

August 5, 2016  
Project No: 1CM002.045

Minto Explorations Ltd.  
#13 Calcite Business Centre- 151 Industrial Road  
Whitehorse, Yukon  
Y1A 2V3

**Attention: Ryan Herbert, Environmental Specialist**

Dear Ryan:

**RE: Minto Mine Closure Cost Estimates – RCP Revision 2016-01**

This document presents the estimates for reclamation and closure liability based on the Minto Mine Reclamation Closure Plan, revision 2016-01. The estimates have been prepared in accordance with the costing guidance from YG EMR in the document Reclamation and Closure Planning for Quartz Mining Projects: Plan Requirements and Closure Costing Guidance (YG, 2013).

The following sections describe the basis of the estimate and the major costing assumptions. A cost summary is presented in Section 7 with the complete costing details provided in Attachment 1.

## 1 Scope of Estimate

YG (2013) guidance document requires liability estimates for three separate conditions:

1. Current status (i.e. Year 0);
2. Peak Liability within the two-year period for this the RCP approval will apply ; and,
3. End-of-mine (EOM) Life.

For the Minto Mine, the peak liability is the same as the Year 0 liability estimate and as a result, two estimates are presented. The Year 0 liability estimate assumes that mining at Minto North is complete, and that mining of the Area 2 Stage 3 Pit has yet to begin. This point of time is the peak liability as the closure cost is expected to be reduced as overburden stripped from the Area 2 Stage 3 Pit will be placed as covers over completed waste dump facilities. The end-of-mine life closure liability occurs following completion of mining in the Area 2 Stage 3 Pit in 2018.

### U.S. Offices:

Anchorage	907.677.3520
Denver	303.985.1333
Elko	775.753.4151
Fort Collins	970.407.8302
Reno	775.828.6800
Tucson	520.544.3688

### Canadian Offices:

Saskatoon	306.955.4778
Sudbury	705.682.3270
Toronto	416.601.1445
Vancouver	604.681.4196
Yellowknife	867.873.8670

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North America
South America

Closure implementation is estimated to take 3 years for both liability estimates with construction occurring between April and September. The site is estimated to be access by air during the spring, and by barge following spring break-up. Two years of interim care and maintenance is assumed to be required after mining ceases and prior to implementation of the final closure plan for the Year 0 liability estimate. These costs are not included in the EOM estimate as the closure plan would be finalized at the end-of-mining.

As noted in Section 8, the Post-Closure I and Post-Closure II periods have durations of 5 years and 10 years, respectively. During Post-Closure I, site access is maintained by air during the spring, and by barge following spring break-up. During Post-Closure II, site maintenance is assumed to be required every 5 years with the site accessed by barge and work completed in one month. Site access for monitoring events and geotechnical inspections when no barge is in place are assumed to be completed by helicopter. During Post-Closure II, the geotechnical inspection completed by helicopter will also be used to determine the maintenance requirements to be completed during the next summer.

Costs have also been allocated for on-going site maintenance past the Post-Closure II period into perpetuity. Routine site inspections and maintenance were assumed to be completed every 10 years, with access to the site established by barge. During these 10 year maintenance events, costs were allocated for passive treatment maintenance, site grading, as well as maintenance of the access road (including Big Creek Bridge).

## 2 Unit Rates

Equipment rates were obtained from the 2015-16 BC Blue Book (B.C. Road Builders and Heavy Construction Association, 2015). The Blue Book publishes 'all found less operator' equipment rates that include: ownership costs, operating costs (fuel, lube, and wear), insurance and profit. The operating costs are calculated using a base fuel rate of \$0.94/L with a fuel price adjustment published monthly on the B.C. Ministry of Transportation website. Overhead, profit, and fuel costs were backed out of the equipment rates as these costs were applied elsewhere in the cost model calculations.

Base labour rates were obtained from the Yukon Government Fair Wage Schedule effective April 1, 2016. Rates were adjusted based on either a "2 week in, 2 week out" or a "3 week in, 1 week out" rotation that accounted for: overtime, EQ, CPP, and MSP/health benefits. Hourly rates for project management and technical consultants were estimated based on past project experience. The workforce is assumed to primarily be based in either Pelly Crossing or Whitehorse.

Primary material rates used in the estimate consisted of: revegetation materials, fuel, and geosynthetic materials. The revegetation, fuel, and geotextile costs were provided by supplier quotes. The remaining material costs were obtained using RSMMeans Online – a cost database service that provides up-to-date construction cost data. Material costs used were factored by RSMMeans to be based in Whitehorse, and were further adjusted by 15% to account for shipping to Minto.

### 3 Basis of Estimate – Closure

#### 3.1 Direct Costs

Direct costs were estimated based on the construction fleet and productivities assigned to each task. Determination of the construction fleet and productivities were obtained based on first principals, from experience on similar projects, or from the RS Means Online cost database. Earthmoving unit rates were based on calculated productivities that followed standard methods, as used by earthwork contractors. The calculations make use of equipment specifications obtained from manufacturer's data, in this case the Caterpillar Handbook.

Table 1 provides a summary of the major direct cost quantity sources and assumptions. Further details are provided in the cost estimate worksheets provided in Attachment 1.

**Table 1: Direct Cost Inputs and Costing Assumptions**

Area	Inputs and Assumptions
Waste Dumps	<ul style="list-style-type: none"> <li>• Waste rock dump and ore stockpile dimensions were obtained from AutoCAD drawings of the September 2015 site topography.</li> <li>• The dimensions for waste dump facilities currently under construction (MVFE Stage 2 and MWDE) were estimated based on design drawings and observations from site in June 2016.</li> <li>• The dump slopes were assumed to be regraded to be flatter than 3H:1V and flat areas were assumed to be regraded to form tertiary drainage catchments with a minimum 2% grade</li> <li>• The SWD high grade waste stockpile was assumed to be regraded to be flatter than 5H:1V, lined with a bituminous geomembrane liner and covered with one meter of soil..</li> <li>• The waste rock covers were assumed to be entirely sourced from the Reclamation Overburden Dump.</li> </ul>
Overburden Dumps	<ul style="list-style-type: none"> <li>• Dump dimensions were obtained from AutoCAD drawings of the September 2015 site topography.</li> <li>• The dump slopes were assumed to be regraded to be flatter than 3H:1V and flat areas were assumed to be regraded to form tertiary drainage catchments with a minimum 2% grade.</li> </ul>
Ore Stockpiles	<ul style="list-style-type: none"> <li>• Stockpile dimensions were obtained from AutoCAD drawings of the September 2015 site topography.</li> <li>• The remaining stockpile volumes near the mill and the Main Waste Dump were provided by Minto on July 15, 2016. They are assumed to be relocated into the Main Pit, along with the upper two meters of the ore pads.</li> </ul>
Open Pits	<ul style="list-style-type: none"> <li>• Earthen safety berms are assumed to be placed around the pit high walls, with large boulders placed near pit access points and warning signs placed at key locations around the perimeter.</li> <li>• Perimeter lengths were obtained from the latest site topography for completed pits, or design drawings for pits currently under construction, or yet to be mined.</li> </ul>

Area	Inputs and Assumptions
Underground Openings	<ul style="list-style-type: none"> <li>• A backfill plug is assumed to be placed at the Minto South Portal with backfill material sourced from near-by waste rock. The area near the portal is assumed to be backfilled and recontoured.</li> <li>• The Area 118 vent raise is assumed to be sealed with a reinforced concrete cap with a vent raise pipe, and covered with fill.</li> </ul>
External Tailings Facilities	<ul style="list-style-type: none"> <li>• Dimensions of the DSTSF were obtained from AutoCAD drawings of the September 2015 site topography.</li> <li>• The area south of the DSTSF is assumed to be regraded to drain to the east of the facility.</li> </ul>
Roads	<ul style="list-style-type: none"> <li>• Road dimensions were obtained from the 2015 site topography and aerial photos. Roads no longer required following closure are assumed to be scarified and revegetated.</li> <li>• The main site access road is assumed to be maintained for long-term site access.</li> </ul>
Demolition	<ul style="list-style-type: none"> <li>• Building dimensions were obtained from site drawings for all major structures, and were estimated based on site photos for minor structures where drawings were not available.</li> <li>• All equipment was assumed to be dismantled and removed from site. Equipment lists were provided by Minto in 'Issued-for-Construction' Drawings, or based of the Hatch 2006 feasibility study cost estimate.</li> <li>• Demolition debris was assumed to be disposed in the on-site landfill located near the airstrip, with all hazardous material, recyclables, and re-useable equipment removed an appropriate off-site facility.</li> </ul>
Site infrastructure	<ul style="list-style-type: none"> <li>• Pipeline and power line lengths and details were provided by Minto in AutoCAD format.</li> <li>• The pipelines were assumed to be disposed on-site, with the power lines and power poles disposed off-site once no longer needed.</li> </ul>
Water Detention Structures	<ul style="list-style-type: none"> <li>• The water storage dam volumes were obtained from dam as-built drawings. The dam material is assumed to be partially utilized as construction material for the wetland system upstream of the dam.</li> </ul>
Yards	<ul style="list-style-type: none"> <li>• Yard areas were obtained from AutoCAD drawings and aerial photography. The yard boundaries are provided in Figure 9-1.</li> </ul>
Waste Disposal	<ul style="list-style-type: none"> <li>• Hydrocarbon contaminated soils were assumed to be hauled to the on-site landfill located at the airstrip, with the landfarm operated for a period of three years.</li> <li>• Areas of hydrocarbon contaminated soils were assumed to be present near fuelling storage and mechanic working areas, with an average contamination depth of 1.0 m.</li> </ul>
Surface water conveyance	<ul style="list-style-type: none"> <li>• Excavation volumes, channel lengths, alignments, and other quantities for the primary catchment channels were obtained from AutoCAD drawings.</li> <li>• The secondary catchment quantities were calculated based on the typical section provided in Section 7, with an allowance of 40 m of secondary channel lengths per hectare of dump.</li> </ul>

Area	Inputs and Assumptions
Water Treatment	<ul style="list-style-type: none"> <li>• Fill used to construct the wetland cells was assumed to be sourced from the Water Storage Pond Dam.</li> <li>• The wetland cells are assumed to be lined with HDPE with organics assumed to be produced using a power mulcher from vegetation cleared from the water storage pond footprint.</li> <li>• The passive treatment system is assumed to be constructed in Year 3 of closure with the first year of operation in Year 1 of post-closure.</li> <li>• The active treatment system is assumed to be decommissioned and removed from site at the end of Post-Closure 2.</li> </ul>

### 3.2 Indirect Costs

Indirect costs during the closure implementation included costs for mobilization-demobilization, site transport costs, site and road maintenance, construction support, project management, and quality assurance. A summary of the major indirect assumptions are provided in Table 2. Further details are provided in the cost estimate worksheets in Attachment 1.

**Table 2: Indirect Cost Inputs and Costing Assumptions**

Area	Inputs and Assumptions
Mobilization	<ul style="list-style-type: none"> <li>• The assumed closure equipment fleet is listed in Worksheet 19 in Attachment 1. Each piece of equipment is likely not required throughout the entire closure period, however, for the purposes of the estimate, the entire fleet was assumed to be mobilized in Year 1 of closure, with most equipment demobilized from site at the end of Year 3.</li> <li>• A small site maintenance fleet was assumed to remain on site to allow for earthwork repairs and passive treatment maintenance during the post-closure period. The storage location of the equipment has yet to be finalized, but is expected to consist of an existing site warehouse.</li> <li>• All equipment was assumed to be mobilized from Whitehorse.</li> </ul>
Site Transport	<ul style="list-style-type: none"> <li>• Site transport costs include barge and bus operations, as well as air transport and airstrip operations during periods where the barge is not in service.</li> </ul>
Road and Site Maintenance	<ul style="list-style-type: none"> <li>• A water truck and grader were assumed to be required 150 hours per month.</li> <li>• An allowance of 7 km of silt fencing and 1 ha of erosion control matting was assumed for erosion protection prior to vegetation begin established.</li> </ul>
Construction Support	<ul style="list-style-type: none"> <li>• Field support staff, vehicles, and support equipment were estimated based on past project experience on projects of similar size.</li> <li>• The existing camp and office facilities are assumed to be used by the closure contractor.</li> <li>• Camp cost man-days were estimate based on a sum of the calculated man-hours required for closure implementation.</li> <li>• Camp costs including power and heat were provided by Minto.</li> </ul>

Area	Inputs and Assumptions
QA and Project Management	<ul style="list-style-type: none"> <li>• Project management and QA includes costs for staffing to provide on-site management of the contractor to ensure the project is implemented as per the closure plan.</li> </ul>
Indirect Percentage Add-on Costs	<ul style="list-style-type: none"> <li>• Additional indirect add-ons included the following:               <ul style="list-style-type: none"> <li>○ Contingency = 12%</li> <li>○ Worker's Compensation = 0% (included in labour rates)</li> <li>○ Insurance = 2% of labour costs (equipment insurance included in equipment rates).</li> <li>○ Bonding = 3% of project implementation and care and maintenance costs.</li> <li>○ Contractor profit = 10%</li> <li>○ Contract administration = 5%</li> </ul> </li> </ul>

## 4 Basis of Estimate – Post Closure and C&M Costs

The following section describes the costs allocated for care and maintenance of the site for all phases of closure. Further details of the costs for each closure phase are provided in Worksheet 8 in Attachment 1.

### 4.1 Water Treatment

Active treatment operational costs are based on on-site costs for 2015. The active treatment system is assumed to be operated through Active Closure and Post-Closure I. Costs for capital replacement and maintenance of the active treatment system are included through to the end of the Post-Closure II period, after which the system is assumed to be dismantled and removed from site.

The passive treatment wetlands are assumed to start operations in Year 1 of post-closure. Allocated costs for operation and maintenance of the system includes costs for staffing and oversight of the system, an allowance for replacement of the organic media, as well as for carbon source injections.

### 4.2 Reclamation and Site Maintenance

Reclamation and site maintenance costs include allowances for equipment maintenance, road maintenance, repair of earthworks including site grading, cover and revegetation repair.

### 4.3 Site Management

Costs are included for the management of the site and care and maintenance activities, as well as camp operation.

### 4.4 Transport Costs

Transport costs include staffing transport between site and Whitehorse, as well as barge operations and mobilization-demobilization.

### 4.5 Post-Closure Indirect Costs

Post-closure indirect costs include the same percentage add-on costs as used during closure. These costs include: contingency (12%), insurance, bonding, contractor profit, and contract administration.

## 5 Closure Planning, Permitting, and Monitoring

Planning and permitting costs are included for the Year 0 liability estimate. These costs are assumed to be included during operations in the End-of-Mine Scenario. Planning and permitting costs include: reclamation research and planning, technical studies and investigations, monitoring and management plans, and permitting staffing and meetings. The engineering design to support planning and permitting is included in the indirect costs.

Monitoring of the site was costed according to the monitoring schedule presented in Section 7 of the RCP. Monitoring costing details are provided in Worksheet 20 in Attachment 1.

## 6 Inflation and Net Present Value Analysis

Inflation and net present value (NPV) calculations are presented in Worksheet 2 and 7 of Attachment 1 for the Year 0 and EOM liability estimates respectively. The tables include the cost schedule and undiscounted cash flow starting in 2016 through post-closure year 105. As required by YG (2013), 2% inflation has been applied to the period of active implementation, while NPV discount rates were applied to post-closure monitoring and maintenance costs. The NPV calculations include annual cash flows to perpetuity (modeled as 105 years after decommissioning and reclamation, or 2125).

As per Yukon Mine Site Reclamation and Closure Policy Financial Guidelines (YG 2014), the discount rate used in NPV calculation are to be the most recent Government of Canada benchmark bond yields as published by the Bank of Canada, with the bond term selected to be the longest term published that does not exceed the expected duration of the post-closure reclamation, monitoring and maintenance program. For the Minto site, this corresponds to a bond term of ten years, which as of July 2016, this corresponds to a bond yield of 1.75%. Given the historically low yield, a variable discount rate has been selected for the NPV calculations. The NPV calculations apply a discount rate of 1.75% for the first two years, 2% for the next 3 years, and 2.5% thereafter. The 2.5% corresponds to the average yield for the past ten years.

## 7 Cost Summary

Table 3 summarizes the reclamation and closure liability for the Year 0 (and peak two-year liability, and the End-of-Mine scenarios. The costs are presented in 2016 Canadian Dollars.

**Table 3: Reclamation and Closure Liability Cost Summary**

Description of Cost	Year 0	EOM
<b>Closure Implementation</b>		
Direct Costs	\$16,660,159	\$9,758,628
Care & Maintenance Costs to end of implementation	\$9,502,236	\$4,356,453
Indirect Costs	\$18,924,757	\$14,842,748
<i>Cost Inflation</i>	<i>\$2,329,764</i>	<i>\$1,769,366</i>
<b>Sub-total - Implementation Costs</b>	<b>\$47,416,916</b>	<b>\$30,727,195</b>
Post-Closure NPV	\$13,645,322	\$13,251,943
<b>TOTAL FINANCIAL SECURITY</b>	<b>\$61,062,239</b>	<b>\$43,979,138</b>

## Closure

We trust that this report meets with your project requirements. If you have any questions or concerns, please contact Peter Mikes at (604) 681-4196 at your convenience.

Sincerely,  
SRK Consulting (Canada) Inc.

## ORIGINAL SIGNED AND STAMPED BY

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Peter Mikes, PEng  
Senior Consultant

Reviewed by:

## ORIGINAL SIGNED BY

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Stu McPhee, EIT  
Consultant

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## 8 References

B.C. Road Builders and Heavy Construction Association, 2016. 2015-16 Equipment Rental Rate Guide. Published July.

[YG] Government of Yukon, Energy Mines and Resources, 2013. Reclamation and Closure Planning for Quartz Mining Projects: Plan Requirements and Closure Costing Guidance. August.

[YG] Government of Yukon, Department of Community Services, 2016. Fair Wage Schedule, effective April 1, 2016. Accessed at <http://www.community.gov.yk.ca/fairwage.html> on July 15, 2016.

Figures

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	 <small>OPERATED BY MINTO EXPLORATIONS LTD.</small>	MINTO CLOSURE PLAN		
		Cost Estimate Reclamation Areas		
<small>SRK JOB NO.: 1CM002.044</small> <small>FILE NAME: 1CM002-45_ClosureQuantities_rev03-ForFigure.dwg</small>	MINTO	<small>DATE:</small> July 2016	<small>APPROVED:</small>	<small>FIGURE:</small> 9.1



Attachment 1 – Cost Estimate Worksheets

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Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01

Project No.: 1CM002.045

Client: Minto Explorations Ltd.

Date of Submission: August 5, 2016

File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

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3	Year 0 Estimate - Annual C&M costs	03-Yr0CCM
4	Year 0 Estimate - Implementation Costs	04-Yr0Active
5	Year 0 Estimate - Schedule Details	05-Yr0Sched
6	Year 0 Estimate - Planning and Permitting	06-Yr0Planning
7	EOM Estimate - Cashflow Calculations	07-EOMNPV
8	EOM Estimate - Annual C&M costs	08-EOMCCM
9	EOM Estimate - Implementation Costs	09-EOMActive
10	EOM Estimate - Schedule Details	10-EOMSched
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12	Labour Rate Calculations	12-LaborRate
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14	Material Rates and Indirect Cost Inputs	14-MatRate
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27	Underground	27-UG
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## Worksheet 1 - Cost Summary

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



### COST SUMMARY YEAR 0

WBS	Description of Cost	Proposed Cost
<b>Closure Implementation</b>		
<b>Direct Costs</b>		
A01	Waste Dump	\$7,903,181
A02	Overburden Dumps	\$340,650
A03	Ore Stockpiles	\$1,114,877
A04	Open Pits	\$38,797
A05	Underground Openings	\$25,661
A06	External Tailings Facilities	\$583,143
A07	Roads	\$106,478
A08	Demolition	\$1,933,168
A09	Surface Infrastructure	\$118,389
A10	Water Detention Structures	\$739,172
A11	Yards/Laydown Areas	\$703,988
A12	Waste Disposal	\$502,536
A13	Surface Water Conveyance	\$2,071,653
A14	Water Treatment	\$478,467
<b>Subtotal - Direct Implementation</b>		<b>\$16,660,159</b>
<b>Interim Monitoring and C&amp;M</b>		
P	Planning, Permitting, Monitoring	\$1,823,979
CM	Care and Maintenance	\$7,678,257
<b>Subtotal - Monitoring and C&amp;M</b>		<b>\$9,502,236</b>
<b>Indirect Costs</b>		
B1	Mobilization/Demobilization	\$305,210
B2	Transport Costs	\$406,656
B3	Site/Road Maintenance	\$742,995
B4	Construction Support	\$5,169,797
B5	QA and Project Management	\$1,860,889
-	Other Indirects	\$6,297,386
-	Contingency (12%)	\$4,141,823
<b>Subtotal - Indirect Costs</b>		<b>\$18,924,757</b>
<i>Cost Inflation</i>		<i>\$2,329,764</i>
<b>SUB-TOTAL IMPLEMENTATION COSTS</b>		<b>\$47,416,916</b>
<b>Post-Closure Costs (Undiscounted)</b>		
<b>Direct Costs</b>		
1	Monitoring	\$1,647,237
2	Water Treatment - Active Treatment	\$4,319,359
3	Passive Treatment	\$557,443
4	Reclamation Maintenance	\$1,456,236
5	Site Maintenance	\$1,542,451
6	Site Management	\$4,806,132
7	Transportation Costs	\$950,206
<b>Subtotal Direct Costs</b>		<b>\$15,279,064</b>
<b>Indirect Costs</b>		
1	Indirects	\$2,786,941
2	Contingency (12%)	\$1,849,418
<b>Subtotal - Indirects</b>		<b>\$4,636,359</b>
<b>SUB-TOTAL - POST-CLOSURE COSTS</b>		<b>\$19,915,423</b>
<b>POST-CLOSURE NPV</b>		<b>\$13,645,322</b>
<b>TOTAL FINANCIAL SECURITY</b>		<b>\$61,062,239</b>

### COST SUMMARY EOM

WBS	Description of Cost	Proposed Cost
<b>Closure Implementation</b>		
<b>Direct Costs</b>		
A01	Waste Dump	\$1,860,150
A02	Overburden Dumps	\$340,650
A03	Ore Stockpiles	\$718,046
A04	Open Pits	\$39,929
A05	Underground Openings	\$25,661
A06	External Tailings Facilities	\$150,214
A07	Roads	\$106,478
A08	Demolition	\$1,933,168
A09	Surface Infrastructure	\$118,389
A10	Water Detention Structures	\$739,172
A11	Yards/Laydown Areas	\$703,988
A12	Waste Disposal	\$502,536
A13	Surface Water Conveyance	\$2,071,653
A14	Water Treatment	\$448,594
<b>Subtotal - Direct Implementation</b>		<b>\$9,758,628</b>
<b>Interim Monitoring and C&amp;M</b>		
P	Planning, Permitting, Monitoring	\$1,134,928
CM	Care and Maintenance	\$3,221,525
<b>Subtotal - Monitoring and C&amp;M</b>		<b>\$4,356,453</b>
<b>Indirect Costs</b>		
B1	Mobilization/Demobilization	\$305,210
B2	Transport Costs	\$406,656
B3	Site/Road Maintenance	\$742,995
B4	Construction Support	\$4,832,506
B5	QA and Project Management	\$1,860,889
-	Other Indirects	\$4,038,820
-	Contingency (12%)	\$2,655,671
<b>Subtotal - Indirect Costs</b>		<b>\$14,842,748</b>
<i>Cost Inflation</i>		<i>\$1,769,366</i>
<b>SUB-TOTAL IMPLEMENTATION COSTS</b>		<b>\$30,727,195</b>
<b>Post-Closure Costs (Undiscounted)</b>		
<b>Direct Costs</b>		
1	Monitoring	\$1,647,237
2	Water Treatment - Active Treatment	\$4,319,359
3	Passive Treatment	\$557,443
4	Reclamation Maintenance	\$1,107,338
5	Site Maintenance	\$1,542,451
6	Site Management	\$4,815,732
7	Transportation Costs	\$950,206
<b>Subtotal Direct Costs</b>		<b>\$14,939,766</b>
<b>Indirect Costs</b>		
1	Indirects	\$2,724,498
2	Contingency (12%)	\$1,808,702
<b>Subtotal - Indirects</b>		<b>\$4,533,200</b>
<b>SUB-TOTAL - POST-CLOSURE COSTS</b>		<b>\$19,472,966</b>
<b>POST-CLOSURE NPV</b>		<b>\$13,251,943</b>
<b>TOTAL FINANCIAL SECURITY</b>		<b>\$43,979,138</b>



**INFLATION FACTORED INTERIM CARE AND CLOSURE IMPLEMENTATION COSTS**

Area	Present Value	% of Total	Future Value	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 99	Year 107	Year 108		
				2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2116	2124	2125		
<b>Direct Costs</b>																																							
Waste Dumps	\$7,903,181	31%	\$9,321,139	\$0	\$0	\$3,288,868	\$5,032,151	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Overburden Dumps	\$240,650	1%	\$368,730	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Ore Stockpiles	\$1,114,877	4%	\$1,159,918	\$0	\$0	\$1,159,918	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Open Pits	\$38,797	0%	\$41,584	\$0	\$0	\$0	\$20,586	\$20,998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Underground Openings	\$25,661	0%	\$26,698	\$0	\$0	\$26,698	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
External Tailings Facilities	\$583,143	2%	\$612,769	\$0	\$0	\$303,351	\$309,418	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Roads	\$106,478	0%	\$115,255	\$0	\$0	\$115,255	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Demolition	\$1,933,168	8%	\$2,053,626	\$0	\$0	\$201,127	\$1,538,620	\$313,879	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Surface Infrastructure	\$118,389	0%	\$125,647	\$0	\$0	\$30,793	\$62,817	\$32,037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Water Detention Structures	\$739,172	3%	\$792,259	\$0	\$0	\$392,207	\$400,052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Yards/Laydown Areas	\$703,988	3%	\$750,886	\$0	\$0	\$183,107	\$186,769	\$381,009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Waste Dispose	\$502,536	2%	\$546,062	\$0	\$0	\$73,052	\$407,971	\$12,220	\$12,465	\$12,714	\$27,639	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Surface Water Conveyance	\$2,071,653	8%	\$2,211,817	\$0	\$0	\$431,069	\$659,536	\$1,121,212	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Water Treatment	\$478,467	2%	\$524,607	\$0	\$0	\$0	\$0	\$453,541	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Indirect</b>																																							
Mobilization-Demobilization	\$305,210	1%	\$325,813	\$0	\$0	\$158,770	\$0	\$147,336	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Transport Costs	\$406,656	2%	\$431,518	\$0	\$0	\$143,849	\$142,410	\$145,259	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Road Maintenance	\$742,995	3%	\$788,420	\$0	\$0	\$262,824	\$260,196	\$265,400	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Construction Support	\$5,169,797	21%	\$5,485,864	\$0	\$0	\$1,828,743	\$1,810,456	\$1,846,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
QA and Pro. Mgmt.	\$1,860,889	7%	\$1,974,658	\$0	\$0	\$658,263	\$651,681	\$664,714	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Subtotal - Closure Implementation Costs</b>	<b>\$25,145,706</b>		<b>\$26,857,271</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,677,501</b>	<b>\$11,139,902</b>	<b>\$6,684,058</b>	<b>\$12,220</b>	<b>\$12,465</b>	<b>\$12,714</b>	<b>\$27,639</b>	<b>\$90,772</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		

Area	Present Value	% of Total	Future Value	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2116	2124	2125	
				1	Planning and permitting	\$400,000	12%	\$404,000	\$200,000	\$204,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Reclamation Research and Planning	\$58,500	2%	\$59,085	\$29,250	\$29,835	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
3	Engineering, Design, and Construction Plans	\$833,008	24%	\$855,003	\$249,902	\$339,867	\$86,666	\$88,399	\$90,167	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Monitoring and Management Plans	\$95,000	3%	\$95,950	\$47,500	\$48,450	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	Permitting	\$0	0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
1	Monitoring	\$263,428	8%	\$275,122	\$43,497	\$44,366	\$61,188	\$62,412	\$63,660	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	Water Quality Monitoring	\$16,040	0%	\$16,695	\$3,208	\$3,272	\$3,338	\$3,404	\$3,472	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	Sediment Monitoring	\$52,970	2%	\$55,132	\$10,594	\$10,806	\$11,022	\$11,242	\$11,467	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Biological Monitoring	\$61,582	2%	\$64,096	\$12,316	\$12,563	\$12,814	\$13,070	\$13,332	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5	Geotechnical Monitoring	\$31,590	1%	\$33,528	\$0	\$0	\$10,955	\$11,175	\$11,398	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Revegetation Monitoring	\$11,860	0%	\$12,344	\$2,372	\$2,419	\$2,468	\$2,517	\$2,568	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Annual Inspection Reporting	\$1,823,979		\$1,870,954	\$598,639	\$695,579	\$188,451	\$192,220	\$196,064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Area	Present Value	% of Total	Future Value	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2116	2124	2125
				1	Water Treatment	\$																															



**Worksheet 3 - Year 0 Estimate - Annual C&M Costs**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**Summary of Annual Care and Maintenance Costs**

	Annual Cost Per Phase						Total Cost	Number of Years				
	1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual	n/a		1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual
1 Active Water Treatment System	\$686,853	\$686,853	\$686,853	\$88,509	\$0	\$0	\$7,753,625	2	3	5	10	0
2 Passive Treatment System	\$0	\$0	\$34,840	\$34,840	\$34,840	\$0	\$557,443	2	3	5	2	9
3 Reclamation Maintenance	\$0	\$0	\$291,247	\$0	\$0	\$0	\$1,456,236	2	3	5	2	9
4 Site Maintenance	\$328,745	\$30,000	\$93,072	\$93,072	\$98,994	\$0	\$2,289,941	2	3	5	2	9
5 On-site Management	\$1,140,216	\$306,988	\$607,341	\$80,156	\$178,791	\$0	\$8,007,528	2	3	5	2	9
6 Transportation Costs	\$147,552	\$0	\$62,131	\$20,000	\$66,617	\$0	\$1,245,310	2	3	5	2	9

**NOTES:**  
 1. This table is used as a check to the NPV calculation spreadsheet.

**Phase 1 - Annual Care & Maintenance Costs - Prior to Closure**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S1.1	Water Treatment																	
S1.1.1	Active Treatment System														\$686,853	\$686,853		
S1.1.1.1		Operation and maintenance		1	yr								\$496,900	\$63,744	\$37,700	\$598,344		See details on 'Water Treatment' worksheet.
S1.1.1.2		Capital Replacement	annual allowance	1	yr								\$84,400	\$4,109	\$0	\$88,509		See details on 'Water Treatment' worksheet.
S1.2	Onsite Management																	
S1.2.1	Field Support Staff														\$750,335	\$1,140,216		
S1.2.1.1		Mine Manager		4	months	360	site working hours per month			\$23,366						\$81,781		(Notes: staffing costs include cross-shifts)
S1.2.1.2		Office/Camp manager		6	months	360	site working hours per month			\$22,227						\$133,364		
S1.2.1.3		Administrative Assistants/HR/Accounting		4	months	360	site working hours per month			\$16,214						\$56,749		
S1.2.1.4		Water Treatment Staff Operator		5	months	360	site working hours per month			\$18,491						\$92,457		
S1.2.1.5		Environmental/Safety Manager		4	months	360	site working hours per month			\$22,227						\$88,909		
S1.2.1.6		Environmental Technicians		7	months	360	site working hours per month			\$15,699						\$102,045		
S1.2.1.7		Mechanic		2	months	360	site working hours per month			\$17,349						\$34,697		
S1.2.1.8		Tradesmen		2	months	360	site working hours per month			\$18,491						\$41,606		
S1.2.1.9		General Labour/helpers		10	months	360	site working hours per month			\$12,498						\$118,726		
S1.2.2	Field support Vehicles														\$122,281			
S1.2.2.1		Pick-up trucks (3 required)		12	months					\$4,518						\$54,214		
S1.2.2.2		Mechanic service vehicle		2	months					\$6,919						\$13,837		
S1.2.2.3		Emergency transport vehicle		12	months					\$4,519						\$54,229		
S1.2.3	Field Support Equipment/Supplies														\$267,600			
S1.2.3.1		Office supplies		12	months					\$1,000						\$12,000		
S1.2.3.2		Communications		12	months					\$1,000						\$12,000		
S1.2.3.3		Misc. supplies		12	months					\$500						\$6,000		
S1.2.3		Camp Operation		1,995	man-days					\$80						\$159,600		
S1.2.3		Power, heat, fuel		12	months					\$6,500						\$78,000		
S1.3	Site Maintenance														\$328,745	\$328,745		
S1.3.1		Equipment Maintenance		1	ls			\$20,000								\$20,000		Labour included in field support staff
S1.3.2		Road Maintenance	Grader (assume 80 hrs/month)	1	ls	960			\$43	\$92	\$136	\$0	\$41,613	\$88,525	\$130,138		Operator cost included in Field support staff	
S1.3.3		Earthwork Repair allowance (assume 40 hrs per month)		1	ls	480	\$0	\$129	\$310	\$310	\$310		\$148,607	\$148,607			Task Code C.2.14	
S1.3.4		Sundry equipment/consumables allowance		1	ls					\$30,000						\$30,000		Allowance for pump maintenance/fuel etc.
S1.4	Transportation Costs														\$147,552	\$147,552		
S1.4.1		Barge Operations		5	months					\$10,000						\$50,000		One per week
S1.4.2		Staffing Bus trips during barge operation period		20	ea					\$678						\$13,552		One flight per week
S1.4.3		Air transport and airstrip operations		8	flights					\$3,000						\$24,000		One flight per week
S1.4.4		Helicopter transport		20	flights					\$3,000						\$60,000		One flight per week
<b>TOTAL</b>															<b>\$2,303,366</b>	<b>\$2,303,366</b>	<b>\$2,303,366</b>	

**Phase 2 - Annual Care & Maintenance Costs During Active Closure**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S2.1	Water Treatment																	
S2.1.1	Active Treatment System																	
S2.1.1.1		Operation and maintenance			1 yr													
S2.1.1.2		Capital Replacement	annual allowance		1 yr													
S2.2	Onsite Management																	
S2.2.1	Field Support Staff																	
S2.2.1.1		Water Treatment Staff Operator			5 months	360	site working hours per month											
S2.2.1.2		Environmental/Safety Manager			4 months	360	site working hours per month											
S2.2.1.3		Environmental Technicians			4 months	360	site working hours per month											
S2.2.2	Field support Vehicles																	
S2.2.2.1		Pick-up trucks (1 required)			7 months													
S2.2.3	Field Support Equipment/Supplies																	
S2.2.3.1		Camp Operation			390 man-days													
S2.3	Site Maintenance																	
S2.3.1		Pumping equipment/consumables allowance			1 ls													Allowance for pump maintenance/fuel etc.
S2.4	Transportation Costs																	
S2.4.1		Barge Operations			0 months													Included in construction indirect costs
<b>TOTAL</b>																		

**Phase 3 - Annual Care & Maintenance Costs - Post Closure I**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours or Cost Code Ref.	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S3.1	Water Treatment																	
S3.1.1	Active Treatment System																	
S3.1.1.1		Operation and maintenance			1 yr													
S3.1.1.2		Capital Replacement	annual allowance		1 yr													
S3.1.1	Passive Treatment System																	
S3.1.1.1		Operation and maintenance			1 yr													
S3.2	Onsite Management																	
S3.2.1	Field Support Staff																	
S3.2.1.1		Mine Manager			3 months	360	site working hours per month											
S3.2.1.2		Office/Camp manager			3 months	360	site working hours per month											
S3.2.1.3		Administrative Assistants/HR/Accounting			1 months	360	site working hours per month											
S3.2.1.4		Water Treatment Staff Operator			2 months	360	site working hours per month											
S3.2.1.5		Environmental/Safety Manager			3 months	360	site working hours per month											
S3.2.1.6		Environmental Technicians			3 months	360	site working hours per month											
S3.2.1.7		Mechanic			2 months	360	site working hours per month											
S3.2.1.8		Tradesmen			2 months	360	site working hours per month											
S3.2.1.9		General Labour/helpers			2 months	360	site working hours per month											
S3.2.2	Field support Vehicles																	
S3.2.2.1		Pick-up trucks (3 required)			15 months													
S3.2.2.2		Mechanic service vehicle			2 months													
S3.2.2.3		Emergency transport vehicle			5 months													
S3.2.3	Field Support Equipment/Supplies																	
S3.2.3.1		Office supplies			5 months													
S3.2.3.2		Communications			5 months													
S3.2.3.3		Misc. supplies			5 months													
S3.2.3		Camp Operation			1,073 man-days													
S3.2.3		Power, heat, fuel			5 months													
S3.3	Reclamation Maintenance																	
S3.3.1	Cover repairs																	
S3.3.1.1		Cover Repair allowance	Load, haul, dump, spread (spoil)		2% of total	1,098,885	m3 of cover required replacement at:											
S3.3.1.2		Seed/Fertilize: broadcast seeding			55 ha													
S3.3.2.1	Revegetation																	
S3.3.2.2		Reseeding allowance	Seed/Fertilize: broadcast seeding		5% of total	292	ha requires reseeding at											
S3.3	Site Maintenance																	
S3.3.1		Equipment Maintenance			1 ls													
S3.3.2		Road Maintenance	Grader (assume 40 hrs/month)		1 ls	200												
S3.3.3		Earthwork Repair allowance (assume 20 hrs per month)			1 ls	100												
S3.3.4		Sundry equipment/consumables allowance			1 ls													
S3.4	Transportation Costs																	
S3.4.1		Barge Operations			3 months													
S3.4.2		Staffing Bus trips during barge operation period			12 ea													One per week
S3.4.3		Air transport and airstrip operations			8 flights													One flights per week
<b>TOTAL</b>																		

**Phase 4 - Annual Care & Maintenance Costs - Post Closure II**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours or Cost Code Ref.	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S4.1	Water Treatment																\$123,349	
S4.1.1	Active Treatment System																	
S4.1.1.2	Capital Replacement	annual allowance		1	yr									\$88,509	\$88,509			See details on 'Water Treatment' worksheet.
S4.1.1	Passive Treatment System																	
S4.1.1.1	Operation and maintenance			1	yr									\$34,840	\$34,840			See details on 'Water Treatment' worksheet.
S4.2	Onsite Management																	
S4.2.1	Field Support Staff																	\$80,156
S4.2.1.1	Project Manager			0.5	months	360	site working hours per month							\$11,683				(Notes: staffing costs include cross-shifts)
S4.2.1.2	Passive Treatment specialist			0.5	months	360	site working hours per month							\$21,060				
S4.2.1.3	Mechanic			0.5	months	360	site working hours per month							\$8,674				
S4.2.1.4	General Labour/helpers			0.3	months	360	site working hours per month							\$3,124				
S4.2.2	Field support Vehicles																	\$17,014
S4.2.2.1	Pick-up trucks (2 required)			2.0	months									\$9,036				
S4.2.2.2	Mechanic service vehicle			0.5	months									\$3,459				
S4.2.2.3	Emergency transport vehicle			1.0	months									\$4,519				
S4.2.3	Field Support Equipment/Supplies																	\$18,600
S4.2.3.1	Office supplies			1	months									\$1,000				
S4.2.3.2	Communications			1	months									\$1,000				
S4.2.3.3	Misc. supplies			1	months									\$500				
S4.2.3	Camp Operation			120	man-days									\$9,600				
S4.2.3	Power, heat, fuel			1	months									\$6,500				
S4.3	Reclamation Maintenance																	\$0
S4.3.1	Cover repairs																	\$0
S4.3.2	Revegetation																	\$0
S4.3	Site Maintenance																	\$28,903
S4.3.1	Equipment Maintenance (parts, supplies)			1	ls									\$10,000				
S4.3.2	Road Maintenance	Grader (assume 20 hrs/month)		1	ls	20		\$43	\$92	\$136	\$0	\$867	\$1,844	\$2,711				Labour included in field support staff
S4.3.3	Earthwork Repair allowance (assume 20 hrs per month)			1	ls	20	\$0	\$129	\$310	\$310			\$6,192	\$6,192				Operator cost included in Field support staff
S4.3.4	Sundry equipment/consumables allowance			1	ls					\$10,000			\$6,192	\$6,192				Task Code C.2.14
S4.4	Transportation Costs																	\$20,000
S4.4.1	Barge Operations			1	months					\$10,000				\$10,000				
S4.4.2	Staffing Bus trips during barge operation period			0	ea					\$678				\$0				
S4.4.3	Barge mob/demob			1	LS					\$10,000				\$10,000				
<b>TOTAL</b>														<b>\$252,408</b>	<b>\$252,408</b>	<b>\$252,408</b>		

**Phase 5 - Perpetual Care & Maintenance Event Year Annual Costs**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours or Cost Code Ref.	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S5.1	Water Treatment																	\$34,840
S5.1.1	Passive Treatment System																	
S5.1.1.1	Operation and maintenance			1	yr									\$34,840	\$34,840			See details on 'Water Treatment' worksheet.
S5.2	Onsite Management																	\$178,791
S5.2.1	Field Support Staff																	\$128,778
S5.2.1.1	Project Manager			1.0	months	360	site working hours per month			\$23,366				\$23,366				(Notes: staffing costs include cross-shifts)
S5.2.1.2	Passive Treatment specialist			1.0	months	360	site working hours per month			\$42,120				\$42,120				
S5.2.1.3	Site Engineer			1.0	months	360	site working hours per month			\$42,120				\$42,120				
S5.2.1.4	HD mechanic			0.5	months	360	site working hours per month			\$17,349				\$8,674				
S5.2.1.5	General Labour/helpers			1.0	months	360	site working hours per month			\$12,498				\$12,498				
S5.2.2	Field support Vehicles																	\$17,013
S5.2.2.1	Pick-up trucks (3 required)			3	months					\$4,518				\$13,554				
S5.2.2.2	Mechanic service vehicle			1	months					\$6,919				\$3,459				
S5.2.3	Field Support Equipment/Supplies																	\$33,000
S5.2.3.1	Office supplies			1	months					\$1,000				\$1,000				
S5.2.3.2	Communications			1	months					\$1,000				\$1,000				
S5.2.3.3	Misc. supplies			1	months					\$500				\$500				
S5.2.3.4	Camp Operation			300	man-days					\$80				\$24,000				
S5.2.3.5	Power, heat, fuel			1	months					\$6,500				\$6,500				
S5.3	Reclamation Maintenance																	\$0
S5.4	Site Maintenance																	\$98,994
S5.4.1	Grader Maintenance	Grader (assume 2 weeks, 10hrs/c)		1	ls	140		\$43	\$92	\$136	\$0	\$6,069	\$12,910	\$18,978				Operator cost included in Field support staff
S5.4.2	Earthwork Repair allowance (assume 3 weeks, 10hrs/day)			1	ls	210	\$0	\$129	\$310	\$310			\$65,016	\$65,016				Task Code C.2.14
S5.4.3	Big Creek Bridge - Capital replacement allowance			1	ls					\$15,000				\$15,000				Allowance for supplies, pumping, etc.
S5.4.4	Sundry allowance			1	ls					\$2,500				\$2,500				Allowance for supplies, pumping, etc.
S5.5	Transportation Costs																	\$66,617
S5.5.1	Barge Operations			1	months					\$10,000				\$10,000				
S5.5.2	Barge mobilization/demob and set up			1	ls					\$10,000				\$10,000				assumed
S5.5.3	Camp Mob/demob			1	ls					\$10,000				\$10,000				assumed
S5.5.4	Equipment mobilization and demobilization			2	ls					\$18,308				\$36,616.67				See details on 'mob-demob' worksheet
<b>TOTAL</b>														<b>\$381,742</b>	<b>\$379,242</b>	<b>\$379,242</b>		

Worksheet 4 - Year 0 Estimate - Implementation Costs

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01
Project No.: 1CM002.045
Client: Minto Explorations Ltd.
Date of Submission: August 5, 2016
File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



Table with columns: WBS, Facility/Area, Task, Activity, Qnty, Units, Cost Code, Labour (Total Mhrs, Unit Rate, Cost), Equipment (Unit Rate, Cost), Fuel (Consumed (L), Cost), Material (Unit Rate, Cost), Activity Totals (Unit Rate, Cost), Subtotals (WBS Level 2, WBS Level 1), Source / Comments.





WBS	Facility/Area	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material			Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	
A8	Demolition																					
A8.1	Airstrip Area																					
A8.1.1.1	Demolition	Remove tanks/equipment	Dismantle and prep for transport	7	hrs	C.1.13	28.0	\$164.14	\$1,149.00	\$87.08	\$610	\$14.53	106	\$101.70	\$0.00	\$0.00	\$265.75	\$1,860	\$20,720	\$1,933,168		
A8.1.1.2		Waste Oil Tanker Secondary	Bedding Material: Load, haul dump bedding material to landfarm	47	Cm3	R.001	1.5	\$1.36	\$64.19	\$2.70	\$128	\$0.90	44	\$42.57	\$0.00	\$0.00	\$4.96	\$235				
A8.1.2.2			Cut and fold liner		219	m2	C.1.15	2.5	\$0.42	\$92.63	\$0.20	\$43	\$0.07	16	\$15.13	\$0.00	\$0.00	\$0.69	\$151			
A8.1.2.3			Regrade area to promote positive drainage		192	m2	C.2.11	1.9	\$0.43	\$83.23	\$1.29	\$247	\$0.35	71	\$67.74	\$0.00	\$0.00	\$2.07	\$398			
A8.1.3.1			Prepare for demolition	Remove hazardous materials/prep for transport offsite	10	hrs	C.1.22	40.0	\$155.59	\$1,555.87	\$97.38	\$974	\$26.93	281	\$269.28	\$0.00	\$0.00	\$279.90	\$2,799			
A8.1.3.2			Disconnect services		4	hrs	C.1.09	12.0	\$86.08	\$344.32	\$7.75	\$31	\$4.80	20	\$19.20	\$0.00	\$0.00	\$98.63	\$395			
A8.1.4.1			Demolition	Structural building demolition: wooden buildings/tents	1,149	m3	C.1.08	87.7	\$2.82	\$3,233.87	\$1.61	\$1,849	\$0.57	680	\$652.51	\$0.00	\$0.00	\$4.99	\$5,736			
A8.1.4.2				Other demolition: covered storage, debris, etc.	530	m3	C.1.07	52.5	\$3.65	\$1,934.55	\$2.09	\$1,106	\$0.74	407	\$390.34	\$0.00	\$0.00	\$6.48	\$3,431			
A8.1.5.1			Waste disposal	On-site disposal (demolition debris, etc.)	379	m3	R.006	12.8	\$1.45	\$548.89	\$2.56	\$971	\$0.92	361	\$346.89	\$0.00	\$0.00	\$4.92	\$1,867			
A8.1.5.2				Off-site disposal (re-usable equipment, etc.)	4	m3	C.7.07	34.6	\$346.78	\$1,500.89	\$429.22	\$1,858	\$113.33	511	\$490.50	\$0.00	\$0.00	\$889.33	\$3,849			
A8.2		Airport Laydown Area																				
A8.2.1.1		Demolition	Remove tanks/equipment	Dismantle and prep for transport	2	hrs	C.1.13	8.0	\$164.14	\$328.29	\$87.08	\$174	\$14.53	30	\$29.06	\$0.00	\$0.00	\$265.75	\$532	\$32,681		
A8.2.2.1			Prepare for demolition	Remove hazardous materials/prep for transport offsite	2	hrs	C.1.22	8.0	\$155.59	\$311.17	\$97.38	\$195	\$26.93	56	\$53.86	\$0.00	\$0.00	\$279.90	\$560			
A8.2.2.2			Disconnect services		4	hrs	C.1.09	12.0	\$86.08	\$344.32	\$7.75	\$31	\$4.80	20	\$19.20	\$0.00	\$0.00	\$98.63	\$395			
A8.2.3.1			Demolition	Structural building demolition: steel structures	96	tonnes	C.1.05	191.3	\$67.73	\$6,477.52	\$136.09	\$13,015	\$33.84	3,371	\$3,236.25	\$0.00	\$0.00	\$237.66	\$22,729			
A8.2.3.2				Other demolition: covered storage etc.	560	m3	C.1.07	55.5	\$3.65	\$2,045.31	\$2.09	\$1,170	\$0.74	430	\$412.69	\$0.00	\$0.00	\$6.48	\$3,628			
A8.2.4.1			Waste disposal	On-site disposal (demolition debris, etc.)	393	Lm3	R.005	15.8	\$1.72	\$676.99	\$3.01	\$1,182	\$1.08	441	\$423.19	\$0.00	\$0.00	\$5.81	\$2,282			
A8.2.4.2				Off-site disposal (re-usable equipment, etc.)	3	trips	C.7.07	23.0	\$346.78	\$996.98	\$429.22	\$1,234	\$113.33	339	\$325.82	\$0.00	\$0.00	\$889.33	\$2,557			
A8.3	Camp Area																					
A8.3.1.1	Demolition		Equipment Removal	Remove salvageable equipment	48	hrs	C.1.13	192.0	\$164.14	\$7,878.86	\$87.08	\$4,180	\$14.53	726	\$697.34	\$0.00	\$0.00	\$265.75	\$12,756	\$370,330		
A8.3.2.1			Remove modular buildings	Dismantle and prep for transport	92	ea.	C.1.20	1,794.0	\$831.26	\$76,475.46	\$737.86	\$67,883	\$166.46	15,953	\$15,314.69	\$0.00	\$0.00	\$1,735.58	\$159,673			
A8.3.2.2				Transport structures off-site (Whitehorse)		92	ea.	C.7.04	736.0	\$343.01	\$31,557.04	\$309.18	\$28,445	\$113.33	10,861	\$10,426.18	\$0.00	\$0.00	\$765.52	\$70,428		
A8.3.3.1				Prepare for demolition	Remove hazardous materials/prep for transport offsite	1	hrs	C.1.22	4.0	\$155.59	\$622.35	\$97.38	\$97	\$26.93	28	\$26.93	\$0.00	\$0.00	\$279.90	\$280		
A8.3.3.2				Disconnect services		8	hrs	C.1.09	24.0	\$86.08	\$688.64	\$7.75	\$62	\$4.80	40	\$38.40	\$0.00	\$0.00	\$98.63	\$789		
A8.3.4.1			Demolition	Structural building demolition: Steel	175	tonnes	C.1.05	350.7	\$67.73	\$11,875.46	\$136.09	\$23,861	\$33.84	6,180	\$5,933.13	\$0.00	\$0.00	\$237.66	\$41,669			
A8.3.4.2				Structural building demolition: Wood/misc. structures	10,959	m3	C.1.08	836.7	\$2.82	\$30,850.94	\$1.61	\$17,644	\$0.57	6,484	\$6,224.86	\$0.00	\$0.00	\$4.99	\$54,720			
A8.3.4.4				Other demolition: Utilidors, etc.	466	m3	C.1.07	46.1	\$3.65	\$1,701.64	\$2.09	\$973	\$0.74	358	\$343.34	\$0.00	\$0.00	\$6.48	\$3,018			
A8.3.5.1			Waste disposal	On-site disposal (demolition debris, etc.)	3,867	m3	R.007	175.3	\$1.95	\$7,528.19	\$3.40	\$13,146	\$1.22	4,902	\$4,705.86	\$0.00	\$0.00	\$6.56	\$25,380			
A8.3.5.2				Off-site disposal (re-usable equipment, etc.)	1	trips	C.7.07	8.0	\$346.78	\$429.22	\$429.22	\$429	\$113.33	118	\$113.33	\$0.00	\$0.00	\$889.33	\$889			
A8.3.6.1			Demolish foundations	Break in place concrete foundations	51	m3	C.1.01	4.1	\$2.33	\$119.29	\$9.40	\$481	\$2.48	132	\$126.81	\$0.00	\$0.00	\$14.22	\$727			
A8.4		Explosives Plant and Storage Areas																				
A8.4.1.1		Demolition	Remove equipment	Small equipment: dismantle and prep for transport	37	hrs	C.1.13	149.3	\$164.14	\$6,128.00	\$87.08	\$3,251	\$14.53	565	\$542.38	\$0.00	\$0.00	\$265.75	\$9,921	\$30,166		
A8.4.2.1	Remove modular buildings		Dismantle and prep for transport	1	ea.	C.1.20	19.5	\$831.26	\$831.26	\$737.86	\$738	\$166.46	173	\$166.46	\$0.00	\$0.00	\$1,735.58	\$1,736				
A8.4.2.2			Transport structures off-site (Whitehorse)		1	ea.	C.7.04	8.0	\$343.01	\$309.18	\$309	\$113.33	118	\$113.33	\$0.00	\$0.00	\$765.52	\$766				
A8.4.3.1			Prepare for demolition	Remove hazardous materials/prep for transport offsite	4	hrs	C.1.22	16.0	\$155.59	\$622.35	\$97.38	\$390	\$26.93	112	\$107.71	\$0.00	\$0.00	\$279.90	\$1,120			
A8.4.3.2			Disconnect services		2	hrs	C.1.09	6.0	\$86.08	\$172.16	\$7.75	\$15	\$4.80	10	\$9.60	\$0.00	\$0.00	\$98.63	\$197			
A8.4.4.1			Demolition	Structural building demolition: Steel	47	tonnes	C.1.05	94.2	\$67.73	\$3,189.69	\$136.09	\$6,409	\$33.84	1,660	\$1,593.61	\$0.00	\$0.00	\$237.66	\$11,192			
A8.4.5.1			Waste disposal	On-site disposal (demolition debris, etc.)	103	m3	R.008	5.4	\$2.27	\$233.62	\$3.96	\$408	\$1.42	152	\$146.04	\$0.00	\$0.00	\$7.65	\$788			
A8.4.5.2				Off-site disposal (re-usable equipment, etc.)	5	trips	C.7.07	40.0	\$346.78	\$1,733.88	\$429.22	\$2,146	\$113.33	590	\$566.64	\$0.00	\$0.00	\$889.33	\$4,447			
A8.5	Fuel Storage Area																					
A8.5.1.1	Demolition		Remove equipment/dismant	Small equipment: dismantle and prep for transport	24	hrs	C.1.13	96.0	\$164.14	\$3,939.43	\$87.08	\$2,090	\$14.53	363	\$348.67	\$0.00	\$0.00	\$265.75	\$6,378	\$113,164		
A8.5.1.2				Large equipment (crane req'd): dismantle and prep for transport	192	hrs	C.1.14	1,153.4	\$263.70	\$50,693.54	\$168.95	\$32,479	\$20.53	4,111	\$3,946.31	\$0.00	\$0.00	\$453.18	\$87,119			
A8.5.2.1				Prepare for demolition	Hazardous materials: Gather and prep for transport offsite	2	hrs	C.1.22	8.0	\$155.59	\$311.17	\$97.38	\$195	\$26.93	56	\$53.86	\$0.00	\$0.00	\$279.90	\$560		
A8.5.2.2				Disconnect services		8	hrs	C.1.09	24.0	\$86.08	\$688.64	\$7.75	\$62	\$4.80	40	\$38.40	\$0.00	\$0.00	\$98.63	\$789		
A8.5.2.3				Clean out tanks, pressure wash, remove sludge	10	hrs	C.1.04	10.3	\$34.72	\$356.69	\$17.00	\$182	\$2.00	21	\$20.55	\$0.00	\$0.00	\$54.42	\$559			
A8.5.3.1			Demolish structures	Misc. debris/scrap (tanks included in dismantling above)	75	m3	C.1.08	5.7	\$2.82	\$211.13	\$1.61	\$121	\$0.57	44	\$42.60	\$0.00	\$0.00	\$4.99	\$374			
A8.5.4.1			Remove secondary contain	Bedding Material: Load, haul dump bedding material to landfarm	623	Cm3	R.009	32.8	\$2.26	\$1,408.92	\$3.95	\$2,460	\$1.41	917	\$880.71	\$0.00	\$0.00	\$7.63	\$4,750			
A8.5.4.2				Cut and fold liner	1,747	m2	C.1.15	20.3	\$0.42	\$740.64	\$0.20	\$343	\$0.07	126	\$120.97	\$0.00	\$0.00	\$0.69	\$1,204			
A8.5.4.3				Regrade area to promote positive drainage	1,666	m2	C.2.11	16.7	\$0.43	\$722.16	\$1.29	\$2,146	\$0.35	612	\$587.76	\$0.00	\$0.00	\$2.07	\$3,456			
A8.5.5.1			Waste disposal	On-site disposal (demolition debris, etc.)	229	m3	R.009	12.1	\$2.26	\$518.73	\$3.95	\$906	\$1.41	338	\$324.26	\$0.00	\$0.00	\$7.63	\$1,749			
A8.5.5.2				Off-site disposal (re-usable equipment, etc.)	7	trips	C.7.07	56.0	\$346.78	\$2,427.44	\$429.22	\$3,005	\$113.33	826	\$793.30	\$0.00	\$0.00	\$889.33	\$6,225			
A8.6		Mill Area																				
A8.6.1.1		Demolition	Remove equipment	Small equipment: dismantle and prep for transport	379	hrs	C.1.13	1,515.0	\$164.14	\$62,167.87	\$87.08	\$32,982	\$14.53	5,732	\$5,502.37	\$0.00	\$0.00	\$265.75	\$100,652	\$1,243,185		
A8.6.1.2			Large equipment (crane req'd): dismantle and prep for transport	466	hrs	C.1.14	2,796.5	\$263.70	\$122,905.21	\$168.95	\$78,746	\$20.53	9,966	\$9,567.74	\$0.00	\$0.00	\$453.18	\$211,219				
A8.6.2.1			Prepare for demolition	Hazardous materials: Gather and prep for transport offsite	65	hrs	C.1.22	260.0	\$155.59	\$10,113.15	\$97.38	\$6,330	\$26.93	1,823	\$1,750.32	\$0.00	\$0.00	\$279.90	\$18,193			
A8.6.2.6				Reagents: Disposal and tipping fees	1.0	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0			
A8.6.2.7				Decontaminate buildings: wash equipment/structures, etc.	38	hrs	C.1.04	37.8	\$34.72	\$1,311.88	\$17.00	\$669	\$2.00	79	\$75.58	\$0.00	\$0.00	\$54.42	\$2,056			
A8.6.2.8				Decontaminate buildings: Wash floors etc.	4,732	m2	C.1.03	40.8	\$0.30	\$1,414.68	\$0.15	\$721	\$0.02	85								

WBS	Facility/Area	Task	Activity	Qty	Units	Cost Code	Labour		Equipment		Fuel		Material		Activity Totals		Subtotals		Source / Comments		
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost		Unit Rate	WBS Level 2
A8.10.2.1		Waste disposal	Off-site disposal (re-usable equipment, etc.)		1 trips	R.038	0.0	\$1.94	\$1.94	\$3.39		\$3	\$1.21		\$1.21	\$0.00	\$0.00	\$6.54	\$7		
<b>A9</b>	<b>Surface Infrastructure</b>																				
A9.1	<i>Tailings and Water Conveyance Pipelines</i>																				
A9.1.1.1		Dismantle piping systems	Flush and clean tailings pipeline systems	6	ls	C.1.21	24.0	\$199.11	\$1,194.67	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$199.11	\$1,195	\$49,547		
A9.1.1.2			Cut pipelines and prep for transport (6 to 8" HDPE pipes)	2,968	m	C.1.17	467.4	\$7.05	\$20,919.48	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$7.05	\$20,919			
A9.1.1.3			Cut pipelines and prep for transport (10 to 18" HDPE pipes)	278	m	C.1.18	73.0	\$11.75	\$3,265.73	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$11.75	\$3,266			
A9.1.1.4			Cut pipelines and prep for transport (20 to 36" HDPE pipes)	1,283	m	C.1.19	505.1	\$17.62	\$22,607.56	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$17.62	\$22,608			
A9.2.2.1		Waste disposal	Haul pipes lines and debris to landfill	253	m3	R.033	10.8	\$1.83	\$462.44	\$3.20	\$808	\$1.14	301	\$289.07	\$0.00	\$0.00	\$6.17	\$1,559			
A9.2		<i>Conveyance Pipeline Equipment</i>																			
A9.2.1.1		Dismantle piping systems	Remove pumps and prep for transport	5	ea.	C.1.24	66.0	\$589.10	\$2,945.50	\$8.66	\$43	\$14.40	75	\$72.00	\$0.00	\$0.00	\$612.16	\$3,061	\$5,682		
A9.2.1.2			Remove barges/Support Equipment prep for transport	2	ea.	C.1.23	52.8	\$1,178.20	\$2,356.40	\$17.32	\$35	\$28.80	60	\$57.60	\$0.00	\$0.00	\$1,224.33	\$2,449			
A9.2.2.1		Waste disposal	Transport pumps, barge and support equip. offsite (Whitehorse)	4.5	tonnes	C.7.02	1.8	\$17.15	\$77.18	\$15.46	\$70	\$5.67	27	\$25.50	\$0.00	\$0.00	\$38.28	\$172			
A9.3		<i>Powerlines</i>																			
A9.3.1.1		Dismantle	Dismantle and collect powerlines	3.2	km	C.1.10	217.9	\$2,579.57	\$8,151.44	\$733.22	\$2,317	\$251.90	829	\$795.99	\$0.00	\$0.00	\$3,564.68	\$11,264			
A9.3.1.2			Remove power poles and load for transport off-site	60	ea.	C.1.11	548.6	\$414.04	\$24,842.65	\$85.43	\$5,126	\$18.29	1,143	\$1,097.14	\$0.00	\$0.00	\$517.76	\$31,065			
A9.3.1.3			Disconnect transformers and load for transport	4	ea.	C.1.12	93.3	\$872.46	\$3,489.86	\$247.99	\$992	\$85.20	355	\$340.78	\$0.00	\$0.00	\$1,205.65	\$4,823			
A9.3.2.1		Waste disposal	Transport powerlines, poles and transformers off-site	18	trips	C.7.07	144.0	\$346.78	\$6,241.98	\$429.22	\$7,726	\$113.33	2,125	\$2,039.90	\$0.00	\$0.00	\$889.33	\$16,008			
<b>A10</b>	<b>Water Detention Structures</b>																				
A10.1		<i>W15 Sump</i>																			
A10.1.1.1		Remove secondary contain	Cut and fold liner	1,310	m2	C.1.15	15.2	\$0.42	\$555.32	\$0.20	\$257	\$0.07	94	\$90.70	\$0.00	\$0.00	\$0.69	\$903	\$1,026		
A10.1.1.2			Haul liner to landfill	20	Lm3	R.059	0.8	\$1.86	\$36.48	\$3.24	\$64	\$1.16	24	\$22.80	\$0.00	\$0.00	\$6.26	\$123			
A10.2		<i>Mill Water Pond</i>																			
A10.3		<i>Sewage Lagoon (near IROD)</i>																			
A10.3.1		Remove pond	Backfill pond	4,488	m3	R.001	141.4	\$1.36	\$6,085.16	\$2.70	\$12,129	\$0.90	4,203	\$4,035.32	\$0.00	\$0.00	\$4.96	\$22,249			
A10.4		<i>Water Storage Pond Dam</i>																			
A10.4.1.1		Water Management	Install pump and pump around system	4	hrs	C.4.14	16.0	\$117.62	\$470.48	\$22.69	\$91	\$6.80	28	\$27.20	\$0.00	\$0.00	\$147.11	\$588			
A10.4.1.2			Pump pond water to discharge	400,000	m3	C.4.12	146.8	\$0.01	\$5,095.45	\$0.05	\$21,929	\$0.01	3,058	\$2,935.56	\$0.00	\$0.00	\$0.07	\$29,960			
A10.4.1.3			Maintain pump around system during WSP closure activities	103	days	C.4.13	10.3	\$3.47	\$355.89	\$14.94	\$1,532	\$2.00	214	\$205.03	\$0.00	\$0.00	\$20.41	\$2,092		Duration calculated as sum of associated tasks plus 20% contingency	
A10.4.2.1		Breach dam	Granular zones/gen. fill: Load, haul, dump, spread in upstream North ab	62,301	m3	R.001	1,963.4	\$1.36	\$84,472.81	\$2.70	\$168,372	\$0.90	58,351	\$56,017.38	\$0.00	\$0.00	\$4.96	\$308,862			
A10.4.2.2			Dam Core: Load, haul, dump in temporary stockpile	23,617	m3	R.001	744.3	\$1.36	\$32,021.27	\$2.70	\$63,825	\$0.90	22,119	\$21,234.62	\$0.00	\$0.00	\$4.96	\$117,081			
A10.4.2.3			Rip-rap: Sort and stockpile durable rip-rap for reuse	19,285	m3	R.001	607.8	\$1.36	\$26,148.62	\$2.70	\$52,120	\$0.90	18,063	\$17,340.22	\$0.00	\$0.00	\$4.96	\$95,609			
A10.4.2.4			Rip-rap: Load haul, dump unsuitable rip-rap in upstream North abutment	19,285	m3	R.001	607.8	\$1.36	\$26,148.62	\$2.70	\$52,120	\$0.90	18,063	\$17,340.22	\$0.00	\$0.00	\$4.96	\$95,609			
A10.4.3.1		Channel restoration	Excavate stream channel	5,584	m3	R.902	97.1	\$0.75	\$4,207.57	\$1.41	\$7,876	\$0.46	2,681	\$2,574.22	\$0.00	\$0.00	\$2.62	\$14,658			
A10.4.3.2			Bedding layer: Load haul, dump, place granular bedding layer along cha	726	m3	R.001	22.9	\$1.36	\$984.97	\$2.70	\$1,963	\$0.90	680	\$653.17	\$0.00	\$0.00	\$4.96	\$3,601			
A10.4.3.3			Rip-rap: Load, haul dump from temporary stockpile	964	m3	R.001	30.4	\$1.36	\$1,306.42	\$2.70	\$2,604	\$0.90	902	\$866.34	\$0.00	\$0.00	\$4.96	\$4,777			
A10.4.3.4			Rip-rap: place and secure	964	m3	R.904	10.5	\$0.47	\$454.19	\$0.92	\$884	\$0.32	325	\$311.83	\$0.00	\$0.00	\$1.71	\$1,650			
A10.4.4.1		Cover	Cover material: Load, haul, dump spread (1m)	6,975	m3	R.001	219.8	\$1.36	\$9,457.22	\$2.70	\$18,850	\$0.90	6,533	\$6,271.47	\$0.00	\$0.00	\$4.96	\$34,579		Cover sourced from dam core material	
A10.4.5.1		Revegetate	Seed/Fertilize: broadcast seeding	1.4	ha	C.6.01	46.2	\$1,005.46	\$1,402.62	\$397.11	\$554	\$232.94	338	\$324.96	\$986.00	\$1,375.47	\$2,621.52	\$3,657			
A10.4.5.2			Tree seedling application (1,000 stems/ha)	1.4	ha	C.6.06	71.5	\$1,789.95	\$2,496.98	\$9.02	\$13	\$15.00	22	\$20.93	\$460.50	\$642.40	\$2,274.47	\$3,173			
<b>A11</b>	<b>Yards/Laydown Areas</b>																				
A11.1		<i>Airstrip Area</i>																			
A11.1.1.1		Re-grade	Re-grade slopes to be 3H:1V or flatter	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46	\$0	\$38,351		
A11.1.1.2			Scarify surface	64,378	m2	C.2.16	0.0	\$0.03	\$2,184.55	\$0.06	\$3,549	\$0.02	1,144	\$1,098.24	\$0.00	\$0.00	\$0.11	\$6,832			
A11.1.2.1		Revegetate	Seed/Fertilize: broadcast seeding	6.4	ha	C.6.01	213.3	\$1,005.46	\$6,472.91	\$397.11	\$2,557	\$232.94	1,562	\$1,499.64	\$986.00	\$6,347.62	\$2,621.52	\$16,877			
A11.1.2.2			Tree seedling application (1,000 stems/ha)	6.4	ha	C.6.06	329.9	\$1,789.95	\$11,523.25	\$9.02	\$58	\$15.00	101	\$96.57	\$460.50	\$2,274.47	\$14,642				
A11.2		<i>Airport Laydown Area</i>																			
A11.2.1.1		Re-grade	Scarify surface	21,277	m2	C.2.16	0.0	\$0.03	\$722.00	\$0.06	\$1,173	\$0.02	378	\$362.97	\$0.00	\$0.00	\$0.11	\$2,258	\$12,675		
A11.2.2.1		Revegetate	Seed/Fertilize: broadcast seeding	2.1	ha	C.6.01	70.5	\$1,005.46	\$2,139.32	\$397.11	\$845	\$232.94	516	\$495.64	\$986.00	\$2,097.91	\$2,621.52	\$5,578			
A11.2.2.2			Tree seedling application (1,000 stems/ha)	2.1	ha	C.6.06	109.0	\$1,789.95	\$3,808.47	\$9.02	\$19	\$15.00	33	\$31.92	\$460.50	\$979.81	\$2,274.47	\$4,839			
A11.3		<i>Camp Area</i>																			
A11.3.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	7	hrs	C.2.13	6.9	\$43.35	\$299.02	\$195.11	\$1,346	\$67.01	481	\$462.24	\$0.00	\$0.00	\$305.46	\$2,107			
A11.3.1.2			Re-grade slopes to be 3H:1V or flatter	24	hrs	C.2.13	24.5	\$43.35	\$1,061.11	\$195.11	\$4,776	\$67.01	1,709	\$1,640.31	\$0.00	\$0.00	\$305.46	\$7,478			
A11.3.1.3			Scarify surfaces	20,626	m2	C.2.16	0.0	\$0.03	\$699.92	\$0.06	\$1,137	\$0.02	367	\$351.87	\$0.00	\$0.00	\$0.11	\$2,189			
A11.3.2.1		Cover	Flat area cover material: Load, haul, dump spread	10,313	Cm3	R.041	198.2	\$0.83	\$8,524.90	\$2.20	\$22,733	\$0.91	9,724	\$9,335.37	\$0.00	\$0.00	\$3.94	\$40,593			
A11.3.2.2			Slope area cover material: Load, haul, dump along crest	9,349	Cm3	R.042	157.2	\$0.72	\$6,754.61	\$1.89	\$17,715	\$0.82	7,990	\$7,670.53	\$0.00	\$0.00	\$3.44	\$32,140			
A11.3.2.3			Slope area cover material: Spread down slope	10	hrs	C.2.13	10.2	\$43.35	\$440.87	\$195.11	\$1,984	\$67.01	710	\$681.52	\$0.00	\$0.00	\$305.46	\$3,107			
A11.3.3.1		Revegetate	Seed/Fertilize: broadcast seeding	3.93	ha	C.6.01	130.3	\$1,005.46	\$3,953.95	\$397.11	\$1,562	\$232.94	954	\$916.05	\$986.00	\$3,877.42	\$2,621.52	\$10,309			
A11.3.3.2			Tree seedling application (1,000 stems/ha)	3.93	ha	C.6.06	201.5	\$1,789.95	\$7,038.93	\$9.02	\$35	\$15.00	61	\$58.99	\$460.50	\$1,810.90	\$2,274.47	\$8,944			
A11.4		<i>Crusher Area</i>																			
A11.2.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	9	hrs	C.2.13	9.0	\$43.35	\$390.90	\$195.11	\$1,759	\$67.01	629	\$604.27	\$0.00	\$0.00	\$305.46	\$2,755	\$66,100		
A11.2.1.2		Cover	Load, haul, dump spread 0.5 m overburden cover	13,482	m3	R.049	244.8	\$0.78	\$10,530.65	\$2.08	\$28,081	\$0.86	12,012	\$11,531.82	\$0.00	\$0.00	\$3.72	\$50,144			
A11.2.3.1		Revegetate	Seed/Fertilize: broadcast seeding	2.70	ha	C.6.01	89.3	\$1,005.46	\$2,711.13	\$397.11	\$1,071	\$232.94	654	\$628.11	\$986.00	\$2,658.65	\$2,621.52	\$7,069			
A11.2.3.2			Tree seedling application (1,000 stems/ha)	3	ha	C.6.06	138.2	\$1,789.95	\$4,826.42	\$9.02	\$24	\$15.00	42	\$40.45	\$460.50	\$1,241.69	\$2,274.47	\$6,133			
A11.5		<i>Exploration Disturbances</i>																			
A11.5.1.1		Ridgetop Area	Scarify surfaces	34,778	m2	C.2.16	0.0	\$0.03	\$1,180.13	\$0.06	\$1,917	\$0.02	618	\$593.29	\$0.00	\$0.00	\$0.11	\$3,691			
A11.5.1.2			Seed/Fertilize: broadcast seeding	3	ha	C.6.01	115.2	\$1,005.46	\$3,496.79	\$397.11	\$1,381	\$232.94	844	\$810.13	\$986.00	\$3,429.11	\$2,621.52	\$9,117			
A11.5.1.3			Tree seedling application (1,000 stems/ha)	3	ha	C.6.06	178.2	\$1,789.95	\$6,225.09	\$9.02	\$31	\$15.00	54	\$52.17	\$460.50	\$1,601.53	\$2,274.47	\$7,910			

WBS	Facility/Area	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material		Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	WBS Level 1	
A11.10	Mill Valley Fill Extension (Stage 1 and 2)		Costs included in Waste Rock Dump Section (WBS#: A1.5)		hrs															\$0	
A11.10.1	Minto South Portal																				
A11.11		Re-grade	Flat areas: Re-grade to ensure positive drainage	51	hrs	C.2.13	51.5	\$43.35	\$2,231.14	\$195.11	\$10,042	\$67.01	3,593	\$3,449.00	\$0.00	\$0.00	\$305.46	\$15,723		\$85,111	
A11.11.1		Re-grade	Re-grade slopes to be 3H:1V or flatter	28	hrs	C.2.13	28.0	\$43.35	\$1,215.40	\$195.11	\$5,471	\$67.01	1,957	\$1,878.82	\$0.00	\$0.00	\$305.46	\$8,565			
A11.11.1.1		Revegetate	Scarify surface	62,765	m2	C.2.16	0.0	\$0.03	\$2,129.82	\$0.06	\$3,460	\$0.02	1,115	\$1,070.73	\$0.00	\$0.00	\$0.11	\$6,661			
A11.11.1.2		Revegetate	Seed/Fertilize: broadcast seeding	11.1	ha	C.6.01	366.5	\$1,005.46	\$11,123.13	\$397.11	\$4,393	\$232.94	2,684	\$2,576.99	\$986.00	\$10,907.83	\$2,621.52	\$29,001			
A11.11.2		Revegetate	Tree seedling application (1,000 stems/ha)	11.1	ha	C.6.06	567.0	\$1,789.95	\$19,801.68	\$9.02	\$100	\$15.00	173	\$165.94	\$460.50	\$5,094.38	\$2,274.47	\$25,162			
A11.12	Pelly Laydown Area																				\$137,020
A11.12.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	107	hrs	C.2.13	107.4	\$43.35	\$4,655.75	\$195.11	\$20,956	\$67.01	7,497	\$7,197.08	\$0.00	\$0.00	\$305.46	\$32,808			
A11.12.2		Cover	Load, haul, dump spread 0.5 m overburden cover	25,855	m3	R.052	380.7	\$0.63	\$16,386.19	\$1.73	\$44,667	\$0.69	18,585	\$17,841.31	\$0.00	\$0.00	\$3.05	\$78,894			
A11.12.3.1		Revegetate	Seed/Fertilize: broadcast seeding	5.17	ha	C.6.01	171.3	\$1,005.46	\$5,199.24	\$397.11	\$2,053	\$232.94	1,255	\$1,204.55	\$986.00	\$5,098.61	\$2,621.52	\$13,556			
A11.12.3.2		Revegetate	Tree seedling application (1,000 stems/ha)	5.17	ha	C.6.06	265.0	\$1,789.95	\$9,255.83	\$9.02	\$47	\$15.00	81	\$77.57	\$460.50	\$2,381.25	\$2,274.47	\$11,761			
A11.13	W15 Sump Area Laydown																				\$32,883
A11.13.1.1		Re-grade	Flat areas: Re-grade to ensure positive drainage	9	hrs	C.2.13	8.8	\$43.35	\$380.98	\$195.11	\$1,715	\$67.01	613	\$588.94	\$0.00	\$0.00	\$305.46	\$2,685			
A11.13.1.2		Re-grade	Slopes: Re-grade to 3H:1V	1	hrs	C.2.13	1.2	\$43.35	\$53.86	\$195.11	\$242	\$67.01	87	\$83.26	\$0.00	\$0.00	\$305.46	\$380			
A11.13.1.3		Revegetate	Scarify surface	9,484	m2	C.2.16	0.0	\$0.03	\$321.81	\$0.06	\$523	\$0.02	169	\$161.79	\$0.00	\$0.00	\$0.11	\$1,006			
A11.13.2.1		Cover	Load, haul, dump spread 0.5 m overburden cover	6,974	m3	R.056	106.1	\$0.65	\$4,565.96	\$1.78	\$12,446	\$0.71	5,179	\$4,971.43	\$0.00	\$0.00	\$3.15	\$21,984			
A11.13.3.1		Revegetate	Seed/Fertilize: broadcast seeding	1.39	ha	C.6.01	46.2	\$1,005.46	\$1,402.44	\$397.11	\$554	\$232.94	338	\$324.92	\$986.00	\$1,375.30	\$2,621.52	\$3,657			
A11.13.3.2		Revegetate	Tree seedling application (1,000 stems/ha)	1.39	ha	C.6.06	71.5	\$1,789.95	\$2,496.66	\$9.02	\$13	\$15.00	22	\$20.92	\$460.50	\$642.32	\$2,274.47	\$3,172			
A12	Waste Disposal																				\$502,536
A12.1	Hydrocarbon contaminated soils																				\$61,130
A12.1.1		Excavate HC contaminated	Complete testing for contaminated soils	37	test pits	C.3.03	18.5	\$21.74	\$804.34	\$3.49	\$129	\$2.92	112	\$107.89	\$200.00	\$7,400.00	\$228.14	\$8,441			
A12.1.1.1		Excavate HC contaminated	Excavate and haul contaminated soils to on-site landfarm facility	554	m3	R.034	19.9	\$1.54	\$853.07	\$2.67	\$1,478	\$0.96	552	\$529.72	\$0.00	\$0.00	\$5.16	\$2,861			
A12.1.2		Construct landfarm	Existing Facility assumed to have sufficient capacity	0	m3																\$0
A12.1.3.1		Operate landfarm	Aerate contaminated soils (mix)	12	event	C.3.04	270.0	\$976.58	\$11,719.01	\$931.77	\$11,181	\$333.60	4,170	\$4,003.20	\$0.00	\$0.00	\$2,241.95	\$26,903			
A12.1.3.2		Operate landfarm	Annual confirmation sampling	3	years	C.3.05	48.0	\$695.65	\$2,086.95	\$111.61	\$335	\$93.31	292	\$279.94	\$1,200.00	\$3,600.00	\$2,100.57	\$6,302			
A12.1.4		Close landfarm	Remove soils and collect liner	554	m3	R.001	17.5	\$1.36	\$751.29	\$2.70	\$1,497	\$0.90	519	\$498.21	\$0.00	\$0.00	\$4.96	\$2,747			
A12.1.4.1		Close landfarm	Cut/fold liner and place into waste disposal container	4,265	m2	C.1.15	49.6	\$0.42	\$1,807.96	\$0.20	\$837	\$0.07	308	\$295.29	\$0.00	\$0.00	\$0.69	\$2,940			
A12.1.4.2		Close landfarm	Regrade area	4,265	m2	C.2.11	42.7	\$0.43	\$1,848.75	\$1.29	\$5,494	\$0.35	1,567	\$1,504.69	\$0.00	\$0.00	\$2.07	\$8,848			
A12.1.4.3		Close landfarm	Revegetation: Seed/Fertilizer: broadcast seeding	0.43	ha	C.6.01	14.1	\$1,005.46	\$428.83	\$397.11	\$169	\$232.94	103	\$99.35	\$986.00	\$420.53	\$2,621.52	\$1,118			
A12.1.4.5		Close landfarm	Tree seedling application (1,000 stems/ha)	0.43	ha	C.6.06	21.9	\$1,789.95	\$763.41	\$9.02	\$4	\$15.00	7	\$6.40	\$460.50	\$196.40	\$2,274.47	\$970			
A12.2	Metal Contaminated soils																				\$154,581
A12.2.1		Crusher area	Delineate contaminated soil areas	197	test pits	C.3.01	98.5	\$21.74	\$4,282.59	\$3.49	\$687	\$2.92	598	\$574.45	\$260.00	\$51,220.00	\$288.14	\$56,764			
A12.2.1.1		Crusher area	Load, haul, dump contaminated soils to underground	2,949	m3	R.035	102.1	\$1.49	\$4,394.19	\$2.97	\$8,759	\$0.99	3,035	\$2,913.97	\$0.00	\$0.00	\$5.45	\$16,067			
A12.2.1.2		Crusher area	Complete confirmation testing	197	ea	C.3.02	32.8	\$7.27	\$1,431.83	\$1.25	\$246	\$0.00	0	\$0.00	\$13.00	\$2,561.00	\$21.52	\$4,239			
A12.2.2		Mill Area	Delineate contaminated soil areas	198	test pits	C.3.01	99.0	\$21.74	\$4,304.33	\$3.49	\$691	\$2.92	601	\$577.37	\$260.00	\$51,480.00	\$288.14	\$57,052			
A12.2.2.1		Mill Area	Load, haul, dump contaminated soils to underground	2,973	m3	R.035	103.0	\$1.49	\$4,430.17	\$2.97	\$8,830	\$0.99	3,060	\$2,937.83	\$0.00	\$0.00	\$5.45	\$16,198			
A12.2.2.2		Mill Area	Complete confirmation testing	198	ea	C.3.02	33.0	\$7.27	\$1,439.10	\$1.25	\$248	\$0.00	0	\$0.00	\$13.00	\$2,574.00	\$21.52	\$4,261			
A12.3	Solid Waste Landfill																				\$213,770
A12.3.1		Construction landfill	Place waste from site facilities	12,920	LCM	C.2.07	550.6	\$1.85	\$23,867.81	\$8.31	\$107,430	\$2.86	38,433	\$36,895.99	\$0.00	\$0.00	\$13.02	\$168,193			
A12.3.1.1		Construction landfill	Place fill to minimize voids in the debris	3,371	m3	R.001	106.2	\$1.36	\$4,569.99	\$2.70	\$9,109	\$0.90	3,157	\$3,030.55	\$0.00	\$0.00	\$4.96	\$16,710			
A12.3.2.1		Close landfill	Soil Cover: Load haul, dump spread, compact (0.6m)	5,024	m3	R.002	190.0	\$1.57	\$7,911.01	\$2.89	\$14,536	\$0.99	5,196	\$4,988.33	\$0.00	\$0.00	\$5.46	\$27,436			
A12.3.2.2		Close landfill	Revegetation: Seed/Fertilizer: broadcast seeding	0.55	ha	C.6.01	18.1	\$1,005.46	\$548.93	\$397.11	\$217	\$232.94	132	\$127.18	\$986.00	\$538.31	\$2,621.52	\$1,431			
A12.4	Hazardous Material Off-Site Disposal																				\$73,055
A12.4.1		Hazardous Waste	From Building Demo: Transport off-site for disposal	2	trip	C.7.04	14.5	\$343.01	\$620.06	\$309.18	\$559	\$113.33	213	\$204.86	\$0.00	\$0.00	\$765.52	\$1,384			
A12.4.2		Hazardous Waste	Hazardous materials: Disposal and Tipping fees.	1	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$63,000	\$63,000			
A12.4.2.1		Reagents	Reagents: Transport to Whitehorse	25	hrs	C.1.22	99.3	\$155.59	\$3,863.74	\$97.38	\$2,418	\$26.93	697	\$668.71	\$0.00	\$0.00	\$279.90	\$6,951			
A12.4.2.2		Reagents	Reagents: Disposal and tipping fees	2.2	trips	C.7.04	18.0	\$343.01	\$771.00	\$309.18	\$695	\$113.33	265	\$254.73	\$0.00	\$0.00	\$765.52	\$1,721			
A13	Surface Water Conveyance																				\$2,071,653
A13.1	W-15 to Main Pit (Ditch A3)																				\$167,817
A13.1.1		Excavate channel	Load, haul, dump locally	40,300	m3	R.902	700.5	\$0.75	\$30,364.10	\$1.41	\$56,839	\$0.46	19,351	\$18,576.93	\$0.00	\$0.00	\$2.62	\$105,780			
A13.1.2		Place channel materials	Bedding layer: Screen and stockpile	1,872	m3	C.2.01	38.1	\$0.94	\$1,751.95	\$2.08	\$3,898	\$0.44	860	\$825.55	\$0.00	\$0.00	\$3.46	\$6,475			
A13.1.2.1		Place channel materials	Bedding layer: Load, haul, dump and place	1,872	m3	R.016	69.6	\$1.60	\$2,996.40	\$3.45	\$6,464	\$1.10	2,149	\$2,062.79	\$0.00	\$0.00	\$6.15	\$11,523			
A13.1.2.3		Place channel materials	Rip-rap (angular, high quality): Screen and stockpile	2,700	m3	C.2.15	0.0	\$2.48	\$6,689.06	\$6.09	\$16,447	\$1.86	5,227	\$5,018.29	\$0.00	\$0.00	\$10.43	\$28,155			
A13.1.2.4		Place channel materials	Rip-rap: Load, haul, dump	2,700	m3	R.015	71.6	\$1.14	\$3,079.56	\$2.27	\$6,138	\$0.76	2,127	\$2,042.18	\$0.00	\$0.00	\$4.17	\$11,260			
A13.1.2.5		Place channel materials	Rip-rap: Place and secure	2,700	m3	R.904	29.4	\$0.47	\$1,272.97	\$0.92	\$2,477	\$0.32	910	\$873.96	\$0.00	\$0.00	\$1.71	\$4,624			
A13.2	W-35 to Area 2 Pit (Ditch B)																				\$89,892
A13.2.1		Excavate channel	Load, haul, dump locally	3,800	m3	R.902	66.1	\$0.75	\$2,863.23	\$1.41	\$5,360	\$0.46	1,825	\$1,751.74	\$0.00	\$0.00	\$2.62	\$9,975			
A13.2.2		Place channel materials	Surface preparation: remove sharp objects, place fill as required	2,616	m2	C.2.18	89.4	\$1.28	\$3,345.38	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$1.28	\$3,345			
A13.2.2.1		Place channel materials	BGM Liner: Supply and install	2,616	m2	C.5.01	124.0	\$1.88	\$4,930.27	\$0.80	\$2,091	\$0.28	769	\$737.84	\$17.86	\$46,705.04	\$20.82	\$54,464			
A13.2.2.2		Place channel materials	Bedding layer: Screen and stockpile	646	m3	C.2.01	13.1	\$0.94	\$604.56	\$2.08	\$1,345	\$0.44	297	\$284.88	\$0.00	\$0.00	\$3.46	\$2,235			
A13.2.2.4		Place channel materials	Bedding layer: Load, haul, dump and place	646	m3	R.018	27.3	\$1.82	\$1,176.49	\$3.93	\$2,538	\$1.25	844	\$809.92	\$0.00	\$0.00	\$7.00	\$4,524			
A13.2.2.5		Place channel materials	Rip-rap (angular, high quality): Screen and stockpile	912	m3	C.2.15	0.0	\$2.48	\$2,258.42	\$6.09	\$5,553	\$1.86	1,765	\$1,694.32	\$0.00	\$0.00	\$10.43	\$9,506			
A13.2.2.6		Place channel materials	Rip-rap: Load, haul, dump	912	m3	R.017	27.2	\$1.28	\$1,170.96	\$2.56	\$2,334	\$0.85	809	\$776.51	\$0.00	\$0.00	\$4.70	\$4,281			
A13.2.2.7		Place channel materials	Rip-rap: Place and secure	912	m3	R.904	9.9	\$0.47	\$429.79	\$0.92	\$836	\$0.32	307	\$295.07	\$0.00	\$0.00	\$1.71	\$1,561			
A13.3	Main Pit to Main Access Road (Ditch C1)																				\$165,579
A13.3.2.1		Excavate channel																			



WBS	Facility/Area	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material			Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	
A13.5.2.5	Minto Creek Wetland By-Pass Channel	Stilling basin/Energy Dissipation	Rip-rap: Place and secure	5,973	m3	R.904	65.0	\$0.47	\$2,815.52	\$0.92	\$5,479	\$0.32	2,014	\$1,933.00	\$0.00	\$0.00	\$1.71	\$10,227	\$202,344			
A13.5.3.1			Excavate basin (spoil locally)	645	m3	R.902	11.2	\$0.75	\$486.20	\$1.41	\$910	\$0.46	310	\$297.46	\$0.00	\$0.00	\$2.62	\$1,694				
A13.5.3.2			Geotextile: Supply and place	540	m2	C.5.07	7.7	\$0.53	\$288.66	\$0.07	\$36	\$0.06	31	\$29.86	\$2.12	\$1,142.80	\$2.77	\$1,497				
A13.5.3.3			Bedding layer: Screen and stockpile	131	m3	C.2.01	2.7	\$0.94	\$122.14	\$2.08	\$272	\$0.44	60	\$57.55	\$0.00	\$0.00	\$3.46	\$451				
A13.5.3.4			Bedding layer: Load, haul, dump and place	131	m3	R.024	7.7	\$2.53	\$329.77	\$5.15	\$672	\$1.69	229	\$220.12	\$0.00	\$0.00	\$9.36	\$1,222				
A13.5.3.5			Rip-rap (at inlet and outlet): Screen and stockpile	75	m3	C.2.15	0.0	\$2.48	\$185.77	\$6.09	\$457	\$1.86	145	\$139.37	\$0.00	\$0.00	\$10.43	\$782				
A13.5.3.6			Rip-rap (at inlet and outlet): Load, haul, dump	75	m3	R.023	3.2	\$1.81	\$135.89	\$3.45	\$259	\$1.17	91	\$87.84	\$0.00	\$0.00	\$6.43	\$482				
A13.5.3.7			Rip-rap (at inlet and outlet): Place and secure	75	m3	R.904	0.8	\$0.47	\$35.35	\$0.92	\$69	\$0.32	25	\$24.27	\$0.00	\$0.00	\$1.71	\$128				
A13.6			Minto Creek Wetland By-Pass Channel	Place channel materials	Load, haul, dump locally	19,986	m3	R.902	347.4	\$0.75	\$15,058.23	\$1.41	\$28,188	\$0.46	9,597	\$9,212.71	\$0.00	\$0.00			\$2.62	\$52,458
A13.6.1.1					Excavate channel	12,402	m2	C.5.08	352.7	\$1.07	\$13,257.86	\$0.13	\$1,640	\$0.11	1,428	\$1,371.19	\$2.12	\$26,243.29			\$3.43	\$42,512
A13.6.2.1	Geotextile: Supply and place	3,161			m3	C.2.01	64.3	\$0.94	\$2,957.64	\$2.08	\$6,580	\$0.44	1,452	\$1,393.69	\$0.00	\$0.00	\$3.46	\$10,932				
A13.6.2.2	Bedding layer: Screen and stockpile	3,161			m3	R.001	99.6	\$1.36	\$4,286.02	\$2.70	\$8,543	\$0.90	2,961	\$2,842.24	\$0.00	\$0.00	\$4.96	\$15,671				
A13.6.2.3	Bedding layer: Load, haul, dump and place	4,725			m3	C.2.15	0.0	\$2.48	\$11,702.71	\$6.09	\$28,775	\$1.86	9,145	\$8,779.64	\$0.00	\$0.00	\$10.43	\$49,258				
A13.6.2.4	Rip-rap (angular, high quality): Screen and stockpile	4,725			m3	R.001	148.9	\$1.36	\$6,405.95	\$2.70	\$12,768	\$0.90	4,425	\$4,248.05	\$0.00	\$0.00	\$4.96	\$23,422				
A13.6.2.5	Rip-rap: Load, haul, dump	4,725	m3	R.904	51.4	\$0.47	\$2,227.10	\$0.92	\$4,334	\$0.32	1,593	\$1,529.02	\$0.00	\$0.00	\$1.71	\$8,090						
A13.6.2.6	Rip-rap: Place and secure																					
A13.7	Secondary Catchment Channels	Southwest Dump	Excavate mild-graded channels (good access), spoil locally	10,787	Bm3	R.902	187.5	\$0.75	\$8,127.66	\$1.41	\$15,214	\$0.46	5,180	\$4,972.55	\$0.00	\$0.00	\$2.62	\$28,314				
A13.7.1.1			Excavate steep-graded channels (poor access), spoil locally	6,640	Bm3	R.903	131.0	\$0.86	\$5,679.08	\$1.60	\$10,631	\$0.52	3,619	\$3,474.49	\$0.00	\$0.00	\$2.98	\$19,784				
A13.7.1.2			Geotextile: Supply and place	25,206	m2	C.5.07	358.4	\$0.53	\$13,472.20	\$0.07	\$1,667	\$0.06	1,451	\$1,393.36	\$2.12	\$53,335.12	\$2.77	\$69,867				
A13.7.1.3			Bedding layer: Screen and stockpile	2,054	Cm3	C.2.01	41.8	\$0.94	\$1,922.03	\$2.08	\$4,276	\$0.44	943	\$905.70	\$0.00	\$0.00	\$3.46	\$7,104				
A13.7.1.4	Bedding layer: Load, haul, dump and place in steep areas	2,054	Cm3	R.028	72.2	\$1.51	\$3,102.18	\$2.93	\$6,021	\$0.99	2,111	\$2,026.92	\$0.00	\$0.00	\$5.43	\$11,151						
A13.7.1.5	Rip-rap (angular, high quality): Screen and stockpile	6,806	Cm3	C.2.15	0.0	\$2.48	\$16,859.25	\$6.09	\$41,455	\$1.86	13,175	\$12,648.20	\$0.00	\$0.00	\$10.43	\$70,962						
A13.7.1.6	Rip-rap: Load, haul, dump	6,806	m3	R.027	223.5	\$1.41	\$9,616.00	\$2.82	\$19,167	\$0.94	6,642	\$6,376.76	\$0.00	\$0.00	\$5.17	\$35,159						
A13.7.1.7	Rip-rap: Place in mild-graded channels (good access)	3,787	m3	R.904	41.2	\$0.47	\$1,785.25	\$0.92	\$3,474	\$0.32	1,277	\$1,225.66	\$0.00	\$0.00	\$1.71	\$6,485						
A13.7.1.8	Rip-rap: Place in steep-graded channels (poor access)	3,019	m3	R.905	74.5	\$1.07	\$3,231.01	\$2.00	\$6,048	\$0.65	2,059	\$1,976.75	\$0.00	\$0.00	\$3.73	\$11,256						
A13.7.1.9	Main Waste Dump		Excavate mild-graded channels (good access), spoil locally	6,477	Bm3	R.902	112.6	\$0.75	\$4,879.85	\$1.41	\$9,135	\$0.46	3,110	\$2,985.52	\$0.00	\$0.00	\$2.62	\$17,000				
A13.7.2.1			Excavate steep-graded channels (poor access), spoil locally	3,986	Bm3	R.903	78.6	\$0.86	\$3,408.84	\$1.60	\$6,381	\$0.52	2,172	\$2,085.55	\$0.00	\$0.00	\$2.98	\$11,875				
A13.7.2.2			Geotextile: Supply and place	15,132	m2	C.5.07	215.1	\$0.53	\$8,087.98	\$0.07	\$1,000	\$0.06	871	\$836.50	\$2.12	\$32,019.54	\$2.77	\$41,945				
A13.7.2.3			Bedding layer: Screen and stockpile	1,233	Cm3	C.2.01	25.1	\$0.94	\$1,153.69	\$2.08	\$2,567	\$0.44	566	\$543.64	\$0.00	\$0.00	\$3.46	\$4,264				
A13.7.2.4	Bedding layer: Load, haul, dump and place in steep areas	1,233	Cm3	R.026	34.8	\$1.22	\$1,499.66	\$2.52	\$3,106	\$0.82	1,059	\$1,016.39	\$0.00	\$0.00	\$4.56	\$5,622						
A13.7.2.5	Rip-rap (angular, high quality): Screen and stockpile	4,086	Cm3	C.2.15	0.0	\$2.48	\$10,121.14	\$6.09	\$24,887	\$1.86	7,909	\$7,593.11	\$0.00	\$0.00	\$10.43	\$42,601						
A13.7.2.6	Rip-rap: Load, haul, dump	4,086	m3	R.025	101.4	\$1.07	\$4,368.25	\$2.21	\$9,048	\$0.72	3,084	\$2,960.56	\$0.00	\$0.00	\$4.01	\$16,377						
A13.7.2.7	Rip-rap: Place in mild-graded channels (good access)	2,274	m3	R.904	24.7	\$0.47	\$1,071.86	\$0.92	\$2,086	\$0.32	767	\$735.89	\$0.00	\$0.00	\$1.71	\$3,894						
A13.7.2.8	Rip-rap: Place in steep-graded channels (poor access)	1,812	m3	R.905	44.7	\$1.07	\$1,939.40	\$2.00	\$3,630	\$0.65	1,236	\$1,186.53	\$0.00	\$0.00	\$3.73	\$6,756						
A13.7.2.9	Reclamation Overburden D		Excavate mild-graded channels (good access), spoil locally	4,886	Bm3	R.902	84.9	\$0.75	\$3,681.50	\$1.41	\$6,891	\$0.46	2,346	\$2,252.36	\$0.00	\$0.00	\$2.62	\$12,825				
A13.7.3.1			Excavate steep-graded channels (poor access), spoil locally	3,007	Bm3	R.903	59.3	\$0.86	\$2,571.73	\$1.60	\$4,814	\$0.52	1,639	\$1,573.40	\$0.00	\$0.00	\$2.98	\$8,959				
A13.7.3.2			Geotextile: Supply and place	11,416	m2	C.5.07	162.3	\$0.53	\$6,101.82	\$0.07	\$755	\$0.06	657	\$631.08	\$2.12	\$24,156.52	\$2.77	\$31,644				
A13.7.3.3			Bedding layer: Screen and stockpile	930	Cm3	C.2.01	18.9	\$0.94	\$870.38	\$2.08	\$1,936	\$0.44	427	\$410.14	\$0.00	\$0.00	\$3.46	\$3,217				
A13.7.3.4	Bedding layer: Load, haul, dump and place in steep areas	930	Cm3	R.030	34.7	\$1.60	\$1,491.64	\$3.20	\$2,973	\$1.06	1,030	\$989.17	\$0.00	\$0.00	\$5.86	\$5,454						
A13.7.3.5	Rip-rap (angular, high quality): Screen and stockpile	3,083	Cm3	C.2.15	0.0	\$2.48	\$7,635.69	\$6.09	\$18,775	\$1.86	5,967	\$5,728.47	\$0.00	\$0.00	\$10.43	\$32,139						
A13.7.3.6	Rip-rap: Load, haul, dump	3,083	m3	R.029	97.0	\$1.35	\$4,171.85	\$2.70	\$8,315	\$0.90	2,882	\$2,766.52	\$0.00	\$0.00	\$4.95	\$15,254						
A13.7.3.7	Rip-rap: Place in mild-graded channels (good access)	1,715	m3	R.904	18.7	\$0.47	\$808.64	\$0.92	\$1,574	\$0.32	578	\$555.18	\$0.00	\$0.00	\$1.71	\$2,937						
A13.7.3.8	Rip-rap: Place in steep-graded channels (poor access)	1,367	m3	R.905	33.8	\$1.07	\$1,463.14	\$2.00	\$2,739	\$0.65	932	\$895.16	\$0.00	\$0.00	\$3.73	\$5,097						
A13.7.3.9	DSTSF & MVFE		Excavate mild-graded channels (good access), spoil locally	7,378	Bm3	R.902	128.3	\$0.75	\$5,559.32	\$1.41	\$10,406	\$0.46	3,543	\$3,401.22	\$0.00	\$0.00	\$2.62	\$19,367				
A13.7.4.1			Excavate steep-graded channels (poor access), spoil locally	4,541	Bm3	R.903	89.6	\$0.86	\$3,883.49	\$1.60	\$7,270	\$0.52	2,475	\$2,375.94	\$0.00	\$0.00	\$2.98	\$13,529				
A13.7.4.2			Geotextile: Supply and place	17,239	m2	C.5.07	245.1	\$0.53	\$9,214.16	\$0.07	\$1,140	\$0.06	993	\$952.97	\$2.12	\$36,477.96	\$2.77	\$47,785				
A13.7.4.3			Bedding layer: Screen and stockpile	1,405	Cm3	C.2.01	28.6	\$0.94	\$1,314.33	\$2.08	\$2,924	\$0.44	645	\$619.34	\$0.00	\$0.00	\$3.46	\$4,858				
A13.7.4.4	Bedding layer: Load, haul, dump and place in steep areas	1,405	Cm3	R.024	82.5	\$2.53	\$3,548.72	\$5.15	\$7,233	\$1.69	2,467	\$2,368.79	\$0.00	\$0.00	\$9.36	\$13,151						
A13.7.4.5	Rip-rap (angular, high quality): Screen and stockpile	4,655	Cm3	C.2.15	0.0	\$2.48	\$11,530.41	\$6.09	\$28,352	\$1.86	9,011	\$8,650.38	\$0.00	\$0.00	\$10.43	\$48,533						
A13.7.4.6	Rip-rap: Load, haul, dump	4,655	m3	R.023	196.3	\$1.81	\$8,434.03	\$3.45	\$16,056	\$1.17	5,679	\$5,451.80	\$0.00	\$0.00	\$6.43	\$29,942						
A13.7.4.7	Rip-rap: Place in mild-graded channels (good access)	2,590	m3	R.904	28.2	\$0.47	\$1,221.11	\$0.92	\$2,376	\$0.32	873	\$838.35	\$0.00	\$0.00	\$1.71	\$4,436						
A13.7.4.8	Rip-rap: Place in steep-graded channels (poor access)	2,065	m3	R.905	51.0	\$1.07	\$2,209.44	\$2.00	\$4,136	\$0.65	1,408	\$1,351.75	\$0.00	\$0.00	\$3.73	\$7,697						
A13.7.4.9	Tailings Diversion Ditch	Regrade Cover	Slopes: Re-grade to 3H:1V	28	hrs	C.2.13	28	\$43.35	\$1,197	\$195.11	\$5,388	\$67.01	1,928	\$1,850	\$0.00	\$0	\$305.46	\$8,435				
A13.8.1.2			Flat area cover material: Load, haul, dump spread	25,182	Cm3	R.057	562.3	\$0.96	\$2,483	\$2.56	\$6,487	\$1.05	27,585	\$26,482	\$0.00	\$0	\$4.57	\$115,152				
A13.8.2.1			Slope area cover material: Load, haul, dump along crest	18,049	Cm3	R.058	352.6	\$0.84	\$1,515.00	\$2.20	\$3,732	\$0.95	17,921	\$17,204	\$0.00	\$0	\$3.99	\$72,086				
A13.8.2.2			Slope area cover material: Spread down slope	14	hrs	C.2.13	14.0	\$43.35	\$606	\$195.11	\$2,730	\$67.01	977	\$937	\$0.00	\$0	\$305.46	\$4,274				
A13.8.2.3			Seed/Fertilize: tractor application	9	ha	C.6.01	286.4	\$1,005.46	\$8,694	\$397.11	\$3,434	\$232.94	2,098	\$2,014	\$986.00	\$8,525	\$2,622	\$22,666				
A13.8.3.1			Tree seedling application (1,000 stems/ha)	9	ha	C.6.06	443.1	\$1,789.95	\$15,476	\$9.02	\$78	\$15.00	135	\$130	\$460.50	\$3,982	\$2,274	\$19,666				
A13.8.3.2			Clear and grub footprint	7,645	m2	C.2.03	29.1	\$0.16	\$1,260	\$0.49	\$3,744	\$0.13	1,068	\$1,025	\$0.00	\$0	\$0.79	\$6,029				
A13.8.4.1			Geotextile: Supply and place	7,645	m2	C.5.07	108.7	\$0.53	\$4,086	\$0.07	\$505	\$0.06	440	\$423	\$2.12	\$16,177	\$2.77	\$21,191				
A13.8.4.2			Rip-rap (angular, high quality): Screen and stockpile	3,70																		

WBS	Facility/Area	Task	Activity	Qty	Units	Cost Code	Labour			Equipment		Fuel		Material		Activity Totals		Subtotals		Source / Comments		
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2		WBS Level 1	
A14.3.2.2			Reagents: Transport to Whitehorse		0.0	trips	C.7.04	0.0	\$343.01	\$0.00	\$309.18	\$0	\$113.33	\$0	\$0.00	\$0.00	\$765.52	\$0				
A14.3.2.3			Reagents: Disposal and tipping fees		1.0	ls	n/a	0.0	\$0.00	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0.00	\$0.00	\$0					
A14.3.3.1		Demolition	Structural building demolition		163	tonnes	C.1.05	325.0	\$67.73	\$11,007.90	\$136.09	\$22,118	\$33.84	\$5,499.69	\$0.00	\$0.00	\$237.66	\$38,625				
A14.3.3.2			Other demolition: miscellaneous		15	m3	C.1.07	1.5	\$3.65	\$54.78	\$2.09	\$31	\$0.74	\$11.05	\$0.00	\$0.00	\$6.48	\$97				
A14.3.4.1		Waste disposal	Off-site disposal (re-usable equipment, etc.)		3	trips	C.7.07	27.1	\$346.78	\$1,174.13	\$429.22	\$1,453	\$113.33	400	\$383.71	\$0.00	\$0.00	\$889	\$3,011			
<b>Subtotal Direct Costs - Active Closure</b>								<b>109,936</b>	<b>\$4,463,861</b>	<b>\$7,476,591</b>		<b>\$2,764,110</b>	<b>\$1,877,596</b>					<b>\$16,660,159</b>				
<b>INDIRECT COSTS</b>																						
<b>B1 Mobilization-Demobilization</b>																						
B1.1		Mobilization	Year 0		1	LS											\$152,605	\$152,605.16				
B1.2		Demobilization	Year 3 (end of Active Closure)		1	LS											\$136,116	\$136,116.00				
B1.4		Demobilization	End of Passive closure		1	LS											\$16,489	\$16,489.16				
<b>B2 Transportation Costs</b>																						
B2.1.1		Barge Operations			15	month											\$10,000	\$150,000				
		Staffing Bus trips during barge operation period			60	ea (one per week)											\$678	\$40,656		Turnaround labour costs included in labour build-up		
B2.2.2		Air transport and airstrip operations			72	flights											\$3,000	\$216,000		Three flights per week		
<b>B3 Site/Road Maintenance</b>																						
<i>Road Maintenance</i>																						
B3.1.1		Water Truck	Assume needed 150 hrs per month		21	month											\$12,159	\$255,344	\$682,358			
B3.1.2		Grader	Assume needed 150 hrs per month (16H + Operator)		21	month											\$20,334	\$427,015		Includes Main Access Road throughout closure period.		
<i>Soil Erosion</i>																						
B3.2.1		Erosion control allowance	Silt fencing: supply, install remove at strategic locations		7023.7	m	C.2.17	283.5	\$3.15	\$22,133.92	\$1.70	\$11,961	\$0.68	4,941	\$4,743.08	\$0.91	\$6,358.42	\$6.43	\$45,197			
B3.2.2			Supply and install erosion control matting		10000	m2	C.2.09	175.4	\$0.65	\$6,468.99	\$0.03	\$317	\$0.05	548	\$526.32	\$0.81	\$8,128.20	\$1.54	\$15,440			
<b>B4 Construction Support</b>																						
<i>Field Support Staff</i>																						
B4.1.1		Mine Manager			21	month		(	360	) site working hours per month							\$23,366	\$490,685	\$3,198,878	Turnaround labour costs included in labour build-up		
B4.1.2		Office/Camp manager			21	month		(	360	) site working hours per month							\$22,227	\$466,773				
B4.1.3		Security/Administrative Assistant			21	month		(	360	) site working hours per month							\$16,214	\$340,496				
B4.1.4		Foreman			21	month		(	360	) site working hours per month							\$17,349	\$364,320				
B4.1.5		Mechanic			21	month		(	360	) site working hours per month							\$17,349	\$364,320				
B4.1.6		Surveyor			21	month		(	360	) site working hours per month							\$17,349	\$364,320				
B4.1.7		Engineering technician	Material & QA/QC testing		10.5	month		(	360	) site working hours per month							\$42,120	\$442,260		Assumed needed 1/2 of time		
B4.1.8		Medic/H&S supervisor			21	month		(	360	) site working hours per month							\$17,414	\$365,703				
<i>Field support Vehicles</i>																						
B4.2.1		Pick-up trucks (4 required)			84	month											\$4,518	\$379,500	\$774,669			
B4.2.2		Fuel truck			21	month											\$5,121	\$107,540				
B4.2.3		Mechanic service vehicle			21	month											\$6,919	\$145,293				
B4.2.4		Emergency transport vehicle			21	month											\$4,519	\$94,901				
B4.2.5		Passenger bus			21	month											\$2,259	\$47,436				
<i>Field Support Equipment/Supplies</i>																						
B4.3.1		Light Towers			21	month				2 # of Units							\$3,894	\$81,764	\$1,196,249			
B4.3.2		Material/Laboratory testing allowance			21	month											\$1,000	\$21,000				
B4.4		Construction, Environmental, and H&S Management Plans			1	LS											\$25,000	\$25,000				
B4.5		Office supplies			21	month											\$1,000	\$21,000				
B4.6		Communications			21	month											\$1,000	\$21,000				
B4.7		Misc. supplies			21	month											\$500	\$10,500				
B4.8		Camp costs	Includes catering and housekeeping		10,994	man-day											\$80	\$879,485				
B4.9		Power and heat			21	month											\$6,500	\$136,500				
<b>B5 QA and Project Management</b>																						
B5.1		Project Manager			21	month		(	160	) site working hours per month							\$9,879	\$207,455	\$1,860,889			
B5.2		Design Engineer			21	month		(	360	) site working hours per month							\$54,000	\$1,134,000				
B5.3		Environmental Monitor			21	month		(	360	) site working hours per month							\$15,699	\$329,684				
B5.4		Engineering, Design, and Construction plans (included in Planning and Permitting Costs)															\$0.00	\$0				
B5.5		Field support vehicles (2 vehicles)			42	month											\$4,518	\$189,750				
<b>Subtotal Indirect Costs - Active Closure</b>																			<b>\$8,485,547</b>			
<b>CLOSURE IMPLEMENTATION COSTS - TOTAL</b>																					<b>\$25,145,706</b>	

### Worksheet 5 - Year 0 Estimate - Schedule Details

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



#### A: Year 0 Site Access Schedule

Stage	Flight Months	Helicopter Months	Barge Months	Total Months	Month												Comments/Notes	
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Interim Care	2	5	5	12	H	H												
<b>SUB-TOTAL INTERIM CARE</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>12</b>														
Active Closure 1	2	0	5	7				F	F	B	B	B	B	B				
Active Closure 2	2	0	5	7				F	F	B	B	B	B	B				
Active Closure 3	2	0	5	7				F	F	B	B	B	B	B				
<b>SUB-TOTAL ACTIVE CLOSURE</b>	<b>6</b>	<b>0</b>	<b>15</b>	<b>21</b>														
Post-Closure 1	2	0	3	5				F	F	B	B	B						
<b>SUB-TOTAL POST-CLOSURE 1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>5</b>														
Post-Closure 2	0	0	1	1						B								
<b>SUB-TOTAL POST-CLOSURE 2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>														

#### B: Annual C&M Staffing Schedule - Interim Operations

#	Role	Months Required	Month												Comments/Notes		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
<b>Months Active at Site</b>			<b>12</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	
<b>Administration/Office</b>																	
1	Mine Manager	4					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
2	Office/Camp Mgr	6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
3	Payroll/Accounting/HR	4					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
<b>Water Treatment/Environmental Staffing</b>																	
1	Warehouse/Water Treatment Operator	5					1.0	1.0	1.0	1.0	1.0						
2	Environmental Manager	4					1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
3	Environmental Technician	7	0.5	0.5	0.5	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
<b>Operations</b>																	
4	Barge Operator	10							2.0	2.0	2.0	2.0	2.0	2.0			
5	Equipment operators	13					2.0	3.0	1.5	1.5	1.5	1.5	1.5	1.5			
6	HD Mechanic	2					0.5	0.3	0.3	0.3	0.25	0.25	0.25	0.25			
7	Tradesmen	2					0.5	0.3	0.3	0.3	0.25	0.25	0.5				
8	Labour/Helpers	10	1	1	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0		
<b>Camp/Support</b>																	
1	Cooks/Housecleaning etc.	0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Contract (accounted for in camp costs)
<b>Other</b>																	
1	Visitors	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.0		
<b>TOTAL</b>		<b>66.5</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>8.8</b>	<b>8.3</b>	<b>8.3</b>	<b>8.3</b>	<b>8.3</b>	<b>8.3</b>	<b>7.3</b>	<b>7.5</b>	<b>2.0</b>	<b>2.0</b>		
<b>Annual man-days:</b>			<b>1,995</b>														

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

#### C: Annual C&M Staffing Schedule - During Active Phase

#	Role	Months Required	Month												Comments/Notes		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
<b>Months Active at Site</b>			<b>7</b>				<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	
<b>Water Treatment/Environmental Staffing</b>																	
1	Warehouse/Water Treatment Operator	5					1.0	1.0	1.0	1.0	1.0						
2	Environmental Manager	4					1.0	0.5	0.5	0.5	0.5	0.5	0.5				
3	Environmental Technician	4					1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
<b>TOTAL</b>		<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>		
<b>Annual man-days:</b>			<b>390</b>														

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)

**D: Annual C&M Staffing Schedule - Post Closure 1**

#	Role	Months Required	Month												Comments/Notes	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<b>Months Active at Site</b>		5				1	1	1	1	1						
<b>Administration/Office</b>																
1	Mine Manager	3				0.5	0.5	0.5	0.5	0.5						
2	Office/Camp Mgr	3				1.0	0.5	0.5	0.5	0.5						
3	Payroll/Accounting/HR	1				0.25	0.25	0.25	0.25	0.25						
<b>Water Treatment/Environmental Staffing</b>																
1	Passive treatment specialist	2				0.5	0.5	0.3	0.3	0.3						
2	Environmental Manager	3				0.5	0.5	0.5	0.5	0.5						
3	Environmental Technician	3				0.5	0.5	0.5	0.5	0.5						
<b>Operations</b>																
4	Barge Operator	6						2.0	2.0	2.0						
5	Equipment operators	10				2.0	3.0	1.5	1.5	1.5						
6	HD Mechanic	2				1.0	0.25	0.25	0.25	0.25						
7	Tradesmen	2				1.0	0.25	0.25	0.25	0.25						
8	Labour/Helpers	2				1.0	0.25	0.25	0.25	0.5						
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0				0.0	0.0	0.0	0.0	0.0						Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	1				0.25				0.25						
<b>TOTAL</b>		36	0	0	0	9	7	7	7	7	0	0	0	0	0	

Annual man-days: 1,073

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

**E: Annual C&M Staffing Schedule - Post Closure 2**

#	Role	Months Required	Month												Comments/Notes	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<b>Months Active at Site</b>		1							1							
<b>Administration/Office</b>																
1	Mine Manager	1							0.5							
2	Office/Camp Mgr	0							0.0							
3	Payroll/Accounting/HR	0							0.00							
<b>Water Treatment/Environmental Staffing</b>																
1	Passive Treatment Scientist	1							0.5							
2	Environmental Manager	0														
3	Environmental Technician	0														
<b>Operations</b>																
4	Barge Operator	1							1.0							
5	Equipment operators	1							1.0							
6	HD Mechanic	1							0.50							
7	Tradesmen	0														
8	Labour/Helpers	0							0.25							
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0							0.0							Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	0							0.25							
<b>TOTAL</b>		4	0	0	0	0	0	0	4	0	0	0	0	0	0	

Annual man-days: 120

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

**E: Annual C&M Staffing Schedule - Long-term perpetual maintenance year**

#	Role	Months Required	Month												Comments/Notes	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<b>Months Active at Site</b>		1								1						
<b>Administration/Office</b>																
1	Project Manager/Foreman	1								1.0						
<b>Water Treatment/Engineering Staffing</b>																
1	Passive Treatment Scientist	1								1.0						
2	Site Engineer	1								1.0						
3	Environmental Technician	0														
<b>Operations</b>																
4	Barge Operator	1								1.0						Assumed required 1/2 the time (near mob and demob)
5	Equipment operators	4								4.0						
6	HD Mechanic	1								0.50						
7	Tradesmen	0														
8	Labour/Helpers	1								1.00						
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0														Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	1								0.50						
<b>TOTAL</b>		10	0	0	0	0	0	0	0	10	0	0	0	0	0	

Annual man-days: 300

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

**Worksheet 6- Year 0 Estimate - Planning and Permitting Costs**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**Planning And Permitting**

WBS	Facility/Area	Task	Activity	Qty	Unit	Total Unit Rate (\$/unit)	Activity Total	Subtotal	Source / Comments	
M1	<b>Planning and Permitting</b>									
M1.1	<i>Reclamation Research/Planning</i>									
M1.1.1			Complete reclamation closure and research plan	2	yr	\$200,000	\$400,000	\$400,000		
M1.2	<i>Technical studies and investigations</i>									
M1.2.1			Tailings and WR materials testing and monitoring program	1	ls	\$36,000	\$36,000	\$58,500		
M1.2.2			Pit lake water quality model	1	ls	\$22,500	\$22,500			
M1.3	<i>Monitoring and Management Plans</i>									
M1.3.1			Adaptive Mgmt Plans Physical, water quality, etc	1	ls	\$15,000	\$15,000	\$95,000		
M1.3.2			Revegetation plan	1	ls	\$30,000	\$30,000			
M1.3.3			Waste Management Plan Water treatment, sludge, landfarm, etc.	1	ls	\$50,000	\$50,000			
M1.4	<i>Engineering, Design, and Construction Plans</i>									
M1.4.1			Percentage of direct implementation costs	5%	of	\$16,660,159	\$833,008	\$833,008		
M1.5	<i>Permitting</i>									
M1.5.1.1		Permit Staffing	Permitting Manager	0	ls	\$0	\$0		Staffing costs included in tasks above	
M1.5.1.2			Environmental Manager	0	ls	\$0	\$0			
M1.5.1.3			Technical Consultants	0	ls	\$0	\$0			
<b>TOTAL</b>								<b>\$1,386,508</b>		







**Worksheet 8 - EOM Estimate - Annual C&M Costs**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**Summary of Annual Care and Maintenance Costs**

	Annual Cost Per Phase						Total Cost	Number of Years				
	1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual	n/a		1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual
1 Active Water Treatment System	\$686,853	\$686,853	\$686,853	\$88,509	\$0	\$0	\$6,379,919	0	3	5	10	0
2 Passive Treatment System	\$0	\$0	\$34,840	\$34,840	\$34,840	\$0	\$557,443	0	3	5	2	9
3 Reclamation Maintenance	\$0	\$0	\$221,468	\$0	\$0	\$0	\$1,107,338	0	3	5	2	9
4 Site Maintenance	\$0	\$30,000	\$93,072	\$93,072	\$98,994	\$0	\$1,632,451	0	3	5	2	9
5 On-site Management	\$0	\$306,988	\$607,341	\$84,956	\$178,791	\$0	\$5,736,697	0	3	5	2	9
6 Transportation Costs	\$0	\$50,000	\$62,131	\$20,000	\$66,617	\$0	\$1,100,206	0	3	5	2	9

**NOTES:**  
 1. This table is used as a check to the NPV calculation spreadsheet.

**Phase 1 - Annual Care & Maintenance Costs - Prior to Closure**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S1.1	Water Treatment																	
S1.1.1	Active Treatment System																	
S1.1.1.1		Operation and maintenance		1	yr						\$496,900	\$63,744	\$37,700	\$598,344	\$686,853	\$686,853		See details on 'Water Treatment' worksheet.
S1.1.1.2		Capital Replacement	annual allowance	1	yr						\$84,400	\$4,109	\$0	\$88,509				See details on 'Water Treatment' worksheet.
S1.2	Onsite Management																	
S1.2.1	Field Support Staff																	
S1.2.1.1		Mine Manager		0	months	360	site working hours per month			\$23,366								(Notes: staffing costs include cross-shifts)
S1.2.1.2		Office/Camp manager		0	months	360	site working hours per month			\$22,227								
S1.2.1.3		Administrative Assistants/HR/Accounting		0	months	360	site working hours per month			\$16,214								
S1.2.1.4		Water Treatment Staff Operator		0	months	360	site working hours per month			\$18,491								
S1.2.1.5		Environmental/Safety Manager		0	months	360	site working hours per month			\$22,227								
S1.2.1.6		Environmental Technicians		0	months	360	site working hours per month			\$15,699								
S1.2.1.7		Mechanic		0	months	360	site working hours per month			\$17,349								
S1.2.1.8		Tradesmen		0	months	360	site working hours per month			\$18,491								
S1.2.1.9		General Labour/helpers		0	months	360	site working hours per month			\$12,498								
S1.2.2	Field support Vehicles																	
S1.2.2.1		Pick-up trucks (3 required)		0	months					\$4,518								
S1.2.2.2		Mechanic service vehicle		0	months					\$6,919								
S1.2.2.3		Emergency transport vehicle		0	months					\$4,519								
S1.2.3	Field Support Equipment/Supplies																	
S1.2.3.1		Office supplies		0	months					\$1,000								
S1.2.3.2		Communications		0	months					\$1,000								
S1.2.3.3		Misc. supplies		0	months					\$500								
S1.2.3		Camp Operation		0	man-days					\$80								
S1.2.3		Power, heat, fuel		0	months					\$6,500								
S1.3	Site Maintenance																	
S1.3.1		Equipment Maintenance		1	ls			\$0										
S1.3.2		Road Maintenance	Grader (assume 80 hrs/month)	1	ls	0		\$43	\$92	\$136	\$0	\$0	\$0	\$0				Labour included in field support staff
S1.3.3		Earthwork Repair allowance (assume 40 hrs per month)		1	ls	0	\$0	\$129	\$310	\$310			\$0	\$0				Operator cost included in Field support staff
S1.3.4		Sundry equipment/consumables allowance		1	ls					\$0				\$0				Task Code C.2.14
S1.4	Transportation Costs																	
S1.4.1		Barge Operations		0	months					\$10,000				\$0				
S1.4.2		Staffing Bus trips during barge operation period		0	ea					\$678				\$0				One per week
S1.4.3		Air transport and airstrip operations		0	flights					\$3,000				\$0				1 flight per week
<b>TOTAL</b>														<b>\$686,853</b>	<b>\$686,853</b>	<b>\$686,853</b>		

**Phase 2 - Annual Care & Maintenance Costs During Active Closure**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S2.1	Water Treatment																	
S2.1.1	Active Treatment System																	
S2.1.1.1		Operation and maintenance		1	yr						\$496,900	\$63,744	\$37,700	\$598,344	\$686,853	\$686,853		See details on 'Water Treatment' worksheet.
S2.1.1.2		Capital Replacement	annual allowance	1	yr						\$84,400	\$4,109	\$0	\$88,509				See details on 'Water Treatment' worksheet.
S2.2	Onsite Management																	
S2.2.1	Field Support Staff																	
S2.2.1.1		Water Treatment Staff Operator		5	months	360	site working hours per month			\$18,491				\$92,457	\$244,163			
S2.2.1.2		Environmental/Safety Manager		4	months	360	site working hours per month			\$22,227				\$88,909				
S2.2.1.3		Environmental Technicians		4	months	360	site working hours per month			\$15,699				\$62,797				
S2.2.2	Field support Vehicles																	
S2.2.2.1		Pick-up trucks (1 required)		7	months					\$4,518				\$31,625	\$31,625			
S2.2.3	Field Support Equipment/Supplies																	
S2.2.3.1		Camp Operation		390	man-days					\$80				\$31,200	\$31,200			
S2.3	Site Maintenance																	
S2.3.1		Pumping equipment/consumables allowance		1	ls					\$30,000				\$30,000	\$30,000			Allowance for pump maintenance/fuel etc.
S2.4	Transportation Costs																	
S2.4.1		Barge Operations		5	months					\$10,000				\$50,000	\$50,000			Included in construction indirect costs
<b>TOTAL</b>														<b>\$1,073,842</b>	<b>\$1,073,842</b>	<b>\$1,073,842</b>		



**Phase 3 - Annual Care & Maintenance Costs - Post Closure I**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours or Cost Code Ref.	Unit Rates				Activity Totals				Subtotals		Source / Comments
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1	
S3.1	Water Treatment													\$686,853	\$721,694		
S3.1.1	Active Treatment System																
S3.1.1.1		Operation and maintenance			1 yr								\$496,900	\$63,744	\$37,700	\$598,344	See details on 'Water Treatment' worksheet.
S3.1.1.2		Capital Replacement	annual allowance		1 yr								\$84,400	\$4,109	\$0	\$88,509	
S3.1.1	Passive Treatment System															\$34,840	See details on 'Water Treatment' worksheet.
S3.1.1.1		Operation and maintenance			1 yr								\$10,000	\$11,706	\$13,134	\$34,840	
S3.2	Onsite Management															\$607,341	
S3.2.1	Field Support Staff															\$372,340	(Notes: staffing costs include cross-shifts)
S3.2.1.1		Mine Manager			3 months	360	site working hours per month		\$23,366							\$58,415	
S3.2.1.2		Office/Camp manager			3 months	360	site working hours per month		\$22,227							\$66,682	
S3.2.1.3		Administrative Assistants/HR/Accounting			1 months	360	site working hours per month		\$16,214							\$20,268	
S3.2.1.4		Water Treatment Staff Operator			2 months	360	site working hours per month		\$18,491							\$32,360	
S3.2.1.5		Environmental/Safety Manager			3 months	360	site working hours per month		\$22,227							\$55,568	
S3.2.1.6		Environmental Technicians			3 months	360	site working hours per month		\$15,699							\$39,248	
S3.2.1.7		Mechanic			2 months	360	site working hours per month		\$17,349							\$34,697	
S3.2.1.8		Tradesmen			2 months	360	site working hours per month		\$18,491							\$36,983	
S3.2.1.9		General Labour/helpers			2 months	360	site working hours per month		\$12,498							\$28,119	
S3.2.2	Field support Vehicles															\$104,201	
S3.2.2.1		Pick-up trucks (3 required)			15 months				\$4,518							\$67,768	
S3.2.2.2		Mechanic service vehicle			2 months				\$6,919							\$13,837	
S3.2.2.3		Emergency transport vehicle			5 months				\$4,519							\$22,596	
S3.2.3	Field Support Equipment/Supplies															\$130,800	
S3.2.3.1		Office supplies			5 months				\$1,000							\$5,000	
S3.2.3.2		Communications			5 months				\$1,000							\$5,000	
S3.2.3.3		Misc. supplies			5 months				\$500							\$2,500	
S3.2.3		Camp Operation			1,073 man-days				\$80							\$85,800	
S3.2.3		Power, heat, fuel			5 months				\$6,500							\$32,500	
S3.3	Reclamation Maintenance															\$221,468	
S3.3.1	Cover repairs															\$198,515	Assumes 5% of area reseeded over 5 yr PC1 period.
S3.3.1.1		Cover Repair allowance	Load, haul, dump, spread (spoil)		1% of total	1,098,885	m3 of cover required replacement at:		\$4.96 /m3							\$54,478	
S3.3.1.2		Seed/Fertilize: broadcast seeding			55 ha				\$2,621.52 /ha							\$144,037	
S3.3.2.1	Revegetation															\$22,953	Assumes 15% of area reseeded over 5 yr PC1 period.
S3.3.2.2		Reseeding allowance	Seed/Fertilize: broadcast seeding		3% of total	292	ha requires reseeding at		\$2,621.52 /ha							\$22,953	
S3.3	Site Maintenance															\$93,072	\$93,072
S3.3.1		Equipment Maintenance			1 ls				\$20,000							\$20,000	Labour included in field support staff Operator cost included in Field support staff Task Code C.2.14 Allowance for pump maintenance/fuel etc.
S3.3.2		Road Maintenance	Grader (assume 40 hrs/month)		1 ls	200		\$43	\$92	\$136	\$0	\$8,669	\$18,443	\$20,000	\$27,112		
S3.3.3		Earthwork Repair allowance (assume 20 hrs per month)			1 ls	100		\$0	\$129	\$310	\$310	\$30,960	\$30,960	\$15,000	\$15,000		
S3.3.4		Sundry equipment/consumables allowance			1 ls				\$15,000							\$15,000	
S3.4	Transportation Costs															\$62,131	\$62,131
S3.4.1		Barge Operations			3 months				\$10,000							\$30,000	One per week One flight per week
S3.4.2		Staffing Bus trips during barge operation period			12 ea				\$678							\$8,131	
S3.4.3		Air transport and airstrip operations			8 flights				\$3,000							\$24,000	
<b>TOTAL</b>														<b>\$1,705,705</b>	<b>\$1,705,705</b>	<b>\$1,705,705</b>	

**Phase 4 - Annual Care & Maintenance Costs - Post Closure II**

WBS	Facility/Area	Task	Activity	Qty	Unit	Hours or Cost Code Ref.	Unit Rates				Activity Totals				Subtotals		Source / Comments	
							Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Total Unit Rate (\$/unit)	Material Cost	Labour Cost	Equipment Cost	Cost	WBS Level 2	WBS Level 1		
S4.1	Water Treatment															\$123,349		
S4.1.1	Active Treatment System																	
S4.1.1.2		Capital Replacement	annual allowance		1 yr												\$88,509	See details on 'Water Treatment' worksheet.
S4.1.1	Passive Treatment System																\$34,840	
S4.1.1.1		Operation and maintenance			1 yr												\$34,840	See details on 'Water Treatment' worksheet.
S4.2	Onsite Management																\$84,956	
S4.2.1	Field Support Staff																\$44,542	(Notes: staffing costs include cross-shifts)
S4.2.1.1		Project Manager			0.5 months	360	site working hours per month		\$23,366							\$11,683		
S4.2.1.2		Passive Treatment specialist			0.5 months	360	site working hours per month		\$42,120							\$21,060		
S4.2.1.3		Mechanic			0.5 months	360	site working hours per month		\$17,349							\$8,674		
S4.2.1.4		General Labour/helpers			0.3 months	360	site working hours per month		\$12,498							\$3,124		
S4.2.2	Field support Vehicles															\$17,014		
S4.2.2.1		Pick-up trucks (2 required)			2.0 months				\$4,518							\$9,036		
S4.2.2.2		Mechanic service vehicle			0.5 months				\$6,919							\$3,459		
S4.2.2.3		Emergency transport vehicle			1.0 months				\$4,519							\$4,519		
S4.2.3	Field Support Equipment/Supplies															\$23,400		
S4.2.3.1		Office supplies			1 months				\$1,000							\$1,000		
S4.2.3.2		Communications			1 months				\$1,000							\$1,000		
S4.2.3.3		Misc. supplies			1 months				\$500							\$500		
S4.2.3		Camp Operation			180 man-days				\$80							\$14,400		
S4.2.3		Power, heat, fuel			1 months				\$6,500							\$6,500		
S4.3	Reclamation Maintenance															\$0		
S4.3.1	Cover repairs															\$0		
S4.3.2	Revegetation															\$0		
S4.3	Site Maintenance															\$28,903	\$28,903	
S4.3.1		Equipment Maintenance (parts, supplies)			1 ls				\$10,000							\$10,000	Labour included in field support staff Operator cost included in Field support staff Task Code C.2.14 Allowance for pump maintenance/fuel etc.	
S4.3.2		Road Maintenance	Grader (assume 20 hrs/month)		1 ls	20		\$43	\$92	\$136	\$0	\$867	\$1,844	\$2,711	\$2,711			
S4.3.3		Earthwork Repair allowance (assume 20 hrs per month)			1 ls	20		\$0	\$129	\$310	\$310	\$6,192	\$6,192	\$6,192				
S4.3.4		Sundry equipment/consumables allowance			1 ls				\$10,000						\$10,000			
S4.4	Transportation Costs															\$20,000	\$20,000	
S4.4.1		Barge Operations			1 months				\$10,000							\$10,000		



### Worksheet 9 - EOM Estimate - Implementation Costs

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submis:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment		Fuel		Material		Activity Totals		Subtotals		Source / Comments	
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2		WBS Level 1
<b>DIRECT COSTS</b>																					
A1		<b>Waste Dumps</b>																		\$1,860,150	
A1.1		Main Waste Dump (inc. MWDE)																		\$0	
A1.1.1.1		Regrade	Flat areas: Re-grade to form tertiary drainage catchments	0	hrs	C.2.13	0	\$43.35	\$0	\$195.11	\$0	\$67.01	0	\$0	\$0.00	\$0	\$305.46				
A1.1.1.2			Slopes: Re-grade to 3H:1V	0	hrs	C.2.13	0	\$43.35	\$0	\$195.11	\$0	\$67.01	0	\$0	\$0.00	\$0	\$305.46				
A1.1.2.1		Cover	Flat area cover material: Load, haul, dump spread	0	Cm3	R.045	0.0	\$0.80	\$0	\$2.14	\$0	\$0.88	0	\$0	\$0.00	\$0	\$3.82				
A1.1.2.2			Slope area cover material: Load, haul, dump along crest	0	Cm3	R.046	0.0	\$0.70	\$0	\$1.84	\$0	\$0.80	0	\$0	\$0.00	\$0	\$3.34				
A1.1.2.3			Slope area cover material: Spread down slope	0	hrs	C.2.13	0.0	\$43.35	\$0	\$195.11	\$0	\$67.01	0	\$0	\$0.00	\$0	\$305.46				
A1.1.3.1		Revegetate	Seed/Fertilize: tractor application	0	ha	C.6.01	0.0	\$1,005.46	\$0	\$397.11	\$0	\$232.94	0	\$0	\$986.00	\$0	\$2,621.52				
A1.1.3.2			Tree seedling application (1,000 stems/ha)	0	ha	C.6.06	0.0	\$1,789.95	\$0	\$9.02	\$0	\$15.00	0	\$0	\$460.50	\$0	\$2,274.47				
A1.2		Southwest Dump (excluding high grade waste area)																		\$0	
A1.2.1		Re-grade	Slopes: Re-grade to 3H:1V	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A1.2.2.1		Cover	Load, haul, dump spread	0	m3	R.053	0.0	\$0.75	\$0.00	\$2.04	\$0	\$0.82	0	\$0.00	\$0.00	\$0.00	\$3.61				
A1.2.3.1		Revegetate	Seed/Fertilize: tractor application	0.00	ha	C.6.01	0.00	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.00	\$986.00	\$0.00	\$2,621.52				
A1.2.3.2			Tree seedling application (1,000 stems/ha)	0.00	ha	C.6.06	0.00	\$1,789.95	\$0.00	\$9.02	\$0	\$15.00	0	\$0.00	\$460.50	\$0.00	\$2,274.47				
A1.3		Southwest Dump High-Grade Waste																		\$1,255,412	
A1.3.1.1		Regrade	Flat areas: Re-grade to form tertiary drainage catchments	12	hrs	C.2.13	11.8	\$43.35	\$510.98	\$195.11	\$2,300	\$67.01	823	\$789.90	\$0.00	\$0.00	\$305.46				
A1.3.1.2			Slopes: Re-grade to 5H:1V	109	hrs	C.2.13	109.5	\$43.35	\$4,744.65	\$195.11	\$21,356	\$67.01	7,640	\$7,334.51	\$0.00	\$0.00	\$305.46				
A1.3.2.1		Cover Surface preparation	Proof-roll flat areas with vibratory roller	5,915	m2	C.2.05	7.3	\$0.04	\$254.45	\$0.03	\$148	\$0.01	76	\$72.71	\$0.00	\$0.00	\$0.08				
A1.3.2.2			Proof-roll slope areas with vibratory roller	41,485	m2	C.2.06	128.5	\$0.11	\$4,461.32	\$0.06	\$2,595	\$0.03	1,328	\$1,274.84	\$0.00	\$0.00	\$0.20				
A1.3.2.3			Bedding: Load, haul, dump, spread, compact	7,110	m2	R.011	103.9	\$0.61	\$4,365.11	\$1.56	\$11,063	\$0.63	4,641	\$4,455.00	\$0.00	\$0.00	\$2.80				
A1.3.3.1		Cover	BGM Liner: Supply and install	47,400	m2	C.5.01	2,246.5	\$1.88	\$89,345.02	\$0.80	\$37,898	\$0.28	13,928	\$13,370.88	\$17.86	\$846,376.84	\$20.82	\$986,991			
A1.3.3.2			Flat area cover material: Load, haul, dump spread	5,915	Cm3	R.054	97.9	\$0.71	\$4,212.11	\$1.94	\$11,482	\$0.78	4,777	\$4,586.16	\$0.00	\$0.00	\$3.43				
A1.3.3.3			Slope area cover material: Load, haul, dump along base of slope	41,485	Cm3	R.055	574.5	\$0.60	\$24,697.30	\$1.60	\$66,301	\$0.68	29,199	\$28,031.47	\$0.00	\$0.00	\$2.87				
A1.3.3.4			Slope area cover material: Spread up slope	132	hrs	C.2.13	131.5	\$43.35	\$5,701.70	\$195.11	\$25,664	\$67.01	9,181	\$8,813.96	\$0.00	\$0.00	\$305.46				
A1.3.4.1		Revegetate	Seed/Fertilize: broadcast seeding	4.74	ha	C.6.01	157.0	\$1,005.46	\$4,765.90	\$397.11	\$1,882	\$232.94	1,150	\$1,104.16	\$986.00	\$4,673.65	\$2,621.52	\$12,426			
A1.3.4.2			Tree seedling application (1,000 stems/ha)	4.74	ha	C.6.06	242.9	\$1,789.95	\$8,484.38	\$9.02	\$43	\$15.00	74	\$71.10	\$460.50	\$2,182.78	\$2,274.47	\$10,781			
A1.4		Main Pit Dump (Incl. SWB) (EOM Configuration)																		\$604,739	
A1.4.1.1		Relocated SAT below water	Load, haul, dump, spread in pit	0	Cm3	R.004	0.0	\$0.50	\$0.00	\$1.34	\$0	\$0.57	0	\$0.00	\$0.00	\$0.00	\$2.41				
A1.4.2.1		Regrade	Flat areas: Re-grade to form tertiary drainage catchments	104	hrs	C.2.13	103.8	\$43.35	\$4,499.93	\$195.11	\$20,254	\$67.01	7,246	\$6,956.20	\$0.00	\$0.00	\$305.46				
A1.4.2.2			Slopes: Re-grade to 3H:1V	141	hrs	C.2.13	140.6	\$43.35	\$6,094.73	\$195.11	\$27,433	\$67.01	9,814	\$9,421.52	\$0.00	\$0.00	\$305.46				
A1.4.3.1		Cover	Flat area cover material: Load, haul, dump spread	72,135	m3	R.047	1,166.5	\$0.70	\$50,204.42	\$1.90	\$136,851	\$0.76	56,940	\$54,662.66	\$0.00	\$0.00	\$3.35				
A1.4.3.2			Slope area cover material: Load, haul, dump along crest	52,465	m3	R.048	727.2	\$0.60	\$31,261.11	\$1.60	\$83,922	\$0.68	36,960	\$35,481.42	\$0.00	\$0.00	\$2.87				
A1.4.3.3			Slope area cover material: Spread down slope	51	hrs	C.2.13	51.4	\$43.35	\$2,226.34	\$195.11	\$10,021	\$67.01	3,585	\$3,441.59	\$0.00	\$0.00	\$305.46				
A1.4.4.1		Revegetate	Seed/Fertilize: broadcast seeding	24.9	ha	C.6.01	825.5	\$1,005.46	\$25,056.17	\$397.11	\$9,896	\$232.94	6,047	\$5,804.98	\$986.00	\$24,571.19	\$2,621.52	\$65,328			
A1.4.4.2			Tree seedling application (1,000 stems/ha)	24.9	ha	C.6.06	1,277.2	\$1,789.95	\$44,605.66	\$9.02	\$225	\$15.00	389	\$373.80	\$460.50	\$11,475.69	\$2,274.47	\$56,680			
A1.5.0.0		Mill Valley Fill Extension (Stage 1 and 2)																		\$0	
A1.5.1.1		Complete Fill Placement	Waste Rock fill: Load, haul, dump spread	0	m3	R.037	0.0	\$0.95	\$0.00	\$2.52	\$0	\$1.04	0	\$0.00	\$0.00	\$0.00	\$4.50				
A1.5.2.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A1.5.2.2			Slopes: Re-grade to 3H:1V	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A1.5.3.1		Cover	Flat area cover material: Load, haul, dump spread	0	m3	R.050	0.0	\$0.88	\$0.00	\$2.34	\$0	\$0.96	0	\$0.00	\$0.00	\$0.00	\$4.17				
A1.5.3.2			Slope area cover material: Load, haul, dump along crest	0	m3	R.051	0.0	\$0.77	\$0.00	\$2.01	\$0	\$0.87	0	\$0.00	\$0.00	\$0.00	\$3.64				
A1.5.3.3			Slope area cover material: Spread down slope	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A1.5.4.1		Revegetate	Seed/Fertilize: broadcast seeding	0.00	ha	C.6.01	0.00	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.00	\$986.00	\$0.00	\$2,621.52				
A1.5.4.2			Tree seedling application (1,000 stems/ha)	0.00	ha	C.6.06	0.00	\$1,789.95	\$0.00	\$9.02	\$0	\$15.00	0	\$0.00	\$460.50	\$0.00	\$2,274.47				
A2		<b>Overburden Dumps</b>																		\$340,650	
A2.1		Area 118 Pit Backfill Dump																		\$0	
A2.1.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A2.1.1.2			Berm: Re-grade to 3H:1V or flatter	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A2.1.2.1		Revegetate	Seed/Fertilize: broadcast seeding	0	ha	C.6.01	0.0	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.00	\$986.00	\$0.00	\$2,621.52				
A2.1.2.2			Tree seedling application (1,000 stems/ha)	0	ha	C.6.06	0.0	\$1,789.95	\$0.00	\$9.02	\$0	\$15.00	0	\$0.00	\$460.50	\$0.00	\$2,274.47				
A2.2		Ice-rich Overburden Dump																		\$13,505	
A2.2.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A2.2.1.2			Berm: Re-grade to 3H:1V or flatter	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A2.2.3.1		Revegetate	Seed/Fertilize: broadcast seeding	2.76	ha	C.6.01	91.4	\$1,005.46	\$2,773.36	\$397.11	\$1,095	\$232.94	669	\$642.53	\$986.00	\$2,719.68	\$2,621.52	\$7,231			
A2.2.3.2			Tree seedling application (1,000 stems/ha)	2.76	ha	C.6.06	141.4	\$1,789.95	\$4,937.22	\$9.02	\$25	\$15.00	43	\$41.37	\$460.50	\$1,270.20	\$2,274.47	\$6,274			
A2.3		Reclamation Overburden Dump																		\$327,145	
A2.3.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	594	hrs	C.2.13	593.6	\$43.35	\$25,729.80	\$195.11	\$115,811	\$67.01	41,432	\$39,774.35	\$0.00	\$0.00	\$305.46				
A2.3.1.2			Slopes: Re-grade to 3H:1V or flatter	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46				
A2.3.2.1		Revegetate	Seed/Fertilize: broadcast seeding	29.79	ha	C.6.01	986.7	\$1,005.46	\$29,948.38	\$397.11	\$11,828	\$232.94	7,228	\$6,938.40	\$986.00	\$29,368.70	\$2,621.52	\$78,084			
A2.3.2.2			Tree seedling application (1,000 stems/ha)	29.79	ha	C.6.06	1,526.5	\$1,789.95	\$53,314.89	\$9.02	\$269	\$15.00	465	\$446.79							

WBS	Facili	Task	Activity	Qty	Units	Cost Code	Labour			Equipment		Fuel		Material		Activity Totals		Subtotals		Source / Comments	
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2		WBS Level 1
<b>A4</b>		<b>Open Pits</b>																			
A4.1		Main Pit																	\$14,595	\$39,929	
A4.1.1.1		Secure Access	Safety Berm: Clear land around highwall perimeter (10m width)	7,500	m2	C.2.03	28.5	\$0.16	\$1,235.88	\$0.49	\$3,673	\$0.13	1,048	\$1,005.87	\$0.00	\$0.00	\$0.79	\$5,914			
A4.1.1.2			Safety Berm: Construct around highwall perimeter	4,860	m3	C.2.02	45.8	\$0.41	\$1,987.42	\$0.77	\$3,720	\$0.25	1,267	\$1,215.92	\$0.00	\$0.00	\$1.42	\$6,924			
A4.1.1.3			Place large boulders across any pit access points	52	m3	R.001	1.6	\$1.36	\$70.51	\$2.70	\$141	\$0.90	49	\$46.76	\$0.00	\$0.00	\$4.96	\$258			
A4.1.1.4			Allowance: Install warning signs around pit perimeter at key locations	6	ea	C.5.13	5.6	\$39.33	\$235.97	\$9.61	\$58	\$5.57	35	\$33.39	\$195.35	\$1,172.12	\$249.86	\$1,499			
A4.2		Area 2 Pit (incl. Stage 3 Pit)																	\$9,203		
A4.2.1.1		Secure Access	Safety Berm: Clear land around highwall perimeter (10m width)	0	m2	C.2.03	0.0	\$0.16	\$0.00	\$0.49	\$0	\$0.13	0	\$0.00	\$0.00	\$0.00	\$0.79	\$0			
A4.2.1.2			Safety Berm: Construct around highwall perimeter	5,317	m3	C.2.02	50.2	\$0.41	\$2,174.34	\$0.77	\$4,070	\$0.25	1,386	\$1,330.27	\$0.00	\$0.00	\$1.42	\$7,575			
A4.2.1.3			Place large boulders across any pit access points	26	m3	R.001	0.8	\$1.36	\$35.25	\$2.70	\$70	\$0.90	24	\$23.38	\$0.00	\$0.00	\$4.96	\$129			
A4.2.1.4			Allowance: Install warning signs around pit perimeter at key locations	6	ea	C.5.13	5.6	\$39.33	\$235.97	\$9.61	\$58	\$5.57	35	\$33.39	\$195.35	\$1,172.12	\$249.86	\$1,499			
A4.3		Area 118 Pit																	\$5,207		
A4.3.1.1		Secure Access	Safety Berm: Clear land around highwall perimeter (10m width)	2,580	m2	C.2.03	9.8	\$0.16	\$425.14	\$0.49	\$1,263	\$0.13	360	\$346.02	\$0.00	\$0.00	\$0.79	\$2,035			
A4.3.1.2			Safety Berm: Construct around highwall perimeter	1,435	m3	C.2.02	13.5	\$0.41	\$586.76	\$0.77	\$1,098	\$0.25	374	\$358.99	\$0.00	\$0.00	\$1.42	\$2,044			
A4.3.1.3			Place large boulders across any pit access points	26	m3	R.001	0.8	\$1.36	\$35.25	\$2.70	\$70	\$0.90	24	\$23.38	\$0.00	\$0.00	\$4.96	\$129			
A4.3.1.4			Allowance: Install warning signs around pit perimeter at key locations	4	ea	C.5.13	3.7	\$39.33	\$157.31	\$9.61	\$38	\$5.57	23	\$22.26	\$195.35	\$781.42	\$249.86	\$999			
A4.4		Minto North Pit																	\$10,924		
A4.4.1.1		Secure Access	Safety Berm: Clear land around highwall perimeter (10m width)	5,900	m2	C.2.03	22.4	\$0.16	\$972.22	\$0.49	\$2,889	\$0.13	824	\$791.29	\$0.00	\$0.00	\$0.79	\$4,653			
A4.4.1.2			Safety Berm: Construct around highwall perimeter	3,610	m3	C.2.02	34.1	\$0.41	\$1,476.37	\$0.77	\$2,764	\$0.25	941	\$903.25	\$0.00	\$0.00	\$1.42	\$5,143			
A4.4.1.3			Place large boulders across any pit access points	26	m3	R.001	0.8	\$1.36	\$35.25	\$2.70	\$70	\$0.90	24	\$23.38	\$0.00	\$0.00	\$4.96	\$129			
A4.4.1.4			Allowance: Install warning signs around pit perimeter at key locations	4	ea	C.5.13	3.7	\$39.33	\$157.31	\$9.61	\$38	\$5.57	23	\$22.26	\$195.35	\$781.42	\$249.86	\$999			
<b>A5</b>		<b>Underground Openings</b>																		\$25,661	
A5.1		Minto South Portal																		\$15,185	
A5.1.1.1		Seal portal	Load, Haul, Dump backfill plug	2,588	m3	R.001	81.5	\$1.36	\$3,508.32	\$2.70	\$6,993	\$0.90	2,423	\$2,326.51	\$0.00	\$0.00	\$4.96	\$12,828		Material sourced from nearby laydown area rockfill	
A5.1.1.2			Doze backfill plug into portal with small dozer	16	hrs	C.2.19	0.0	\$43.35	\$706.93	\$77.93	\$1,271	\$23.28	395	\$379.66	\$0.00	\$0.00	\$144.56	\$2,358			
A5.1.2.1		Revegetate	Included in Yards (WBS No. A11-10)															\$0			
A5.2		Area 118 Vent Raise																	\$10,476		
A5.2.1.1		Site Preparation	Removal of Heater/Fan included in Demolition															\$0			
A5.2.1.2			Excavate and clean perimeter around shaft to suitable material.	4	ea	C.8.01	8.0	\$82.07	\$328.29	\$15.83	\$63	\$6.83	28	\$27.33	\$0.00	\$0.00	\$104.73	\$419			
A5.2.2.1		Concrete Cap installation	Structural steel - Supply and install I-Beam structural support	8	m	C.8.02	9.8	\$49.04	\$392.34	\$16.11	\$129	\$6.05	50	\$48.37	\$15.77	\$126.16	\$86.97	\$696			
A5.2.2.2			Formwork: Supply and install concrete ring-wall formwork	8	m2	C.8.03	51.3	\$302.50	\$2,419.98	\$0.00	\$0	\$0.00	0	\$0.00	\$3.47	\$27.76	\$305.97	\$2,448			
A5.2.2.3			Ringwall Rebar: supply and install	32	m	C.8.05	0.8	\$1.24	\$39.84	\$0.00	\$0	\$0.00	0	\$0.00	\$3.30	\$105.71	\$4.55	\$146			
A5.2.2.4			Concrete slab: supply and install	8.6	m3	C.8.06	61.1	\$321.82	\$2,780.48	\$10.75	\$93	\$3.50	31	\$30.21	\$378.65	\$3,271.53	\$714.72	\$6,175		Includes slab formwork, rebar, finishing.	
A5.2.2.5			Vent Raise Pipe Supply and install	1	ea.	C.8.07	0.5	\$17.36	\$8.68	\$0.00	\$0	\$0.00	0	\$0.00	\$451.59	\$451.59	\$468.95	\$469			
A5.2.3.1		Backfill cap area	Backfill: Load, haul, dump, place over concrete cap	25	m3	R.001	0.8	\$1.36	\$33.90	\$2.70	\$68	\$0.90	23	\$22.48	\$0.00	\$0.00	\$4.96	\$124			
<b>A6</b>		<b>External Tailings Facilities</b>																		\$150,214	
A6.1		Dry Stack Tailings Storage Facility																		\$150,214	
A6.1.1.1		Waste Rock Shell	Regrade WR shell slopes to 4H:1V	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46	\$0			
A6.1.1.2			Cover material: Load, haul, dump spread (0.5m)	0	m3	R.043	0.0	\$0.84	\$0.00	\$2.23	\$0	\$0.91	0	\$0.00	\$0.00	\$0.00	\$3.98	\$0			
A6.1.1.3			Scarify surface	0	m2	C.2.16	0.0	\$0.03	\$0.00	\$0.06	\$0	\$0.02	0	\$0.00	\$0.00	\$0.00	\$0.11	\$0			
A6.1.1.4			Seed/Fertilize: broadcast seeding	0.00	ha	C.6.01	0.0	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.00	\$986.00	\$0.00	\$2,621.52	\$0			
A6.1.1.5			Tree seedling application (1,000 stems/ha)	0.00	ha	C.6.06	0.0	\$1,789.95	\$0.00	\$9.02	\$0	\$15.00	0	\$0.00	\$460.50	\$0.00	\$2,274.47	\$0			
A6.1.2.1		Fill Area at south end of DS	Load, haul, dump, spread	30,300	Cm3	R.001	954.9	\$1.36	\$41,082.96	\$2.70	\$81,887	\$0.90	28,379	\$27,243.79	\$0.00	\$0.00	\$4.96	\$150,214		Fill from TDD road and/or unsuitable DSTSF cover material	
A6.1.3.1		Tailings surface	Regrade tailings area south of the tailings	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46	\$0			
A6.1.3.2			Regrade surface to form tertiary drainage catchments	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46	\$0			
A6.1.3.3			Cover: Excavate unsuitable temporary cover material	0	m3	R.003	0.0	\$0.50	\$0.00	\$1.34	\$0	\$0.57	0	\$0.00	\$0.00	\$0.00	\$2.41	\$0			
A6.1.3.4			Cover material: Load, haul, dump spread (0.5m)	0	m3	R.043	0.0	\$0.84	\$0.00	\$2.23	\$0	\$0.91	0	\$0.00	\$0.00	\$0.00	\$3.98	\$0			
A6.1.3.5			Seed/Fertilize: broadcast seeding	0.00	ha	C.6.01	0.0	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.00	\$986.00	\$0.00	\$2,621.52	\$0			
A6.1.3.6			Tree seedling application (1,000 stems/ha)	0.00	ha	C.6.06	0.0	\$1,789.95	\$0.00	\$9.02	\$0	\$15.00	0	\$0.00	\$460.50	\$0.00	\$2,274.47	\$0			
<b>A7</b>		<b>Roads</b>																		\$106,478	
A7.1		Exploration Roads																		\$32,339	
A7.1.1.1		Regrade/Scarify	Scarify road surface	54,285	m2	C.2.16	0.0	\$0.03	\$1,842.07	\$0.06	\$2,993	\$0.02	965	\$926.07	\$0.00	\$0.00	\$0.11	\$5,761			
A7.1.2.1		Revegetate	Seed/Fertilize: broadcast seeding	5.43	ha	C.6.01	179.8	\$1,005.46	\$5,458.15	\$397.11	\$2,156	\$232.94	1,317	\$1,264.54	\$986.00	\$5,352.50	\$2,621.52	\$14,231			
A7.1.2.2			Tree seedling application (1,000 stems/ha)	5.43	ha	C.6.06	278.2	\$1,789.95	\$9,716.74	\$9.02	\$49	\$15.00	85	\$81.43	\$460.50	\$2,499.82	\$2,274.47	\$12,347			
A7.2		Access Roads (excl. Main Site Access Road)																		\$8,479	
A7.2.1.1		Regrade/Scarify	Regrade side slopes	9	hrs	C.2.13	9.5	\$43.35	\$410.01	\$195.11	\$1,845	\$67.01	660	\$633.81	\$0.00	\$0.00	\$305.46	\$2,889			
A7.2.1.2			Scarify road surface	52,636	m2	C.2.16	0.0	\$0.03	\$1,786.12	\$0.06	\$2,902	\$0.02	935	\$897.94	\$0.00	\$0.00	\$0.11	\$5,586			
A7.2.2.1		Revegetate	Seed/Fertilize: broadcast seeding	0.00	ha	C.6.01	0.0	\$1,005.46	\$0.00	\$397.11	\$0	\$232.94	0	\$0.17	\$986.00	\$0.73	\$2,621.52	\$2			
A7.2.2.2			Tree seedling application (1,000 stems/ha)	0.00	ha	C.6.06	0.0	\$1,789.95	\$1.33	\$9.02	\$0	\$15.00	0	\$0.01	\$460.50	\$0.34	\$2,274.47	\$2			
A7.3		Main Site Access Road																	\$1,281		
A7.3.1.1		New Access over MVFE	Regrade new access through MVFE	0	m3													\$0			
A7.3.2.1		Signage	Install large sign on east and west side of barge landing on Yukon River	2	ea.	C.5.14	1.9	\$39.33	\$78.66	\$9.61	\$19	\$5.57	12	\$11.13	\$586.06	\$1,172.12	\$640.56	\$1,281			
A7.4		Haul Roads																	\$44,917		
A7.4.1.1		Regrade/Scarify	Regrade side slopes	12	hrs	C.2.13	12.1	\$43.35	\$524.01	\$195.11	\$2,359	\$67.01	844	\$810.04	\$0.00	\$0.00	\$305.46	\$3,693			



WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material		Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	WBS Level 1	
A8.2.2.2			Disconnect services	4	hrs	C.1.09	12.0	\$86.08	\$344.32	\$7.75	\$31	\$4.80	20	\$19.20	\$0.00	\$0.00	\$98.63	\$395			
A8.2.3.1		Demolition	Structural building demolition: steel structures	96	tonnes	C.1.05	191.3	\$67.73	\$6,477.52	\$136.09	\$13,015	\$33.84	3,371	\$3,236.25	\$0.00	\$0.00	\$237.66	\$22,729			
A8.2.3.2			Other demolition: covered storage etc.	560	m3	C.1.07	55.5	\$3.65	\$2,045.31	\$2.09	\$1,170	\$0.74	430	\$412.69	\$0.00	\$0.00	\$6.48	\$3,628			
A8.2.4.1		Waste disposal	On-site disposal (demolition debris, etc.)	393	Lm3	R.005	15.8	\$1.72	\$676.99	\$3.01	\$1,182	\$1.08	441	\$423.19	\$0.00	\$0.00	\$5.81	\$2,282			
A8.2.4.2			Off-site disposal (re-usable equipment, etc.)	3	trips	C.7.07	23.0	\$346.78	\$996.98	\$429.22	\$1,234	\$113.33	339	\$325.82	\$0.00	\$0.00	\$889.33	\$2,557			
A8.3		<b>Camp Area</b>																	\$370,330		
A8.3.1.1		Equipment Removal	Remove salvageable equipment	48	hrs	C.1.13	192.0	\$164.14	\$7,878.86	\$87.08	\$4,180	\$14.53	726	\$697.34	\$0.00	\$0.00	\$265.75	\$12,756			
A8.3.2.1		Remove modular buildings	Dismantle and prep for transport	92	ea.	C.1.20	1,794.0	\$831.26	\$76,475.46	\$737.86	\$67,883	\$166.46	15,953	\$15,314.69	\$0.00	\$0.00	\$1,735.58	\$159,673			
A8.3.2.2			Transport structures off-site (Whitehorse)	92	ea.	C.7.04	736.0	\$343.01	\$31,557.04	\$309.18	\$28,445	\$113.33	10,861	\$10,426.18	\$0.00	\$0.00	\$765.52	\$70,428			
A8.3.3.1		Prepare for demolition	Remove hazardous materials/prep for transport offsite	1	hrs	C.1.22	4.0	\$155.59	\$155.59	\$97.38	\$97	\$26.93	28	\$26.93	\$0.00	\$0.00	\$279.90	\$280			
A8.3.3.2			Disconnect services	8	hrs	C.1.09	24.0	\$86.08	\$688.64	\$7.75	\$62	\$4.80	40	\$38.40	\$0.00	\$0.00	\$98.63	\$789			
A8.3.4.1		Demolition	Structural building demolition: Steel	175	tonnes	C.1.05	350.7	\$67.73	\$11,875.46	\$136.09	\$23,861	\$33.84	6,180	\$5,933.13	\$0.00	\$0.00	\$237.66	\$41,669			
A8.3.4.2			Structural building demolition: Wood/misc. structures	10,959	m3	C.1.08	836.7	\$2.82	\$30,850.94	\$1.61	\$17,644	\$0.57	6,484	\$6,224.86	\$0.00	\$0.00	\$4.99	\$54,720			
A8.3.4.4			Other demolition: Utilidors, etc.	466	m3	C.1.07	46.1	\$3.65	\$1,701.64	\$2.09	\$973	\$0.74	358	\$343.34	\$0.00	\$0.00	\$6.48	\$3,018			
A8.3.5.1		Waste disposal	On-site disposal (demolition debris, etc.)	3,867	m3	R.007	175.3	\$1.95	\$7,528.19	\$3.40	\$13,146	\$1.22	4,902	\$4,705.86	\$0.00	\$0.00	\$6.56	\$25,380			
A8.3.5.2			Off-site disposal (re-usable equipment, etc.)	1	trips	C.7.07	8.0	\$346.78	\$346.78	\$429.22	\$429	\$113.33	118	\$113.33	\$0.00	\$0.00	\$889.33	\$889			
A8.3.6.1		Demolish foundations	Break in place concrete foundations	51	m3	C.1.01	4.1	\$2.33	\$119.29	\$9.40	\$481	\$2.48	132	\$126.81	\$0.00	\$0.00	\$14.22	\$727			
A8.4		<b>Explosives Plant and Storage Areas</b>																	\$30,166		
A8.4.1.1		Remove equipment	Small equipment: dismantle and prep for transport	37	hrs	C.1.13	149.3	\$164.14	\$6,128.00	\$87.08	\$3,251	\$14.53	565	\$542.38	\$0.00	\$0.00	\$265.75	\$9,921			
A8.4.2.1		Remove modular buildings	Dismantle and prep for transport	1	ea.	C.1.20	19.5	\$831.26	\$831.26	\$737.86	\$738	\$166.46	173	\$166.46	\$0.00	\$0.00	\$1,735.58	\$1,736			
A8.4.2.2			Transport structures off-site (Whitehorse)	1	ea.	C.7.04	8.0	\$343.01	\$343.01	\$309.18	\$309	\$113.33	118	\$113.33	\$0.00	\$0.00	\$765.52	\$766			
A8.4.3.1		Prepare for demolition	Remove hazardous materials/prep for transport offsite	4	hrs	C.1.22	16.0	\$155.59	\$622.35	\$97.38	\$390	\$26.93	112	\$107.71	\$0.00	\$0.00	\$279.90	\$1,120			
A8.4.3.2			Disconnect services	2	hrs	C.1.09	6.0	\$86.08	\$172.16	\$7.75	\$15	\$4.80	10	\$9.60	\$0.00	\$0.00	\$98.63	\$197			
A8.4.4.1		Demolition	Structural building demolition: Steel	47	tonnes	C.1.05	94.2	\$67.73	\$3,189.69	\$136.09	\$6,409	\$33.84	1,660	\$1,593.61	\$0.00	\$0.00	\$237.66	\$11,192			
A8.4.5.1		Waste disposal	On-site disposal (demolition debris, etc.)	103	m3	R.008	5.4	\$2.27	\$233.62	\$3.96	\$408	\$1.42	152	\$146.04	\$0.00	\$0.00	\$7.65	\$788			
A8.4.5.2			Off-site disposal (re-usable equipment, etc.)	5	trips	C.7.07	40.0	\$346.78	\$1,733.88	\$429.22	\$2,146	\$113.33	590	\$566.64	\$0.00	\$0.00	\$889.33	\$4,447			
A8.5		<b>Fuel Storage Area</b>																	\$113,164		
A8.5.1.1		Remove equipment/dismant	Small equipment: dismantle and prep for transport	24	hrs	C.1.13	96.0	\$164.14	\$3,939.43	\$87.08	\$2,090	\$14.53	363	\$348.67	\$0.00	\$0.00	\$265.75	\$6,378			
A8.5.1.2			Large equipment (crane req'd): dismantle and prep for transport	192	hrs	C.1.14	1,153.4	\$263.70	\$50,693.54	\$168.95	\$32,479	\$20.53	4,111	\$3,946.31	\$0.00	\$0.00	\$453.18	\$87,119			
A8.5.2.1		Prepare for demolition	Hazardous materials: Gather and prep for transport offsite	2	hrs	C.1.22	8.0	\$155.59	\$311.17	\$97.38	\$195	\$26.93	56	\$53.86	\$0.00	\$0.00	\$279.90	\$560			
A8.5.2.2			Disconnect services	8	hrs	C.1.09	24.0	\$86.08	\$688.64	\$7.75	\$62	\$4.80	40	\$38.40	\$0.00	\$0.00	\$98.63	\$789			
A8.5.2.3			Clean out tanks, pressure wash, remove sludge	10	hrs	C.1.04	10.3	\$34.72	\$356.69	\$17.70	\$182	\$2.00	21	\$20.55	\$0.00	\$0.00	\$54.42	\$559			
A8.5.3.1		Demolish structures	Misc. debris/scrap (tanks included in dismantling above)	75	m3	C.1.08	5.7	\$2.82	\$211.13	\$1.61	\$121	\$0.57	44	\$42.60	\$0.00	\$0.00	\$4.99	\$374			
A8.5.4.1		Remove secondary contain	Bedding Material: Load, haul dump bedding material to landfarm	623	Cm3	R.009	32.8	\$2.26	\$1,408.92	\$3.95	\$2,460	\$1.41	917	\$880.71	\$0.00	\$0.00	\$7.63	\$4,750			
A8.5.4.2			Cut and fold liner	1,747	m2	C.1.15	20.3	\$0.42	\$740.64	\$0.20	\$343	\$0.07	126	\$120.97	\$0.00	\$0.00	\$0.69	\$1,204			
A8.5.4.3			Regrade area to promote positive drainage	1,666	m2	C.2.11	16.7	\$0.43	\$722.16	\$1.29	\$2,146	\$0.35	612	\$587.76	\$0.00	\$0.00	\$2.07	\$3,456			
A8.5.5.1		Waste disposal	On-site disposal (demolition debris, etc.)	229	m3	R.009	12.1	\$2.26	\$518.73	\$3.95	\$906	\$1.41	338	\$324.26	\$0.00	\$0.00	\$7.63	\$1,749			
A8.5.5.2			Off-site disposal (re-usable equipment, etc.)	7	trips	C.7.07	56.0	\$346.78	\$2,427.44	\$429.22	\$3,005	\$113.33	826	\$793.30	\$0.00	\$0.00	\$889.33	\$6,225			
A8.6		<b>Mill Area</b>																	\$1,243,185		Excludes WTP
A8.6.1.1		Remove equipment	Small equipment: dismantle and prep for transport	379	hrs	C.1.13	1,515.0	\$164.14	\$62,167.87	\$87.08	\$32,982	\$14.53	5,732	\$5,502.37	\$0.00	\$0.00	\$265.75	\$100,652			
A8.6.1.2			Large equipment (crane req'd): dismantle and prep for transport	466	hrs	C.1.14	2,796.5	\$263.70	\$122,905.21	\$168.95	\$78,746	\$20.53	9,966	\$9,567.74	\$0.00	\$0.00	\$453.18	\$211,219			
A8.6.2.1		Prepare for demolition	Hazardous materials: Gather and prep for transport offsite	65	hrs	C.1.22	260.0	\$155.59	\$10,113.15	\$97.38	\$6,330	\$26.93	1,823	\$1,750.32	\$0.00	\$0.00	\$279.90	\$18,193			Off-site disposal included in 'Waste Disposal'
A8.6.2.6			Reagents: Disposal and tipping fees	1.0	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0			
A8.6.2.7			Decontaminate buildings: wash equipment/structures, etc.	38	hrs	C.1.04	37.8	\$34.72	\$1,311.88	\$17.70	\$669	\$2.00	79	\$75.58	\$0.00	\$0.00	\$54.42	\$2,056			
A8.6.2.8			Decontaminate buildings: Wash floors etc.	4,732	m2	C.1.03	40.8	\$0.30	\$1,414.68	\$0.15	\$721	\$0.02	85	\$81.50	\$0.00	\$0.00	\$0.47	\$2,217			
A8.6.3.1		Demolition	Structural building demolition: Steel	2,660	tonnes	C.1.05	5,319.1	\$67.73	\$180,139.34	\$136.09	\$361,944	\$33.84	93,750	\$89,999.96	\$0.00	\$0.00	\$237.66	\$632,083			
A8.6.3.2			Structural building demolition: Wood/misc. structures	960	m3	C.1.08	73.3	\$2.82	\$2,702.52	\$1.61	\$1,546	\$0.57	568	\$545.29	\$0.00	\$0.00	\$4.99	\$4,793			
A8.6.3.3			Other demolition: Steel	526	tonnes	C.1.05	1,052.7	\$67.73	\$35,649.79	\$136.09	\$71,629	\$33.84	18,553	\$17,811.10	\$0.00	\$0.00	\$237.66	\$125,090			
A8.6.3.4			Other demolition: concrete	602	m3	C.1.06	323.7	\$15.55	\$9,354.72	\$62.69	\$37,723	\$16.53	10,359	\$9,944.51	\$0.00	\$0.00	\$94.77	\$57,022			
A8.6.3.5			Other demolition: miscellaneous	244	m3	C.1.07	24.1	\$3.65	\$889.64	\$2.09	\$509	\$0.74	187	\$179.50	\$0.00	\$0.00	\$6.48	\$1,578			
A8.6.4.1		Waste disposal	On-site disposal (demolition debris, etc.)	5,985	m3	R.033	255.1	\$1.83	\$10,954.37	\$3.20	\$19,129	\$1.14	7,133	\$6,847.56	\$0.00	\$0.00	\$6.17	\$36,931			
A8.6.4.2			Off-site disposal (re-usable equipment, etc.)	33	trips	C.7.07	266.0	\$346.78	\$11,529.45	\$429.22	\$14,271	\$113.33	3,925	\$3,767.87	\$0.00	\$0.00	\$889	\$29,568			
A8.6.5.1		Demolish foundations	Break in place concrete foundations	1,532	m3	C.1.01	123.7	\$2.33	\$3,573.27	\$9.40	\$14,409	\$2.48	3,957	\$3,798.55	\$0.00	\$0.00	\$14.22	\$21,781			
A8.7		<b>Mill Valley Fill Extension (Stage 1 and 2)</b>																	\$27,640		
A8.7.1.1		Prepare for demolition	Hazardous materials: Gather and prep for transport offsite	8	hrs	C.1.22	30.0	\$155.59	\$1,166.90	\$97.38	\$730	\$26.93	210	\$201.96	\$0.00	\$0.00	\$279.90	\$2,099			
A8.7.1.2			Reagents: Disposal and tipping fees	1	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0			
A8.7.2.1		Demolish buildings	Structural building demolition: Wood/misc. structures (Reagent tent)	1,800	m3	C.1.08	137.4	\$2.82	\$5,06												

WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material		Activity Totals		Subtotals		Source / Comments	
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	WBS Level 1		
A9.2.1.2			Remove barges/Support Equipment prep for transport	2	ea.	C.1.23	52.8	\$1,178.20	\$2,356.40	\$17.32	\$35	\$28.80	60	\$57.60	\$0.00	\$0.00	\$1,224.33	\$2,449				
A9.2.2.1		Waste disposal	Transport pumps, barge and support equip. offsite (Whitehorse)	4.5	tonnes	C.7.02	1.8	\$17.15	\$77.18	\$15.46	\$70	\$5.67	27	\$25.50	\$0.00	\$0.00	\$38.28	\$172				
A9.3		Powerlines																\$63,160				
A9.3.1.1		Dismantle	Dismantle and collect powerlines	3.2	km	C.1.10	217.9	\$2,579.57	\$8,151.44	\$733.22	\$2,317	\$251.90	829	\$795.99	\$0.00	\$0.00	\$3,564.68	\$11,264				
A9.3.1.2			Remove powerpoles and load for transport off-site	60	ea.	C.1.11	548.6	\$414.04	\$24,842.65	\$85.43	\$5,126	\$18.29	1,143	\$1,097.14	\$0.00	\$0.00	\$517.76	\$31,065				
A9.3.1.3			Disconnect transformers and load for transport	4	ea.	C.1.12	93.3	\$872.46	\$3,489.86	\$247.99	\$992	\$85.20	355	\$340.78	\$0.00	\$0.00	\$1,205.65	\$4,823				
A9.3.2.1		Waste disposal	Transport powerlines, poles and transformers off-site	18	trips	C.7.07	144.0	\$346.78	\$6,241.98	\$429.22	\$7,726	\$113.33	2,125	\$2,039.90	\$0.00	\$0.00	\$889.33	\$16,008				
<b>A10</b>		<b>Water Detention Structures</b>																			<b>\$739,172</b>	
A10.1		W15 Sump																			\$1,026	
A10.1.1.1		Remove secondary container	Cut and fold liner	1,310	m2	C.1.15	15.2	\$0.42	\$555.32	\$0.20	\$257	\$0.07	94	\$90.70	\$0.00	\$0.00	\$0.69	\$903				
A10.1.1.2			Haul liner to landfill	20	Lm3	R.059	0.8	\$1.86	\$36.48	\$3.24	\$64	\$1.16	24	\$22.80	\$0.00	\$0.00	\$6.26	\$123				
A10.2		Mill Water Pond																			\$0	
A10.3		Sewage Lagoon (near IROD)																			\$22,249	
A10.3.2.1		Remove pond	Backfill pond	4,488	m3	R.001	141.4	\$1.36	\$6,085.16	\$2.70	\$12,129	\$0.90	4,203	\$4,035.32	\$0.00	\$0.00	\$4.96	\$22,249				
A10.4		Water Storage Pond Dam																			\$715,896	
A10.4.1.1		Water Management	Install pump and pump around system	4	hrs	C.4.14	16.0	\$117.62	\$470.48	\$22.69	\$91	\$6.80	28	\$27.20	\$0.00	\$0.00	\$147.11	\$588				
A10.4.1.2			Pump pond water to discharge	400,000	m3	C.4.12	146.8	\$0.01	\$5,095.45	\$0.05	\$21,929	\$0.01	3,058	\$2,935.56	\$0.00	\$0.00	\$0.07	\$29,960				
A10.4.1.3			Maintain pump around system during WSP closure activities	103	days	C.4.13	10.3	\$3.47	\$355.89	\$14.94	\$1,532	\$2.00	214	\$205.03	\$0.00	\$0.00	\$20.41	\$2,092				
A10.4.2.1		Breach dam	Granular zones/gen. fill: Load, haul, dump, spread in upstream North abutment	62,301	m3	R.001	1,963.4	\$1.36	\$84,472.81	\$2.70	\$168,372	\$0.90	58,351	\$56,017.38	\$0.00	\$0.00	\$4.96	\$308,862				
A10.4.2.2			Dam Core: Load, haul, dump in temporary stockpile	23,617	m3	R.001	744.3	\$1.36	\$32,021.27	\$2.70	\$63,825	\$0.90	22,119	\$21,234.62	\$0.00	\$0.00	\$4.96	\$117,081				
A10.4.2.3			Rip-rap: Sort and stockpile durable rip-rap for reuse	19,285	m3	R.001	607.8	\$1.36	\$26,148.62	\$2.70	\$52,120	\$0.90	18,063	\$17,340.22	\$0.00	\$0.00	\$4.96	\$95,609				
A10.4.2.4			Rip-rap: Load haul, dump unsuitable rip-rap in upstream North abutment	19,285	m3	R.001	607.8	\$1.36	\$26,148.62	\$2.70	\$52,120	\$0.90	18,063	\$17,340.22	\$0.00	\$0.00	\$4.96	\$95,609				
A10.4.3.1		Channel restoration	Excavate stream channel	5,584	m3	R.902	97.1	\$0.75	\$4,207.57	\$1.41	\$7,876	\$0.46	2,681	\$2,574.22	\$0.00	\$0.00	\$2.62	\$14,658				
A10.4.3.2			Bedding layer: Load haul, dump, place granular bedding layer along channel	726	m3	R.001	22.9	\$1.36	\$984.97	\$2.70	\$1,963	\$0.90	680	\$653.17	\$0.00	\$0.00	\$4.96	\$3,601				
A10.4.3.3			Rip-rap: Load, haul dump from temporary stockpile	964	m3	R.001	30.4	\$1.36	\$1,306.42	\$2.70	\$2,604	\$0.90	902	\$866.34	\$0.00	\$0.00	\$4.96	\$4,777				
A10.4.3.4			Rip-rap: place and secure	964	m3	R.904	10.5	\$0.47	\$454.19	\$0.92	\$884	\$0.32	325	\$311.83	\$0.00	\$0.00	\$1.71	\$1,650				
A10.4.4.1		Cover	Cover material: Load, haul, dump spread (1m)	6,975	m3	R.001	219.8	\$1.36	\$9,457.22	\$2.70	\$18,850	\$0.90	6,533	\$6,271.47	\$0.00	\$0.00	\$4.96	\$34,579				
A10.4.5.1		Revegetate	Seed/Fertilize: broadcast seeding	1.4	ha	C.6.01	46.2	\$1,005.46	\$1,402.62	\$397.11	\$554	\$232.94	338	\$324.96	\$986.00	\$1,375.47	\$2,621.52	\$3,657				Cover sourced from dam core material
A10.4.5.2			Tree seedling application (1,000 stems/ha)	1.4	ha	C.6.06	71.5	\$1,789.95	\$2,496.98	\$9.02	\$13	\$15.00	22	\$20.93	\$460.50	\$642.40	\$2,274.47	\$3,173				
<b>A11</b>		<b>Yards/Laydown Areas</b>																			<b>\$703,988</b>	
A11.1		Airstrip Area																			\$38,351	
A11.1.1.1		Re-grade	Re-grade slopes to be 3H:1V or flatter	0	hrs	C.2.13	0.0	\$43.35	\$0.00	\$195.11	\$0	\$67.01	0	\$0.00	\$0.00	\$0.00	\$305.46	\$0				
A11.1.1.2			Scarify surface	64,378	m2	C.2.16	0.0	\$0.03	\$2,184.55	\$0.06	\$3,549	\$0.02	1,144	\$1,098.24	\$0.00	\$0.00	\$0.11	\$6,832				
A11.1.2.1		Revegetate	Seed/Fertilize: broadcast seeding	6.4	ha	C.6.01	213.3	\$1,005.46	\$6,472.91	\$397.11	\$2,557	\$232.94	1,562	\$1,499.64	\$986.00	\$6,347.62	\$2,621.52	\$16,877				
A11.1.2.2			Tree seedling application (1,000 stems/ha)	6.4	ha	C.6.06	329.9	\$1,789.95	\$11,523.25	\$9.02	\$58	\$15.00	101	\$96.57	\$460.50	\$2,964.58	\$2,274.47	\$14,642				
A11.2		Airport Laydown Area																			\$12,675	
A11.2.1.1		Re-grade	Scarify surface	21,277	m2	C.2.16	0.0	\$0.03	\$722.00	\$0.06	\$1,173	\$0.02	378	\$362.97	\$0.00	\$0.00	\$0.11	\$2,258				
A11.2.2.1		Revegetate	Seed/Fertilize: broadcast seeding	2.1	ha	C.6.01	70.5	\$1,005.46	\$2,139.32	\$397.11	\$845	\$232.94	516	\$495.64	\$986.00	\$2,097.91	\$2,621.52	\$5,578				
A11.2.2.2			Tree seedling application (1,000 stems/ha)	2.1	ha	C.6.06	109.0	\$1,789.95	\$3,808.47	\$9.02	\$19	\$15.00	33	\$31.92	\$460.50	\$979.81	\$2,274.47	\$4,839				
A11.3		Camp Area																			\$106,867	
A11.3.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	7	hrs	C.2.13	6.9	\$43.35	\$299.02	\$195.11	\$1,346	\$67.01	481	\$462.24	\$0.00	\$0.00	\$305.46	\$2,107				
A11.3.1.2			Re-grade slopes to be 3H:1V or flatter	24	hrs	C.2.13	24.5	\$43.35	\$1,061.11	\$195.11	\$4,776	\$67.01	1,709	\$1,640.31	\$0.00	\$0.00	\$305.46	\$7,478				
A11.3.1.3			Scarify surfaces	20,626	m2	C.2.16	0.0	\$0.03	\$699.92	\$0.06	\$1,137	\$0.02	367	\$351.87	\$0.00	\$0.00	\$0.11	\$2,189				
A11.3.2.1		Cover	Flat area cover material: Load, haul, dump spread	10,313	Cm3	R.041	198.2	\$0.83	\$8,524.90	\$2.20	\$22,733	\$0.91	9,724	\$9,335.37	\$0.00	\$0.00	\$3.94	\$40,593				
A11.3.2.2			Slope area cover material: Load, haul, dump along crest	9,349	Cm3	R.042	157.2	\$0.72	\$6,754.61	\$1.89	\$17,715	\$0.82	7,990	\$7,670.53	\$0.00	\$0.00	\$3.44	\$32,140				
A11.3.2.3			Slope area cover material: Spread down slope	10	hrs	C.2.13	10.2	\$43.35	\$440.87	\$195.11	\$1,984	\$67.01	710	\$681.52	\$0.00	\$0.00	\$305.46	\$3,107				
A11.3.3.1		Revegetate	Seed/Fertilize: broadcast seeding	3.93	ha	C.6.01	130.3	\$1,005.46	\$3,953.95	\$397.11	\$1,562	\$232.94	954	\$916.05	\$986.00	\$3,877.42	\$2,621.52	\$10,309				
A11.3.3.2			Tree seedling application (1,000 stems/ha)	3.93	ha	C.6.06	201.5	\$1,789.95	\$7,038.93	\$9.02	\$35	\$15.00	61	\$58.99	\$460.50	\$1,810.90	\$2,274.47	\$8,944				
A11.4		Crusher Area																			\$66,100	
A11.4.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	9	hrs	C.2.13	9.0	\$43.35	\$390.90	\$195.11	\$1,759	\$67.01	629	\$604.27	\$0.00	\$0.00	\$305.46	\$2,755				
A11.4.2.1		Cover	Load, haul, dump spread 0.5 m overburden cover	13,482	m3	R.049	244.8	\$0.78	\$10,530.65	\$2.08	\$28,081	\$0.86	12,012	\$11,531.82	\$0.00	\$0.00	\$3.72	\$50,144				
A11.4.3.1		Revegetate	Seed/Fertilize: broadcast seeding	2.70	ha	C.6.01	89.3	\$1,005.46	\$2,711.13	\$397.11	\$1,071	\$232.94	654	\$628.11	\$986.00	\$2,658.65	\$2,621.52	\$7,069				
A11.4.3.2			Tree seedling application (1,000 stems/ha)	3	ha	C.6.06	138.2	\$1,789.95	\$4,826.42	\$9.02	\$24	\$15.00	42	\$40.45	\$460.50	\$1,241.69	\$2,274.47	\$6,133				
A11.5		Exploration Disturbances																			\$20,718	
A11.5.1.1		Ridgetop Area	Scarify surfaces	34,778	m2	C.2.16	0.0	\$0.03	\$1,180.13	\$0.06	\$1,917	\$0.02	618	\$593.29	\$0.00	\$0.00	\$0.11	\$3,691				
A11.5.1.2			Seed/Fertilize: broadcast seeding	3	ha	C.6.01	115.2	\$1,005.46	\$3,496.79	\$397.11	\$1,381	\$232.94	844	\$810.13	\$986.00	\$3,429.11	\$2,621.52	\$9,117				
A11.5.1.3			Tree seedling application (1,000 stems/ha)	3	ha	C.6.06	178.2	\$1,789.95	\$6,225.09	\$9.02	\$31	\$15.00	54	\$52.17	\$460.50	\$1,601.53	\$2,274.47	\$7,910				
A11.6		Explosives Plant and Storage Areas																			\$41,877	
A11.6.1.1		Re-grade	Flat areas: Re-grade to ensure positive drainage	30	hrs	C.2.13	29.6															

WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material		Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2	WBS Level 1	
A11.11.2.1		Revegetate	Seed/Fertilize: broadcast seeding	11.1	ha	C.6.01	366.5	\$1,005.46	\$11,123.13	\$397.11	\$4,393	\$232.94	2,684	\$2,576.99	\$986.00	\$10,907.83	\$2,621.52	\$29,001			
A11.11.2.2			Tree seeding application (1,000 stems/ha)	11.1	ha	C.6.06	567.0	\$1,789.95	\$19,801.68	\$9.02	\$100	\$15.00	173	\$165.94	\$460.50	\$5,094.38	\$2,274.47	\$25,162			
A11.12		<i>Pelly Laydown Area</i>																	\$137,020		
A11.12.1.1		Re-grade	Flat areas: Re-grade to form tertiary drainage catchments	107	hrs	C.2.13	107.4	\$43.35	\$4,655.75	\$195.11	\$20,956	\$67.01	7,497	\$7,197.08	\$0.00	\$0.00	\$305.46	\$32,808			
A11.12.2.1		Cover	Load, haul, dump spread 0.5 m overburden cover	25,855	m3	R.052	380.7	\$0.63	\$16,386.19	\$1.73	\$44,667	\$0.69	18,585	\$17,841.31	\$0.00	\$0.00	\$3.05	\$78,894			
A11.12.3.1		Revegetate	Seed/Fertilize: broadcast seeding	5.17	ha	C.6.01	171.3	\$1,005.46	\$5,199.24	\$397.11	\$2,053	\$232.94	1,255	\$1,204.55	\$986.00	\$5,098.61	\$2,621.52	\$13,556			
A11.12.3.2			Tree seeding application (1,000 stems/ha)	5.17	ha	C.6.06	265.0	\$1,789.95	\$9,255.83	\$9.02	\$47	\$15.00	81	\$77.57	\$460.50	\$2,381.25	\$2,274.47	\$11,761			
A11.13		<i>W15 Sump Area Laydown</i>																	\$32,883		
A11.13.1.1		Re-grade	Flat areas: Re-grade to ensure positive drainage	9	hrs	C.2.13	8.8	\$43.35	\$380.98	\$195.11	\$1,715	\$67.01	613	\$588.94	\$0.00	\$0.00	\$305.46	\$2,685			
A11.13.1.2			Slopes: Re-grade to 3H:1V	1	hrs	C.2.13	1.2	\$43.35	\$53.86	\$195.11	\$242	\$67.01	87	\$83.26	\$0.00	\$0.00	\$305.46	\$380			
A11.13.1.3			Scarify surface	9,484	m2	C.2.16	0.0	\$0.03	\$321.81	\$0.06	\$523	\$0.02	169	\$161.79	\$0.00	\$0.00	\$0.11	\$1,006			
A11.13.2.1		Cover	Load, haul, dump spread 0.5 m overburden cover	6,974	m3	R.056	106.1	\$0.65	\$4,565.96	\$1.78	\$12,446	\$0.71	5,179	\$4,971.43	\$0.00	\$0.00	\$3.15	\$21,984			
A11.13.3.1		Revegetate	Seed/Fertilize: broadcast seeding	1.39	ha	C.6.01	46.2	\$1,005.46	\$1,402.44	\$397.11	\$554	\$232.94	338	\$324.92	\$986.00	\$1,375.30	\$2,621.52	\$3,657			
A11.13.3.2			Tree seeding application (1,000 stems/ha)	1.39	ha	C.6.06	71.5	\$1,789.95	\$2,496.66	\$9.02	\$13	\$15.00	22	\$20.92	\$460.50	\$642.32	\$2,274.47	\$3,172			
<b>A12</b>		<b>Waste Disposal</b>																		<b>\$502,536</b>	
A12.1		<i>Excavate HC contaminated</i>	Complete testing for contaminated soils	37	test pits	C.3.03	18.5	\$21.74	\$804.34	\$3.49	\$129	\$2.92	112	\$107.89	\$200.00	\$7,400.00	\$228.14	\$8,441		\$61,130	
A12.1.1.1			Excavate and haul contaminated soils to on-site landfarm facility	554	m3	R.034	19.9	\$1.54	\$853.07	\$2.67	\$1,478	\$0.96	552	\$529.72	\$0.00	\$0.00	\$5.16	\$2,861			
A12.1.2.1		<i>Construct landfarm</i>	Existing Facility assumed to have sufficient capacity	0	m3													\$0			
A12.1.3.1		<i>Operate landfarm</i>	Aerate contaminated soils (mix)	12	event	C.3.04	270.0	\$976.58	\$11,719.01	\$931.77	\$11,181	\$333.60	4,170	\$4,003.20	\$0.00	\$0.00	\$2,241.95	\$26,903			
A12.1.3.2			Annual confirmation sampling	3	years	C.3.05	48.0	\$695.65	\$2,086.95	\$111.61	\$335	\$93.31	292	\$279.94	\$1,200.00	\$3,600.00	\$2,100.57	\$6,302			
A12.1.4.1		<i>Close landfarm</i>	Remove soils and collect liner	554	m3	R.001	17.5	\$1.36	\$751.29	\$2.70	\$1,497	\$0.90	519	\$498.21	\$0.00	\$0.00	\$4.96	\$2,747			
A12.1.4.2			Cut/fold liner and place into waste disposal container	4,265	m2	C.1.15	49.6	\$0.42	\$1,807.96	\$0.20	\$837	\$0.07	308	\$295.29	\$0.00	\$0.00	\$0.69	\$2,940			
A12.1.4.3			Regrade area	4,265	m2	C.2.11	42.7	\$0.43	\$1,848.75	\$1.29	\$5,494	\$0.35	1,567	\$1,504.69	\$0.00	\$0.00	\$2.07	\$8,848			
A12.1.4.4			Revegetation: Seed/Fertilizer: broadcast seeding	0.43	ha	C.6.01	14.1	\$1,005.46	\$428.83	\$397.11	\$169	\$232.94	103	\$99.35	\$986.00	\$420.53	\$2,621.52	\$1,118			
A12.1.4.5			Tree seeding application (1,000 stems/ha)	0.43	ha	C.6.06	21.9	\$1,789.95	\$763.41	\$9.02	\$4	\$15.00	7	\$6.40	\$460.50	\$196.40	\$2,274.47	\$970			
A12.2		<i>Metal contaminated soils</i>																		\$154,581	
A12.2.1.1		<i>Crusher area</i>	Delineate contaminated soil areas	197	test pits	C.3.01	98.5	\$21.74	\$4,282.59	\$3.49	\$687	\$2.92	598	\$574.45	\$260.00	\$51,220.00	\$288.14	\$56,764			
A12.2.1.2			Load, haul, dump contaminated soils to underground	2,949	m3	R.035	102.1	\$1.49	\$4,394.19	\$2.97	\$8,759	\$0.99	3,035	\$2,913.97	\$0.00	\$0.00	\$5.45	\$16,067			
A12.2.1.3			Complete confirmation testing	197	ea	C.3.02	32.8	\$7.27	\$1,431.83	\$1.25	\$246	\$0.00	0	\$0.00	\$13.00	\$2,561.00	\$21.52	\$4,239			
A12.2.2.1		<i>Mill area</i>	Delineate contaminated soil areas	198	test pits	C.3.01	99.0	\$21.74	\$4,304.33	\$3.49	\$691	\$2.92	601	\$577.37	\$260.00	\$51,480.00	\$288.14	\$57,052			
A12.2.2.2			Load, haul, dump contaminated soils to underground	2,973	m3	R.035	103.0	\$1.49	\$4,430.17	\$2.97	\$8,830	\$0.99	3,060	\$2,937.83	\$0.00	\$0.00	\$5.45	\$16,198			
A12.2.2.3			Complete confirmation testing	198	ea	C.3.02	33.0	\$7.27	\$1,439.10	\$1.25	\$248	\$0.00	0	\$0.00	\$13.00	\$2,574.00	\$21.52	\$4,261			
A12.3		<i>Solid Waste Landfill</i>																		\$213,770	
A12.3.1.1		<i>Construction landfill</i>	Place waste from site facilities	12,920	LCM	C.2.07	550.6	\$1.85	\$23,867.81	\$8.31	\$107,430	\$2.86	38,433	\$36,895.99	\$0.00	\$0.00	\$13.02	\$168,193			
A12.3.1.2			Place fill to minimize voids in the debris	3,371	m3	R.001	106.2	\$1.36	\$4,569.99	\$2.70	\$9,109	\$0.90	3,157	\$3,030.55	\$0.00	\$0.00	\$4.96	\$16,710			
A12.3.2.1		<i>Close landfill</i>	Soil Cover: Load haul, dump spread, compact (0.6m)	5,024	m3	R.002	190.0	\$1.57	\$7,911.01	\$2.89	\$14,536	\$0.99	5,196	\$4,988.33	\$0.00	\$0.00	\$5.46	\$27,436			
A12.3.2.2			Revegetation: Seed/Fertilizer: broadcast seeding	0.55	ha	C.6.01	18.1	\$1,005.46	\$548.93	\$397.11	\$217	\$232.94	132	\$127.18	\$986.00	\$538.31	\$2,621.52	\$1,431			
A12.4		<i>Hazardous Material Off-Site Disposal</i>																		\$73,055	
A12.4.1.1		<i>Hazardous Waste</i>	From Building Demo: Transport off-site for disposal	2	trip	C.7.04	14.5	\$343.01	\$620.06	\$309.18	\$559	\$113.33	213	\$204.86	\$0.00	\$0.00	\$765.52	\$1,384			
A12.4.1.2			Hazardous materials: Disposal and Tipping fees.	1	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$63,000	\$63,000			
A12.4.2.1		<i>Reagents</i>	Reagents: Transport to Whitehorse	25	hrs	C.1.22	99.3	\$155.59	\$3,863.74	\$97.38	\$2,418	\$26.93	697	\$668.71	\$0.00	\$0.00	\$279.90	\$6,951			
A12.4.2.2			Reagents: Disposal and tipping fees	2.2	trips	C.7.04	18.0	\$343.01	\$771.00	\$309.18	\$695	\$113.33	265	\$254.73	\$0.00	\$0.00	\$765.52	\$1,721			
<b>A13</b>		<b>Surface Water Conveyance</b>																		<b>\$2,071,653</b>	
A13.1		<i>W-15 to Main Pit (Ditch A3)</i>																		\$167,817	
A13.1.1.1		<i>Excavate channel</i>	Load, haul, dump locally	40,300	m3	R.902	700.5	\$0.75	\$30,364.10	\$1.41	\$56,839	\$0.46	19,351	\$18,576.93	\$0.00	\$0.00	\$2.62	\$105,780			
A13.1.2.1		<i>Place channel materials</i>	Bedding layer: Screen and stockpile	1,872	m3	C.2.01	38.1	\$0.94	\$1,751.95	\$2.08	\$3,898	\$0.44	860	\$825.55	\$0.00	\$0.00	\$3.46	\$6,475			
A13.1.2.2			Bedding layer: Load, haul, dump and place	1,872	m3	R.016	69.6	\$1.60	\$2,996.40	\$3.45	\$6,464	\$1.10	2,149	\$2,062.79	\$0.00	\$0.00	\$6.15	\$11,523			
A13.1.2.3			Rip-rap (angular, high quality): Screen and stockpile	2,700	m3	C.2.15	0.0	\$2.48	\$6,689.06	\$6.09	\$16,447	\$1.86	5,227	\$5,018.29	\$0.00	\$0.00	\$10.43	\$28,155			
A13.1.2.4			Rip-rap: Load, haul, dump	2,700	m3	R.015	71.6	\$1.14	\$3,079.56	\$2.27	\$6,138	\$0.76	2,127	\$2,042.18	\$0.00	\$0.00	\$4.17	\$11,260			
A13.1.2.5			Rip-rap: Place and secure	2,700	m3	R.904	29.4	\$0.47	\$1,272.97	\$0.92	\$2,477	\$0.32	910	\$873.96	\$0.00	\$0.00	\$1.71	\$4,624			
A13.2		<i>W-35 to Area 2 Pit (Ditch B)</i>																		\$89,892	
A13.2.1.1		<i>Excavate channel</i>	Load, haul, dump locally	3,800	m3	R.902	66.1	\$0.75	\$2,863.23	\$1.41	\$5,360	\$0.46	1,825	\$1,751.74	\$0.00	\$0.00	\$2.62	\$9,975			
A13.2.2.1		<i>Place channel materials</i>	Surface preparation: remove sharp objects, place fill as required	2,616	m2	C.2.18	89.4	\$1.28	\$3,345.38	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$1.28	\$3,345			
A13.2.2.2			BGM Liner: Supply and install	2,616	m2	C.5.01	124.0	\$1.88	\$4,930.27	\$0.80	\$2,091	\$0.28	769	\$737.84	\$17.86	\$46,705.04	\$20.82	\$54,464			
A13.2.2.3			Bedding layer: Screen and stockpile	646	m3	C.2.01	13.1	\$0.94	\$604.56	\$2.08	\$1,345	\$0.44	297	\$284.88	\$0.00	\$0.00	\$3.46	\$2,235			
A13.2.2.4			Bedding layer: Load, haul, dump and place	646	m3	R.018	27.3	\$1.82	\$1,176.49	\$3.93	\$2,538	\$1.25	844	\$809.92	\$0.00	\$0.00	\$7.00	\$4,524			
A13.2.2.5			Rip-rap (angular, high quality): Screen and stockpile	912	m3	C.2.15	0.0	\$2.48	\$2,258.42	\$6.09	\$5,553	\$1.86	1,765	\$1,694.32	\$0.00	\$0.00	\$10.43				



WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment			Fuel		Material		Activity Totals		Subtotals		Source / Comments
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Cost	
A13.5.3.1		Stilling basin/Energy Dissipation	Excavate basin (spoil locally)	645	m3	R.902	11.2	\$0.75	\$486.20	\$1.41	\$910	\$0.46	310	\$297.46	\$0.00	\$0.00	\$2.62	\$1,694			
A13.5.3.2			Geotextile: Supply and place	540	m2	C.5.07	7.7	\$0.53	\$288.66	\$0.07	\$36	\$0.06	31	\$29.86	\$2.12	\$1,142.80	\$2.77	\$1,497			
A13.5.3.3			Bedding layer: Screen and stockpile	131	m3	C.2.01	2.7	\$0.94	\$122.14	\$2.08	\$272	\$0.44	60	\$57.55	\$0.00	\$0.00	\$3.46	\$451			
A13.5.3.4			Bedding layer: Load, haul, dump and place	131	m3	R.024	7.7	\$2.53	\$329.77	\$5.15	\$672	\$1.69	229	\$220.12	\$0.00	\$0.00	\$9.36	\$1,222			
A13.5.3.5			Rip-rap (at inlet and outlet): Screen and stockpile	75	m3	C.2.15	0.0	\$2.48	\$185.77	\$6.09	\$457	\$1.86	145	\$139.37	\$0.00	\$0.00	\$10.43	\$782			
A13.5.3.6			Rip-rap (at inlet and outlet): Load, haul, dump	75	m3	R.023	3.2	\$1.81	\$135.89	\$3.45	\$259	\$1.17	91	\$87.84	\$0.00	\$0.00	\$6.43	\$482			
A13.5.3.7			Rip-rap (at inlet and outlet): Place and secure	75	m3	R.904	0.8	\$0.47	\$35.35	\$0.92	\$69	\$0.32	25	\$24.27	\$0.00	\$0.00	\$1.71	\$128			
A13.6	Minto Creek Wetland By-Pass Channel																	\$202,344			
A13.6.1.1		Excavate channel	Load, haul, dump locally	19,986	m3	R.902	347.4	\$0.75	\$15,058.23	\$1.41	\$28,188	\$0.46	9,597	\$9,212.71	\$0.00	\$0.00	\$2.62	\$52,458			
A13.6.2.1		Place channel materials	Geotextile: Supply and place	12,402	m2	C.5.08	352.7	\$1.07	\$13,257.86	\$0.13	\$1,640	\$0.11	1,428	\$1,371.19	\$2.12	\$26,243.29	\$3.43	\$42,512			
A13.6.2.2			Bedding layer: Screen and stockpile	3,161	m3	C.2.01	64.3	\$0.94	\$2,957.64	\$2.08	\$6,580	\$0.44	1,452	\$1,393.69	\$0.00	\$0.00	\$3.46	\$10,932			
A13.6.2.3			Bedding layer: Load, haul, dump and place	3,161	m3	R.001	99.6	\$1.36	\$4,286.02	\$2.70	\$8,543	\$0.90	2,961	\$2,842.24	\$0.00	\$0.00	\$4.96	\$15,671			Assumes WSP fill can be re-used
A13.6.2.4			Rip-rap (angular, high quality): Screen and stockpile	4,725	m3	C.2.15	0.0	\$2.48	\$11,702.71	\$6.09	\$28,775	\$1.86	9,145	\$8,779.64	\$0.00	\$0.00	\$10.43	\$49,258			
A13.6.2.5			Rip-rap: Load, haul, dump	4,725	m3	R.001	148.9	\$1.36	\$6,405.95	\$2.70	\$12,768	\$0.90	4,425	\$4,248.05	\$0.00	\$0.00	\$4.96	\$23,422			Assumes WSP rip-rap can be re-used
A13.6.2.6			Rip-rap: Place and secure	4,725	m3	R.904	51.4	\$0.47	\$2,227.10	\$0.92	\$4,334	\$0.32	1,593	\$1,529.02	\$0.00	\$0.00	\$1.71	\$8,090			
A13.7	Secondary Catchment Channels																	\$717,240			
A13.7.1.1		Southwest Dump	Excavate mild-graded channels (good access), spoil locally	10,787	Bm3	R.902	187.5	\$0.75	\$8,127.66	\$1.41	\$15,214	\$0.46	5,180	\$4,972.55	\$0.00	\$0.00	\$2.62	\$28,314			
A13.7.1.2			Excavate steep-graded channels (poor access), spoil locally	6,640	Bm3	R.903	131.0	\$0.86	\$5,679.08	\$1.60	\$10,631	\$0.52	3,619	\$3,474.49	\$0.00	\$0.00	\$2.98	\$19,784			
A13.7.1.3			Geotextile: Supply and place	25,206	m2	C.5.07	358.4	\$0.53	\$13,472.20	\$0.07	\$1,667	\$0.06	1,451	\$1,393.36	\$2.12	\$53,335.12	\$2.77	\$69,867			
A13.7.1.4			Bedding layer: Screen and stockpile	2,054	Cm3	C.2.01	41.8	\$0.94	\$1,922.03	\$2.08	\$4,276	\$0.44	943	\$905.70	\$0.00	\$0.00	\$3.46	\$7,104			
A13.7.1.5			Bedding layer: Load, haul, dump and place in steep areas	2,054	Cm3	R.028	72.2	\$1.51	\$3,102.18	\$2.93	\$6,021	\$0.99	2,111	\$2,026.92	\$0.00	\$0.00	\$5.43	\$11,151			
A13.7.1.6			Rip-rap (angular, high quality): Screen and stockpile	6,806	Cm3	C.2.15	0.0	\$2.48	\$16,859.25	\$6.09	\$41,455	\$1.86	13,175	\$12,648.20	\$0.00	\$0.00	\$10.43	\$70,962			
A13.7.1.7			Rip-rap: Load, haul, dump	6,806	m3	R.027	223.5	\$1.41	\$9,616.00	\$2.82	\$19,167	\$0.94	6,642	\$6,376.76	\$0.00	\$0.00	\$5.17	\$35,159			
A13.7.1.8			Rip-rap: Place in mild-graded channels (good access)	3,787	m3	R.904	41.2	\$0.47	\$1,785.25	\$0.92	\$3,474	\$0.32	1,277	\$1,225.66	\$0.00	\$0.00	\$1.71	\$6,485			
A13.7.1.9			Rip-rap: Place in steep-graded channels (poor access)	3,019	m3	R.905	74.5	\$1.07	\$3,231.01	\$2.00	\$6,048	\$0.65	2,059	\$1,976.75	\$0.00	\$0.00	\$3.73	\$11,256			
A13.7.2.1		Main Waste Dump	Excavate mild-graded channels (good access), spoil locally	6,477	Bm3	R.902	112.6	\$0.75	\$4,879.85	\$1.41	\$9,135	\$0.46	3,110	\$2,985.52	\$0.00	\$0.00	\$2.62	\$17,000			
A13.7.2.2			Excavate steep-graded channels (poor access), spoil locally	3,986	Bm3	R.903	78.6	\$0.86	\$3,408.84	\$1.60	\$6,381	\$0.52	2,172	\$2,085.55	\$0.00	\$0.00	\$2.98	\$11,875			
A13.7.2.3			Geotextile: Supply and place	15,132	m2	C.5.07	215.1	\$0.53	\$8,087.98	\$0.07	\$1,000	\$0.06	871	\$836.50	\$2.12	\$32,019.54	\$2.77	\$41,945			
A13.7.2.4			Bedding layer: Screen and stockpile	1,233	Cm3	C.2.01	25.1	\$0.94	\$1,153.69	\$2.08	\$2,567	\$0.44	566	\$543.64	\$0.00	\$0.00	\$3.46	\$4,264			
A13.7.2.5			Bedding layer: Load, haul, dump and place in steep areas	1,233	Cm3	R.026	34.8	\$1.22	\$1,499.66	\$2.52	\$3,106	\$0.82	1,059	\$1,016.39	\$0.00	\$0.00	\$4.56	\$5,622			
A13.7.2.6			Rip-rap (angular, high quality): Screen and stockpile	4,086	Cm3	C.2.15	0.0	\$2.48	\$10,121.14	\$6.09	\$24,887	\$1.86	7,909	\$7,593.11	\$0.00	\$0.00	\$10.43	\$42,601			
A13.7.2.7			Rip-rap: Load, haul, dump	4,086	m3	R.025	101.4	\$1.07	\$4,368.25	\$2.21	\$9,048	\$0.72	3,084	\$2,960.56	\$0.00	\$0.00	\$4.01	\$16,377			
A13.7.2.8			Rip-rap: Place in mild-graded channels (good access)	2,274	m3	R.904	24.7	\$0.47	\$1,071.86	\$0.92	\$2,086	\$0.32	767	\$735.89	\$0.00	\$0.00	\$1.71	\$3,894			
A13.7.2.9			Rip-rap: Place in steep-graded channels (poor access)	1,812	m3	R.905	44.7	\$1.07	\$1,939.40	\$2.00	\$3,630	\$0.65	1,236	\$1,186.53	\$0.00	\$0.00	\$3.73	\$6,756			
A13.7.3.1		Reclamation Overburden Dump	Excavate mild-graded channels (good access), spoil locally	4,886	Bm3	R.902	84.9	\$0.75	\$3,681.50	\$1.41	\$6,891	\$0.46	2,346	\$2,252.36	\$0.00	\$0.00	\$2.62	\$12,825			
A13.7.3.2			Excavate steep-graded channels (poor access), spoil locally	3,007	Bm3	R.903	59.3	\$0.86	\$2,571.73	\$1.60	\$4,814	\$0.52	1,639	\$1,573.40	\$0.00	\$0.00	\$2.98	\$8,959			
A13.7.3.3			Geotextile: Supply and place	11,416	m2	C.5.07	162.3	\$0.53	\$6,101.82	\$0.07	\$755	\$0.06	657	\$631.08	\$2.12	\$24,156.52	\$2.77	\$31,644			
A13.7.3.4			Bedding layer: Screen and stockpile	930	Cm3	C.2.01	18.9	\$0.94	\$870.38	\$2.08	\$1,936	\$0.44	427	\$410.14	\$0.00	\$0.00	\$3.46	\$3,217			
A13.7.3.5			Bedding layer: Load, haul, dump and place in steep areas	930	Cm3	R.030	34.7	\$1.60	\$1,491.64	\$3.20	\$2,973	\$1.06	1,030	\$989.17	\$0.00	\$0.00	\$5.86	\$5,454			
A13.7.3.6			Rip-rap (angular, high quality): Screen and stockpile	3,083	Cm3	C.2.15	0.0	\$2.48	\$7,635.69	\$6.09	\$18,775	\$1.86	5,967	\$5,728.47	\$0.00	\$0.00	\$10.43	\$32,139			
A13.7.3.7			Rip-rap: Load, haul, dump	3,083	m3	R.029	97.0	\$1.35	\$4,171.85	\$2.70	\$8,315	\$0.90	2,882	\$2,766.52	\$0.00	\$0.00	\$4.95	\$15,254			
A13.7.3.8			Rip-rap: Place in mild-graded channels (good access)	1,715	m3	R.904	18.7	\$0.47	\$808.64	\$0.92	\$1,574	\$0.32	578	\$555.18	\$0.00	\$0.00	\$1.71	\$2,937			
A13.7.3.9			Rip-rap: Place in steep-graded channels (poor access)	1,367	m3	R.905	33.8	\$1.07	\$1,463.14	\$2.00	\$2,739	\$0.65	932	\$895.16	\$0.00	\$0.00	\$3.73	\$5,097			
A13.7.4.1		DSTSF & MVFE	Excavate mild-graded channels (good access), spoil locally	7,378	Bm3	R.902	128.3	\$0.75	\$5,559.32	\$1.41	\$10,406	\$0.46	3,543	\$3,401.22	\$0.00	\$0.00	\$2.62	\$19,367			
A13.7.4.2			Excavate steep-graded channels (poor access), spoil locally	4,541	Bm3	R.903	89.6	\$0.86	\$3,883.49	\$1.60	\$7,270	\$0.52	2,475	\$2,375.94	\$0.00	\$0.00	\$2.98	\$13,529			
A13.7.4.3			Geotextile: Supply and place	17,239	m2	C.5.07	245.1	\$0.53	\$9,214.16	\$0.07	\$1,140	\$0.06	993	\$952.97	\$2.12	\$36,477.96	\$2.77	\$47,785			
A13.7.4.4			Bedding layer: Screen and stockpile	1,405	Cm3	C.2.01	28.6	\$0.94	\$1,314.33	\$2.08	\$2,924	\$0.44	645	\$619.34	\$0.00	\$0.00	\$3.46	\$4,858			
A13.7.4.5			Bedding layer: Load, haul, dump and place in steep areas	1,405	Cm3	R.024	82.5	\$2.53	\$3,548.72	\$5.15	\$7,233	\$1.69	2,467	\$2,368.79	\$0.00	\$0.00	\$9.36	\$13,151			
A13.7.4.6			Rip-rap (angular, high quality): Screen and stockpile	4,655	Cm3	C.2.15	0.0	\$2.48	\$11,530.41	\$6.09	\$28,352	\$1.86	9,011	\$8,650.38	\$0.00	\$0.00	\$10.43	\$48,533			
A13.7.4.7			Rip-rap: Load, haul, dump	4,655	m3	R.023	196.3	\$1.81	\$8,434.03	\$3.45	\$16,056	\$1.17	5,679	\$5,451.80	\$0.00	\$0.00	\$6.43	\$29,942			
A13.7.4.8			Rip-rap: Place in mild-graded channels (good access)	2,590	m3	R.904	28.2	\$0.47	\$1,221.11	\$0.92	\$2,376	\$0.32	873	\$838.35	\$0.00	\$0.00	\$1.71	\$4,436			
A13.7.4.9			Rip-rap: Place in steep-graded channels (poor access)	2,065	m3	R.905	51.0	\$1.07	\$2,209.44	\$2.00	\$4,136	\$0.65	1,408	\$1,351.75	\$0.00	\$0.00	\$3.73	\$7,697			
A13.8	Tailings Diversion Ditch																	\$348,393			
A13.8.1.2		Regrade	Slopes: Re-grade to 3H:1V	28	hrs	C.2.13	28	\$43.35	\$1,197	\$195.11	\$5,388	\$67.01	1,928	\$1,850	\$0.00	\$0	\$305.46	\$8,435			
A13.8.2.1		Cover	Flat area cover material: Load, haul, dump spread	25,182	Cm3	R.057	562.3	\$0.96	\$24,183	\$2.56	\$64,487	\$									



WBS	Facil	Task	Activity	Qty	Units	Cost Code	Labour			Equipment		Fuel		Material		Activity Totals		Subtotals		Source / Comments		
							Total Mhrs	Unit Rate	Cost	Unit Rate	Cost	Unit Rate	Consumed (L)	Cost	Unit Rate	Cost	Unit Rate	Cost	WBS Level 2		WBS Level 1	
A14.2.1.2			Large equipment (crane req'd): dismantle and prep for transport	29	hrs	C.1.14	175.7	\$263.70	\$7,722.69	\$168.95	\$4,948	\$20.53	626	\$601.18	\$0.00	\$0.00	\$453.18	\$13,272				
A14.2.2.1		Prepare for demolition	Reagents: Load for transport	0	hrs	C.1.22	0.0	\$155.59	\$0.00	\$97.38	\$0	\$26.93	0	\$0.00	\$0.00	\$0.00	\$279.90	\$0				
A14.2.2.2			Reagents: Transport to Whitehorse	0.0	trips	C.7.04	0.0	\$343.01	\$0.00	\$309.18	\$0	\$113.33	0	\$0.00	\$0.00	\$0.00	\$765.52	\$0				
A14.2.2.3			Reagents: Disposal and tipping fees	1.0	ls	n/a	0.0	\$0.00	\$0.00	\$0.00	\$0	\$0.00	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0				
A14.2.3.1		Demolition	Structural building demolition	163	tonnes	C.1.05	325.0	\$67.73	\$11,007.90	\$136.09	\$22,118	\$33.84	5,729	\$5,499.69	\$0.00	\$0.00	\$237.66	\$38,625				
A14.2.3.2			Other demolition: miscellaneous	15	m3	C.1.07	1.5	\$3.65	\$54.78	\$2.09	\$31	\$0.74	12	\$11.05	\$0.00	\$0.00	\$6.48	\$97				
A14.2.4.1		Waste disposal	Off-site disposal (re-usable equipment, etc.)	3	trips	C.7.07	27.1	\$346.78	\$1,174.13	\$429.22	\$1,453	\$113.33	400	\$383.71	\$0.00	\$0.00	\$889	\$3,011				
<b>Subtotal Direct Costs - Active Closure</b>							<b>67,774</b>		<b>\$2,780,713</b>		<b>\$3,957,730</b>			<b>\$1,305,907</b>		<b>\$1,651,278</b>			<b>\$9,758,628</b>			
<b>INDIRECT COSTS</b>																						
<b>B1 Mobilization-Demobilization</b>																						
B1.1		Mobilization	Year 0	1	LS												\$152,605	\$152,605.16				
B1.2		Demobilization	Year 3 (end of Active Closure)	1	LS												\$136,116	\$136,116.00				
B1.4		Demobilization	End of Passive closure	1	LS												\$16,489	\$16,489.16				
<b>B2 Transportation Costs</b>																						
B2.1.1		Barge Operations		15	month												\$10,000	\$150,000				
		Staffing Bus trips during barge operation period		60	ea (one per week)												\$678	\$40,656			Turnaround labour costs included in labour build-up	
B2.2.2		Air transport and airstrip operations		72	flights												\$3,000	\$216,000			Three flights per week	
<b>B3 Site/Road Maintenance</b>																						
B3.1		Road Maintenance																	\$682,358			
B3.1.1		Water Truck	Assume needed 150 hrs per month	21	month												\$12,159	\$255,344				
B3.1.2		Grader	Assume needed 150 hrs per month (16H + Operator)	21	month												\$20,334	\$427,015				
B3.2		Soil Erosion																	\$60,637			
B3.2.1		Erosion protection allowance	Silt fencing: supply, install remove at strategic locations	7023.7	m	C.2.17	283.5	\$3.15	\$22,133.92	\$1.70	\$11,961	\$0.68	4,941	\$4,743.08	\$0.91	\$6,358.42	\$6.43	\$45,197				
B3.2.2			Supply and install erosion control matting	10000	m2	C.2.09	175.4	\$0.65	\$6,468.99	\$0.03	\$317	\$0.05	548	\$526.32	\$0.81	\$8,128.20	\$1.54	\$15,440				
<b>B4 Construction Support</b>																						
B4.1		Field Support Staff																	\$3,198,878			
B4.1.1		Mine Manager		21	month				( 360 ) site working hours per month								\$23,366	\$490,685			Turnaround labour costs included in labour build-up	
B4.1.2		Office/Camp manager		21	month				( 360 ) site working hours per month								\$22,227	\$466,773				
B4.1.3		Security/Administrative Assistant		21	month				( 360 ) site working hours per month								\$16,214	\$340,496				
B4.1.4		Foreman		21	month				( 360 ) site working hours per month								\$17,349	\$364,320				
B4.1.5		Mechanic		21	month				( 360 ) site working hours per month								\$17,349	\$364,320				
B4.1.6		Surveyor		21	month				( 360 ) site working hours per month								\$17,349	\$364,320				
B4.1.7		Engineering technician	Material & QA/QC testing	10.5	month				( 360 ) site working hours per month								\$42,120	\$442,260			Assumed needed 1/2 of time	
B4.1.8		Medic/H&S supervisor		21	month				( 360 ) site working hours per month								\$17,414	\$365,703				
B4.2		Field support Vehicles																	\$774,669			
B4.2.1		Pick-up trucks (4 required)		84	month												\$4,518	\$379,500				
B4.2.2		Fuel truck		21	month												\$5,121	\$107,540				
B4.2.3		Mechanic service vehicle		21	month												\$6,919	\$145,293				
B4.2.4		Emergency transport vehicle		21	month												\$4,519	\$94,901				
B4.2.5		Passenger bus		21	month												\$2,259	\$47,436				
B4.3		Field Support Equipment/Supplies							2 # of Units										\$858,959			
B4.3.1		Light Towers		21	month												\$3,894	\$81,764				
B4.3.2		Material/Laboratory testing allowance		21	month												\$1,000	\$21,000				
B4.4		Construction, Environmental, and H&S Management Plans		1	LS												\$25,000	\$25,000				
B4.5		Office supplies		21	month												\$1,000	\$21,000				
B4.6		Communications		21	month												\$1,000	\$21,000				
B4.7		Misc. supplies		21	month												\$500	\$10,500				
B4.8		Camp costs	Includes catering and housekeeping	6,777	man-day												\$80	\$542,195				
B4.9		Power and heat		21	month												\$6,500	\$136,500				
<b>B5 QA and Project Management</b>																						
B5.1		Project Manager		21	month				( 160 ) site working hours per month								\$9,879	\$207,455				
B5.2		Design Engineer		21	month				( 360 ) site working hours per month								\$54,000	\$1,134,000				
B5.3		Environmental Monitor		21	month				( 360 ) site working hours per month								\$15,699	\$329,684				
B5.4		Engineering, Design, and Construction plans (included in Planning and Permitting Costs)															\$0.00	\$0				
B5.5		Field support vehicles (2 vehicles)		42	month												\$4,518	\$189,750				
<b>Subtotal Indirect Costs - Active Closure</b>																			<b>\$8,148,257</b>			
<b>CLOSURE IMPLEMENTATION COSTS - TOTAL</b>																					<b>\$17,906,885</b>	

**Worksheet 10 - EOM Estimate - Schedule Details**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**A: Year 0 Site Access Schedule**

Stage	Year	Flight Months	Barge Months	Total Months	Month												Comments/Notes
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Interim Care		0	0	0													
<b>SUB-TOTAL INTERIM CARE</b>		<b>0</b>	<b>0</b>	<b>0</b>													
Active Closure	1	2	5	7				F	F	B	B	B	B	B			
Active Closure	2	2	5	7				F	F	B	B	B	B	B			
Active Closure	3	2	5	7				F	F	B	B	B	B	B			
<b>SUB-TOTAL ACTIVE CLOSURE</b>		<b>6</b>	<b>15</b>	<b>21</b>													
Post-Closure 1	1	2	3	5				F	F	B	B	B					
<b>SUB-TOTAL POST-CLOSURE 1</b>		<b>2</b>	<b>3</b>	<b>5</b>													
Post-Closure 2	1	0	1	1						B							
<b>SUB-TOTAL POST-CLOSURE 2</b>		<b>0</b>	<b>1</b>	<b>1</b>													

**B: Annual C&M Staffing Schedule - Interim Operations**

#	Role	Months Required	Month												Comments/Notes		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
<b>Months Active at Site</b>			<b>0</b>				0	0	0	0	0	0	0	0	0	0	
<b>Administration/Office</b>																	
1	Mine Manager	0															
2	Office/Camp Mgr	0															
3	Payroll/Accounting/HR	0															
<b>Water Treatment/Environmental Staffing</b>																	
1	Warehouse/Water Treatment Operator	0															
2	Environmental Manager	0															
3	Environmental Technician	0															
<b>Operations</b>																	
4	Barge Operator	0															
5	Equipment operators	0															
6	HD Mechanic	0															
7	Tradesmen	0															
8	Labour/Helpers	0															
<b>Camp/Support</b>																	
1	Cooks/Housecleaning etc.	0															
<b>Other</b>																	
1	Visitors	0															
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Annual man-days:</b>			<b>0</b>														

**Notes:**  
 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)  
 2. Orange highlighted cells are used for camp-man day calculations only.

**C: Annual C&M Staffing Schedule - During Active Phase**

#	Role	Months Required	Month												Comments/Notes		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
<b>Months Active at Site</b>			<b>7</b>				1	1	1	1	1	1	1				
<b>Water Treatment/Environmental Staffing</b>																	
1	Warehouse/Water Treatment Operator	5					1.0	1.0	1.0	1.0	1.0						
2	Environmental Manager	4					1.0	0.5	0.5	0.5	0.5	0.5	0.5				
3	Environmental Technician	4					1.0	0.5	0.5	0.5	0.5	0.5	0.5				
<b>TOTAL</b>		<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	
<b>Annual man-days:</b>			<b>390</b>														

**Notes:**  
 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)

**D: Annual C&M Staffing Schedule - Post Closure 1**

#	Role	Months Required	Month												Comments/Notes		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
<b>Months Active at Site</b>			<b>5</b>				1	1	1	1	1						
<b>Administration/Office</b>																	
1	Mine Manager	3					0.5	0.5	0.5	0.5	0.5						
2	Office/Camp Mgr	3					1.0	0.5	0.5	0.5	0.5						
3	Payroll/Accounting/HR	1					0.25	0.25	0.25	0.25	0.25						
<b>Water Treatment/Environmental Staffing</b>																	
1	Passive treatment specialist	2					0.5	0.5	0.3	0.3	0.3						
2	Environmental Manager	3					0.5	0.5	0.5	0.5	0.5						
3	Environmental Technician	3					0.5	0.5	0.5	0.5	0.5						
<b>Operations</b>																	

4	Barge Operator	6						2.0	2.0	2.0						
5	Equipment operators	10					2.0	3.0	1.5	1.5	1.5					
6	HD Mechanic	2					1.0	0.25	0.25	0.25	0.25					
7	Tradesmen	2					1.0	0.25	0.25	0.25	0.25					
8	Labour/Helpers	2					1.0	0.25	0.25	0.25	0.5					
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0					0.0	0.0	0.0	0.0	0.0					Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	1					0.25				0.25					
<b>TOTAL</b>		<b>36</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Annual man-days:</b>		<b>1,073</b>														

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

**E: Annual C&M Staffing Schedule - Post Closure 2**

#	Role	Months Required	Month												Comments/Notes	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<b>Months Active at Site</b>		<b>1</b>								1						
<b>Administration/Office</b>																
1	Mine Manager	1								0.5						
2	Office/Camp Mgr	0								0.0						
3	Payroll/Accounting/HR	0								0.0						
<b>Water Treatment/Environmental Staffing</b>																
1	Passive Treatment Scientist	1								0.5						
2	Environmental Manager	0														
3	Environmental Technician	0														
<b>Operations</b>																
4	Barge Operator	1								1.0						
5	Equipment operators	3								3.0						
6	HD Mechanic	1								0.50						
7	Tradesmen	0														
8	Labour/Helpers	0								0.25						
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0								0.0						Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	0								0.25						
<b>TOTAL</b>		<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Annual man-days:</b>		<b>180</b>														

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

**F: Annual C&M Staffing Schedule - Long-term perpetual maintenance year**

#	Role	Months Required	Month												Comments/Notes	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<b>Months Active at Site</b>		<b>1</b>									1					
<b>Administration/Office</b>																
1	Project Manager/Foreman	1									1.0					
<b>Water Treatment/Engineering Staffing</b>																
1	Passive Treatment Scientist	1									1.0					
2	Site Engineer	1									1.0					
3	Environmental Technician	0														
<b>Operations</b>																
4	Barge Operator	1									1.0					Assumed required 1/2 the time (near mob and demob)
5	Equipment operators	4									4.0					
6	HD Mechanic	1									0.50					
7	Tradesmen	0														
8	Labour/Helpers	1									1.00					
<b>Camp/Support</b>																
1	Cooks/Housecleaning etc.	0														Contract (accounted for in camp costs)
<b>Other</b>																
1	Visitors	1									0.50					
<b>TOTAL</b>		<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Annual man-days:</b>		<b>300</b>														

**Notes:**

- 1. 0.5 personnel indicates staff on site 50% of time (i.e. no cross shift)
- 2. Orange highlighted cells are used for camp-man day calculations only.

### Worksheet 11- EOM Estimate - Planning and Permitting Costs

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**Planning And Permitting**

WBS	Facility/Area	Task	Activity	Qty	Unit	Total Unit Rate (\$/unit)	Activity Total	Subtotal	Source / Comments	
M1	<b>Planning and Permitting</b>									
M1.1	<i>Reclamation Research/Planning</i>									
M1.1.1		Complete reclamation closure and research plan		1	yr	\$200,000	\$200,000	\$200,000		
M1.2	<i>Technical studies and investigations</i>									
M1.2.1		Tailings and WR materials testing and monitoring program		1	ls	\$36,000	\$36,000	\$58,500		
M1.2.2		Pit lake water quality model		1	ls	\$22,500	\$22,500			
M1.3	<i>Monitoring and Management Plans</i>									
M1.3.1		Adaptive Mgmt Plans	Physical, water quality, etc.	1	ls	\$15,000	\$15,000	\$95,000		
M1.3.2		Revegetation plan		1	ls	\$30,000	\$30,000			
M1.3.3		Waste Management Plan	Water treatment, sludge, landfarm, etc.	1	ls	\$50,000	\$50,000			
M1.4	<i>Engineering, Design, and Construction Plans</i>									
M1.4.1		Percentage of direct implementation costs		5%	of	\$9,758,628	\$487,931	\$487,931		
M1.5	<i>Permitting</i>									
M1.5.1.1		Permit Staffing	Permitting Manager	0	ls	\$0	\$0	\$0	Staffing costs included in tasks above	
M1.5.1.2			Environmental Manager	0	ls	\$0	\$0			
M1.5.1.3			Technical Consultants	0	ls	\$0	\$0			
<b>TOTAL</b>								<b>\$841,431</b>		



**Worksheet 12 - Labour Rate Calculations**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVRO\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**LABOUR RATES**

**Benefit Factors**  
 Employment Insurance (EI) percentage: 2.13% of base earnings 2016 Source: http://www.cra-arc.ca/tx/bnsns/tpcs/pyrll/clctng/ei/hstrc-eng.html  
 EI salary limit: \$50,800 2016 Source: http://www.cra-arc.ca/tx/bnsns/tpcs/pyrll/clctng/ei/hstrc-eng.html  
 Canada Pension Plan (CPP) percentage: 4.63% of base earnings 2016 Source: http://www.cra-arc.ca/tx/bnsns/tpcs/pyrll/clctng/cpp-rpc/hstrc-eng.html  
 CPP salary limit: \$54,900 2016 Source: http://www.cra-arc.ca/tx/bnsns/tpcs/pyrll/clctng/cpp-rpc/hstrc-eng.html  
 MSP/Health Benefits: \$0 per month Yukon Territory has no employer or employee premiums or payroll taxes for health care (Source: CostMine 2014)  
 Small tools/safety gear allowance: \$250 per year Estimated based on a BC mine site (CostMine 2014)  
 2016 YWC rates http://www.wcb.yk.ca/QuestionResults/Assessments/Rates/Q0269.aspx

**Workers Compensation:**  
 Resources (low): 3.22% Metal mining, gravel crushing and screening, air services  
 Resources (med.): 4.56% DEFAULT - Reclamation, Exploration, short haul trucking  
 Resources (high): 7.69% Diamond drilling, forestry, long haul trucking, oil/gas  
 Services (med.): 1.37% Catering, Housekeeping, Consultants doing fieldwork

Cost Code	Item	Base Hourly Wage (\$/hr)	Loading Rate (%)	Rate Used in Estimate (\$/hr)	Source (See Notes)	Include Loading Calculations?	Rotation Details				Travel Costs				Overtime		Other		Hours					Annual Totals													
							Rotation Type	Weeks Onsite per Year	Hours Worked per Day	Days per Week	Site Hours per Year	Travel Hours per year	Travel Time (1 way) (hrs)	Travel Origin	Flights (1 way)	Hotel (1 way)	Meals (1 way)	Total Per Rotation	Overtime Multiplier	Overtime Hourly Wage	Small Tool Allowance ?	Worker's Comp Classification	Base Work Hours per Year	Overtime Work Hours per Year	Vacation Hours	Stat Hours	Total Hours Paid per Year	Base Earnings (\$/yr)	Base Salary	Overtime Salary	EI	CPP	Worker's Comp.	Small Tool Allowance	MSP/Health Benefits	Travel Cost	Annual Total
P.01	Camp Labourer	\$23.19	150%	\$34.77	1	Yes	2 in - 2 out	28	12	7	2,352	70	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$34.79	No	Services (med.)	1120	1470	80	88	2590	\$54,543	\$25,973	\$51,134	\$1,081	\$2,525	\$1,056	\$0	\$0	\$0	\$81,769
P.02	Design Engineer	\$150.00	90%	\$150.00	3, 4	No	2 in - 2 out	28	12	7	2,352	140	5	Vancouver	\$400	\$100	\$50	\$1,100	1	\$150.00	No	Resources (med.)	1120	1620	160	88	2740	\$352,800	\$168,000	\$243,000	\$1,081	\$2,542	\$18,742	\$0	\$0	\$154,000	\$587,364
P.03	Driller / Blaster	\$28.81	150%	\$43.35	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	Yes	Resources (med.)	1400	1801	80	88	3201	\$84,701	\$40,334	\$77,845	\$1,081	\$2,542	\$5,389	\$250	\$0	\$0	\$127,440
P.04	Engineering Technician (Consultant)	\$130.00	90%	\$117.00	3, 4	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	No	Services (med.)	1120	1512	80	88	2632	\$67,761	\$32,267	\$65,341	\$1,081	\$2,542	\$1,337	\$0	\$0	\$0	\$102,568
P.05	Environmental Monitor	\$28.81	151%	\$43.81	3	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	No	Services (med.)	1120	1512	80	88	2632	\$67,761	\$32,267	\$65,341	\$1,081	\$2,542	\$1,337	\$0	\$0	\$0	\$102,568
P.06	Environmental Scientist (Consultant)	\$130.00	90%	\$117.00	3, 4	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	No	Services (med.)	1120	1512	80	88	2632	\$67,761	\$32,267	\$65,341	\$1,081	\$2,542	\$1,337	\$0	\$0	\$0	\$102,568
P.07	Foreman	\$32.13	150%	\$48.19	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$0	\$141,680
P.08	Head Camp Cook	\$32.13	145%	\$46.68	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	No	Services (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$1,806	\$0	\$0	\$0	\$137,226
P.09	Health and Safety Supervisor	\$32.00	151%	\$48.37	3	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.00	Yes	Services (med.)	1120	1512	80	88	2632	\$75,264	\$35,840	\$72,576	\$1,081	\$2,542	\$1,485	\$250	\$0	\$0	\$113,774
P.10	Heavy Equip. Operator 1: Crane, Dragline, Shovels	\$32.13	150%	\$48.19	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$0	\$141,680
P.11	Heavy Equip. Operator 2: Excavator, Loader, Dozers	\$28.81	150%	\$43.35	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	Yes	Resources (med.)	1400	1801	80	88	3201	\$84,701	\$40,334	\$77,845	\$1,081	\$2,542	\$5,389	\$250	\$0	\$0	\$127,440
P.12	Heavy Equip. Operator 3: Rollers and compactors	\$23.19	150%	\$34.72	1	Yes	3 in - 2 out	35	12	7	2,940	58	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$34.79	Yes	Resources (med.)	1400	1766	80	88	3166	\$68,179	\$32,466	\$61,442	\$1,081	\$2,542	\$4,282	\$250	\$0	\$0	\$102,063
P.13	Heavy Equip. Mechanic	\$32.13	150%	\$48.19	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$0	\$141,680
P.14	Heavy Equip. Servicer	\$28.81	150%	\$43.35	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	Yes	Resources (med.)	1400	1801	80	88	3201	\$84,701	\$40,334	\$77,845	\$1,081	\$2,542	\$5,389	\$250	\$0	\$0	\$127,440
P.15	Helicopter Pilot	\$32.13	148%	\$47.50	3	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	No	Resources (low)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$4,244	\$0	\$0	\$0	\$139,964
P.16	Labourers	\$23.19	150%	\$34.72	1	Yes	3 in - 2 out	35	12	7	2,940	58	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$34.79	Yes	Resources (med.)	1400	1766	80	88	3166	\$68,179	\$32,466	\$61,442	\$1,081	\$2,542	\$4,282	\$250	\$0	\$0	\$102,063
P.17	Linesperson (electric)	\$32.13	150%	\$48.19	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$0	\$141,680
P.18	Medic, First Aid Attendant	\$23.19	157%	\$36.46	1	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$34.79	No	Resources (med.)	1120	1512	80	88	2632	\$54,543	\$25,973	\$52,595	\$1,081	\$2,525	\$3,583	\$0	\$0	\$0	\$85,757
P.19	Office Manager	\$39.90	155%	\$61.74	2	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$59.85	Yes	Resources (med.)	1120	1512	80	88	2632	\$93,845	\$44,688	\$90,493	\$1,081	\$2,542	\$6,164	\$250	\$0	\$0	\$145,218
P.20	Owner's Project Manager	\$39.90	155%	\$61.74	2	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$59.85	Yes	Resources (med.)	1120	1512	80	88	2632	\$93,845	\$44,688	\$90,493	\$1,081	\$2,542	\$6,164	\$250	\$0	\$0	\$145,218
P.21	Mine Manager	\$42.00	155%	\$64.91	2	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$63.00	Yes	Resources (med.)	1120	1512	80	88	2632	\$98,784	\$47,040	\$95,256	\$1,081	\$2,542	\$6,489	\$250	\$0	\$0	\$152,658
P.22	Security Guard	\$23.19	150%	\$34.72	1	Yes	3 in - 2 out	35	12	7	2,940	58	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$34.79	Yes	Resources (med.)	1400	1766	80	88	3166	\$68,179	\$32,466	\$61,442	\$1,081	\$2,542	\$4,282	\$250	\$0	\$0	\$102,063
P.23	Site Caretaker	\$25.55	151%	\$38.59	3	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$38.33	Yes	Resources (med.)	1400	1801	80	88	3201	\$75,117	\$35,770	\$69,036	\$1,081	\$2,542	\$4,779	\$250	\$0	\$0	\$113,458
P.24	Site Clerk / Administration	\$28.81	156%	\$45.04	3	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$43.22	Yes	Resources (med.)	1120	1512	80	88	2632	\$67,761	\$32,267	\$65,341	\$1,081	\$2,542	\$4,451	\$250	\$0	\$0	\$105,332
P.25	Site Supervisor	\$39.90	155%	\$61.74	2	Yes	2 in - 2 out	28	12	7	2,352	112	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$59.85	Yes	Resources (med.)	1120	1512	80	88	2632	\$93,845	\$44,688	\$90,493	\$1,081	\$2,542	\$6,164	\$250	\$0	\$0	\$145,218
P.26	Surveyor	\$32.13	150%	\$48.19	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$0	\$0	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$0	\$141,680
P.27	Trades Labourer (carpenter, electrician, welder etc.)	\$32.13	160%	\$51.37	1	Yes	3 in - 2 out	35	12	7	2,940	93	4	Whitehorse	\$0	\$0	\$50	\$100	1.5	\$48.20	Yes	Resources (med.)	1400	1801	80	88	3201	\$94,462	\$44,982	\$86,815	\$1,081	\$2,542	\$6,010	\$250	\$0	\$9,333	\$151,013
P.28	Truck Driver 1: 10 Ton GVW and up.	\$28.81	149%	\$42.81	1	Yes	3 in - 2 out	35	12	7	2,940	58	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$43.22	Yes	Resources (med.)	1400	1766	80	88	3166	\$84,701	\$40,334	\$76,332	\$1,081	\$2,542	\$5,320	\$250	\$0	\$0	\$125,859
P.29	Truck Driver 2: 3 - 10 Ton GVW	\$25.55	149%	\$38.11	1	Yes	3 in - 2 out	35	12	7	2,940	58	2.5	Pelly	\$0	\$0	\$0	\$0	1.5	\$38.33	Yes	Resources (med.)	1400	1766	80	88	3166	\$75,117	\$35,770	\$67,695	\$1,081	\$2,542	\$4,718	\$250	\$0	\$0	\$112,056

**Notes:**  
 1 Basic Rate: Yukon Government Fair Wage Schedule - Effective Apr 1, 2016 (Accessed July 2016)  
 2 CostMine 2014 for an active BC mine site  
 3 Estimated from project experience  
 4 Consultants rates are reduced by 10% as this value is added back in later in the estimate (Contractor Profit = 10%)

**Worksheet 13 - Equipment Rate Calculations**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVRO\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**EQUIPMENT RATES**

**Adjustment Factors**

Equipment Rates used in estimate: 3rd-Party - BC Blue Book  
 Fuel Consumption Rates: 2 - Medium Note: Medium consumption applied to most situations  
 On-site fuel cost per litre (diesel): \$0.96 Average On-site Cost for the period May 2015-Feb2016  
**BC Blue Book Cost Breakdown Assumptions**  
 BC Blue Book Source: 2015-16  
 Owner overhead rate: 10% BC Roadbuilder Association (2000)  
 Profit rate: 10% BC Roadbuilder Association (2000)  
 BC Govt Fuel Price Adjustment Factors:  
 Avg. BC diesel cost: \$1.02 Average BC diesel cost for the past 12 months  
 On-Road Equipment (\$/hr): \$1.20  
 Off-road equipment (\$/hr): \$2.80  
 Date: July/12/2016  
 Source: <http://www2.gov.bc.ca/gov/content/industry/construction-industry/transportation-infrastructure/hired-equipment-program/fuel-price-adjustment>

Equipment		Rate Summary				Operator Details			Weight	Fuel Consumption Details				BC Blue Book Cost Breakdown						Comments
Equip Code	Model	Source Used in Estimate	Equipment Cost (\$/hr)	Fuel Operating Cost (\$/hr)	Total Equipment Rate (\$/hr)	Number of Operators	Operator Type	Operator Rate (\$/hr)	Shipping Weight (tonnes)	On-Road/Off-Road	Low (liters/hr)	Medium (liters/hr)	High (liters/hr)	All-Found Rate (\$/hr)	Operators Wage (\$/hr)	Ownership/ Maintenc e Cost (\$/hr)	Fuel Operating Cost (\$/hr)	Contractor Overhead Cost (\$/hr)	Contractor Profit (\$/hr)	
<b>Backhoe</b>																				
E.01.1	CAT430E (4x4)	3rd Party	\$13.95	\$11.66	\$25.61	1	E. Operator 2	\$43.35	7.4	Off	8.1	12.15	21.95	\$91.65	\$46.60	\$13.95	\$15.19	\$7.57	\$8.33	
<b>Compactors</b>																				
E.02.1	CAT CP563	3rd Party	\$30.29	\$14.88	\$45.17	1	Roller Operator	\$34.72	11.5	Off	1.3	15.5	18.5	\$115.55	\$46.60	\$30.29	\$18.61	\$9.55	\$10.50	
E.02.2	Walk-behind vibrating (30 in)	3rd Party	\$9.46	\$2.25	\$11.71	0	Roller Operator	\$0.00	n/a	n/a	1.2	2.3	3.5	\$11.45	\$0.00	\$9.46	\$0.00	\$0.95	\$1.04	
<b>Dozers</b>																				
E.03.1	CAT D6R	3rd Party	\$77.93	\$23.28	\$101.21	1	E. Operator 2	\$43.35	18.0	Off	18	24.25	30.5	\$184.00	\$46.60	\$77.93	\$27.54	\$15.21	\$16.73	
E.03.2	CAT D8R	3rd Party	\$128.82	\$35.28	\$164.10	1	E. Operator 2	\$43.35	37.6	Off	27.25	36.75	46.25	\$261.00	\$46.60	\$128.82	\$40.29	\$21.57	\$23.73	
E.03.3	CAT D10T	3rd Party	\$195.11	\$67.01	\$262.11	1	E. Operator 2	\$43.35	66.4	Off	51.45	69.8	88.6	\$382.00	\$46.60	\$195.11	\$74.00	\$31.57	\$34.73	
E.03.4	CAT D11R	3rd Party	\$207.28	\$96.00	\$303.28	1	E. Operator 2	\$43.35	104.6	Off	71.7	100	126.25	\$434.00	\$46.60	\$207.28	\$104.80	\$35.87	\$39.45	
<b>Drills</b>																				
E.04.1	Air Rotary, 200 cfm compressor	3rd Party	\$169.45	\$24.00	\$193.45	2	Driller / Blaster	\$86.69	n/a	Off	20	25	30	\$352.05	\$93.20	\$169.45	\$28.30	\$29.10	\$32.00	
E.04.2	Air track production drill rig (900cfm)	3rd Party	\$75.40	\$48.00	\$123.40	2	Driller / Blaster	\$86.69	41.0	Off	33.35	50	66.5	\$269.10	\$93.20	\$75.40	\$53.80	\$22.24	\$24.46	
<b>Excavators</b>																				
E.05.1	CAT 330	3rd Party	\$84.35	\$29.76	\$114.11	1	E. Operator 2	\$43.35	35.1	Off	21.5	31	38.5	\$200.10	\$46.60	\$84.35	\$34.42	\$16.54	\$18.19	
E.05.2	CAT 385	3rd Party	\$178.39	\$62.40	\$240.79	1	E. Operator 2	\$43.35	83.0	Off	45.5	65	74.5	\$355.85	\$46.60	\$178.39	\$69.10	\$29.41	\$32.35	
<b>Graders</b>																				
E.06.1	CAT 140M	3rd Party	\$65.80	\$15.60	\$81.40	1	E. Operator 2	\$43.35	13.6	Off	10.35	16.25	24.2	\$159.45	\$46.60	\$65.80	\$19.38	\$13.18	\$14.50	
E.06.2	CAT 16M	3rd Party	\$70.42	\$21.79	\$92.21	1	E. Operator 2	\$43.35	24.7	Off	14.7	22.7	37.25	\$173.00	\$46.60	\$70.42	\$25.95	\$14.30	\$15.73	
<b>Haul Trucks</b>																				
E.07.1	Std Tandem Haul Truck (10 yds)	3rd Party	\$13.51	\$11.52	\$25.03	1	Truck Driver 1	\$42.81	n/a	On	8.04	12	15.96	\$89.00	\$46.60	\$13.51	\$13.44	\$7.36	\$8.09	
E.07.2	CAT 735	3rd Party	\$71.87	\$25.87	\$97.74	1	Truck Driver 1	\$42.81	29.9	Off	16.55	26.95	37.35	\$180.00	\$46.60	\$71.87	\$30.29	\$14.88	\$16.36	
E.07.3	CAT 769D	3rd Party	\$78.65	\$34.27	\$112.92	1	Truck Driver 1	\$42.81	35.4	Off	25.5	35.7	45.9	\$199.00	\$46.60	\$78.65	\$39.21	\$16.45	\$18.09	
E.07.4	CAT 773G	3rd Party	\$96.30	\$48.77	\$145.07	1	Truck Driver 1	\$42.81	45.0	Off	36.25	50.8	65.35	\$239.00	\$46.60	\$96.30	\$54.62	\$19.75	\$21.73	
E.07.5	CAT 777D	3rd Party	\$157.19	\$63.02	\$220.21	1	Truck Driver 1	\$42.81	72.6	Off	46.85	65.65	84.4	\$331.00	\$46.60	\$157.19	\$69.76	\$27.36	\$30.09	
<b>Lifting</b>																				
E.08.1	Hydraulic Crane, 30Ton	3rd Party	\$81.87	\$6.00	\$87.87	1	E. Operator 1	\$48.19	30.0	Off	4.19	6.25	8.31	\$166.55	\$46.60	\$81.87	\$9.18	\$13.76	\$15.14	
<b>Loaders</b>																				
E.09.1	CAT 950H	3rd Party	\$62.08	\$12.53	\$74.61	1	E. Operator 2	\$43.35	18.3	Off	9.65	13.05	16.6	\$151.00	\$46.60	\$62.08	\$16.11	\$12.48	\$13.73	
E.09.2	CAT 990	3rd Party	\$105.45	\$62.64	\$168.09	1	E. Operator 2	\$43.35	77.8	Off	50	65.25	84.75	\$267.90	\$46.60	\$105.45	\$69.36	\$22.14	\$24.35	
<b>Support Vehicles</b>																				
E.10.1	Concrete Transit Mix Truck	3rd Party	\$29.52	\$10.85	\$40.36	1	Labourer	\$34.72	n/a	On	7.54	11.3	15.03	\$107.50	\$46.60	\$29.52	\$12.73	\$8.88	\$9.77	
E.10.2	Fuel Truck	3rd Party	\$4.97	\$9.25	\$14.22	1	Equip. Servicer	\$43.35	n/a	On	6.43	9.64	12.82	\$75.75	\$46.60	\$4.97	\$11.03	\$6.26	\$6.89	
E.10.3	Highway, Line Truck, with Aerial Platform	3rd Party	\$56.06	\$12.00	\$68.06	1	Trade Labourer	\$51.37	n/a	On	8.34	12.5	16.63	\$141.10	\$46.60	\$56.06	\$13.95	\$11.66	\$12.83	
E.10.4	Highway Service/Flatbed Truck (HIAB) 5 ton	3rd Party	\$7.22	\$12.00	\$19.22	1	Equip. Servicer	\$43.35	n/a	On	8.34	12.5	16.63	\$82.00	\$46.60	\$7.22	\$13.95	\$6.78	\$7.45	
E.10.5	Lowbed Tractor/Trailer - 5 Axle (25 tonnes)	3rd Party	\$29.27	\$11.52	\$40.79	1	Truck Driver 1	\$42.81	n/a	Off	8.00	12	15.96	\$110.00	\$46.60	\$29.27	\$15.04	\$9.09	\$10.00	
E.10.6	Lowbed Tractor/Trailer - 6 Axle (33 tonnes)	3rd Party	\$35.30	\$14.40	\$49.70	1	Truck Driver 1	\$42.81	n/a	Off	10.01	15	19.95	\$121.00	\$46.60	\$35.30	\$18.10	\$11.00	\$11.00	
E.10.7	Lowbed Tractor/Trailer - 7 Axle (41 tonnes)	3rd Party	\$49.85	\$14.40	\$64.25	1	Truck Driver 1	\$42.81	n/a	Off	10.01	15	19.95	\$138.60	\$46.60	\$49.85	\$18.10	\$11.45	\$12.60	
E.10.8	Lowbed Tractor/Trailer - 8 Axle (48 tonnes)	3rd Party	\$52.45	\$14.40	\$66.85	1	Truck Driver 1	\$42.81	n/a	Off	10.01	15	19.95	\$141.75	\$46.60	\$52.45	\$18.10	\$11.71	\$12.89	
E.10.9	Pick-up Truck (1.5T) 4x4	3rd Party	\$7.75	\$4.80	\$12.55	0	Labourer	\$0.00	n/a	On	3	5	10	\$17.00	\$0.00	\$7.75	\$6.30	\$1.40	\$1.55	
E.10.10	Pilot Vehicle	3rd Party	\$6.95	\$4.80	\$11.75	1	Labourer	\$34.72	n/a	On	3	5	10	\$53.55	\$31.01	\$6.95	\$6.30	\$4.43	\$4.87	
E.10.12	Water Truck (5,000 gal)	3rd Party	\$16.56	\$21.70	\$38.25	1	Truck Driver 1	\$42.81	n/a	Off	15.07	22.6	30.06	\$107.70	\$46.60	\$16.56	\$25.85	\$8.90	\$9.79	

Notes:  
 1 Fuel consumption obtained from the Caterpillar Performance Handbook Version 42.  
 2 All-found BC Blue Book rate excludes the fuel adjustment factor  
 3 Equipment weights from Caterpillar Performance Handbook Version 35; values of n/a means the equipment would be driven to site/towed by a pick-up.

	Misc. Equipment and Attachments	Unit	Equipment Rate (\$/Unit)	Fuel Rate (\$/Unit)	Total Equipment Rate (\$/Unit)	Number of Operators	Operator Type	Operator Rate (\$/hr)	Shipping Weight (tonnes)	Source
E.11.1	ATV (4 wheel)	month	\$1,500.25	\$20.00	\$1,520.25	0		\$0.00	0.3	BC Blue Book 2015-16; fuel rate estimated
E.11.2	Boomlift: 60' articulating	hr	\$25.00	\$2.00	\$27.00	0		\$0.00	10.0	United rental 2005; fuel rate estimated
E.11.3	Soil auger (Truck mounted)	hr	\$27.00	\$0.00	\$27.00	0		\$0.00	n/a	Estimated
E.11.4	Bus: Passenger Bus (24 person cap.)	month	\$1,658.85	\$600.00	\$2,258.85	0		\$0.00	n/a	BC BlueBook 2015-16; fuel rate estimated
E.11.5	Butt-fusion welding machine	hr	\$38.20	\$9.55	\$47.75	0		\$0.00	n/a	RSMMeans2016; fuel rate estimated
E.11.6	Cleaning Equipment - High pressure washer	hr	\$17.70	\$2.00	\$19.70	0		\$0.00	n/a	BC Blue Book 2015-16; fuel rate estimated, 2,000 gallons, includes 3 wands
E.11.7	Crusher (200 Tons/hr)	hr	\$150.00	\$35.00	\$185.00	1	E. Operator 2	\$43.35	25.0	RSMMeans 2005 (17 03 9902)
E.11.8	Demolition shears (excavator attach.)	hr	\$150.00	\$0.00	\$150.00	0		\$0.00	7.0	Estimated; S390 (fits CAT 365-385)
E.11.9	Demolition grapples (excavator attach.)	hr	\$21.00	\$0.00	\$21.00	0		\$0.00	7.0	Estimated; G330 (fits CAT 345-365)
E.11.10	Emergency Transport Vehicle	Month	\$4,509.10	\$10.00	\$4,519.10	0		\$0.00	n/a	Rate: BCBlue Book 2015-16
E.11.11	Helicopter	hr	\$1,500.00	\$100.00	\$1,600.00	1	Trade Labour	\$51.37	n/a	Estimated from past project (2006)
E.11.12	Hydraulic hammer (excavator attachment)	hr	\$86.85	\$0.00	\$86.85	0		\$0.00	4.0	BC Blue Book 2015-16; 2,500hr energy class
E.11.13	Hydraulic plate tamper (excavator attach.)	hr	\$13.45	\$0.00	\$13.45	0		\$0.00	3.0	BC Blue Book 2015-16; 454-680kg
E.11.14	Hydroseed Truck	hr	\$23.65	\$16.25	\$39.90	0		\$0.00	n/a	BC Blue Book 2015-16; 3,000gal water truck with highpressure spray nozzle
E.11.15	Light towers	month	\$1,674.61	\$272.16	\$1,946.77	0		\$0.00	1.0	BC Blue Book 2015-16; telescopic trailer mounted, multi-vapor light (3kV); (fuel assumes used average 5 hrs per day)
E.11.16	Power mulcher, (20 ton/hr, 115 HP)	hr	\$25.00	\$24.33	\$49.33	0		\$0.00	n/a	RSMMeans 2016 (015433202860)
E.11.17	Pump: mud pump 6 in discharge	hr	\$14.94	\$2.00	\$16.94	0		\$0.00	n/a	BC Blue Book 2015-16; fuel rate estimated
E.11.18	Screener (linley 583) (~400tonnes/hr)	hr	\$183.00	\$40.00	\$223.00	1	E. Operator 2	\$43.35	75.0	Nova Scotia Road Builder Association, 2012, fuel rate estimated
E.11.19	Spreader (for reveg application)	hr	\$6.15	\$0.00	\$6.15	0		\$0.00	n/a	BC Blue Book 2015-16; based on "hopper sander" for truck attachments
E.11.20	Welding outfit (truck mounted) - 400 amps	hr	\$27.00	\$0.00	\$27.00	0		\$0.00	n/a	BC Blue Book 2015-16
E.11.21	XRF rental	month	\$1,200.00	\$0.00	\$1,200.00	0		\$0.00	n/a	Quote: Pine Environmental (2010)

**Worksheet 14 - Material Rates and Indirect Cost Inputs**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



**MATERIAL RATES**

**RS Means Adjustment Factors**

RSMeans Source: RSMeans Online (2016 Q1)

Notes:

- 1 All RSMeans 2016 material costs are in CAD and have been adjusted for location (Whitehorse).
- 2 As per note 1, a factor of 1.371 was applied to obtain a Yukon rate (compared to the US national average).

Cost Code	Item	Unit Cost	Unit	Additional Details	Source
M.01	Bitumen Geomembrane (BGM) Liner	\$17.86	m2		Quote: Coletanche 2014, plus 15% shipment to site
M.02	Concrete: elevated slabs	\$378.65	m3	Includes forms, grade 60 rebar, concrete, pla	RSMeans2016 (33053401900)
M.03	Erosion control mats (jute mesh), 4' wide	\$0.81	m2		RSMeans2016 (312515160020), add 15% for shipment to site
M.04	Fertilizer	\$1.10	kg		Access (2014) Closure Plan
M.05	Fertilizer tablets (for tree-planting)	\$0.08			Quote: Pickseed (Prince George), 2014; factor of 15% applied for shipment to site
M.06	Formwork: curb forms, wood, 12" high, on grade, 1 use	\$3.47	m2	Unit is m2 contact area	RSMeans2016 (31113652000)
M.07	Geosynthetic Clay Liner	\$10.35	m2		Quote: Nilix Vancouver 15% added for shipment to site
M.08	Geotextile	\$2.12	m2		Minto Quote: Layfield (2014) FOB Edmonton, 15% added for shipment to site
M.09	HDPE liner (60mil)	\$9.20	m2		Minto Quote: Layfield (2014) FOB Edmonton, 15% added for shipment to site
M.10	HDPE pipe: 100mm	\$20.17	m	Butt fusion joints, 40'length, SDR 21	RSMeans2016 (33 11 13-350-100)
M.11	HDPE pipe: 150mm	\$56.25	m	Butt fusion joints, 40'length, SDR 21	RSMeans2016 (33 11 13-350-200)
M.12	HDPE pipe: 300mm	\$181.06	m	Butt fusion joints, 40'length, SDR 21	RSMeans2016 (33 11 13-350-500)
M.13	Intake Structure: precast concrete check structure (CS-1.0-20-OS)	\$30,763	each		Quote : Precon (2011) FOB Edmonton. Adjusted 15% for shipment, and 7% for inflation to 2016 dollars
M.14	Lab testing: Hydrocarbons	\$100	each		Estimated
M.15	Lab testing: SAL metals + pH (BC CSR package)	\$130	each		Quote: CARO 2014 for BC CSR package, \$30 allowance added for shipping
M.16	Mulch (for hydroseeding)	\$1.00	kg		Quote: Pickseed (Prince George), 2014; factor of 15% applied for shipment to site
M.17	Rebar (#6 bar)	\$3.30	m		RSMeans2016 (032111600400) , (#6 bar = 1.5 lbs per foot)
M.18	Seed/Fertilizer Mix 1: Dry mix	\$15.80	kg		PickSeed (2015) onsite cost
M.19	Seed/Fertilizer Mix 2: Wet area mix	\$17.50	kg		Access (2014) Closure Plan
M.20	Signage: Open Pit Warning signs (incl. posts)	\$195.35	each		Includes concrete, post and sign
M.21	Signage: Large warning signs at entries (incl. posts)	\$586.06	each		Assumed to be 3 times open pit signs.
M.22	Silt Fencing (3ft high)	\$0.91	m		RSMeans2016 (31251416100), 15% added for shipment to site
M.23	Steel Beam: I-Beam W6x9	\$15.77	m		RSMeans2016
M.24	Steel decking (q-deck):	\$44.46	m2		RSMeans2016 (53133506700)
M.25	Steel Pipe: 6" dia.	\$112.90	m		RSMeans2016 (22131620200)
M.26	Tackifier (for hydroseeding)	\$3.62	kg		Quote: Pickseed (Prince George), 2014; factor of 15% applied for shipment to site
M.27	Wetland planting	\$1,136.50	ha		EPA, 1997. Costs for Wetland Creation and Restoration Projects in the Glaciated Northeast. Average cost adjusted up by 37% for location factor, 15% for shipping, 42% for inflation.
M.28	Tree seedlings	\$0.38	stem		Quote from a site in central BC in 2011; updated to 2016 dollars.

**INDIRECT COSTS**

Cost Code	Category	Rate Used in Estimate	Unit		Source/Comments
1.01	Barge Operating Costs	\$10,000	month		
1.01	Bonding	3.0%	%	of direct costs	Past Project (2014)
1.02	Camp Operation Costs	\$80	\$/day/person	includes catering and housekeeping	Estimated
1.03	Camp power and heating costs	\$6,500	month		Typical 2015 monthly cost between May and Sept 2015
1.04	Communications	\$1,000	month		Estimated
1.05	Contract Administration	5%	%	Of Direct and other indirect costs	
1.06	Contractor Profit	10%	%	Of Direct and other indirect costs	
1.07	Contingency	12%	%		
1.09	Engineering, Design, and Construction Plans	5%	%		allowance
1.11	Flight - Whitehorse-Minto Return	\$3,000	ea		
1.13	Helicopter trip Carmacks-Minto Return	\$3,000	ea		Based on site costs, assumes 2 hrs helicopter time.
1.15	Freight	0%	%	Included in material costs	
1.17	Insurance	1.5%	%	Of labour costs	
1.19	Laboratory/Material Testing	\$1,000	month		Estimated
1.21	Misc. Admin Supplies	\$500	month		Estimated
1.23	Office Supplies	\$1,000	month		Estimated







**Worksheet 16 - Relocation Unit Rates**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01

Project No.: 1CM002.045

Client: Minto Explorations Ltd.

Date of Submission: August 5, 2016

File Location: \\WAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



Cost Code	Source	Destination	Activities	Material	Costed Volume Unit	Unit Rate Summary										Fleet					
						Total Unit Rate (\$/m <sup>3</sup> )	Manhours (hrs/m <sup>3</sup> )	Labor Rate (\$/m <sup>3</sup> )	Equipme nt Rate (\$/m <sup>3</sup> )	Fuel Rate (\$/m <sup>3</sup> )	Productivity (m <sup>3</sup> /hr)	Total Dist. (1-way) (km)	Avg. Grade (%)	Excavator	Truck Fleet	Max. # of Trucks	# of Dozers	Dozer Size	Compaction?		
R 001	Misc. 1km flat haul w/ Articulated Trucks		Load haul, dump, spread	Earth, moist	CCM	\$4.96	0.03	\$1.36	\$2.70	\$0.90	159	1.0	0.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 002	Misc. 1km flat haul w/ Articulated Trucks w/ compaction		Load haul, dump, spread, compact	Earth, moist	CCM	\$5.46	0.04	\$1.57	\$2.89	\$0.99	159	1.0	0.0%	CAT 330	GAT 735	5	1	CAT D8R	Yes		
R 003	Misc. 1km flat haul w/ Large Fleet		Load haul, dump, spread	Earth, moist	CCM	\$2.41	0.01	\$0.50	\$1.34	\$0.57	516	1.0	0.0%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 004	Misc. 1km flat haul w/ Large Fleet		Load haul, dump, spread	Earth, moist	CCM	\$2.41	0.01	\$0.50	\$1.34	\$0.57	516	1.0	0.0%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 005	Airport Laydown	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$5.81	0.04	\$1.72	\$3.01	\$1.08	100	2.4	3.2%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 006	Airstrip Area	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$4.92	0.03	\$1.45	\$2.56	\$0.92	89	1.0	0.0%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 007	Camp Area	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$6.56	0.05	\$1.95	\$3.40	\$1.22	88	3.1	2.7%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 008	Dyno Compound	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$7.65	0.05	\$2.27	\$3.96	\$1.42	76	5.5	-0.5%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 009	Fuel Farm Area	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$7.63	0.05	\$2.26	\$3.95	\$1.41	76	3.6	2.3%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 010	Fuel Farm Area	Landfarm	Load haul, dump	Earth, moist	CCM	\$7.07	0.05	\$2.12	\$3.65	\$1.31	122	3.6	2.3%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 011	IRDD Laydown	SWD-High Grade Waste	Load haul, dump, spread, compact	Sand, dry	CCM	\$2.80	0.01	\$0.61	\$1.56	\$0.63	547	1.6	-0.8%	CAT 385	GAT 773G	5	2	CAT D8R	Yes		
R 012	Main Waste Dump Extension	Main Pit Access Point	Load haul, dump, place	Rip-rap (Minto)	CCM	\$4.45	0.03	\$1.22	\$2.42	\$0.81	177	1.8	-6.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 013	Main Waste Dump Extension	Area 2 Pit Access point	Load haul, dump, place	Rip-rap (Minto)	CCM	\$4.26	0.03	\$1.17	\$2.32	\$0.77	184	1.6	-6.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 014	Main Waste Dump Extension	Area 118 Pit Access Point	Load haul, dump, place	Rip-rap (Minto)	CCM	\$5.96	0.04	\$1.66	\$3.22	\$1.08	156	3.2	-1.4%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 015	Main Waste Dump Extension	W15/Main Pit Channel	Load haul, dump	Rip-rap (Minto)	CCM	\$4.17	0.03	\$1.14	\$2.27	\$0.76	189	1.2	-10.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 016	Main Waste Dump Extension	W15/Main Pit Channel	Load haul, dump, place	Sand & gravel, dry	CCM	\$6.15	0.04	\$1.60	\$3.45	\$1.10	162	1.2	-10.0%	CAT 330	GAT 735	5	2	CAT D8R	No		
R 017	Main Waste Dump Extension	Ditch B1 (W35 to Mill area)	Load haul, dump	Rip-rap (Minto)	CCM	\$4.70	0.03	\$1.28	\$2.56	\$0.85	168	2.0	-4.8%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 018	Main Waste Dump Extension	Ditch B1 (W35 to Mill area)	Load haul, dump, place	Sand & gravel, dry	CCM	\$7.00	0.04	\$1.82	\$3.93	\$1.25	142	2.0	-4.8%	CAT 330	GAT 735	5	2	CAT D8R	No		
R 019	Main Waste Dump Extension	Mill Area	Load haul, dump	Rip-rap (Minto)	CCM	\$5.41	0.04	\$1.51	\$2.92	\$0.98	171	2.1	-5.3%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 020	Main Waste Dump Extension	Mill Area	Load haul, dump, place	Sand & gravel, dry	CCM	\$7.97	0.05	\$2.12	\$4.42	\$1.43	142	2.1	-5.3%	CAT 330	GAT 735	5	2	CAT D8R	No		
R 021	Main Waste Dump Extension	MVFE2 (by access road)	Load haul, dump	Rip-rap (Minto)	CCM	\$6.36	0.04	\$1.77	\$3.43	\$1.16	146	2.5	-4.9%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 022	Main Waste Dump Extension	MVFE2 (by access road)	Load haul, dump, place	Sand & gravel, dry	CCM	\$8.48	0.05	\$2.29	\$4.67	\$1.53	150	2.5	-4.9%	CAT 330	GAT 735	5	2	CAT D8R	No		
R 023	Main Waste Dump Extension	MVFE2 Toe area	Load haul, dump	Rip-rap (Minto)	CCM	\$6.43	0.04	\$1.81	\$3.45	\$1.17	166	2.9	-5.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 024	Main Waste Dump Extension	MVFE2 Toe area	Load haul, dump, place	Sand & gravel, dry	CCM	\$9.36	0.06	\$2.53	\$5.15	\$1.69	136	2.9	-5.0%	CAT 330	GAT 735	5	2	CAT D8R	No		
R 025	Main Waste Dump Extension	Main Waste Dump	Load haul, dump	Rip-rap (Minto)	CCM	\$4.01	0.02	\$1.07	\$2.21	\$0.72	161	0.4	-6.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 026	Main Waste Dump Extension	Main Waste Dump	Load haul, dump	Sand & gravel, dry	CCM	\$4.56	0.03	\$1.22	\$2.52	\$0.82	142	0.4	-6.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 027	Main Waste Dump Extension	Southwest Dump	Load haul, dump	Rip-rap (Minto)	CCM	\$5.17	0.03	\$1.41	\$2.82	\$0.94	152	2.0	-3.5%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 028	Main Waste Dump Extension	Southwest Dump	Load haul, dump	Sand & gravel, dry	CCM	\$5.43	0.04	\$1.51	\$2.93	\$0.99	171	2.0	-3.5%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 029	Main Waste Dump Extension	Reclamation OVB Dump	Load haul, dump	Rip-rap (Minto)	CCM	\$4.95	0.03	\$1.35	\$2.70	\$0.90	159	1.3	1.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 030	Main Waste Dump Extension	Reclamation OVB Dump	Load haul, dump, place	Sand & gravel, dry	CCM	\$5.86	0.04	\$1.60	\$3.20	\$1.06	134	1.3	1.0%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 031	Main Waste Dump Extension	Tailings Diversion Ditch	Load haul, dump	Rip-rap (Minto)	CCM	\$7.16	0.05	\$2.02	\$3.84	\$1.30	149	3.3	-4.8%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 032	MWD Low Grade Stockpile	Main Pit	Load haul, dump, spread	Waste Rock (Minto)	CCM	\$2.62	0.01	\$0.54	\$1.46	\$0.62	474	1.9	-5.4%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 033	Mill Area	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$6.17	0.04	\$1.83	\$3.20	\$1.14	94	3.0	3.1%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 034	Mill Area	Landfarm	Load haul, dump	Waste Rock (Minto)	CCM	\$5.16	0.04	\$1.54	\$2.67	\$0.96	139	3.0	3.1%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 035	Mill Area	Minto South Portal	Load haul, dump	Waste Rock (Minto)	CCM	\$5.45	0.03	\$1.49	\$2.97	\$0.99	144	1.6	3.8%	CAT 330	GAT 735	5	1	CAT D8R	No		
R 036	Mill Pond	Main Pit	Load haul, dump	Sand, wet	CCM	\$3.04	0.02	\$0.89	\$1.58	\$0.56	144	0.4	5.0%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 037	Minto North	MVFE Stage 2	Load haul, dump, spread	Waste Rock (Minto)	CCM	\$4.50	0.02	\$0.95	\$2.52	\$1.04	364	4.1	-3.1%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 038	Minto South Portal	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$6.54	0.05	\$1.94	\$3.39	\$1.21	88	3.2	0.3%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 039	Ore Stockpile Area (Mill)	Main Pit	Load haul, dump, spread	Waste Rock (Minto)	CCM	\$2.48	0.01	\$0.51	\$1.40	\$0.57	425	1.1	1.5%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 040	Pelly Laydown	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$6.69	0.05	\$1.98	\$3.46	\$1.24	87	4.3	-0.7%	CAT 330	GAT 735	5	0	CAT D8R	No		
R 041	Reclamation Ovb. Dump	Camp Area	Load haul, dump, spread	Earth, moist	CCM	\$3.94	0.02	\$0.83	\$2.20	\$0.91	416	2.9	-4.3%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 042	Reclamation Ovb. Dump	Camp Area	Load haul, dump	Earth, moist	CCM	\$3.44	0.02	\$0.72	\$1.89	\$0.82	416	2.9	-4.3%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 043	Reclamation Ovb. Dump	DSTSF	Load haul, dump, spread	Earth, moist	CCM	\$3.98	0.02	\$0.84	\$2.23	\$0.91	412	3.1	-4.2%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 044	Reclamation Ovb. Dump	Fuel Storage Area	Load haul, dump, spread	Earth, moist	CCM	\$3.99	0.02	\$0.84	\$2.23	\$0.92	411	2.7	-3.7%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 045	Reclamation Ovb. Dump	Main Dump	Load haul, dump, spread	Earth, moist	CCM	\$3.82	0.02	\$0.80	\$2.14	\$0.88	429	1.5	2.0%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 046	Reclamation Ovb. Dump	Main Dump	Load haul, dump	Earth, moist	CCM	\$3.34	0.02	\$0.70	\$1.84	\$0.80	429	1.5	2.0%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 047	Reclamation Ovb. Dump	Main Pit Dump	Load haul, dump, spread	Earth, moist	CCM	\$3.35	0.02	\$0.70	\$1.90	\$0.76	433	1.7	-5.5%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 048	Reclamation Ovb. Dump	Main Pit Dump	Load haul, dump	Earth, moist	CCM	\$2.87	0.01	\$0.60	\$1.60	\$0.68	433	1.7	-5.5%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 049	Reclamation Ovb. Dump	Mill Area	Load haul, dump, spread	Earth, moist	CCM	\$3.72	0.02	\$0.78	\$2.08	\$0.86	441	2.7	-4.8%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 050	Reclamation Ovb. Dump	MVFE Stage 1 and 2	Load haul, dump, spread	Earth, moist	CCM	\$4.17	0.02	\$0.88	\$2.34	\$0.96	393	3.4	-3.8%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 051	Reclamation Ovb. Dump	MVFE Stage 1 and 2	Load haul, dump	Earth, moist	CCM	\$3.64	0.02	\$0.77	\$2.01	\$0.87	393	3.4	-3.8%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 052	Reclamation Ovb. Dump	Pelly Laydown	Load haul, dump, spread	Earth, moist	CCM	\$3.05	0.01	\$0.63	\$1.73	\$0.69	475	1.4	-4.5%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 053	Reclamation Ovb. Dump	Southwest Dump	Load haul, dump, spread	Earth, moist	CCM	\$3.61	0.02	\$0.75	\$2.04	\$0.82	402	1.7	0.2%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 054	Reclamation Ovb. Dump	SWD-High Grade Waste	Load haul, dump, spread	Earth, moist	CCM	\$3.43	0.02	\$0.71	\$1.94	\$0.78	423	1.9	-0.8%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 055	Reclamation Ovb. Dump	SWD-High Grade Waste	Load haul, dump	Earth, moist	CCM	\$2.87	0.01	\$0.60	\$1.60	\$0.68	433	2.0	-1.0%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 056	Reclamation Ovb. Dump	W15 Sump Area	Load haul, dump, spread	Earth, moist	CCM	\$3.15	0.02	\$0.65	\$1.78	\$0.71	460	1.5	-4.8%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 057	Reclamation Ovb. Dump	Tailings Diversion Ditch	Load haul, dump, spread	Earth, moist	CCM	\$4.57	0.02	\$0.96	\$2.56	\$1.05	358	4.1	-3.2%	CAT 385	GAT 773G	5	2	CAT D8R	No		
R 058	Reclamation Ovb. Dump	Tailings Diversion Ditch	Load haul, dump	Earth, moist	CCM	\$3.99	0.02	\$0.84	\$2.20	\$0.95	358	4.1	-3.2%	CAT 385	GAT 773G	5	1	CAT D8R	No		
R 059	W15 Sump	Solid Waste Landfill	Load haul, dump	Demo Debris	LCM	\$6.26	0.04	\$1.86	\$3.24	\$1.16	93	3.7	1.1%								

**EXCAVATION UNIT RATES (NO HAULING)**

Cost Code	Description	Material	Costed Volume Unit	Unit Rate Summary						Inputs				Source, Comments/Notes
				Total Unit Rate (\$/m <sup>3</sup> )	Manhours (hrs/m <sup>3</sup> )	Labor Rate (\$/m <sup>3</sup> )	Equipment Rate (\$/m <sup>3</sup> )	Fuel Rate (\$/m <sup>3</sup> )	Productivity (m <sup>3</sup> /hr)	Excavator	# of Dozers	Dozer Size	Job Condition	
R.901	Culvert removal, large excavator	Waste Rock (Minto)	BCM	\$0.93	0.00	\$0.14	\$0.58	\$0.20	305	CAT 385	0	CAT D8R	Avg. (Typical)	
R.902	Channel excavation, small excavator, dozer used to spoil locally	Earth, moist	BCM	\$2.62	0.02	\$0.75	\$1.41	\$0.46	115	CAT 330	1	CAT D6R	Below Avg.	Below average conditions used to account for channel shaping
R.903	Channel excavation in steep areas, small excavator, dozer used to spoil locally	Earth, moist	BCM	\$2.98	0.02	\$0.86	\$1.60	\$0.52	101	CAT 330	1	CAT D6R	Severe	Severe conditions used to account for channel shaping, difficult access
R.904	Channel rip-rap placement	Rip-rap (Minto)	CCM	\$1.71	0.01	\$0.47	\$0.92	\$0.32	92	CAT 330	0	CAT D6R	Below Avg.	Below average conditions used to account for channel shaping/placement
R.905	Channel rip-rap placement in difficult access areas	Rip-rap (Minto)	CCM	\$3.73	0.02	\$1.07	\$2.00	\$0.65	81	CAT 330	1	CAT D6R	Severe	Severe conditions used to account for channel shaping/placement, dozer added to help
<small>Note: Leave this row blank - Insert new rows above this one.</small>														

Notes:



**Worksheet 17 - Area Calculations for Covers and Revegetation**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**References (dwgs/plans):** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg

**A: Existing Yards, Waste Rock Dumps**

Facility	Areas				Reveg Prescription						Calculated Quantities						Comments/Notes			
	Total 2D Area (pre- regrade) (m2)	2D Slope Area (from 'Regrade' worksheet) (m <sup>2</sup> )	3D Slope Area (from 'Regrade' worksheet) (m <sup>2</sup> )	Footprint Area increase due to regrading (from 'Regrade' worksheet) (m <sup>2</sup> )	3D slope Area override (m <sup>2</sup> )	Flat Area (post-regrade) override (m <sup>2</sup> )	Flat Area Cover Thickness (m)	Slope Area Cover Thickness (m)	Flat Area Scarified/ Ripped?	Slopes Scarified/ Ripped?	Percentage of flat areas seeded/fertilized?	Percentage of sloped Areas seeded/fertilized?	Estimated Flat Area (post-regrade) (m <sup>2</sup> )	3D Sloped Area (m <sup>2</sup> )	Scarified flat areas (m <sup>2</sup> )	Scarified sloped areas (m <sup>2</sup> )		Cover Volume in Flat Areas (m <sup>3</sup> )	Cover Volume - Sloped Areas (m <sup>3</sup> )	Revegetated Area (ha)
Airport Laydown	21,277								Yes		100%		21,277	0	21,277	0	0	0	2.13	
Camp	64,378	17,739	18,699	4,840			0.5	0.5	Yes	Yes	100%	100%	64,378	0	64,378	0	0	0	6.44	
Crusher Area	33,525						0.5	0.5	Yes	Yes	100%	100%	20,626	18,699	20,626	18,699	10,313	9,349	3.93	
DSTF WR Shell	26,964			0	0	26,964	0.5	0.5	Yes	Yes	100%	100%	26,964	0	26,964	0	13,482	0	2.70	
DSTF Tailings Surface	50,237	51,376	52,957			0	0.5	0.5	Yes	No	100%	100%	0	52,957	0	0	0	26,479	5.30	
DSTF Tailings Surface	191,561	10,000	10,308		48,000		0.5	0.5	No	No	100%	100%	48,000	10,308	0	0	24,000	5,154	19.16	Assumes areas covered in residuum only require covers. Note: Reveg area formula has been adjusted compared to the other rows so that the entire DSTSF area is included in the reveg area calculation.
Explosive Plant & Storage Areas	55,113						0	0	Yes	No	100%	100%	55,113	0	55,113	0	0	0	5.51	Roads between laydown/storage areas included in Roads' worksheet
Fuel Storage Area	8,400						0.5	0	No	No	100%	0%	8,400	0	0	0	4,200	0	0.84	
Ice Rich Overburden Dump	27,583				0		0	0	No	No	100%	100%	27,583	0	0	0	0	0	2.76	
IROD Laydown	23,055	4,949	5,147	0			0	0	Yes	No	100%	100%	18,106	5,147	18,106	0	0	0	2.33	Roads between laydown/storage areas included in Roads' worksheet
Main Waste Dump Ext. (includes Main Dump)	496,414	280,341	295,506	9,053			0.5	0.5	No	No	100%	100%	225,126	295,506	0	0	112,563	147,753	52.06	
Main Pit Dump	234,016	111,492	117,522	6,268			0.5	0.5	No	No	100%	100%	128,793	117,522	0	0	64,396	58,761	24.63	
Mill Area	42,365						0.5	0.5	Yes	Yes	100%	100%	42,365	0	42,365	0	21,182	0	4.24	
Mill Valley Fill Extension (1 and 2)	171,634				59,852	114,853	0.5	0.5	No	No	100%	100%	114,853	59,852	0	0	57,427	29,926	17.47	
Minto South Portal	105,446	45,406	47,862	2,725			0	0	Yes	No	100%	100%	62,765	47,862	62,765	0	0	0	11.06	
Ore Stockpile Area	139,307				0		0.5	0.5	Yes	No	100%	100%	139,307	0	139,307	0	69,653	0	13.93	
Pelly Laydown	51,710						0.5	0.5	Yes	No	100%	100%	51,710	0	51,710	0	25,855	0	5.17	
Reclamation OVB Dump	297,857				0	297,857			No	No	100%	100%	297,857	0	0	0	0	0	29.79	
Ridgetop Exploration Area	34,778				0				Yes	No	100%	100%	34,778	0	34,778	0	0	0	3.48	Assumes 50% of area scarified/reveged.
Southwest Dump	627,621				0		0.5	0.5	No	No	100%	100%	627,621	0	0	0	313,810	0	62.76	Excludes High Grade Waste Stockpile
SWD - High grade waste	31,165	40,679	41,485	15,430			1	1	No	No	100%	100%	5,915	41,485	0	0	5,915	41,485	4.74	
Tailings Diversion Ditch	72,143	34,246	36,099	12,467			0.5	0.5	No	No	100%	100%	50,364	36,099	0	0	25,182	18,049	8.65	
WSP Dam Breach	13,950				13,950	0	0.5	0.5	No	No	100%	100%	0	13,950	0	0	0	6,975	1.40	Cover volume is an allowance; it is unlikely it will be to be placed over a large portion of the dam footprint due to slopes steeper than 2H:1V
W15 Sump Area	12,306	4,235	4,465	1,413			0.5	0.5	Yes	No	100%	100%	9,484	4,465	9,484	0	4,742	2,232	1.39	
<b>TOTAL</b>																	<b>752,721</b>	<b>346,164</b>	<b>292</b>	

Notes:

**B: Future Yards, Waste Rock Dumps**

Facility	Areas				Reveg Prescription						Calculated Quantities						Comments/Notes			
	Total 2D Area (pre- regrade) (m2)	2D Slope Area (from 'Regrade' worksheet) (m <sup>2</sup> )	3D Slope Area (from 'Regrade' worksheet) (m <sup>2</sup> )	Footprint Area increase due to regrading (from 'Regrade' worksheet) (m <sup>2</sup> )	3D slope Area override (m <sup>2</sup> )	Flat Area (post-regrade) override (m <sup>2</sup> )	Flat Area Cover Thickness (m)	Slope Area Cover Thickness (m)	Flat Area Scarified/ Ripped?	Slopes Scarified/ Ripped?	Percentage of flat areas seeded/fertilized?	Percentage of sloped Areas seeded/fertilized?	Estimated Flat Area (post-regrade) (m <sup>2</sup> )	3D Sloped Area (m <sup>2</sup> )	Scarified flat areas (m <sup>2</sup> )	Scarified sloped areas (m <sup>2</sup> )		Cover Volume in Flat Areas (m <sup>3</sup> )	Cover Volume - Sloped Areas (m <sup>3</sup> )	Revegetated Area (ha)
Area 118 Backfill Dump	68,438	18,405	19,401	0			0	0	Yes	Yes	100%	100%	50,033	19,401	50,033	19,401	0	0	6.94	
Main Pit Dump	243,816	99,546	104,931	0			0.5	0.5	No	No	100%	100%	144,270	104,931	0	0	72,135	52,465	24.92	

**C: Complex Covers**

Facility	Inputs				Calculated Quantities														Comments/Notes
	Flat Area (m2)	3D Slope Area (from 'Regrade' worksheet) (m <sup>2</sup> )	Bedding Layer Thickness (m)	Liner (Y/N)	Geotextile Layers	Protection Layer Thickness (m)	Growth Medium Cover Thickness (m)	Liner Area (m <sup>2</sup> )	Geotextile Area (m <sup>2</sup> )	Bedding Volume - Flat Areas (m <sup>3</sup> )	Bedding Volume - Sloped Areas (m <sup>3</sup> )	Total Bedding Volume (m <sup>3</sup> )	Protection Layer Volume - Flat Areas (m <sup>3</sup> )	Protection Layer Volume - Sloped Areas (m <sup>3</sup> )	Total Protection Layer Volume (m <sup>3</sup> )	Growth Medium Volume - Flat Areas (m <sup>3</sup> )	Growth Medium Volume - Sloped Areas (m <sup>3</sup> )	Total Growth Medium Volume (m <sup>3</sup> )	
SWD High Grade Waste	5,915	41,485	0.15	Yes	0	0	1	47,400	0	887	6,223	7,110	0	0	0.00	5,915	41,485	47,400	

**Worksheet 18 - Demolition Quantity Calculations**

Project: Minto Mine Closure Cost Estimate  
 Project No.: 1CM002.P04  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 2016  
 File Location: \\VAN-SVR01\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

TOTAL DEMOLITION/SOLID WASTE VOLUME FOR SOLID WASTE LANDFILL 12,920 LCM

**A: Building Demolition**

No.	Area	Sub Area	Sub-component/ Building/ Section	Exterior Building Dimensions				Sub-component Measurements					Disposal Location	Steel Quantity Calcs			Concrete Quantity Calcs		Wood/Misc. Qnty Calcs.		Off-site Transport		On-site Disposal	Comments/Notes										
				Building Demolition Type	Length (m)	Width (m)	Height (m)	Modular Building Loads	Material	Wall thickness (m) <sup>1</sup>	# of Exterior Steel Columns	Avg. Ext. Column X-Section Area (m2)		# of Steel Trusses	Average Truss x section area (m2)	Disposal	Wall mass (tonnes)	Column and Truss Mass (tonnes)	Total Mass (tonnes)	In-Place Concrete Volume (m3)	Concrete Debris Volume (LCM)	In-Place Demo Volume (m3)			Debris Volume (LCM)	Modular Building Truckloads (Offsite)	Off-site Debris Trips	On-site Demolition Debris Volume (LCM)						
<b>Airport Laydown</b>																																		
1	Airport Laydown	Mechanics Shop	Entire building	Steel Building - Small	24.00	25.00	6.00			Steel	0.01				On-site	95.6	0.0	95.6	0.0	0.0	0.0	0.0	0.0	0.0	137	AutoCAD/Photos								
2		Covered Storage		Wooden Building - Large	70.00	4.00	2.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	560.0	184.8	0.0	0.0	185	Photos								
<b>SUBTOTAL - Airport Laydown</b>																																		
<b>Airstrip Area</b>																																		
1	Airstrip	Exploration Camp	Camp tents (11)	Wooden Building - Small	44.00	4.00	2.50			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	440.0	145.2	0.0	0.0	145	AutoCAD/Photos (lengths summed to account for 11 structures)								
2			Exploration core shed 1	Wooden Building - Small	7.50	4.50	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	101.3	33.4	0.0	0.0	33	AutoCAD/Photos								
3			Exploration core shed 2	Wooden Building - Small	10.00	4.50	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	135.0	44.6	0.0	0.0	45	AutoCAD/Photos								
4			Core Logging Shack	Wooden Building - Small	25.00	6.30	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	472.5	155.9	0.0	0.0	156	AutoCAD/Photos								
<b>SUBTOTAL - Airstrip</b>																																		
<b>Camp Area</b>																																		
1	Offices	Safety Building	Prefab Bldg. Shell	Steel Building - Small	17.00	18.00	6.00			Steel	0.03				On-site	175.3	0.0	175.3	0.0	0.0	0.0	0.0	0.0	0.0	250	AutoCAD/Photos								
2		Mine Offices	Entire building	Wooden Building - Small	50.00	10.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	1500.0	495.0	0.0	0.0	495	AutoCAD/Photos								
3	Old Camp Complex	Capstone Building	Entire building	Wooden Building - Small	56.00	9.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	1512.0	499.0	0.0	0.0	499	AutoCAD/Photos								
4		Building betw Capstone & Sherwood		Wooden Building - Small	19.00	7.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	399.0	131.7	0.0	0.0	132	AutoCAD/Photos								
5		Sherwood Building		Wooden Building - Small	110.00	7.50	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	2475.0	816.8	0.0	0.0	817	AutoCAD/Photos								
6		Minto Building		Wooden Building - Small	70.00	7.50	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	1575.0	519.8	0.0	0.0	520	AutoCAD/Photos								
7		Dining Hall/Dry		Wooden Building - Small	64.00	9.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	1728.0	570.2	0.0	0.0	570	AutoCAD/Photos								
8		Gym/Muster		Wooden Building - Small	16.00	8.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	384.0	126.7	0.0	0.0	127	AutoCAD/Photos								
9		Site Services/IT Offices		Wooden Building - Small	28.00	9.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	756.0	249.5	0.0	0.0	249	AutoCAD/Photos								
10	North End of Camp	Trailer betw/Minto and Selkirk Tower		Wooden Building - Small	30.00	7.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	630.0	207.9	0.0	0.0	208	AutoCAD/Photos								
11		Selkirk Towers		Modular Buildings - Dismantle/Prep											Off-site										87.0	Photos								
12	Other	Misc. Seacans		Modular Buildings - Dismantle/Prep											Off-site										5.0	Photos								
<b>SUBTOTAL - Camp Area</b>																																		
<b>Explosive Plant and Storage Areas</b>																																		
1	Explosive Plant	Dyno Compound	Dyno Garage	Steel Building - Small	15.00	15.00	6.00			Steel	0.01				On-site	47.1	0.0	47.1	0.0	0.0	0.0	0.0	0.0	0.0	67	AutoCAD/Photos								
2		Dyno office		Modular Buildings - Dismantle/Prep											Off-site											1.0	Photos							
<b>SUBTOTAL - Explosive Plant and Storage Areas</b>																																		
<b>Fuel Farm Area</b>																																		
1	Fuel Farm Area	Generators	Sheds	Wooden Building - Small	5.00	5.00	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	75.0	24.8	0.0	0.0	25	AutoCAD/Photos								
<b>SUBTOTAL - Fuel Farm Area</b>																																		
<b>Mill Area Complex</b>																																		
1	Mill Complex	Process Building	Prefab Bldg. Shell	Steel Building - Large	59.76	21.34	15.24			Steel	0.03	20	0.0055914	10	0.0223656	On-site	905.1	52.1	957.2	0.0	0.0	0.0	0.0	0.0	1367	Drawings: 16-10-001 and 105								
2		Concentrator Storage	Bayline 1	Steel Building - Large	30.49	6.71	9.15			Steel	0.03				On-site	213.7	0.0	213.7	0.0	0.0	0.0	0.0	0.0	0.0	305	Drawing 34-14-004								
3		Tailings filter building	Prefab Bldg. Shell	Steel Building - Large	36.5854	20	15.24			Steel	0.03				On-site	593.3	0.0	593.3	0.0	0.0	0.0	0.0	0.0	0.0	848	Drawings 35-10-106 and 35-10-104								
4		Mill Building	Phase 2 shell	Steel Building - Large	24.3902	14.4817	13.72			Steel	0.03	5	0.0055914	10	0.0223656	On-site	342.9	29.2	372.0	0.0	0.0	0.0	0.0	0.0	531	Drawings: 16-10-001 and 105								
5		Mill Warehouse	Shell	Steel Building - Large	30.4878	24.3902	7.32			Steel	0.03				On-site	373.5	0.0	373.5	0.0	0.0	0.0	0.0	0.0	0.0	534									
6		Assay Lab	Entire building	Wooden Building - Small	17	10	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	510.0	168.3	0.0	0.0	168									
7		Mechanics Shop	Shell	Steel Building - Small	14	20	5.00			Steel	0.03				On-site	149.7	0.0	149.7	0.0	0.0	0.0	0.0	0.0	0.0	214	AutoCAD/Photos								
8		Electricians shop	Entire building	Wooden Building - Small	15	10	3.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	450.0	148.5	0.0	0.0	149	AutoCAD/Photos								
<b>SUBTOTAL - Mill Area Complex</b>																																		
<b>Mill Valley Fill Laydown</b>																																		
1	Reagent Storage Area		Tent	Wooden Building - Small	25.00	18.00	4.00			Wood/Mixed	0.01				On-site	0.0	0.0	0.0	0.0	0.0	1800.0	594.0	0.0	0.0	594	height negatively adjusted to reduce demo vol.								
<b>SUBTOTAL - Mill Valley Fill Laydown</b>																																		
<b>Pelly Laydown</b>																																		
1	Pelly Laydown	Pelly office	3 modular trailers	Modular Buildings - Dismantle/Prep											Off-site																			
2		Pelly workshop	Wooden building	Wooden Building - Large	12.00	21.00	6.00			Wood/Mixed Debris					On-site	0.0	0.0	0.0	0.0	0.0	1512.0	499.0	0.0	0.0	499	AutoCAD/Photos								
3			prefab building shell	Steel Building - Small	15.00	30.00	6.00			Steel	0.01				On-site	79.7	0.0	79.7	0.0	0.0	0.0	0.0	0.0	0.0	114	AutoCAD/Photos								
4		Pelly warehouse	Weatherhaven	Wooden Building - Small	40.00	25.00	4.00			Wood/Mixed	0.03				On-site	0.0	0.0	0.0	0.0	0.0	4000.0	1320.0	0.0	0.0	1320	AutoCAD/Photos								
5	W15 Sump Area	W15 Laydown	4 propane tanks	Modular Buildings - Dismantle/Prep											Off-site											4.0	AutoCAD/Photos							
<b>SUBTOTAL - Pelly Laydown</b>																																		
<b>Water Treatment Plant</b>																																		
1	Water Treatment Plant		Prefab Bldg. Shell	Steel Building - Large	46.04	18.29	9.15			Steel	0.01				Off-site	162.5	0.0	162.5	0.0	0.0	0.0	0.0	0.0	3.4	0									
<b>SUBTOTAL - Water Treatment Plant</b>																																		

Notes:  
 1. Internal steel structure/demo debris accounted for in part C  
 2. Steel wall thickness adjusted to account for airspace, insulation, HVAC debris, etc.  
 3. Wall areas includes the roof  
 4. Building debris volume for wooden structures based on FEMA "Debris Estimating Field Guide" FEMA publication No. 329.

**B: Concrete Foundations**

No.	Area	Sub Area	Sub-component/ Building/ Section	Disposal Location	Exterior Building		Foundation Dimensions					Calculations					Comments/Notes	
					Length (m)	Width (m)	Slab Thickness (m)	Wall Thickness (m)	Wall Height (m)	Requires washing/decontamination?	In-place Concrete Vol. Override (m3)	In-Place Concrete Volume (m3)	Concrete Debris Volume (m3)	Total Mass (tonnes)	Washing Area (m2)	On-site Demolition Debris Volume (LCM)		
<b>Camp Area</b>																		
1	Offices	Safety Building	Concrete foundation	Bury-in-place	17	18	0.15	0.25	0.3	No		51.2	86.1	122.8	0.0	0.0		
<b>SUBTOTAL - Camp Area</b>												<b>51</b>	<b>86</b>	<b>123</b>	<b>0</b>	<b>0</b>		
<b>Mill Area Complex</b>																		
1	Mill Complex	Crusher and Ore Storage	Concrete - Ore Dump	Bury-in-place	12	6	0.3	0.305	1	No		32.6	54.9	78.2	0.0	0.0		
2		Mill Building	phase 1 portion	Bury-in-place	59.7561	21.3415	0.203	0.254	0.3	Yes		271.6	457.4	651.8	1275.3	0.0	Dwg. 16-10-022 and 16--10-001	
3		Mill Building	Phase 2 portion	Bury-in-place	24.3902	14.4817	0.203	0.254	0.3	Yes		77.6	130.7	186.3	353.2	0.0	Dwg. 16-10-022 and 16--10-001	
4		Mill Building	Compressor/generator area	Bury-in-place	12.1951	10.061	0.203	0.254	0.3	Yes		28.3	47.7	67.9	122.7	0.0	Dwg. 16-10-022 and 16--10-001	
5		Concentrate Storage	Concrete foundation	Bury-in-place	73.7805	30.4878	0.3	0.45	2.21037	Yes		882.2	1485.9	2117.4	2249.4	0.0	Dwg. 34-15-001	
6		Tailings Filter Building	Concrete foundation	Bury-in-place	36.5854	20	0.3	0.305	0.3	Yes		229.9	387.1	551.7	731.7	0.0	Dwg 35-10-022 and 35-10-101	
7		Mill Warehouse	Concrete foundation	Bury-in-place	30.4878	24.3902	0	0.305	0.3	No		10.0	16.9	24.1	0.0	0.0	Dwg. 131-20020-00-C-2001 and 2002	
<b>SUBTOTAL - Mill Area Complex</b>												<b>1532</b>	<b>2581</b>	<b>3677</b>	<b>4732</b>	<b>0</b>		
<b>Mill Valley Fill Laydown</b>																		
1	Reagent storage area	Strip footings		Bury-in-place	25	18	0	0.3	0.3	No		7.7	13.0	18.6	0.0	0.0	AutoCAD/Photos	
<b>SUBTOTAL - Mill Valley Fill Laydown</b>												<b>8</b>	<b>13</b>	<b>19</b>	<b>0</b>	<b>0</b>		
<b>Pelly Laydown</b>																		
1	Pelly Laydown	Washpad		Bury-in-place	15	5	0.3	0	0	No		22.5	37.9	54.0	0.0	0.0	Photos	
<b>SUBTOTAL - Pelly Laydown</b>												<b>23</b>	<b>38</b>	<b>54</b>	<b>0</b>	<b>0</b>		
<b>Water Treatment Plant</b>																		
1	Water Treatment Plant	No foundation present																
<b>SUBTOTAL - Water Treatment Plant</b>												<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		

Notes:  
1. Regrading of the areas are included in the elsewhere in the estimate.

**C: Other Demolition**

No.	Area	Sub Area	Sub-component/ Building/ Section	Material	Quantity	Dimensions				Height/ Thickness (m)	Diameter (m)	Volume (m³)	Air Factor	Disposal Location	Demolition Quantities (Manual Calcs)			Transport			Comments/Notes		
						Length (m)	Width (m)	Area (m²)	Disposal						Steel (tonnes)	Concrete In-place volume (m3)	Concrete Debris Volume (LCM)	Misc. Demolition Volume (m3)	Total Mass (tonnes)	Off-site Demolition Debris Trips		On-site Demolition Debris Volume (LCM)	
<b>Airstrip Area</b>																							
1	Airstrip area	Exploration camp	misc. debris	Wood/Mixed Debris							50	1	On-site				50.0	35.0	0.0	50.0	Allowance based on photos		
2		Waste Storage Areas	misc. debris	Wood/Mixed Debris							100	1	On-site				100.0	70.0	0.0	100.0	Allowance based on photos		
3			Special waste pole barn	Wood/Mixed Debris		55	5		2.5		687.5	0.33	On-site				226.9	158.8	0.0	226.9			
4				Wood/Mixed Debris		32	2		2.5		160	0.33	On-site				52.8	37.0	0.0	52.8			
5		Storage East of strip	misc. debris	Wood/Mixed Debris							100	1	On-site				100.0	70.0	0.0	100.0	Allowance based on photos		
<b>SUBTOTAL - Airstrip Area</b>																	<b>530</b>	<b>371</b>	<b>0</b>	<b>530</b>			
<b>Camp Area</b>																							
1	Camp area	Utilidors	Mill to Camp	Wood/Mixed Debris		229	1		1		229	0.5	On-site				114.5	80.2	0.0	114.5			
2			East side of camp	Wood/Mixed Debris		181	1		1		181	0.5	On-site				90.5	63.4	0.0	90.5			
3		Covered walkways	Camp to Selkirk towers	Wood/Mixed Debris		55	2		2.5		275	0.33	On-site				90.8	63.5	0.0	90.8			
4			Misc. walkway/corridor allow	Wood/Mixed Debris		100	2		2.5		500	0.33	On-site				165.0	115.5	0.0	165.0			
5		Smokers area	Building	Wood/Mixed Debris		2.5	2.5		2.5		15.625	0.33	On-site				5.2	3.6	0.0	5.2			
<b>SUBTOTAL - Camp Area</b>																	<b>466</b>	<b>326</b>	<b>0</b>	<b>466</b>			
<b>Fuel Farm Area</b>																							
1	Fuel Farm Area	Generators	Generator wooden support st	Wood/Mixed Debris	8	6	3		1		18	0.33	On-site				5.9	10.0	0.0	14.3	AutoCAD/Photos		
			Misc. piping/electrical condui	Wood/Mixed Debris									On-site				15.0	25.3	0.0	36.1	Allowance		
<b>SUBTOTAL - Fuel Farm Area</b>																	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>35</b>	<b>0</b>	<b>50</b>
<b>Mill Area Complex</b>																							
1	Crushing & Ore Storage Re	Reclaim Tunnel	Feeder floor, stairs, ladders	Steel									On-site	7			6.8	0.0	0.0	9.7	Source Hatch: FS (2006)		
2			Grating feeder floor	Steel	1		42		0.01				On-site	3			3.4	0.0	0.0	4.8	Source Hatch: FS (2006)		
3			Mechanical (liners, conveyor	Steel									On-site	28			28.2	0.0	0.0	40.3	Source Hatch: FS (2006)		
4		Ore Dump	Concrete components	Concrete	1						44.5		Bury-in-place				44.5	75	0.0	0.0	Source Hatch: FS (2006)		
5		Reclaim area	Concrete components	Concrete	1						329		Bury-in-place				329.0	554	0.0	0.0	Source Hatch: FS (2006)		
6	Mill Area	Mill Building	Process building elevated sla	Concrete									Bury-in-place				96.9	163	0.0	0.0	Source Hatch: FS (2006)		
7			Structural steel platforms	Steel									On-site	108			108.0	0.0	0.0	154.3	Source Hatch: FS (2006)		
8			Grating	Steel			527.9		0.01				On-site	42			42.5	0.0	0.0	60.7	Source Hatch: FS (2006)		
9			Q-deck	Steel			690.3		0.001				On-site	6			5.6	0.0	0.0	7.9	Source Hatch: FS (2006)		
10			Partition walls	Wood/Mixed Debris			130		0.15			0.5	On-site				9.8	16.4	0.0	23.5	Source Hatch: FS (2006)		
11			Concrete separation walls	Concrete			408		0.15			1.3	On-site				61.2	79.6	0.0	162.0	Source Hatch: FS (2006)		
12		Concentrate storage area	Coverall structure	Wood/Mixed Debris			2044		0.005		10.21925	10	On-site				102.2	172.1	0.0	245.9	Source Hatch: FS (2006)		
13			Metal trusses	Steel	12	39.6341					33.6	2	On-site				67.2	113.2	0.0	161.8	Estimated based on dwg and photo		
14		Grinding circuit	Misc. grinding ancillary equip	Steel	1								On-site	0.7			0.7	0.0	1.0	Source Hatch: FS (2006)			
15			Process water tank	Steel	1								On-site	14.0			14.0	0.0	0.0	20.0	Source Hatch: FS (2006)		
16			Fresh water tank	Steel	1								On-site	4.0			4.0	0.0	0.0	5.7	Source Hatch: FS (2006)		
17				Steel	1								On-site	3.0			3.0	0.0	0.0	4.3	Source Hatch: FS (2006) (mostly pump frames)		
18		Flotation circuit	Misc. mechanical equip. steel	Steel			70.08312	2.13414634	6.097561	2.102494			On-site	16.9			16.9	0.0	0.0	24.2	Source Hatch: FS (2006)		
19		Concentrate dewatering	Concentrate Thickeners	Steel	1								On-site	5.2			5.2	0.0	0.0	7.4	Source Hatch: FS (2006)		
20			Misc. mechanical equip. steel	Steel									On-site	5.2			5.2	0.0	0.0	7.4	Source Hatch: FS (2006)		
21		Tailings Filter building	Concrete components	Concrete	1						313		Bury-in-place				44.5	75	0.0	0.0	Source Hatch: FS (2006)		
22			Filter support steel and platfo	Steel									On-site	102.0			102.0	0.0	0.0	145.7	Source Hatch: FS (2006)		
23			Q-deck	Steel			28		0.01				On-site	2			2.3	0.0	0.0	3.2	Source Hatch: FS (2006)		
24			Concrete separation walls	Concrete			112		0.15			1.3	On-site				16.8	21.8	0.0	44.5	Source Hatch: FS (2006)		
25			Architectural walls	Wood/Mixed Debris			100		0.1			0.5	On-site				8.4	0.0	0.0	12.0	Source Hatch: FS (2006)		
26			Tanks & misc. mechanical eq	Steel									On-site	36			36.1	0.0	0.0	51.5	Source Hatch: FS (2006)		
27			Thickener	Steel			205.8692		4.88	9.15	6.176075		On-site	49.7			49.7	0.0	0.0	71.0			
28		Reagents	Tanks & misc. mechanical eq	Steel									On-site	1			1.5	0.0	0.0	2.1	Source Hatch: FS (2006)		
29		Mill building - phase 2	Interior retaining wall	Concrete									Bury-in-place				8.8	15	0.0	0.0	Source Hatch: FS (2006)		
30			Structural steel platforms	Steel									On-site	37.1			37.1	0.0	0.0	53.0	Source Hatch: FS (2006)		
31			Grating	Steel			696.8		0.01				On-site	56			56.1	0.0	0.0	80.1	Source Hatch: FS (2006)		
32			Misc. mechanical equip. steel	Steel									On-site	1			1.0	0.0	0.0	1.4	Source Hatch: FS (2006)		



39			Concentrate discharge conveyer	1	50.0	1.0	2.44						Off-site	Yes	Large	16	2.1	0.0	16.0	1.0	2.1	0.0		
40			Concentrate stockpile feed conveyor	1	50.0	1.0	2.44						Off-site	Yes	Large	16	2.1	0.0	16.0	1.0	2.1	0.0		
41			Haul truck freed conveyor	1	92.3	1.0	2.44						Off-site	Yes	Large	16	3.4	0.0	16.0	1.0	3.4	0.0		
42			Fresh water pumps	2								2.0	Off-site	No	Small	2		2.0	0.0	0.0	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
43			Wash water pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
44			Vacuum pump #1	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
45			Tailings filtrate pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
46			Filter area sump pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
47			Tailings area sump pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
48			Belt filter compressors	2	3.0	3.0	2.44		22.67			9.1	Off-site	Yes	Large			0.0	12.2	0.7	0.2	0.0	assumed 1 hr for dismantling, 1 tonne each	
49			Tailings Area Boiler	1	4.6	1.5	1.22		8.50			1.7	Off-site	Yes	Small			2.3	0.0	0.1	0.0	0.0		
50			Boiler feed pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
51			Boiler blower	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
52			Boiler fuel pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
53			Water collection pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
54	Reagents	Mechanical equip.	Metering pumps	11								11.0	Off-site	Yes	Small	11		11.0	0.0	0.8	0.2	0.0	assumed 1 hr for dismantling, 1 tonne each	
55			Pax transfer pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
56			Thickener flocculent unit	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
57	Mill Services	Mechanical equip.	Reclaim water pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
58			Mill water Pump	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
59			Mill water Booster Pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
60			Plant air compressors	2	1.8	0.9	0.91		1.53			2.0	Off-site	Yes	Small	2	0.1	2.0	0.0	0.1	0.1	0.0		
61	First fills	Grinding balls	Ball Mill and SAG Mill									184.5	On-site	No	Small			246.0	0.0	0.0	0.0	263.6		
62	Mill Building - Phase 2	Mechanical equip.	O/H Crane Ball Mill area		22.9				0.0055914			1.5	Off-site	Yes	Large			0.0	2.0	0.1	0.0	0.0	Assumed I-beam dimensions for crane rail, plus 0.5 tonnes for crane	
63	Grinding Circuit - Phase 2	Mechanical Grinding	Grinding area sump pump#2	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
64			Cyclo-pac 2x26" dia.	1	3.0	4.6	3.05		42.51			8.6	Off-site	Yes	Large			0.0	11.4	0.6	0.2	0.0	pick-up truck factor applied	
65		Grinding ancillary equip.	No. 2 floatation feed sampler	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
66			Pump box	1								2.0	Off-site	Yes	Small			2.7	0.0	0.1	0.0	0.0		
67			SAG discharge pump	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
68			VFD cyclone feed pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
69	Flotation Circuit - Phase 2	Mechanical equip.	Flotation feed pumps	2								2.0	Off-site	Yes	Small	2		2.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
70			Flotation cells 15m3	5			3.00	2.523133	15.00	23.779971	0	9.6	On-site	Yes	Large			0.0	12.8	0.7	0.0	13.7	Assumed dimensions and steel thickness	
71			Pump box	1								2.0	Off-site	Yes	Small			2.7	0.0	0.1	0.0	0.0		
72			Sump pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
73			Recleaner tails pump	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
74			Rougher concentrate pump 2	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
75			Flotation cells 100 cu. Ft	4			2.00	1.335118	2.80	8.3887937	0	2.7	On-site	Yes	Small			3.6	0.0	0.2	0.0	3.9		
76	Tailings Deposal - phase 2	Mechanical equip.	Belt filter #3 (90m2 x 3m)	1	18.3	3.0	6.10		334.62			67.3	Off-site	Yes	Large		3.0	0.0	89.8	4.8	3.0	0.0	dwg. 35-10-105; pick-up truck factor applied	
77			Fresh water pumps	1								1.0	Off-site	No	Small	1		1.0	0.0	0.0	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
78			Wash water pumps	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
79			Vacuum pump #3	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
80			Tailings filtrate pumps	1								1.0	Off-site	Yes	Small	1		1.0	0.0	0.1	0.0	0.0	assumed 1 hr for dismantling, 1 tonne each	
81			Belt filter compressor	1	3.0	3.0	2.44		22.67			4.6	Off-site	Yes	Large			0.0	6.1	0.3	0.1	0.0	pick-up truck factor applied	
<b>SUBTOTAL - Mill Area Complex</b>																								
<b>Mill Valley Fill Laydown</b>																								
1	MVF Laydown Area	Grinding media											On-site	No	Small			0.0	0.0	0.0	0.0	0.0		
2		Steel rack	misc.		76.0	2.00	1.00		152			106.4	On-site	No	Small	0		0.0	0.0	0.0	0.0	152.0		
3		Tire racks	Tires		150.0	3.0	1.50		675			472.5	Off-site	No	Small	0		0.0	0.0	0.0	9.8	0.0		
4		Site Services			100	2	1		200			140.0	On-site	No	Small	0		0.0	0.0	0.0	0.0	200.0		
5		Mill Elect			40	2	2.5		200			140.0	On-site	No	Small	0		0.0	0.0	0.0	0.0	200.0		
6		Misc.			50	2	1		100			70.0	On-site	No	Small	0		0.0	0.0	0.0	0.0	100.0		
<b>SUBTOTAL - Mill Valley Fill Laydown</b>																								
<b>0 0 0 10 652</b>																								
<b>Minto South Portal</b>																								
1	Minto South Portal	Pad A	Fuel tank	1									Off-site	No	Small	2	1	2.0	0.0	0.0	1.0	0.0		
		Pad C	Propane Fuel tanks	2									Off-site	No	Small	4	2	4.0	0.0	0.0	2.0	0.0		
<b>SUBTOTAL - Minto South Portal</b>																								
<b>6 0 0 3 0</b>																								
<b>Pelly Laydown</b>																								
1	Pelly Laydown	Tires			30	3	2			180.00		90.0	Off-site	No	Small	0		0.0	0.0	0.0	1.9	0.0		
		Seacans/trailers			7								50.0	Off-site	No	Small	0	0	0.0	0.0	0.0	0.0	0.0	Assumed to be filled other materials and removed.
		Misc. equipment			1								50.0	On-site	No	Small	0		0.0	0.0	0.0	0.0	71.4	Allowance based on photos
<b>SUBTOTAL - Pelly Laydown</b>																								
<b>0 0 0 2 71</b>																								
<b>Vent Raises - Area 118</b>																								
1	Area 118	Air Heater	All components	1								44.6	Off-site	No	Small	20	1	20.0	0.0	0.0	1.0	0.0	Dwg. 9057-MGD; Mass of equipment listed on drawings.	
2																								
<b>SUBTOTAL - Vent Raises - Area 118</b>																								
<b>20 0 0 1 0</b>																								
<b>Water Treatment Plant</b>																								
1	Water Treatment Plant	WTP building	Actiflo clarifier	1	6.85976	2.7439	3.04878		57.39			11.5	Off-site	No	Large		1	0.0	15.4	0.0	1.0	0.0	Dwg. MIN-000-GA-01 and-02; pick-up truck factor applied	
2			BOE skid #1	1	9.1	2.62	1.52		36.56			1.5	Off-site	No	Small		1	2.0	0.0	0.0	1.0	0.0	Dwg. MIN-000-GA-01 and-02	
3			BOE Skid #2	1	4.6	2.13	2.22		22.05			1.5	Off-site	No	Small		0.5	2.0	0.0	0.0	0.5	0.0	Dwg. MIN-000-GA-01 and-02	
4			BOE Skid #3	1	5.9	3.57	2.44		51.75			10.4	Off-site	No	Large		1	0.0	13.9	0.0	1.0	0.0	Dwg. MIN-000-GA-01 and-02	
5			BOE Skid #4	1	8.2	3.05	0.91		22.95			1.0	Off-site	No	Small		0.5	1.3	0.0	0.0	0.5	0.0	Dwg. MIN-000-GA-01 and-02	
6			RO Skids	2	7.8	1.83	1.50		21.33			8.6	Off-site	No	Small		0.5	11.4	0.0	0.0	0.5	0.0	Dwg. MIN-000-GA-01 and-02	
<b>SUBTOTAL - Water Treatment Plant</b>																								
<b>17 29 0 5 0</b>																								
<b>Notes:</b>																								
1. Assumes steel material																								
2. See disassembly crew details below																								
3. Time to dismantle includes time to prepare for transport																								
4. Where noted, demolition quantities were taken directly from the Hatch 2006 feasibility study.																								
5. HVAC equipment (fans, ducts, heater, etc.) assumed to be part of demo debris and considered as part of the wall thickness in Part A.																								
6. 'pick-p truck factor' = 20 m3 bulk volume - 4 tonnes																								



**Worksheet 19 - Mobilization-Demobilization Calculations**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR01\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**A: Equipment Mobilization - Year 0**

Equipment

Equip. Code	Equipment	Equipment Input				Breakdown and Assembly Time (each)			Transport Time (each)							Calculations							Comments/Notes				
		Qty	Shipping Weight (tonne)	Transport Vehicle 1 (axles)	Transport Vehicle #2 (axles)	Breakdown Time (hrs)	Assembly Time (hrs)	Mechanic Workforce Size	Shipping Origin	Shipping Distance (km)	Average Speed to Barge (km/hr)	Average Speed from Barge to Site (km/hr)	Loading and Off-Loading Time (hrs)	# of Pilot Vehicles required per equip.	Meals/Hotel Allowance (\$)	Total Mechanic Hourly Rate (\$/hr)	Breakdown-Assembly Cost Per Equip.	Travel Time to Barge (hrs)	Travel Time Barge to Site (hrs)	Total Travel Time (1-way) (hrs)	Equipment Rate	Transport Vehicle 1 Hourly Rate		Transport Vehicle 2 Hourly Rate	Total Transport Cost per Equip.	Total cost Per Equip.	TOTAL COST
E.03.1	CAT D6R	1	18	5	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$77.93	\$83.60	\$0.00	\$1,695.25	\$3,222	\$3,222	
E.03.2	CAT D8R	2	38	8	0	4	8	3	Whitehorse	283	80	35	3	2	\$50	\$190.79	\$2,289	4	1.1	5	\$128.82	\$109.66	\$0.00	\$3,266.85	\$5,556	\$11,113	
E.03.3	CAT D10T	2	66	8	5	4	8	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$2,289	4	1.1	5	\$195.11	\$109.66	\$83.60	\$4,850.22	\$7,140	\$14,279	
E.05.1	CAT 330	3	35	7	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$84.35	\$107.05	\$0.00	\$2,032.43	\$3,559	\$10,676	
E.05.2	CAT 385	1	83	8	8	8	16	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$4,579	4	1.1	5	\$178.39	\$109.66	\$109.66	\$5,042.57	\$9,622	\$9,622	
E.06.2	CAT 16M	1	25	6	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$70.42	\$92.51	\$0.00	\$1,747.32	\$3,274	\$3,274	
E.07.2	CAT 735	5	30	6	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$71.87	\$92.51	\$0.00	\$1,758.40	\$3,285	\$16,424	
E.07.4	CAT 773G	5	45	8	5	4	12	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$3,053	4	1.1	5	\$96.30	\$109.66	\$83.60	\$4,095.23	\$7,148	\$35,739	
E.08.1	Hydraulic Crane, 30Ton	1	30	7	0	4	4	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$1,526	4	1.1	5	\$81.87	\$107.05	\$0.00	\$2,926.12	\$4,452	\$4,452	
E.09.1	CAT 950H	1	18	5	0	4	4	3	Whitehorse	283	80	35	3	0	\$100	\$190.79	\$1,526	4	1.1	5	\$62.08	\$83.60	\$0.00	\$1,624.15	\$3,150	\$3,150	
E.09.2	CAT 990	1	78	8	8	8	16	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$4,579	4	1.1	5	\$105.45	\$109.66	\$109.66	\$4,485.20	\$9,064	\$9,064	
E.10.2	Fuel Truck	1	n/a	0	0	0	0	0	Whitehorse	283	80	60	3	0	\$100	\$0.00	\$0	4	0.8	4	\$4.97	\$43.81	\$0.00	\$668.28	\$668	\$668	
E.10.4	Highway Service/Flatbed Truck (HIAB) 5 ton	1	n/a	0	0	0	0	0	Whitehorse	283	80	60	3	0	\$100	\$0.00	\$0	4	0.8	4	\$7.22	\$43.81	\$0.00	\$684.74	\$685	\$685	
E.10.12	Water Truck (5,000 gal)	1	n/a	0	0	0	0	0	Whitehorse	283	80	60	3	0	\$100	\$0.00	\$0	4	0.8	4	\$16.56	\$43.81	\$0.00	\$753.09	\$753	\$753	
E.11.2	Boomlift: 60' articulating	1	10	2	0	0	0	0	Whitehorse	283	80	60	3	0	\$100	\$0.00	\$0	4	0.8	4	\$25.00	\$35.74	\$0.00	\$720.97	\$721	\$721	
E.11.4	Bus: Passenger Bus (24 person cap.)	1	n/a	0	0	0	0	0	Whitehorse	283	80	50	3	0	\$100	\$0.00	\$0	4	0.9	4	\$75.30	\$42.81	\$0.00	\$1,186.17	\$1,186	\$1,186	
E.11.7	Crusher (200 Tons/hr)	1	25	8	8	8	16	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$4,579	4	1.1	5	\$150.00	\$109.66	\$109.66	\$4,825.63	\$9,405	\$9,405	
E.11.10	Emergency Transport Vehicle	1	n/a	0	0	0	0	0	Whitehorse	283	80	60	0	0	\$0	\$0.00	\$0	4	0.8	4	\$150.30	\$42.81	\$0.00	\$1,019.18	\$1,019	\$1,019	
E.11.18	Screener (finley 583) (~400tonnes/hr)	1	75	8	8	8	16	3	Whitehorse	283	80	35	3	2	\$100	\$190.79	\$4,579	4	1.1	5	\$183.00	\$109.66	\$109.66	\$5,077.79	\$9,657	\$9,657	
n/a	Misc. Equipment/Supplies	4	#N/A	8	0	0	0	0	Whitehorse	283	80	40	3	0	\$100	\$0.00	\$0	4	1.0	5	\$0.00	\$109.66	\$0.00	\$1,448.40	\$1,448	\$5,794	
<b>TOTAL - Equipment Mobilization Costs</b>																									<b>\$152,605</b>		

- Notes:
- See Transport vehicle details below for number capacity.
  - Loading and off-loading time is a total (ie. Include both loading and unloading).
  - Calculations include costs for transport vehicles to return to shipping origin.
  - Mob costs for materials are included in the material rates.

**B: Equipment Demobilization - End of Post-Closure 2**

1. Demobilization assumed to consist of the same equipment assumed in the Year 0 mobilization, EXCEPT for a reduced fleet that is assumed to remain for post closure maintenance/repairs activities.

Equip. Code	Equipment to remain during post closure	Qty	TOTAL MOB COST (from Part A)
E.03.1	CAT D6R	1	\$3,222
E.05.1	CAT 330	1	\$3,559
E.07.2	CAT 735	2	\$3,285
E.09.1	CAT 950H	1	\$3,150
E.06.2	CAT 16M	1	\$3,274
<b>TOTAL:</b>			<b>\$16,489</b>

TOTAL Equipment Demobilization Cost at end of Active Closure: **\$136,116**

**C: Equipment Mobilization - Perpetual Care Year**

Equipment

Equip. Code	Equipment	Equipment Input				Breakdown and Assembly Time (each)			Transport Time (each)							Calculations							Comments/Notes				
		Qty	Shipping Weight (kg)	Transport Vehicle 1 (axles)	Transport Vehicle #2 (axles)	Breakdown Time (hrs)	Assembly Time (hrs)	Mechanic Workforce Size	Shipping Origin	Shipping Distance (km)	Average Speed to Barge (km/hr)	Average Speed from Barge to Site (km/hr)	Loading and Off-Loading Time (hrs)	# of Pilot Vehicles required per equip.	Meals/Hotel Allowance (\$)	Total Mechanic Hourly Rate (\$/hr)	Breakdown-Assembly Cost Per Equip.	Travel Time to Barge (hrs)	Travel Time Barge to Site (hrs)	Total Travel Time (1-way) (hrs)	Equipment Rate	Transport Vehicle 1 Hourly Rate		Transport Vehicle 2 Hourly Rate	Total Transport Cost per Equip.	Total cost Per Equip.	TOTAL COST
E.03.1	CAT D6R	1	18	5	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$77.93	\$83.60	\$0.00	\$1,695.25	\$3,222	\$3,222	
E.05.1	CAT 330	1	35	7	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$84.35	\$107.05	\$0.00	\$2,032.43	\$3,559	\$3,559	
E.07.2	CAT 735	2	30	6	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$71.87	\$92.51	\$0.00	\$1,758.40	\$3,285	\$6,569	
E.09.1	CAT 950H	1	18	5	0	4	4	3	Whitehorse	283	80	35	3	0	\$50	\$190.79	\$1,526	4	1.1	5	\$62.08	\$83.60	\$0.00	\$1,574.15	\$3,100	\$3,100	
E.10.4	Highway Service/Flatbed Truck (HIAB) 5 ton	1	n/a	0	0	0	0	0	Whitehorse	283	80	60	0	0	\$50	\$0.00	\$0	4	0.8	4	\$7.22	\$43.81	\$0.00	\$459.70	\$460	\$460	
n/a	MISC. Equipment	1	#N/A	8	0	0	0	0	Whitehorse	283	80	40	3	0	\$50	\$0.00	\$0	4	1.0	5	\$0.00	\$109.66	\$0.00	\$1,398.40	\$1,398	\$1,398	Fuel tanks, etc.
<b>TOTAL - Equipment Mobilization Costs</b>																									<b>\$18,308</b>		

- Notes:
- See Transport vehicle details below for number capacity.
  - Loading and off-loading time is a total (i.e., Include both loading and unloading).
  - Calculations include costs for transport vehicles to return to shipping origin.

**Worksheet 20 - Monitoring Costs**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Subr: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**Summary of Monitoring Costs Per Event**

	Annual Cost Per Phase					n/a	Comments/Notes
	1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual		
1 Water Quality Monitoring	\$43,497	\$58,812	\$47,712	\$23,763	\$24,214	\$0	
2 Sediment Monitoring	\$3,208	\$3,208	\$3,208	\$3,208	\$3,208	\$0	Assumes samples collected during water quality sampling.
3 Biological Monitoring	\$10,594	\$10,594	\$10,594	\$10,594	\$10,594	\$0	
4 Geotechnical Monitoring	\$12,316	\$12,316	\$12,316	\$23,188	\$23,188	\$0	
5 Revegetation Monitoring	\$0	\$10,530	\$10,530	\$10,530	\$10,530	\$0	
6 Annual Inspection Reporting	\$2,372	\$2,372	\$2,372	\$23,900	\$23,900	\$0	

**Monitoring Schedule and Total Cost Summary**

**1. Year 0 Scenario**

	# of Years					TOTAL COST	Comments/Notes
	1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual		
1 Water Quality Monitoring	2	3	5	10	9	\$957,544	
2 Sediment Monitoring	2	3	3	2	9	\$60,952	
3 Biological Monitoring	2	3	3	2	9	\$201,287	
4 Geotechnical Monitoring	2	3	5	2	9	\$378,234	
5 Revegetation Monitoring	0	3	5	2	9	\$200,071	
6 Annual Inspection Reporting	2	3	5	2	9	\$286,620	

**2. EOM Scenario**

	# of Years					TOTAL COST	Comments/Notes
	1 - Interim	2 - Active	3 - PC 1	4 - PC 2	5 - Perpetual		
1 Water Quality Monitoring	0	3	5	10	9	\$870,551	
2 Sediment Monitoring	0	3	3	2	9	\$64,536	
3 Biological Monitoring	0	3	3	2	9	\$180,099	
4 Geotechnical Monitoring	0	3	5	2	9	\$353,601	
5 Revegetation Monitoring	0	3	5	2	9	\$200,071	
6 Annual Inspection Reporting	0	3	5	2	9	\$281,876	

**NOTES:**

1. These tables are used as a check to the NPV calculation spreadsheets.

**Phase 1 - Annual Monitoring Costs - Prior to Closure**

WBS	Facility/Area	Task	Crew/Qty	Unit	Hours	Unit Rates			Activity Totals				Sub-Totals	Source / Comments
						Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Material Cost	Labour Cost	Equipment Cost	Cost		
M1.1	Water Quality Monitoring	Collect water quality sampling (by onsite staff)	2	ea	144		\$44	\$13		\$12,559	\$1,807	\$14,367	\$43,497	
M1.1.1		Helicopter time (5 months)	5	ea	2.25		\$48	\$1,600		\$534	\$18,000	\$18,534		
M1.1.2		Complete lab testing	163	yr	40	\$150	\$117		\$24,450	\$4,680	\$29,130	\$24,450		
M1.1.3		Reporting	1	ea	40		\$117			\$4,680	\$4,680	\$4,680		
M1.2	Sediment Monitoring	Collect data/samples	2	ea	0		\$44	\$13		\$0.00	\$0.00	\$0	\$3,208	
M1.2.1		Laboratory Analysis	2	ea	24	\$200	\$117		\$400	\$2,808	\$3,208	\$400		
M1.2.2		Reporting	1	ls	24		\$117			\$2,808	\$2,808	\$2,808		
M1.3	Biological Monitoring	Consultant travel - Whitehorse to/from site	2	ls	8.1	\$50	\$117		\$100	\$1,892	\$1,992	\$1,992	\$10,594	
M1.3.1		Truck Rental (inc. fuel)	3	days	8		\$117	\$350		\$1,872	\$1,050	\$1,050		
M1.3.2		Collect data/samples	2	ls	8		\$117			\$1,872	\$1,872	\$1,872		
M1.3.3		Laboratory Analysis	10	ea	40	\$100	\$117		\$1,000	\$4,680	\$5,680	\$1,000		
M1.3.4		Reporting	1	ls	40		\$117			\$4,680	\$4,680	\$4,680		
M1.4	Geotechnical Monitoring	Consultant travel - Whitehorse to/from site	1	ls	8.1	\$50	\$117		\$50	\$946	\$996	\$996	\$12,316	
M1.4.1.1	Annual Geotech Inspection	Truck Rental (inc. fuel)	3	days	12		\$117	\$350		\$1,404	\$1,050	\$1,050		
M1.4.1.2		Site Inspection	1	ls	12		\$117			\$1,404	\$1,404	\$1,404		
M1.4.1.3		Reporting	1	ls	40		\$117			\$4,680	\$4,680	\$4,680		
M1.4.1.4		Collect data, plot and review trends	1	ls	96		\$44			\$4,186	\$4,186	\$4,186		
M1.4.2.1	Instrumentation Monitoring	Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
M1.5	Annual Reclamation Reports	Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
M1.5.1		Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
<b>TOTAL</b>													<b>\$71,987</b>	<b>\$71,987</b>

**NOTES:**

- Assumes water quality sampling completed by site personnel.
- Assumes sediment samples collected during water quality sampling.
- Assumes biological sampling completed by consultants based in Whitehorse, and sampling takes place while barge in place.
- Assumes geotechnical instrumentation readings collected and plotted by on-site staff.
- Assumes annual reclamation report compiled by on-site staff whose salary is included in indirect costs; cost included here is for additional consultant review.

**Phase 2 - Annual Monitoring Costs - Active Closure**

WBS	Facility/Area	Task	Crew/Qty	Unit	Hours	Unit Rates			Activity Totals				Sub-Totals	Source / Comments
						Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Material Cost	Labour Cost	Equipment Cost	Cost		
M2.1	Water Quality Monitoring	Collect water quality sampling (by onsite staff)	2	ea	42		\$44	\$13		\$3,663	\$1,054.17	\$4,717	\$58,812	
M2.1.1	Sampling during camp ops.	Helicopter time (5 months)	5	ea	2.25		\$48	\$1,600		\$534	\$18,000	\$18,534		Helicopter cost based on onsite costs
M2.2	Winter sampling	Consultant time incl. travel	5	ea	8		\$117			\$4,680	\$4,680	\$4,680		1 consultant
M2.2.1		Car Rental (inc. fuel)	5	days	8		\$117	\$350		\$1,750	\$1,750	\$1,750		
M2.3	Lab testing	Complete lab testing	163	ea	40	\$150	\$117		\$24,450	\$4,680	\$29,130	\$24,450		
M2.3.1		Reporting	1	ea	40		\$117			\$4,680	\$4,680	\$4,680		
M2.2	Sediment Monitoring	Collect data/samples	2	ea	0		\$44	\$13		\$0	\$0	\$0	\$3,208	
M2.2.1		Laboratory Analysis	2	ea	24	\$200	\$117		\$400	\$2,808	\$3,208	\$400		
M2.2.2		Reporting	1	ls	24		\$117			\$2,808	\$2,808	\$2,808		
M2.3	Biological Monitoring	Consultant travel - Whitehorse to/from site	2	ls	8.1	\$50	\$117		\$100	\$1,892	\$1,992	\$1,992	\$10,594	
M2.3.1		Truck Rental (inc. fuel)	3	days	8		\$117	\$350		\$1,872	\$1,050	\$1,050		
M2.3.2		Collect data/samples	2	ls	8		\$117			\$1,872	\$1,872	\$1,872		
M2.3.3		Laboratory Analysis	10	ea	40	\$100	\$117		\$1,000	\$4,680	\$5,680	\$1,000		
M2.3.4		Reporting	1	ls	40		\$117			\$4,680	\$4,680	\$4,680		
M2.4	Geotechnical Monitoring	Consultant travel - Whitehorse to/from site	1	ls	8.1	\$50	\$117		\$50	\$946	\$996	\$996	\$12,316	
M2.4.1.1	Annual Geotech Inspection	Truck Rental (inc. fuel)	3	days	12		\$117	\$350		\$1,404	\$1,050	\$1,050		
M2.4.1.2		Site Inspection	1	ls	12		\$117			\$1,404	\$1,404	\$1,404		
M2.4.1.3		Reporting	1	ls	40		\$117			\$4,680	\$4,680	\$4,680		
M2.4.1.4		Collect data, plot and review trends	1	ls	96		\$44			\$4,186	\$4,186	\$4,186		
M2.5	Reclamation Monitoring	Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
M2.5.1	Instrumentation Monitoring	Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
M2.5.2	Reclamation Monitoring	Consultant travel - Whitehorse to/from site	2	ls	8.1	\$50	\$117		\$100	\$1,892	\$1,992	\$1,992		
M2.5.3		Truck Rental (inc. fuel)	3	days	12		\$117	\$350		\$1,404	\$1,050	\$1,050		
M2.5.4		Inspect vegetation	2	ls	12		\$117			\$2,808	\$2,808	\$2,808		
M2.5.5		Reporting	1	ls	40		\$117			\$4,680	\$4,680	\$4,680		
M2.6	Annual Reclamation Reports	Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
M2.6.1		Reporting	1	ls	16	\$500	\$117		\$500	\$1,872	\$2,372	\$2,372	\$2,372	
<b>TOTAL</b>													<b>\$97,832</b>	<b>\$97,832</b>

**NOTES:**

- Assumes water quality sampling completed by site personnel when camp in operation, and by helicopter during the winter months
- Assumes sediment samples collected during water quality sampling.
- Assumes biological sampling completed by consultants based in Whitehorse, and sampling takes place while barge in place.
- Assumes geotechnical instrumentation readings collected and plotted by on-site staff.
- Assumes annual reclamation report compiled by on-site staff whose salary is included in indirect costs; cost included here is for additional consultant review.

**Phase 3 - Annual Monitoring Costs - Post-Closure 1**

WBS	Facility/Area	Task	Crew/Qty	Unit	Hours	Unit Rates			Activity Totals				Sub-Totals	Source / Comments
						Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Material Cost	Labour Cost	Equipment Cost	Cost		
M3.1	Water Quality Monitoring	Collect water quality samples	2 ea		42								\$47,712	
M3.1.1	Sampling during camp ops.	Helicopter time (5 months)	5 ea		2.25		\$48	\$1,600	\$3,663	\$1,054	\$4,717			Helicopter cost based on onsite costs
M3.1.2	Winter sampling	Consultant time incl. travel	5 ea		8		\$117	\$350	\$4,680	\$1,750	\$6,430			1 consultant
M3.1.2.1		Car Rental (inc. fuel)	3 ea		3 days			\$350	\$4,680	\$1,050	\$5,730			
M3.1.2.2		Complete lab testing	18 ea		40	\$150	\$117		\$2,700	\$4,680	\$7,380			
M3.1.2.3		Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M3.1.3	Lab testing	Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M3.2	Sediment Monitoring (Bi - Annual)	Collect data/samples	2 ea		0		\$44	\$13	\$0.00	\$0.00	\$0		\$3,208	Samples collected during water sampling
M3.2.1		Laboratory Analysis	2 ea		24	\$200	\$117		\$400	\$2,808	\$400			
M3.2.2		Reporting	1 ls		24		\$117		\$2,808		\$2,808			
M3.3	Biological Monitoring (Bi-Annual)	Consultant travel - Whitehorse to/from site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,594	
M3.3.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M3.3.2		Collect data/samples	2 ls		8		\$117		\$1,872		\$1,872			
M3.3.3		Laboratory Analysis	10 ea		40	\$100	\$117		\$1,000	\$4,680	\$5,680			
M3.3.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M3.3.5		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M3.4	Geotechnical Monitoring	Consultant travel - Whitehorse to/from site	1 ls		8.1	\$50	\$117		\$50	\$946	\$996		\$12,316	
M3.4.1	Annual Geotech Inspection	Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M3.4.1.1		Site Inspection	1 ls		12		\$117		\$1,404		\$1,404			
M3.4.1.2		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M3.4.1.3		Collect data, plot and review trends	1 ls		96		\$44		\$4,186		\$4,186			
M3.5	Reclamation Monitoring	Consultant travel - Whitehorse to/from site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,530	
M3.5.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M3.5.2		Inspect vegetation	2 ls		12		\$117		\$2,808		\$2,808			
M3.5.3		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M3.5.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M3.6	Annual Reclamation Reports	Reporting	1 ls		16	\$500	\$117		\$500	\$1,872	\$2,372		\$2,372	
M3.6.1		Reporting	1 ls		16	\$500	\$117		\$500	\$1,872	\$2,372			
<b>TOTAL</b>												<b>\$86,732</b>	<b>\$86,732</b>	

- NOTES:**
1. Assumes water quality sampling completed by site personnel when camp in operation, and by helicopter during the winter months
  2. Assumes sediment samples collected during water quality sampling.
  3. Assumes biological sampling completed by consultants based in Whitehorse, and sampling takes place while barge in place.
  4. Assumes geotechnical instrumentation readings collected and plotted by on-site staff.
  5. Assumes annual reclamation report compiled by on-site staff whose salary is included in indirect costs; cost included here is for additional consultant review.

**Phase 4 - Annual Monitoring Costs - Post-Closure 2**

WBS	Facility/Area	Task	Crew/Qty	Unit	Hours	Unit Rates			Activity Totals				Sub-Totals	Source / Comments
						Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Material Cost	Labour Cost	Equipment Cost	Cost		
M4.1	Water Quality Monitoring	Helicopter time (3 rounds)	3 ea		2.25		\$48	\$1,600	\$321	\$10,800	\$11,121		\$23,763	Helicopter cost based on onsite costs
M4.1.1		Consultant time incl. travel	3 ea		12		\$117		\$4,212		\$4,212			1 consultant
M4.1.2		Car Rental (inc. fuel)	3 ea		3 days			\$350	\$4,680	\$1,050	\$5,730			
M4.1.3		Complete lab testing	18 ea		40	\$150	\$117		\$2,700	\$4,680	\$7,380			
M4.1.4		Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M4.1.5		Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M4.2	Sediment Monitoring (Bi - Annual)	Collect data/samples	2 ea		0		\$44	\$13	\$0.00	\$0.00	\$0		\$3,208	Samples collected during water sampling
M4.2.1		Laboratory Analysis	2 ea		24	\$200	\$117		\$400	\$2,808	\$400			
M4.2.2		Reporting	1 ls		24		\$117		\$2,808		\$2,808			
M4.3	Biological Monitoring (Bi-Annual)	Consultant travel - Whitehorse to/from site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,594	
M4.3.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M4.3.2		Collect data/samples	2 ls		8		\$117		\$1,872		\$1,872			
M4.3.3		Laboratory Analysis	10 ea		40	\$100	\$117		\$1,000	\$4,680	\$5,680			
M4.3.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M4.3.5		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M4.4	Geotechnical Monitoring	Consultant travel/on-site time	2 ea		16.0	\$50	\$117		\$100	\$3,744	\$3,844		\$23,188	
M4.4.1	Annual Geotech Inspection	Car Rental (2 days)	2 days		2 days			\$350	\$0	\$700	\$700			
M4.4.2		Helicopter time	1 ea		5		\$48	\$1,600	\$238	\$8,000	\$8,238			
M4.4.3		Instrumentation review	1 ea		24		\$44		\$1,047		\$1,047			
M4.4.4		Reporting/Maintenance Planning	1 ls		80		\$117		\$9,360		\$9,360			
M4.4.5		Reporting	1 ls		80		\$117		\$9,360		\$9,360			
M4.5	Reclamation Monitoring	Consultant travel - Whitehorse to site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,530	
M4.5.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M4.5.2		Inspect vegetation	2 ls		12		\$117		\$2,808		\$2,808			
M4.5.3		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M4.5.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M4.6	Annual Reclamation Reports	Reporting	1 ls		200	\$500	\$117		\$500	\$23,400	\$23,900		\$23,900	Includes as-built reporting
M4.6.1		Reporting	1 ls		200	\$500	\$117		\$500	\$23,400	\$23,900			
<b>TOTAL</b>												<b>\$95,183</b>	<b>\$95,183</b>	

- NOTES:**
1. Water quality sampling assumes 2 rounds of sampling completed by helicopter from Carmacks, and one round when the barge is in place.
  2. Assumes sediment samples collected during water quality sampling.
  3. Assumes biological sampling completed by consultants based in Whitehorse, and sampling takes place while barge in place.
  4. Geotechnical inspection assumed to be completed by helicopter. Two consultants assumed to be present to also collect geotech data. The inspection is also used to determine the site maintenance required for the year.
  5. Assumes annual reclamation report compiled by outside consultants.

**Phase 5 - Annual Monitoring Costs - Perpetual Maintenance Year**

WBS	Facility/Area	Task	Crew/Qty	Unit	Hours	Unit Rates			Activity Totals				Sub-Totals	Source / Comments
						Material Cost (\$/unit)	Labour Rate (\$/hr)	Equipment Rate (\$/hr)	Material Cost	Labour Cost	Equipment Cost	Cost		
M5.1	Water Quality Monitoring	Helicopter time (3 rounds)	3 ea		2.25		\$48	\$1,600	\$321	\$10,800	\$11,121		\$24,214	Helicopter cost based on onsite costs
M5.1.1		Consultant time incl. travel	3 ea		12		\$117		\$4,212	\$452	\$4,664			1 consultant
M5.1.2		Car Rental (inc. fuel)	3 ea		3 days			\$350	\$4,680	\$1,050	\$5,730			
M5.1.3		Complete lab testing	18 ea		40	\$150	\$117		\$2,700	\$4,680	\$7,380			
M5.1.4		Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M5.1.5		Reporting	1 ea		40		\$117		\$4,680		\$4,680			
M5.2	Sediment Monitoring	Collect data/samples	2 ea		0		\$44	\$13	\$0.00	\$0.00	\$0		\$3,208	Collected during water sampling
M5.2.1		Laboratory Analysis	2 ea		24	\$200	\$117		\$400	\$2,808	\$400			
M5.2.2		Reporting	1 ls		24		\$117		\$2,808		\$2,808			
M5.3	Biological Monitoring	Consultant travel - Whitehorse to/from site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,594	
M5.3.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M5.3.2		Collect data/samples	2 ls		8		\$117		\$1,872		\$1,872			
M5.3.3		Laboratory Analysis	10 ea		40	\$100	\$117		\$1,000	\$4,680	\$5,680			
M5.3.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M5.3.5		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M5.4	Geotechnical Monitoring	Consultant travel/on-site time	2 ea		16.0	\$50	\$117		\$100	\$3,744	\$3,844		\$23,188	
M5.4.1	Annual Geotech Inspection	Car Rental (2 days)	2 days		2 days			\$350	\$0	\$700	\$700			
M5.4.2		Helicopter time	1 ea		5		\$48	\$1,600	\$238	\$8,000	\$8,238			
M5.4.3		Instrumentation review	1 ea		24		\$44		\$1,047		\$1,047			
M5.4.4		Reporting/Maintenance Planning	1 ls		80		\$117		\$9,360		\$9,360			
M5.4.5		Reporting	1 ls		80		\$117		\$9,360		\$9,360			
M5.5	Reclamation Monitoring	Consultant travel - Whitehorse to site	2 ls		8.1	\$50	\$117		\$100	\$1,892	\$1,992		\$10,530	
M5.5.1		Truck Rental (inc. fuel)	3 days		3 days			\$350	\$0	\$1,050	\$1,050			
M5.5.2		Inspect vegetation	2 ls		12		\$117		\$2,808		\$2,808			
M5.5.3		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M5.5.4		Reporting	1 ls		40		\$117		\$4,680		\$4,680			
M5.6	Annual Reclamation Reports	Reporting	1 ls		200	\$500	\$117		\$500	\$23,400	\$23,900		\$23,900	Includes Asbuilt reporting
M5.6.1		Reporting	1 ls		200	\$500	\$117		\$500	\$23,400	\$23,900			
<b>TOTAL</b>												<b>\$95,635</b>	<b>\$95,635</b>	

- NOTES:**
1. Water quality sampling assumes 2 rounds of sampling completed by helicopter from Carmacks, and one round when the barge is in place.
  2. Assumes sediment samples collected during water quality sampling.
  3. Assumes biological sampling completed by consultants based in Whitehorse, and sampling takes place while barge in place.
  4. Geotechnical inspection assumed to be completed by helicopter. Two consultants assumed to be present to also collect geotech data. The inspection is also used to determine the site maintenance required for the year.
  5. Assumes annual reclamation report compiled by outside consultants and includes additional hours for asbuilt reporting

### Worksheet 21 - Ore Stockpiles and Misc. Volume Calculations

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

References (dwgs/plans) [\\VAN-SVR0\Projects\01\\_SITES\Minto\1CM002.045\\_ClosureCosts\040\\_AutoCAD\1CM002-45\\_ClosureQuantities.dwg](#)

#### A: Ore Stockpile Excavation

Area	Description	Inputs				Calculated Quantities			Comments/Notes
		Volume of Ore Remaining (m <sup>3</sup> )	Ore Pad Area (m <sup>2</sup> )	Ore Pad Excavation depth (m)	Confirmation Test Grid Spacing (m)	Ore Relocation Volume (m <sup>3</sup> )	Ore Pad Excavation Volume (m <sup>3</sup> )	Confirmation Tests Required	
<b>Year 0 Scenario</b>									
Mill Area	North Stockpile	0	13,760	0.5	10	0	6,880	138	
	West Stockpile	0	38,670	0.5	10	0	19,335	387	
	East Stockpile	0	31,190	0.5	10	0	15,595	312	
	South Stockpile	110,942	41,571	0.5	10	110,942	20,786	416	
	Crushed Ore Stockpiles	0	4,145	0.5	10	0	2,073	41	
	Crusher Stockpile	0	12,678	0.5	10	0	6,339	127	
Mill Area	<b>TOTAL</b>					110,942	71,007	1,421	
Main Waste Dump	Low Grade Ore Stockpiles	46,329	62,631	0.5	10	46,329	31,316	626	
Mill Area	<b>TOTAL</b>					46,329	31,316	626	

**Notes:**

1. Year 0 volumes of ore supplied by Minto in July 2016
2. Covers and revegetation of the ore stockpiles included in the "Areas" worksheet.

#### B: Misc. Volumes

Area	Description	Inputs				Calculated Quantities			Comments/Notes
		Length (m)	Width (m)	Area (m <sup>2</sup> )	Average Thickness (m)	Volume (Cm <sup>3</sup> )	Volume (Lm <sup>3</sup> )		
DSTSF	Fill at south side of DSTSF to cover tailings and provide drainage to the east.	404	25		3	30,300			Material assumed to be sourced from the Tailings Diversion Ditch road
DSTSF	Unsuitable existing cover material to be removed.			69,467	0.75	52,100			Area based on 2014 aerial photo
Main Pit	SAT in the Main Pit to be relocated to below 786 m elevation					1,040,000			Volume provided by Minto Dec. 2015, and includes a projection of the SAT volume to be placed from Minto North
Main Pit	Est. Tailings near outlet above long term water table elevation of 786.			2,311	1.50	3,467			Area estimated from 2014 site aerial photographs and June 2016 site photography
Southwest Wetlands	3 Berms across valley	300	5		2.00	3,000			Assumed width, thickness. Length estimated from 2014 orthophoto.

**Notes:**

## Worksheet 22 - Open Pit Calculations

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**References (dwgs/plans):** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg  
**Layer:** -Pits

### Open Pit Quantity Calculations

Pit	Scenario	Safety Berms							Boulder Fence		Warning Signs			Quantity Calculations					Comments/Notes
		Berm Placement Length (m)	% Open Space in Berm	Length of berm requiring land clearing (m)	Land clearing width (m)	Berm Height (m)	Berm Side-Slope Angle (H:1V)	Berm Crest Width (m)	Fence Length (m)	Boulder Spacing (m)	Warning Sign Perimeter Length (m)	Sign Spacing (m)	User Override - Number of Signs	Berm Volume (m <sup>3</sup> /m)	Berm Volume (m <sup>3</sup> )	Land Clearing Area (m <sup>2</sup> )	Boulder Fence Volume (m <sup>3</sup> )	Warning Signs	
Main Pit	All	1680	14%	750	10	1.5	1.3	0.3	40	1	2741	100	6	3.4	4,860	7,500	52	6	
Area 2 Pit	Yr0	1506	14%	30	10	1.5	1.3	0.3	20	1	1506	100	6	3.4	4,357	300	26	6	Does not include Stage 3 Pit
Area 2 Pit (inc. Stage 3)	EOM	1838	14%	0	10	1.5	1.3	0.3	20	1	1506	100	6	3.4	5,317	0	26	6	
Area 118 Pit	All	496	14%	258	10	1.5	1.3	0.3	20	1	600	100	4	3.4	1,435	2,580	26	4	
Minto North	All	1248	14%	590	10	1.5	1.3	0.3	20	1	1248	100	4	3.4	3,610	5,900	26	4	

**Notes:**

1. Vegetated areas of the highwall require clearing to ensure visibility of the safety berm.
2. Main Pit Rock fence assumed to be placed near the entrance ramp of the pit.



**Worksheet 23 - Resloping Quantity Calculations**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Mnto\1CM002.045\_ClosureCosts\Cost Estimate\

**Notes/Instructions:** 1. When adding a new row, make sure all columns are copied (there are a lot of calculations hidden in columns to the right).  
 2. Once complete, check that the Dozer used on this sheet matches the correct task unit rate used on the cost estimate worksheet

**References (dwgs/plans):** \\VAN-SVR0\Projects\01\_SITES\Mnto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002.45\_ClosureQuantities.dwg  
 (Layer --Regrading)

**A: Slopes**

Facility	Segment	Dump				Dozing Conditions							Calculated Quantities					Total Quantities				Comments/Notes			
		Mid-bench length (m)	Height (m)	Existing Side Slope Angle (H:1V)	Final Side Slope Angle (H:1V)	Underlying slope grade (%) (See Note 2)	Does regrading increase the dump footprint?	Soil Cover Thickness (m)	Dozer Size	Material Type	Dozing Condition	Bank or Placed? (See note 3)	Slot or Side-by-side Dozing?	Cut Volume per m crest (m <sup>3</sup> )	Average Regrade Push Distance (m)	Unfactored Dozer Productivity (Lm <sup>3</sup> /hr)	Factored Dozer Productivity (Bm <sup>3</sup> /hr)	Time to complete 1m width (hrs)	Time Required - Regrading (Hrs)	Time Required - Spreading Cover (hrs)	Total Regrade Volume (Bm <sup>3</sup> )		3D Surface Area (m <sup>2</sup> )	2D Sloped Area (m <sup>2</sup> )	2D Footprint increase due to regrading (m <sup>2</sup> )
<b>Existing Facilities</b>																									
Camp Area	R1	309	18	1.3	3	0	Yes	0.5	D10	Sand & gravel	Normal	Placed	No	68.9	37.9	1114.1	873.5	0.1	24	10	21,275	17,589	16,686	4,728	
Camp Area	R2	73	3	1.3	3	0	No	0.5	D10	Sand & gravel	Normal	Placed	No	1.9	6.3	2293.7	1798.4	0.0	0	0	140	693	657	0	
Camp Area	R3	44	3	1.3	3	0	Yes	0.5	D10	Sand & gravel	Normal	Placed	No	1.9	6.3	2293.7	1798.4	0.0	0	0	84	417	396	112	
Camp Area	<b>TOTAL</b>																								
DSTSF - WR Shell	R1	3211	4	1.3	4	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	5.4	11.0	2293.7	1309.0	0.0	13	14	17,339	52,957	51,376	0	
DSTSF - WR Shell	<b>TOTAL</b>																								
DSTSF - South end	R1	500	5	1.3	4	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	8.4	13.7	2293.7	1309.0	0.0	3	3	4,219	10,308	10,000	0	
DSTSF - South end	<b>TOTAL</b>																								
IROD Laydown	R1	101	14	3.5	3.5	0	No	0	D10	Sand & gravel	Normal	Placed	No	0.0	0.0	2293.7	1787.2	0.0	0	0	0	5,147	4,949	0	
IROD Laydown	<b>TOTAL</b>																								
Main Dump (2014)	R1	282	60	2.5	3	2	Yes	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	226.2	127.2	377.5	227.7	1.0	280	89	63,786	53,790	51,029	4,489	
Main Dump	R2	186	38	2.5	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	76.8	73.8	614.4	370.7	0.2	38	21	14,164	20,476	19,425	0	
Main Dump	R3	358	15	1.3	3	0	Yes	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	22	8	17,117	16,981	16,110	4,565	
Main Dump	R5	266	22	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	102.9	46.4	931.0	561.6	0.2	49	12	27,358	18,506	17,556	0	
Main Dump	R6	73	17	1.5	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	54.2	36.8	1172.6	707.4	0.1	6	2	3,956	3,924	3,723	0	
Main Dump	R9	50	7	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	10.4	14.8	2293.7	1383.7	0.0	0	0	521	1,107	1,050	0	
Main Dump	R11	200	20	1.3	3	-75	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	65.2	32.9	1267.0	764.4	0.1	17	5	13,049	9,661	9,355	0	
Main Dump	R12	75	5	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	5.3	10.5	2293.7	1383.7	0.0	0	0	388	1,186	1,125	0	
Main Dump	R13	85	20	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	85.0	42.2	1013.9	611.6	0.1	13	4	7,905	5,882	5,880	0	
Main Dump	R14	123	30	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	191.3	63.2	703.3	425.5	0.4	55	10	23,624	11,869	11,070	0	
Main Dump	R15	205	10	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	21.3	21.1	1885.4	1137.4	0.0	4	2	4,356	6,483	6,150	0	
Main Dump	R16	112	20	1.3	3	-75	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	65.2	32.9	1267.0	764.4	0.1	10	3	7,307	5,522	5,239	0	
Main Dump Extension	R17	964	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	58	23	46,091	45,727	43,380	0	
Main Dump Extension	R18	990	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	60	22	47,334	46,360	44,550	0	
Main Dump Extension	R91	1000	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	60	23	47,813	47,434	45,000	0	
<b>MWD &amp; MWDE</b>	<b>TOTAL</b>																								
Main Pit Dump - Yr 0	R1	277	16	1.3	3	15	Yes	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	65.2	40.8	1043.9	629.8	0.1	26	10	13,066	16,056	16,056	6,268	
Main Pit Dump - Yr 0	R2	422	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	21	8	20,177	20,177	19,990	0	
Main Pit Dump - Yr 0	R3	353	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	21	8	16,878	16,744	15,855	0	
Main Pit Dump - Yr 0	R4	233	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	14	5	11,140	11,052	10,485	0	
Main Pit Dump - Yr 0	R5	290	12	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	30.6	25.3	1601.5	966.2	0.0	7	3	7,038	8,728	8,290	0	
Main Pit Dump - Yr 0	R6	203	21	1.5	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	82.7	44.3	970.5	585.5	0.1	29	9	16,786	13,481	12,789	0	
Main Pit Dump - Yr 0	R7	178	14	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	41.7	29.5	1395.1	841.6	0.0	9	3	7,330	7,792	7,392	0	
Main Pit Dump - Yr 0	R8	170	11	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	25.7	23.2	1731.2	1044.4	0.0	4	2	4,371	5,913	5,910	0	
Main Pit Dump - Yr 0	R9	355	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	21	8	16,873	16,839	15,975	0	
Main Pit Dump - Yr 0	<b>TOTAL</b>																								
Main Pit Dump - Yr 0	<b>TOTAL</b>																								
MVFE Stage 1 and 2	R1	255	17	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	61.4	35.8	1172.6	707.4	0.1	22	7	15,660	13,708	13,005	0	
MVFE Stage 1 and 2	R2	188	12	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	30.6	25.3	1601.5	966.2	0.0	6	3	5,753	7,134	6,768	0	
MVFE Stage 1 and 2	R3	250	10	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	21.3	21.1	1885.4	1137.4	0.0	5	3	5,313	7,906	7,500	0	
MVFE Stage 1 and 2	R4	265	12	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	30.6	25.3	1601.5	966.2	0.0	8	4	8,109	10,056	9,540	0	
MVFE Stage 1 and 2	R5	400	5	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	5.3	10.5	2293.7	1383.7	0.0	2	2	2,125	6,325	6,000	0	
MVFE Stage 1 and 2	<b>TOTAL</b>																								
Minto South Portal	R1	200	7	1.3	3	0	Yes	0	D10	Waste Rock (M)	Rock, rippled or	Placed	No	10.4	14.8	2293.7	1383.7	0.0	2	0	2,083	4,427	4,200	1,190	
Minto South Portal	R2	133	10	1.3	3	10	Yes	0	D10	Waste Rock (M)	Rock, rippled or	Placed	No	23.6	23.5	1710.6	1032.0	0.0	3	0	3,142	4,689	4,448	1,535	
Minto South Portal	R3	200	7	1.3	3	10	No	0	D10	Waste Rock (M)	Rock, rippled or	Placed	No	11.6	16.5	2353.9	1420.0	0.0	2	0	2,315	4,936	4,692	0	
Minto South Portal	R4	80	10	1.3	3	10	No	0	D10	Waste Rock (M)	Rock, rippled or	Placed	No	23.6	23.5	1710.6	1032.0	0.0	2	0	2,890	2,859	2,976	0	
Minto South Portal	R5	490	20	2.5	3	0	No	0	D10	Waste Rock (M)	Rock, rippled or	Placed	No	25.0	42.2	1013.9	611.6	0.0	20	0	12,250	30,990	29,400	0	
Minto South Portal	<b>TOTAL</b>																								
Southwest Dump	Advantage	1000	15	1.3	3	0	No	0.5	D10	Waste Rock (M)	Rock, rippled or	Placed	No	47.8	31.6	1311.6	791.2	0.1	60	23	47,813	47,434	45,000	0	
Southwest Dump	<b>TOTAL</b>																								
SWD - High Grade Waste	R1	320	8	1.3	5	0	Yes	1	D10	Waste Rock (M)	Rock, rippled or	Placed	No	29.6	27.2	1501.2	796.2	0.0	12	11	9,472	13,053	12,800	4,736	
SWD - High Grade Waste	R2	113	11	1.3	5	0																			

**B: Flat Area Tertiary Catchments**

Facility	Dimensions			Dozing Conditions				Calculated Quantities						Total Quantities		Comments/Notes	
	Total Flat Area (m <sup>2</sup> )	Maximum Tertiary Catchment Area (m <sup>2</sup> )	Avg. Final Slope (%)	Length of dozing direction over-ride (m)	Dozer Size	Material Type	Dozing Condition	Bank or Placed? (See note 3)	Number of catchments	Catchment Length (in dozing direction) (m)	Average Regrade Push Distance (m)	Unfactored Dozer Productivity (Lm <sup>3</sup> /hr)	Factored Dozer Productivity (Bm <sup>3</sup> /hr)	Cut Volume Per Catchment (Bm <sup>3</sup> )	Time to complete 1 catchment (hrs)		Total Time Required (Hrs)
Camp Area	20,626	15,000	3%	50	D10	Sand & gravel	Normal	Placed	1	50.0	33.3	1251.2	560.6	2,813	5.0	7	2,990
Crusher Area	38,364	15,000	3%	50	D10	Sand & gravel	Normal	Placed	2	50.0	33.3	1251.2	560.6	2,813	5.0	9	2,990
DSTF	0	15,000	1%	80	D10	Earth, moist	Normal	Placed	0	122.5	81.6	561.2	241.3	2,296	9.5	0	#DIV/0!
Explosive Plant/Storage area	55,113	15,000	3%	60	D10	Waste Rock	Hard to cut: fr	Placed	4	60.0	40.0	1062.8	418.8	3,375	8.1	30	1,861
Fuel Storage Area	8,400	15,000	3%	60	D10	Waste Rock	Hard to cut: fr	Placed	1	60.0	40.0	1062.8	418.8	3,375	8.1	5	1,861
Ign Rich Overburden Dump	0	15,000	3%	80	D10	Earth, moist	Normal	Placed	0	80.0	53.3	821.5	337.4	4,500	13.3	0	#DIV/0!
IROD Laydown	18,106	15,000	3%	80	D10	Sand & gravel	Normal	Placed	1	80.0	53.3	821.5	368.1	4,500	12.2	15	1,227
Main Dump	90,055	15,000	3%	D10	Waste Rock	Hard to cut: fr	Placed	6	122.5	81.6	561.2	221.1	6,889	31.2	187	481	Total Flat Area was reduced by 13.5 ha (flat area at the top of the MWDE) that is being constructed at a 2% grade during ops.
Main Pit Dump (Yr 0)	128,793	15,000	3%	70	D10	Waste Rock	Hard to cut: fr	Placed	9	70.0	46.7	925.8	364.8	3,938	10.8	83	1,390
Main Pit Dump (EOM)	144,270	15,000	3%	70	D10	Waste Rock	Hard to cut: fr	Placed	10	70.0	46.7	925.8	364.8	3,938	10.8	104	1,390
Mill Area	42,365	15,000	3%	100	D10	Waste Rock	Hard to cut: fr	Placed	3	100.0	66.7	672.8	265.1	5,625	21.2	60	707
MWFE Stage 1 and 2	114,652	15,000	3%	100	D10	Waste Rock	Hard to cut: fr	Placed	8	100.0	66.7	672.8	265.1	5,625	21.2	162	707
Mine South Portal	62,765	15,000	3%	75	D10	Waste Rock	Hard to cut: fr	Placed	4	75.0	50.0	870.4	343.0	4,219	12.3	61	1,219
Ore Stockpile Area	138,307	15,000	3%	D10	Waste Rock	Hard to cut: fr	Placed	9	122.5	81.6	561.2	221.1	6,889	31.2	289	481	
Pebble Laydown	51,710	15,000	3%	D10	Waste Rock	Hard to cut: fr	Placed	3	122.5	81.6	561.2	221.1	6,889	31.2	107	481	
Reclamation OVR Dump	287,357	15,000	3%	D10	Earth, moist	Normal	Placed	20	122.5	81.6	561.2	230.5	6,889	29.9	594	502	
SWD - High Grade Waste	5,915	15,000	3%	D10	Earth, moist	Normal	Placed	0	122.5	81.6	561.2	230.5	6,889	29.9	12	502	
W15 Sump Area	9,484	15,000	3%	80	D10	Waste Rock	Hard to cut: fr	Placed	1	80.0	53.3	821.5	323.7	4,500	13.9	9	1,079

- Notes:
1. Regrading productivity calculations/details are provided in below (spreadsheet).
  2. Productivity calculations assumes the dozer is pushing uphill.
  3. Dozer pushing distance calculations assume the tertiary catchments are approximately square, unless the 'length of dozing direction' user over-ride is used.
  4. Bank materials are insitu, natural soils. Placed are materials that have been placed and compacted and are generally denser than Bank/In-situ materials (See densities and bulking factors below). For Waste Rock - Use 'Placed'.

**C: Miscellaneous Regrading**

Facility	Volume to Push (m <sup>3</sup> )	Avg. Grade (%)	Dozer Size	Material Type	Dozing Condition	Bank or Placed? (See note 3)	Average Regrade Push Distance (m)	Unfactored Dozer Productivity (Lm <sup>3</sup> /hr)	Factored Dozer Productivity (Bm <sup>3</sup> /hr)	Total Time Required (Hrs)	Comments/Notes
Mill Pond Backfilling	7,088	0%	D10	Waste Rock	Hard to cut: fr	Placed	50.0	870.4	367.0	19	Assumes material pushed from the north (crusher area)
SWD Cover placement on s	41,485	20%	D10	Earth, moist	Loose Stockp	Placed	40.0	1062.8	315.4	132	

- Notes:
1. Regrading productivity calculations/details are provided in below (spreadsheet).
  2. Productivity calculations assumes the dozer is pushing uphill.
  3. Dozer pushing distance calculations assume the tertiary catchments are approximately square, unless the 'length of dozing direction' user over-ride is used.
  4. Bank materials are insitu, natural soils. Placed are materials that have been placed and compacted and are generally denser than Bank/In-situ materials (See densities and bulking factors below). For Waste Rock - Use 'Placed'.

## Worksheet 24 - Revegetation Prescriptions

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



### A: Tractor-Applied Seed Mixes

#### Seed Mix 1 - DRY AREA SEED MIX

Item	Target Application Rate (kg/ha)	Over-application Allowance (%)	Applied Rate (kg/ha)	Unit Cost (\$/kg)	Item Cost (\$/ha)	Comment
Seed Mix	30		45	\$15.80	\$711.00	
Fertilizer	200	25%	250	\$1.10	\$275.00	
Mulch	0	0%	0	\$1.00		
Tackifier	0	0%	0	\$3.62		
<b>TOTAL SEED MIX COST PER HA:</b>					<b>\$986.00</b>	

#### Seed Mix 2 - WET AREA SEED MIX

Item	Target Application Rate (kg/ha)	Over-application Allowance (%)	Applied Rate (kg/ha)	Unit Cost (\$/kg)	Item Cost (\$/ha)	Comment
Seed Mix	30		45	\$15.80	\$711.00	
Fertilizer	200	25%	250	\$1.10	\$275.00	
Mulch	0	0%	0	\$1.00	\$0.00	
Tackifier	0	0%	0	\$3.62	\$0.00	
<b>TOTAL SEED MIX COST PER HA:</b>					<b>\$986.00</b>	

### B: Tree Planting

Item	Target Application Rate (stem/ha)	Over-application Allowance (%)	Applied Rate (kg/ha)	Unit Cost (\$/kg)	Item Cost (\$/ha)	Comment
Trees	Seedlings per ha					
Tree seedlings	1,000	0%	1,000			Target application rates from Closure Plan
Subtotal - Seed Mix	1000		1000	\$0.38	\$380	
Fertilizer	1000	0%	1000	\$0.08	\$80.50	
<b>TOTAL TREE PLANTING COST PER HA:</b>					<b>\$461</b>	

### Worksheet 25-Road Calculations

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

References (dw \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg

#### A: Exploration Roads

Area	Description	Road Parameters				Safety Berms				Reclamation Prescription				X-Section Quantities				Total Quantities				Comments/Notes	
		Length (m)	Width (at crest) (m)	Average Fill Height (m)	Number of slopes to regrade (0, 1 or 2)	Existing Side Slope Angle (H:1V)	Final Side-Slope Angle (H:1V)	Number of Berms (0, 1 or 2)	Berm Height (m)	Berm Side-Slope Angle (H:1V)	Berm Crest Width (m)	Dozer Size	Scarify (y/n)	Growth Media Thickness (mm)	Revegetate (y/n)	Berm Volume (1-side) (m³/m)	Regrade Cut Volume (m³/m)	Average Regrade Push Distance (m)	Factored Dozer Productivity (m/hr)	Scarification Area (m²)	Cover Volume (Cm³)		Revegetation Area (ha)
Airstrip East	Area east of airstrip	4581	3		0	1	3	0	0	0	0		Yes	0	Yes	0.0	0.0	0.0	#N/A	13,743	0	1.37	0.0
Airstrip West	Area west of airstrip	4299	3		0	1	3	0	0	0	0		Yes	0	Yes	0.0	0.0	0.0	#N/A	12,897	0	1.29	0.0
Ridgetop		4252	3		0	1	3	0	0	0	0		Yes	0	Yes	0.0	0.0	0.0	#N/A	12,756	0	1.28	0.0
North	North of Main Pit	4963	3		0	1	3	0	0	0	0		Yes	0	Yes	0.0	0.0	0.0	#N/A	14,889	0	1.49	0.0
<b>TOTALS</b>																				<b>54,285</b>	<b>0</b>	<b>5</b>	<b>0</b>

Notes:  
 1. Dozer regrading productivity calculations details are provided in the "reslope" worksheet.  
 2. If a side slope is not regraded, it is assumed that it is not revegetated, and no cover is placed.

#### B: Access Roads

Area	Description	Road Parameters				Safety Berms				Reclamation Prescription				X-Section Quantities				Total Quantities				Comments/Notes	
		Length (m)	Width (at crest) (m)	Average Fill Height (m)	Number of slopes to regrade (0, 1 or 2)	Existing Side Slope Angle (H:1V)	Final Side-Slope Angle (H:1V)	Number of Berms (0, 1 or 2)	Berm Height (m)	Berm Side-Slope Angle (H:1V)	Berm Crest Width (m)	Dozer Size	Scarify (y/n)	Growth Media Thickness (mm)	Revegetate (y/n)	Berm Volume (1-side) (m³/m)	Regrade Cut Volume (m³/m)	Average Regrade Push Distance (m)	Factored Dozer Productivity (m/hr)	Scarification Area (m²)	Cover Volume (Cm³)		Revegetation Area (ha)
Airstrip	Airport Access Road	968	14	1.5	2	1.3	3	2	1	1.3	0	D8	Yes	0	Yes	1.3	3.2	3.2	266.0	13,552	0	2.27	3.6
	Betw. Landfill/waste storage	236	10	1.5	0	1.3	3	1	1	1.3	0	D8	Yes	0	Yes	1.3	1.3	3.2	648.8	2,360	0	0.24	0.4
	Old Exploration camp road	460	10	1.5	0	1.3	3	1	1	1.3	0	D8	Yes	0	Yes	1.3	1.3	3.2	648.8	4,600	0	0.46	0.7
Camp	2 Access Roads	238	14	1.5	2	1.3	3	2	1	1.3	0	D8	Yes	0	Yes	1.3	3.2	3.2	266.0	3,332	0	0.56	0.9
Explosives	Roads between explosive plant	1633	10	2	1	1.3	3	1	1	1.3	0	D8	Yes	0	Yes	1.3	1.7	4.2	501.9	16,330	0	2.67	3.3
IROD Laydown	Road between yard areas	703	10	0	0	1.3	3	0	1	1.3	0	D8	Yes	0	Yes	1.3	0.0	0.0	#DIV/0!	7,030	0	0.70	0.0
W15 Laydown	2 "F" shaped roads	388	14	0	1	1.3	3	1	1	1.3	0	D8	Yes	0	Yes	1.3	1.3	0.0	648.8	5,432	0	0.54	0.6
<b>TOTALS</b>																				<b>52,636</b>	<b>0</b>	<b>7</b>	<b>9</b>

Notes:  
 1. Dozer regrading productivity calculations details are provided in the "reslope" worksheet.  
 2. If a side slope is not regraded, it is assumed that it is not revegetated, and no cover is placed.

#### C: Haul Roads

Area	Description	Road Parameters				Safety Berms				Reclamation Prescription				X-Section Quantities				Total Quantities				Comments/Notes	
		Length (m)	Width (at crest) (m)	Average Fill Height (m)	Number of slopes to regrade (0, 1 or 2)	Existing Side Slope Angle (H:1V)	Final Side-Slope Angle (H:1V)	Number of Berms (0, 1 or 2)	Berm Height (m)	Berm Side-Slope Angle (H:1V)	Berm Crest Width (m)	Dozer Size	Scarify (y/n)	Growth Media Thickness (mm)	Revegetate (y/n)	Berm Volume (1-side) (m³/m)	Regrade Cut Volume (m³/m)	Average Regrade Push Distance (m)	Factored Dozer Productivity (m/hr)	Scarification Area (m²)	Cover Volume (Cm³)		Revegetation Area (ha)
Main Pit	Mill to Main Dump	1193	28	1.5	0	1.3	3	1	1.5	1.3	0	D8	Y	0	Yes	2.9	2.9	3.2	288.3	33,404	0	3.34	4.1
Minto North Ha	MWDE to Minto North	1000	28	1.5	2	1.3	3	2	1.5	1.3	0	D8	Y	0	Yes	2.9	6.7	3.2	125.8	28,000	0	3.75	8.0
TDD Road	Area costed as WR dump														0.0					0	0	0.00	0.0
<b>TOTALS</b>																				<b>61,404</b>	<b>0</b>	<b>7</b>	<b>12</b>

Notes:  
 1. Dozer regrading productivity calculations details are provided in the "reslope" worksheet.  
 2. If a side slope is not regraded, it is assumed that it is not revegetated, and no cover is placed.  
 3. Most haul road costs are included within their respective areas.

#### D: Culvert Removal

Area	Description	Input Parameters							Total Quantities			Comments/Notes
		Qty	Culvert length (m)	Culvert Diameter (m)	Average Excavation Depth (m)	Excavation Side-Slope (H:1V)	Excavation Base Width (m)	Mobilization time (hrs)	Mobilization/Demobilization Hours	Excavation Volume (BCM)	Demolition Volume (LCM)	
Mill Water Pond	Upstream Culvert	1	210	1.4	4	2	2	0	1.0	8,400	69	Average excavation depth assumed
	Tailings line to Main Pit	1	38	1	4	2	2	0	0.0	1,520	9	diameter assumed
	Reclaim line culvert by ore stockpile	1	35	1	2	2	2	0	0.0	420	8	diameter assumed
Mill	Tailings line culverts between confluence area and mill	4	50	1	2	2	2	0	0.0	2,400	12	diameter assumed
	Culverts between mill and main access road	2	50	1	2	2	2	0	0.0	1,200	12	diameter assumed
Area 2	Tailings discharge culvert by Area 2 pit	1	86	1	2	2	2	0	1.0	1,032	20	diameter assumed
	Culvert for water line between Main and Area 2 pit	1	54	1	2	2	2	0	0.0	648	13	diameter assumed
Pelly laydown		1	200	1	2	2	2	0	1.0	2,400	47	diameter assumed
<b>TOTAL</b>									<b>3.0</b>	<b>18020.0</b>	<b>190.1</b>	

Notes:  
 1. Demolition volume assumes culvert is flattened and then has an average height of 15 cm.

## Worksheet 26 - Surface Infrastructure Calculations

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

References (dwgs/plans): \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg  
 Layer: -Pipelines

### A. Conveyance Pipelines

Calculation Inputs  
 Pipe Debris Bulking Factor: 1.30

Line	Type	Details	From	To	Pipeline Details					Calculated Quantities				Pipe Debris Volume (Lm3)	Comments/Notes
					Length (m)	Pipe Diameter (inches)	Total Diameter (incl. insulation) (inch)	Pipe Diameter Category	Lines to flush	0.75 to 4 inch	6 to 8 inches	10 to 18 inches	20 to 36 inches		
Main Pit Tailings Line	Tailings	8" Insulated discharge	Tailings Building	Main Pit	630	8	12	6 to 8 inch	1	0	630	0	0	60	
Area 2-Main Pit Tailings Lin	Tailings	8" Insulated discharge	Mill Pond Junction	Area 2 Pit	283	8	12	6 to 8 inch	1	0	283	0	0	27	
Area 2 Pit Tailings Line	Tailings	8" Insulated discharge	Area 2 Pit	Main Pit	450	8	12	6 to 8 inch	1	0	450	0	0	43	
Main Pit Reclaim Line	Water	8" Insulated, heat traced	Main Pit	Mill Building	870	8	12	6 to 8 inch	1	0	870	0	0	63	
Area 2 Pit Dewatering Line	Water	8"	Area 2 Pit Bottom	Area 2 Pit - Top	735	8	8	6 to 8 inch	1	0	735	0	0	24	
Area 2 Pit Dewatering Line	Water	16"	Area 2 Pit Top	Main Pit	278	16	16	10 to 18 inch	1	0	0	278	0	36	
W15 Discharge Line	Water	24 "	W15	Tailings Building	1283	24	24	20 to 36 inch	0	0	0	0	1,283	0	
<b>TOTALS:</b>									<b>6</b>	<b>0</b>	<b>2,968</b>	<b>278</b>	<b>1,283</b>	<b>253</b>	

Notes:

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### B. Pipeline Infrastructure/Equipment

Area	Details	Quantity	Estimated Weight (kg)	Total Weight (kg)	Comments/Notes
<b>Pumps</b>		<b>5</b>			
Main Pit	Reclaim Pump	3	100	300	
Area 2	Dewatering Pumps	1	0	0	
W15 Sump	W15 Pump	1	200	200	
<b>Barges/Misc. Equipment</b>		<b>2</b>			
Main Pit	Reclaim Barge	1	2000	2000	
Main Pit	Power Shack	1	2000	2000	
<b>TOTALS:</b>				<b>4500</b>	

Notes:

- Weights of pumping equipment are assumed
- Equipment is assumed to be placed in semi-trailers for transport to Whitehorse for disposal/salvage.

### C. Power Line and Substation Removal

Line	Power Line Length (km)	Number of power poles	Number of Transformers	Off-site Disposal Trips			TOTAL TRIPS	Comments/Notes
				Power Pole Trips	Power Line Reels	Transformer/Powerline Trips		
Mill to Water Storage Pond	1.58	30	2	1.2	5.2	1.5		
Mill to Minto South Portal	1.58	30	2	1.2	5.2	1.5		
<b>TOTALS:</b>	<b>3.16</b>	<b>60</b>	<b>4</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>18</b>	

Notes:

- Power line lengths and number of poles provide by Minto in file "powerpoles.dxf"



**Worksheet 27- Underground**

Project: Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
 Project No.: 1CM002.045  
 Client: Minto Explorations Ltd.  
 Date of Submission: August 5, 2016  
 File Location: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

References (dwgs/pla [\\VAN-SVR0\Projects\01\\_SITES\Minto\1CM002.045\\_ClosureCosts\040\\_AutoCAD\1CM002-45\\_ClosureQuantities.dwg](#))

**A: Existing Portals**

Description	Inputs							Calculated Quantities					Comments/Notes
	Height (m)	Width (m)	Backfill Plug Thickness (m)	Backfill height above portal opening (m)	Backfill width outside of portal (m)	Backfill outside side slope (H:1V)	Relocation Cost Code for LHD	Underground Plug Volume (m <sup>3</sup> )	Plug Volume in Front of Portal (m3)	Total Plug Volume (m <sup>3</sup> )	Backfill LHD Productivity (m <sup>3</sup> /hr)	Small Dozer Hours	
<b>Existing Portals</b>													
Minto South Portal	5	7	15	5	12	3	R.001	788	1,800	2,588	159	16	
<b>Future Portals</b>													

Notes:

**B: Shafts and Vent Raises**

Facility	Inputs								Calculated Quantities												Comments/Notes	
	Length (m)	Width (m)	Depth to competent material (m)	Concrete Cap Length (m)	Concrete Cap Width (m)	Concrete Slab Thickness (m)	Concrete Slab rebar layers	Backfill Thickness over cap (m)	Concrete Cap Perimeter (m)	Excavation Volume (m3)	Vent Raise Pipe Length (m)	I-beams required (W 250x33)	Total I-Beam Length (m)	Concrete Ring Wall Formwork (m2)	Concrete Ring Wall Rebar Length (m)	Ringwall Dowel Length (m)	Steel Decking (q-deck) (m2)	Total Rebar Length (m)	Total Concrete Volume (m3)	Backfill Volume (m3)		
<b>Existing shafts and vent raises:</b>																						
Area 118 Vent Raise	3	3	0.5	4	4	0.45	2	1	16	4.0	4	2	8	8	16	16	16	32	8.6	25		

**CALCULATION INPUTS**

**Vent Raise design**

- I-Beam spacing (m): 2
- Concrete ring wall height (m): 0.5
- Concrete ring wall rebar spacing (into bedrock) (m): 1
- Concrete ring wall rebar (into bedrock) length (m): 1
- Ringwall dowel spacing at top of wall (m): 0.4
- Ringwall dowel length (m): 0.4
- Concrete slab rebar spacing: 0.2

**Worksheet 28 - Waste Disposal**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**References (dwgs/plans):** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg

**A: Reagents**

Area	Reagents	Inputs					Calculated Quantities								TOTAL TRIPS	Comments/Notes
		Solid/Liquid	Mass of Solid (kg)	Volume of Liquid (m³)	Container Type	Disposal Fee (per container)	Number of drums	Number of tote bags	Number of Solid Bulk Carriers	Number of Small Tankers	Number of Large Tankers	Loading Time (hrs)	Trips Required - 55 Gal. Drums	Trips Required - Tote Bags		
Mill Area	PAX	Solid	2,000		55 gal. drum	\$0	7	0	0	0	0	1	0.1	0.0	\$0	
	MIBC	Solid	3,652		55 gal. drum	\$0	12	0	0	0	2	0.1	0.0	\$0		
	MagnaFlocc 338	Solid	5,000		55 gal. drum	\$0	17	0	0	0	3	0.2	0.0	\$0		
	MagnaFlocc 155	Solid	500		55 gal. drum	\$0	2	0	0	0	0	0.0	0.0	\$0		
	Filter cleaning agent (HNC)	Liquid		3.20	Liquid - 2,200 gal. tank	\$0	0	0	0	1	0	4	0.0	0.0	\$0	
Water Treatment Plant	Reagents	Solid	20,000		Tote bags	\$0	0	15	0	0	8	0.0	0.4	\$0	Assumes 15 totes remaining	
MVF Reagent Tent	Reagents	Solid	20,000		Tote bags	\$0	0	15	0	0	8	0.0	0.4	\$0	Assumes 15 totes	
<b>TOTAL</b>	<b>TOTAL</b>						<b>38</b>	<b>30</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>25</b>	<b>0.4</b>	<b>0.9</b>	<b>\$0</b>	<b>2.2</b>

**Notes:**  
 1. See details on container types below  
 1. Reagents assumed to be returned to supplier (no disposal fee)

**B: Hazardous Materials**

Area	Description	Inputs					Calculated Quantities								TOTAL TRIPS	Comments/Notes
		Solid/Liquid	Mass of Solid (kg)	Volume of Liquid (m³)	Container Type	Disposal Fee (per container)	Number of drums	Number of tote bags	Number of Solid Bulk Carriers	Number of Small Tankers	Number of Large Tankers	Loading Time (hrs)	Trips Required - 55 Gal. Drums	Trips Required - Tote Bags		
Mill Area	Misc. drums, oils, glycol &	Solid	20,000		55 gal. drum	\$750	65	0	0	0	65	0.6	0.0	\$48,750		
Camp Area	Misc. oils, cleaning supplie	Solid	100		55 gal. drum	\$750	1	0	0	0	1	0.0	0.0	\$750		
Fuel Farm Area	Misc. fuel containers/oil	Solid	500		55 gal. drum	\$750	2	0	0	0	2	0.0	0.0	\$1,500		
Explosives Plant	Misc. explosive material	Solid	2,000		Solid - Bulk	\$0	0	0	1	0	4	0.0	0.0	\$0	Assumed	
Airport Laydown	Misc. fuel containers/oil	Solid	500		55 gal. drum	\$750	2	0	0	0	2	0.0	0.0	\$1,500	Assumed	
Pelly Laydown	Misc. fuel containers/oil	Solid	500		55 gal. drum	\$750	2	0	0	0	2	0.0	0.0	\$1,500	Assumed	
Minto South Portal	Misc. fuel containers/oil	Solid	500		55 gal. drum	\$750	2	0	0	0	2	0.0	0.0	\$1,500	Assumed	
Airstrip Area	Recycling storage area m	Solid	3,000		55 gal. drum	\$750	10	0	0	0	10	0.1	0.0	\$7,500	Assumed	
<b>TOTAL</b>							<b>84</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>88</b>	<b>0.8</b>	<b>0.0</b>	<b>\$63,000</b>	<b>1.8</b>	

**Notes:**  
 1. See details on container types below  
 2. Mill area parameters are assumed, and were adjusted to total \$61,000 in the cost estimate to match a contractor quote from General waste management to MEL.

**C: Metal Contaminated Soils**

Area	Description	Disposal Location	Inputs			Calculated Quantities			Comments/Notes	
			Suspected Contaminated Area (m2)	Test Grid Spacing (m)	Assumed % Contaminated	Assumed Average Excavation Depth (m)	Delineation Test Pits Required	Confirmation Tests Required		Volume of Contaminated Soil (m3)
Crusher Area	Metal Contaminated Soils	UG	19,661	10	50%	0.3	197	197	2949	Suspected area is near processing/tailings/concentrate buildings
Mill Area	Metal Contaminated Soils	UG	19,822	10	50%	0.3	198	198	2973	Suspected area is near processing/tailings/concentrate buildings
<b>TOTAL</b>							<b>395</b>		<b>5922</b>	

**Notes:**  
 1. During investigation program, 2 soil tests completed per grid location (1 near surface and 1 at depth)

**D: Hydrocarbon Contaminated Soils**

Area	Suspected location	Disposal Location	Inputs			Calculated Quantities			Comments/Notes	
			Suspected Contaminated Area (m2)	Test Grid Spacing (m)	Assumed % Contaminated	Assumed Average Excavation Depth (m)	Delineation Test Pits Required	Confirmation Tests Required		Volume of Contaminated Soil (m3)
Fuel Storage Area	near fueling areas	Landfarm	1,644	10	15%	1.0	16	16	247	Entrance, fueling area, and near generators.
Mill area	near mechanic shop	Landfarm	550	10	15%	1.0	6	6	83	
Airstrip	allowance	Landfarm	500	10	15%	1.0	5	5	75	
Dundas area	allowance	Landfarm	500	10	15%	1.0	5	5	75	
Pelly laydown	allowance	Landfarm	500	10	15%	1.0	5	5	75	
<b>TOTAL</b>							<b>37</b>		<b>554.1</b>	

**Notes:**  
 1. During investigation program, 2 soil tests completed per grid location (1 near surface and 1 at depth)

**E: Landfarm**

Facility	Location	Inputs						Calculated Quantities					Comments/Notes	
		Total Volume to be treated (m3)	Maximum thickness (m)	Containment berm height (m)	Liner Protection Layer thickness (m)	Mixing events per year	Years mixing required	Landfarm Area (m2)	Landfarm Length/Width (m)	Landfarm Perimeter Length (m)	Containment Berm Volume (m3)	Liner Area (m2)		Total Mixing Events
Existing Landfarm	Airstrip	554				4.0	3.0	4265				4265	12	Overall areas provided by Minto
<b>TOTAL</b>								4265		0	0			

Notes:  
1. During investigation program, 2 soil tests completed per grid location (1 near surface and 1 at depth)

**F: Solid Waste Landfill**

Facility	Location	Inputs						Calculated Quantities					Comments/Notes	
		Total Demolition Waste to be stored (LCM)	Assumed Percentage of fill to be added to provide compaction	Maximum fill thickness (m)	Landfill Side slopes (H:1V)	Landfill base length (m)	Landfill cover thickness (m)	Compacted Waste Volume (CCM)	Fill Volume (CCM)	Total Required Landfill Volume (CCM)	Calculated Landfill Volume (CCM)	Landfill Cover Volume		Revegetation Area (ha)
Solid Waste Landfill	Airstrip	12,920	30%	5	4	73	0.6	11,235	3,371	14,606	14712	5024	0.55	
<b>TOTAL</b>														

Notes:  
1. During investigation program, 2 soil tests completed per grid location (1 near surface and 1 at depth)

**Worksheet 29 - Water Conveyance/Storage Quantity Calculations**

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR01\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\

**References (dwgs/plans):** \\VAN-SVR01\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\040\_AutoCAD\1CM002-45\_ClosureQuantities.dwg  
**Layer:** For secondary conveyance channel - "Drainage Paths"

**A: Primary Conveyance Channels**

Area	Channel Parameters										X-Section Quantities						Total Quantities				Comments/Notes		
	Length (m)	Channel Base Width, Bc (m)	Side Slope, z (1:1)	Average Final Channel Depth, Df (m)	Flow depth including Freeboard, D (m)	Excavation Volume User Over-ride (BCM)	Rip-Rap Thickness (m)	Bedding Layer Thickness (m)	Geotextile Layers	Liner? (Y/N)	Geosynthetic Wastage	Geosynthetic Anchor Trench Allowance (m)	Average Excavation Depth (m)	Average Excavated Area (m <sup>2</sup> )	Rip-Rap Area (m <sup>2</sup> )	Bedding Layer Area (m <sup>2</sup> )	Geotextile Length (m)	Liner Length (m)	Excavation Volume (m <sup>3</sup> )	Rip-Rap Volume (CCM)		Bedding Layer Volume (CCM)	Geotextile Area (m <sup>2</sup> )
WSP Breach Channel Restoration (pilot channel)	250	2	2	2	1		0.5	0.3	1	No	10%	0.3	2.8	22.3	3.9	2.9	11.0	0.0	5,584	954	725	3,033	0
W15 to Main Pit (Ditch A-3)	425	2	2	n/a	1	40300	0.5	0.3	1	No	10%	0.3	n/a	94.8	6.4	4.4	16.0	0.0	40,300	2,700	1,872	7,493	0
W35 to Area 2 Pit (Ditch B)	167	7	2	1.2	0.6	16900	0.5	0.3	0	Yes	10%	0.3	2	22.8	5.5	3.9	0.0	14.2	3,800	912	646	0	2,616
Main Pit to Main Access Road (Ditch C-1)	357	7	2	n/a	1	16900	0.5	0.3	0	No	10%	0.3	n/a	47.3	6.4	4.4	0.0	0.0	16,900	2,268	1,573	0	0
Area 2 Pit to Main Pit Channel (Ditch D-1)	297	7	2	n/a	1	7200	0.5	0.3	0	No	10%	0.3	n/a	24.2	6.4	4.4	0.0	0.0	7,200	1,887	1,309	0	0
Main Access Road to WSP	940	7	2	1.5	1		0.5	0.3	0	No	10%	0.3	2.3	27.5	6.4	4.4	0.0	0.0	25,896	5,973	4,141	0	0
Tailings Diversion Ditch	420	0	6	0.5	0.5	0	0.8	0	1	No	10%	0.3	n/a	0.0	8.8	0.0	16.5	0.0	0	3,701	0	7,645	0
Mill Valley Fill Wetland conveyance channels	160	4	2	1	1		0	0.3	1	Yes	10%	0.3	1.3	8.8	0.0	2.8	10.6	10.6	1,402	0	442	1,858	1,858
Minto Creek Wetland By-Pass Channel	550	7	2	2	2		0.5	0.3	1	No	10%	0.3	2.8	36.3	8.6	5.7	20.5	0.0	19,986	4,725	3,161	12,402	0

**Notes:**  
 1. See channel drawing and parameter definitions below.

**B: Secondary Conveyance Channels**

Area	Channel Parameters										X-Section Quantities						Total Quantities				Comments/Notes		
	Length (m)	Channel Base Width, Bc (m)	Side Slope, z (1:1)	Average Final Channel Depth, Df (m)	Rip-Rap Thickness (m)	Bedding Layer Thickness (m)	Geotextile Layers	Geotextile Wastage	Geosynthetic Anchor Trench Allowance (m)	Average Excavation Depth (m)	Average Excavated Area (m <sup>2</sup> )	Rip-Rap Area (m <sup>2</sup> )	Bedding Layer Area (m <sup>2</sup> )	Geotextile Length (m)	Excavation Volume (m <sup>3</sup> )	Rip-Rap Volume (CCM)	Bedding Layer Volume (CCM)	Geotextile Area (m <sup>2</sup> )					
<b>Southwest Dump</b>																							
SWD SC1 - Shallow grade	389	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	2,398	842	0	3,661					
SWD SC3 - Shallow grade	825	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	5,085	1,785	0	7,764					See Note 1
SWD SC4 - Shallow grade	276	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	1,701	597	0	2,597					
SWD SC5 - Shallow grade	260	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	1,603	563	0	2,447					
SWD SC1 - Steep grade	21	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	171	78	53	225					
SWD SC2 - Steep grade	240	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	1,953	888	604	2,570					
SWD SC3 - Steep grade	225	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	1,831	832	566	2,409					
SWD SC4 - Steep grade	190	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	1,546	703	478	2,034					
SWD SC5 - Steep grade	140	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	1,139	518	352	1,499					
<b>SUBTOTAL - South West Dump</b>														<b>17,427</b>	<b>6,806</b>	<b>2,054</b>	<b>25,206</b>						
<b>Main Waste Dump</b>																							
MWD - Shallow grade	1051	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	6,477	2,274	0	9,888					
MWD - Steep grade	490	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	3,986	1,812	1,233	5,244					
<b>SUBTOTAL - Main Waste Dump</b>														<b>10,462</b>	<b>4,086</b>	<b>1,233</b>	<b>15,132</b>						
<b>Reclamation Overburden Dump</b>																							
ROD - Shallow grade	793	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	4,886	1,715	0	7,460					
ROD - Steep grade	370	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	3,007	1,367	930	3,956					
<b>SUBTOTAL - Reclamation Overburden Dump</b>														<b>7,893</b>	<b>3,083</b>	<b>930</b>	<b>11,416</b>						
<b>Dry Stack Tailings Storage Facility and Mill Valley Fill Buttress (Stage 1 and 2)</b>																							
DSTSF - Shallow grade	692	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	4,263	1,497	0	6,509					
MVFE - Shallow grade	505	2	2	1	0.3	0	1	10%	0.3	1.3	6.2	2.2	0.0	8.6	3,115	1,094	0	4,756					
DSTSF - Steep grade	322	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	2,623	1,193	812	3,452					
MVFE - Steep grade	236	2	2	0.6	0.6	0.3	1	10%	0.3	1.5	8.1	3.7	2.5	9.7	1,917	872	593	2,522					
<b>SUBTOTAL - DSTSF and MVFE</b>														<b>11,919</b>	<b>4,655</b>	<b>1,405</b>	<b>17,239</b>						
<b>TOTAL</b>	<b>7023.7</b>																						

**Notes:**  
 1. SWD secondary channel lengths obtained from SRK project number 1CM002.031 (Progressive reclamation)  
 2. Channel lengths for all other dumps were based on SWD design scaled by area. 26.6 m of shallow sloped channel length per dump area (ha) were applied, and 12.4 m of steep sloped channel length area (ha) were applied, and 12.4 m of steep sloped channel length per dump area (ha) was applied  
 3. 26.6 m of shallow sloped channel length per dump area (ha) was applied, and 12.4 m of steep sloped channel length per dump area (ha) was applied  
 4. Approx. dump areas used in the calculations are: SWD - 65.8 ha, MWD - 39.5 ha, ROD - 29.8 ha, DSTSF - 26 ha, and MVFE - 19 ha.

**C1: Construct New Ponds/Sediment Basins**

Area	Pond Parameters										Total Quantities						Comments/Notes				
	Pond Base Length (m)	Channel Base Width, Bc (m)	Side Slope, z (1:1)	Final Pond Depth, Df (m)	Protected depth including Freeboard, D (m)	Excavation Volume User Over-ride (BCM)	Rip-Rap Thickness (m)	Rip-Rap Volume User Over-ride (BCM)	Bedding Layer Thickness (m)	Geotextile Layers	Liner? (Y/N)	Geosynthetic Wastage	Geosynthetic Anchor Trench Allowance (m)	Excavation Depth (m)	Excavation Volume (BCM)	Rip-Rap Volume (CCM)		Bedding Layer Volume (CCM)	Geotextile Area (m <sup>2</sup> )	Liner Area (m <sup>2</sup> )	
Stilling Basin at MVFE Stage 2 Toe	15	5	2	2.5	2.5		0	75	0.3	1	No	10%	0.3	2.8	645	75.00	131	540	0		Rip-rap assumes an area of 75m2 at both the inlet and outlet with a thickness of 0.5m

**Notes:**  
 1. See channel drawing and parameter definitions below.

**C2: Decommission Ponds/Sediment Basins**

Name	Pond Parameters						Calculations				Total Quantities					Source, Comments/Notes
	Base Length (m)	Base Width (m)	Pond Side Slope (:1)	Pond Depth (m)	Sediment Depth (m)	Water Depth (m)	Liner Bulking Factor (See note 1)	Top Length (m)	Top Width (m)	Liner X-Section Width (mid-pond) (m)	Backfill Volume (m3)	Water Volume (m³)	Sediment Volume (BCM)	Liner Area (m²)	Liner Debris Volume (LCM)	
Mill Water Pond	43	25	4	5	0.5	4	10	83.0	42.5	43.7	7,088	4,366	101	3,630	54	Pond to be Filled In; dimension source: 2011 Annual Review plan drawing
Sewage Lagoon at IROD Laydown	35	25	3	3	0	0	n/a	53.0	43.0	44.0	4,488	0	0	2,331	#VALUE!	No liner present - dimensions from AutoCAD
W15 Sump								10	131.0	10.0	10.0			1,310	20	Liner Length from AutoCAD; width/depth assumed
Fuel Tank Farm	45	30	1	2	0.45	0	10	49.0	34.0	35.7	3,008	0	623	1,747	26	Farm dimensions from AutoCAD;
Waste Oil Tanker Containment	12	8	1	2	0.45	0	10	16.0	12.0	13.7	280	0	47	219	3	Farm dimensions from AutoCAD;

Notes:  
 1. Liner assumed to be 60mil HDPE (thickness 1.5mm); bulking factor estimated

**D: Dams**

Name	Dewatering Inputs				Dam Volumes								Calculations						Source, Comments/Notes			
	Storage Capacity (m³)	Pond Drawdown Rate (m³/hr)	Seepage during drawdown (L/s)	Pump dewatering system install time (hrs)	Stripping Volume (BCM)	General backfill (CCM)	Upstream Shell (CCM)	Dam Core (CCM)	Filter Layers (CCM)	Downstream Shell (CCM)	Toe Berm (CCM)	Spillway Rip-rap (CCM)	Rip-rap % able to be reused	Time Required to dewater (days)	Total Dewatering Volume (m³)	Rip-rap for Reuse (CCM)	Rip-rap to discard (CCM)	Total Dam Fill Vol		General Fill to Breach (CCM)	Dam Core to Breach (CCM)	Downstream Shell to breach (CCM)
Water Storage Pond Dam	360,000	1080	30	4	33,031	10,740	30,449	29,883	31,630	43,005	6,013	5,800	50%	15	400,000	19,285	19,285	157,520	62,301	23,617	38,571	Max drawdown rate: 300L/s (1,080m³/hr)

Notes:  
 1. WSP max drawdown rate from "Dam Stability Analysis - Water Retention Dam Reservoir Dewatering (EBA 2008)  
 2. Dam volumes from asbuilt report (EBA 2008)  
 3. Upstream shell is residuum, downstream shell is rip-rap sized material, the core is fine-grained clayey material, the filters are screened/crushed materials

**E: Intake Structures**

Name	Pond Parameters						Total Quantities		Source, Comments/Notes	
	Quantity	Length (m)	Width (m)	Height (m)	Depth to Competent Foundation (m)	Over-excavation Allowance (m) (See note 1)	Excavation Side Slopes (H:1)	Excavation Volume (BCM)		Backfill volume (CCM)
Main Pit Pre-cast concrete intake structure	1	15	4	3	3	2	1	2,450	2,450	Based on check structure (CS-1.0-20-OS) manufactured by Precon
Area 2 Pit pre-cast concrete intake structure	1	15	4	3	5	2	1	4,453	4,453	Based on check structure (CS-1.0-20-OS) manufactured by Precon

Notes:  
 1. The perimeter around the intake structure assumed to be over excavated around the perimeter to for worker access during installation.

**F: Passive Treatment System/Wetlands**

Area	Valley Fill Parameters				Wetland Cell Parameters										Calculated Quantities						Comments/Notes			
	Length (m)	Average Width (m)	Average Fill Thickness (m)	Valley Fill Volume User Over-ride (CCM)	Number of cells	Base of organics Length (m)	Base of organics width, Bc (m)	Organic Thickness (m)	Final Pond Depth, Df (m)	Side Slope, z (:1)	Excavation Volume User Over-ride (BCM)	Organic Volume User Over-ride (BCM)	Geotextile Layers	Liner? (Y/N)	Geosynthetic Wasteage	Geosynthetic Anchor Trench Allowance (m)	Valley Fill Volume	Cell Excavation Depth (m)	Cell Excavation Volume (BCM)	Organic Volume (CCM)		Subgrade preparation area (m2)	Geotextile Area (m²)	Liner Area (m²)
Stilling Basin at MVFE Stage 2 Toe	400	40	4.5		7	41	15	1	1.3	2			1	Yes	10%	0.3	72,000	2.3	14,459	5,122	9,273	10,201	10,201	

Notes:  
 1. See channel drawing and parameter definitions below.  
 2. The domains/formulas in the channel drawing below are adjusted in the Wetlands calculations as follows: Wetland media is the equivalent of 'water' (blue), the protection layer is the equivalent to bedding/filter layer (green), and rip-rap was not included in the calculations.



## Worksheet 30 - Annual Water Treatment Cost Calculations

**Project:** Minto Mine Closure Cost Estimate - RCP Rev. 2016-01  
**Project No.:** 1CM002.045  
**Client:** Minto Explorations Ltd.  
**Date of Submission:** August 5, 2016  
**File Location:** \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.045\_ClosureCosts\Cost Estimate\



### A: Active Treatment

#### Operating Costs

Item	Crew/Unit	Hours	Materials (\$)	Labor Cost (\$/hr)	Equipment Cost (\$/hr)	Total Materials (\$)	Total Labor (\$/hr)	Total Equip (\$/hr)	Total Cost (\$)	Comments/Notes
Contractor Equipment	1	1			\$37,700	\$0	\$0	\$37,700	\$37,700	
Reagents	1	1	\$45,900			\$45,900	\$0	\$0	\$45,900	
Filters	1	1	\$62,100			\$62,100	\$0	\$0	\$62,100	
Operating Parts	1	1	\$192,800			\$192,800	\$0	\$0	\$192,800	
Power	1	1	\$142,000			\$142,000	\$0	\$0	\$142,000	
O&M Supplies	1	1	\$15,900			\$15,900	\$0	\$0	\$15,900	
Membranes	1	1	\$38,200			\$38,200	\$0	\$0	\$38,200	
Labour	1	1241		\$51.37		\$0	\$63,744	\$0	\$63,744	Based on plant availability 34%, 10hr/day.
<b>TOTAL - Annual Active Treatment Operating Costs</b>						<b>\$496,900</b>	<b>\$63,744</b>	<b>\$37,700</b>	<b>\$598,344</b>	

**NOTES:**

1. Based on site costs - 2015
2. Source: "2015 - WTP Costs.xlsx" supplied by Minto in April 2016.

#### Capital Replacement Costs

Item	Crew/Unit	Hours	Materials (\$)	Labor Cost (\$/hr)	Equipment Cost (\$/hr)	Total Materials (\$)	Total Labor (\$/hr)	Total Equip (\$/hr)	Total Cost (\$)	Comments/Notes
Mechanical/Electrical Parts	1	1	\$60,100			\$60,100	\$0	\$0	\$60,100	
Pipes & Fittings	1	1	\$24,300			\$24,300	\$0	\$0	\$24,300	
Replacement Labour	1	80		\$51.37		\$0	\$4,109	\$0	\$4,109	Hours assumed.
<b>TOTAL - Annual Active Treatment Operating Costs</b>						<b>\$84,400</b>	<b>\$4,109</b>	<b>\$0</b>	<b>\$88,509</b>	

**NOTES:**

1. Based on site costs - 2015
2. Source: "2015 - WTP Costs.xlsx" supplied by Minto in April 2016.

### B: Passive Treatment

#### Wetland maintenance

Item	Crew/Unit	Hours	Materials (\$)	Labor Cost (\$/hr)	Equipment Cost (\$/hr)	Total Materials (\$)	Total Labor (\$/hr)	Total Equip (\$/hr)	Total Cost (\$)	Comments/Notes
Excavator	1	80		\$43	\$114	\$0	\$3,468	\$9,129	\$12,597	
Std. Dump Truck	2	80		\$43	\$25	\$0	\$6,849	\$4,005	\$10,855	
Misc. supplies	1	1	\$10,000			\$10,000	\$0	\$0	\$10,000	Reveg, bacteria, etc.
Labour	1	40		\$35		\$0	\$1,389	\$0	\$1,389	
<b>TOTAL - Annual Active Treatment Operating Costs</b>						<b>\$10,000</b>	<b>\$11,706</b>	<b>\$13,134</b>	<b>\$34,840</b>	

**NOTES:**

1. Assumed costs for earthwork repairs/cell repair and hydraulic adjustments.