APPENDIX G

Closure and Reclamation Strategy and Security Estimate for the Pre-development works

July 2017

AGNICO EAGLE

CLOSURE AND RECLAMATION STRATEGY AND SECURITY ESTIMATE

Pre-development Type B Water Licence

Submitted to:
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B1J0

Executive Summary

In June 2016, Agnico Eagle Mines Limited (Agnico Eagle) filed amendment applications to the Nunavut Impact Review Board (NIRB) and Nunavut Water Board (NWB) for development of the Whale Tail Pit. A joint coordinated review of the Final Environmental Impact Statement (FEIS) and Type A Water Licence Application are ongoing pending final ministerial approval. Following submission of the application it may take up to one year before Agnico Eagle receives a Ministerial approved Type A Water Licence authorizing full development of the Project. Since construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sea lift to support mobilization of supplies and equipment, waiting up to a year to receive a Type A Water Licence before starting even pre-development construction would have a significant impact on the overall project schedule.

The regulatory framework provided in the Nunavut Land Claims Agreement (NLCA) and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act) allows for interim, short-term approvals for water uses related to exploration or development work (referred to as pre-development work herein) for a proposal under development impact review. The NIRB allows for approvals or licences to be issued for development activities prior to the completion of a Review if the activity falls within a list of project types normally exempt from the requirement for Screening, or if in the judgement of the NIRB, the activity may proceed without such a Review. The NWB is not restricted from issuing an interim, short-term period water licence for development work related to the Project provided the scope of works being considered for development works are being considered by the NIRB as part of the review of the Project.

Agnico Eagle has identified specific pre-development (site preparation) activities that would be beneficial in achieving the overall project schedule. The schedule planned for pre-development activities to be permitted separately, allowing construction to start soon thereafter, rather than delay the project significantly, while other permitting issues involving mine operations are addressed. This pre-development permitting approach could allow construction work to start while awaiting the Type A Water Licence, following issuance of the Project Certificate, which would be a substantial gain considering the very small window for construction in the Arctic each year.

Proposed mining activities for pre-development that will require closure and reclamation include the following:

- pre-delivery of material (i.e., equipment, construction material, and fuel);
- construction of the permanent camp pad, which under the pre-development will be used as a laydown area for pre-delivery of material;
- construction of service roads to undertake the other pre-development activities;
  - road between Quarry 2 and Waste Rock Storage Facility (WRSF)
  - a road and one culvert between the existing exploration camp and proposed Nemo freshwater intake
  - temporary bridge crossing of the Mammoth Channel
  - a road between exploration area and new road between Quarry 2 and the WRSF

  - upgrade/widen Whale Tail Pit Haul Road from 6.5 m wide to 9.5 m plus bypasses
- quarrying at Quarry 2; and
- construction of the waste rock berm.

The overall goal of closure and reclamation is to return the mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. The overall closure goal is supported by the four closure principles of physical stability, chemical stability, no long-term active care requirements, and compatibility with future land uses for each component of the Project.

In accordance with NWNSRTA, Agnico Eagle is required to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. For the NWB to be able to issue a licence, Agnico Eagle must satisfy the Board that the company has the financial ability to adequately implement mitigation measures and apply any costs associated with closing or abandonment of the undertaking.

This document provides for the closure and reclamation approach proposed by Agnico Eagle and an estimate of financial liability for the site as it pertains to the facilities and infrastructure related to pre-development and site preparations of the Whale Tail Pit and Haul Road Project in advance of receipt of a Type A Water Licence.

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1.0 INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing to develop the Whale Tail Pit, a satellite deposit located on the Amaruq property, to continue mine operations and milling at Meadowbank Mine (herein referred to as the Project). The Meadowbank Mine is an approved mining operation and Agnico Eagle is looking to extend the life of the mine by constructing and operating the Whale Tail Pit within the Amaruq property. The Amaruq property is located in the Kivalliq Region of Nunavut, Canada, centered at approximately latitude 65° 24' 36 " N, longitude 96° 41' 41" W. The property was acquired by Agnico Eagle in April 2013 subject to a mineral exploration agreement with Nunavut Tunngavik Incorporated. The Amaruq property is a 408 square kilometre (km^2) site located on Inuit Owned Land (IOL) approximately 150 kilometres (km) north of the hamlet of Baker Lake and northwest of the Meadowbank Mine. Inuit Owned Land is governed under the Nunavut Land Claims Agreement (NLCA).

The Whale Tail deposit is partly located within Whale Tail Lake. The proposed approach to develop the pit involves isolating the pit area with three dikes (Whale Tail Dike, Mammoth Dike, and Northeast Dike). The operations phase will span approximately three to four years, during which time the Whale Tail Pit will produce approximately 8.3 million tonnes (Mt) of ore, 46.1 Mt of waste rock, and 5.6 Mt of overburden (with very limited organic material) for a total of 51.7 Mt of waste.

The proposed Project facilities will consist of a personnel camp (i.e., Main Camp), a power plant, a heli-pad, a maintenance shop, a tank farm, a waste rock storage facility (WRSF), an ore stockpiling facility, an attenuation pond, a water and sewage collection and treatment system, haul roads, service roads, water management infrastructure (e.g., collection ponds, channels, dikes, dams, and culverts), and the Whale Tail Pit. To accommodate development, Agnico Eagle is also proposing to expand the width of the existing exploration access road to a haul road to accommodate increased traffic rates and haul trucks. No new infrastructure is required at the existing Meadowbank Mine to support the development of the Project.

Ore from Whale Tail Pit will be segregated by grade then crushed on-site after which it will be transported to Meadowbank Mine for milling. The milling rate will be approximately 9,000 to 12,000 tonnes per day. Agnico Eagle proposes to process the Whale Tail ore and to dispose of the tailings slurry at the existing Meadowbank Mine tailings storage facility (TSF), which is authorized under the current Project Certificate and Type A Water Licence.

The Project is subject to the regulatory requirements of the the NLCA and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act), and as such is required to obtain a project certificate from the Nunavut Impact Review Board (NIRB) and a Type A Water Licence (Application) from the Nunavut Water Board (NWB) to allow for mine development and mining of the Project. In June 2016, Agnico Eagle filed amendment applications to the NIRB and NWB for development of the Project.

Following submission of the Type A Water Licence Amendment Application, it may take up to one year before Agnico Eagle receives a Ministerial approved Type A Water Licence authorizing full development of the Project. Since construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sea lift to support mobilization of supplies and equipment, waiting up to a year to receive a Type A Water Licence before starting even pre-development construction would have a significant impact on the overall project schedule. The regulatory framework provided in the NLCA and the Act allows for interim, short-term approvals for water uses related to exploration or development work for a proposal under development impact

review. The NIRB allows for approvals or licenses to be issued for development activities prior to the completion of a Review if the activity falls within a list of project types normally exempt from the requirement for Screening or, if in the judgement of the NIRB, the activity may proceed without such a Review. The NWB is not restricted from issuing an interim, short-term period water licence for pre-development work related to the Project provided the scope of works being considered for development works are being considered by the NIRB as part of the review of the Project. As such, Agnico Eagle is submitting the Type B application (the Application) for the pre-development activities.

Agnico Eagle has identified specific pre-development (site preparation) activities that would be beneficial in accelerating the overall project schedule. These facilities are listed in Section 3.0 and the closure and reclamation of these facilities along with an estimate of financial liability are provided in this document.

2.0 REGULATORY CONTEXT

A detailed overview of the legislative and regulatory requirements are provided in Section 2.0 of the Main Application Supporting Document. In summary:

- The Project is subject to conformity determination to the Keewatin Regional Land Use Plan. On June 17, 2016, the Nunavut Planning Commission (NPC) issued a positive conformity determination for the Project proposal and forwarded the Project proposal and determination to the NIRB for screening (NPC 2016).
- The Project is subject to environmental and socio-economic impact assessment processes by the NIRB established under Article 12 of the NLCA and more recently subject to the ***Nunavut Planning and Project Assessment Act* legislative requirements**. The Project is currently under joint review by the NIRB and NWB. For more information on the timelines and processes used by the NIRB in screening and review, refer to Section 2.2 on the Main Application Supporting Document.
- The Project is subject to the requirements of the NWNSRTA, Regulations for water management. A Type A Water Licence Application is pending (Agnico Eagle 2016b). A Type B Water Licence is required from the NWB in order for Agnico Eagle to undertake site preparation and pre-development works.
- The 408 km^2 Amaruq property is located on IOL, and the rights to explore and develop mineral resources were acquired by Agnico Eagle in 2013 subject to a mineral exploration agreement with Nunavut Tunngavik Inc. (NTI). The surface ownership of the land is held by the Kivalliq Inuit Association (KivIA). Land and environmental management in this area are generally governed by the provisions of the NLCA. The proposed Whale Tail Pit and associated infrastructure is to be constructed on IOL leased by Agnico Eagle from the KivIA. In addition, quarry permits will be sought from the KivIA as needed. The Project will require the authorization and consent of the KivIA for development, construction, operations, and closure of the Mine and its related facilities.
- Fisheries protection and pollution prevention measures for the Project are subject to the requirements of the *Fisheries Act* s.35, which states that no person shall carry on any work, undertaking, or activity that results in serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery (CRA), or to fish species that support such a fishery. Agnico Eagle has conducted two years' of aquatic baseline studies for the Project, and will work together with Fisheries and Oceans Canada (DFO) to seek a *Fisheries Act* Authorization during the review/regulatory phase of this Project.

  There will be serious harm to fish habitat as a result of the Project during both the operations and post-closure phases. Accepted methods of habitat enhancement and habitat creation will be utilized, possibly with complementary measures, to offset the serious harm that will occur. The final offsetting plan will be prepared with input from local stakeholders and DFO. Pre-development activities is not expected to cause serious harm to fish that are part of commercial, recreational, or Aboriginal fisheries, or to fish that support the commercial, recreational, or Aboriginal fisheries. Therefore, it is not anticipated that an authorization will be required under the *Fisheries Act* for the proposed pre-development activities undertakings, works, or activities.
- The Project will be subject to Metal Mining Effluent Regulations (MMER) requirements (Government of Canada 2012). Pre-development works proposed in the Application will not require deposit of mine effluent. Agnico Eagle will ensure requirements of the MMER are met under the Type A Water Licence Application.

- The Project may be subject to the *Navigation Protection Act*. Agnico Eagle met with Transport Canada to explore the implications of applying the *Navigation Protection Act* to the Project. The *Navigation Protection Act* which came into force on 1 April 2014, is the result of the 2012 amendments made to the *Navigable Waters Protection Act*. Along the current alignment of the haul road, none of the water crossings are located on Transport Canada's schedule of navigable waters. Eleven watercourses are considered to be potential migration routes and/or potentially provide spawning or nursery habitat for large-bodied or small-bodied fish. At this time, Agnico Eagle does not believe that the small lakes, ponds, and streams within the Project's footprint on the Whale Tail site are navigable waterbodies. Agnico Eagle will work with Transport Canada to confirm this to ensure compliance with the *Navigation Protection Act*.
- The Mammoth Temporary Bridge to be constructed at the crossing of the watercourse connecting Whale Tail Lake and Mammoth Lake will facilitate ongoing exploration activities and connect the pre-development quarry and associated activities to the WRSF during the pre-construction phase. A pathway of effects analysis and review of mitigation measures were carried out for the proposed temporary bridge using the DFO guidelines.

3.0 SCOPE OF PRE-DEVELOPMENT WORKS

The scope of pre-development works is provided in Section 3.0 of the Main Application Supporting Document. In summary the following pre-development works are proposed (Figure 3.1):

- quarrying at Quarry 2;
- construction of the permanent camp pad, which under the pre-development will be used as a laydown area for pre-delivery of material;
- construction of the waste rock berm;
- construction of Mammoth Temporary Bridge;
- pre-delivery of material (i.e., equipment, material, and fuel); and
- construction of necessary service roads to undertake the pre-development activities:
  - a road between Quarry 2 and the WRSF
  - a road and one culvert between the existing exploration camp and proposed Nemo freshwater intake
  - a road between exploration area and new road between Quarry 2 and the WRSF
  - upgrade/widen the Project access road (referred to in this document as the Haul Road) from 6.5 m wide to 9.5 m plus the construction of associated bypasses.

During pre-development, fuel at Amaruq will be stored in the existing double-walled envirotanks permitted under licence 2BB-MEA1318.

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A10
A39
C48
C50
C49
C-P37
C46
C48
C-P2
A-P59
A41
A42
A11
C44
A-P47
A113
184
NEMO LAKE
C38
C41
C42
A-P18
A40
A48
A-P51
A-P38
A-P31
C39
A-P37
A-P33
C40
A47
A-P49
C-P1
A-P21
A-P68
A-P67
A46
A49
A50
A54
A-P57
A12
WASTE ROCK BERM
A-P10
A51
A52
A-P52
A-P5
A53
A13
HAUL ROAD
MAMMOTH CHANNEL
TEMPORARY BRIDGE
QUARRY 2
WHALE TAIL CAMP
A15
MAMMOTH LAKE
A16
A58
A-P3
WHALE TAIL LAKE
A55
A-P39
A17
A-P29
A62
A61
A-P47
A43
A-P16
A63
A59
A64
A45
A18
A60
ARCHAEOLOGICAL SITE
2015 - 14
A-P45
Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1658927_RegulatorySupport\02_PRODUCTION\5000\MXD\Report\1658927_5000_5010_FIG_1.3_PRE_DEVELOPMENT_GENERAL_SITE_LAYOUT.mxd

LEGEND

- BRIDGE
- ROAD
- TEMPORARY ROAD
- CULVERT
- QUARRY
- ARCHAEOLOGICAL SITE
- WATERBODY
- WATERCOURSE

REFERENCE

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM 6108-600-210-001_R2(2018)s.dwg.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT
DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

400 0 400
METRES

PROJECT
AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

PRE-DEVELOPMENT GENERAL SITE LAYOUT FOR TYPE B WATER LICENSE APPLICATION

Golder Associates

PROJECT		1658927	FILE No.	
DESIGN	JR	29 May 2017	SCALE AS SHOWN	REV. A
GIS	CDB	06 Jul. 2017		
CHECK	JR	12 Jul. 2017		
REVIEW	LY	12 Jul. 2017		

FIGURE 3.1

The proposed quarrying activities at Quarry 2 (to be located west of Whale Tail Lake) will be conducted in accordance with the Quarry Management Plan Addendum (Main Application Supporting Document, Appendix D, Agnico Eagle 2016a). During pre-development activities, approximately 1.01 Mt of material will be excavated from Quarry 2, 0.97 Mt of which will be used to construct the proposed: camp pad, the service roads, and the waste rock berm. The remaining material, based on their geochemical properties, will be stockpiled in the in the existing exploration waste rock pad as described below. The Whale Tail deposit (intermediate intrusive, southern greywacke waste rock and mafic volcanic rock away from the greywacke and ultramafic units) being considered for use as infrastructure construction material on the mine site are non-potentially acid generating (non-PAG) and leach relatively low levels of arsenic.

Any overburden or waste rock material classified as non-PAG/non-metal leaching (non-ML) will be used for construction, stockpiled within the footprint of the quarry, or left in place. If not feasible, it will be stored on the north side of the waste rock berm. It has been assumed that runoff and seepage from the waste rock berm will be suitable for direct discharge to the environment. Any overburden and waste rock material identified as potentially acid generating and/or metal leaching, will be disposed of in the existing exploration waste rock pad. The exploration waste rock pad is not covered in this application as it is covered under the approved Type B Water Licence for advance exploration activities (2BB-MEA1318).

In November 2015, Agnico Eagle received approval to construct an access road under the approved Type B Water Licence (8BC-AEA1525), which will connect the Vault Pit (one of the Meadowbank Mine pits) to the Amaruq exploration camp site in support of exploration activities. The proposed access road will be about 64.1 km long and, during the exploration stage, it will have a top width of 6.5 m. Under this application, Agnico Eagle is proposing to upgrade the proposed access road to accommodate increased traffic rates and haul trucks (Haul Road). The proposed upgrade of the access road entails widening from the top width from the current 6.5 m width to 9.5 m width and the construction of the associated bypasses.

A temporary bridge will be constructed across the inlet to Mammoth Lake. The temporary bridge is expected to be used for pre-development activities during the open water season from June to October 2018. It has been designed to comply with all of the application DFO Operational Statements (i.e., bridge maintenance, clear span bridges, culvert maintenance, and ice bridge) for protecting fish and fish habitat. The bridge will consist of two spans of 28 m, supported by abutments on each bank and a center pier.

The existing emulsion plant located near the Meadowbank Mine will be maintained and will provide explosive deliveries to the Whale Tail site on an as need basis during operations. The exploration access road will be used to truck explosives between Meadowbank Mine and the Whale Tail site, with minimal amounts of explosives to be stored at the Whale Tail Pit site. Explosives truck(s) will be based at the emulsion plant at Meadowbank Mine.

For the purposes of this Type B Application, any use, production and storage of explosives, will be undertaken in conjunction with the existing Type B Water Licence 2BB-MEA1318.

Fuel and raw materials for manufacturing explosives will continue to be supplied to Meadowbank Mine using the approved shipping routes.

All wastes that could attract wildlife, used spill response supplies, and other appropriate wastes will be incinerated in the Amaruq Exploration on-site incinerators. Wastes that cannot be incinerated but that can be landfilled will be shipped by winter road or by the access road and disposed of in Meadowbank's approved

landfill. Wastes that cannot be incinerated or landfilled will be prepared for shipment to a certified waste management company outside of Nunavut for treatment, recycling and/or disposal.

The exploration facilities (i.e., exploration laydown area, camp, stormwater storage pond, communication tower, exploration magazine, ramp, two vent raises, a small airstrip, 10 km of exploration roads, two borrow pits, Quarry 1, and the proposed access road and associates borrow pits (seven in total) are not covered under this application as they are covered under the existing Type B Licence 2BB-MEA1318 as amended on December 1, 2016 for advanced exploration activities on the Amaruq property.

4.0 CLOSURE AND RECLAMATION APPROACH

Agnico Eagle estimates pre-development work could be initiated as early as November 2017, subject to NWB approval of the Type B Application for pre-development works and issuance of the Project Certificate. The process for application for pre-development work in this case is similar to the approach taken by Agnico Eagle for the pre-development work that was completed at the Meadowbank Mine.

Agnico Eagle acknowledges that the NWB may require the company to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. As such, Agnico Eagle has provided this Closure and Reclamation Approach and Security Estimate (the Plan). The Plan includes an estimate of financial liability for pre-development works and site preparation of $714,265; however, Agnico Eagle would propose that the NWB defer full consideration of security of project liability to the Type A Water Licence submitted to the NWB in June 2016.

For further information on Agnico Eagle's past performance and financial responsibility refer to the Whale Tail Pit FEIS and Type A Amendment Application (Volume 8, Appendix 8-F, Section 10.0 and Appendix D; Agnico Eagle 2016b).

In accordance with the Nunavut Mine Site Reclamation Policy, Agnico Eagle's financial security cost estimate for the pre-development works requested in the Application for a Type B Water Licence has been developed assuming third party contractor rates, on the presumption that Agnico Eagle would be somehow unable to fulfill its closure and reclamation obligations, and that the government would be required to take over reclamation of the works.

The decision to implement the Type B closure and reclamation approach does not mean that Agnico Eagle would abandon its current work program for which it holds valid authorizations, licenses and permits. Therefore, Agnico Eagle proposes to defer security of the pre-development components to the Type A Water Licence.

Should the pre-development activities require the implementation of the reclamation and closure plans as outlined Section 5.0 in advance of receipt of a Type A Water Licence, then the pre-development works remediation and closure would be undertaken at the same time as current approvals for the Amaruq property (refer to Section 2.3 of the Main Application Supporting Document for the Type B Application). For additional information on closure and reclamation refer to the Closure and Reclamation Plan submitted under the Type A Water Licence (where appropriate).

The closure and reclamation activities associated with the proposed Type B Water Licence pre-development work will follow applicable KivIA and federal/territorial guidelines and policies, and the closure and reclamation objectives and criteria outlined in this document and in general the Preliminary Closure and Reclamation Plan submitted with the Type A Water Licence application for the Project.

5.0 CLOSURE AND RECLAMATION ACTIVITIES

Closure and reclamation of proposed pre-development and site preparation works described in Section 3.0 will include:

- Hazardous wastes will be removed for disposal by a licenced handler.
- The overburden and any non-PAG/non-ML waste rock will be stockpiled within the footprint of the quarry or left in place. If not feasible, alternatively it will be stored in the approved Type 2BB WRSF and/or stored on the north side of the waste rock berm. A closure spillway will be constructed in the berm to avoid ponding of water and the overflow will be directed into the Mammoth Lake. It is expected that natural re-vegetation will occur over the overburden top area over time.
- The temporary bridge on Mammoth Lake will be dismantled and waste materials will be disposed of in the Meadowbank Mine landfill area or reused elsewhere.
- An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons. Any hydrocarbon contaminated soils will be excavated and hauled to Meadowbank Mine landfarm for remediation.
- Fuel resupply, the year before closure, will be planned to leave a minimum amount in the envirotanks that will be required for closure activities. Fuel not required during the closure and reclamation activities, if any, will be sent to Meadowbank Mine for use, sold, returned to suppliers, disposed by a licensed handler, or incinerated on-site.
- Waste oil will be incinerated on-site.
- All disturbed site areas will be re-graded to suit the surrounding topography. In areas where the original ground surface was lowered for site grading or structural requirements, the slopes will be stabilized and contoured. Cover materials may be required for erosion and dust control. It is anticipated that a succession of indigenous plant species will naturally re-vegetate the surface over time.
- Quarry 2:
  - All mobile equipment will be demobilized from the site.
  - Quarry 2 will be allowed to flood naturally. The water in the quarry lake will be tested for water quality and if found acceptable, it will be released to the environment. A lined channel will be constructed north of the Quarry 2 to connect and convey any overflow into the Whale Tail Lake. If the water quality in the quarry lake is not acceptable, it will be treated before discharging to the environment.
  - Should acid-generating bedrock be exposed, these areas will be covered with a minimum 2 m thick layer of non-acid generating soil or rock.
  - Exposed slopes (on the south side of the quarry) will be stabilized and contoured.
  - A safety berm will be constructed at the crest of the perimeter of Quarry 2 (south side) to restrict access, and access to the Quarry 2 will be blocked with boulders.

- Service Roads to Support Pre-Development Activities:
  - The roads not required for post-closure monitoring, and not assumed by the community or by a third party after consultation, will be decommissioned and the terrain will be restored. Decommissioning of the haul road will start from the site end.
  - Decommissioning will occur by loosening compacted surfaces and flattening side slopes.
  - The road surface will be scarified, allowing the native plant community to naturally establish itself on the former road surface.
  - Slopes will be stabilized against erosion potential.
  - If necessary, wildlife access will be provided at suitable intervals by re-grading the embankment shoulders to provide flatter slopes.
  - Should potentially acid generating bedrock be exposed along the roadway, these areas will be covered with a minimum 2 m thick layer of non-potentially acid generating and non-metal leaching soil or rock to direct water away from the surface.
  - All bridges and culverts will be removed and original drainage patterns will be restored.
  - Stream crossings will be rehabilitated as they are encountered during the progression of the road decommissioning work.

Monitoring and maintenance of the reclaimed facilities will be carried out during pre-development, operations, and into closure. Periodic inspections will be performed to visually assess the reclaimed areas.

Surface and groundwater will be sampled if site specific conditions dictate during the closure period.

6.0 SCHEDULE OF CLOSURE AND RECLAMATION ACTIVITIES

Agnico Eagle requests a term from November 2017 to issuance of the Type A Water Licence to allow for pre-development activities and for site preparation. Agnico Eagle would request that, should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the scope of this Type B Application/Licence into the Type A Water Licence.

Similar to the Term of Licence, Agnico Eagle also requests that, should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the security required under the Type B Licence into the Type A Water Licence such that a “double bonding” for project activities of the same scope does not occur.

Agnico Eagle estimates that, if the Type A Licence is not issued, it would require 2 consecutive seasons to complete the work noted in this Plan. Agnico Eagle anticipates the Type A Water Licence will be issued, so this Plan would not need to be implemented.

7.0 ESTIMATE OF PROPOSED PRE-DEVELOPMENT WORKS FINANCIAL LIABILITY

A permanent closure and reclamation financial security cost estimate for the proposed pre-development works described in this Plan has been prepared to a conceptual level using RECLAIM Version 7.0, March 2014 (Attachment A).

A summary of the financial security cost estimate for the pre-development works is provided in Table 7.1.

Table 7.1: Summary Financial Security Cost Estimate

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
QUARRY	Quarry 2	$33,721	$0	$33,721
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE	Waste Rock Pile	$68,920	$0	$68,920
BUILDINGS AND EQUIPMENT		$305,500	$0	$305,500
CHEMICALS AND CONTAMINATED SOIL MANAGEMEN		$21,235	$0	$21,235
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$429,376**	**$0**	**$429,376**
	PERCENT OF SUBTOTAL		**0%**	**100%**
INDIRECT COSTS		**COST**	**LAND LIABILITY**	**WATER LIABILITY**
MOBILIZATION/DEMOBILIZATION		$68,350	$0	$68,350
POST-CLOSURE MONITORING AND MAINTENANCE		$79,138	$0	$79,138
ENGINEERING	5%	$21,469	$0	$21,469
PROJECT MANAGEMENT	5%	$21,469	$0	$21,469
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$4,294	$0	$4,294
BONDING/INSURANCE	1%	$4,294	$0	$4,294
CONTINGENCY	20%	$85,875	$0	$85,875
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$284,889**	**$0**	**$284,889**
TOTAL COSTS		**$714,265**	**$0**	**$714,265**

8.0 References

Agnico Eagle (Agnico Eagle Mines Limited). 2016a. Quarry Management Plan KVCA15Q01.

Agnico Eagle. 2016b. Whale Tail Pit Final Environmental Impact Statement and Type A Water Licence Amendment Application, currently under review. Submitted in June 2016.

Government of Canada. 2012. Metal Mining Effluent Regulation (MMER). SOR/2002-222.

NPC (Nunavut Planning Commission). 2016. File #148297 Whale Tail Pit Project – Meadowbank Division on June 17, 2016.

NWB (Nunavut Water Board). 2016. Water Licence 2BB-MEA-1318 Meadowbank Advanced Exploration Project (previously 2BE-MEA1318). Issued on December 01, 2016. Expires on March 06, 2018).

ATTACHMENT A

Security Estimate - Reclaim Model v.7.0 - Whale Tail Pit Type B Water Licence for Pre-development Works

Project Name:

Whale Tail Pre-development

Reclaim Model - Overview of Program

All users are urged to read the Reclaim Model User Manual - Scroll down for overview description of program.

Important! Reclaim 7.0 works better with no other excel files open.
If other excel files are open ignore run time error and proceed

Reclaim Menu

The default Excel menu bar has an additional tab labelled "Add-Ins" that provides options specific to the Reclaim Model.

Clear	This option deletes all input data, deletes any duplicated elements and blanks out the project name. It also allows for segregation into land costs vs water costs if required.
Duplicate	This option Duplicates components of the project. E.g. if there is more than one Open Pit, use duplicate to add a second Open Pit Quantities for the new Open Pit are erased, but the Activities and Cost Codes are carried over from the original Open Pit. The new Open Pit subtotal is added to the Summary page.
Unit Costs	This option opens a window of unit costs to provide easy reference. NOTE: the unit cost table has a filter in the 'UNITS' column. You can select to only see a particular unit (eg km) or multiple units (km and m3) or all units.
Print All	This option prints the Summary Worksheet, Unit Cost Worksheet, and the individual component worksheets having non-zero balances. Individual worksheets can be printed directly using standard printing methods, such as Ctl - P.
Quit	Select Quit to exit the program
Help	Redirects user to Instructions worksheet.

WorkSheets

Summary	This worksheet contains a cumulative summary of costs for each component of the project. Associated costs such as engineering and project management are added as a percentage of the component costs.
Components	Costs are derived for individual closure and reclamation activities by multiplying a "quantity" of activity by a "unit cost". An activity can be edited, added, or deleted from worksheet. However, care should be taken not to modify cells that are defined and used elsewhere in the program. ***Do not change the content or column width of the first column of each component worksheet.***
Unit Costs	This worksheet contains a look up table with costs for typical work associated with each closure and reclamation activity

Limitations

The Reclaim Program will NOT work if the worksheets are changed such that the following requirements are not met. Please review the following prior to modifiying worksheets.

WorkSheet Names	*The names of the worksheets must not be changed.*
Defined Names	Certain cells have defined names, which must not be changed. Where the cell is named, the name will appear in the "Name Box" to the left of the formula bar.
First line of data	The first line of data for any component worksheet starts on line 4. ***Do not change the first line of a component worksheet, ie the component name.***
Cell A1	Cell A1 on the component sheet MUST always contain the count of that component for the duplicate function to operate.***DO NOT CHANGE.***
Adding Lines	You can add lines to components and the unit cost table, as long as they are not the last lines. The last line might fall outside the named ranges. You can check the size of the named range by selecting the name from the dro down box at the top left of the sheet. Usually this box has a cell reference, or a name.
Printing	A component will only be printed if its sub-total is greater than zero. In addition, a component and the summary sheet cannot be printed if there is an error. Printing has been set to print 1 page per component.

Conditions of Use

The Reclamation Cost Estimating Model was prepared to serve as a guide for Government Agencies, mining companies, and others to estimate the cost of mine reclamation. This model is not intended to replace reclamation planning or to be used to determine the activities required to reclaim a site or to dictate how much should be spent on reclamation.

Reclaim was prepared by Brodie Consulting Ltd. on behalf of AANDC. AANDC and Brodie Consulting Ltd. are not responsible fo the completeness or accuracy of any reclamation estimate made using this model. The user agrees to check and take responsibility for all aspects of any cost estimate made using this model.

The following table provides guidance as to whether water management and treatment is considered short term or long term. Short term closure activities may be costed within a component (eg 'Open Pit' or 'Rock Pile') or 'Water Management'. Long term or post-closure water treatment is costed in 'Water Treatment'.

		Short Term/ Capital Ex.	Long term/ NPV
Open Pit	flood pit - install/operate pumping system	x	
	construct diversion ditches	x	
	treat 1st filling	x	
	install pump/decant system	x	
	passive/biological treatment	x	
	overflow treatment		x
Rock Pile/Heap Leach Facility	construct diversion ditches	x	
	install groundwater collection system	x	
	install toe seepage collection system	x	
	collect and treat groundwater		x
	collect and treat seepage (ARD/ML)		x
	install passive treatment system	x	
	operate and maintain passive treatment system		x
	operate pump and detoxify heap leach pile (cyanide destruction)	x	
Tailings Facility	construct diversion ditches	x	
	pump supernatant (to pit, U/G)	x	
	treat supernatant	x	
	install toe seepage collection system	x	
	collect and treat seepage (ARD/ML)		x
	install passive treatment system	x	
	operate and maintain passive treatment system		x
U/G Mine	accelerate flooding	x	
	install seepage collection system	x	
	install dewatering/pumping system	x	
	operate seepage/dewatering system (ARD/ML)		x
Water Management	refill lakes		
	redirect creeks/streams	x	
	stabilize water management ponds	x	
	stabilize/close sediment ponds	x	
	fresh water supply - breach embankment	x	
	fresh water supply - remove piping system	x	
	construct water treatment plant	x	
	construct sludge pond	x	
	water control in reclamation quarry	x	
	operate/maintain water treatment plant		x

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
QUARRY	Quarry 2	$33,721	$0	$33,721
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE	Waste Rock Pile	$68,920	$0	$68,920
BUILDINGS AND EQUIPMENT		$305,500	$0	$305,500
CHEMICALS AND CONTAMINATED SOIL MANAGEMEN		$21,235	$0	$21,235
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$429,376**	**$0**	**$429,376**
	PERCENT OF SUBTOTAL		**0%**	**100%**

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		$68,350	$0	$68,350
POST-CLOSURE MONITORING AND MAINTENANCE		$79,138	$0	$79,138
ENGINEERING	5%	$21,469	$0	$21,469
PROJECT MANAGEMENT	5%	$21,469	$0	$21,469
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$4,294	$0	$4,294
BONDING/INSURANCE	1%	$4,294	$0	$4,294
CONTINGENCY	20%	$85,875	$0	$85,875
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$284,889**	**$0**	**$284,889**

TOTAL COSTS	**$714,265**	**$0**	**$714,265**

Note: Existing underground workings from explorations are covered under Type B land and water permits

1 **Quarry Name:** **Quarry 2** **Quarry # 2**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
CONTROL ACCESS								
Fence,		m		#N/A	$0.00	$0	$0	$0
Signs	Assumed	each	2	SS	$75.00	$150	$0	$150
Berm at crest	At crest of rock backslope only - assumed 600 m x 1.5 m3/m	m3	900	RC1L	$12.05	$10,845	$0	$10,845
Block roads	Assumed: 1 entrance, each block 5m base, 1 m crest width, 1 m high, 2H:1V slopes and 30m long	m3	90	RB1L	$11.40	$1,026	$0	$1,026
Other				#N/A	$0.00	$0	$0	$0
STABILITY STUDY								
Conduct stability and setback study		Allow		#N/A	$0.00	$0	$0	$0
STABILIZE SLOPES								
Off-load crest, soil A		m3		#N/A	$0.00	$0	$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0	$0	$0
Doze/trim overburden at crest		hrs	20	dozersL	$205.00	$4,100	$0	$4,100
Drill & blast pit crest		m3		#N/A	$0.00	$0	$0	$0
Buttress slope		m3		#N/A	$0.00	$0	$0	$0
Other	Backhoe to pull down loose rock on 600 m long bedrock backslope	hrs	40	exc-sL	$190.00	$7,600	$0	$7,600
COVER/CONTOUR SLOPES								
Place fill, soil A		m3		#N/A	$0.00	$0	$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Vegetate slopes		ha		#N/A	$0.00	$0	$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	$0.00	$0	$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0	$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0	$0	$0
CONSTRUCT SPILLWAY								
Overflow lined channel	Construct lined overflow channel - discharge into Whale Tail Take	Allow	1	AE	$10,000.00	$10,000	$0	$10,000
Concrete		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
RECLAIM QUARRIES								
Contour slopes		Allow		#N/A	$0.00	$0	$0	$0
Place overburden		m3		#N/A	$0.00	$0	$0	$0
Vegetate		m3		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Captital								
Remove stationary equipment (sump pumps) and dewatering pipeline	Quarry will be allowed to pond naturally	Allow		#N/A	$0.00	$0	$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0	$0	$0
Remove power lines		each		#N/A	$0.00	$0	$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0	$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0	$0	$0
Supply/install pump station and piping system (including pumps		Allow		#N/A	$0.00	$0	$0	$0
Supply/install piping system		m		#N/A	$0.00	$0	$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0	$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Annual Cost								
Operate pumps to flood pit	Quarry will be allowed to pond naturally	each		#N/A	$0.00	$0	$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0	$0	$0
Labour:fuel management, comissioning/decom		$/h		#N/A	$0.00	$0	$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0	$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0	$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Other- Pump operation cost		m3		#N/A	$0.00	$0	$0	$0
					Annual pumping costs	$0		
Number of years of pump flooding		years	0					
					Total pumping costs	$0	$0	$0
					Total	$33,721	$0	$33,721
					% of Total		0%	100%

Note: No water purchase is needed for quarry flooding

1 **Rock Pile Name:** **Waste Rock Pile**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
STABILIZE SLOPES								
Flatten slopes with dozer		m3		#N/A	$0.00	$0	$0	$0
Flatten "bubble dump" areas	overburden	allow	4000	DRL	$1.05	$4,200	$0	$4,200
Divert runon, ditch mat'l A		m3		#N/A	$0.00	$0	$0	$0
Divert runon, ditch mat'l B		m3		#N/A	$0.00	$0	$0	$0
Toe buttress, drain mat'l		m3		#N/A	$0.00	$0	$0	$0
Toe buttress, fill mat'l A		m3		#N/A	$0.00	$0	$0	$0
Toe buttress, fill mat'l B		m3		#N/A	$0.00	$0	$0	$0
COVER ROCK PILE								
Subgrade preparation - doze surface		m3		#N/A	$0.00	$0	$0	$0
Soil cover - excavate,haul,spread&compa	Not required - only NPAG/NML material from Quarry 2 will be placed in WRSF	m3		#N/A	$0.00	$0	$0	$0
non-PAG waste rock cover (4 m thick)	Not required - only NPAG/NML material from Quarry 2 will be placed in WRSF	m3		#N/A	$0.00	$0	$0	$0
Excavate downslope drainage channel & chute		m3		#N/A	$0.00	$0	$0	$0
Rip rap drainage channel and chute		m3		#N/A	$0.00	$0	$0	$0
Vegetate		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
VERY LOW PERMEABILITY COVER (in addition to above)								
Liner subgrade preparation - compact		m2		#N/A	$0.00	$0	$0	$0
Supply geomembrame		m2		#N/A	$0.00	$0	$0	$0
Install geomembrane		m2		#N/A	$0.00	$0	$0	$0
Protective cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0	$0	$0
Vegetate		ha		#N/A	$0.00	$0	$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0	$0	$0
CONSTRUCT DIVERSION DITCHES / SPILLWAY								
Construct closure spillway		allow	1	AE	$20,000.00	$20,000	$0	$20,000
Excavate ditches -soil		m3	10400	SB1L	$4.30	$44,720	$0	$44,720
Excavate ditches -rock		m3		#N/A	$0.00	$0	$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0	$0	$0
CONSTRUCT SEEPAGE COLLECTION POND								
Excavate seepage collection pond		m3		#N/A	$0.00	$0	$0	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0	$0	$0
Vegetate spread material		ha		#N/A	$0.00	$0	$0	$0
Bedding layer		m3		#N/A	$0.00	$0	$0	$0
Supply geomembrane		m2		#N/A	$0.00	$0	$0	$0
Install geomembrane		m2		#N/A	$0.00	$0	$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0	$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM								
Excavate/install sumps		m3		#N/A	$0.00	$0	$0	$0
Install pumping wells		m3		#N/A	$0.00	$0	$0	$0
Install pumps/pipelines/power supply		allow		#N/A	$0.00	$0	$0	$0
RELOCATE DUMPS								
Load, haul, dump or doze		m3		#N/A	$0.00	$0	$0	$0
Add lime		tonne		#N/A	$0.00	$0	$0	$0
Contour reclaimed area		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
SPECIALIZED ITEMS								
Install permanent instrumentation		Allow		#N/A	$0.00	$0	$0	$0
Install permanent instrumentation, drilling		each		#N/A	$0.00	$0	$0	$0
TREAT ROCK PILE SEEPAGE - "It is included on Water Treatment Sheet"								
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox								
Cyanide destruction water treatment pumping		m3		#N/A	$0.00	$0	$0	$0
Reagents		tonnes		#N/A	$0.00	$0	$0	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0	$0	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0	$0	$0
					Annual treatment costs	$0		
Number of years of treatment		years						
					Total treatment costs	$0		$0
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**								
Upgrade/modify pumping system - report to WTP		allow		#N/A	$0.00	$0		$0
					Total	$68,920	$0	$68,920
					% of Total		0%	100%

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment becomes post-closure water treatment cost

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

1 **Chemicals/Soil Area Name:**

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	$0.00	$0		$0	$0
Phase 1 audit		each		#N/A	$0.00	$0		$0	$0
Phase 2 audit		each		#N/A	$0.00	$0		$0	$0
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate: oil, fuel		mandays	1	AE	$1,000.00	$1,000		$0	$1,000
Decontaminate maintenance shop		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate power plant		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate bulk fuel storage		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate ANFO plant	In exploration Type B estimate.	mandays		#N/A	$0.00	$0		$0	$0
Decontaminate offices/warehouse/accom		mandays		#N/A	$0.00	$0		$0	$0
Removal of asbestos siding on buildings		m2		#N/A	$0.00	$0		$0	$0
Removal of friable asbestos on equipment		m2		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS REMOVAL									
Waste oils	Burn on site	litre	1000	ORL	$0.43	$430		$0	$430
Unused fuel	Burn on site	litre	500	ORL	$0.43	$215		$0	$215
Waste batteries	includes fee and transportation	allow	5	AE	$500.00	$2,500		$0	$2,500
Assay & environmental lab reagents		kg		#N/A	$0.00	$0		$0	$0
Machine shop paints, solvents etc		allow		#N/A	$0.00	$0		$0	$0
Glycol		allow		#N/A	$0.00	$0		$0	$0
Process reagents		kg		#N/A	$0.00	$0		$0	$0
Nuclear sources		allow		#N/A	$0.00	$0		$0	$0
Other hazardous materials	includes fee and transportation	allow	1	AE	$2,500.00	$2,500		$0	$2,500
HAZARDOUS MATERIALS									
Transportation to disposal facility		allow		#N/A	$0.00	$0		$0	$0
Disposal fees		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONTAMINATED SOILS									
Contam. soil investigation - Phase 1		each	0.25	CS1L	$7,500.00	$1,875		$0	$1,875
Contam. soil investigation - Phase 2		each	0.2	CS2L	$50,000.00	$10,000		$0	$10,000
CONTAMINATED SOIL REMOVAL									
Excavate and transport to Meadowbank landfarm (Site fuel, power plant,Mine maitenance shop)		m3	50	SB2H	$7.30	$365		$0	$365
Manage hydrocarbon remediation at Meadowbank landfarm		m3	50	CSRL	$47.00	$2,350		$0	$2,350
Reagents/stabilizing agent		m2		#N/A	$0.00	$0		$0	$0
Excavate and transport to offsite facility		m3		#N/A	$0.00	$0		$0	$0
Contour decontaminated area		m3		DSL	$0.95	$0		$0	$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrame, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Upper and lower bedding layers		m3		#N/A	$0.00	$0		$0	$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m2		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
OTHER									
				#N/A	$0.00	$0		$0	$0
					Total	$21,235		$0	$21,235
					% of Total			0%	100%

1 **Building / Equip Name:** **Bldg / Equip #:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT									
Decontaminate and ship off-site	Blast hole drill covered in Exploration Type B. Construction eqpt will be demobed by Contractor.	allow	1	AE	$5,000.00	$5,000		$0	$5,000
Decontaminate and dispose on-site		manhours		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
REMOVE BUILDINGS - see note below									
Accomodation Complex - Main Camp	No buildings, only camp pad in pre-development.	m2		#N/A	$0.00	$0		$0	$0
Process Facilities - Crushers	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Offices, kitchen, ERT	Use exploration facilities during pre-development. In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Storage Facilites (Main Warehouse)	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Water and Wastewater Treatment Facilities	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Power Plant	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Communication Tower	In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
U/G Heating Plant	In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Emulsion Plant	In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
AN Storage Facility	In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Shops and Other	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Storage Facility at Laydown/Airstrip	Not applicable/In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Fuel tanks on site / Bulk fuel tank	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Fuel Tanks	Envirotanks In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Fire protection- Pumping station	Use exploration facilities during pre-development. In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Freshwater intake	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Reclaim pumps	Not applicable - not in pre-development	allow		#N/A	$0.00	$0		$0	$0
Outfall & Diffuser	Not applicable - not in pre-development	allow		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, electrician	Not applicable	mandays		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, mechanical	Not applicable	mandays		#N/A	$0.00	$0		$0	$0
Break foundation slabs	Not applicable - not in pre-development	mandays		#N/A	$0.00	$0		$0	$0
Consolidate & dump boneyard debris	Not applicable - not in pre-development	m3		#N/A	$0.00	$0		$0	$0
Steel - teardown	Not applicable - not in pre-development	hrs		#N/A	$0.00	$0		$0	$0
Ramp portal	In exploration Type B estimate.	m2		#N/A	$0.00	$0		$0	$0
Workers Dry	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
WTP & Fresh water pumping station	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
WRSF Pond, Attenuation Pond pumphouses	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
Water Intake	Not applicable - not in pre-development	m2		#N/A	$0.00	$0		$0	$0
LANDFILL FOR DEMOLITION WASTE									
Place rock cover	No on-site landfill for pre-development - haul to Meadowbank	m3		#N/A	$0.00	$0		$0	$0
Place soil cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
GRADE AND CONTOUR PADS									
Accomodation Complex - Main Camp	Scarify pad	ha	6	SCFYL	$4,300.00	$25,800		$0	$25,800
Process Facilities - Crushers	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Offices, kitchen, ERT	Use exploration facilities during pre-development. In exploration Type B estimate.	m3		#N/A	$8.47	$0		$0	$0
Storage Facilites (Main Warehouse)	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Water and Wastewater Treatment Facilities	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Power Plant	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Communication Tower	In exploration Type B estimate.	m2		#N/A	$8.47	$0		$0	$0
U/G Heating Plant	In exploration Type B estimate.	m3		#N/A	$0.00	$0		$0	$0
Emulsion Plant	In exploration Type B estimate.	m3		#N/A	$0.00	$0		$0	$0
Shops and Other	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Fuel tanks on site / Bulk fuel tank	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Fire protection- Pumping station	Use exploration facilities during pre-development. In exploration Type B estimate.	m3		#N/A	$8.47	$0		$0	$0
Ramp portal	In exploration Type B estimate.	m3		#N/A	$0.00	$0		$0	$0
Workers Dry	Not applicable - not in pre-development	m3		#N/A	$8.47	$0		$0	$0
Place rock cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Operational WTP	Not applicable - not in pre-development	m3		#N/A	$0.00	$0		$0	$0
WRSF Pond, Attenuation Pond pumphouses	Not applicable - not in pre-development	m3		#N/A	$0.00	$0		$0	$0
PUNCTURE LINED SUMPS									
Puncture liner and place soil cover		m3		#N/A	$0.00	$0		$0	$0
RECLAIM ROADS									
Remove culverts and rip rap sides of roads	For on site access roads from pre-development. Removal of bridges and culverts on haul road are already in Type B for site access road.	each	1	EA	$3,000.00	$3,000		$0	$3,000
Scarify roads	On site access roads - assumed 8 m wide, 6 km	ha	4.8	SCFYH	$6,030.00	$28,944		$0	$28,944
Remove bridge	Temporary Mammoth Lake Bridge	allow	1	EA	$35,000.00	$35,000		$0	$35,000
Scarify and install water breaks - Haul Road	Incremental width from exploration road (9.5m-6.5m) x 64.1 km. Bridges and culverts are in current Type B permit for access road.	ha	19.23	SCFYH	$6,030.00	$115,957		$0	$115,957
Scarify bypasses - Haul Road	Bypass details: 9.5m wide, 100m long, one every 400 m	ha	15.22	SCFYH	$6,030.00	$91,799		$0	$91,799
Scarify airstrip	Not applicable	ha		#N/A	$0.00	$0		$0	$0
Scarify overburden storage and ore stockpile areas	Not applicable - not in pre-development	ha		SCFYH	$6,030.00	$0		$0	$0
Vegetate	Allow to revegetate naturally.	ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Dispose of misc. debris and laydown area refuse		each		#N/A	$0.00	$0		$0	$0
					Total	$305,500		$0	$305,500
					% of Total			0%	100%

Note
Costs are based on file "6108 Building Listing_RA.xlsx" dated 3/14/2016, ground area used to remove foundation, grade and contour pads

1 **Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
BREACH DYKE EMBANKMENT						
Remove (excavate) fill		m3		#N/A	$0.00	$0
Contour water intake area		m3		#N/A	$0.00	$0
STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS				#N/A		
Place soil cover		m3		#N/A	$0.00	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0
Vegetate spread material		ha		#N/A	$0.00	$0
Rip rap in channel base		each		#N/A	$0.00	$0
Remove sediments from WRSF pond and place them in the landfill		allow		#N/A	$0.00	$0
REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES				#N/A	$0.00	
Excavate ditches -soil		m3		#N/A	$0.00	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0
Stabilize side slopes		m3		#N/A	$0.00	$0
Rip rap in channel base		m3		#N/A	$0.00	$0
BREACH DITCHES				#N/A		
Excavate breaches		m3		#N/A	$0.00	$0
Backfill/recontour		m3		#N/A	$0.00	$0
Install flow dissipation		m3		#N/A	$0.00	$0
Vegetate remainder of ditch		m2		#N/A	$0.00	$0
DECOMMISSION CURTAINS						
Decommission turbidity curtains		allow		#N/A	$0.00	$0
DECOMMISSION FRESH WATER SUPPLY						
Breach embankment		m		#N/A	$0.00	$0
Remove pump		LS		#N/A	$0.00	$0
Remove pipeline		LS		#N/A	$0.00	$0
WATER CONTROL IN RECLAMATION QUARRY						
Install pumping system		LS		#N/A	$0.00	$0
Remove pumping system		LS		#N/A	$0.00	$0
REMOVE PIPELINES						
Remove pipes		m		#N/A	$0.00	$0
Concrete plug deep pipes		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
GROUNDWATER COLLECTION SYSTEM						
Excavate/install sumps		m3		#N/A	$0.00	$0
Install pumping wells		m3		#N/A	$0.00	$0
Install pumps/pipelines/power supply		LS		#N/A	$0.00	$0
CONSTRUCT CONTAMINATED WATER STORAGE POND						
Excavate pond		m3		#N/A	$0.00	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0
Vegetate spread material		ha		#N/A	$0.00	$0
Bedding layer		m3		#N/A	$0.00	$0
Supply geomembrane		m2		#N/A	$0.00	$0
Install geomembrane		m2		#N/A	$0.00	$0
Erosion protection layer		m3		#N/A	$0.00	$0
CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)						
Construct access roads		km		#N/A	$0.00	$0
Install HDPE piping system from collection pond		m		#N/A	$0.00	$0
Inter-cell flow structures		allow		#N/A	$0.00	$0
Install liners		m2		#N/A	$0.00	$0
Install growth media		m3		#N/A	$0.00	$0
Wetland vegetation		ha		#N/A	$0.00	$0
CONSTRUCT WATER TREATMENT PLANT						
Build treatment plant		LS		#N/A	$0.00	$0
Build sludge containment facility		LS		#N/A	$0.00	$0
					Total	$0

For cost of long-term/post-closure water treatment see "WATER TREATMENT" Worksheet"

1 **Post Closure Water Treatment - Identified as long term/post-closure in 'Instructions' worksheet**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
ADDITION OF REAGENTS TO WTP						
H2O2		kg		#N/A	$0.00	$0
lime		kg		#N/A	$0.00	$0
ferric sulphate		kg		#N/A	$0.00	$0
ferrous sulphate		kg		#N/A	$0.00	$0
flocculents		kg		#N/A	$0.00	$0
Other		kg		#N/A	$0.00	$0
LABOUR AND SUPPLIES						
Annual fuel		litres		#N/A	$0.00	$0
Annual power		kW-h		#N/A	$0.00	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0
Misc. supplies, hoses, tools		allow		#N/A	$0.00	$0
Communications		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
WATER MANAGEMENT						
Water Treatment (reagents, equip. Op., labour)		m3		#N/A	$0.00	$0
Water pumping from sumps and ponds to treatment plant		allow		#N/A	$0.00	$0
Annual Treatment Plant Servicing (2 Consultants x 7days/year)		manhours		#N/A	$0.00	$0
Treatment Plant Servicing Travel Allowance (Round Trip Flight/person)		visits		#N/A	$0.00	$0
WTP WATER SAMPLING AND ANALYSES						
Sampling equipment		allow		#N/A	$0.00	$0
Analyses		allow		#N/A	$0.00	$0
Shipping to laboratory		allow		#N/A	$0.00	$0
Reporting		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SITE ACCESS						
Road maintenance (incl. snow removal)		allow		#N/A	$0.00	$0
Winter road tariff		allow		#N/A	$0.00	$0
Truck rental		allow		#N/A	$0.00	$0
Air support		allow		#N/A	$0.00	$0
					Annual water treatment costs	$0
Number of years of water treatment		years				
					Total	$0

1 **Interim Care and Maintenance**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
on-site caretaker		manmonths		#N/A	0	$0
extra personnel		manmonths		#N/A	0	$0
-electrician		manmonths		#N/A	0	$0
-mechanic		manmonths		#N/A	0	$0
annual fuel		litre		#N/A	0	$0
misc. supplies		allow		#N/A	0	$0
pick-up truck		each		#N/A	0	$0
small dozer		allow		#N/A	0	$0
small excavator		allow		#N/A	0	$0
snow machine		allow		#N/A	0	$0
communications		allow		#N/A	0	$0
SNP/AEMP water sampling & reporting		each		#N/A	0	$0
geotechnical assessment		each		#N/A	0	$0
interim water treatment		each		#N/A	0	$0
other		each		#N/A	0	$0
			Annual	Interim C&M Cost		$0
Number of years of ICM		years			**Total**	$0

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection		each	1	VIH	$7,977.79	$7,978
Surface water sampling		each	1	WSH	$10,000.00	$10,000
Ground water sampling		each	0	WSH	$10,000.00	$0
Receiving/downstream water sampling		each	1	WSH	$10,000.00	$10,000
Monitoring program		ech		#N/A	$0.00	$0
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)		each		#N/A	$0.00	$0
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring		each		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	$0.00	$0
Repair erosion - upgrade diversion ditches		allow		#N/A	$0.00	$0
Remove problem vegetation		allow		#N/A	$0.00	$0
Repair animal damage		allow		#N/A	$0.00	$0
Repair/upgrade access controls		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0
WATER TREATMENT						
Water treatment - refer to water treatment tab		each	1	WT tab	$0.00	$0
POST-CLOSURE WATER TREATMENT						
Subtotal, Annual post-closure costs						$27,978
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity		Assumed		3	years	
Present Value of payment stream						$79,138

*Regulatory costs - annual reporting, management plans, progress reports etc

1 **Mobilization/Demobilization:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators	1 excavator - time in transit from Meadowbank	hrs	3	exc-sL	190	$570
Dump trucks		each		#N/A	0	$0
Dozers	1 dozer - time in transit from Meadowbank	hrs	3	dozersH	260	$780
Demolition shears		each		#N/A	0	$0
Crane		each		#N/A	0	$0
Loader		each		#N/A	0	$0
Compactor		each		#N/A	0	$0
Flat bed truck	1 excavator @ 30t + 1 dozer @ 50 t x 70 km	kmtonne	5600	MHERL	3.4	$19,040
Light duty vehicles	2 at 3hrs each way	each	6	AE	20	$120
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	$0
Pipe shipping		m		#N/A	0	$0
Minor tools and equipment		allow	1	AE	2500	$2,500
Truck tires		allow		#N/A	0	$0
Other				#N/A	0	$0
MOBILIZE CAMP						
Maintain Camp Accomodations		mandays	210	ACCML	100	$21,000
Reclamation activities		allow		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	$0
MOBILIZE WORKERS						
Reclamation activities - travel time	Round trip to Baker Lake by light duty trucks: 4 hours each way	manhours	48	AE	31	$1,488
Crew transportation (ticket and travel accomodation)		each		#N/A		$0
Reclamation activities - transport	2 round trips from Baker Lake by 2 trucks	km	1200	AE	0.75	$900
Long term reclamation activities (eg pump flooding) - travel time	Round trip to Baker Lake by light duty trucks: 4 hours each way	manhours	32	#N/A	31	$992
Long term reclamation activities (eg pump flooding) - ticket and travel accomodation		each		#N/A	0	$0
Long term reclamation activities - transport	1 round trip from Baker Lake by 1 truck	km	600	AE	0.75	$450
WORKER ACCOMODATIONS						
Reclamation activities		manmonths		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	$0
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#N/A	0	$0
Fuel freight - long term reclamation activities		litre		#N/A	0	$0
Fuel freight accomodations		litre		#N/A	0	$0
WINTER ROAD						
Construction and operation		km		#N/A	0	$0
Limited winter use		km		#N/A	0	$0
Winter road tarriff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators	1 excavator - time in transit to Meadowbank	hrs	3	exc-sL	190	$570
Dump trucks		km		#N/A	0	$0
Dozers	1 dozer - time in transit back to Meadowbank	hrs	3	dozersH	260	$780
Demolition shears		km		#N/A	0	$0
Crane		km		#N/A	0	$0
Loader		km		#N/A	0	$0
Compactor		each		#N/A	0	$0
Light duty vehicles	2 at 3hrs each way	each	6	AE	20	$120
Flat bed truck	1 excavator @ 30t + 1 dozer @ 50 t x 70 km	kmtonne	5600	MHERL	3.4	$19,040
DEMOBILIZE CAMP						
		allow		#N/A	0	$0
DEMOBILIZE WORKERS						
crew travel time	trip)	mandays		#N/A	0	$0
crew transportation	trip)	each		#N/A	0	$0
WINTER ROAD						
Construction and operation		km		#N/A	0	$0
Limited winter use		km		#N/A	0	$0
Winter road tarriff		km		#N/A	0	$0
					Total	**$68,350**

Note: Labour costs not included under mobilization - included elsewhere

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	COMMENTS
Accomodation							
		ACCM	manday	100.00	175.00		
Buildings - Decontaminate							
	Asbestos	BDA	m2	25.60	51.20		Low: removal of asbestos siding & flooring; High: removal of insulated pipes, friable asbestos
Buildings - Remove							Unit costs are based on 3m high, single storey building. Scale areas accordingly.
	Wood	BRW	m2	27.50	41.00		
	Concrete	BRC	m2	40.00	65.00	6.00	Specified: puncture concrete foundation slabs
	Steel - teardown	BRS1	m2	45.00	65.00		
	Steel - for salvage	BRS2	m2	67.00	100.00		
Concrete work							
	Small pour	CSF	m3	426.50	639.75		Low: YK; High=1.5xLow
	Large pour	CLF	m3	353.50	530.25	2,130.00	Specified: concrete crown pillar
Contaminated Soils							
	ESA Phase 1	CS1	each	7500.00			Low: small, "clean" site
	ESA Phase 1	CS2	each	50000.00			Low: small, "clean" site
	Remediate on site	CSR	m3	47.00	146.00		
Dozing							
	doze rock piles	DR	m3	1.05	2.40		Low cost: doze crest off dump
	doze overburden/soil piles	DS	m3	0.95	3.80		High cost: push up to 300 m
Excavate Rock; Low Spec's and QA/QC							
	drill/blast/load/short haul	RB1	m3	11.40	17.05		Low:quarry operations for bulk fill
	drill/blast/load/long haul	RB2	m3	12.05	17.80		
	RB1 + spread and compact	RB3	m3	12.05	17.80		
	RB2 + spread and compact	RB4	m3	12.50	30.75		
	Specified activity	RBS	m3				
Excavate Rock; High Spec's and QA/QC							(e.g. ditch/spillway excavation)
	drill/blast/load/short haul	RC1	m3	12.05	17.80		Low:foundation excavation;High:spillway excavation
	drill/blast/load/long haul	RC2	m3	12.70	18.40		
	RC1 + spread and compact	RC3	m3	12.70	18.40		e,g, cover construction
	RC2 + spread and compact	RC4	m3	13.50	19.20		e,g, cover construction
	Specified activity	RCS	m3			175.00	Specified-drift excavation
Excavate Rip Rap							
	drill/blast/load/short haul/place	RR1	m3	13.50	17.75		High: quarry & place rip rap in channel
	drill/blast/load/long haul/place	RR2	m3	14.20	20.65		
	source is waste dump/short haul	RR3	m3	7.00			cost includes sorting
	source is waste dump/long haul	RR4	m3	7.60			
	Specified activity	RRS	m3				
Excavate Soil; Low Spec's and QA/QC							
	clear & grub	SBC	m2	3.40	5.00		
	excavate/load/short haul	SB1	m3	4.30	5.90		
	excavate/load/long haul	SB2	m3	4.60	7.30		
	SB1 + spread and compact	SB3	m3	5.10	8.90		Low: non-engineered; High:engineered
	SB2 + spread and compact	SB4	m3	5.50	11.00		Low: non-engineered; High:engineered
	Specified activity	SBS	m3	3.20	6.30		Low: rehandle waste rock dump by dozing; High:rehandle waste rock by hauling
	Tailings	SBT	m3	1.35	3.70	15.50	High:contour surface - wet or frozen; Specified:haul/place wet infill
Excavate Soil, High Spec's and QA/QC							
	excavate/load/short haul	SC1	m3	6.80	9.30		
	excavate/load/long haul	SC2	m3	7.10	11.75		
	SC1 + spread and compact	SC3	m3	8.90	14.20		Low: non-engineered; High:engineered
	SC2 + spread and compact	SC4	m3	9.30	23.20		Low: non-engineered; High:engineered (e.g. complex covers, low volume dam construction)
	Specified activity	SCS	m3			18.80	Backfill adit with waste rock
Fence							
		FNC	m	13.55	203.00		
Fuel and Electricity							
	Fuel cost - gas	FCG	litre	1.05	1.40		
	Fuel cost - diesel	FCD	litre	0.99	1.39		
	Fuel mobilization	FCM	litre	0.22	0.42		High: winter road usage
	Electricity	FCE	kW-h	0.17	0.19	0.49	Low and High:Yellowknife; Specified:diesel generator
Geo-Synthetics							
	geotextile	GST	m2	3.44			Supply and install
	geogrid	GSG	m2	5.75			

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

liner, HDPE	GSHDPE	m2	7.95			Supply and install; large quantity
liner, ES3	GSES3	m2	20.20			FOB Yellowknife
geosynthetic installation	GSI	m2	3.16	14.00		Low:geotextile; High:ES3 or HDPE
bentonite soil ammendment	GSBA	tonne	308.30	348.50		FOB Edmonton, add shipping & mixing
Grouting (/m3 of rock grouted)						
	grout	m3	236.55	286.75		High: cement, FOB Yellowknife
Laboratory Chemicals						
Remove from site	LCR	pallet	1966.36	2606.83		
Labour & Equipment Rates						
Site manager	sman	$/hr	125.00	152.00		
Supervisor	super	$/hr	52.00	91.84		
Registered engineer	eng	$/hr	95.00	220.00		
Environmental coordinator	envco	$/hr	74.16	130.00		
Evironmental technologist	envtech	$/hr	36.00			
Electrician	elec	$/hr	74.00	95.00		
Journeyman - various	journey	$/hr	44.00	71.79		
Labour - skilled	lab-s	$/hr	41.00	49.60	120.00	Specified - Skilled Manufacturer Mechanic
Labour - unskilled	lab-us	$/hr	31.00	43.98		
Equipment operator	oper	$/hr	41.00	65.00		
Heavy duty mechanic	mech	$/hr	49.00	72.85		
Water treatment plant operator	oper-wt	$/hr	41.00	59.86		
Security / first aid	safety	$/hr	36.00	66.97		
Administative staff	admin	$/hr	38.00	57.89		
Equipment rates include operator and fuel						
Loader - 4 cu.yd (3.06m3)	load-s	$/hr	175.00			
Loader - 7 cu.yd (5.35m3)	load-l	$/hr	315.00			
Excavator - 26.76-30.84 tonnes	exc-s	$/hr	190.00			
Excavator - 68.95+tonnes	exc-l	$/hr	420.00			
Grader	grad	$/hr	190.00			
Dump truck off hwy 30-50 tonnes	truck-s	$/hr	225.00			
Dump truck off hwy 55-75 tonnes	truck-l	$/hr	300.00			
dozer, small	dozers	$/hr	205.00	260.00		
dozer, large	dozerl	$/hr	490.00	565.00		
smooth drum compactor	comp	$/hr	155.00			
scooptram, 6 yd3 bucket	scoop	$/hr	170.00			
flat bed truck with hiab	hiab	$/hr	155.00			
fuel truck	ftruck	$/hr	150.00			
water truck	wtruck	$/hr	58.00	150.00		
Mobilize Heavy Equipment						
Road access	MHER	kmtonne	3.40	10.25		
Air access	MHEA	kmtonne	12.00			cargo rate>500lb
Mobilize Camp						
Road access	MCR	each	50000.00			refurbish existing camp
Mobilize Workers						
flight	MW	each	4500.00	9100.00	400.00	Low:e.g. 8 passenger; High: Dash 7 Spec'd 8 hour by bus from Baker Lake
Oil Removal						
oil removal	OR	litre	0.43	1.20		Low:waste oil heater; High: ship offsite
PCB Removal						
Remove from site	PCBR	litre	40.20	46.90		Low: shipping, handling & disposal from Yellowknife
Pipes, small (<6in dia.)						
remove/dispose on site	PSR	m	1.00	24.00		Low: remove/dispose on site; High: remove/re-use
supply	PSS	m	6.10	11.10		Low:supply; High:supply and ship
install	PSI	m	25.00			
Pipes, large (>6in dia.)						
remove/dispose on site	PLR	m	22.00	72.00		Low: remove/dispose on site; High: remove/re-use
supply	PLS	m	129.00	143.00		Low:supply; High:supply and ship
install	PLI	m	50.00			
Power Lines						
remove/dispose on site	POWR	m	25.50			
Process Chemicals						
Remove from site	PCR	kg	0.45	2.50		Low: shipping, handling & disposal from Yellowknife
Pumps						

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

	Filter by unit					
Pump capital cost	PC	each	195000.00			
Pump shipping	PS	each	2500.00			
Pump operating cost	POC	m3	0.12			pump operating costs should be calculated based on pump capacity, fuel costs, etc.
Pump maintenance	PM	allow	25000.00			
Pump sand BackFill						
	PBF	m3	85.00	300.00		
Scarify - road/mine site						
	SCFY	ha	4300	6030	2150	
Shaft, Raise & Portal Closures						
Shaft & Raises	SR	m2	645.00	2132.00		Low:pre-cast concrete slabs, little site prep. Area=shaft+>1m all around
Portals	POR	m3	18.80	250.00	1200.00	Low:unit cost code SCS;High:excavate & backfill collapsed portal;Spec: installed pressure plug
Signs						
Signs	S	each	12.36	37.08	75.00	AEM used $75 in Type B for Exploration
Site Inspection Report						
	RPT	each	10000.00	20000.00		
SpillWay - Clear						
	SW	each	3000.00	7000.00		
Survey/Instrumentation						
	SI	each	1800.00	3600.00		2 person crew
Treatment Plant - Construct						
Small (< 1000 m3/d)	TPS	lump sum	9000000	15000000		
Large (> 1000 m3/d)	TPL	lump sum	15000000	46000000		
Constructed Wetland	CWTS	ha	200000	300000		
Treatment Plant - Operate						
	TPO	m3	0.35	2.00		
Treatment Chemicals						
ferric sulphate	ferric	kg	1.19			
ferrous sulphate	ferrous	kg	1.32			
lime	lime	kg	0.56			
hydrogen peroxide, 35%	hperox	kg	1.50			
Sodium Metabisulfate	Nametab	kg	1.18			
Caustic soda, 50%	caustic	kg	0.74			
Sulfuric acid, 93%	sulfuric	kg	0.31			
flocculant	flocc	kg	6.00			
copper sulphate	copper	kg				
shipping	shipping	kg	0.20			
Vegetation						
Hydroseed, Flat	VHF	ha	4000.00			
Hydroseed, Sloped	VHS	ha	4500.00			
Veg. blanket/erosion mat	VB	ha	13000.00			
Tree planting	VT	ha	2600.00	6000.00		
Wetland species	VW	ha			47.72	Specified= /m3, Wetland Growth Media Substrate mixed and installed (sand, biochar and fertilizer, woodchips)
Visual Site Inspection						
Visual site inspection	VI	each	3955.18	7977.79	11000.00	
Water Sampling/Analysis/Reporting						
	WS	each	7000.00	10000.00		
Winter Road						
Construction	WRC	km	2000.00	11500.00		
Usage	WRU	kmtonne	0.29			

Unit Cost Estimator

1 Equipment Productivity Figures and Graphs have been reproduced from Caterpillar Performance Handbook - Edition 42

EXCAVATION

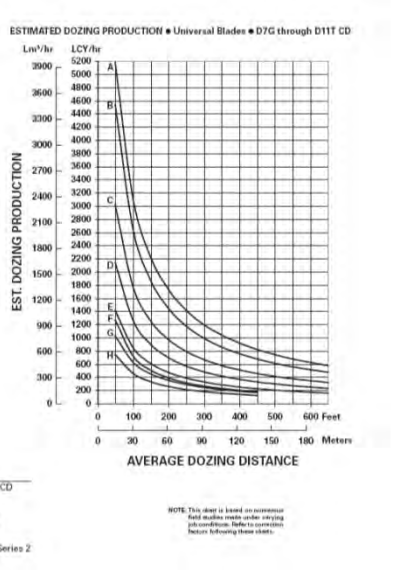
Productivity		
Machine Cat 336EL		
bucket capacity	3.16	m3
fill factor	75%	%
cycle time	45	seconds
operator skill	80%	%
machine availability	83%	%
altitude adjustment	100%	%
Hourly productivity	125.89	m3/hr
Operating Costs		
- Contractor		
Contractor hourly rate	$180.00	$/hr
Excavation cost - contractor rate	1.43	$/m3
- Owner		
ownership, daily		$/day
maintenance		$/hr
fuel		$/hr
consumables (cutters, tires)		$/hr
operator		$/hr
Owner hourly rate	$0.00	$/hr
Excavation cost - owner rate	$0.00	$/m3
Excavation cost - select contractor or owner rate (D22 or D31)		$/m3

HAUL AND DUMPING

Productivity		
Machine Cat 770		
truck capacity	25.1	m3
fill factor	80%	%
load time	6.0	min.
haul distance	1.5	km
average velocity	20.0	km/hr
haul time + return time	9.0	min.
wait time	0.5	min.
dump time	1.0	min.
cycle time	16.5	min.
machine availability	83%	%
altitude adjustment	100%	%
	13.7	ve. min/cycle
Hourly productivity	88.0	m3/hr
Operating Costs		
- Contractor		
Contractor hourly rate	$225.00	$/hr
Haul and Dump - contractor rate	2.56	$/m3
- Owner		
ownership, daily		$/day
maintenance		$/hr
fuel		$/hr
consumables (cutters, tires)		$/hr
operator		$/hr
Owner hourly rate	$0.00	$/hr
Haul/Dumping Cost - owner rate	$0.00	$/m3
Haul/Dumping Cost - select contractor or owner rate (I22 or I31		$/m3

SPREADING/DOZING

Productivity		
Machine Cat D8		
Estimate production using example curves provided or equivalent from other supplier	600	m3/hr
Correction factors (see table provided)		
operator skill	0.75	
material type, see table	0.80	
slot dozing	1.00	
side by side dozing	1.00	
visibility	1.00	
job efficiency	0.83	
altitude adjustment	1.00	
slope adjustment	1.00	
Hourly productivity	298.8	m3/hr
Operating Costs		
- Contractor		
Hourly rate - contractor supplied	$260.00	$/hr
Dozing - contractor rate	0.87	$/m3
- Owner		
ownership, daily		$/day
maintenance		$/hr
fuel		$/hr
consumables (cutters, tires)		$/hr
operator		$/hr
Owner hourly rate	$0.00	
Spreading/Dozing Cost - owner rate	$0.00	$/hr
Spreading/Dozing Cost - select contractor or owner rate (N22 or N31)		$/m3



KEY
A — D11T CD
B — D11T
C — D10T
D — D9T
E — D8T
F — D7E
G — D7R Series 2
H — D7G

NOTE: This chart is based on numerous field studies made under varying job conditions. Refer to correction factors following these charts.

Excavator

	Cat 320	Cat 325B	Cat 375
heaped bucket capacity, m3	1.5	2.2	5.4
	Typical Cycle Times (seconds)		
easy digging, shallow digging, small swing angle	16	18	20
med. to hard digging, rocky soil, swing angle to 90 deg.	23	23	25
tough digging, sandstone, caliche, at max. machine depth, swing angle > 120 deg.	27	29	35

Material	Fill Factor (% of heaped bucket capacity
Moist loam or sandy clay	100 - 110
sand and gravel (not till)	95 - 110
hard tough clay	80 - 90
rock - will blasted	60 - 75
rock - poorly blasted	40 -60

Operator Skill	poor	average	good
Correction factor	0.6	0.75	1

Machine availability	poor	average	good
Correction factor	0.9	0.95	1

Trucking

	Cat 771 D	Cat 777D	Cat 789C
Truck capacity - heaped, m3	27.5	60.5	137

Dozing

JOB CONDITION CORRECTION FACTORS

	TRACK-TYPE TRACTOR
OPERATOR —	
Excellent	1.00
Average	0.75
Poor	0.60
MATERIAL —	
Loose stockpile	1.20
Hard to cut; frozen —	
with tilt cylinder	0.80
without tilt cylinder	0.70
Hard to drift; "dead" (dry, non-cohesive material) or very sticky material	0.80
Rock, ripped or blasted	0.60-0.80
SLOT DOZING	1.20
SIDE BY SIDE DOZING	1.15-1.25
VISIBILITY —	
Dust, rain, snow, fog or darkness	0.90
JOB EFFICIENCY —	
50 min/hr	0.83
40 min/hr	0.67
BULLDOZER*	
Adjust based on SAE capacity relative to the base blade used in the Estimated Dozing Production graphs.	
GRADES — See following graph.	

*NOTE: Angling blades and cushion blades are not considered production dozing tools. Depending on job conditions, the A-blade and C-blade will average 50-75% of straight blade production.