-term synthetic values for mean annual precipitation generated using an orographic factor of + 8% per 100 m elevation gain using Pelly Ranch as basis
Annual Precipitation	378 mm
Precipitation as Snow	157 mm (41.5%)
Precipitation as Rain	221 mm (58.5%)
Probable Maximum 24-hour Precipitation	183 mm
Snowmelt Periods	80% April, 20% May
Mean Annual Pond Evaporation	409mm

Note: Pelly Ranch data was chosen as the basis for analysis because of the close proximity of the meteorological station and the Project site, a reasonable correlation between station and site precipitation records, and a reasonable correlation between station precipitation and site runoff.

4.2 TERRESTRIAL RESOURCES

4.2.1 Surficial Geology / Terrain Hazards

The following discussion of terrain hazards at the Minto Project Site was taken directly from Volume II of Hallam Knight Piesold's Initial Environmental Assessment, 1994.

Surficial Geology

The Minto area is considered part of the Pelly River Ecoregion and lies within the Dawson Range on the west side of the Klondike Plateau. Erosion surfaces are dissected by narrow stream valleys. The topography is gently rolling with relief up

to 2000 ft (600 m). The ore body is located beneath a small stream valley, known as Minto Creek, and extends beneath the toe of the south-facing slope on the left hand side of the creek. The bottom of the valley in the region of the ore body is at an elevation of approximately 2650 ft (922 m). On either side of Minto Creek, the topography rises at slopes generally of approximately 20° to the rounded tops of the surrounding hills which are at a maximum elevation of 3250 ft (1131 m). The site is located within the discontinuous widespread permafrost subzone and extensive areas within the general region are underlain by permafrost. Permafrost is extensively distributed throughout the site with the majority located on north aspect slopes. Within the area of the open pit, overburden has been measured to be as thick at 280 feet (85.3 m) with permafrost extending to a depth of 60 feet (18.3 m).

The area west of the Yukon River and north of Carmacks, including the Minto area, was not covered during the last continental glaciation (Wisconsin Drift) and as a result, glacial till soils are not present. However, a study by Bostock (1970) on the glaciation of central Yukon indicates that two older drifts, the Klaza and Reid Advances may have partially encroached on the upper region of Minto Creek. Gravel deposits, terraces and few erratics indicate that glaciation extended above 3000 ft (1044 m), from south of the mouth of Dark Creek, north to Wolverine Creek. Due to the lack of glaciation, bedrock exposure is poor and generally limited to the tops of ridges where it forms blocky, castellated outcrops.

Soils in the Minto area have developed from saprolite, colluvial and fluvial parent materials. Where drainage is impeded, gleysols or gleyed brunisols tend to develop. On well drained materials, eutric or dystric brunisols predominate, although some podzols may also occur. Regosols may occur on recent fluvial deposits.

The predominant bedrock type in the development area is granodiorite; derived materials are generally coarse textured, basic, well to moderately drained, and have low inherent fertility. Organic content in soils is expected to be low except in the upper few centimeters.

Overburden within the plant site consists predominantly of micaceous, organic, silty sand and of sand and fine gravel, derived predominantly through *in situ* weathering of the upper surface of the bedrock. Bedrock is encountered at depths of 2 to 11 feet (0.7 to 3.8 m) below surface. Overburden in the vicinity of the proposed open pit has a maximum thickness of 280 feet (97.4 m). Soils consist of frozen micaceous silt and fine sand with varying amounts of organic constituents throughout. Overburden in the vicinity of the tailings storage facility also consists of frozen silts and sands and is approximately 200 feet (96 m) in thickness. Overburden material is described as consisting of 30% fine gravels, 40% coarse sands and 10% medium sands. In all cases, the overburden is covered by a moss and topsoil layer. Bedrock below these layers is granodiorite.

Debris Flow

Solifluction is slow downward movement (mud flow or creep) of water-saturated, near surface soil and surface vegetation from higher to lower elevations. Solifluction areas on the Minto Project site are underlain at shallow depth by permafrost, which retards subsurface drainage. The active layer becomes saturated with surface and shallow subsurface drainage from the adjacent slopes. When subjected to these conditions, the active layer creeps during the spring and summer months, even on very gentle slopes. This slow downslope creep of the saturated surface mantle is commonly referred to as solifluction.

Slope Stability

South aspect scree slopes in lower Minto Creek are comprised of a minimal vegetative layer consisting of grasses and some low growing shrubs such a kinnikinnick, juniper and soopalallie. Active erosion was observed in these areas. Extensive regions of burn, combined with steep slopes, thin overburden layers and solifluction may result in some north aspect slopes being unstable during the spring thaw and summer months.

Avalanche Hazard

The Minto Project is within an area that receives very low levels of precipitation. Regionally, snowfall averages 185 mm annually. The potential for the occurrence of an avalanche are very low.

Forest Fires

Due to the dry climate and frequent electrical storm events that occur in the summer months, forest fires are very common in the Minto area. Many areas are in varying degrees of seral succession of vegetation. Two burns have occurred in the Minto Creek watershed between 1950 and 1980, and two further burns since 1980.

Permafrost

The Minto Project lies in the southerly boundary of the discontinuous permafrost zone. From site investigations by Golder (1976), it was determined that permafrost is extensively distributed throughout the site with the majority located on north aspect slopes. Within the area of the open pit, overburden has been measured to be as thick as 280 feet (85.3 m) with permafrost extending to a depth of 60 feet (18.3 m). A significant percentage of the permafrost is clear segregated ice with water content close to the liquid limit and will not be suitable as construction material. Permafrost of the same sort is found within the proposed tailings and waste rock storage areas.

4.2.2 Wildlife and Waterfowl

Information on wildlife in the Project area has been gathered from various sources including the IEE for the Minto Project (prepared by Hallam Knight Piesold, 1994), YTG-Renewable Resources, and other reports on the Project and surrounding area. Additional information was provided by the SFN and other local residents, as part of data gathered from First Nation interviews.

Numerous aerial and ground surveys were conducted in 1994 by Hallam Knight Piesold. Some were conducted in association with the Yukon Territorial Government, Fish and Wildlife Branch of Renewable Resources. In general, it was noted during these surveys that wildlife distributions follow vegetation zone classifications. Three distinct habitat classifications, based on the predominant vegetation communities, exist in the Minto Project area. These include: mixed coniferous/deciduous forest zone, black spruce/willow/sedge zone, and areas of regenerative forests.

Wildlife species likely to be present within the Minto Project area are presented in Table 2. Although not all of these species were observed in the 1994 surveys it is suggested, by the availability of habitat and historical record, that these species are likely to be present at one time or another. This information was also confirmed during SFN interviews.

The Project area does not likely contain key habitat for either moose or caribou. However, moose utilization of the area has been reported. Moose may use new vegetative growth in the extensive burn areas for feeding during the growing season, and occasionally foraging on tall shrubs during the winter. The low-gradient areas near the Yukon River, including the area through which the access road passes, may also provide foraging habitat. Moose are also known to use some islands of the Yukon River for calving. YTG-Renewable Resources estimates the local density of moose to be approximately 40 moose/1000 km^2.

Migration corridors have been qualified as key habitat for woodland caribou. Populations of these ungulates in the region are represented by the Klaza and the Tatchun/Glenyon herds. Key winter range habitat has been identified for the Klaza herd in the headwaters of Big Creek, some 15 km west of the Project. The herd is consists of approximately 955 animals (1994 estimate). The results of radio collaring/tracking and home range mapping by YTG-Renewable Resources suggests that the herd does not enter the Minto Project area. However the Tatchun/Glenyon herd maintains a home range that may intersect portions of the access road.

Mule deer are designated as 'specially protected wildlife' due to their low abundance in the Yukon. Mule deer are commonly found in burn areas and south aspect slopes. Physical observations of Mule deer presence, in the Project area, has been limited to two groups of pellets observed in the vicinity of Minto Creek in 1994.

A population of Dall sheep inhabit the east bank of the Yukon river between Minto Landing and the Pelly River confluence. This area is considered key winter habitat for the species. It is anticipated that the Minto Project will have no significant effects upon this sheep population as no Project activities occur in this area.

Table 2 Wildlife Species in the Vicinity of the Minto Project Area

Ungulates	
Moose	*Alces alces*
Woodland caribou	*Rangifer tarandus*
Dall sheep	*Ovis dalli dalli*
Mule deer	*Odocoileus hemionus*
Carnivores and Furbearers	
Grizzly bear	*Ursus horribilis*
Black bear	*Ursus americanus*
Coyote	*Canis latrans*
Wolf	*Canis lupus*
Lynx	*Lynx canadensis*
Red fox	*Vulpes vulpes*
Wolverine	*Gulo luscus*
Marten	*Martes americana*
Least weasel	*Mustela rixosa*
Mink	*Mustela vison*
Muskrat	*Ondantra zibethicus*
River otter	*Lutra canadensis*
Beaver	*Castor canadensis*
Squirrel	*Tamiascurus hudsonieus*
Snowshoe hare	*Lepus americanus*
Game Birds	
Spruce grouse	*Dendragapus canadensis*
Ruffed grouse	*Bonada umbellus*
Sharp-tailed grouse	*Tympanuchus phasianellus*
Willow ptarmigan	*Lagopus lagopus*
White-tailed ptarmigan	*Lagopus leucurus*
Rock ptarmigan	*Lagopus mutus*
Canada goose	*Branta canadensis*
Mallard duck	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Green-winged teal	*Anas crecca*
American widgeon	*Anas americana*

Adapted from Table 10.1 (Minto Explorations Ltd. IEE, *Volume II Environmental Setting)*

Large carnivores, such as bears and wolves have been observed in the Project area. A female grizzly with two cubs has been observed in the upper Minto Creek drainage, Black bears have been sighted in the lower Minto Creek watershed during the summer months. A variety of smaller furbearers can also be found associated with the various Project area habitats. This is consistent with the observation of continued trapping in the area.

Big Game harvest levels and the trapping and outfitting concessions in the Project area are shown in Figure 8.

Waterfowl are not known to use the Project area for any length of time due to the lack of suitable habitat (i.e. wetlands). However, key habitat for waterfowl does exist in the area of the Wilczek Lakes, approximately 30 km east of the Project area (Hallam Knight Piesold, 1994).

SFN members do however confirm that a large number of waterfowl do inhabit the slough and wetland areas along the Yukon River. Other game birds are found in the Project area, with specific sightings of sharp-tailed grouse and spruce grouse. Raptors in the area primarily utilize the Yukon River Corridor, as there is a lack of suitable alpine habitat in the Project area. One pair Peregrine Falcons (listed in Canada as 'endangered') is currently known to utilize the Yukon River near the Minto Project area. The Yukon River shores are also home to eagles and osprey, with eagles nests reported near the Project area along the Yukon River.

4.2.3 Vegetation

The Minto Project lies within the Yukon Plateau (Central) Ecozone/Pelly River Ecoregion. The area forest types commonly include Black and white spruce, paper birch (cooler sites), aspen and balsam poplar (disturbed sites - pioneering species), and lodgepole pine (frequently in competition with deciduous species in burned areas). Mosses dominate coniferous forest floors, with willows and ericaceous shrubs becoming more prevalent as forest stand density decreases. Lichens tend to dominate in rocky Alpine areas. Alpine areas begin at elevations of 1350-1500 m. Sedges and tussocks occur in moist, low-gradient areas and under Black spruce, which also thrive in moist substrates.

The first 10-18 kilometers of the Project access road traverses a low gradient, moist habitat, as discussed above (associated with the ancient Yukon River floodplain). The remaining portion of the road ascends the Minto Creek drainage, terminating in the sub-alpine/alpine reaches of the

watershed. It is here that the local forests are regenerating as a result of successive forest fires. The Minto Project area has been burned by four separate forest fires over the last 40 years. The upper Minto Creek area was burned in 1980, while another fire occurred in 1995 in the lower Minto Creek area (within 300m of the confluence with the Yukon River). Figure 6 outlines the extent of burn areas as a result of various forest fires. Vegetation surveys and mapping were completed as art of the IEE (HKP, 1994). No further vegetation studies have been completed in the Project area, although MEL has initiated a test re-vegetation program as part of the company's reclamation efforts.

4.3 HYDROLOGY AND WATER QUALITY

4.3.1 Surface Water Hydrology and Water Quality

Hydrological and water quality information for the Project area has been collected by B.C. Research and Environment Canada (1975-1976). Further data was collected by Hallam Knight Piesold from 1993-1995. Additional hydrological and water quality data is now being collected by MEL as part of their Water Use Licence (QZ96-006) surveillance network. Figure 5 provides the location of these monitoring stations.

Although of limited quantity, the water quality data base appears to show some similarity across sampling events. Historical water quality monitoring data exists for Minto Creek, Big Creek, Unnamed Creek A & B, Wolverine Creek, and the Yukon River. These water samples were collected and analyzed on several occasions during 1975 and 1976 (conducted by B.C. Research and Environment Canada). Water quality data collected during the Initial Environmental Evaluation consists of several sampling occasions from September 1993 to October 1995, primarily on Minto Creek (MEL & DIAND). Further data was collected by Minto Explorations in 1998 as part of the monitoring requirements of their Water Use Licence (QZ96-006). Two water quality monitoring stations were sampled in Minto Creek during the October, 1999 inspection to document existing stream chemistry prior to full scale mine production in the area.

During the course of the environmental data compilation, little information or data was found regarding Yukon River winter ice conditions at Minto Landing, the site of the proposed winter ice bridge crossing.

4.3.1.1 MINTO CREEK

Minto Creek is an ephemeral watercourse with a mainstream length of approximately 17km. Three staff gauges were installed along Minto Creek (at Environmental Monitoring Stations W1, W2 & W3) to gather baseline hydrological information. During a fishery survey in 1994, the watercourse was divided up into seven (7) reaches (Minto Explorations Ltd., IEE Volume II). Lower reaches of the watercourse show lower flows than the upper reaches. This is presumably due to reduced runoff retention times in the upper regions of the drainage as a result of the burn areas and also due to the high streambed infiltration that occurs within the lower reaches.

Hydrological studies conducted as part of the 1994 IEE, by Hallam Knight Piesold also indicate that a significant amount of infiltration of Minto Creek flow is occurring in the upper reaches of the watershed. Up to 75% of the surface runoff may be entering the subsurface regime, resulting in a large amount of attenuation. As such, a reasonable estimate of maximum flow that would be expected at the Minto Creek crossing of the access road at km 15.7 is approximately 5 m^3/sec. This compares to a 1:100 year flood event, assuming approximately 50% surface flow is lost to upstream subsurface attenuation (Minto Explorations Ltd., IEE Volume II).

In the absence of long-term and complete records of streamflow for the study area streams, a regional hydrological analysis was completed using a combination of data collected on site and data collected at the hydrometric networks of the Water Survey of Canada (WSC) and the Water Resources Division of DIAND. Regional streamflow and precipitation records were used to generate synthetic long-term flow values (Minto Project IEE Volume II, 1994). Hydrological information gathered on Minto Creek is presented in Table 3. Table 4 presents the seasonal streamflow distributions for Minto Creek.

The existing Water Use License (QZ96-006) requires flow monitoring at a number of stations in the Minto Creek drainage. During the October, 1999 site inspection, flow monitoring station W2 was found in a state of disrepair.

Table 3 Measured Minto Creek Streamflow Data

Gauge Location	Catchment Area (km^2)	Mean Basin Elevation (m)	Flow (m^3/s)					Unit Area Flow (mm)				
			29-Sep-93	15-May-94	5-Jun-94	7-Jul-94	11-Aug-94	29-Sep-93	15-May-94	5-Jun-94	7-Jul-94	11-Aug-94
Minto Creek (Station W1)	4.75	885	0.035	0.119	0.029	0.042	0.005	0.637	2.165	0.527	0.764	0.091
Minto Creek (Station W3)	10.38	-	0.028	0.101	0.029	0.04	0.011	0.236	0.841	0.241	0.333	0.092
Minto Creek (Station W2)	42.18	775	0.06	0.312	0.061	0.095	n/a	0.123	0.639	0.125	0.195	n/a

Streamflow data adapted from Table 4.2 (Minto Explorations Ltd. IEE, Volume II Environmental Setting)

Table 4 Minto Creek Seasonal Streamflow Distributions (Measured and generated long-term values)

Environmental Monitoring Station	Years of Record	unit	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Big Creek (WSC Site #09AH003)	1975-83, 1984-93	m^3/s	0.30	0.20	0.10	2.00	26.80	17.30	19.40	13.30	10.00	3.80	1.30	0.60	7.90
		mm	0.40	0.20	0.20	2.90	40.40	26.00	29.20	20.00	15.00	5.80	1.90	0.90	143.00
		%	0.30	0.20	0.20	2.10	28.20	18.20	20.40	14.00	10.50	4.00	1.30	0.60	100.00
Minto Creek Station W2 (measured)	1994	m^3/s	-	-	-	-	-	0.10	0.04	0.04	0.02	-	-	-	-
		mm		-	-	-	-	6.50	2.60	2.30	1.40	-	-	-	-
Minto Creek Station W2 (estimated)	1994	m^3/s	-	-	-	-	-	0.09	0.06	0.01	0.03	-	-	-	-
		mm	-	-	-	-	-	5.60	3.80	0.90	2.20	-	-	-	-
Minto Creek Station W2 (estimated)	Synthetic Long-term	m^3/s	0.00	0.00	0.00	0.20	0.09	0.06	0.09	0.06	0.04	0.00	0.00	0.00	0.05
		mm	0.00	0.00	0.00	12.00	5.00	4.00	5.00	4.00	3.00	0.00	0.00	0.00	34.00
		%	0.00	0.00	0.00	37.00	16.00	11.00	16.00	10.00	8.00	1.00	0.00	0.00	100.00

Streamflow distribution data adapted from Table 4.4 (Minto Explorations Ltd. IEE, Volume II Environmental Setting)

Table 5 presents the results of water quality analysis conducted as a part of the 1999 site inspection, as well as the water quality data from the 1998-1999 Annual Report to the Yukon Territory Water Board for water use licence QZ96-006 (for Minto Creek water quality monitoring sites W2 and W3 only). Water quality monitoring data collected at other locations in the Project area have been included in its entirety, as Appendix A. Figure 5 shows the current and historic environmental monitoring sites.

Water quality in the Minto Creek drainage is characterized as neutral to slightly basic pH, moderately hard, moderately high in total suspended and dissolved solids, and moderately to highly conductive. Concentrations of anions, nutrients, and cyanide/cyanogen-like compounds have been found to be moderate to high. Metal concentrations are generally moderately high with iron, copper, and aluminum present in high concentrations and in exceedance of the CCME Guidelines for the Protection of Freshwater Aquatic Life, particularly in the upper reaches of Minto Creek near the orebody (Minto Project IEE Volume II, 1994) (CCME, 1999)

Water quality samples were collected at Station W3 – Upper Minto Creek and the lower reach of Minto Creek, Station W2 on October 13, 1999 (Figure 5). Samples were analyzed for physical parameters, nutrients, residues, total and dissolved metals, and shipped for analysis to Norwest Labs of Vancouver the following day. Water samples taken during the October 1999 site inspection showed elevated concentrations for nutrients and metal concentrations, with cadmium, copper, iron, and selenium again exceeding CCME concentrations for the protection of freshwater aquatic life. These water quality results are consistent with previous sampling results; however, higher metal concentrations were encountered at W2 (lower Minto Creek) as opposed to W3 (upper Minto Creek).

Table 5 Minto Creek Water Quality

	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	MEAN	Minto IEE*	DIAND*	DIAND*	ACG*	MEAN	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Physical Tests													
Conductivity (microS/cm)	185.7		174.0	127.0	247.0	220.0	190.7	239.4	337.0	297.0	300.0	293.4	
Hardness (mg/l)	93.4		114.0	65.5	145.0		104.5	113.1	173.0	176.0		154.0	
Turbidity (NTU)	18.4		5.0				11.7	33.0	0.4	1.0		11.5	
Water Analysis (mg/l)													
Total Alkalinity	86.5		85.0	54.0	123.0	97.0	89.1	105.3	148.0	132.0	112.0	124.3	
Ammonium-N	0.0052		0.002			0.001	0.0036	0.0157	0.005	0.002	0.001	0.00757	
Chloride (dissolved)	1.07						1.07	1.2	1.0			1.10000	
Fluoride (dissolved)	0.203						0.203	0.162	0.26			0.211	
Sulphate (dissolved)	13.7		15.0				14.35	20.32	35.4	21.0		25.57	
Nitrate-N (+ Nitrite-N)	0.0339		0.016	0.005	0.094	0.25	0.09848	0.0602	0.043	0.054	0.12	0.0693	
Nitrite Nitrogen	0.0029			0.008	0.001		0.00397	0.005	0.002			0.0035	0.06
pH (units)	7.8		8.0	7.6	7.7	7.8	7.8	7.9	8.1	8.1	7.9	8.0	0.0065-0.009
Phosphorus-Orthophosphate	0.0083					0.19	0.09915	0.0166	0.002		0.19	0.06953	
Total Dissolved Phosphate	0.0155						0.0155	0.0256	0.006			0.0158	
Total Phosphorus	0.0573		0.058				0.05765	0.068	0.01	0.014		0.03067	
Total Dissolved Solids	125.8			100.0	179.0	161.0	141.5	154.0				154.0	
Total Suspended Solids	42.0		20.0	150.0	1.0	31.0	48.8	85.4	248.0	5.0		112.8	
Dissolved Parameters (mg/l)													
Dissolved Organic Carbon	27.2							20.9				20.9	
Total Organic Carbon	18.9					12.1	15.5	16.1	9.1		11.8	12.3	
Total Metals (mg/l)													
Aluminum (Al)	0.948	0.084	0.901	0.8	0.2	0.35	0.6166	1.9520	0.026	0.186	0.12	0.571	
Antimony (Sb)	0.0001	0.0001	0.0004	0.2	0.2	0.02	0.0002	0.0001	0.0001	0.0004	0.02	0.0002	
Arsenic (As)	0.0009	0.0003	0.0007	0.2	0.2	0.02	0.0006	0.0014	0.0003	0.0004	0.02	0.0007	0.005
Barium (Ba)	0.0678	0.058	0.0676	0.06	0.06	0.0546	0.0613	0.1048	0.059	0.0558	0.0523	0.068	
Beryllium (Be)	0.0025	0.005	0.0001	0.005	0.005	0.0002	0.0025	0.0025	0.005	0.0001	0.0002	0.0025	
Bismuth (Bi)	0.05	0.1	0.0001	0.1	0.1	0.02	0.05	0.05	0.1	0.0001	0.02	0.05	
Boron (B)	0.107	0.1		0.1	0.1	0.04	0.0823	0.112	0.1		0.03	0.0807	
Cadmium (Cd)	0.0001	0.0002	0.0001	0.01	0.01	0.0005	0.0001	0.0001	0.0002	0.0001	0.0005	0.0001	0.000017
Calcium (Ca)	24.77	32.5	33.1	16.3	34.7	27.7	28.1783	29.28	42.0	48.0	35.8	38.77	
Chromium (Cr)	0.0026	0.001	0.0026	0.01	0.01	0.001	0.0021	0.0042	0.001	0.0006	0.001	0.0017	0.0089
Cobalt (Co)	0.0009	0.001	0.001	0.01	0.01	0.001	0.001	0.0016	0.001	0.0002	0.001	0.0009	
Copper (Cu)	0.008	0.003	0.005	0.01	0.01	0.0120	0.007	0.019		0.004	0.01	0.011	0.003
Iron (Fe)	1.834	0.087	0.357	1.49	0.17	0.73	0.778	4.064	0.046	0.1400	0.195	1.1113	0.3
Lead (Pb)	0.0022	0.001	0.0002	0.05	0.05	0.005	0.0011	0.0048	0.001	0.0002	0.005	0.002	0.004
Lithium (Li)			0.0016	0.01	0.01	0.003	0.0023			0.001	0.005	0.003	
Magnesium (Mg)	8.3	11.1	7.7	6.0	11.3	8.6	8.8	11.2	15.8	13.5	13.6	13.5	
Manganese (Mn)	0.066	0.0110	0.0804	0.088	0.034	0.0502	0.0549	0.2376	0.027	0.0287	0.0143	0.0769	

Table 5 Minto Creek Water Quality

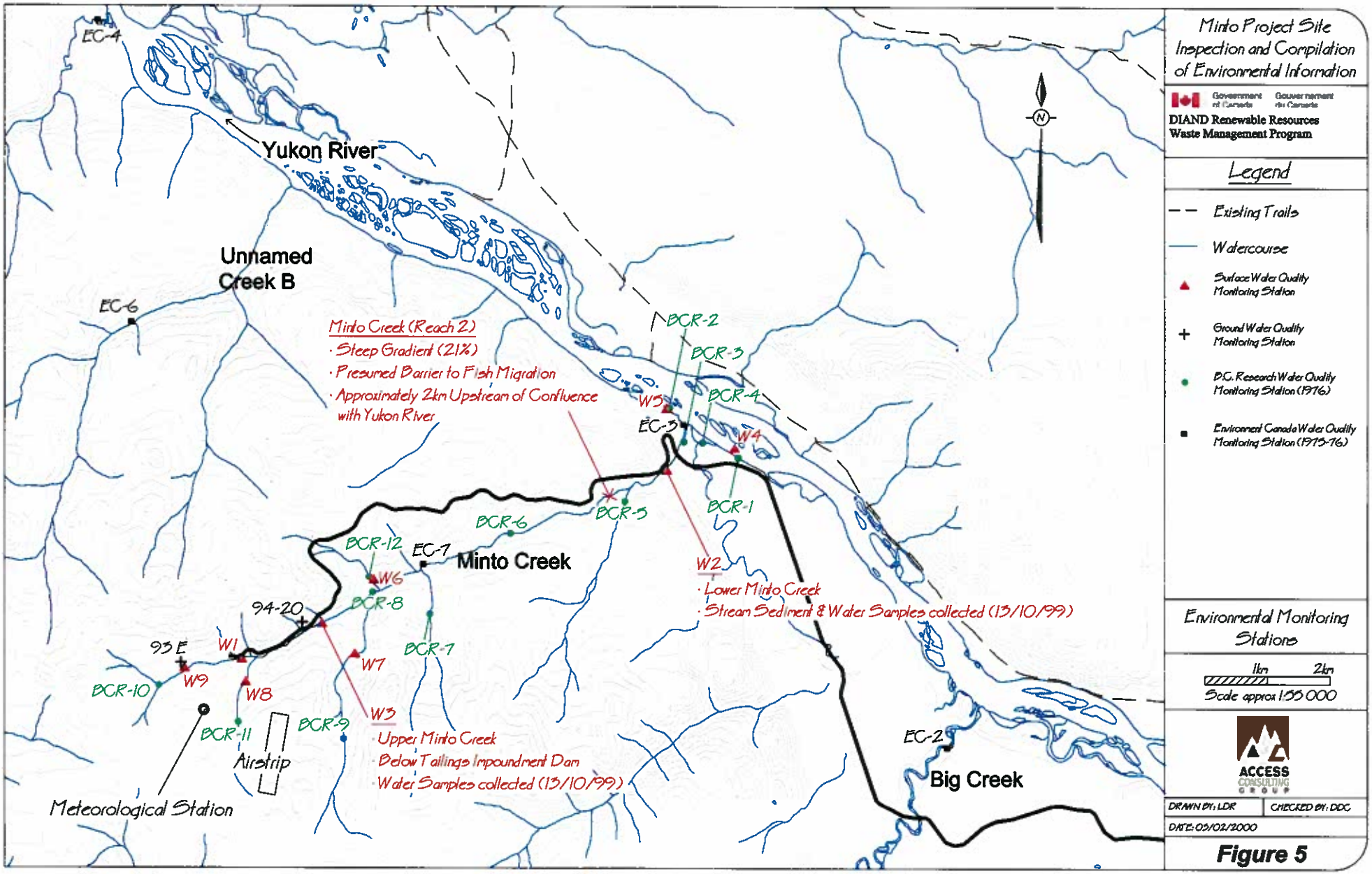
	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	MEAN	Minto IEE*	DIAND*	DIAND*	ACG*	MEAN	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Mercury (Hg)	0.00001	0.00001	0.00002				0.00001	0.00001	0.00001	0.00002		0.00001	0.001
Molybdenum (Mo)	0.0006	0.0050	0.001	0.05	0.03	0.005	0.0153	0.0014	0.004	0.002	0.005	0.0031	0.073
Nickel (Ni)	0.004	0.0010	0.0031	0.05	0.05	0.002	0.0025	0.007	0.001	0.0019	0.002	0.0033	0.025-0.15
Phosphorus			0.06	0.3	0.3	0.06	0.06			0.01	0.06	0.01	
Potassium (K)			0.98	2	2	1.0	0.99			1.00	1.1	1.05	
Selenium (Se)	0.0003	0.0005	0.01	0.2	0.2	0.02	0.0036	0.0003	0.0005	0.01	0.02	0.0036	0.001
Silicon (Si)	6.3	4.7	0.0	4.9	5.3	6.4	4.6	7.7	4.9		6.1	6.3	
Silver (Ag)	0.0001	0.0001	0.0001	0.01	0.01	0.001	0.0001	0.0001	0.0001	0.0001	0.001	0.0003	0.001
Sodium (Na)			4.51	3.0	7.0	5.46	4.9925			8.9	8.91	8.905	
Strontium (Sr)	0.1942	0.289	0.213	0.129	0.321	0.219	0.2275	0.206	0.334	0.266	0.282	0.272	
Sulphur (S)						4.1	4.1				11.2	11.2	
Thallium (Tl)			0.001	0.2	0.2	0.003	0.001			0.0001	0.003	0.003	
Thorium (Th)						0.005	0.005				0.005	0.005	
Tin (Sn)				0.03	0.03	0.005	0.005				0.005	0.05	
Titanium (Ti)		0.01		0.03	0.01	0.013	0.0177		0.01		0.013	0.0115	
Uranium	0.0004	0.001				0.06	0.0007	0.0005	0.0018		0.06	0.0011	
Vanadium (V)	0.015	0.03	0.003	0.03	0.03	0.003	0.0128	0.015	0.03	0.001	0.003	0.0123	
Zinc (Zn)	0.0061	0.005	0.01	0.013	0.005	0.003	0.0074	0.0108	0.005	0.005	0.003	0.006	0.03
Zirconium (Zr)						0.001	0.001				0.001	0.001	
Dissolved Metals (mg/l)													
Aluminum (Al)	0.0335	0.019	0.065			0.02	0.0344	0.0422	0.018	0.01	0.02	0.0226	
Antimony (Sb)	0.0001	0.0001	0.0005			0.02	0.0002	0.0001	0.0001	0.0004	0.02	0.0002	
Arsenic (As)	0.0004	0.0003	0.4			0.02	0.1336	0.0004	0.0003	0.0003	0.02	0.0003	
Barium (Ba)	0.0457	0.059	0.0458			0.0448	0.0488	0.0576	0.059	0.0501	0.0523	0.0548	
Beryllium (Be)	0.0025	0.005	0.0001			0.0002	0.0025	0.0025	0.005	0.0001	0.0002	0.0025	
Bismuth (Bi)	0.05	0.1	0.001			0.02	0.0503	0.05	0.1	0.0001	0.02	0.05	
Boron (B)	0.05	0.1				0.01	0.053	0.05	0.1		0.01	0.053	
Cadmium (Cd)	0.0001	0.0002	0.0001			0.0005	0.0001	0.0001	0.0002	0.0001	0.0005	0.0001	
Calcium (Ca)	24.2	32.4	19.5			27.5	25.9	28.0	42.9	29.3	35.8	34.0	
Chromium (Cr)	0.0005	0.001	0.0016			0.001	0.001	0.0005	0.001	0.0014	0.001	0.001	
Cobalt (Co)	0.0005	0.001	0.0001			0.001	0.0005	0.0005	0.001	0.0002	0.001	0.0006	
Copper (Cu)	0.0038	0.003	0.003			0.003	0.0032	0.0056	0.003	0.004	0.005	0.0044	
Iron (Fe)	0.3393	0.032	0.099			0.139	0.1523	0.7596	0.038	0.093	0.09	0.2452	
Lead (Pb)	0.0005	0.001	0.0002			0.005	0.0006	0.0005	0.001	0.0002	0.005	0.0006	
Lithium (Li)			0.0013			0.002	0.0017			0.001	0.003	0.002	
Magnesium (Mg)	8.0	11.1	7.3			8.4	8.7	10.5	16.1	12.9	13.6	13.3	
Manganese (Mn)	0.0148	0.006	0.0122			0.0087	0.0104	0.137	0.025	0.0136	0.0114	0.0468	
Molybdenum (Mo)	0.0005	0.001	0.001			0.005	0.0008	0.001	0.001	0.002	0.005	0.0013	
Nickel (Ni)	0.001	0.001	0.0023			0.002	0.0014	0.0011	0.001	0.0017	0.002	0.0013	

Table 5 Minto Creek Water Quality

	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	MEAN	Minto IEE*	DIAND*	DIAND*	ACG*	MEAN	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Phosphorus						0.06	0.06				0.06	0.06	
Potassium (K)	0.823	1.37	1.0			1.0	1.0483	0.888	1.5	1.0	1.1	1.122	
Selenium (Se)	0.0003	0.0005	0.01			0.02	0.0036	0.0003	0.0005	0.01	0.02	0.0036	
Silicon (Si)	5.0	4.7				6.0	5.2	5.2	5.0		6.0	5.4	
Silver (Ag)	0.0001	0.0001	0.0001			0.001	0.0001	0.0001	0.0001	0.0001	0.001	0.0001	
Sodium (Na)	4.8	7.8	4.5			5.5	5.6	6.7	11.6	8.6	8.9	9.0	
Strontium (Sr)	0.1895	0.288	0.205			0.218	0.2251	0.1946	0.337	0.259	0.282	0.2682	
Sulphur (S)						4.1	4.1				11.2	11.2	
Thallium (Tl)			0.0001			0.003	0.003			0.0001	0.003	0.003	
Thorium (Th)						0.005	0.005				0.005	0.005	
Tin (Sn)						0.005	0.05				0.005	0.005	
Titanium (Ti)		0.01				0.001	0.01		0.01		0.001	0.010	
Uranium	0.0003	0.001				0.06	0.0006	0.0003	0.0012		0.06	0.0007	
Vanadium (V)	0.015	0.03	0.001			0.002	0.0153	0.015	0.03	0.001	0.002	0.0153	
Zinc (Zn)	0.0025	0.005	0.005			0.002	0.0036	0.0025	0.005	0.005	0.001	0.0042	
Zirconium (Zr)						0.001	0.001				0.001	0.001	
Cyanide (mg/l)													
Total Cyanide	0.0127	0.006	0.004				0.00757	0.0196	0.005	0.004		0.00953	0.005

*Source of information: **DIAND**=Water Resources, **Minto IEE**=Minto Explorations (IEE Volume II, 1994), **ACG**=Access Consulting Group, **Minto Annual Report**=1998/1999 Annual Report to the Yukon Territory

Note: **Bold** and shaded values represent those samples exceeding CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 1999). CCME guidelines are for total metals and some Water analysis parameters only.


EC-4
Yukon River
Unnamed
Creek B
EC-6
Minto Creek (Reach 2)
· Steep Gradient (21%)
· Presumed Barrier to Fish Migration
· Approximately 2km Upstream of Confluence with Yukon River
BCR-2
BCR-3
BCR-4
W5
EC-3
W4
BCR-5
BCR-1
BCR-6
BCR-12
EC-7
Minto Creek
W6
BCR-8
94-20
W2
· Lower Minto Creek
· Stream Sediment & Water Samples collected (13/10/99)
93 E
W1
W9
W8
BCR-10
BCR-11
BCR-9
BCR-7
W7
W3
· Upper Minto Creek
· Below Tailings Impoundment Dam
· Water Samples collected (13/10/99)
Airstrip
Meteorological Station
EC-2
Big Creek
N
Minto Project Site
Inspection and Compilation
of Environmental Information
Government of Canada / Gouvernement du Canada
DIAND Renewable Resources
Waste Management Program
Legend
Existing Trails
Watercourse
Surface Water Quality Monitoring Station
Ground Water Quality Monitoring Station
D.C. Research Water Quality Monitoring Station (1976)
Environment Canada Water Quality Monitoring Station (1975-76)
Environmental Monitoring Stations
1km
2km
Scale approx 1:50 000
ACCESS CONSULTING GROUP
DRAWN BY: LDR
CHECKED BY: DDC
DATE: 05/02/2000
Figure 5

Environmental Monitoring Station W2 – Disturbed Housing for Hydrometric Datalogger

4.3.2 Groundwater Hydrology and Water Quality

Little information exists in regards to groundwater hydrology in the Minto Creek Drainage. However, attempts to quantify groundwater quality led to the installation of a pair of two (2) inch groundwater wells. They are located within the mineral deposit area and are designated 93-E (83.4m depth) and 94-20 (36.4m depth). Comparison of water quality parameters indicate that the ground water in the area is similar in quality to the near-deposit surface watercourses, except for elevated turbidity, alkalinity, fluoride, and sulphate concentrations. Monitoring data collected at these wells is also included in Appendix B. The location of the ground water monitoring wells is shown in Figure 5.

4.4 AQUATIC RESOURCES

4.4.1 Fishery Resources

Fish species found in the Yukon River include chinook, coho, and chum salmon, rainbow trout, lake trout, least cisco, round whitefish, inconnu, Arctic grayling, northern pike, burbot, longnose sucker, and slimy sculpin. Of these species only slimy sculpins and Arctic grayling were found in Minto Creek during the 1994 fishery survey. Minto Creek has been classified as a Type II habitat by the Yukon Fisheries Protection Authorization. This habitat designation is applicable to

the lower 1.5 km portion of the watercourse as steep gradients prevent fish from further migration upstream (Volume II Minto Project IEE). Since Minto Creek is an ephemeral watercourse, freezing completely during the winter, it is unlikely that any over wintering habitat for fish exists along the creek. No fish were found in reaches above the 1.5 km mark of the creek that provides the barrier to fish migration. The location of the barrier to fish migration on Minto Creek is shown on Figure 5.

Numerous locations along the Yukon River, including the confluence of Big Creek provide spawning and rearing habitat for the aforementioned fish species, including important commercial and subsistence species such as chinook and chum (dog) salmon. These areas have been identified as a result of consultation with SFN members, government fish habitat data, and other personal communications. Figure 6 provides more information on the uses and the location of Yukon River fish and fish habitat in the Minto Project area.

4.4.2 Benthic Macroinvertebrates

Benthic macroinvertebrate samples were collected along Minto Creek on several occasions during June 1975 and September 1976 by the Department of Fisheries and Oceans and Environment Canada, and by Environmental Protection Service in 1977. The most recent sampling occurred in August 1994, by Hallam Knight Piesold. The following discussion and presentation of results has been adapted from Minto Explorations Ltd. IEE, Volume II, Environmental Setting.

Benthic invertebrate communities that develop in a particular habitat reflect the relative success of those species that have adapted to suit that particular environment. Community structures of these species change as the habitat in which they reside changes, be it as a result of seasonal hydrology or water quality fluctuations or environmental disturbances. Routine sampling can track these temporal and spatial trends in species composition and abundance. The relative sensitivity of the various invertebrate inhabitants to ambient water chemistry and the changes discussed above can also be used as indicators of water quality (Minto Explorations Ltd. IEE, Vol. II).

Sampling occurred along Minto Creek at benthic sampling stations, designated B1 to B6, which correspond to water quality monitoring stations W1, W2, W3, W7, W8 and W9, respectively (see

Figure 5). Samples were preserved, stained, and sent to Dr. Charles Low in Victoria, BC for taxonomic analysis and enumeration.

Table 6 presents the numerical, statistical, and qualitative analysis results conducted as a part of the benthic invertebrate studies.

Once taxonomic identification of the samples was determined, species abundance and number of taxa were determined for each sample. Statistical analyses such as richness, diversity, dominance, and equitability indices were generated for the data set. In addition, relative abundance values and tolerance categories were determined.

Groups/species of benthic invertebrates exhibit various tolerances to disturbance, natural or otherwise. Species with a low tolerance range are susceptible to disturbance and therefore represent the best and most immediate indicators of environmental change. Organisms in the facultative and tolerant categories are more able to exploit habitat in which seasonal fluctuations or disturbances occur. With the exception of Station B4, benthic communities in Minto Creek contain a large portion of facultative species, followed by lower percentages of sensitive and tolerant species, respectively.

In general, all sites contained a well-rounded representation of sensitive, facultative, and tolerant species (Minto Explorations Ltd. IEE, Vol. II). Dipteran taxa (flies) were well represented in the facultative category; however, the facultative species composition consisted primarily of other insects and invertebrates. Populations of copepods enumerated in Minto Creek indicate a relatively large quantity of pool habitat (high numbers, specifically standing water).

It should be noted that as portions of the Minto Creek watershed recover from previous forest fires, changes in riparian and in-stream ecosystems might occur. Subsequently, benthos populations and species distributions within the watershed may also change.

Table 6 Minto Creek Benthic Community Characteristics

	B1	B2	B3	B4	B5	B6
Density (#/m^2)						
Sensitive	1381	3489	1302	14453	2342	345
Facultative	3496	5802	1173	4673	10395	13608
Tolerant	421	36	162	1014	1277	950
Total	5298	9327	2637	20140	14014	14903
% Composition						
Sensitive	26.07	37.41	49.39	71.76	16.71	2.32
Facultative	65.99	62.21	44.47	23.2	74.18	91.31
Tolerant	7.94	0.39	6.14	5.04	9.11	6.37
# of Species	44	43	38	34	33	31
Shannon-Weiner Diversity	3.88	3.69	3.76	2.59	3.56	2.82
Dominance	0.11	0.11	0.13	0.38	0.13	0.27
Equitability	0.71	0.68	0.72	0.51	0.71	0.57
Richness	5.89	5.34	5.61	3.82	3.87	3.6
TU Diversity	0.892	0.894	0.873	0.623	0.871	0.732
Variance	0.027	0.015	0.049	0.319	0.03	0.165

Adapted from Table 7.3 Minto Explorations Ltd. IEE, Vol. II Environmental Setting

4.4.3 Periphyton

Periphytic alga are simple aquatic organisms which inhabit the substrate and water column of various water bodies. These organisms manufacture energy via photosynthesis and represent the base of the food chain within any aquatic community. As with benthic invertebrates, community species distributions and populations of periphyton can vary both temporally and spatially and as a result of seasonal hydrology or water quality fluctuations or environmental disturbances.

Information pertaining to species distribution and community structure of periphytic organisms in Minto Creek was gathered during the same period as the benthic invertebrate studies conducted in 1994. Five sites were established for periphyton sampling designated P1-P5, corresponding to water quality sampling sites W1, W2, W3, W5 and W9 on Minto Creek.

Concentrations of chlorophyll 'a' were determined to estimate algal biomass and therefore primary productivity in sections of the Minto Creek watershed. The highest mean concentrations of chlorophyll 'a' were detected in the upper reaches of Minto Creek where there is little vegetative cover and an abundance of sunlight exposure to the creek. The lowest concentrations of chlorophyll 'a' were detected at P3 (W3). Table 7 summarizes the results of the periphyton sampling, displaying chlorophyll concentrations calculated from the various sampling sites.

Table 7 Minto Creek Periphyton Chlorophyll 'a' Content

(micrograms/cm^2)

Replicate	Site P1	Site P2	Site P3	Site P4	Site P5
1	0.187	0.059	0.094	0.352	0.375
2	0.208	0.112	0.141	<0.01	0.181
3	0.132	0.637	0.098	0.153	1.104
4	0.059	0.077	0.073	0.092	0.0189
5	0.941	0.473	0.022	0.081	0.167
6	0.061	0.312	0.047	0.077	0.334
Mean	**0.265**	**0.278**	**0.079**	**0.126**	**0.392**
Standard Deviation	**0.045**	**0.053**	**0.206**	**0.109**	**0.142**

Note: Adapted from Minto Explorations Ltd. IEE, Vol. II, Environmental Setting, Table 8.1

Taxonomic identification and relative abundance rankings of the various alga samples has provided information on community composition and complexity. In general, samples from most of the sites on Minto Creek contained very little periphyton, indicating a relatively unproductive environment. This may be due to nutrient availability limitations and/or habitat disturbances as the result of seasonal scouring from high flow events, for example (i.e. substantial freshet). Species composition here is similar to other Southwest Yukon streams (Minto Explorations IEE, Vol. II). *Nitzschia* spp. were the most prevalent species, especially at sites P2 and P3 (downstream of the orebody).

4.4.4 Stream Sediments

Stream sediments were sampled at the lower reach of Minto Creek (Station W2) on October 13, 1999. The sediments were sampled in triplicate and shipped for analysis to Norwest Labs of Vancouver the following day. ICP semi-trace metal analysis in solids and a wet sieve analysis were conducted on the samples. Another sampling of Minto Creek sediments was conducted in 1994 during the collection of baseline information for the Minto Project IEE.

Sediments in Minto Creek consist primarily of sand with some gravels and minimal fractions silts and clays (Volume II Minto Project IEE, 1994). Results from the 1994 sediment analysis showed high levels of arsenic in the lowest reach of Minto Creek, high levels of chromium and zinc one (1) kilometer downstream of the proposed tailings dam, and high levels of copper in the vicinity of the ore body in the upper reaches of the creek. Results of the 1999 analysis, restricted to the lower reach of Minto Creek, showed similarly high concentrations of arsenic and chromium. However, only one replicate for each of chromium and arsenic exceeded CCME Sediment Quality Guidelines for the Protection of Aquatic Life, in 1999 (CCME, 1999). No stream sediments were collected elsewhere on site.

The results of this analysis and that of October 1999 are presented in Table 8.

Table 8 Results of Stream Sediment Analysis at Lower Minto Creek - Station W2

	Location						
	W2 Replicate #1	W2 Replicate #2	W2 Replicate #3	W2 Replicate #1	W2 Replicate #2	W2 Replicate #3	CCME Guidelines
Source	ACG	ACG	ACG	Minto IEE	Minto IEE	Minto IEE	
	13-Oct-99	13-Oct-99	13-Oct-99	1994	1994	1994	
Physical Tests							
Moisture %				21.00	18.10	16.30	
Particle Size							
Gravel - % (>2.00 mm)				25.00	27.50	34.00	
Sand - % (2.00 - 0.063 mm)				64.00	64.00	58.50	
Silt - % (0.063 mm - 4 um)				7.59	6.56	5.74	
Clay - % (<4 um)				1.99	1.93	1.75	
Wet Sieve for Solids (% Retained)							
10 Mesh (2mm)	86.2	57.4	62.8				
18 Mesh (1mm)	4.3	12.5	6.3				
35 Mesh (0.5mm)	3.7	14.3	8.4				
60 Mesh (0.25mm)	2.8	9.6	9.6				
140 Mesh (0.1mm)	1.5	4.4	7.2				
270 Mesh (0.053mm)	0.8	1.1	3				
Total Metals (mg/L)							
Mercury (Hg)				0.01	0.01	0.02	
Metals in Solids (micrograms/gram)							
Aluminum (Al)	13100	12600	11400				
Antimony (Sb)	<2	<2	<2	0.32	0.29	0.25	
Arsenic (As)	2	**6**	<2	4.57	4.66	4.09	5.9
Barium (Ba)	184	196	169				
Beryllium (Be)	0.3	0.3	0.3				
Bismuth (Bi)	<5	<5	<5				
Cadmium (Cd)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6
Calcium (Ca)	9590	6610	7530				
Chromium (Cr)	**37.6**	25	26.3	13.40	15.00	13.70	37.3
Cobalt (Co)	6.7	5.7	6.2				
Copper (Cu)	10.9	10.3	13	14.20	14.20	13.00	35.7
Iron (Fe)	15000	13000	14000				
Lead (Pb)	4	5	3	2.60	2.20	<2	35
Lithium (Li)	5	3.8	5.1				
Magnesium (Mg)	5290	3840	5290				
Manganese (Mn)	439	470	367				
Molybdenum (Mo)	<1	<1	<1	<4.0	<4.0	<4.0	
Nickel (Ni)	13.5	10	14.7				
Phosphorus	841	445	835				
Potassium (K)	2920	2960	2340				
Selenium (Se)	<2	<2	<2				
Silicon (Si)	447	817	114				
Silver (Ag)	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	
Sodium (Na)	1940	3130	1650				
Strontium (Sr)	78	79	59				
Sulphur (S)	100	60	140				
Thorium	<1	2	<1				
Tin (Sn)	2	2	2				
Titanium (Ti)	989	518	683				
Uranium	<5	<5	<5				
Vanadium (V)	44	30	36				
Zinc (Zn)	30.9	22.8	30.7	30.40	28.90	29.00	123
Zirconium (Zr)	9.6	6.4	8.3				

Note: **Bold** and shaded values represent those samples exceeding CCME Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 1999). CCME guidelines are for total metals.

4.5 ARCHAEOLOGY AND TRADITIONAL LAND USE

4.5.1 General Project Area

Areas of archeological interest near Minto are represented by four sites identified during an archeological survey conducted by Sheila Greer, in 1994 (Minto Project IEE, Vol. II, 1994). Three of the sites exist on the east side of the Yukon River, outside of the mine development area, while the other is located near the mouth of Minto Creek. No sites were identified or suspected of existing along the Project access road or within the mine site area. The reader is referred to the Minto Project IEE Volume II by Hallam Knight Piesold for a more detailed discussion archeology and historical anthropology of the Minto area (1994).

Interviews of SFN members were conducted as part of the compilation of environmental information for the Project area. The Project area lies within the traditional territory of the SFN and comprises part of land claim settlement parcels R-6A (Type A settlement lands), R-44A and R-40B, specifically the upper reaches of Minto Creek.

4.5.2 Selkirk First Nation Interview Results

The SFN continues to use the Project area for various activities including fishing, hunting, berry picking, and spiritual fulfillment. As a result, their current and historical knowledge of the area the SFN represents a valuable source of baseline information.

Interviews were conducted with elders and knowledgeable band members in the community of Pelly Crossing to gather local and traditional knowledge about the Project area. The interview process was initiated by introduction of the study goals to the prospective candidate. Each person interviewed was provided a description of the Project area and given some background regarding the Minto Project itself. Upon acceptance to participate, the person would be asked a series of questions presented in a questionnaire format. A site map of the area facilitated discussion and response to interview questions.

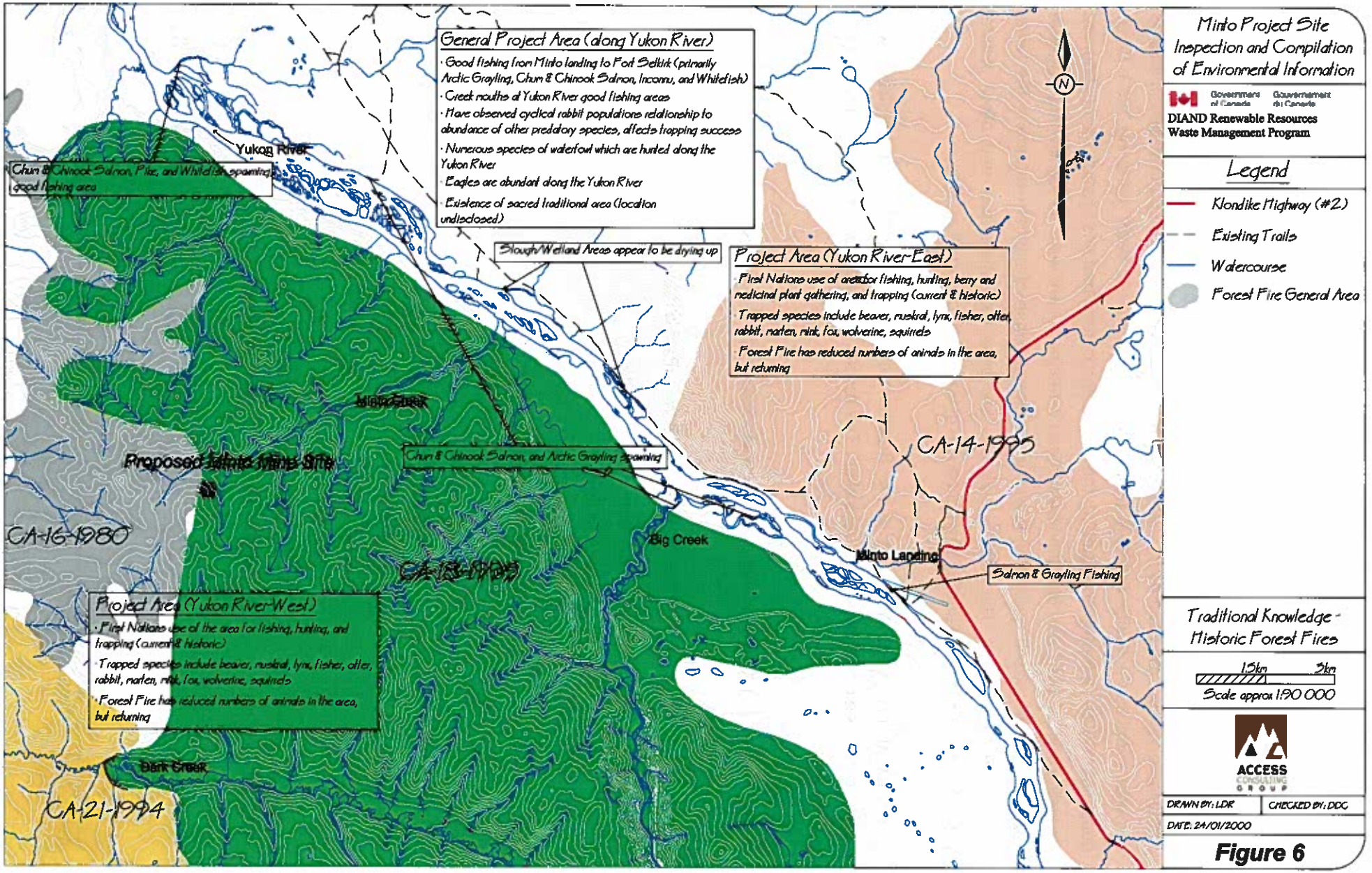
Twelve SFN members from Pelly Crossing were interviewed, including nine elders, by Nancy Alfred, a SFN member. Table 9 provides the list of interview participants. Interview questions consisted of natural resource based questions such as knowledge of and participation in various resource extraction activities (hunting, fishing, trapping, plant and berry gathering, etc.). Other questions solicited information regarding the knowledge of temporal and spatial trends observed regarding animal, plant and fish abundances and locations. There were no significantly negative responses to the posed questions, however a general sense of concern regarding the Minto Project was expressed. The respondents use the area for subsistence and other cultural activities and are keen on seeing it remain a site of continued cultural land use.

Respondents indicated on a map of the Project area where they know of, or they have, conducted various cultural land use activities. The results of this questionnaire are summarized in Figure 6.

A copy of the original questionnaire and the associated results are included as Appendix C.

Table 9 List of Interview Participants

Kitty Johnathan	Elder
Tommy Joe	Elder
George McGinty	SFN Member
Maria VanBibber	Elder
Alex Joe	Elder
Franklin Roberts	Elder
Danny Roberts	Elder
Daniel Luke	SFN Member
Darryl Johnny	SFN Member
Annie McGinty	Elder
Mary Blanchard	Elder
Johnny Simon	SFN Member


General Project Area (along Yukon River)
· Good fishing from Minto landing to Fort Selkirk (primarily Arctic Grayling, Chum & Chinook Salmon, Inconnu, and Whitefish)
· Creek mouths at Yukon River good fishing areas
· Have observed cyclical rabbit populations relationship to abundance of other predatory species, affects trapping success
· Numerous species of waterfowl which are hunted along the Yukon River
· Eagles are abundant along the Yukon River
· Existence of sacred traditional area (location undisclosed)
Yukon River
Chum & Chinook Salmon, Pike, and Whitefish spawning; good fishing area
Slough/Wetland Areas appear to be drying up
Project Area (Yukon River-East)
· First Nations use of area for fishing, hunting, berry and medicinal plant gathering, and trapping (current & historic)
· Trapped species include beaver, muskrat, lynx, fisher, otter, rabbit, marten, mink, fox, wolverine, squirrels
· Forest Fire has reduced numbers of animals in the area, but returning
Minto Creek
Proposed Minto Mine Site
Chum & Chinook Salmon, and Arctic Grayling Spawning
CA-14-1995
CA-16-1980
CA-15-1995
Big Creek
Minto Landing
Salmon & Grayling Fishing
Project Area (Yukon River-West)
· First Nations use of the area for fishing, hunting, and trapping (current & historic)
· Trapped species include beaver, muskrat, lynx, fisher, otter, rabbit, marten, mink, fox, wolverine, squirrels
· Forest Fire has reduced numbers of animals in the area, but returning
Dark Creek
CA-21-1994
N
Minto Project Site
Inspection and Compilation
of Environmental Information
Government of Canada / Gouvernement du Canada
DIAND Renewable Resources
Waste Management Program
Legend
Klondike Highway (#2)
Existing Trails
Watercourse
Forest Fire General Area
Traditional Knowledge -
Historic Forest Fires
1.5km
3km
Scale approx 1:90 000
ACCESS CONSULTING GROUP
DRAWN BY: LDR
CHECKED BY: DDC
DATE: 24/01/2000
Figure 6

4.6 CURRENT LAND USE & CULTURAL RESOURCES

4.6.1 Land Tenure

Land tenure in the general vicinity of the Minto Project is limited to areas east of the Yukon River. Much of the Minto Landing area is held under title by the SFN. Other settlement lands and site specific land selections by the SFN are also located in the region. Several fee simple titled properties also exist in the area that are held by non-first nation persons. Figure 7 displays land tenure in the Project area. Detailed land tenure information for the Minto Landing area is provided in Figure 8.

The SFN has several tracts of settlement land adjacent to or within the Project area (Figure 7). The importance of the area for traditional and historic use is reflected in the lands chosen by the SFN. SFN concerns were addressed in September of 1997, upon the signing of a co-operation agreement with MEL. The SFN remains a strong supporter of the Project.

4.6.2 Mining

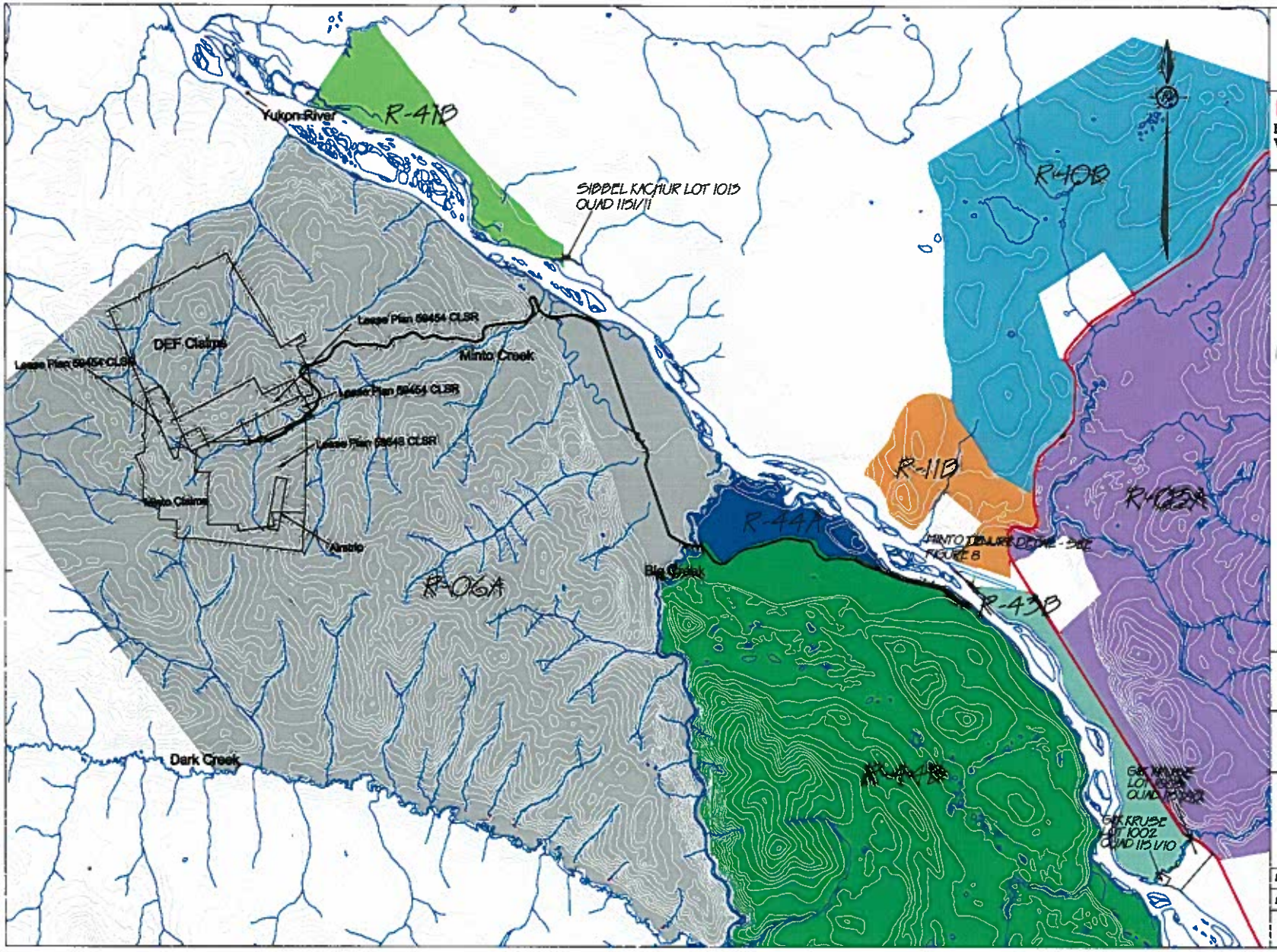
Mining in the immediate Project area is limited to the proposed Minto Project (currently in development). However, south of the Project area there is placer mining in the Big Creek watershed, and the proposed Carmacks Copper Project open pit copper mine in the Williams Creek watershed.

Mineral claims and leases were acquired by MEL from ASARCO Inc., Teck Corporation, and Falconbridge. Claim boundaries and lease numbers are shown in Figure 2.

4.6.3 Forestry

There are currently no permitted forestry activities in the Project area. Regional forest uses are limited to commercial permits to log burn-areas near Minto and harvest of fuel-wood for domestic use (DIAND-Field Operations, 2000).

MEL conducted a survey of harvest potential for fire killed fuel wood. The results of this survey indicated that there was sufficient fire killed fuel wood within the quartz claim boundaries to supply fuel wood for 100 years. This estimate was based on a volume of 725 m^3 of timber necessary to fire a one to two (1-2) million BTU per hour boiler/furnace at the mine site. The survey also suggested that a 30-year timber supply having 'good potential' exists in the area.



Minto Project Site Inspection and Compilation of Environmental Information

Government of Canada / Gouvernement du Canada

DIAND Renewable Resources
Waste Management Program

Legend

- Klondike Highway (#2)
- Existing Trails
- Watercourse
- Selkirk First Nations Settlement Lands

Minto Project Area Land Tenure

1.5km 3km

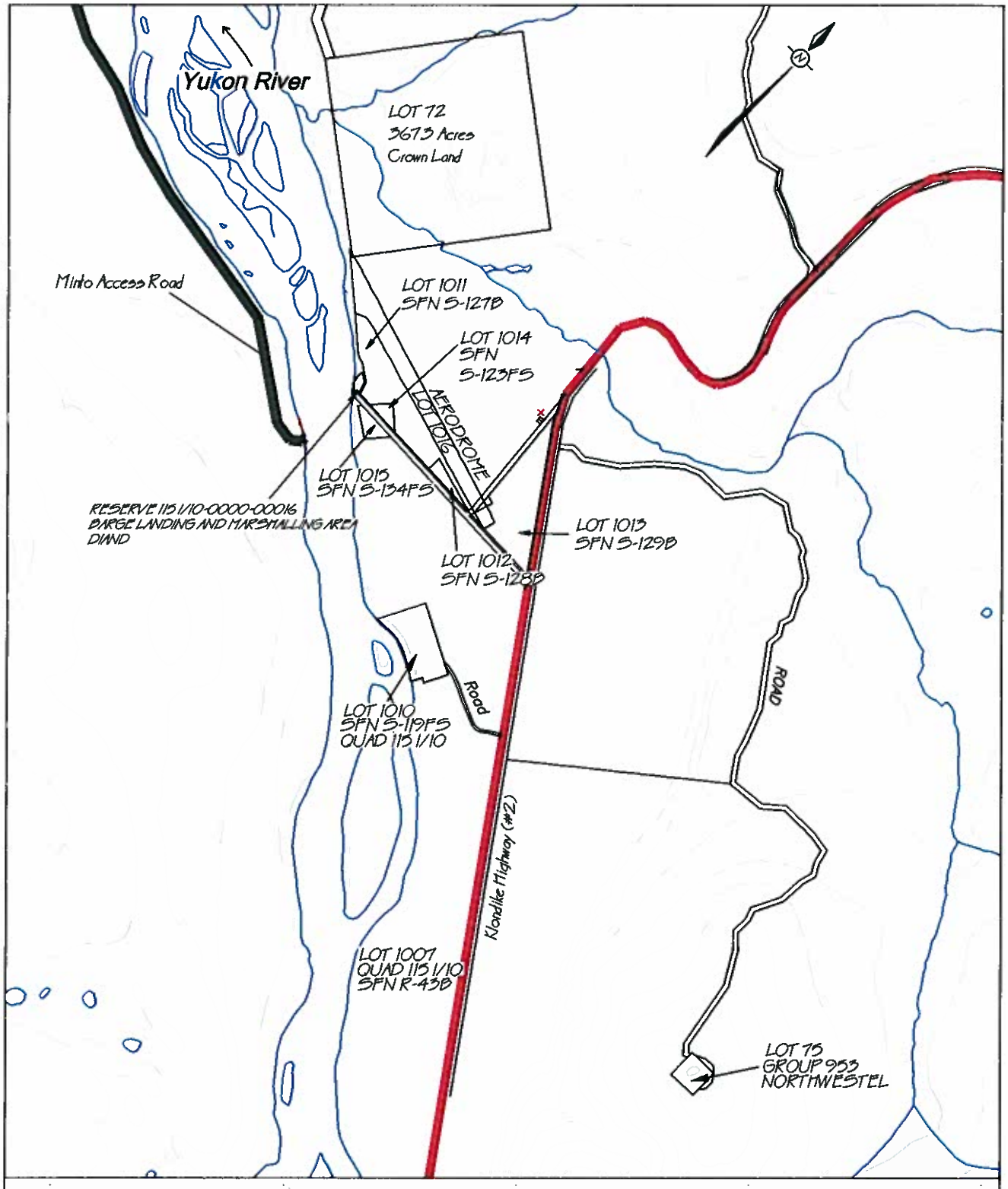
Scale approx 1:80 000

ACCESS CONSULTING GROUP

DRAWN BY: LDR | CHECKED BY: DDC

DATE: 03/02/2000

Figure 7



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DIAND Renewable Resources
Waste Management Program

Minto Project Site Inspection and Compilation of Environmental Information

Minto Landing - Land Tenure Detail

DRAWN BY: LDR	CHECKED BY: DDC	**Figure 8**
DATE: 05/02/2000		

4.6.4 Trapping and Outfitting

Trapping remains an important economic and subsistence activity for many SFN members and Yukoners in the Project area. Several Registered Trapping Concessions are held in the Project area. These include: RTC #136: Heinz Sauer, RTC#139: Danny Joe, RTC #142: OPEN, RTC #143: Johnny Sam, RTC #145: Glen and Jim Bullied, RTC #146: Geo and Ken M^{c}Ginty, RTC #147: Kathleen Sam.

Trapper access to the Project area has been identified and will be maintained, according to compensation agreements negotiated with the Project proponent.

Only two outfitting concession falls within the Project area, Registered Outfitting Concessions #13 – Held by Tim Mervyn (Mervyn Outfitting) and #14 – Held by Curt Thompson (Trophystone Safaris).

Trapping and outfitting concessions, as well as game zone locations and historical records of big game harvests in the area are presented in Figure 9.

4.6.5 Recreation and Other Land Uses

The Yukon River, in the vicinity of Minto Landing and the Minto Project access route, currently hosts recreational activities such as fishing, hunting, hiking and canoeing/rafting. The nearby Minto Resorts, owned and operated by the SFN, provides camping and other outdoor adventure excursions for visitors to the area. Minto Landing is also a starting point for tourist excursions down-river to historic Fort Selkirk. The Yukon River is also used as a transportation corridor for freight and other cargo. Land use on the western shores of the Yukon River is limited, as vehicle access to the western shore is available only in winter over river ice, or during open water by barge.

4.6.6 Cultural Land Use Activities

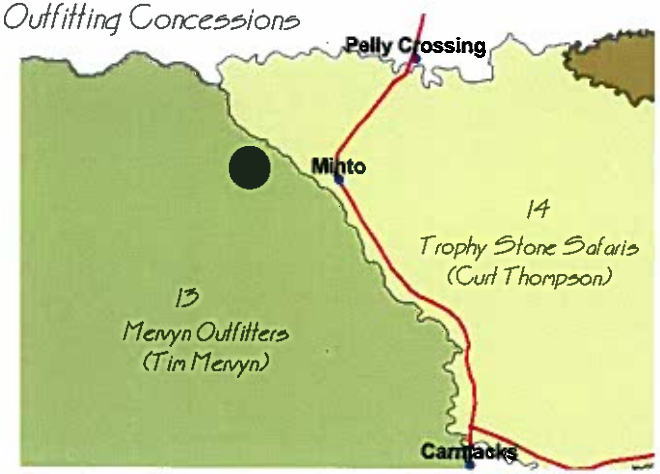
Annual salmon fishing occurs at Minto Landing and other sites along the Yukon River. Members of the SFN were seen catching chum salmon at Minto Landing during the site inspection. The Minto landing area is used for various cultural activities throughout the year, including berry

picking, trapping, hunting, and spiritual activities. Figure 6 displays the location of some of the current cultural land use activities in the area.

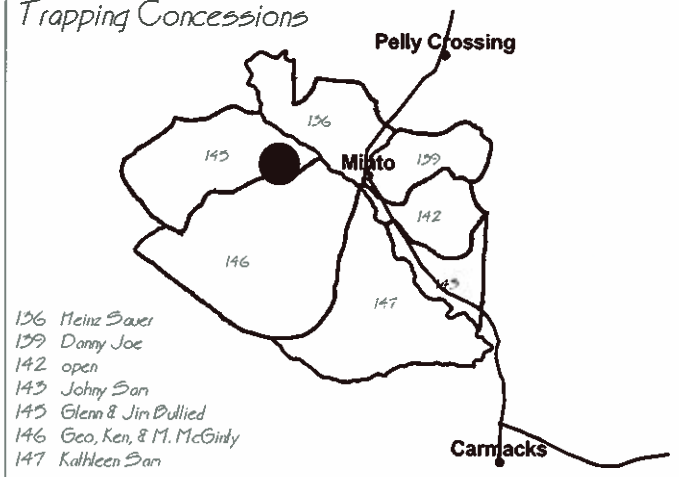
As part of the Minto mine development Project, a comprehensive cooperation agreement was signed with the SFN and MEL on September 16, 1997 (Minto Exploration Ltd., 1997).

Please refer to Section 4.5 for a more detailed discussion of cultural land use activities in the Project area.

Outfitting Concessions

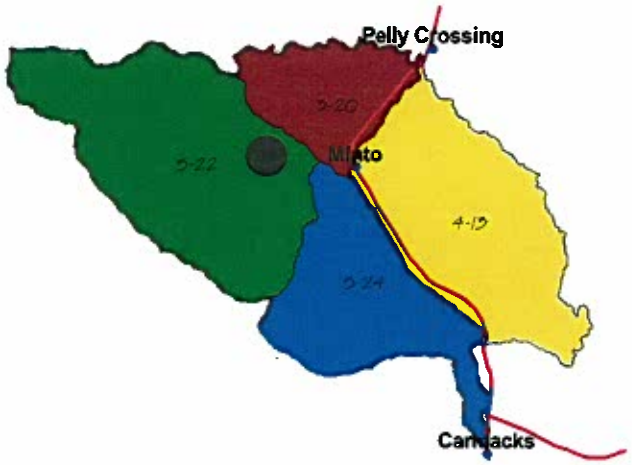


Trapping Concessions



136 Meinz Sauer
139 Danny Joe
142 open
143 Johny Sam
145 Glenn & Jim Dullied
146 Geo, Ken, & M. McGinty
147 Kathleen Sam

Game Management Zones



Big Game Harvest Levels (1980 to 1998)

Game Zone 5-20	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	0	2	0	3	1	1	1	2	2	2	3	2	1	1	0	1	1	1	1
Grizzly	0	0	1	0	0	0	1	2	0	2	0	1	0	0	2	1	3	2	0
Caribou	0	0	0	0	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Moose	1	3	3	3	4	2	0	6	3	3	1	0	1	2	1	4	2	1	5

Game Zone 4-13	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	0	2	0	1	2	2	1	1	2	2	1	0	1	0	1	0	1	1	0
Grizzly	3	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Caribou	0	0	0	0	5	0	1	0	0	1	0	0	1	1	0	0	0	0	0
Moose	1	2	1	2	4	0	1	0	0	1	5	1	2	2	1	3	1	3	1

Game Zone 5-22	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	1	3	0	0	1	0	4	2	3	0	0	1	0	0	0	0	1	0	0
Grizzly	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Caribou	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	1	1	5	6	2	1	1	3	1	0	0	0	1	1	0	0	0	0	0

Game Zone 5-24	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	1	1	0	1	1	1	0	2	0	0	0	0	2	0	0	0	2	0	0
Grizzly	0	0	0	0	0	2	0	0	1	0	0	1	0	1	0	0	0	0	1	0
Caribou	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Moose	2	2	8	5	0	2	2	6	1	0	0	0	0	1	1	0	0	0	1

Minto Project Site
Inspection and Compilation
of Environmental Information

Government of Canada / Gouvernement du Canada

DIAND Renewable Resources
Waste Management Program

Legend

- Minto Project Location
- Highway

Game Management,
Trapping, and Outfitting Concessions

10 0 10 20 30 40Km

Scale approx 1: 1 000 000

ACCESS CONSULTING GROUP

DRAWN BY: LDR | CHECKED BY: DDC

DATE: 03/02/2000

Figure 9

MINTO EXPLORATIONS LTD.

A Subsidiary of Capstone Mining Corp.

Minto Project, Yukon

Detailed Decommissioning and Reclamation Plan

Appendix B

Annual Reports – Reclamation Research Program

Minto Explorations Ltd.

A SUBSIDIARY OF CAPSTONE MINING LTD.

Minto Mine

Reclamation Research Program

Detailed Decommissioning and Reclamation Plan

2008 Activities

Prepared by:

ACCESS

CONSULTING GROUP

Table of Contents

1.0 INTRODUCTION

Minto Explorations Ltd. submitted a Detailed Decommissioning and Reclamation Plan (DDRP) to the Yukon Government for the Minto Mine Project for review and approval in November 2006. Submitted under condition of Quartz Mining License QML-0001, it was approved in June 2007 as Revision 1. This plan guides not only closure measures at the end of mine life, but also reclamation planning during the operational life of the mine.

An important component of the reclamation planning process is ongoing reclamation research, which is conducted to develop the methods required to implement a successful reclamation program. Reclamation research at Minto is focusing 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 minesite reclamation including re-contouring and erosion stabilization techniques are well established and are less reliant upon site-specific research for success.

A comprehensive reclamation research program was initiated by Minto Explorations Ltd. (MEL) at the Minto Mine in 2007 under the guidance of Access Consulting Group and with the assistance of Selkirk First Nation. In order to ascertain effective methods for revegetating disturbed areas at the Minto Mine, on-site test plots were established and snow-seeded in the fall of 2007. Progressive reclamation was also initiated in the form of snow seeding some larger disturbed areas with a preliminary seed mix that will be refined based on test results.

This summary report presents the background and methodology for the reclamation research program and describes the reclamation research activities conducted in 2008 – the first full year of the program – following the plot establishment and initial seeding in 2007. Recommendations are also presented for the further development of the research program.

2.0 BACKGROUND

Planning for the reclamation research program began with information obtained during the site baseline studies program. Indigenous species of plants were catalogued and soils were characterized and were documented in the Initial Environmental Evaluation prepared by Hallam Knight Piesold (HKP, 1994). In addition, natural re-vegetation has been effective in largely covering disturbed areas over the 35 years since the area was first disturbed.

The natural vegetation found on undisturbed sites around the mine generally indicate the underlying soil properties, including texture, drainage, and pH, and the level of available nutrients. A program involving sampling and analysis of soils in the project area was completed in 1994 and provided the basic information required for reclamation planning. Additional soil sampling was conducted from stockpiled overburden in late March 2007, and the analysis results were similar for both samples with both looking reasonably good for reclamation purposes.

Revegetation trials were initiated on site in 2007 (ACG, 2008a). Sites were selected and prepared at four locations including three on-site locations and one off-site control location and were snow-seeded in the fall.

Minto Mine's progressive reclamation program was also initiated at two sites in 2007. In this program, early reclamation is begun on disturbed sites where no further usage is anticipated. The two sites included a clearing along the main access road and a site on the toe of the first lift of the main waste rock dump.

The 2008 reclamation research activities at the Minto Mine built upon the initiatives from 2007. Additional trial plots were added at the established sites to determine optimum seeding time, additional progressive reclamation was initiated, and all sites were surveyed and sampled in early September. The following sections reiterate program foundational aspects and outline 2008 activities in more detail.

3.0 OBJECTIVES

The approved DDRP submits that:

> *"The overall goal of closure at the Minto site is to leave the area as a self-supporting 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."*

Specific to the revegetation aspect of the mine closure and decommissioning, the following sections present the objectives for the revegetation program in general and within that, the reclamation research program.

3.1 REVEGETATION PROGRAM

The primary objectives of land reclamation and revegetation at the Minto mine site include:

- undertaking mine planning that incorporates progressive reclamation;
- providing short and long term slope stabilization and erosion control on linear and non-linear disturbances;
- ensuring the long-term chemical stability of residual mining components and their effects on water quality draining the property;
- ensuring the long-term physical stability of key structures such as the waste dumps and the diversion and drainage ditches; and
- working towards a passive closure scenario for most or all mine components.

The establishment of an initial ground cover of graminoids has historically been viewed as a desirable closure objective on most disturbed areas to stabilize slopes and control soil erosion. Graminoids are all grasses and grass-like plants, including sedges and rushes. Reclamation and revegetation efforts on site will ensure that this objective is achieved; however, the establishment of existing or natural vegetative communities and species is also another desirable objective. Based on recent reclamation research, it is noted that there is typically an abundance of natural seed or reproductive seed material

available from local surroundings, and that these naturally occurring seed sources should be considered as part of any reclamation program (Craig, et al., 1998).

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. The creation of shrub willow islands can also enhance natural succession.

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 at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species.

In the larger, more open disturbed areas at the minesite (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 seral stages of plant succession on these sites.

The continued initiation of progressive reclamation measures that begin with the placement of a cover of overburden will provide areas of different aspect/exposure for the establishment of more revegetation trial plots.

3.2 REVEGETATION RESEARCH PROGRAM

Key to long term reclamation success is site-specific revegetation research. In order to establish successful revegetation of disturbed areas over the life of mine and at closure, MEL has initiated a methodical revegetation trial program to assess and provide:

a) a further inventory of available soils around the site (particularly the overburden material) and their physical characteristics;

b) the nutrients in the available soils - while fertilizers will likely be necessary to encourage quick initial establishment of healthy growth, the plant mixtures used must be capable of sustaining long term growth without the aid of artificial fertilizers;

c) 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 revegetating the site, further reviews and investigations are necessary to confirm the appropriate seed mixes that should be used. 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 (see section 4.1); and
- information gained from revegetation test plot trials on site.

d) the effect of slope and aspect on revegetation success, and if necessary the subsequent effect of erosion control measures; and

e) the potential for metals uptake by the plants on the growth media over the tailings - different plant varieties and species, tailings characteristics, cover designs and other environmental conditions are all factors influencing uptake of metals by plant tissues.

Successes and failures of this research program will provide valuable information on alternative approaches to closing reclamation methodology. The following sections outline the research methodology, existing trial plot locations, program expansion/modification specifics and monitoring schedules for the revegetation trial program.

4.0 METHODOLOGY

The reclamation research program at the Minto Mine Site is centered on a network of revegetation test plots. Table 4-1 outlines the details and schedule for the implementation and monitoring of the trial plots proposed in the DDRP, and the actual establishment timing to date.

The successes from these trial plots are being transferred to the ongoing progressive reclamation efforts that will provide a large-scale opportunity for refinement of reclamation and revegetation techniques and measures. A schedule for the progressive reclamation activities and associated costs is presented in the DDRP and is summarized below in Table 4-2. Revegetation follows required re-contouring/earthworks and preparation with overburden on disturbed areas which have been confirmed for final reclamation.

Over the life of the reclamation research project, a number of selected variables are being adjusted at the trial locations to determine:

- optimum seed mixes/compositions;
- optimum seeding times;
- optimum growth media (overburden) covering depth;
- utility of techniques such as snow seeding;
- fertilizer requirements to amend nutrient content of the overburden; and
- utility of soil amendments such as lime, wood fibre or mulches.

Generally, new plots will be established in the spring and all plots will be surveyed in the fall to determine growth success. Sampling of plant tissues from the tailings test plots is also being conducted to assist in refining the revegetation program, and existing literature and research regarding plant metal uptake and foraging patterns will be utilized to refine the seed mix. In these early stages of the program, the selection of seed and fertilizers for use on the test plots is being based in part on the results of soil sample analyses collected from the overburden stockpiles, and partially on mixes used successfully in other reclamation initiatives in the Yukon. The methodology for seed selection is presented in Section 4.1.

Table 4-1. Proposed and actual revegetation test plot establishment locations and monitoring schedule

Location	Description	Proposed Plot Details	Establishment Timeline	Monitoring Timeline
Toe Berm of Ice Rich Overburden Dump	east facing aspect, ~50% slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Proposed: Spring 2007 Actual: Fall 2007 (2 sites)	Anually in August Observations, soil samples
Toe of Waste Rock Dump	south facing aspect, rolled bench/slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Proposed: Spring 2007 Actual: Fall 2007 (progressive reclamation)	Anually in August Observations, soil samples
Starter Bench below Tailings Deposit	north facing aspect, ~40% slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Proposed: Fall 2007 Actual: Fall 2007	Anually in August Observations, soil samples
Tailings Deposit Surface	low slope (~2%)	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Proposed: Spring 2008 Not established	Anually in August Observations, vegetation samples, soil samples
Typical Fill Slope	variable slopes and aspects	Control Plot (no treatment) Various slopes to determine erosion/slumping impacts Plots with variable seed/fertilizer rates Spring and fall plantings	Spring 2007 Not established	Anually in August Observations, soil samples
Borrow Area on Access Road	flat, compacted gravels	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings Indigenous shrub plantings	Proposed: Spring 2007 Actual: Fall 2007	Anually in August Observations, soil samples

Table 4-2. Proposed progressive reclamation schedule in hectares by year of mine operations.

	Main Waste Rock Dump		Ice-Rich Overburden Dump (Toe Berm)		Dry Stack Tailings Area	
Year	**Earthworks**	**Revegetation**	**Earthworks**	**Revegetation**	**Earthworks**	**Revegetation**
1	0.25	0.25	0.25	0.25	0.25	0.25
2	8.00	8.00	0.95	0.95	0.00	0.00
3	5.55	5.55	0.00	0.00	2.00	2.00
4	5.50	5.50	0.00	0.00	2.00	2.00
5	5.50	5.50	0.00	0.00	8.90	8.90
6	5.50	5.50	0.00	0.00	9.75	9.75
7	2.00	2.00	0.00	0.00	8.00	8.00
Total	**32.30**	**32.30**	**1.20**	**1.20**	**30.90**	**30.90**

Note: The project start-up date is August 1, 2007; therefore Year 1 is from August 1, 2007 to July 31, 2008.

4.1 RATIONALE FOR STARTING SEED MIX SELECTION

The selection of these species was based in part on site-specific biophysical conditions, the analytical results of soil samples collected from the mine's overburden stockpiles, and the reclamation guidelines described below. The program is also guided by the collective experience gained from previous efforts to revegetate disturbed lands in the region. For details of Minto Explorations Ltd.'s revegetation research program, see reports by Access Consulting Group (2008).

Reclamation guidelines for the area, as well as accounts of two other recent revegetation programs in the Yukon, were reviewed and are summarized it this report (these documents are referenced at the end of this report).

4.1.1. Reclamation Guidelines

The foremost documents guiding reclamation and revegetation endeavors in the Yukon since the 1990s have been Guidelines for Reclamation / Revegetation in the Yukon (Kennedy 1993) and Guidelines for Reclamation / Revegetation in the Yukon - Volume II (Hill et al. 1996).

These guidelines prescribe seed formulations based on the original plant communities in any given area. It also prescribes formulations for specific problems (steep cut slopes, saline soils, etc.). These prescriptions have been based on original data obtained through extensive research conducted in the late 1970s and early 1980s. Seeds from indigenous species of grasses and legumes were collected from widely geographically dispersed locations in the Yukon. These seed stocks were increased in nurseries and then planted in test plots with various surface preparations in numerous locations throughout the Yukon. The seed prescription in the reclamation guidelines were based on the results of several years' monitoring of these test plots.

These reclamation guidelines have focused on specific regions of the Yukon. The Minto Mine area lies near the southern boundary of the Central Yukon Region 5 as described in Volume II of these guidelines.

The Minto Mine area is currently in various stages of regenerative growth following at least four separate forest fires in the last half century. Should the forests of this fire-

prone area reach a climax stage, those forests would most likely be a combination of black spruce, mixed deciduous-coniferous (primarily white spruce and trembling aspen), and a narrow riparian corridor of willow and sedge.

The reclamation guidelines for this area prescribe a number of species of native grasses for these types of forested areas including:

Violet Wheatgrass	(*Agropyron violaceum*)
Slender Wheatgrass	(*Agropyron pauciflorum*)
Bearded Wheatgrass	(*Agropyron subsecundum*)
Northern Fescue	(*Festuca saximontana*)
Sheep Fescue	(*Festuca ovina*)
Fowl Bluegrass	(*Poa palustris*)
Altai Fescue	(*Festuca altaica*)
Glaucous Bluegrass	(*Poa glauca*)
Tufted Hairgrass	(*Deschampsia caespitosa*)
Red Top *	(*Agrostis gigantea*)
Meadow Foxtail *	(*Alopecurus pratensis*)

* Although listed as native species in the guidelines, these two grasses have been introduced to the Yukon flora (Cody 1996).

4.1.2. Other Yukon Mine Sites

In order to evaluate the potential success of grass species at the Minto Mine, two other recent Yukon mine site revegetation projects where these reclamation species were used are hereby scrutinized.

4.1.2.1. Brewery Creek Reclaimed Open Pit Mine

The Brewery Creek Mine in the central Yukon operated from 1996 to 2002. Although revegetation commenced at the mine in 1996, most reclaimed surfaces were seeded from 2003 to 2007. These reclaimed areas include approximately 130 ha of recontoured waste rock dumps, filled-in mine pits, haul roads, the capped leach pad and other disturbed sites.

Several seed mixes were used to revegetate the Brewery Creek Mine. All of the six grass species used at the Minto Mine test plots were used in at least some of these seed

mixes. The progress of revegetation on the seeded areas has been monitored annually since 2005.

Violet Wheatgrass was included in almost all seed mixes used at Brewery Creek and is now widespread at the mine site.

Sheep Fescue was included in the last seed mix acquired at Brewery Creek and was seeded at a number of sites in 2006 and 2007. It is now one of the dominant seeded species in these areas.

Northern Fescue was also seeded at Brewery Creek in 2006 and 2007. Although not as widespread as Sheep Fescue, it is a significant component of the vegetative cover in most areas where it was seeded.

Fowl Bluegrass was included in the seed blend that was used to revegetate many of the reclaimed surfaces from 2003 to 2006. Although not resulting in as dense a cover as other seeded grass species, Fowl Bluegrass is widespread, particularly on surfaces with some soil moisture.

Glaucous Bluegrass was included in the last seed mix acquired at Brewery Creek and was seeded at a number of sites in 2006 and 2007. Although not a dominant species, it is growing particularly well on drier sites.

Tufted Hairgrass was included in the seed blend that was used to revegetate many of the reclaimed surfaces from 2003 to 2006. Although not resulting in as dense a cover as other seeded grass species, Fowl Bluegrass is now widespread throughout much of the reclaimed mine site.

4.1.2.2. Faro Mine Dewatered Freshwater Reservoir

The dewatered freshwater reservoir on the south fork of Rose Creek at the Faro Mine was seeded with northern native grass species in several phases during the 2003 and 2004 seasons. Approximately 60 ha of the formerly submerged valley bottom and sides of the reservoir were seeded.

Three of the six grass species used at the Minto Mine test plots were included in the seed mix used at the Faro reservoir. The progress of revegetation on the seeded areas has been monitored annually since 2005.

Violet Wheatgrass, although not resulting in a dense ground cover, is now widespread throughout all areas of the reclaimed freshwater reservoir.

Sheep Fescue is the dominant seeded species on the steeper side slopes of the reservoir, where it has and has helped stabilize the soil and prevent erosion.

Tufted Hairgrass is now widespread throughout much of the reclaimed area, and is the dominant species on the wetter reservoir bottom.

4.1.3. Grass Seed Prescription for the Minto Mine

The seed test plots at the Minto Mine were established with the assumption that the underlying principle of the revegetation program is for the mine site area to eventually assimilate with the surrounding area as far as possible. This natural succession would take several decades to occur after mine closure. The short term assisted revegetation program is to provide soil stabilization and to “kick-start” the natural revegetation process.

Based on this review of guidelines, local knowledge and experience from reclamation projects at other Yukon mine sites and the current commercial availability of grass seeds, it was decided to start with the following grass species on the test plots at the Minto Mine:

Violet Wheatgrass (*Agropyron violaceum*) is found from Greenland to Alaska and occurs through much of the Yukon Territory. Violet Wheatgrass has a bunch growth habit with extensive cover production with a strong competitive ability. It is drought tolerant and has tolerance to alkaline soils, nutrient-poor soils and permafrost.

Sheep Fescue (*Festuca ovina*) is a wide-ranging circumpolar species and is found through much of the Yukon Territory. Sheep fescue has a bunch growth habit and is tolerant to drought and to nutrient-poor, acidic soils.

Northern Fescue (*Festuca saximontana*) is a North American grass species that occurs as far north as the central Yukon. Northern Fescue is has a bunch growth habit with rapid, early emergence. It is drought-tolerant and is tolerant to alkaline soils, nutrient-poor soils and permafrost.

Fowl Bluegrass (*Poa palustris*) is a circumpolar species that occurs in the Yukon as far north as the Porcupine River. Fowl Bluegrass has a bunch growth habit and has a strong competitive ability. It is drought-tolerant and is tolerant to nutrient-pooracidic soils, permafrost and wet soils.

Glaucous Bluegrass (*Poa glauca*) is a circumpolar, arctic-alpine grass species found throughout the Yukon Territory. Glaucous Bluegrass has a bunch growth habit and has a strong competitive ability. It is drought-tolerant and is tolerant to alkaline soils, nutrient-poor soils and permafrost.

Tufted Hairgrass (*Deschampsia caespitosa*) is a circumpolar grass species that occurs throughout much of the Yukon Territory. Tufted Hairgrass has a bunch growth habit, extensive cover production and a strong competitive ability. It is drought-tolerant and is tolerant to nutrient-poor acidic soils, permafrost and wet soils.

No legumes have been seeded at the Minto Mine test plots. Seeds of northern varieties of legumes were commercially unavailable at the time of seeding. A survey of the area surrounding the Minto Mine may be beneficial in order to determine if locally occurring legume seeds are available.

It was noted that mountain alder (*Alnus crispa*) is a commonly occurring nitrogen-fixing species in the Minto Mine area. Seeds from these naturally occurring shrubs could be easily collected and propagated on site.

5.0 2008 ACTIVITIES

Activities in 2008 were undertaken during two periods – a spring preparation and seeding initiative in late May, and a survey in early September.

5.1 REVEGETATION TRIAL PLOTS

Trial sites were selected and prepared at four locations including three on-site locations and one off-site control location in 2007 (ACG, 2008). These sites were selected in locations where reclamation will be undertaken progressively early in the mine life, and represent a range of aspects and slopes as proposed in the DDRP.

Plate 1. Establishing new test plots and seeding at trial site R1 (IROD – Upper)

Two additional test plots were established at each of the four trial sites on May 26, 2008, by S. Withers and S. Van Bibber (Access Consulting Group) and by representatives of the Selkirk First Nation (Ashley Van Bibber and Joseph O'Brien). The ground at the time

MINTO MINE

2008 RECLAMATION RESEARCH PROGRAM

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

N

R4

Minto Creek

Main Water Dam

Main Access Road

Reclamation Overburden Dump

Main Waste Rock Dump

Open Pit

R3

Contractors Work Area

Tailings Storage Facility

Ore Stockpiles

R1

R2

Ice Rich Overburden Dump

South West Dump

South Diversion Ditch

Exploration Camp

Airstrip

Explosives Plant Site

AN Storage Site

Magazine Site

1:13,500 (when printed on 11 X 17 inch paper)

0 125 250 500 750 1,000 Meters

- Trial Sites
  - R1
- Mine Road
- Exploration/Trail
- Contour
- Watercourse
- Mine Feature Footprints
- Progressive Reclamation Sites
- Waterbody

ID

- Structures

Hydrology data provided by Minto Explorations Ltd, May 2009
Site Layout provided by Minto Explorations Ltd, July 2009.
Contour data compiled by Natural Resources Canada; 1:50,000, NTS map sheet 115I11

Projection : UTM Zone 8 N
Datum: NAD 83

FIGURE 1

REVEGETATION TRIAL SITES LOCATIONS

ACCESS Consulting Group

August 2009	Drawn by: MD	Checked by: SK

D:\Project\AllProjects\MINTO\gis\mxd\Progressive_Reclamation\Fig_1_Progessive_reclamation_sites.mxd

of seeding and plot layout was unfrozen and quite dry. New plots established at each trial site included:

- A plot with an application of both seed and fertilizer; and
- A plot with an application of seed (no fertilizer).

The plot layout, seed and fertilizer composition, and application methods in May 2008 were identical those used on the plots established in October 2007 (ACG, 2008), and will be assessed to compare the relative success of spring seeding versus snow-seeding.

The seed mix used for all four locations consisted of the following:

Species	Latin Name	Application Rate (kg/ha)	Percentage
Violet Wheatgrass	*Agropyron violaceum*	10	33.3
Sheep Fescue	*Festuca ovina*	5	16.6
Rocky Mountain Fescue	*Festuca saximontana*	5	16.6
Glaucous Bluegrass	*Poa glauca*	5	16.6
Fowl Bluegrass	*Poa palustris*	3	10.0
Tufted Hairgrass	*Deschampsia caespitosa*	2	6.6
Total		**30**	**100**

These grass seed mixes were acquired from Brett Young Seeds in Calmar, Alberta. The seeds, although produced in Alberta, are species that are found naturally occurring in the Yukon.

The grass seeds were weighed and mixed on-site prior to application with a hand-held broadcast seeder. The fertilizer used at all four locations (18-24-12) was applied at a rate of 160 kg/ha also with a hand-held broadcaster. After the seed and fertilizer were applied, they were hand-raked into the ground.

5.2 SOIL SAMPLING AND ANALYSIS

Composite soil samples were collected from each of the four test plot locations during the September 2008 survey. They were analyzed for physical and aggregate properties, ICP metals, acidity, soil classification and nutrients. Results are included in Appendix A.

The three on-site soil samples showed moderate amount of organic matter, while the control site showed low organic matter content. The upper IROD and the control samples had low concentrations of available nitrogen (nitrate), while the lower IROD and toe-of-tailings samples showed moderate concentrations of available nitrogen (nitrate). Phosphorus and potassium levels were in the moderate range for all four sites. The carbon/nitrogen ratio and the cation exchange capacity were good for the three on-site samples, but low for the control site sample. The on-site samples were in the mildly alkaline range while the control site sample was slightly acidic. The on-site samples showed low electrical conductivity while the control site sample had very low electrical conductivity.

Further soil sampling will continue annually throughout the program. If these samples are representative of the soil to be used for reclamation at the mine, a high nitrogen fertilizer is recommended.

5.3 VEGETATION SAMPLING AND ANALYSIS

Samples of the seeded grasses were collected from each of the four test plot locations during the September 2008 survey. These samples were analyzed for ICP metals. Results are included in Appendix A.

Of significance in the soil and vegetation tissue metal analyses results are the higher levels of copper in both soils (102-182 ug/g) and vegetation tissue (16.0-29.5 ug/g) in the three on-site samples compared to the soils (18 ug/g) and vegetation tissue (8.44 ug/g) in the control site samples. This may indicate an uptake of copper by the seeded grasses, to be expected in this area of mineralization.

5.4 SURVEY OBSERVATIONS

A survey of the trial sites and progressive reclamation seeded areas was conducted on September 5, 2008 by S. Withers. Observations from the survey are presented below with trial site information. The trial site locations are also shown on Figure 1.

R1: Ice-Rich Overburden Dump (IROD) – Upper

This site is located near the northern entrance to the ice-rich overburden dump on the top of the berm.

UTM Coordinates:	383501 E, 6944737 N
Elevation:	886 m
Slope:	15^{o}
Aspect:	80^{o} (ENE)

Plate 2. Revegetation at trial site R1 (IROD – Upper)

Revegetation Observations:

Fall 2007 Seed and Fertilizer Plot

- 20% cover
- All grasses still too immature to identify

Fall 2007 Seed (no fertilizer) Plot

- 15% cover
- All grasses still too immature to identify

Spring 2008 Seed and Fertilizer Plot

- 50% cover
- All grasses still too immature to identify

Spring 2008 Seed (no fertilizer) Plot

- 40% cover
- All grasses still too immature to identify

Control Plot

- no seeded grasses

Other Observations:

- Volunteer plant species colonizing this area include *Salix spp., Rubus idaeus, Mertensia paniculata, Epilobium angustifolium, Polemonium acutiflorum, Stellaria sp., Calamagrostis Canadensis, Carex brunnescens and Equisetum sp.*

- The area seeded in the fall of 2007 is highly compacted and has recently been driven over by heavy vehicles.

R2: Ice-Rich Overburden Dump (IROD) – Lower

This site is located at the toe of the berm on the eastern extremity of the ice-rich overburden dump, and can be accessed from below via the contractor's work area.

UTM Coordinates:	383769 E, 6944612 N
Elevation:	857m
Slope:	18^{o}
Aspect:	80^{o} (ENE)

Plate 3. Revegetation cover at R2 Trial Site (IROD – Lower)

Revegetation Observations:

Fall 2007 Seed and Fertilizer Plot

- 70% cover, including Violet Wheatgrass, Tufted Hairgrass and Glaucous Bluegrass
- Other grasses still too immature to identify

Fall 2007 Seed (no fertilizer) Plot

- 60% cover, including Violet Wheatgrass, Tufted Hairgrass and Glaucous Bluegrass
- Other grasses still too immature to identify

Spring 2008 Seed and Fertilizer Plot

- 80% cover, including Wheatgrass, Tufted Hairgrass and Glaucous Bluegrass
- Other grasses still too immature to identify

Spring 2008 Seed (no fertilizer) Plot

- 60% cover, including Wheatgrass and Glaucous Bluegrass
- Other grasses still too immature to identify

Control Plot

- no seeded grasses

Other Observations

- Volunteer plant species colonizing this area include *Salix* spp., *Rubus idaeus*, *Epilobium angustifolium*, *Dracocephalum parviflorum, Corydalis sempervirens, Potentilla palustris, Chenopodium capitatum, Calamagrostis canadensis*, *Carex brunnescens* and *Equisetum* sp.

R3: Toe of Tailings Starter Bench

This site is located on the northern edge of the Dry Stack Tailings Storage Area on the north face of the starter bench, which is constructed from waste rock/fill. The plots in this trial site are not constructed on the tailings surface.

UTM Coordinates:	385395 E, 6944986 N
Elevation:	772 m
Slope:	18^{o}
Aspect:	10^{o} (NNE)

Plate 4. Revegetation at trial site R3 (Toe of Tailings Starter Bench)

Revegetation Observations:

Fall 2007 Seed and Fertilizer Plot

- 60% cover including Violet Wheatgrass, Glaucous Bluegrass, Fowl Bluegrass and Tufted Hairgrass
- Other grasses still too immature to identify

Fall 2007 Seed (no fertilizer) Plot

- 60% cover including Violet Wheatgrass, Glaucous Bluegrass, Fowl Bluegrass and Tufted Hairgrass
- Other grasses still too immature to identify

Spring 2008 Seed and Fertilizer Plot

- 80% cover
- All grasses still too immature to identify

Spring 2008 Seed (no fertilizer) Plot

- 70% cover including Violet Wheatgrass
- Other grasses still too immature to identify

Control Plot

- no seeded grasses

Other Observations

- Volunteer plant species colonizing this area include *Salix* spp., *Populus balsamifera*, *Crepis tectorum*, *Taraxacum officinale*, *Arabis* sp., *Calamagrostis canadensis* and *Equisetum* sp.

R4: Control

This site is located in an old borrow pit along the main access road (km 3) northeast of the mine site, and has not been prepared with an overburden cover.

UTM Coordinates:	386843 E, 6946494 N
Elevation:	770 m
Slope:	14^{o}
Aspect:	45^{o} (NE)

Plate 5. Plots at control site R4 showing nil revegetation.

Revegetation Observations:

Fall 2007 Seed and Fertilizer Plot

- 0% cover by seeded grasses

Fall 2007 Seed (no fertilizer) Plot

- 0% cover by seeded grasses

Spring 2008 Seed and Fertilizer Plot

- 10% cover
- All grasses still too immature to identify

Spring 2008 Seed (no fertilizer) Plot

- 0% cover by seeded grasses

Control Plot

- no seeded grasses

Other Observations

- Volunteer plant species colonizing this area include *Salix* spp., *Epilobium angustifolium*, *Arabis* sp., *Crepis tectorum*, *Corydalis sempervirens*, *Festuca altaica*, *Calamagrostis canadensis*, and *Equisetum* sp.

5.5 PROGRESSIVE RECLAMATION

In addition to the area reclaimed in 2007 at the access road and waste dump locations, progressive reclamation was furthered in 2008 in two locations for erosion control. Two small disturbed riparian areas on Minto Creek - one just below the flume and one by the pumphouse below the dam - were seeded on May 27-28, 2008. These locations are shown on Figure 1 and described further in section 5.5.1. These areas were not included in the areal requirements in the DDRP (Table 2), but were seeded to establish a vegetative mat and to reduce the potential for erosion in the vicinity of Minto Creek.

The species used for progressive reclamation consisted of the following:

Violet Wheatgrass	*Agropyron violaceum*
Sheep Fescue	*Festuca ovina*
Rocky Mountain Fescue	*Festuca saximontana*
Glaucous Bluegrass	*Poa glauca*
Barley	*Hordeum vulgare*
Rye	*Secale cereale*

The first four grasses are from the same seed stock used for the revegetation test plots. The barley and rye are non-indigenous annual cereal grains that had already been acquired by Minto Explorations Ltd. with the intention of being used to establish a mat of biomass rapidly on areas of higher erosion potential.

5.5.1. Survey Observations

A survey of the progressive reclamation seeded areas was conducted on September 5, 2008 by S. Withers. Observations from the survey are presented below with site information. Sites where progressive reclamation has been undertaken are outlined on Figure 1.

Km 2 – Main Access Road

This is an area of approximately 0.5 ha on the northwest side of the road that was cleared during dam construction. This site was not prepared with an overburden cover, as the disturbed soils at surface still contained visible organic matter.

Slope: Slope variable (approximately15^{o})
Aspect: 120^{o} (SE)

In September 2008, this area had a very sparse vegetative cover by the seeded grass species. The cover ranged from 5 to 15 % and included Violet Wheatgrass, Rocky Mountain Fescue, Glaucous Bluegrass, Barley and Rye (see photo below).

Plate 6. Sparse revegetation on disturbed area along access road (Km 2).

Toe of Waste Rock Dump

This is an area of approximately 0.1 ha on the lower toe of the waste rock dump. A portion of the face of the initial lift of the dump was covered with overburden prior to resloping the crest, and this revegetation test area will assess the reclamation potential on a steeper slope.

In September 2008, this area had a vegetative cover by the seeded grass species ranging from 10 to 40%, including Violet Wheatgrass, Rocky Mountain Fescue, Glaucous Bluegrass, Barley and Rye.

Riparian Area near Water Quality Station W3

This is an area of approximately 0.05 ha in the vicinity of the water quality station W3 on Minto Creek (approx 350 m downstream of the dam). The establishment of a weir and later a flume in the creek channel for effluent flow measurements required the clearing and disturbance of the riparian area along the north side of the creek. This area was revegetated to mitigate the potential for erosion and sediment mobilization into the creek.

The seed mix used at this site consisted of the following:

Violet Wheatgrass	(*Agropyron violaceum*)	40 kg/ha
Sheep Fescue	(*Festuca ovina*)	20 kg/ha
Fowl Bluegrass	(*Poa palustris*)	10 kg/ha
Tufted Hairgrass	(*Deschampsia caespitosa*)	10 kg/ha
Barley	(*Hordeum vulgare*)	20 kg/ha
Rye	(*Secale cereale*)	20 kg/ha
Total		**120 kg/ha**

No fertilizer was applied in order to avoid the contamination of runoff reporting to Minto Creek.

In September 2008, this area had a patchy vegetative cover by the seeded grass species averaging about 60%. Identifiable species included Violet Wheatgrass, Fowl Bluegrass, Rye and Barley. A few oats (probably from the Rye or Barley seed stock) were also found in this area. The vegetative mat has established well in this area.

Plate 8. Revegetation of the riparian and roadside areas near W3.

Toe of Main Dam

The construction of the main dam in 2006/07 required the clearing of the banks of Minto Creek. After the finalization of the construction, some disturbed soils remained along the margin of the downstream face of the dam on the south bank (Figure 1.) This area of approximately 0.15 ha was identified as having erosion potential and was therefore seeded for stabilization in May of 2008. No fertilizer was applied in order to avoid the runoff contamination of Minto Creek.

The seed mix used at this site consisted of the following:

Violet Wheatgrass	(*Agropyron violaceum*)	40 kg/ha
Sheep Fescue	(*Festuca ovina*)	20 kg/ha
Fowl Bluegrass	(*Poa palustris*)	10 kg/ha
Glaucous Bluegrass	(*Poa glauca*)	20 kg/ha
Tufted Hairgrass	(*Deschampsia caespitosa*)	10 kg/ha
Barley	(*Hordeum vulgare*)	40 kg/ha
Rye	(*Secale cereale*)	40 kg/ha
Total		**180 kg/ha**

Plate 9. Revegetation of the margin of main dam – downstream side, south alignment.

In September 2008, this area had a very variable vegetative cover by the seeded grass species ranging from 10 to 70%. Identifiable species included Rye and Barley. Other seeded species were still too immature to identify. A few oats (probably from the Rye or Barley seed stock) were also found in this area.

6.0 RECOMMENDATIONS

The revegetation and research work initiated at the Minto Mine during the 2007 season marked the commencement of a multi-year reclamation program that will lead to the eventual decommissioning and restoration of the site. The program continued in 2008 as summarized in this report. The following steps in this program are recommended for the 2009 season:

- A trial plot should be established on the tailings surface as planned in the DDRP once an appropriate area has been developed to final grade.

- A mid-summer monitoring of the revegetation test plots and the progressive reclamation sites should include a documentation of:
    - the approximate total vegetative cover (percent of ground cover);
    - the relative abundance of each seeded plant species;
    - the occurrence of naturally occurring plant species colonizing the sites; and
    - any evidence of erosion.

- For the longer term and larger area requiring revegetation in the coming years, ATV-mounted seeding equipment should be acquired. This should include, at a minimum, a harrow (several types of chain or tine harrows are available), a broadcast seeder (most are 12-volt motor driven seeders that mount on the front of the quad) and a packer.

- Measurement of rooting depths and the sampling of plant tissue for metal concentrations should be conducted. In order to further evaluate the soil conditions in the area, soil samples should be collected from each of the revegetation test plots, as well as from the progressive reclamation sites (both existing areas and those identified for near-future treatment). These soil samples should be analysed for texture, nutrients and metal concentrations and compared with similar results from the previous year(s).

- A mid-summer inventory of indigenous plant species in the area that may be used for revegetating disturbed areas at the mine should be carried out. Most useful would be the documentation of species with an abundance of collectible seeds (a locally occurring source of nitrogen-fixing legumes would be particularly beneficial). Naturally occurring shrub or tree species that could be propagated on site by transplanting or the planting of stem cuttings should also be noted. This field work would be most effective under the guidance of the Selkirk First Nation.

- Additional sites at the mine should be targeted for progressive reclamation as per the schedule in the DDRP. Seed and fertilizer treatments should be formulated based on the monitoring results of the 2007/08 sites. Further seed and fertilizer applications may also be required on the sites seeded in 2007/08, but this will be assessed based on future observations.

- Naturally occurring plant species should be analysed for concentrations of metals considered to be toxic to wildlife. The levels of metals found in willow twigs and leaves (the primary browse for moose in the area) would be particularly useful background data.

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Appendix A
Soil and Vegetation Analysis Results

LOT # 642780

Bodycote TESTING GROUP

LOT: [ ] Control Number [ ]

Environmental Sample Information Sheet

Norwest Labs – A New Bodycote Company

Note: Proper completion of this form is required in order to proceed with analysis
See reverse for your nearest Bodycote Norwest location and proper sampling protocol

Billing Address:	**Copy of Report To:** Copy of invoice: [ ]
Company: ACCESS CONSULTING GROUP	Company: ACCESS CONSULTING GROUP
Address: #5 CALCITE CENTRE 151 INDUSTRIAL ROAD WHITEHORSE, YUKON Y1A 2V3	Address: #5 CALCITE CENTRE 151 INDUSTRIAL ROAD WHITEHORSE, YUKON Y1A 2V3
QA/QC Report [✓]	Mail invoice to this address for approval [ ]
Attention: SCOTT KEESEY	Attention: SCOTT KEESEY
Phone: 867-668-6463	Phone: 867-668-6463
Fax: 867-668-6463	Fax:
Cell:	Cell:
e-mail: skeesey@accessconsulting.ca	e-mail: skeesey@accessconsulting.ca
Report Result: Fax [ ] Mail [ ] Courier [ ] e-mail [✓] e-Service [✓]	Report Result: Fax [ ] Mail [ ] Courier [ ] e-mail [✓] e-Service [✓]

Information to be included on Report and Invoice

Project ID:
Project Name: MINTO TEST PLOTS
Project Location: MINTO MINE, YUKON
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

RUSH Please contact the laboratory to confirm rush dates and times before submitting samples.

Upon filling out this section, client accepts that surcharges will be attached to this analysis

RUSH required on: All Analysis [ ] or As indicated [ ]
Date Required:
Signature:
Bodycote Authorization:

Sample Custody (Please Print)
Sampled by: Stu Withers
Company AEG Signature
I authorize Bodycote Norwest to proceed with the work indicated on this form:
Date: Sept. 15/08 Initial: SW

Received by:	Sample Temp.
Waybill #:	Date
Company	Time

Special Instructions / Comments

For further questions regarding samples or analyses, contact
Stu Withers
867-393-2884
stuwithers@xplornet.com

Please indicate which regulations you are required to meet:

FOR LAB USE ONLY
Condiftion of containers/coolers upon arrival at lab

RECEIVED
SEP 16 2008

[ ] Check here if Bodycote Norwest is required to report results directly to a regulatory body (Please include contact information)

[ ] Check here if you are testing POTABLE WATER for **HUMAN CONSUMPTION**

	Sample Identification	Location	Depth IN (CM) M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	Enter tests above (✓ relevant samples below) ICP METALS	pH/EC TEXTURE	TOC	C:N RATIO	CEC	TOTAL N	NUTRIENTS
1	IROD UPPER		1-10	SEPT. 5	SOIL	GRAB	1	✓	✓	✓	✓	✓	✓	✓
2	IROD LOWER		1-10	"	SOIL	"	1	✓	✓	✓	✓	✓	✓	✓
3	TOE OF TAILINGS		1-10	"	SOIL	"	1	✓	✓	✓	✓	✓	✓	
4	CONTROL		1-10	"	SOIL	"	1	✓	✓	✓	✓	✓	✓	
5	"													
6	IROD UPPER			"	VEG	"	1	✓						
7	IROD LOWER			"	VEG	"	1	✓						
8	TOE OF TAILINGS			"	VEG	"	1	✓						
9	CONTROL			"	VEG	"	1	✓						
10														
11														
12														
13														
14														
15														

NOTE: All hazardous samples must be labelled according to WHIMIS guidelines.

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

	Reference Number	642780-1	642780-2	642780-3	
	Sample Date	Sep 05, 2008	Sep 05, 2008	Sep 05, 2008	
	Sample Location				
	Sample Description	Irod Upper	Irod Lower	Toe of Tailings	
	Matrix	Soil	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Available Nutrients						
Nitrate - N	Farmsoil	ppm	2	8	6	1
Phosphorus	Farmsoil	ppm	12	28	11	5
Potassium	Farmsoil	ppm	72	76	49	10
Sulfate-S	Farmsoil	ppm	12	7	15	1
Classification						
Cation Exchange Capacity		meq/100g	19	19	18	4
C:N Ratio			7.4	10	9.9	
Organic Matter		%	2.56	5.21	5.01	.15
Carbon	Total Organic	% dry weight	1.28	2.60	2.50	0.05
Nitrogen	Total	% dry weight	0.17	0.25	0.25	0.02
Hot Water Soluble						
Boron	Water Soluble	ug/g	0.2	0.2	0.2	0.5
Metals Strong Acid Digestion						
Antimony	Strong Acid Extractable	ug/g	<0.5	<0.5	<0.5	0.5
Arsenic	Strong Acid Extractable	ug/g	6.1	5.1	5.0	0.2
Barium	Strong Acid Extractable	ug/g	197	231	207	0.03
Beryllium	Strong Acid Extractable	ug/g	0.48	0.37	0.37	0.01
Cadmium	Strong Acid Extractable	ug/g	0.2	0.2	0.2	0.05
Chromium	Strong Acid Extractable	ug/g	30.9	24.9	28.3	0.04
Cobalt	Strong Acid Extractable	ug/g	12.1	9.36	9.82	0.05
Copper	Strong Acid Extractable	ug/g	124	102	182	0.05
Lead	Strong Acid Extractable	ug/g	5.2	5.3	4.6	0.3
Lithium	Strong Acid Extractable	ug/g	12.8	10.1	10.9	0.1
Manganese	Strong Acid Extractable	ug/g	523	414	410	0.3
Mercury	Strong Acid Extractable	ug/g	0.032	0.043	0.043	0.003
Molybdenum	Strong Acid Extractable	ug/g	0.65	0.76	0.58	0.05
Nickel	Strong Acid Extractable	ug/g	49.9	27.2	30.3	0.1
Selenium	Strong Acid Extractable	ug/g	<0.3	<0.3	<0.3	0.3
Silver	Strong Acid Extractable	ug/g	<0.2	<0.2	<0.2	0.2
Strontium	Strong Acid Extractable	ug/g	61.2	43.2	44.7	0.02
Thallium	Strong Acid Extractable	ug/g	0.6	0.7	0.4	0.3
Tin	Strong Acid Extractable	ug/g	0.4	0.4	0.4	0.2
Uranium	Strong Acid Extractable	ug/g	22	20	21	3
Vanadium	Strong Acid Extractable	ug/g	60.6	52.5	54.3	0.1
Zinc	Strong Acid Extractable	ug/g	58.5	54.5	56.2	0.1
Physical and Aggregate Properties						
Sand	Soil Texture	%	53.0	56.0	57.0	0.1
Silt	Soil Texture	%	40.1	36.7	35.4	0.1

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

		Reference Number	642780-1	642780-2	642780-3
		Sample Date	Sep 05, 2008	Sep 05, 2008	Sep 05, 2008
		Sample Location			
		Sample Description	Irod Upper	Irod Lower	Toe of Tailings
		Matrix	Soil	Soil	Soil
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Physical and Aggregate Properties - Continued						
Clay	Soil Texture	%	6.9	7.3	7.6	0.1
Texture			Sandy Loam	Sandy Loam	Sandy Loam	
Soil Acidity						
pH	1:2 sample to water	pH	8.1	7.3	7.4	0.5
pH	1:2 Soil:Water	pH	8.0	7.7	7.7	
Electrical Conductivity	Sat. Paste equiv based on 1:2	dS/m at 25 C	0.38	0.34	0.46	0.02

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

Reference Number	642780-4
Sample Date	Sep 05, 2008
Sample Location	
Sample Description	Control
Matrix	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Available Nutrients						
Nitrate - N	Farmsoil	ppm	1			1
Phosphorus	Farmsoil	ppm	21			5
Potassium	Farmsoil	ppm	81			10
Sulfate-S	Farmsoil	ppm	<1			1
Classification						
Cation Exchange Capacity		meq/100g	11			4
C:N Ratio			4.8			
Organic Matter		%	1.2			.15
Carbon	Total Organic	% dry weight	0.58			0.05
Nitrogen	Total	% dry weight	0.12			0.02
Hot Water Soluble						
Boron	Water Soluble	ug/g	<0.1			0.5
Metals Strong Acid Digestion						
Antimony	Strong Acid Extractable	ug/g	<0.5			0.5
Arsenic	Strong Acid Extractable	ug/g	3.2			0.2
Barium	Strong Acid Extractable	ug/g	160			0.03
Beryllium	Strong Acid Extractable	ug/g	0.37			0.01
Cadmium	Strong Acid Extractable	ug/g	0.1			0.05
Chromium	Strong Acid Extractable	ug/g	23.7			0.04
Cobalt	Strong Acid Extractable	ug/g	7.75			0.05
Copper	Strong Acid Extractable	ug/g	18.0			0.05
Lead	Strong Acid Extractable	ug/g	3.8			0.3
Lithium	Strong Acid Extractable	ug/g	8.9			0.1
Manganese	Strong Acid Extractable	ug/g	425			0.3
Mercury	Strong Acid Extractable	ug/g	0.031			0.003
Molybdenum	Strong Acid Extractable	ug/g	0.4			0.05
Nickel	Strong Acid Extractable	ug/g	16.5			0.1
Selenium	Strong Acid Extractable	ug/g	<0.3			0.3
Silver	Strong Acid Extractable	ug/g	<0.2			0.2
Strontium	Strong Acid Extractable	ug/g	26.1			0.02
Thallium	Strong Acid Extractable	ug/g	0.3			0.3
Tin	Strong Acid Extractable	ug/g	0.3			0.2
Uranium	Strong Acid Extractable	ug/g	17			3
Vanadium	Strong Acid Extractable	ug/g	46.8			0.1
Zinc	Strong Acid Extractable	ug/g	48.8			0.1
Physical and Aggregate Properties						
Sand	Soil Texture	%	63.0			0.1
Silt	Soil Texture	%	30.1			0.1

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

Reference Number	642780-4
Sample Date	Sep 05, 2008
Sample Location	
Sample Description	Control
Matrix	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Physical and Aggregate Properties - Continued						
Clay	Soil Texture	%	6.9			0.1
Texture			Sandy Loam			
Soil Acidity						
pH	1:2 sample to water	pH	6.0			0.5
pH	1:2 Soil:Water	pH	6.6			
Electrical Conductivity	Sat. Paste equiv based on 1:2	dS/m at 25 C	0.03			0.02

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

		Reference Number	642780-5	642780-6	642780-7	
		Sample Date	Sep 05, 2008	Sep 05, 2008	Sep 05, 2008	
		Sample Location				
		Sample Description	Irod Upper	Irod Lower	Toe of Tailings	
		Matrix	Tissue	Tissue	Tissue	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Metals Total						
Aluminum	Total (dry weight)	ug/g	240	95.2	126	1
Antimony	Total (dry weight)	ug/g	<0.5	<0.5	<0.5	0.5
Arsenic	Total (dry weight)	ug/g	<0.2	<0.2	<0.2	0.2
Barium	Total (dry weight)	ug/g	27.8	26.3	27.2	0.03
Beryllium	Total (dry weight)	ug/g	<0.01	<0.01	<0.01	0.01
Bismuth	Total (dry weight)	ug/g	<0.5	<0.5	0.62	0.5
Boron	Total (dry weight)	ug/g	2.9	4.9	4.1	0.5
Cadmium	Total (dry weight)	ug/g	0.2	0.1	0.1	0.05
Calcium	Total (dry weight)	ug/g	5090	4600	5000	2
Chromium	Total (dry weight)	ug/g	2.24	1.50	1.46	0.04
Cobalt	Total (dry weight)	ug/g	0.2	0.08	0.2	0.05
Copper	Total (dry weight)	ug/g	25.0	16.0	29.5	0.05
Iron	Total (dry weight)	ug/g	407	186	265	1
Lead	Total (dry weight)	ug/g	<0.2	<0.2	<0.2	0.3
Lithium	Total (dry weight)	ug/g	1.4	1.2	1.4	0.1
Magnesium	Total (dry weight)	ug/g	1580	1350	1780	1
Manganese	Total (dry weight)	ug/g	95.2	152	284	0.3
Mercury	Total (dry weight)	ug/g	0.147	0.123	0.113	0.003
Molybdenum	Total (dry weight)	ug/g	1.4	3.0	1.7	0.05
Nickel	Total (dry weight)	ug/g	1.7	1.0	1.5	0.1
Phosphorus	Total (dry weight)	ug/g	2880	2600	2420	1
Potassium	Total (dry weight)	ug/g	22300	19200	20000	5
Selenium	Total (dry weight)	ug/g	0.3	<0.2	<0.2	0.3
Silver	Total (dry weight)	ug/g	<0.1	<0.1	<0.1	0.2
Sodium	Total (dry weight)	ug/g	19	7.3	14	1
Strontium	Total (dry weight)	ug/g	23.1	19.3	21.0	0.02
Sulfur	Total (dry weight)	ug/g	3950	3800	4380	1
Titanium	Total (dry weight)	ug/g	13.1	4.6	7.05	0.05
Vanadium	Total (dry weight)	ug/g	0.76	<0.1	0.4	0.1
Zinc	Total (dry weight)	ug/g	25.6	25.3	43.4	0.1
Zirconium	Total (dry weight)	ug/g	0.1	<0.05	<0.05	0.05
Thallium	Total (dry weight)	ug/g	1.7	1.8	1.9	0.3

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	
	# 3 Calcite Business Centre	Name:	Minto Test Plots
	151 Industrial Road	Location:	Minto Mine, Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	Stu Withers		
Company:	ACG		

Lot ID:	**642780**
Control Number:	
Date Received:	Sep 16, 2008
Date Reported:	Sep 24, 2008
Report Number:	1150469

Reference Number	642780-8
Sample Date	Sep 05, 2008
Sample Location	
Sample Description	Control
Matrix	Tissue

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Aluminum	Total (dry weight)	ug/g	123			1
Antimony	Total (dry weight)	ug/g	<0.5			0.5
Arsenic	Total (dry weight)	ug/g	<0.2			0.2
Barium	Total (dry weight)	ug/g	59.1			0.03
Beryllium	Total (dry weight)	ug/g	<0.01			0.01
Bismuth	Total (dry weight)	ug/g	<0.5			0.5
Boron	Total (dry weight)	ug/g	1.7			0.5
Cadmium	Total (dry weight)	ug/g	<0.05			0.05
Calcium	Total (dry weight)	ug/g	3900			2
Chromium	Total (dry weight)	ug/g	2.06			0.04
Cobalt	Total (dry weight)	ug/g	0.08			0.05
Copper	Total (dry weight)	ug/g	8.44			0.05
Iron	Total (dry weight)	ug/g	239			1
Lead	Total (dry weight)	ug/g	<0.2			0.3
Lithium	Total (dry weight)	ug/g	1.2			0.1
Magnesium	Total (dry weight)	ug/g	688			1
Manganese	Total (dry weight)	ug/g	137			0.3
Mercury	Total (dry weight)	ug/g	0.032			0.003
Molybdenum	Total (dry weight)	ug/g	0.84			0.05
Nickel	Total (dry weight)	ug/g	2.0			0.1
Phosphorus	Total (dry weight)	ug/g	2480			1
Potassium	Total (dry weight)	ug/g	16000			5
Selenium	Total (dry weight)	ug/g	<0.2			0.3
Silver	Total (dry weight)	ug/g	<0.1			0.2
Sodium	Total (dry weight)	ug/g	15			1
Strontium	Total (dry weight)	ug/g	22.4			0.02
Sulfur	Total (dry weight)	ug/g	1660			1
Titanium	Total (dry weight)	ug/g	7.32			0.05
Vanadium	Total (dry weight)	ug/g	0.4			0.1
Zinc	Total (dry weight)	ug/g	20.0			0.1
Zirconium	Total (dry weight)	ug/g	0.06			0.05
Thallium	Total (dry weight)	ug/g	1.7			0.3

Approved by: Andrew Garrard

Andrew Garrard, BSc
Operations Manager

MINTO EXPLORATIONS Ltd.
A Subsidiary of Sherwood Copper Corp.

Minto Mine

Reclamation Research Program
Detailed Decommissioning and Reclamation Plan

2007 Activities

Prepared by:

ACCESS
CONSULTING GROUP

Table of Contents

1.0 INTRODUCTION

Minto Explorations Ltd. submitted a Detailed Decommissioning and Reclamation Plan (DDRP) to the Yukon Government for the Minto Mine Project for review and approval in November 2006. Submitted under condition of Quartz Mining License QML-0001, it was approved in June 2007 as Revision 1. This plan guides not only closure measures at the end of mine life, but also reclamation planning during the operational life of the mine.

An important component of the reclamation planning process is ongoing reclamation research, which is conducted to develop the methods required to implement a successful reclamation program. Reclamation research at Minto is focusing 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 minesite reclamation including re-contouring and erosion stabilization techniques are well established and are less reliant upon site-specific research for success.

A comprehensive reclamation research program was initiated by Minto Explorations Ltd. (MEL) at the Minto Mine in 2007 under the guidance of Access Consulting Group and with the assistance of Selkirk First Nation. In order to ascertain effective methods for revegetating disturbed areas at the Minto Mine, test plots were established at four trial site locations and snow-seeded in the fall of 2007. Progressive reclamation was also initiated in the form of snow seeding some larger disturbed areas with a preliminary seed mix that will be refined based on test results.

This summary report presents the background and methodology for the reclamation research program and describes the reclamation research activities conducted in 2007, namely the initiation of the revegetation trials.

2.0 BACKGROUND

Planning for the reclamation research program began with information obtained during the site baseline studies program. Indigenous species of plants were catalogued and soils were characterized and were documented in the Initial Environmental Evaluation prepared by Hallam Knight Piesold (HKP, 1994). In addition, natural re-vegetation has been effective in largely covering disturbed areas over the 35 years since the area was first disturbed.

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, natural revegetation is occurring more extensively next to undisturbed areas and on linear disturbances. It will therefore also be important to further document natural re-vegetation successes on the site.

The natural vegetation found on undisturbed sites around the mine generally indicate the underlying soil properties, including texture, drainage, and pH, and the level of available nutrients. A program involving sampling and analysis of soils in the project area was done in 1994 which provides the basic information required for reclamation planning. Additional soil sampling is being completed on disturbed sites in order to determine areas of localized nutrient deficiencies and from the stockpiled overburden to characterize this primary growth medium.

3.0 OBJECTIVES

The approved DDRP submits that:

> *"The overall goal of closure at the Minto site is to leave the area as a self-supporting 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."*

Specific to the revegetation aspect of the mine closure and decommissioning, the following sections present the objectives for the revegetation program in general and within that, the reclamation research program.

3.1 REVEGETATION PROGRAM

The primary objectives of land reclamation and revegetation at the Minto mine site include:

- undertaking mine planning that incorporates progressive reclamation;
- providing short and long term slope stabilization and erosion control on linear and non-linear disturbances;
- ensuring the long-term chemical stability of residual mining components and their effects on water quality draining the property;
- ensuring the long-term physical stability of key structures such as the waste dumps and the diversion and drainage ditches; and
- working towards a walk-away closure scenario for most or all mine components.

The establishment of an initial ground cover of graminoids has historically been viewed as a desirable closure objective on most disturbed areas to stabilize slopes and control soil erosion. Graminoids are all grasses and grass-like plants, including sedges and rushes. Reclamation and revegetation efforts on site will ensure that this objective is achieved; however, the establishment of existing or natural vegetative communities and species is also another desirable objective. Based on recent reclamation research, it is noted that there is typically an abundance of natural seed or reproductive seed material

available from local surroundings, and that these naturally occurring seed sources should be considered as part of any reclamation program (Craig, et al., 1998).

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. The creation of shrub willow islands can also enhance natural succession.

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 at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species.

In the larger, more open disturbed areas at the minesite (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 seral stages of plant succession on these sites. Shrub species would be planted concurrently with the revegetation plot trial plantings.

The initiation of progressive reclamation measures that see the covering of areas with overburden (toe berm of ice-rich overburden dump, toe of first lift of waste rock dump and toe of starter bench for tailings deposit) will provide areas of different aspect/exposure for the establishment of initial revegetation trial plots. The following sections outline the proposed trial plot locations and design considerations as well as implementation and monitoring schedules for the revegetation trial program.

3.2 REVEGETATION RESEARCH PROGRAM

Key to long term reclamation success is site-specific revegetation research. In order to establish successful revegetation of disturbed areas over the life of mine and at closure, MEL has initiated a methodical revegetation trial program to assess and provide:

a) a further inventory of available soils around the site (particularly the overburden material) and their physical characteristics;

b) the nutrients in the available soils - while fertilizers will likely be necessary to encourage quick initial establishment of healthy growth, the plant mixtures used must be capable of sustaining long term growth without the aid of artificial fertilizers;

c) 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 revegetating the site, further reviews and investigations are necessary to confirm the appropriate seed mixes that should be used. 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.

d) the effect of slope and aspect on revegetation success, and if necessary the subsequent effect of erosion control measures; and

e) the potential for metals uptake by the plants on the growth media over the tailings - different plant varieties and species, tailings characteristics, cover designs and other environmental conditions are all factors influencing uptake of metals by plant tissues.

Successes and failures of this program will provide valuable information on alternative approaches to closing reclamation methodology.

4.0 METHODOLOGY

The reclamation research program at the Minto Mine Site will be centered on a network of revegetation trial sites. Test plots at each trial site are typically small and optimum conditions may apply. The information obtained from test plots will therefore be applied in further reclamation trials to areas 1 ha. or larger in size. Table 4-1 outlines the details and schedule for the implementation and monitoring of the trial sites proposed in the DDRP.

The successes from these trials will then be transferred to the ongoing progressive reclamation efforts that will provide a large-scale opportunity for refinement of reclamation and revegetation techniques and measures. A schedule for the progressive reclamation activities and associated costs is presented in the DDRP and is summarized below in Table 4-2. Revegetation will follow required re-contouring/earthworks and preparation with overburden on areas which have been confirmed for final reclamation.

Over the life of the reclamation research project, different seed mixes will be grown on test plots to develop optimum seed compositions. Results from the test plot trials will also confirm:

- optimum seeding times;
- optimum growth media (overburden) covering depth;
- utility of techniques such as snow seeding;
- fertilizer requirements to amend nutrient content of the overburden; and
- utility of soil amendments such as lime, wood fibre or mulches.

Sampling of plant tissues from the test plots at the tailings trial site will be conducted to assist in refining the revegetation program, and existing literature and research regarding plant metal uptake and foraging patterns will be utilized to refine the seed mix.

The selection of seed and fertilizers to be utilized initially in the program has been based in part on the results of soil sample analyses collected from the overburden stockpiles,

and partially on mixes used successfully in other reclamation initiatives in the Yukon. The methodology for seed selection is presented in Section 4.1.

Table 4-1. Proposed revegetation trial site locations, plot details and monitoring schedule

Location	Description	Proposed Plot Details	Establishment Timeline	Monitoring Timeline
Toe Berm of Ice Rich Overburden Dump	east facing aspect, ~50% slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Spring 2007	Anually in August Observations, soil samples
Toe of Waste Rock Dump	south facing aspect, rolled bench/slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Spring 2007	Anually in August Observations, soil samples
Starter Bench below Tailings Deposit	north facing aspect, ~40% slope	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Fall 2007	Anually in August Observations, soil samples
Tailings Deposit Surface	low slope (~2%)	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings	Spring 2008	Anually in August Observations, vegetation samples, soil samples
Typical Fill Slope	variable slopes and aspects	Control Plot (no treatment) Various slopes to determine erosion/slumping impacts Plots with variable seed/fertilizer rates Spring and fall plantings	Spring 2007	Anually in August Observations, soil samples
Borrow Area on Access Road	flat, compacted gravels	Control Plot (no treatment) Plots with variable seed/fertilizer rates Spring and fall plantings Indigenous shrub plantings	Spring 2007	Anually in August Observations, soil samples

Table 4-2. Proposed progressive reclamation schedule in hectares by year of mine operations.

	Main Waste Rock Dump		Ice-Rich Overburden Dump (Toe Berm)		Dry Stack Tailings Area	
Year	**Earthworks**	**Revegetation**	**Earthworks**	**Revegetation**	**Earthworks**	**Revegetation**
1	0.25	0.25	0.25	0.25	0.25	0.25
2	8.00	8.00	0.95	0.95	0.00	0.00
3	5.55	5.55	0.00	0.00	2.00	2.00
4	5.50	5.50	0.00	0.00	2.00	2.00
5	5.50	5.50	0.00	0.00	8.90	8.90
6	5.50	5.50	0.00	0.00	9.75	9.75
7	2.00	2.00	0.00	0.00	8.00	8.00
Total	**32.30**	**32.30**	**1.20**	**1.20**	**30.90**	**30.90**

Note: The project start-up date is August 1, 2007; therefore Year 1 is from August 1, 2007 to July 31, 2008.

4.1 RATIONALE FOR STARTING SEED MIX SELECTION

The selection of these species was based in part on site-specific biophysical conditions, the analytical results of soil samples collected from the mine's overburden stockpiles, and the reclamation guidelines described below. The program is also guided by the collective experience gained from previous efforts to revegetate disturbed lands in the region. For details of Minto Explorations Ltd.'s revegetation research program, see reports by Access Consulting Group (2008).

Reclamation guidelines for the area, as well as accounts of two other recent revegetation programs in the Yukon, were reviewed and are summarized it this report (these documents are referenced at the end of this report).

4.1.1. Reclamation Guidelines

The foremost documents guiding reclamation and revegetation endeavours in the Yukon since the 1990s have been Guidelines for Reclamation / Revegetation in the Yukon (Kennedy 1993) and Guidelines for Reclamation / Revegetation in the Yukon - Volume II (Hill et al. 1996).

These guidelines prescribe seed formulations based on the original plant communities in any given area. It also prescribes formulations for specific problems (steep cut slopes, saline soils, etc.). These prescriptions have been based on original data obtained through extensive research conducted in the late 1970s and early 1980s. Seeds from indigenous species of grasses and legumes were collected from widely geographically dispersed locations in the Yukon. These seed stocks were increased in nurseries and then planted in test plots with various surface preparations in numerous locations throughout the Yukon. The seed prescription in the reclamation guidelines were based on the results of several years' monitoring of these test plots.

These reclamation guidelines have focused on specific regions of the Yukon. The Minto Mine area lies near the southern boundary of the Central Yukon Region 5 as described in Volume II of these guidelines.

The Minto Mine area is currently in various stages of regenerative growth following at least four separate forest fires in the last half century. Should the forests of this fire-prone area reach a climax stage, those forests would most likely be a combination of black spruce, mixed deciduous-coniferous (primarily white spruce and trembling aspen), and a narrow riparian corridor of willow and sedge.

The reclamation guidelines for this area prescribe a number of species of native grasses for these types of forested areas including:

Violet Wheatgrass	(*Agropyron violaceum*)
Slender Wheatgrass	(*Agropyron pauciflorum*)
Bearded Wheatgrass	(*Agropyron subsecundum*)
Northern Fescue	(*Festuca saximontana*)
Sheep Fescue	(*Festuca ovina*)
Fowl Bluegrass	(*Poa palustris*)
Altai Fescue	(*Festuca altaica*)
Glaucous Bluegrass	(*Poa glauca*)
Tufted Hairgrass	(*Deschampsia caespitosa*)
Red Top *	(*Agrostis gigantea*)
Meadow Foxtail *	(*Alopecurus pratensis*)

* Although listed as native species in the guidelines, these two grasses have been introduced to the Yukon flora (Cody 1996).

4.1.2. Other Yukon Mine Sites

In order to evaluate the potential success of grass species at the Minto Mine, two other recent Yukon mine site revegetation projects where these reclamation species were used are hereby scrutinized.

4.1.2.1. Brewery Creek Reclaimed Open Pit Mine

The Brewery Creek Mine in the central Yukon operated from 1996 to 2002. Although revegetation commenced at the mine in 1996, most reclaimed surfaces were seeded from 2003 to 2007. These reclaimed areas include approximately 130 ha of recontoured waste rock dumps, filled-in mine pits, haul roads, the capped leach pad and other disturbed sites.

Several seed mixes were used to revegetate the Brewery Creek Mine. All of the six grass species used at the Minto Mine test plots were used in at least some of these seed mixes. The progress of revegetation on the seeded areas has been monitored annually since 2005.

Violet Wheatgrass was included in almost all seed mixes used at Brewery Creek and is now widespread at the mine site.

Sheep Fescue was included in the last seed mix acquired at Brewery Creek and was seeded at a number of sites in 2006 and 2007. It is now one of the dominant seeded species in these areas.

Northern Fescue was also seeded at Brewery Creek in 2006 and 2007. Although not as widespread as Sheep Fescue, it is a significant component of the vegetative cover in most areas where it was seeded.

Fowl Bluegrass was included in the seed blend that was used to revegetate many of the reclaimed surfaces from 2003 to 2006. Although not resulting in as dense a cover as other seeded grass species, Fowl Bluegrass is widespread, particularly on surfaces with some soil moisture.

Glaucous Bluegrass was included in the last seed mix acquired at Brewery Creek and was seeded at a number of sites in 2006 and 2007. Although not a dominant species, it is growing particularly well on drier sites.

Tufted Hairgrass was included in the seed blend that was used to revegetate many of the reclaimed surfaces from 2003 to 2006. Although not resulting in as dense a cover as other seeded grass species, Fowl Bluegrass is now widespread throughout much of the reclaimed mine site.

4.1.2.2. Faro Mine Dewatered Freshwater Reservoir

The dewatered freshwater reservoir on the south fork of Rose Creek at the Faro Mine was seeded with northern native grass species in several phases during the 2003 and 2004 seasons. Approximately 60 ha of the formerly submerged valley bottom and sides of the reservoir were seeded.

Three of the six grass species used at the Minto Mine test plots were included in the seed mix used at the Faro reservoir. The progress of revegetation on the seeded areas has been monitored annually since 2005.

Violet Wheatgrass, although not resulting in a dense ground cover, is now widespread throughout all areas of the reclaimed freshwater reservoir.

Sheep Fescue is the dominant seeded species on the steeper side slopes of the reservoir, where it has and has helped stabilize the soil and prevent erosion.

Tufted Hairgrass is now widespread throughout much of the reclaimed area, and is the dominant species on the wetter reservoir bottom.

4.1.3. Prescription for Minto Mine

The seed test plots at the Minto Mine were established with the assumption that the underlying principle of the revegetation program is for the mine site area to eventually assimilate with the surrounding area as far as possible. This natural succession would take several decades to occur after mine closure. The short term assisted revegetation program is to provide soil stabilization and to "kick-start" the natural revegetation process.

Based on this review of guidelines, local knowledge and experience from reclamation projects at other Yukon mine sites and the current commercial availability of grass seeds, it was decided to start with the following grass species on the test plots at the Minto Mine:

Violet Wheatgrass (*Agropyron violaceum*) is found from Greenland to Alaska and occurs through much of the Yukon Territory. Violet Wheatgrass has a bunch growth habit with extensive cover production with a strong competitive ability. It is drought tolerant and has tolerance to alkaline soils, nutrient-poor soils and permafrost.

Sheep Fescue (*Festuca ovina*) is a wide-ranging circumpolar species and is found through much of the Yukon Territory. Sheep fescue has a bunch growth habit and is tolerant to drought and to nutrient-poor, acidic soils.

Northern Fescue (*Festuca saximontana*) is a North American grass species that occurs as far north as the central Yukon. Northern Fescue is has a bunch growth habit with rapid, early emergence. It is drought-tolerant and is tolerant to alkaline soils, nutrient-poor soils and permafrost.

Fowl Bluegrass (*Poa palustris*) is a circumpolar species that occurs in the Yukon as far north as the Porcupine River. Fowl Bluegrass has a bunch growth habit and has a strong competitive ability. It is drought-tolerant and is tolerant to nutrient-poor acidic soils, permafrost and wet soils.

Glaucous Bluegrass (*Poa glauca*) is a circumpolar, arctic-alpine grass species found throughout the Yukon Territory. Glaucous Bluegrass has a bunch growth habit and has a strong competitive ability. It is drought-tolerant and is tolerant to alkaline soils, nutrient-poor soils and permafrost.

Tufted Hairgrass (*Deschampsia caespitosa*) is a circumpolar grass species that occurs throughout much of the Yukon Territory. Tufted Hairgrass has a bunch growth habit, extensive cover production and a strong competitive ability. It is drought-tolerant and is tolerant to nutrient-poor acidic soils, permafrost and wet soils.

No legumes have been seeded at the Minto Mine test plots. Seeds of northern varieties of legumes were commercially unavailable at the time of seeding. A survey of the area surrounding the Minto Mine may be beneficial in order to determine if locally occurring legume seeds are available.

It was noted that mountain alder (*Alnus crispa*) is a commonly occurring nitrogen-fixing species in the Minto Mine area. Seeds from these naturally occurring shrubs could be easily collected and propagated on site.

5.0 2007 ACTIVITIES

5.1 SOIL SAMPLING AND ANALYSIS

Two soil samples were collected from the overburden stockpile in late March 2007 and were analyzed for texture, metals (ICP Method) and nutrients. The analysis results were similar for both samples, with both looking reasonably good for reclamation purposes. Laboratory analytical results are presented in Appendix A.

Both samples had a moderate amount of organic matter but with very little available nitrogen (nitrate), which is typical for soils from this region. Phosphorus and potassium levels were in the low to moderate range. The carbon/nitrogen ratio and the cation exchange capacity were good for both samples. One sample (loam) was slightly alkaline and the second one (sandy loam) was of neutral pH. Both had low electrical conductivity.

Further soil sampling will obviously be required, but if these samples are representative of the soil to be used for reclamation at the mine, a high nitrogen fertilizer is recommended.

5.2 PLOT ESTABLISHMENT AND INITIAL SEEDING

Trial sites were selected and prepared at four locations including three on-site locations and one off-site control location. These sites were selected in locations where reclamation will be undertaken progressively early in the mine life, and represent a range of aspects and slopes as proposed in the DDRP.

At the three on-site locations, the trial sites were prepared by hauling overburden material from the Phase II mining operations at the pit, dumping in place and spreading to a uniform depth of approximately 25 cm (0.25 m). Enough area was prepared at each trial site to accommodate numerous plots over the life of mine as the reclamation research program expands.

Revegetation trial sites were scheduled for planting in the spring of 2007 at four locations, but locally dry conditions and a low prospective germination rate forced the postponement of the spring planting. The plot layout and the seed and fertilizer application at all four trial sites were instead conducted on October 16, 2007 under the supervision of S. Withers and S. Keesey (Access Consulting Group) by representatives of the Selkirk First Nation (Daniel Alfred and Ryan Silverfox). The ground was partially frozen with a snow cover of about 10 cm, providing an opportunity to test snow-seeding techniques.

At each of the four locations, three 5 m x 10 m plots were laid out, including:

- A plot with an application of both seed and fertilizer;
- A plot with an application of seed (no fertilizer); and
- A plot with no application of seed or fertilizer (control).

The initial seed mix used for seeding at all four locations consisted of the following:

Species	**Latin Name**	**Application Rate (kg/ha)**	**Percentage**
Violet Wheatgrass	*Agropyron violaceum*	10	33.3
Sheep Fescue	*Festuca ovina*	5	16.6
Rocky Mountain Fescue	*Festuca saximontana*	5	16.6
Glaucous Bluegrass	*Poa glauca*	5	16.6
Fowl Bluegrass	*Poa palustris*	3	10.0
Tufted Hairgrass	*Deschampsia caespitosa*	2	6.6
Total		**30**	**100**

These grass seed mixes were acquired from Brett Young Seeds in Calmar, Alberta. The seeds, although produced in Alberta, are species that are found naturally occurring in the Yukon.

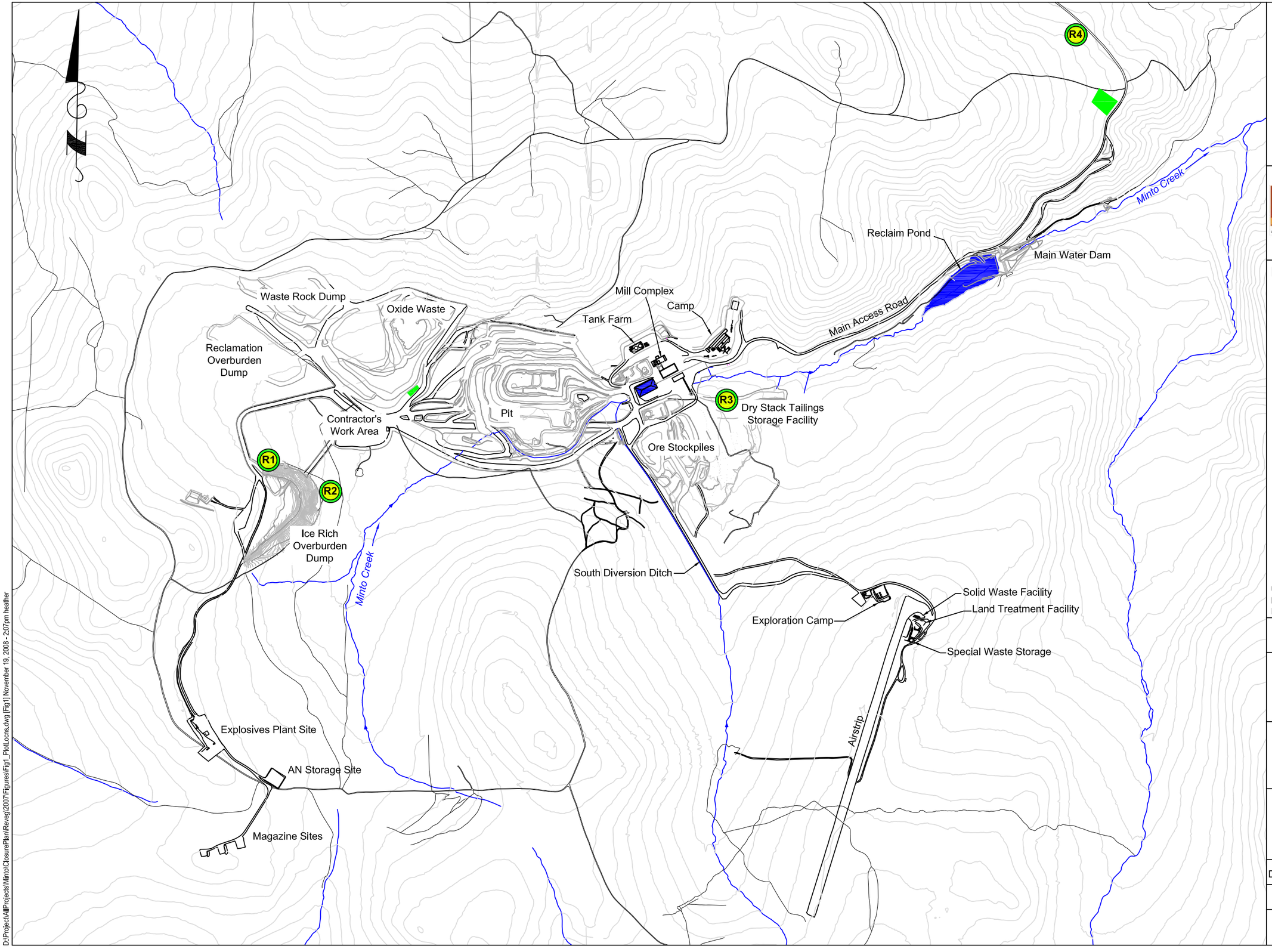
Minto Mine Project

2007 Reclamation Research Program

MINTO EXPLORATIONS Ltd.
A Subsidiary of Sherwood Copper Corp.

Legend:

- R1 Trial Site
- Access Road
- Exploration Road
- Contour
- Water Course
- Water Body
- Progressive Reclamation Sites



UTM Zone 8 NAD83
NTS Sheet 115I11
Basedata obtained from Minto Mine March 2008

Figure 1

Revegetation Trial Site Locations

Scale:

0 50 100 200 300 400 500 m

ACCESS CONSULTING GROUP

Drawn by: HD | Checked by: SK

Date: November 2008

D:\Project\AllProjects\Minto\ClosurePlan\Reveg\2007\Figures\Fig1_PlotLocns.dwg [Fig1] November 19, 2008 - 2:07pm heather

The grass seeds were weighed and mixed on-site prior to application with a hand-held broadcast seeder. The fertilizer used at all four sites (18-24-12) was applied at a rate of 160 kg/ha also with a hand-held broadcaster. After the seed and fertilizer were applied, they were hand-raked into the ground through the snow.

5.3 TRIAL SITE DESCRIPTIONS

The trial site locations are described below and are shown on Figure 1.

R1: Ice-Rich Overburden Dump (IROD) – Upper

This site is located near the northern entrance to the ice-rich overburden dump on the top of the berm.

UTM Coordinates:	383501 E, 6944737 N
Elevation:	886 m
Slope:	15^{o}
Aspect:	80^{o} (ENE)

Plate 1. Raking in seed and fertilizer at trial site R1 (IROD – Upper)

R2: Ice-Rich Overburden Dump (IROD) – Lower

This site is located at the toe of the berm on the eastern extremity of the ice-rich overburden dump, and can be accessed from below via the contractor's work area.

UTM Coordinates:	383769 E, 6944612 N
Elevation:	857m
Slope:	18^{o}
Aspect:	80^{o} (ENE)

Plate 2. Plots established on snow at R2 Trial Site (IROD – Lower)

R3: Toe of Tailings Starter Bench

This site is located on the northern edge of the Dry Stack Tailings Storage Area on the north face of the starter bench, which is constructed from waste rock/fill. The plots in this trial site are not constructed on the tailings surface.

UTM Coordinates:	385395 E, 6944986 N
Elevation:	772 m
Slope:	18^{o}
Aspect:	10^{o} (NNE)

Plate 3. Hand-broadcast seeding plots at trial site R3 (Toe of Tailings Starter Bench)

R4: Control

This site is located in an old borrow pit along the main access road (km 3) northeast of the mine site, and has not been prepared with an overburden cover.

UTM Coordinates:	386843 E, 6946494 N
Elevation:	770 m
Slope:	14^{o}
Aspect:	45^{o} (NE)

Plate 4. Laying out plots at control site R4

5.4 PROGRESSIVE RECLAMATION

Two additional sites were selected for launching Minto Mine's progressive reclamation program. In this program, early reclamation is begun on disturbed sites where no further usage is anticipated. The two sites included an off-site clearing near the main access road and a site on the toe of the waste rock dump.

The species used for progressive reclamation consisted of the following:

Violet Wheatgrass	*Agropyron violaceum*
Sheep Fescue	*Festuca ovina*
Rocky Mountain Fescue	*Festuca saximontana*
Glaucous Bluegrass	*Poa glauca*
Barley	*Hordeum vulgare*
Rye	*Secale cereale*

The first four grasses are from the same seed stock used for the revegetation test plots. The barley and rye are non-indigenous annual cereal grains that had already been acquired by Minto Explorations Ltd. with the intention of being used to establish a mat of biomass rapidly on areas with higher erosion potential or riparian area.

The seed and fertilizer application at both progressive reclamation sites were carried out on October 17, 2007. The ground was partially frozen with a snow cover of about 10 cm. Higher seed and fertilizer rates were applied at these sites because of the steep slope, especially the toe of the waste rock dump. It is anticipated that much of the soil and fertilizer could be eroded and transported to the toe of the slope during spring runoff.

The grass seeds were weighed and mixed on-site followed by application with a hand-held broadcast seeder. Fertilizer (18-24-12) was also applied with a hand-held broadcaster. After the seed and fertilizer was applied, they were hand-raked into the ground through the snow.

5.4.1. Progressive Reclamation Sites

Km 2 – Main Access Road

This is an area of approximately 0.5 ha on the northwest side of the road that was cleared during dam construction. This site was not prepared with an overburden cover, as the disturbed soils at surface still contained visible organic matter.

Slope: Slope variable (approximately15^{o})
Aspect: 120^{o} (SE)

The seed mix used at this site consisted of the following:

Species	Latin Name	Application Rate (kg/ha)	Percent
Violet Wheatgrass	*Agropyron violaceum*	20	33.3
Sheep Fescue	*Festuca ovina*	10	16.6
Rocky Mountain Fescue	*Festuca saximontana*	10	16.6
Glaucous Bluegrass	*Poa glauca*	10	16.6
Barley	*Hordeum vulgare*	5	8.3
Rye	*Secale cereale*	5	8.3
Total		**60**	**100**

Fertilizer (18-24-12) was applied at a rate of 100 kg/ha.

Toe of Waste Rock Dump

This is an area of approximately 0.1 ha on the lower toe of the waste rock dump. A portion of the face of the initial lift of the dump was covered with overburden prior to resloping the crest, and this revegetation test area will assess the reclamation potential on a steeper slope.

Slope: 45^{o}
Aspect: 160^{o} (SSE)

Plate 5. Toe of waste rock dump progressive reclamation site

The seed mix used at this site consisted of the following:

Species	Latin Name	Application Rate (kg/ha)	Percent
Violet Wheatgrass	*Agropyron violaceum*	40	33.3
Sheep Fescue	*Festuca ovina*	20	16.6
Rocky Mountain Fescue	*Festuca saximontana*	20	16.6
Glaucous Bluegrass	*Poa glauca*	20	16.6
Barley	*Hordeum vulgare*	10	8.3
Rye	*Secale cereale*	10	8.3
Total		**120**	**100**

Fertilizer (18-24-12) was applied at a rate of 200 kg/ha.

6.0 RECOMMENDATIONS

The revegetation and research work initiated at the Minto Mine during the 2007 season marked the commencement of a multi-year reclamation program that will carry through the eventual decommissioning and restoration of the site. The following steps in this program are recommended for the 2008 season:

1. Establishment of the remaining trial sites according to the proposed schedule in the DDRP, including tailings surface and fill slopes;

2. Spring seeding of new plots at the established trial locations to test spring seeding success versus success of 2007's snow seeding;

3. Initiation of mid-summer monitoring of the revegetation test plots and the progressive reclamation sites, including a documentation of:
   - the approximate total vegetative cover (percent of ground cover);
   - the relative abundance of each seeded plant species;
   - the occurrence of naturally occurring plant species colonizing the sites; and
   - evidence of any slumping/erosion or other deformation of the cover material.

   Additional monitoring, such as the measurement of rooting depths and the sampling of plant tissue for metal concentrations, should be deferred so as not to disrupt the development these plants that were not seeded until late in the 2007 season.

4. In order to further evaluate the soil conditions in the area, soil samples should be collected from each of the revegetation test plots, as well as from the progressive reclamation sites (both existing areas and those identified for near-future treatment). These soil samples should be analyzed for texture, nutrients and metal concentrations.

5. A mid-summer inventory of indigenous plant species in the area that may be used for revegetating disturbed areas at the mine should be carried out. Most

useful would be the documentation of species with an abundance of collectible seeds (a locally occurring source of nitrogen-fixing legumes would be particularly beneficial). Naturally occurring shrub or tree species that could be propagated on site by transplanting or the planting of stem cuttings should also be noted. This field work would be most effective under the guidance of the Selkirk First Nation.

6. Additional sites at the mine should be targeted for progressive reclamation. Seed and fertilizer treatments should be formulated based on the monitoring results of the 2007 sites. Further seed and fertilizer applications may also be required on the sites seeded in 2007, but this will be assessed based on future observations.

7. Naturally occurring plant species should be analyzed for concentrations of metals considered to be toxic to wildlife. The levels of metals found in willow twigs and leaves (the primary browse for moose in the area) would be particularly useful background data.

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Appendix A

Soil Analysis Results

Lot-537551

Control Number

NORWEST LABS

Environmental Sample Information Sheet

NOTE Proper completion of this form is required in order to proceed with analysis

See reverse for contacting your nearest Norwest location and proper sampling protocol

Billing Address		**Report To:** ☐	**Copy of Report To:**		**Copy of invoice:** ☐
Company:	Access Consulting Group		Company:	Access Consulting Group	**Mail invoice to this address for approval** ☐
Address:	#3 Calcite Business Centre-151 Industrial Road Whitehorse, YT Y1A 2V3	**QA/QC Report** ☑	Address:	#3 Calcite Business Centre-151 Industrial Road Whitehorse, YT Y1A 2V3	
Attention:	Scott Keesey	**Report Result:**	Attention:	Stuart Van Bibber	**Report Result:**
Phone:	867-668-6364	Fax ☐	Phone:	867-668-6364	Fax ☐
Fax:	867-667-6680	Mail ☐	Fax:	867-667-6680	Mail ☐
Cell:		Courier ☐	Cell:		Courier ☐
Email:	scott@accessconsulting.ca	Email ☑	Email:	stuart@accessconsulting.ca	Email ☑

Information to be included on Report and Invoice

Project ID: MIN-06-01
Project Name: Minto Mine
Project Location: Minto
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

RUSH **Please contact the laboratory to confirm rush dates and times before submitting samples.**

Upon filling out this section, client accepts that surcharges will be attached to this analysis

Required on: all analyses **or** as indicated ☐ **or** ☐

Date required:
Signature:
Norwest Authorization:

Sample Custody (Please Print)

Sampled by: John Gibson Date: March 23 & 28
Company: ACG Signature:
Relinquished by: Stuart Withers
Company: ACG Date: April 9
Waybill number:
Received by: RECEIVED
Company: APR 10 2007 Date:
Processed by:
Norwest Labs Date: 3:30pm

Special Instructions/Comments

	Sample Identification	Location	Depth	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	ICP Metal Analysis (TT8)	Soil Nutrients (F10)	Soil Salinity & Acidity (S00)	Particle Size Analysis (PS1)	CEC (CL11)	% Organic Matter (CL44)	TOC (CL30)	Total Nitrogen (CL50)	Total Carbon and Sulphur (CL54)	C:N Ratio (CL41)			
							↓	Enter tests above (check off relevant samples below)												
1	O/B #1 South Pit		-	Mar 23/07	Soil	Grab	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
2	South Pit O/B		-	Mar 28/07	Soil	Grab	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3			-																	
4			-																	
5			-																	
6			-																	
7			-																	
8			-																	
9			-																	
10			-																	
11			-																	
12			-																	
13			-																	
14			-																	

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Accredited by the Standards Council of Canada for specific tests

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	MIN-06-01
	# 3 Calcite Business Centre	Name:	Minto Mine
	151 Industrial Road	Location:	Minto
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	John Gibson		
Company:	ACG		

Lot ID:	**537551**
Control Number:	
Date Received:	Apr 10, 2007
Date Reported:	Apr 20, 2007
Report Number:	986230

		Reference Number	537551-1	537551-2		
		Sample Date	Mar 23, 2007 12:00:00 AM	Mar 28, 2007 12:00:00 AM		
		Sample Location				
		Sample Description	O/B #1 South Pit	South Pit O/B		
		Matrix	Soil	Soil		
Analyte		**Units**	**Results**	**Results**	**Results**	**Detection Limit**
Aggregate Organic Constituents						
Organic Matter	Soil Organic Matter	%	3.6	4.5		0.1
Available Nutrients						
Nitrate - N	Available	mg/kg	1	1		1
Phosphorus	Available	mg/kg	12	6		5
Potassium	Available	mg/kg	80	40		10
Sulfate-S	Available	mg/kg	91	31		1
Ammonium - N	Available-dry basis	mg/kg	4.7	12.4		0.3
Classification						
Sulfur	Total	%	0.01	0.05		0.01
Carbon	Total	%	2.06	3.33		
Cation Exchange Capacity		meq/100g	19.3	21.9		
C:N Ratio			10	11		
Organic Matter		%	4.15	5.52		.15
Carbon	Total Organic	% dry weight	2.07	2.76		0.05
Nitrogen	Total	% dry weight	0.20	0.24		0.02
Metals Strong Acid Digestion						
Aluminum	Strong Acid Extractable	ug/g	14100	12500		20
Antimony	Strong Acid Extractable	ug/g	<0.2	<0.2		0.2
Arsenic	Strong Acid Extractable	ug/g	8.0	5.6		0.2
Barium	Strong Acid Extractable	ug/g	250	204		1
Beryllium	Strong Acid Extractable	ug/g	0.5	0.4		0.1
Bismuth	Strong Acid Extractable	ug/g	<0.5	<0.5		0.5
Cadmium	Strong Acid Extractable	ug/g	0.22	0.18		0.01
Chromium	Strong Acid Extractable	ug/g	32.7	27.4		0.5
Calcium	Strong Acid Extractable	ug/g	16800	7600		200
Cobalt	Strong Acid Extractable	ug/g	12.5	9.7		0.1
Copper	Strong Acid Extractable	ug/g	65	77		1
Iron	Strong Acid Extractable	ug/g	24000	20900		100
Lead	Strong Acid Extractable	ug/g	6.6	6.0		0.1
Magnesium	Strong Acid Extractable	ug/g	9900	6300		100
Manganese	Strong Acid Extractable	ug/g	490	300		10
Molybdenum	Strong Acid Extractable	ug/g	<1	1		1
Nickel	Strong Acid Extractable	ug/g	45.0	26.1		0.5
Phosphorus	Strong Acid Extractable	ug/g	780	780		30
Selenium	Strong Acid Extractable	ug/g	0.4	0.5		0.3
Silicon	Strong Acid Extractable	ug/g	620	610		50
Silver	Strong Acid Extractable	ug/g	0.2	0.2		0.1
Strontium	Strong Acid Extractable	ug/g	85	55		1

Bodycote TESTING GROUP

Analytical Report

Bill To:	Access Mining Consultants Ltd.	Project:	
Report To:	Access Mining Consultants Ltd.	ID:	MIN-06-01
	# 3 Calcite Business Centre	Name:	Minto Mine
	151 Industrial Road	Location:	Minto
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Scott Keesey	Acct code:	
Sampled By:	John Gibson		
Company:	ACG		

Lot ID:	**537551**
Control Number:	
Date Received:	Apr 10, 2007
Date Reported:	Apr 20, 2007
Report Number:	986230

		Reference Number	537551-1	537551-2		
		Sample Date	Mar 23, 2007 12:00:00 AM	Mar 28, 2007 12:00:00 AM		
		Sample Location				
		Sample Description	O/B #1 South Pit	South Pit O/B		
		Matrix	Soil	Soil		
Analyte		**Units**	**Results**	**Results**	**Results**	**Detection Limit**
Metals Strong Acid Digestion - Continued						
Thallium	Strong Acid Extractable	ug/g	0.14	0.11		0.05
Tin	Strong Acid Extractable	ug/g	3	2		1
Titanium	Strong Acid Extractable	ug/g	1070	837		0.5
Vanadium	Strong Acid Extractable	ug/g	60.6	54.2		0.1
Zinc	Strong Acid Extractable	ug/g	58	54		1
Physical and Aggregate Properties						
Texture			Loam	Sandy Loam		
Sand	Soil Texture	% by weight	42.4	56.2		
Silt	Soil Texture	% by weight	45.6	31.6		
Clay	Soil Texture	% by weight	12.0	12.2		
Soil Acidity						
pH	1:2 Soil:Water	pH	7.9	6.6		
Electrical Conductivity	Sat. Paste equiv based on 1:2	dS/m at 25 C	0.66	0.32		0.02
Electrical Conductivity	1:2 Soil:Water	dS/m at 25 C	0.32	0.15		0.01

Approved by:

Walter Brandl
Operations Manager - Surrey