

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	Territorial Land Liability	Territorial Water Liability	Federal Land Liability	Federal Water Liability
UNDERGROUND MINE	Damoti - Portal Closure	\$20,768	\$20,768	\$0	\$0	\$0
ROCK PILE	Damoti - Rock Pile	\$98,649	\$30,649	\$68,000	\$0	\$0
BUILDINGS AND EQUIPMENT	Site Wide	\$36,250	\$36,250	\$0	\$0	0
BUILDINGS AND EQUIPMENT	Colomac	\$79,413	\$0	0	\$79,413	\$0
CHEMICALS AND CONTAMINATED SOIL MANAGEMEN		\$88,226	\$8,610	\$8,610	\$35,503	\$35,503
Inflation (2014 to 2021) ON CAPITAL COSTS	12%	\$41,413	\$11,553	\$9,193	\$13,790	\$6,876
SUBTOTAL: Capital Costs		\$386,517	\$107,830	\$85,803	\$128,705	\$64,179
PERCENT OF SUBTOTAL			28%	22%	33%	17%

INDIRECT COSTS	COST	Territorial Land Liability	Territorial Water Liability	Federal Land Liability	Federal Water Liability	
MOBILIZATION/DEMOBILIZATION	\$199,500	\$55,656	\$44,287	66,431	\$33,126	
POST-CLOSURE MONITORING AND MAINTENANCE	\$140,500	\$39,196	\$31,190	46,785	\$23,329	
Inflation (2014 to 2021) on above 2 lines	12% \$40,800	\$11,382	\$9,057	\$13,586	\$6,775	
ENGINEERING	5% \$19,326	\$5,391	\$4,290	6,435	\$3,209	
PROJECT MANAGEMENT	5% \$19,326	\$5,391	\$4,290	6,435	\$3,209	
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1% \$3,865	\$1,078	\$858	1,287	\$642	
BONDING/INSURANCE	1% \$3,865	\$1,078	\$858	1,287	\$642	
CONTINGENCY	25% \$96,629	\$26,957	\$21,451	32,176	\$16,045	
SUBTOTAL: Indirect Costs		\$523,811	\$146,132	\$116,281	\$174,422	\$86,976

TOTAL COSTS	\$910,329	\$253,961	\$202,084	\$303,128	\$151,155
--------------------	------------------	------------------	------------------	------------------	------------------

1		Underground Mine Name		UG Mine # 1				
ACTIVITY/MATERIAL	Notes	Unit	Qty	Code	Unit Cost	Cost % Land	Land Cost	Water Cost
CONTROL ACCESS								
Fence		m		#N/A	\$0.00	\$0	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0	\$0
Concrete wall in portals		m3		#N/A	\$0.00	\$0	\$0	\$0
Drill/Blast Portal (Damoti)		m3	1,155	RB1H	\$17.05	\$19,693	100%	\$19,693
Backfill/Grade Portal (Damoti)		m3	250	SB1L	\$4.30	\$1,075	100%	\$1,075
Cap raise # 1		m3		#N/A	\$0.00	\$0	\$0	\$0
Cap raise #2		m3		#N/A	\$0.00	\$0	\$0	\$0
Cap shaft #1		m3		#N/A	\$0.00	\$0	\$0	\$0
Cap shaft #2		m3		#N/A	\$0.00	\$0	\$0	\$0
Backfill adits		m3		#N/A	\$0.00	\$0	\$0	\$0
Backfill open stope		m3		#N/A	\$0.00	\$0	\$0	\$0
Concrete cap over open stope		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
REMOVE HAZARDOUS MATERIALS								
Remove hazardous materials, U/G labor		mandays		#N/A	\$0.00	\$0	\$0	\$0
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0	\$0	\$0
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0	\$0	\$0
Remove misc. haz. mat & explosives		kg		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
INSTALL BULKHEADS								
Bulkheads to control water flow		each		#N/A	\$0.00	\$0	\$0	\$0
Grout bulkhead		m3		#N/A	\$0.00	\$0	\$0	\$0
FLOOD MINE								
Supply/install pump		each		#N/A	\$0.00	\$0	\$0	\$0
Supply/install piping system		each		#N/A	\$0.00	\$0	\$0	\$0
Operate pumps to flood workings		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM								
Excavate/install sumps		m2		#N/A	\$0.00	\$0	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0	\$0
SPECIALIZED ITEMS								
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0	\$0	\$0
Install permanent pumping system		each		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
					Total	\$20,768	\$20,768	\$0
					% of Total		100%	0%

Decline at Damoti - ~22m in length, 3.5m wide, depth of blast estimated at 15m - total volume 1155m3
Final grading of area as per ICRP

1 Building / Equip Name:		Bldg / Equip #: 1						
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site		allow		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate and dispose on-site		allow		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
REMOVE BUILDINGS - see note below								
Accommodation Complex	12 Tentframes, 6 plywood buildings, 2 tent pads (each ~12ft x 12f	m2	320	BRWL	\$27.50	\$8,800	100%	\$8,800
Warehouse, Shops and Other	Core Building (6m x 30m)	m2	180	BRWL	\$27.50	\$4,950	100%	\$4,950
Fuel tanks	3x 75,000L Fuel tanks located at Damoti	each	3	ls	\$4,500.00	\$13,500	100%	#####
Sea Containers	2x located at Damoti - empty	each	2	ls	\$4,500.00	\$9,000	100%	\$9,000
Freshwater intake		m2		#N/A	\$0.00	\$0	\$0	\$0
Reclaim pumps		m2		#N/A	\$0.00	\$0	\$0	\$0
Outfall & Diffuser		m2		#N/A	\$0.00	\$0	\$0	\$0
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0	\$0	\$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0	\$0	\$0
Break foundation slabs		m2		#N/A	\$0.00	\$0	\$0	\$0
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
LANDFILL FOR DEMOLITION WASTE								
Place rock cover		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								
Accommodation Complex		ha		#N/A	\$0.00	\$0	\$0	\$0
Process Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0	\$0	\$0
Storage Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
U/G Heating Plant		ha		#N/A	\$0.00	\$0	\$0	\$0
Emulsion Plant		ha		#N/A	\$0.00	\$0	\$0	\$0
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0	\$0	\$0
Place rock cover		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
PUNCTURE LINED SUMPS								
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0	\$0	\$0
RECLAIM ROADS								
Remove culverts		each		#N/A	\$0.00	\$0	\$0	\$0
Remove bridges		each		#N/A	\$0.00	\$0	\$0	\$0
Scarify and install water breaks		ha		#N/A	\$0.00	\$0	\$0	\$0
Scarify airstrip		ha		#N/A	\$0.00	\$0	\$0	\$0
Scarify laydown areas		ha		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		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				#N/A	\$0.00	\$0	\$0	\$0
Total						\$36,250	#####	\$0
% of Total							100%	0%

Haul to Yellowknife \$4500 per trip
Haul to Yellowknife \$4500 per trip

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. 10m high building multiply area by 3.3 (10/3)

1 Building / Equip Name:		Bldg / Equip #: 1								
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost		
DISPOSE MOBILE EQUIPMENT										
Ship off-site Light vehicles	SxS, quads, snowmobiles, boats	allow	3 ls		\$4,500.00	\$13,500	100%	\$13,500	\$0	Haul to Yellowknife @ \$4500 per trip 3 trips for light equipment
Ship off-site Heavy equipment	loader, gensets, drills (7 drills, 1 loader, 2 gensets)	allow	6 ls		\$4,500.00	\$27,000	100%	\$27,000	\$0	Haul to Yellowknife @ \$4500 per trip 6 trips for heavy equipment
Other				#N/A	\$0.00	\$0		\$0	\$0	
REMOVE BUILDINGS - see note below										
Accommodation Complex (tents)	50 Weatherheaven type tent structures (3.5m*4.2m)	m2	735	BRWL	\$27.50	\$20,213	100%	\$20,213	\$0	
Buildings (plywood)	34 Plywood buildings on average 20m2	m2	680	BRWL	\$27.50	\$18,700	100%	\$18,700	\$0	
Process Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0	
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0	\$0	
Storage Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0	
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0	
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0	\$0	
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0	\$0	
AN Storage Facility		m2		#N/A	\$0.00	\$0		\$0	\$0	
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0	\$0	
Storage Facility at Laydown/Airstrip		m2		#N/A	\$0.00	\$0		\$0	\$0	
Fuel tanks		m2		#N/A	\$0.00	\$0		\$0	\$0	
Fuel Tanks		m2		#N/A	\$0.00	\$0		\$0	\$0	
Freshwater intake		m2		#N/A	\$0.00	\$0		\$0	\$0	
Reclaim pumps		m2		#N/A	\$0.00	\$0		\$0	\$0	
Outfall & Diffuser		m2		#N/A	\$0.00	\$0		\$0	\$0	
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0		\$0	\$0	
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0		\$0	\$0	
Break foundation slabs		m2		#N/A	\$0.00	\$0		\$0	\$0	
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0		\$0	\$0	
Other				#N/A	\$0.00	\$0		\$0	\$0	
LANDFILL FOR DEMOLITION WASTE										
Place rock cover		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										
Accommodation Complex	no grading required	ha		#N/A	\$0.00	\$0		\$0	\$0	
Process Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0		\$0	\$0	
Storage Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
U/G Heating Plant		ha		#N/A	\$0.00	\$0		\$0	\$0	
Emulsion Plant		ha		#N/A	\$0.00	\$0		\$0	\$0	
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0		\$0	\$0	
Place rock cover		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	
PUNCTURE LINED SUMPS										
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0		\$0	\$0	
RECLAIM ROADS										
Remove culverts		each		#N/A	\$0.00	\$0		\$0	\$0	
Remove bridges		each		#N/A	\$0.00	\$0		\$0	\$0	
Scarify and install water breaks		ha		#N/A	\$0.00	\$0		\$0	\$0	
Scarify airstrip		ha		#N/A	\$0.00	\$0		\$0	\$0	
Scarify laydown areas		ha		#N/A	\$0.00	\$0		\$0	\$0	
Vegetate		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				#N/A	\$0.00	\$0		\$0	\$0	
						Total	\$79,413	\$79,413	\$0	
						% of Total		100%	0%	

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. 10m high building multiply area by 3.3 (10/3)

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Geotechnical Inspection	Year 2 and 5 following construction (removed from subtotal and added to NPV total)	each	2	WSL	\$7,000.00	\$14,000
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs*	Annual reports	each	1		\$3,500.00	\$3,500
Site water monitoring (AEMP and SNP)	Twice Annual SNP visits (labour, reporting, analytical)	each	2		\$4,500.00	\$9,000
Flights	2 heli flights in support of above including geotechnical trips.	each	2		\$6,400.00	\$12,800
- 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
POST-CLOSURE WATER TREATMENT**						
Annual water treatment cost, from "Water Treatment"						\$0
Subtotal, Annual post-closure costs						\$25,300
Discount rate for calculation of net present value of post-closure cost, %				0.00%		
Number of years of post-closure activity				5 years		
Present Value of payment stream						\$140,500

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

Include water treatment cost from "Water Treatment" worksheet if treatment is considered long term, such as ARD/ML.

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	SNP (2 visits for 1 year)	each	1	#N/A	21800	\$21,800
geotechnical assessment		each		#N/A	0	\$0
interim water treatment				#N/A		\$0
other		each		#N/A	0	\$0
					Annual Interim C&M Cost	\$21,800
Number of years of ICM		years	1	Total		\$21,800

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 Cost	Water Cost	
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	\$0.00	\$0	\$0	\$0	
CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays	36 engL		\$95.00	\$3,420	50%	\$1,710	\$1,710
Decontaminate: oil, fuel		mandays		#N/A	\$0.00	\$0		\$0	\$0
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		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 fuel	Residual in tanks at Damoti + site wide mis	litre	1000 ORL		\$0.43	\$430	50%	\$215	\$215
Waste fuel	Colomac area	litre	125,583 ORL		\$0.43	\$54,001	50%	#####	\$27,000
Waste Oil	Colomac area	litre	500 ORL		\$0.43	\$215	50%	\$108	\$108
Assay & environmental lab reagents		kg		#N/A	\$0.00	\$0		\$0	\$0
Machine shop paints, solvents etc		litre		#N/A	\$0.00	\$0		\$0	\$0
Glycol		litre		#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		allow		#N/A	\$0.00	\$0		\$0	\$0
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		#N/A	\$0.00	\$0		\$0	\$0
Contam. soil investigation - Phase 2		each	2 WSH	#####		\$20,000	50%	#####	\$10,000
CONTAMINATED SOIL REMOVAL									
Excavate and transport to onsite facility		m3		#N/A	\$0.00	\$0		\$0	\$0
Manage hydrocarbon remediation at facility		m3		#N/A	\$0.00	\$0		\$0	\$0
Reagents/stabilizing agent		m2		#N/A	\$0.00	\$0		\$0	\$0
Excavate and transport to offsite facility		m3	200 CSRL		\$47.00	\$9,400	50%	\$4,700	\$4,700
Contour decontaminated area		m3	200 DSH		\$3.80	\$760	50%	\$380	\$380
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrane, 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						\$88,226		#####	\$44,113
% of Total								50%	50%

1 Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators	13T x 300km	mtonne	3900	MHERL	3.4	\$13,260
Dump trucks	10Tx 300km	mtonne	3000	MHERL	3.4	\$10,200
Dozers	10Tx 300km	mtonne	3000	MHERL	3.4	\$10,200
Demolition shears		each		#N/A	0	\$0
Crane		each		#N/A	0	\$0
Loader	8T x 300km	mtonne	2400	MHERL	3.4	\$8,160
Compactor		each		#N/A	0	\$0
Light duty vehicles	4@ 3T x300km	mtonne	1200	MHERL	3.4	\$4,080
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	\$0
Pipe shipping		m		#N/A	0	\$0
Minor tools and equipment		allow		#N/A	0	\$0
Truck tires		allow		#N/A	0	\$0
Other				#N/A	0	\$0
MOBILIZE CAMP						
Reclamation activities		allow	1		4000	\$4,000
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	\$0
MOBILIZE WORKERS						
Reclamation activities - transport		each		#N/A	0	\$0
Reclamation activities - travel time		manhours	60	operh	65	\$3,900
Long term reclamation activities (eg pump flooding) - transport		each		#N/A	0	\$0
Long term reclamation activities (eg pump flooding) - travel time		each		#N/A	0	\$0
Airfare - Reclamation Monitoring		each		#N/A	0	\$0
WORKER ACCOMODATIONS						
Reclamation activities		mandays	180	accml	100	\$18,000
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	\$0
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre	5000	FCDH	1.39	\$6,950
Fuel freight - long term reclamation activities		litre		#N/A	0	\$0
Fuel freight accomodations		litre	5000	FCDH	1.39	\$6,950
WINTER ROAD						
Construction and operation		km	30	WRCL	2000	\$60,000
Limited winter use		km		#N/A	0	\$0
Winter road tarriff		km		#N/A	0	\$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators	13T x 300km	mtonne	3900	MHERL	3.4	\$13,260
Dump trucks	10Tx 300km	mtonne	3000	MHERL	3.4	\$10,200
Dozers	10Tx 300km	mtonne	3000	MHERL	3.4	\$10,200
Demolition shears		each		#N/A	0	\$0
Crane		each		#N/A	0	\$0
Loader	8T x 300km	mtonne	2400	MHERL	3.4	\$8,160
Compactor		each		#N/A	0	\$0
Light duty vehicles	4@ 3T x300km	mtonne	1200	MHERL	3.4	\$4,080
Other		km		#N/A	0	\$0
DEMOBILIZE CAMP						
		allow	1		4000	\$4,000
DEMOBILIZE WORKERS						
crew travel time		manhours	60	operh	65	\$3,900
crew transportation		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	\$199,500

Haul distance from Behchoko

6 person camp for 30 days - minimal camp

1 **Rock Pile Name:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost
STABILIZE SLOPES								
Flatten slopes with dozer		m3		#N/A	\$0.00	\$0	\$0	\$0
Flatten "bubble dump" areas		m3		#N/A	\$0.00	\$0	\$0	\$0
Divert runoff, ditch mat'l A		m3		#N/A	\$0.00	\$0	\$0	\$0
Divert runoff, 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
Other				#N/A	\$0.00	\$0	\$0	\$0
COVER ROCK PILE								
Subgrade preparation - doze surface	956m3 of Sulphide bearing BIF; contour no haul	m3	956	DRL	\$1.05	\$1,004	100%	\$1,004
Soil cover - excavate,haul,spread&compact		m3		#N/A	\$0.00	\$0		\$0
Rock cover - excavate,haul & spread	1063m3 low sulphide BIF and 2032m3 of metasediment	m3	3095	RR3L	\$7.00	\$21,665	100%	\$21,665
Surveyor	12 hour days for 7 days for a surveyor	hours	84	EngL	\$95.00	\$7,980	100%	\$7,980
		m2		#N/A	\$0.00	\$0		\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
VERY LOW PERMEABILITY COVER (in addition to above)								
Liner subgrade preparation - compact		m2		#N/A	\$0.00	\$0		\$0
Supply geomembrane		m2	1800	gshdpeh	\$16.00	\$28,800		\$28,800
Install geomembrane		m2	1800	gsh	\$14.00	\$25,200		\$25,200
Ship geomembrane	\$10000 from Edmonton to Yellowknife, \$4500 from Yellowknife to Site	unit	1	N/A	-	\$14,000		\$14,000
Protective cover - excavate,haul,spread&compact		m3		#N/A	\$0.00	\$0		\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0
Install infiltration/seepage instrumentation		allow		#N/A	\$0.00	\$0		\$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	\$0.00	\$0		\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0		\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0		\$0
CONSTRUCT SEEPAGE COLLECTION POND								
Excavate seepage collection pond		m3		#N/A	\$0.00	\$0		\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0		\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0		\$0
Bedding layer		m3		#N/A	\$0.00	\$0		\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0		\$0
Install geomembrane		m2		#N/A	\$0.00	\$0		\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0		\$0
INSTALL GROUNDWATER COLLECTION SYSTEM								
Excavate/install sumps		m3		#N/A	\$0.00	\$0		\$0
Install pumping wells		m3		#N/A	\$0.00	\$0		\$0
Install pumps/pipelines/power supply		allow		#N/A	\$0.00	\$0		\$0
RELOCATE DUMPS								
Load, haul, dump or doze		m3		#N/A	\$0.00	\$0		\$0
Add lime		tonne		#N/A	\$0.00	\$0		\$0
Contour reclaimed area		ha		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
SPECIALIZED ITEMS								
Install permanent instrumentation		each		#N/A	\$0.00	\$0		\$0
Install permanent instrumentation, drilling		each		#N/A	\$0.00	\$0		\$0
TREAT ROCK PILE SEEPAGE - see "Water Treatment"								
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox								
Cyanide destruction water treatment pumping		m3		#N/A	\$0.00	\$0		\$0
Reagents		tonnes		#N/A	\$0.00	\$0		\$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	\$0.00	\$0		\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$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		\$98,649	\$30,649	\$68,000
				% of Total			31%	69%

* 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

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

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	TRACK-TYPE TRACTOR
JOB CONDITION CORRECTION FACTORS	
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	0.80
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.

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							
	Wood	BRW	m2	27.50	41.00		Unit costs are based on 3m high, single storey building. Scale areas accordingly.
	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							
	drill/blast/load/short haul	RC1	m3	12.05	17.80		(e.g. ditch/spillway excavation)
	drill/blast/load/long haul	RC2	m3	12.70	18.40		Low:foundation excavation;High:spillway excavation
	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			
	liner, HDPE	GSHDPE	m2	7.95	16.00		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
Labour & Equipment Rates							
	Site manager	sman	\$/hr	125.00	152.00		

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

Filter by unit					
Supervisor	super	\$/hr	52.00	91.84	
Registered engineer	eng	\$/hr	95.00	220.00	
Environmental coordinator	envco	\$/hr	74.16	130.00	
Environmental 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	
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	
Administrative 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	Low:e.g. 8 passenger; High: Dash 7
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					
Pump capital cost	PC	each	#####		
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
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	

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

Filter by unit

Large (> 1000 m3/d)	TPL	lump sum	1.5E+07	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
Water Sampling/Analysis/Reporting					
	WS	each	7000.00	10000.00	
Winter Road					
Construction	WRC	km	2000.00	11500.00	
Usage	WRU	kmtone	0.29		

Specified= /m3, Wetland Growth Media Substrate mixed and installed (sand, biochar and fertilizer, wood)