DORIS NORTH MINE

RECLAMATION COST ESTIMATE

Prepared for:

WATER RESOURCES DIVISION
INDIAN & NORTHERN AFFAIRS CANADA
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1 INTRODUCTION

Miramar Hope Bay Ltd. (MHBL) has proposed to develop the Doris North Mine, located in Nunavut at the northeast end of Bathurst Inlet. This report presents an estimate of the cost to carry out the anticipated scope of reclamation activities at the mine. The mine development and reclamation plans have been reviewed and comments provided to INAC separately. It is expected that this cost estimate will be considered in the security requirements for the project. Separate totals for the land and water-related elements of the estimated reclamation liability are developed.

2 INFORMATION SOURCES

The information sources for this review include the following:

- Water License Application Support Document – Revised, April 2007,
- Supplemental information provided by MHBL in conjunction with the Technical Hearing – June 2007
- Comments from other reviewers on acid rock drainage (ARD), permafrost issues, and geotechnical issues.

In addition, a site inspection was conducted in August 2005.

3 APPROACH

The primary purpose of this report is to present an estimate of the reclamation liability. This estimate is to form the basis of financial security so that in the event that the company does not fulfill its obligations then the Government is able to do so without any burden to residents of Nunavut and, if necessary, Canadian citizens.

This estimate is based on the following general assumptions:

- the mine operations cease in approximately 2011 and reclamation (water management) continues to approximately 2020,
- the company goes bankrupt or abandons the property before starting reclamation work,
- all work is based on independent contractor rates,
- all costs are 2007 Canadian dollars,
- the cost estimate does not include revenue from recovery of assets,
- the mine is developed substantially as planned,
- this estimate does not include costs for catastrophic events such as failure of dams, dikes or dump slopes.

This estimate assumes that the mine construction proceeds as proposed. It does not assume departures from plan such as dump construction without set-back on terraces for overall slope stability, expansion of the dumps beyond the indicated limits or significant departures from the current understanding on geochemical issues. Any such departure from the mine plan may increase the reclamation liability.

The estimate has been developed using the RECLAIM model, a spreadsheet developed specifically for estimation of mine reclamation costs. The model is based as much as possible upon costs from the reclamation of other mines.

The Mine Closure and Reclamation Plan provides general descriptions of the anticipated work. MHBL provided a cost estimate which had been prepared using an up-dated version of RECLAIM 4.1 with the Closure and Reclamation Plan.

A brief review of the MHBL estimate suggested that the quantities of work were reasonable and that in general, the unit costs for the work appeared to be reasonable.

The MHBL estimate was used as the basis for this estimate, using the approach described below.

- Review and, if appropriate, accept MHBL's quantities of work
- Review and adjust if necessary, MHBL's unit costs (all were left as per their estimate except the monthly cost of personnel for the post-closure water management activities (raised from $4500/mon to $7500/month)
- Remove elements of the MHBL estimate which appear to be double accounting for costs (Tailings supernatant treatment costs appear in the tailings reclamation and the post-closure sections of the MHBL estimate.)

A new estimate was compiled using RECLAIM 5.1, which includes means to segregate the total liability estimate into land-related and water-related components. RECLAIM has been used since the mid 1990's for estimation of mine reclamation liability at the majority of the mines in northern Canada.

Several reviewers have expressed concern about the waste rock management and the potential for some waste rock to remain on surface at closure. MHBL has presented a table showing the volumes of underground development and the waste rock inventory over the two year mine life. It is noted that much of the mining is by the cut and fill method. The total volume of waste rock to be produced is 206,809 tonnes, which will occupy 114,893 m3 of space at 1.8 tonnes/m3. The cut and fill stopes are expected to produce 324,360 tonnes, which will create a void of 120,133 m3. This suggests that all of the waste rock will be used in backfill. However, the top lift of cut and fill stopes is not usually backfilled, which means that slightly less than 120,133 m3 of void will be backfilled. In addition, it is possible that some waste rock could remain on the stockpile simply because it was impractical to pick it up. Consequently, this estimate includes a provision for backfilling 1.5% of the waste rock as a reclamation activity. This amount is roughly equivalent to a 0.15 m thick layer of waste rock over the stockpile area.

Some detailed comments regarding the quantities of work and specific reclamation measures for each component and the detailed reclamation cost estimate are presented in Appendix A. All of the quantities of work and cost basis for each task are presented in the RECLAIM output, which is presented in Appendix B.

In keeping with conventional engineering practice, and considering the stage of mine development, this estimate includes a contingency of 25%. A lower contingency would be indicative of a plan based on a comprehensive data base of site specific parameters, detailed engineering, and proven reclamation measures. MHBL had suggested a lower contingency, but much higher burdens for engineering and project management than is commonly applied to other reclamation liability estimates. The aggregate burden for engineering, project management and contingency used in this estimate is 40%, which is the same as the aggregate in the MHBL estimate.

4 MARKET FACTOR PRICE ADJUSTMENT

Since its inception, RECLAIM has been updated annually based upon Canadian Consumer Price Index (CPI) as reported by Statistics Canada, and when new reclamation specific unit cost data is available. However, the recent surge in industrial activity in northern Canada has resulted in construction costs reportedly rising at a very high annual rate. There is virtually no statistical data on northern mining related (and reclamation specific) construction trends for this recent period. Some information from other sources can provide some insight. For example, Statistics Canada (CANSIM Table 327-0039) report that Non-residential building costs for Edmonton (the nearest major center for which data is collected) have risen by 30% over the period 2003 to 2006 (index value rose from 118.4 to 154.4 over 3 years). Examination of the rise in costs for the Giant Mine Care & Maintenance program suggest that costs for labor and equipment (parts) are up by 7 – 8 % over each of the past several years. Considering that northern contractors appear to be at their capacity for providing services, it is likely that contractors are seeking higher profits to conduct work.

It is intended that the estimate presented here will provide a reasonable evaluation of the cost in today's dollars should it be necessary to conduct the work. Considering the above, and recognizing the short mine life of 2 years, it is reasonable to add a "market factor price adjustment" to the estimate. This has been considered for recent projects in NWT where a factor of 20% was added to the recommendation for security estimate.

MHBL has used costs which they inflated above the data base values in RECLAIM 5.1 after these were adjusted to 2007 dollars. MHBL noted that their adjustment considered inflation and recent contracting experience. The higher MHBL values were used in this estimate. Considering the adjustment already incorporated into the unit costs, a 20% market price factor adjustment seems too high. Therefore, an adjustment of 10% has been included in this estimate.

Due to the short mine life, this estimate assumes that no progressive reclamation is completed during the operation period of the mine.

5 POST CLOSURE COSTS

The closure of the Doris North mine is unusual because of the extended duration of closure activities, up to nine years. In addition, MHBL has included in their estimate a provision for unspecified and infrequent activities in the long-term, over a 200 year period. These two aspects of post-closure costs, short-term and long-term, are discussed as follow. This report presents both discounted and non-discounted estimates of reclamation liability.

Short-term Post-closure Costs

MHBL has calculated their estimate of short-term closure liability (years 2011-2020) with a discount of the anticipated future costs to 2007 dollars using a 3% real rate of return. The concept of discounting future costs to a net present value (and commonly using a 3% discount rate) is typically only applied to perpetual costs. This occurs in the case of ongoing water treatment and possibly for infrequent maintenance and repairs of critical structures such as dams and spillways. Discounting of short-term reclamation costs is not usually done. However, in this case, discounting of the future costs (after the primary reclamation is complete as MHBL has done) may be reasonable due to the number of years involved, depending on how the security is provided.

It is understood that the form of security (cash, letter of credit, reclamation trust, etc) is a matter between the Minister of INAC and the company. In this case, the use of a discount approach has a significant effect on the amount of security to be provided. Therefore, two estimates of reclamation liability are provided: discounted and non-discounted. The discounted estimate may be reasonable if MHBL provides the security in the form of cash or equivalent (an interest bearing security of some sort). The non-discounted estimate does apply if MHBL provides the security in the form of letter of credit or some other non-income generating form of security.

The short-term closure costs are estimated to be $2,787,175, which if discounted at 3% has a net present value of $2,251,644.

Long-term Post-closure Costs

In their estimate of post-closure costs, MHBL included provision for an average annual maintenance cost of $26,000 for a 200 year period. Considering that there will not be a permanent dam, spillway or other critical waste management structure (covers, diversion ditch) and that the remaining features of the mine development will be disturbed areas, the MHBL provision seems excessive. There is no scope of work attached to this activity and none seems likely. As presented by MHBL this amounts to an additional contingency of nearly 10% to the total liability.

In the estimate presented here, the long-term post-closure has been reduced from $26,000/year to $5000/year. This has a net present value of $166,215.

The long-term post-closure cost has been discounted in both the discounted and non-discounted cost estimates presented here.

6 CLOSURE COST ESTIMATE

The estimated total reclamation liability for the Doris North Mine is listed by mine component in the tables at the start of Appendix B. Page 1 presents the discounted reclamation liability and page 2 presents the non-discounted reclamation liability. A summary is presented in Table 1. The estimated reclamation liability has been segregated into land and water components based on judgment.

Table 1

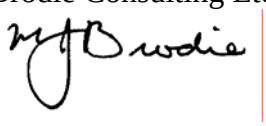
Summary of Estimate Reclamation Liability for the Doris North Mine

Cost Basis	Total Reclamation Liability	Land-Related Reclamation Liability	Water Related Reclamation Liability
Discounted Post-closure costs	$11,500,381	$5,937,385	$5,562,995
Non-discounted post-closure costs	$12,325,067	$6,206,298	$6,118,768

It should be noted that the costs for monitoring and maintenance, and mobilization/demobilization have been split based upon the ratio of land and water-related costs for the primary reclamation activities. This approach assumes that the land and water securities are pooled in the common interest of reclaiming the site. In the event that the securities are not pooled, then the parties holding the security should be aware that there may be a short-fall in funds if only the land or only the water-related portion of the work were to be conducted.

Should there be any questions regarding the approach or conclusion of the report, please contact the undersigned.

Yours truly,
Brodie Consulting Ltd.



M. J. Brodie, P. Eng.

APPENDIX A
RECLAMATION COST DETAILS

This appendix presents notes, assumptions and supporting calculations for the reclamation activities which are shown in the RECLAIM output in Appendix B

Tailings

- Pumping water costs covered in Maintenance (first 2 years) and Long-term Water sections of estimate
- Dam breach (32400 m3 x $25/m3 = $810,000 plus contractor mobilization $250,000) included in year 2020 of Long-Term Water

Waste Rock

- Allowance for waste rock left on surface, assume 0.15 m thickness over 15,000m2, equivalent to roughly 1.5% of pile to be relocated at closure, 0.015 x 145,000 tonnes / 1.8 tonnes/m3 = 2250 m3

Buildings & Equipment

- Jetty removal cost covered separately

Mobilization

- Crews mobilized from YK

Maintenance

- Crews mobilized from Cambridge bay

Long-term Water Management & Site Maintenance

- Labour, supplies and flights for first 2 years covered in Maintenance
- Labour assumes average cost of $25/hr x 10 hrs/day x 30 days/month
- Years 3 – 5, labour assumed to be 4 man-months/year @ $7500/man-month = $30,000/yr
- Years 6 - 9, labour assumed to be 2 man-months/year @ $7500/man-month = $15,000/yr

APPENDIX B

RECLAMATION COST ESTIMATE

SUMMARY OF COSTS

Capital Costs

COMPONENT TYPE	COMPONENT NAME	TOTAL COST	Land Liability	Water Liability
		Future costs discounted @ 3%		
OPEN PIT	0	$0.00	$0	$0
UNDERGROUND MINE	0	$183,500.00	$183,500	$0
TAILINGS	0	$1,246,500.00	$636,900	$609,600
ROCK PILE	0	$35,437.50	$0	$35,438
BUILDINGS AND EQUIPMENT	0	$2,136,036.80	$1,855,043	$280,994
CHEMICALS AND SOIL MANAGEMENT	0	$414,140.00	$0	$414,140
WATER MANAGEMENT	0	$0.00	$0	$0
POST-CLOSURE SITE MAINTENANCE (incl. 200 year provision)		$2,417,879.56	$646,024	$1,771,856
SUBTOTAL		**$6,433,494**	**$3,321,467**	**$3,112,027**
		Percentages	51.6%	48.4%
MOBILIZATION/DEMOBILIZATION	0	$1,123,000	$579,779	$543,221
MONITORING AND MAINTENANCE	0	$325,000	$167,790	$157,210
PROJECT MANAGEMENT	10 %	$643,349	$332,147	$311,203
ENGINEERING	5 %	$321,675	$166,073	$155,601
CONTINGENCY	25 %	$1,608,373	$830,367	$778,007
SUB-TOTAL - CAPITAL COSTS		$10,454,891	$5,397,623	$5,057,268
Market Price Factor Adjustment	10% %	$1,045,489	$539,762	$505,727
GRAND TOTAL		**$11,500,381**	**$5,937,385**	**$5,562,995**

SUMMARY OF COSTS

Capital Costs

COMPONENT TYPE	COMPONENT NAME	TOTAL COST	Land Liability	Water Liability
		No Discount of Future Costs		
OPEN PIT	0	$0.00	$0	$0
UNDERGROUND MINE	0	$183,500.00	$183,500	$0
TAILINGS	0	$1,246,500.00	$636,900	$609,600
ROCK PILE	0	$35,437.50	$0	$35,438
BUILDINGS AND EQUIPMENT	0	$2,136,036.80	$1,855,043	$280,994
CHEMICALS AND SOIL MANAGEMENT	0	$414,140.00	$0	$414,140
WATER MANAGEMENT	0	$0.00	$0	$0
POST-CLOSURE SITE MAINTENANCE		$2,787,174.50	$696,794	$2,090,381
200 year site maintenance		$166,215	$83,108	$83,108
SUBTOTAL		**$6,969,004**	**$3,455,344**	**$3,513,660**
		Percentages	49.6%	50.4%
MOBILIZATION/DEMOBILIZATION	0	$1,123,000	$579,779	$543,221
MONITORING AND MAINTENANCE	0	$325,000	$167,790	$157,210
PROJECT MANAGEMENT	10 %	$696,900	$359,794	$337,107
ENGINEERING	5 %	$348,450	$179,897	$168,553
CONTINGENCY	25 %	$1,742,251	$899,485	$842,766
SUB-TOTAL - CAPITAL COSTS		$11,204,606	$5,642,089	$5,562,517
Market Price Factor Adjustment	10% %	$1,120,461	$564,209	$556,252
GRAND TOTAL		**$12,325,067**	**$6,206,298**	**$6,118,768**

1 **Open Pit Name:** _____ **Pit #** ***1***

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: CONTROL ACCESS								
	Fence	m		#N/A	0	$0		$0	$0
.	Signs	each		#N/A	0	$0		$0	$0
.	Berm	m3		#N/A	0	$0		$0	$0
.	Block roads	m3		#N/A	0	$0		$0	$0
.	Other			#N/A		$0		$0	$0
B	OBJECTIVE: STABILIZE SLOPES								
.	Off-load crest, soil A	m3		#N/A	0	$0		$0	$0
.	Off-load crest, soil B	m3		#N/A	0	$0		$0	$0
.	Doze/trimoverburden at crest	m3		#N/A	0	$0		$0	$0
	Drill & blast pit crest	m3		#N/A	0	$0		$0	$0
.	buttress slope	m3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
C	OBJECTIVE: COVER/CONTOUR SLOPES								
.	Place fill, soil A	m3		#N/A	0	$0		$0	$0
	Place fill, soil B	m3		#N/A	0	$0		$0	$0
.	Rip rap	m3		#N/A	0	$0		$0	$0
.	Vegetate slopes	ha		#N/A	0	$0		$0	$0
	Vegetate pit floor	ha		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
.	OBJECTIVE: SPILLWAY								
.	Excavate channel, soil A	m3		#N/A	0	$0		$0	$0
.	Excavate channel, soil B	m3		#N/A	0	$0		$0	$0
.	Concrete	m3		#N/A	0	$0		$0	$0
.	Rip rap	m3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: FLOOD PIT								
.	Embankment, soil A	m3		#N/A	0	$0		$0	$0
.	Embankment, soil B	m3		#N/A	0	$0		$0	$0
.	Remove pipes etc.	each		#N/A	0	$0		$0	$0
	Remove power lines	each		#N/A				$0	$0
.	LIme addition, kg/m3 of water	tonne		#N/A	0	$0		$0	$0
.	Lime, purchase and shipping	tonne		#N/A	0	$0		$0	$0
.	Other	tonne		#N/A	0	$0		$0	$0
F	RECLAIM QUARRIES								
.	Contour slopes	m3		#N/A	0	$0		$0	$0
.	Berm at crest	m3		#N/A	0	$0		$0	$0
	Place overburder	m3		#N/A	0	$0		$0	$0
.	Vegetate	m3		#N/A	0	$0		$0	$0
H	OTHER ITEMS								
.				#N/A	0	$0		$0	$0
	Subtotal					$0	#DIV/0!	$0	$0
						Total Pits	Percent Land	Total Land	Total Water

1 Underground Mine Name _____ UG Mine # *1*

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A OBJECTIVE: CONTROL ACCESS								
Fence	m		#N/A	0	$0		$0	$0
. Signs	each		#N/A	0	$0		$0	$0
. Ditch, mat'l A	m3		#N/A	0	$0		$0	$0
. , mat'l B	m3		#N/A	0	$0		$0	$0
. Berm	m3		#N/A	0	$0		$0	$0
. Block adits	m3	300	#N/A	50	$15,000	100%	$15,000	$0
steel barricade		1	#N/A	45000	$45,000	100%	$45,000	$0
. Cap shaft	m3		#N/A	0	$0		$0	$0
. Cap raise #1	m3	15	#N/A	2000	$30,000	100%	$30,000	$0
. Cap raise #2	m3	15	#N/A	2000	$30,000	100%	$30,000	$0
Cap raise #3	m3	15	#N/A	2000	$30,000	100%	$30,000	$0
. Backfill adits	m3		#N/A	0	$0		$0	$0
. Backfill shaft	m3		#N/A	0	$0		$0	$0
. Backfill raise #1	m3		#N/A	0	$0		$0	$0
. Backfill raise #2	m3		#N/A	0	$0		$0	$0
. Backfill open stopes	m3		#N/A	0	$0		$0	$0
. remove ventialation raise housing & fans	allow	3	#N/A	4500	$13,500	100%	$13,500	$0
B OBJECTIVE: STABILIZE GROUND SURFACE								
. Backfill mine	m3		#N/A	0	$0		$0	$0
. Collapse crown pillar	m3		#N/A	0	$0		$0	$0
. Contour, mat'l A	m3		#N/A	0	$0		$0	$0
. , mat'l B	m3		#N/A	0	$0		$0	$0
. Maintain dewatering (see "MONITORING/MAINTENANCE" c			#N/A	0	$0		$0	$0
. Other			#N/A	0	$0		$0	$0
C OBJECTIVE: FLOOD MINE								
. Plug adits	m3		#N/A	0	$0		$0	$0
. Plug drillholes to surface	each		#N/A	0	$0		$0	$0
. Grouting	m3		#N/A	0	$0		$0	$0
. LIme addition, kg/m3 of water	tonne		#N/A	0	$0		$0	$0
. Lime, purchase and shipping	tonne		#N/A	0	$0		$0	$0
D OBJECTIVE: HAZARDOUS MATERIALS								
. remove hazardous materials	each	1	#N/A	20000			$0	$0
. remove/decontam. equipment	each	1	#N/A	20000	$20,000	100%	$20,000	$0
. Other			#N/A	0	$0		$0	$0
E SPECIALIZED ITEMS								
.			#N/A	0	$0		$0	$0
Subtotal					$183,500	100%	$183,500	$0
					Total U/G	Percent Land	Total Land	Total Water

1 lings Impoundment Name: Impoundment # *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: CONTROL ACCESS								
.	Other			#N/A	0	$0		$0	$0
B	OBJECTIVE: STABILIZE EMBANKMENT								
.	Breach north dam in year 9	m3		#N/A	25	$0		$0	
.	contractor mobilization	each		#N/A	250000	$0		$0	
.	engineering	m3		#N/A	0	$0		$0	$0
.	const. supervision	m3		#N/A	0	$0		$0	$0
.	Vegetate	ha		#N/A	0	$0		$0	$0
.	Raise crest	m3		#N/A	0	$0		$0	$0
.	stabilize shoreline, rock armoring	m3	22800	#N/A	25	$570,000	50%	$285,000	$285,000
.	stabilize shoreline, geotextile	m2	77400	#N/A	8	$619,200	50%	$309,600	$309,600
C	OBJECTIVE: COVER TAILINGS								
.	Soil cover	m3		#N/A	0	$0		$0	$0
.	Rip rap	m3		#N/A	0	$0		$0	$0
.	Vegetate	ha		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
D	OBJECTIVE: FLOOD TAILINGS								
.	Ditch, mat'l A	m3		#N/A	0	$0		$0	$0
.	, mat'l B	m3		#N/A	0	$0		$0	$0
.	Raise crest	m3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: TREAT SUPERNATANT								
.	Pump water, 2 people x 2 months x 7 yrs	man-mth		#N/A	7500	$0		$0	$0
.	Supply reagents	allow		#N/A	5000	$0		$0	$0
.	Operate treatment plant	allow		#N/A	5000	$0		$0	$0
.	Air Charters			#N/A	2500	$0		$0	$0
F	OBJECTIVE: UPGRADE SPILLWAY								
.	Excavate channel, mat'l A	m3		#N/A	0	$0		$0	$0
.	, mat'l B	m3		#N/A	0	$0		$0	$0
.	Concrete	m3		#N/A	0	$0		$0	$0
.	Rip rap	m3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
G	OBJECTIVE: STABILIZE DECANT SYSTEM								
.	Remove	m3		#N/A	0	$0		$0	$0
.	Plug/backfill	m3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
H	OBJECTIVE: REMOVE TAILINGS DISCHARGE								
.	Remove reclaim barge & pumps	m3	1	#N/A	1500	$1,500	100%	$1,500	$0
.	remove reclaim pipeline	m3	5000	ppsl	2	$10,000	100%	$10,000	$0
	remove 7900 m of discharge pipe	m3	7900	ppsl	2	$15,800	100%	$15,800	$0
	clean out cahtbasin	allow	4		7500	$30,000	50%	$15,000	$15,000
.	Other	100%		#N/A	0	$0		$0	$0
I	SPECIALIZED ITEMS								
.				#N/A	0	$0			$0
	Subtotal					$1,246,500	0.51095	$636,900	$609,600
						Total Tailings	Percent Land	Total Land	Total Water

1 **Rock Pile Name:** **Rock Pile #:** ***1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A OBJECTIVE: STABILIZE SLOPES								
Flatten slopes with dozer	m3		#N/A	0	$0.00		$0	$0
. Divert runon, ditch mat'l A	m3		#N/A	0	$0.00		$0	$0
. , ditch mat'l B	m3		#N/A	0	$0.00		$0	$0
. Toe buttress, drain mat'l	m3		#N/A	0	$0.00		$0	$0
. , fill mat'l A	m3		#N/A	0	$0.00		$0	$0
. , fill mat'l B	m3		#N/A	0	$0.00		$0	$0
. Other			#N/A	0	$0.00		$0	$0
B OBJECTIVE: COVER DUMP								
. Mat'l A	m3		#N/A	0	$0.00		$0	$0
. Mat'l B	m3		#N/A	0	$0.00		$0	$0
. Rip rap	m3		#N/A	0	$0.00		$0	$0
. Vegetate	ha		#N/A	0	$0.00		$0	$0
. Other			#N/A	0	$0.00		$0	$0
C OBJECTIVE: RELOCATE DUMPS								
. Load, haul, dump or doze	m3	2250	SCSS	15.75	$35,437.50		$0	$35,438
. Add lime	tonne		#N/A	0	$0.00		$0	$0
. Contour reclaimed area	ha		#N/A	0	$0.00		$0	$0
. Other			#N/A	0	$0.00		$0	$0
D OBJECTIVE: COLLECT AND TREAT								
. See "ONGOING TREATMENT" costing component			#N/A	0	$0.00		$0	$0
E OBJECTIVE: DEVELOP WETLAND								
. Earthworks, mat'l A	m3		#N/A	0	$0.00		$0	$0
. , mat'l B	m3		#N/A	0	$0.00		$0	$0
. Vegetate	ha		#N/A	0	$0.00		$0	$0
. Other			#N/A	0	$0.00		$0	$0
F SPECIALIZED ITEMS								
.			#N/A	0	$0.00		$0	$0
			#N/A	0	$0.00		$0	$0
Subtotal					$35,438	0.0%	$0	$35,438
					Total for Rock Pile	Percent Land	Total Land	Total Water

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

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
	Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
.	Decontaminate, dispose on-site	each	1	#N/A	32500	$32,500		$0	$32,500
.	Other	each		#N/A	0	$0		$0	$0
B	OBJECTIVE: DISPOSE STATIONARY EQUIPMENT								
.	Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
.	Decontaminate, dispose on-site	each	600	#N/A	75	$45,000		$0	$45,000
.	supplies	each	1	#N/A	20000	$20,000	75%	$15,000	$5,000
C	OBJECTIVE: DISPOSE ORE CONCENTRATION EQUIPMENT								
.	Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
.	Decontaminate tanks & plumb.	each	560	#N/A	75	$42,000		$0	$42,000
.	Remove tanks & plumbing	each	3600	#N/A	75	$270,000	100%	$270,000	$0
.	supplies		1	#N/A	50000	$50,000	75%	$37,500	$12,500
D	OBJECTIVE: DISPOSE WATER TREATMENT EQUIPMENT								
.	Decontaminate tanks & plumb.	each		#N/A	0	$0		$0	$0
.	Remove tanks & plumbing	each		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: DECONTAMINATE BUILDINGS & TANKS								
.	Process plant, chemicals	each	1	#N/A	5000	$5,000		$0	$5,000
.	Maintenance plant, chemicals	each	1	#N/A	5000	$5,000		$0	$5,000
.	Camp	each		#N/A	0	$0		$0	$0
.	Bulk fuel storage	each		#N/A	0	$0		$0	$0
.	Power plant	each		#N/A	0	$0		$0	$0
.	Explosives plant	each		#N/A	0	$0		$0	$0
F	OBJECTIVE: MOTHBALL BUILDINGS								
.	Building 1	m2		#N/A	0	$0		$0	$0
.	Building 2	m2		#N/A	0	$0		$0	$0
.	Building 3	m2		#N/A	0	$0		$0	$0
.	Building 4	m2		#N/A	0	$0		$0	$0
.	Building 5	m2		#N/A	0	$0		$0	$0
.	Other	m2		#N/A	0	$0		$0	
G	OBJECTIVE: REMOVE BUILDINGS								
.	mill	m2	6000	BRS1H	52.8	$316,800	100%	$316,800	$0
.	service complex	m2	2000	BRS1H	52.8	$105,600	100%	$105,600	$0
.	Camp	m2	2318	BRS1H	52.8	$122,390	100%	$122,390	$0
.	office/dry	m2	366	BRS1H	52.8	$19,325	100%	$19,325	$0
.	sewage plant	m2	122	BRS1H	52.8	$6,442	100%	$6,442	$0
.	power house	m2	400	BRS1H	52.8	$21,120	100%	$21,120	$0
.	arcitic corridors	m2	1500	BRS1L	35.2	$52,800	100%	$52,800	$0
.	mill reagent storage	m3	610	BRS1L	35.2	$21,472	100%	$21,472	$0
.	Explosives magazine		610	BRS1H	52.8	$32,208	100%	$32,208	$0
H	tail lake pumphouse		100	BRS1H			100%		
.	incinerator	m2	2		10000	$20,000	100%	$20,000	$0
.	boneyard waste	m2	1		15000	$15,000	100%	$15,000	$0
	Basement slabs								
	mill		6000	BRCS	6	$36,000	100%	$36,000	$0
	powerhouse		400	BRCS	6	$2,400	100%	$2,400	$0

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

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
.	maint shop	m2	2000	BRCS	6	$12,000	100%	$12,000	$0
.	remove mill concrete	m2	1	#N/A	50000	$50,000	100%	$50,000	$0
.	revegetation of mill area	m2	3.63	vhfh	4950	$17,969	100%	$17,969	$0
.	Other			#N/A	0	$0		$0	$0
I	OBJECTIVE: FUEL TANKS								
	decontaminate mill site fuel tanks		5	#N/A	18000	$90,000		$0	$90,000
	remove mill fuel tanks		5	#N/A	24500	$122,500	100%	$122,500	$0
	other small fuel tanks, decontam.		5	#N/A	2500	$12,500		$0	$12,500
.	other small fuel tanks, remmove	m3	5	#N/A	2500	$12,500	100%	$12,500	$0
.	remove fuel piping	m3	1	#N/A	6000	$6,000	100%	$6,000	$0
.	remove fuel trasnfer stn	m3	1	#N/A	6000	$6,000	100%	$6,000	$0
.	remove liner at mill tank farm	m3	1	#N/A	6000	$6,000	100%	$6,000	$0
.	contour tank farm berm		1	#N/A	3000	$3,000	100%	$3,000	$0
J	OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
.	Place soil cover	m3	10000	#N/A	25	$250,000	100%	$250,000	$0
.	grade landfill cover	hrs	16	#N/A	225	$3,600	100%	$3,600	$0
.	Landfill disposal fee	tonne		#N/A	0	$0	100%	$0	$0
K	OBJECTIVE: GRADE AND CONTOUR								
.	grade plant site & camp ara	ha	2.67	SCFYH	4950	$13,217	100%	$13,217	$0
	grade beach laydown	ha	0.6	SCFYH	4950	$2,970	100%	$2,970	$0
	grade mill fuel fuel tank farm	ha	0.36	SCFYH	4950	$1,782	100%	$1,782	$0
	grade explosive magazine area	ha	0.45	SCFYH	4950	$2,228	100%	$2,228	$0
	doze safety berms at explosive mag.	hrs	16	#N/A	225	$3,600	100%	$3,600	$0
.	Place soil cover	m3		#N/A	0	$0		$0	$0
.	Rip rap on ditches	m3		#N/A	0	$0		$0	$0
.	Vegetate	ha	4.08	vhfh	4950	$20,196	100%	$20,196	$0
.	Other			#N/A	0	$0		$0	$0
L	OBJECTIVE: RECLAIM ROADS								
.	remove bridge & armour banks	km	1	#N/A	10000	$10,000	100%	$10,000	$0
.	remove rock drains & scarify road	ha	7.68	SCFYH	4950	$38,016	100%	$38,016	$0
.	Vegetate		7.68	vhfh	4950	$38,016	100%	$38,016	$0
K	SPECIALIZED ITEMS								
	remove landfarm soil into U/G		1250	scss	15.75	$19,688	50%	$9,844	$9,844
	remove landfarm liner & rockfill to U/G		1	#N/A	5000	$5,000	50%	$2,500	$2,500
	remove landfarm rockfill to U/G		2000	scss	15.75	$31,500	50%	$15,750	$15,750
				#N/A	0	$0		$0	$0
	Stabilize 3 quarries		1	#N/A	85000	$85,000	100%	$85,000	$0
	vegetate 3 quarries		1	#N/A	3500	$3,500	100%	$3,500	$0
				#N/A	0	$0		$0	$0
	remove float plane dock		1		3400	$3,400		$0	$3,400
	remove communications equip		1	#N/A	5000	$5,000	100%	$5,000	$0
	remove power lines	km	5	#N/A	2500	$12,500	100%	$12,500	$0
.	remove final temporary camp		1	#N/A	7300	$7,300	100%	$7,300	$0
	Subtotal					$2,136,037	86.8%	$1,855,043	$280,994
						Total Buildings	Percent Land	Total Land	Total Water

1 Chemicals and Soil Contamination: *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
	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.								
A	LABORATORY CHEMICALS							$0	
.		allow	2	lcrh	2320	$4,640		$0	$4,640
B	PCB, hauling	litre		#N/A	0	$0		$0	$0
.	PCB, disposal	litre		#N/A	0	$0		$0	$0
C	FUEL			#N/A		$0		$0	$0
.	burn on site	allow	1		20000	$20,000		$0	$20,000
.	Type 2	kg		#N/A	0	$0		$0	$0
.	Type 3	kg		#N/A	0	$0		$0	$0
D	WASTE OIL								
.	Oils/lubricants - burn on-site	litre	20000	obh	0.55	$11,000		$0	$11,000
.	Oils/lubricants - ship off-site	litre		#N/A	0	$0		$0	$0
.	Oils/lubricants - disposal fee	litre		#N/A	0	$0		$0	$0
E	PROCESS OR TREATMENT CHEMICALS								
.	removal of other chemcials	allow	1	#N/A	150000	$150,000		$0	$150,000
.	Type 2	kg		#N/A	0	$0		$0	$0
.	Type 3	kg		#N/A	0	$0		$0	$0
.	Type 4	kg		#N/A	0	$0		$0	$0
F	EXPLOSIVES	kg							
.		kg	5000	erh	2.2	$11,000		$0	$11,000
G	CONTAMINATED SOILS								
.	Type 1, light fuel	m3	500	csrh	120	$60,000		$0	$60,000
.	Type 2, heavy fuel and oil	m3	500	csrh	120	$60,000		$0	$60,000
.	Type 3, metals	m3		#N/A	0	$0		$0	$0
H	Haz. Mat. testing & assessment								
.	Technician and analyses	each	1	#N/A	5000	$5,000		$0	$5,000
.	test pit excavation	each	1	#N/A	25000	$25,000		$0	$25,000
.	audit		1	#N/A	15000	$15,000		$0	$15,000
.	OTHER								
	Haz. Mat Inventory		1		2500	$2,500		$0	$2,500
.	HHERA	LS	1	#N/A	50000	$50,000		$0	$50,000
	Subtotal					$414,140	0.0%	$0	$414,140
						Total Chemical	Percent Land	Total Land	Total Water

1 /ater Management Project: _____ Project # *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: STABILIZE EMBANKMENT								
	Toe buttress, drain mat'l	m3		#N/A	0	$0		$0	$0
	, fill mat'l A	m3		#N/A	0	$0		$0	$0
	, fill mat'l B	m3		#N/A	0	$0		$0	$0
	Rip rap	m3		#N/A	0	$0		$0	$0
	Vegetate	ha		#N/A	0	$0		$0	$0
	Raise crest	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
B	OBJECTIVE: UPGRADE SPILLWAY								
	Excavate channel, mat'l A	m3		#N/A	0	$0		$0	$0
	, mat'l B	m3		#N/A	0	$0		$0	$0
	Concrete	m3		#N/A	0	$0		$0	$0
	Rip rap	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
C	OBJECTIVE: STABILIZE SEDIMENT CONTAINMENT PONDS								
	Place soil cover	m3		#N/A	0	$0		$0	$0
	Place geotextile	m2		#N/A	0	$0		$0	$0
	Vegetate	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
D	OBJECTIVE: BREACH EMBANKMENT								
	Remove Fill	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: STABILIZE DITCHES								
	Flatten side slopes	m3		#N/A	0	$0		$0	$0
	Rip rap	m3		#N/A	0	$0		$0	$0
	Vegetate	ha		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
F	OBJECTIVE: BREACH DITCHES								
	Excavate	m3		#N/A	0	$0		$0	$0
	Backfill/recontour	m3		#N/A	0	$0		$0	$0
	Vegetate	ha		#N/A	0	$0		$0	
	Other			#N/A	0	$0		$0	$0
G	OBJECTIVE: REMOVE PIPELINES								
	Remove pipes	m		#N/A	0	$0		$0	$0
	Concrete plug deep pipes	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
H	OBJECTIVE: REMOVE STORAGE TANKS								
	Remove tanks & plumbing	m2		#N/A	0	$0		$0	$0
	Excavate & backfill	m3		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
I	OBJECTIVE: COLLECT DRAINAGE FOR TREATMENT								
	Excavate collection ditches	m3		#N/A	0	$0		$0	$0
	Rip rap ditches	m3		#N/A	0	$0		$0	$0
	Pipes	m		#N/A	0	$0		$0	$0
	Pumps	each		#N/A	0	$0		$0	$0
	Collect'n pond, exc. mat'l A	m3		#N/A	0	$0		$0	$0
	, exc. mat'l B	m3		#N/A	0	$0		$0	$0
	Collect'n pond, fill mat'l A	m3		#N/A	0	$0		$0	$0

1 **/ater Management Project:** **Project #** ***1***

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
	, fill mat'l B	m3		#N/A	0	$0		$0	$0
	Collect'n pond, liner	m2		#N/A	0	$0		$0	$0
J	OBJECTIVE: TREAT DRAINAGE (see "ONGOING TREATMENT" for operating costs)								
	Build treatment plant	lump sum		#N/A	0	$0		$0	$0
				#N/A	0	$0		$0	$0
	Subtotal					$0	#DIV/0!	$0	$0
						Total Water	Percent Land	Total Land	Total Water

1 **Mobilization Name:** **Mob # *1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A MOBILIZE HEAVY EQUIPMENT								
Equipment to regional centre								
. Allowance, barge equip to site	LS	2	#N/A	100000	$200,000		$0	$200,000
. Dump trucks	km		#N/A	0	$0		$0	$0
. Dozers	km		#N/A	0	$0		$0	$0
. Demolition shears	km		#N/A	0	$0		$0	$0
Equipment, regional centre to site								
. Excavators	km		#N/A	0	$0		$0	$0
. Dump trucks	km		#N/A	0	$0		$0	$0
. Dozers	km		#N/A	0	$0		$0	$0
. Demolition shears	km		#N/A	0	$0		$0	$0
B MOBILIZE CAMP								
.			#N/A		$0		$0	$0
C MOBILIZE WORKERS	manday							
. air charters		32	#N/A	5000	$160,000		$0	$160,000
D MOBILIZE MISC. SUPPLIES								
. Fuel	owance	1	#N/A	10000	$10,000		$0	$10,000
. Minor tools and equipment	owance	1	#N/A	50000	$50,000		$0	$50,000
. Truck tires	owance	1	#N/A	5000	$5,000		$0	$5,000
E MOBILIZE & HOUSE WORKERS	person days							
.		3600	#N/A	55	$198,000		$0	$198,000
. Barging Costs								
. Sea lift to site	km	2	#N/A	150000	$300,000		$0	$300,000
. Limited winter use	km		#N/A	0	$0		$0	$0
.			#N/A	0	$0		$0	$0
F BONDING	lump sum							
.			#N/A		$0		$0	$0
G TAXES	lump sum							
.			#N/A		$0		$0	$0
H INSURANCE	lump sum							
.		2	#N/A	100000	$200,000		$0	$200,000
Subtotal					$1,123,000	0.0%	$0	$1,123,000
					Total Mob.	Percent Land	Total Land	Total Water

1 Monitoring & Maintenance Mon / Mtce # *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: INSPECTIONS								
	Annual geotechnical insp.	each		#N/A	$0	$0		$0	$0
.	Survey inspection	each		#N/A	$0	$0		$0	$0
.	Water sampling	each		#N/A	$0	$0		$0	$0
.	Reporting	each		#N/A	$0	$0		$0	$0
.	Other			#N/A	$0	$0		$0	$0
B	OBJECTIVE: MAINTENANCE								
.	C&M crew of 2, 2011/12	man-mt	26	#N/A	$7,500	$195,000		$0	$195,000
.	C&M supplies	month	13	#N/A	$5,000	$65,000		$0	$65,000
.	flights	each	26	#N/A	$2,500	$65,000		$0	$65,000
.	Clear spillway	each		#N/A	$0	$0		$0	$0
.	Other								
				#N/A		$0		$0	$0
	Subtotal					$325,000	0.0%	$0	$325,000
						Total Pits	Percent Land	Total Land	Total Water

1 Post-Closure Site Maintenance

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	WATER TREATMENT								
	Total annual cost, unit cost from Ongoing Water Treatment				0	$0		$0	$0
B	Cover Maintenance								
	Repair erosion, remove trees	ha		#N/A	0	$0		$0	$0
C	Spillway Maintenance								
	Repair erosion	m3		#N/A	0	$0		$0	$0
	Clear spillway	each		#N/A	0	$0		$0	$0
	Other			#N/A	0	$0		$0	$0
D	Perpetual site maintenance					$5,000			
								$0	$0
								$0	
	Subtotal, Annual post-closure costs					$5,000		$0	$0
	Discount rate for calculation of net present value of post-closu			3.00%				$0	
	Number of years of post-closure activity			200	years			$0	
	Present Value of payment stream					$166,215	50.0%	$83,108	$83,108
	NPV of years 2011 - 2020					$2,251,664	25.0%	$562,916	$1,688,748
	Total Post-closure costs					$2,417,880		$646,024	$1,771,856
						Total Post closure	Percent Land	Total Land	Total Water

Short-term Post-Closure Costs

Activity	YEAR		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
no. of site visits			4	4	4	4	4	2	2	1	1	1	
Monitoring Labor					$30,000	$30,000	$30,000	$15,000	$15,000	$15,000	$15,000	$15,000	
Monitoring Supplies & Equipment					$2,760	$2,760	$2,760	$1,760	$1,760	$1,760	$1,760	$1,760	
Transprotation to and from site					$26,000	$26,000	$26,000	$13,000	$13,000	$6,500	$6,500	$6,500	
Camp costs					$20,000	$20,000	$20,000	$10,000	$10,000	$10,000	$10,000	$10,000	
Analytical costs			$7,600	$7,600	$7,600	$7,600	$7,600	$3,800	$3,800	$1,900	$1,900	$1,900	
Transportation of samples			$1,000	$1,000	$1,000	$1,000	$1,000	$500	$500	$250	$250	$250	
AEMP			$50,000	$50,000	$50,000	$50,000	$50,000	$50,000		$50,000		$50,000	
Annual Geotech			$10,000	$10,000	$10,000	$10,000	$10,000	$10,000		$10,000		$10,000	
Vegetation monitoring				$25,000			$50,000					$35,000	
Breach dam in Year 9												$1,060,000	
Annual reporting			$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	
Post-closure maintenance			$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	
Sub-total			$98,600	$123,600	$177,360	$177,360	$227,360	$134,060	$74,060	$125,410	$65,410	$1,220,410	
Contingency		15.00%	$14,790	$18,540	$26,604	$26,604	$34,104	$20,109	$11,109	$18,812	$9,812	$183,062	
Totals			$113,390	$142,140	$203,964	$203,964	$261,464	$154,169	$85,169	$144,222	$75,222	$1,403,472	$2,787,175
Net Present Value	$2,251,664.13												
											difference	$535,510.37	

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	
1	**excavate Rock, Bulk**						COMMENTS
	drill, blast, load short haul (<500m) Dump	RB1	m3	9.35	14	#N/A	quarry operations for bulk fill
	RB1 + long haul, up to 1500 m	RB2	m3	9.9	14.6	#N/A	
	RB1 + spread and compact	RB3	m3	9.9	14.6	#N/A	
	RB1 + long haul + spread and compact	RB4	m3	10.45	25.25	#N/A	
	RB1 + Specified activity	RBS	m3	#N/A	#N/A	#N/A	
2	**excavate Rock, Controlled**						
	drill, blast, load short haul (<500m) Dump	RC1	m3	22	33	#N/A	spillway excavation
	RC1 + long haul, up to 1500 m	RC2	m3	10.45	15.1	#N/A	
	RC1 + spread and compact	RC3	m3	9.9	14.6	#N/A	
	RC1 + long haul + spread and compact	RC4	m3	11.1	15.73	#N/A	
	RC1 + Specified activity	RCS	m3	#N/A	#N/A	145	$145/M3-drift excavation
3	**excavate Soil, Bulk**						
	excavate, load short haul (<500m) dump	SB1	m3	3.2	4.85	#N/A	LOW cost: excavation of loose soil, high volume
	SB1 + long haul, up to 1500 m	SB2	m3	3.98	5.97	#N/A	LOW cost: excavation of loose soil, 1.5 km haul, high volume
	SB1 + spread and compact	SB3	m3	3.7	5.31	#N/A	
	SB1 + long haul + spread and compact	SB4	m3	4.5	8.95	#N/A	LOW cost: excavation of loose soil, 1.5 km haul, high volume, const. of simple soil cover
	SB1 + Specified activity	SBS	m3	2.31	6.38	10.95	LOW cost: rehandle waste rock dump into pit, >500,000 m3, 2 km haul SPECIFIED cost: rehandle waste rock, haul 3 km, place & compact on dam
	Soil, tailings	SBT	m3	3.03	7.15		LOW cost: doze tailings, HIGH cost: excavate & short haul
4	**excavate Soil, Controlled**						
	excavate, load short haul (<500 m), dump	SC1	m3	5.61	7.65	#N/A	
	SC1 + long haul, up to 1500 m	SC2	m3	6.95	9.64	#N/A	
	SC1 + spread and compact	SC3	m3	5.61	11.66	#N/A	HIGH cost: for simple soil covers
	SC1 + long haul + spread and compact	SC4	m3	6.3	19.05	#N/A	HIGH cost: for complex covers & dam construction, spillway repair, LOW volume
	SC1 + Specified activity	SCS	m3	#N/A	#N/A	15.75	SPECIFIED cost: backfill adit with waste rock
	Geo-synthetics						
	geotextile, filter cloth	GST	M2	0.99	1.98	#N/A	FOB Edmonton, add shipping & installation
	geogrid	GSG	M2	4.73		#N/A	

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	
	liner, HDPE	GSHDPE	M2	5.89		#N/A	
	liner, PVC	GSPVC	M2			#N/A	
	geosynthetic installation	GSI	m2	0.83	1	#N/A	
	bentonite soil ammendment	GSBA	tonne	253	286	#N/A	FOB Edmonton, add shipping & mixing
	Shaft, Raise & Portal Closures						
	Shaft & Raises	SR	m2	530	1750	#N/A	LOW cost: pre-cast concrete slabs, little site prep. HIGH cost: for hand construction, remote site
	Portals	POR	m3		205	1000	HIGH cost: for excavate & backfill collapsed portal SPECIFIED cost: installed pressure plug
5	**Concrete work**						
	Small pour, no forms	CS	m3	297	595	#N/A	
	Large pour, no forms	CL	m3	235	350	#N/A	
	Small pour, Formed	CSF	m3	350	1750	#N/A	
	Large pour, Formed	CLF	m3	290	410	#N/A	
6	**Vegetation**						
	Hydroseed, Flat	VHF	ha	1595	4950	#N/A	
	Hydroseed, Sloped	VHS	ha	1848	5555	#N/A	
	veg. Blanket/erosion mat	VB	ha	11000	13200	#N/A	
	Tree planting	VT	ha	11000	13200	#N/A	
	Wetland species	VW	ha	55000	82500	#N/A	
7	**Pumps**						
	Small, <	PS	each	3000	6000	#N/A	
	Large, >	PL	each	5000	100000	#N/A	large - 250 hp Gould w/diesel motor
8	**PiPes**						
	Small, < 6 inch diameter	PPS	m	2	5	#N/A	LOW cost: pipe removal, HIGH cost: supply new pipe SPECIFIED: small, heat traced & insulated pipe
	Large, > 6 inch diameter	PPL	m	4	180	#N/A	LOW cost: pipe removal, HIGH cost: supply 24" 100 psi HDPE pipe, FOB Edm. add shipping & installation

Unit Cost Table

	ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	
9	**pump sand BackFill**		BF	m3	5.5	16.5	#N/A	
10	**Fence**		F	m	11	165	#N/A	
11	**Signs**		S	each	11	33	#N/A	
12	**rock, Drill and Blast only**		DB	m3	11	22	#N/A	
	(flatten slope, collapse drift)							
13	**excavate Rip Rap**	drill, blast, load short haul (<500 m) dump and spread	RR1	m3	10.95	16.35	#N/A	
		RR1 + long haul	RR2	m3	11.1	16.95	#N/A	HIGH cost: quarry & place rip rap in channel
		excavate rock from waste dump, short haul, spread	RR3	m3	4.2	5.78	#N/A	LOW cost: removal of 18 in minus from dump, long haul and spread HIGH cost: removal of coarse rock from dump, long haul, armour spillway
		RR3 + long haul	RR4	m3	4.68	6.25	#N/A	
		specified rip rap source	RR5	m3	#N/A	#N/A	#N/A	
14	**Import LimeStone**		ILS	tonne	8.8	13.2	#N/A	
15	**Import LiMe**		ILM	tonne	165	495	#N/A	LOW cost: bulk shipping, high volume, FOB Vancouver/Edmonton HIGH cost: bags delivered to central Yukon, small volume
16	**Grouting**		G	m3	198	240	#N/A	HIGH cost: cement, FOB Yellowknife
17	**Dozing**							
		doze Rock piles	DR	m3	0.85	1.95	#N/A	LOW cost: doze crest off dump
		doze overburden/Soil piles	DS	m3	0.78	3.11	#N/A	HIGH cost: push up to 300 m
18								
							#N/A	
							#N/A	
19								
							#N/A	
							#N/A	
20								
				each	0	0	#N/A	
				each			#N/A	
21	**Buildings - Decontaminate**							

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	
	Chemicals	BDC	m3	#N/A	#N/A	#N/A	
	Asbestos	BDA	m2	21	42	#N/A	LOW cost: removal of asbestos siding & flooring HIGH cost: removal of insulated pipes, friable asbestos
22	**Buildings - Remove**						
	areas are per floor on 3 m average height						LOW cost: removal and on-site disposal - small wooden structures
	Wood - teardown	BRW1	m2	21.5	33	#N/A	
	Wood - burn	BRW2	m2	5.5	11	#N/A	
	Masonry	BRM	m2	23.65	33	#N/A	
	Concrete	BRC	m	33	49.5	6	LOW cost: removal of building perimeter walls, HIGH cost: per m3 for bulk concrete SPECIFIED cost: $/m2 to break floor slab
	Steel - teardown	BRS1	m2	35.2	52.8	240	SPECIFIED cost: demolition shear $/hour operating
	Steel - salvage	BRS2	m2	55	82.5	#N/A	
23	**Power & Pipe Lines**						
	Power lines, remove	POWR	each	20.9	4620	#N/A	
						#N/A	
24	**Laboratory Chemicals**						
	Remove from site	LCR	pallet	1750	2320	#N/A	
	Dispose on site	LCD	each	#N/A	#N/A	#N/A	
25	**PCB - Remove from site**	PCBR	litre	33	38.5	#N/A	LOW cost: shipping, handling & disposal from Yellowknife
26	**Fuel**						
	Remove from site	FR	kg	0	1.02	#N/A	
	Burn on site	FB	kg	#N/A	#N/A	#N/A	
27	**Oil**						
	Remove from site	OR	litre	0.35	1.02	#N/A	
	Burn on site	OB	litre	0.35	0.55	#N/A	
28	**Process Chemicals**						
	Remove from site	PCR	kg	0.35	2.05	#N/A	
	Dispose on site	PCD	kg	#N/A	#N/A	#N/A	
29	**Explosives**						
	Remove from site	ER	kg	0	2.2	#N/A	
	Dispose on site	ED	kg	#N/A	#N/A	#N/A	

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	
30	**Contaminated Soils**						
	Remediate on site	CSR	m3	38.5	120	#N/A	LOW cost: bio-remediate on-site. HIGH cost: ship off-site to landfil as haz. waste
	consolidate & cover	Use cost code items 1 - 4					
	cover in place	Use cost code items 1 - 4					
31	**Mobilize Heavy Equipment**						
	Road access	MHER	$/km	2.81	8.42	2.05	SPECIFIED cost: $/tonne/km in cargo plane
	Air access	MHEA	each	#N/A	#N/A	1375	SPECIFIED cost: helicopter cost, $/hr of operation
32	**Mobilize Camp**						
	<20 persons Road access	MC<R	each	#N/A	#N/A	#N/A	
	<20 persons Air access	MC<A	each	#N/A	#N/A	#N/A	
33	**Mobilize Workers**						
	mobilize	MM<	person	193	990	#N/A	LOW cost: road access. HIGH cost: transport by Twin Otter aircraft
	>20 persons	MM>	person	990	1320	#N/A	
34	**ACCoModation**	ACCM	month	1320	1980	#N/A	LOW cost, accom in existing camp, per man, HIGH cost: - supply new camp
35	**Mobilize Misc. Supplies**	MMS	each	#N/A	#N/A	#N/A	LOW cost: winter road - limited use, LOW snowfall
36	**Winter Road**	WR	km	1320	2620	#N/A	
37	**Visual site Inspection**	VI	each	3520	7100	10000	
38	**Survey site Inspection**	SI	each	#N/A	#N/A	#N/A	
39	**Water Sampling**	WS	each	5500	9000	#N/A	
40	**site inspection RePorT**	RPT	each	#N/A	11000	#N/A	
41	**Security Guard**	SG	pers/mo	5500	7700	#N/A	
42	**Maintain Pumping**	MP	month	3300	#N/A	#N/A	
43	**Clear SpillWay**	CSW	each	1870	5280	#N/A	
44	**Build Treatment Plant**						
	Small (< 1000 m3/d)	BTPS	lump su	1E+06	2E+06	#N/A	
	Large (> 1000 m3/d)	BTPL	lump su	2E+06	3.5E+6	#N/A	
45	**Operate Treatment Plant**	OTP	m3	0.29	1.65	#N/A	
46	**SCariFY road and install water breaks**	SCFY	km	3525	4950	#N/A	

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
water treatment chemicals						
ferric sulphate		ferric	kg	0.67		
ferrous sulphate		ferrous	kg	0.44		
lime		lime	kg	0.3		
hydrogen peroxide, 50%		hperox	kg	1.43		
Sodium Metabisulfate		Nametab	kg	0.99		
Caustic soda, 50%		caustic	kg	0.62		
Sulfuric acid, 93%		sulfuric	kg	0.26		
flocculant		flocc	kg	5.39		
copper sulphate		copper	kg			
typical shipping, to Whitehorse or Yellowknife			kg	0.072		
Typical Labour & Equipment Rates						
	Site manage		$/hr	70	80	
	Mine superintenden		$/hr		60	
	Environmental coordinato		$/hr		60	
	Journeyman (mech, elec, weld)		$/hr	50	60	
	Equipment operato		$/hr	45	55	
	labour - skilled		$/hr	35	38	
	labour - unskillec		$/hr	32	35	
	Security / first aic		$/hr	38	48	
	Admin.		$/hr	42	49	
	Front end loader, ?, Cat99		$/hr		330	
	excavator, Cat23		$/hr		175	
	dump truck - tandem		$/hr			
	dump truck off road, Cat 77		$/hr	265		
	dozer, D8, D1(		$/hr	170	300	