

<b>Project Name:</b>		<b>Reclaim Model - Overview of Program</b>
<b>Discovery</b>	All users are urged to read the Reclaim Model User Manual - Scroll down for overview description of program.	
<b>Important! Reclaim 7.0 works better with no other excel files open.</b> <b>If other excel files are open ignore run time error and proceed</b>		
<b>Reclaim Menu</b>	The default Excel menu bar has an additional tab labelled "Add-Ins" that provides options specific to the Reclaim Model.	
<b>Clear</b>	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.	
<b>Duplicate</b>	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.	
<b>Unit Costs</b>	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.	
<b>Print All</b>	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.	
<b>Quit</b>	Select Quit to exit the program	
<b>Help</b>	Redirects user to Instructions worksheet.	
<b>WorkSheets</b>	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.	
<b>Summary</b>	Costs are derived for individual closure and reclamation activities by multiplying a "quantity" of activity by a "unit cost".	
<b>Components</b>	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. <b>Do not change the content or column width of the first column of each component worksheet.</b>	
<b>Unit Costs</b>	This worksheet contains a look up table with costs for typical work associated with each closure and reclamation activity	
<b>Limitations</b>	<b>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 modifying worksheets.</b>	
<b>WorkSheet Names</b>	The names of the worksheets must not be changed.	
<b>Defined Names</b>	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.	
<b>First line of data</b>	The first line of data for any component worksheet starts on line 4. <b>Do not change the first line of a component worksheet, ie the component name.</b>	
<b>Cell A1</b>	Cell A1 on the component sheet MUST always contain the count of that component for the duplicate function to operate <b>DO NOT CHANGE.</b>	
<b>Adding Lines</b>	You can add lines to components and the unit cost table, as long as they are not the last line. The last line might fall outside the named ranges. You can check the size of the named range by selecting the name from the drop down box at the top left of the sheet. Usually this box has a cell reference, or a name.	

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<b>Printing</b>	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.
<b>Conditions of Use</b>	<p>The Reclamation Cost Estimating Model was prepared to serve as a guide for Government Agencies, mining companies, or 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.</p> <p>Reclaim was prepared by Brodie Consulting Ltd. on behalf of AANDC. AANDC and Brodie Consulting Ltd. are not responsible for 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.</p>

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
<b>Open Pit</b>	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
<b>Rock Pile/Heap Leach Facility</b>	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		
<b>Tailings Facility</b>	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	
	accelerate flooding	X	

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<b>U/G Mine</b>	install seepage collection system	X	
	install dewatering/pumping system	X	
	operate seepage/dewatering system (ARD/ML)		X
<b>Water Management</b>	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 plan		X

**SUMMARY OF COSTS**

<b>CAPITAL COSTS</b>	<b>COMPONENT NAME</b>	<b>COST</b>	<b>LAND LIABILITY</b>	<b>WATER LIABILITY</b>
OPEN PIT		\$0	\$0	\$0
UNDERGROUND MINE		\$16,505	\$11,505	\$5,000
TAILINGS FACILITY		\$0	\$0	\$0
ROCK PILE		\$210	\$210	\$0
BUILDINGS AND EQUIPMENT		\$8,629	\$7,452	\$1,177
CHEMICALS AND CONTAMINATED SOIL MANAGEMEN		\$25,449	\$12,724	\$12,724
SURFACE AND GROUNDWATER MANAGEMENT		\$2,640	-	\$2,640
INTERIM CARE AND MAINTENANCE		\$37,832	-	\$37,832
	<b>SUBTOTAL: Capital Costs</b>	<b>\$91,265</b>	<b>\$31,891</b>	<b>\$59,373</b>
	<b>PERCENT OF SUBTOTAL</b>		<b>35%</b>	<b>65%</b>
<b>INDIRECT COSTS</b>		<b>COST</b>	<b>LAND LIABILITY</b>	<b>WATER LIABILITY</b>
MOBILIZATION/DEMOBILIZATION		\$90,679	\$31,687	\$58,992
POST-CLOSURE MONITORING AND MAINTENANCE		\$41,000	\$14,327	\$26,673
ENGINEERING	5%	\$4,563	\$1,595	\$2,969
PROJECT MANAGEMENT	5%	\$4,563	\$1,595	\$2,969
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	\$913	\$319	\$594
BONDING/INSURANCE	1%	\$913	\$319	\$594
CONTINGENCY	20%	\$18,253	\$6,378	\$11,875
MARKET PRICE FACTOR ADJUSTMENT	0%	\$0	\$0	\$0
	<b>SUBTOTAL: Indirect Costs</b>	<b>\$160,884</b>	<b>\$56,219</b>	<b>\$104,665</b>
<b>TOTAL COSTS</b>		<b>\$252,149</b>	<b>\$134,124</b>	<b>\$164,038</b>

1

Open Pit Name:

Pit # 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
<b>CONTROL ACCESS</b>								
Fence		m		#N/A	\$0.00	\$0	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0	\$0
Berm at crest		m3		#N/A	\$0.00	\$0	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>STABILITY STUDY</b>								
Conduct stability and setback study		allow		#N/A	\$0.00	\$0	\$0	\$0
<b>STABILIZE SLOPES</b>								
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		m3		#N/A	\$0.00	\$0	\$0	\$0
Drill & blast pit crest		m3		#N/A	\$0.00	\$0	\$0	\$0
Buttress slope		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>COVER/CONTOUR SLOPES</b>								
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
<b>CONSTRUCT DIVERSION DITCHES</b>								
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
<b>CONSTRUCT SPILLWAY</b>								
Excavate channel		m3		#N/A	\$0.00	\$0	\$0	\$0
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
<b>RECLAIM QUARRIES</b>								
Contour slopes		m3		#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
<b>FLOOD PIT-Captital</b>								
Remove stationary equipment (sump pumps)		each		#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 & piping system		each		#N/A	\$0.00	\$0	\$0	\$0
<b>FLOOD PIT-Annual Cost</b>								
Operate pumps (power)		m3		#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				#N/A	\$0.00	\$0	\$0	\$0
					Annual pumping costs	\$0		
Number of years of pump flooding		years			Total pumping costs	\$0	\$0	\$0
					<b>Total</b>	\$0	\$0	\$0
					<b>% of Total</b>		0%	0%

1		Underground Mine Name		UG Mine # 1					
ACTIVITY/MATERIAL	Notes	Unit	Qty	Code	Cost	Cost Land	Cost	Cost	
<b>CONTROL ACCESS</b>									
Fence		m		#N/A	\$0.00	\$0		\$0	
Signs		each	5	SL	\$11.00	\$55	100%	\$55	
Block roads		m3		#N/A	\$0.00	\$0		\$0	
Berm		m3		#N/A	\$0.00	\$0		\$0	
Concrete wall in portals		m3		#N/A	\$0.00	\$0		\$0	
Backfill portal #1		m3	40	porh	\$250.00	\$10,000	50%	\$5,000	
Backfill portal #2		m3		#N/A	\$0.00	\$0		\$0	
Cap raise # 1		m3	10	srl	\$645.00	\$6,450	100%	\$6,450	
Cap raise #2		m3		#N/A	\$0.00	\$0		\$0	
Cap shaft #1		m3		#N/A	\$0.00	\$0		\$0	
Cap shaft #2		m3		#N/A	\$0.00	\$0		\$0	
Backfill adits		m3		#N/A	\$0.00	\$0		\$0	
Backfill open stope		m3		#N/A	\$0.00	\$0		\$0	
Concrete cap over open stope		m3		#N/A	\$0.00	\$0		\$0	
Other				#N/A	\$0.00	\$0		\$0	
<b>REMOVE HAZARDOUS MATERIALS</b>									
Remove hazardous materials, U/G labor		mandays		#N/A	\$0.00	\$0		\$0	
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0		\$0	
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0		\$0	
Remove misc. haz. mat & explosives		kg		#N/A	\$0.00	\$0		\$0	
Other				#N/A	\$0.00	\$0		\$0	
<b>INSTALL BULKHEADS</b>									
Bulkheads to control water flow		each		#N/A	\$0.00	\$0		\$0	
Grout bulkhead		m3		#N/A	\$0.00	\$0		\$0	
<b>FLOOD MINE</b>									
Supply/install pump & piping system		each		#N/A	\$0.00	\$0		\$0	
Operate pumps to flood workings		m3		#N/A	\$0.00	\$0		\$0	
Other				#N/A	\$0.00	\$0		\$0	
<b>INSTALL GROUNDWATER COLLECTION SYSTEM</b>									
Excavate/install sumps		m2		#N/A	\$0.00	\$0		\$0	
Install pumping wells		m3		#N/A	\$0.00	\$0		\$0	
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0		\$0	
<b>SPECIALIZED ITEMS</b>									
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0		\$0	
Install permanent pumping system		each		#N/A	\$0.00	\$0		\$0	
Other				#N/A	\$0.00	\$0		\$0	
<b>Total</b>						\$16,505		\$11,505	\$5,000
<b>% of Total</b>								69.706	30.2939

The functions in this worksheet serve as a back up in the event that the menu item "Add-

Save file before clearing all data

Shows both active worksheet as well as table of Unit Costs in a sep

Prints all worksheets having non-zero sums

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shown in Ex

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Excel menu bar

These functions duplicate components within worksheet

1 Tailings Impoundment Name:

Pond # 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost
<b>CONTROL ACCESS</b>								
Fence		m		#N/A	\$0.00	\$0	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>STABILIZE EMBANKMENT(S)</b>								
Toe buttress, drainage layer		m3		#N/A	\$0.00	\$0	\$0	\$0
Toe buttress, bulk fill		m3		#N/A	\$0.00	\$0	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0	\$0
Raise crest		m3		#N/A	\$0.00	\$0	\$0	\$0
Flatten slopes		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>COVER TAILINGS</b>								
Grade/shape tailings surface		m3		#N/A	\$0.00	\$0	\$0	\$0
Liner bedding		m3		#N/A	\$0.00	\$0	\$0	\$0
Subgrade preparation - compact		m2		#N/A	\$0.00	\$0	\$0	\$0
Supply geotextile/geosynthetic		m2		#N/A	\$0.00	\$0	\$0	\$0
Install geotextile/geosynthetic		m2		#N/A	\$0.00	\$0	\$0	\$0
Soil cover		m3		#N/A	\$0.00	\$0	\$0	\$0
Rock cover		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		m2		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>BURY PAG ROCK</b>								
Relocate PAG rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Place cover over PAG rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Raise crest of dam		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>STABILIZE DECANT SYSTEM</b>								
Excavate and replace		m3		#N/A	\$0.00	\$0	\$0	\$0
Plug/backfill with concrete or clay		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>REMOVE TAILINGS DISCHARGE</b>								
Cyclones		m3		#N/A	\$0.00	\$0	\$0	\$0
Pipe		m3		#N/A	\$0.00	\$0	\$0	\$0
Remove reclaim barge		each		#N/A	\$0.00	\$0	\$0	\$0
<b>CONSTRUCT DIVERSION DITCHES</b>								
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
<b>FLOOD TAILINGS</b>								
Doze tailings to final contour		m3		#N/A	\$0.00	\$0	\$0	\$0
Raise crest of dam		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>UPGRADE SPILLWAY</b>								
Excavate channel, rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Excavate channel, soil		m3		#N/A	\$0.00	\$0	\$0	\$0
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
<b>CONSTRUCT SEEPAGE COLLECTION POND</b>								
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
<b>INSTALL GROUNDWATER COLLECTION SYSTEM</b>								
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		LS		#N/A	\$0.00	\$0	\$0	\$0
<b>SPECIALIZED ITEMS</b>								
Install permanent instrumentation, supply & technician		each		#N/A	\$0.00	\$0	\$0	\$0
Install permanent instrumentation, drilling		each		#N/A	\$0.00	\$0	\$0	\$0
<b>TREAT SEEPAGE - see "Water Management" and "Water Treatment"</b>								
<b>TREAT SUPERNATANT</b>								
Pump water (to pit, U/G)		m3		#N/A	\$0.00	\$0	\$0	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0	\$0	\$0
Supply reagents		tonne		#N/A	\$0.00	\$0	\$0	\$0
						Annual treatment costs	\$0	
Number of years of treatment						years		
						Total treatment costs	\$0	\$0
						<b>Total</b>	\$0	\$0
						<b>% of Total</b>	0	0

\* for construction of passive treatment system refer to "Water Management"

1

Rock Pile Name:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost	
<b>STABILIZE SLOPES</b>									
Flatten slopes with dozer		m3	200 dnl		\$1.05	\$210	100%	\$210	\$0
Flatten "bubble dump" areas		m3		#N/A	\$0.00	\$0		\$0	\$0
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
Other				#N/A	\$0.00	\$0		\$0	\$0
<b>COVER ROCK PILE</b>									
Subgrade preparation - doze surface		m3		#N/A	\$0.00	\$0		\$0	\$0
Soil cover - excavate,haul,spread&compact		m3		#N/A	\$0.00	\$0		\$0	\$0
Rock cover - excavate,haul & spread		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
<b>VERY LOW PERMEABILITY COVER (in addition to above)</b>									
Liner subgrade preparation - compact		m2		#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
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
<b>CONSTRUCT DIVERSION DITCHES</b>									
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
<b>CONSTRUCT SEEPAGE COLLECTION POND</b>									
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
<b>INSTALL GROUNDWATER COLLECTION SYSTEM</b>									
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		LS		#N/A	\$0.00	\$0		\$0	\$0
<b>RELOCATE DUMPS</b>									
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
<b>SPECIALIZED ITEMS</b>									
Install permanent instrumentation		each		#N/A	\$0.00	\$0		\$0	\$0
Install permanent instrumentation, drilling		each		#N/A	\$0.00	\$0		\$0	\$0
<b>TREAT ROCK PILE SEEPAGE - see "Water Management"</b>									
<b>HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox</b>									
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
<b>HEAP LEACH SEEPAGE TREATMENT - ARD/ML**</b>									
Upgrade/modify pumping system - report to WTP		allow		#N/A	\$0.00	\$0		\$0	\$0
						<b>Total</b>	\$210	\$210	\$0
						<b>% of Total</b>		100	0

\* 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 Cost	Water Cost
<b>HAZARDOUS MATERIALS AUDIT</b>								
Hazardous materials audit		each		#N/A	\$0.00	\$0	\$0	\$0
<b>BUILDING DECONTAMINATION &amp; CONSOLIDATION OF HAZARDOUS MATERIALS</b>								
Environmental technician/coordinator		mandays		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate, oil, fuel, chemicals, etc.		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
<b>HAZARDOUS MATERIALS REMOVAL</b>								
Waste oils		litre		#N/A	\$0.00	\$0	\$0	\$0
Waste fuel		litre		#N/A	\$0.00	\$0	\$0	\$0
Waste batteries		kg		#N/A	\$0.00	\$0	\$0	\$0
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		each		#N/A	\$0.00	\$0	\$0	\$0
Other hazardous materials		allow	66 mherl		\$3.40	\$224	50%	\$112
<b>HAZARDOUS MATERIALS</b>								
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
<b>CONTAMINATED SOILS</b>								
Contam. soil investigation - phase I		each	1 cseil		\$25,000.00	\$25,000	50%	\$12,500
Contam. soil investigation - drilling & sampling		each		#N/A	\$0.00	\$0	\$0	\$0
<b>CONTAMINATED SOIL REMOVAL</b>								
Contaminated soils - hydrocarbon		km	66 mherl		\$3.40	\$224	50%	\$112
Metal contam. soil at conc. load-out		m3		#N/A	\$0.00	\$0	\$0	\$0
Load, haul, dump or doze		m3		#N/A	\$0.00	\$0	\$0	\$0
Reagents/stabilizing agent		m2		#N/A	\$0.00	\$0	\$0	\$0
Contour reclaimed area		m3		#N/A	\$0.00	\$0	\$0	\$0
<b>CONTAMINATED SOIL VERY LOW PERMEABILITY COVER</b>								
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 instrumentatior		allow		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
<b>OTHER</b>								
				#N/A	\$0.00	\$0	\$0	\$0
<b>Total</b>						\$25,449	\$12,724	\$12,724
<b>% of Total</b>							50	50

1

Building / Equip Name:

Bldg / Equip #: 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost	
<b>DISPOSE MOBILE EQUIPMENT</b>									
Decontaminate and ship off-site		km	60	mherl	\$3.40	\$204	50%	\$102	\$102
Decontaminate and dispose on-site		each		#N/A	\$0.00	\$0		\$0	\$0
Other		each		#N/A	\$0.00	\$0		\$0	\$0
<b>REMOVE BUILDINGS - AREAS SCALED ASSUMING 3m AVG HEIGHT PER FLOOR</b>									
Accomodation Complex		m2	150	brwl	\$27.50	\$4,125	100%	\$4,125	\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		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
Consolidate & dump boneyard debris		m3	100	#N/A	\$0.00	\$0		\$0	\$0
other				#N/A	\$0.00	\$0		\$0	\$0
<b>BREAK BASEMENT SLABS</b>									
Accomodation Complex		m2		#N/A	\$0.00	\$0		\$0	\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		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
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
<b>LANDFILL FOR DEMOLITION WASTE</b>									
Place soil cover		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0	\$0
<b>GRADE AND CONTOUR PADS</b>									
Accomodation Complex		ha	0.5	scfyl	\$4,300.00	\$2,150	100%	\$2,150	\$0
Process Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		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
<b>PUNCTURE LINED SUMPS</b>									
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0		\$0	\$0
<b>RECLAIM ROADS</b>									
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	0.5	scfyl	\$4,300.00	\$2,150	50%	\$1,075	\$1,075
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
<b>SPECIALIZED ITEMS</b>									
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0		\$0	\$0
<b>Total</b>						\$8,629		\$7,452	\$1,177
<b>% of Total</b>								86.36	13.6401

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

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
<b>BREACH DYKE EMBANKMENT</b>						
Remove fill		m3		#N/A	\$0.00	\$0
Contour water intake area		m3		#N/A	\$0.00	\$0
<b>STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS</b>						
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
<b>REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES</b>						
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
<b>BREACH DITCHES</b>						
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
<b>DECOMMISSION FRESH WATER SUPPLY</b>						
Breach embankment		m		#N/A	\$0.00	\$0
Remove pump		LS		#N/A	\$0.00	\$0
Remove pipeline		m		#N/A	\$0.00	\$0
<b>WATER CONTROL IN RECLAMATION QUARRY</b>						
Install pumping system		LS		#N/A	\$0.00	\$0
Remove pumping system		LS		#N/A	\$0.00	\$0
<b>REMOVE PIPELINES</b>						
Remove pipes		m	120 pirl		\$22.00	\$2,640
Concrete plug deep pipes		m3		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
<b>GROUNDWATER COLLECTION SYSTEM</b>						
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
<b>CONSTRUCT CONTAMINATED WATER STORAGE POND</b>						
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
<b>CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)</b>						
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
<b>CONSTRUCT WATER TREATMENT PLANT</b>						
Build treatment plant		LS		#N/A	\$0.00	\$0
Build sludge containment facility		LS		#N/A	\$0.00	\$0
					<b>Total</b>	<b>\$2,640</b>

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
<b>ADDITION OF REAGENTS TO WTP</b>						
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				#N/A	\$0.00	\$0
<b>LABOUR AND SUPPLIES</b>						
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
<b>WTP WATER SAMPLING AND ANALYSES</b>						
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
<b>SITE ACCESS</b>						
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
<b>Annual water treatment costs</b>						\$0
Number of years of water treatment		years				
<b>Total water treatment costs</b>						\$0



1 Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
<b>INTERIM CARE &amp; MAINTENANCE</b>						
on-site caretaker		mandays	420	lab-sh	49.6	\$20,832
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	2	#N/A	5000	\$10,000
communications		allow		#N/A	0	\$0
SNP/AEMP water sampling & reporting		each	1	ws1	7000	\$7,000
geotechnical assessment		each		#N/A	0	\$0
interim water treatment				#N/A		\$0
other		each		#N/A	0	\$0
				Annual Interim C&M Cost		\$37,832
Number of years of ICM		years	\$1	Total Cost		\$37,832

**1 Post-Closure Monitoring & Maintenance:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost		Cost
				Code	Unit Cost	
<b>MONITORING &amp; INSPECTIONS</b>						
Annual geotechnical inspection		each	1	rptl	\$10,000.00	\$10,000
Survey inspection		each	1	rptl	\$10,000.00	\$10,000
Site water monitoring (AEMP and SNP)		each	3	wsl	\$7,000.00	\$21,000
- During pit 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
<b>COVER MAINTENANCE</b>						
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
<b>SPILLWAY MAINTENANCE</b>						
Repair erosion			m3	#N/A	\$0.00	\$0
Clear spillway			each	#N/A	\$0.00	\$0
<b>CWTS MAINTENANCE</b>						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
<b>POST-CLOSURE WATER TREATMENT</b>						
Annual water treatment cost, from "Water Treatment"						\$0
Subtotal, Annual post-closure costs						\$41,000
Discount rate for calculation of net present value of post-closure cost, %				0.00%		
Number of years of post-closure activity					years	
<b>Present Value of payment stream</b>						<b>\$0</b>

**1 Mobilization/Demobilization:**

<b>ACTIVITY/MATERIAL</b>	<b>Notes</b>	<b>Units</b>	<b>Quantity</b>	<b>Cost Code</b>	<b>Unit Cost</b>	<b>Cost</b>
<b>MOBILIZE HEAVY EQUIPMENT</b>						
Excavators		each		#N/A	0	\$0
Dump trucks		each		#N/A	0	\$0
Dozers		km	66	mherl	3.4	\$224
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
Light duty vehicles		km	132	mherl	3.4	\$449
<b>MOBILIZE MISC. EQUIPMENT</b>						
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
<b>MOBILIZE CAMP</b>						
Reclamation activities		allow		#N/A	0	\$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	\$0
<b>MOBILIZE WORKERS</b>						
Reclamation activities - transport		each	1	mwl	4500	\$4,500
Reclamation activities - travel time		manhours	8	operl	41	\$328
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
Monitoring Airfare		each		#N/A	0	\$0
<b>WORKER ACCOMODATIONS</b>						
Reclamation activities		manday	154	accml	100	\$15,400
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	\$0
<b>MOBILIZE FUEL</b>						
Fuel freight - reclamation activities		litre	5,000	fccl	0.99	\$4,950
Fuel freight - long term reclamation activities		litre		#N/A	0	\$0
Fuel freight accomodations		litre		#N/A	0	\$0
<b>WINTER ROAD</b>						
Construction and operation		km	30	wrccl	2000	\$60,000
Limited winter use		km		#N/A	0	\$0
Winter road tarriff		km		#N/A	0	\$0
<b>DEMOBILIZE HEAVY EQUIPMENT</b>						
Excavators		km		#N/A	0	\$0
Dump trucks		km		#N/A	0	\$0
Dozers		km	66	#N/A	0	\$0
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		km	132	#N/A	0	\$0
Other		km		#N/A	0	\$0
<b>DEMOBILIZE CAMP</b>						
		allow		#N/A	0	\$0
<b>DEMOBILIZE WORKERS</b>						
crew travel time		manhours	8	operl	41	\$328
crew transportation		each	1	mwl	4500	\$4,500
<b>WINTER ROAD</b>						
Construction and operation		km	30	#N/A	0	\$0
Limited winter use		km		#N/A	0	\$0
Winter road tarriff		km		#N/A	0	\$0
<b>Mobilization/Demobilization Cost</b>						<b>\$90,679</b>

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

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW \$	HIGH \$	SPECIFIED \$	COMMENTS
<b>Accommodation</b>							
		ACCM	manday	100.00	175.00		
<b>Buildings - Decontaminate</b>							
	Asbestos	BDA	m2	25.60	51.20		Low: removal of asbestos siding & flooring; High: removal of insulated pipes,
<b>Buildings - Remove</b>							
	areas are per floor of 3 m average height						
	Wood	BRW	m2	27.50	41.00		
	Concrete	BRC	m2	40.00	65.00		
	Steel - teardown	BRS1	m2	45.00	65.00		
	Steel - for salvage	BRS2	m2	67.00	100.00		
<b>Concrete work</b>							
	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
<b>Contaminated Soils</b>							
	Remediate on site	CSR	m3	47.00	146.00		
	Env. investigation Phase I/II	CSEI	each	25000.00			Low: small, "clean" site
<b>Dozing</b>							
	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
<b>Excavate Rock; Low Spec's and QA/QC</b>							
	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	12.70	30.75		
	Specified activity	RBS	m3				
<b>Excavate Rock; High Spec's and QA/QC</b>							
	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
<b>Excavate Rip Rap</b>							
	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	13.50	20.65		
	source is waste dump/short haul	RR3	m3	5.20	7.00		
	source is waste dump/long haul	RR4	m3	5.70	7.60		
	specified rip rap source	RR5	m3				
<b>Excavate Soil; Low Spec's and QA/QC</b>							
	clear & grub	SBC	m2	3.40	5.00		
	excavate/load/short haul	SB1	m3	4.30	5.90		
	excavate/load/long haul	SB2	m3	4.30	7.30		
	SB1 + spread and compact	SB3	m3	4.50	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 haul
	Tailings	SBT	m3	1.35	3.70	15.50	High:contour surface - wet or frozen; Specified:haul/place wet infill
<b>Excavate Soil, High Spec's and QA/QC</b>							
	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 dar
	Specified activity	SCS	m3			18.80	Backfill adit with waste rock
<b>Fence</b>							
		FNC	m	13.55	203.00		
<b>Fuel and Electricity</b>							
	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

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

Filter by unit

**Geo-Synthetics**

geotextile	GST	m2	3.44		Supply and install
geogrid	GSG	m2	5.75		
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
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**Labour & Equipment Rates**

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
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	
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refurbish existing camp

**Mobilize Workers**

flight	MW	each	4500.00	9100.00
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Low:e.g. 8 passenger; High: Dash 7

**Oil Removal**

oil removal	OR	litre	0.43	1.20
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Low:waste oil heater; High: ship offsite

**PCB Removal**

Remove from site	PCBR	litre	40.20	46.90
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Low: shipping, handling & disposal from Yellowknife

**Pipes, small (<6in dia.)**

remove/dispose on site	PSR	m	1.00	24.00
supply	PSS	m	6.10	11.10
install	PSI	m	25.00	

Low: remove/dispose on site; High: remove/re-use

Low:supply; High:supply and ship

**Pipes, large (>6in dia.)**

remove/dispose on site	PLR	m	22.00	72.00
supply	PLS	m	129.00	143.00
install	PLI	m	50.00	

Low: remove/dispose on site; High: remove/re-use

Low:supply; High:supply and ship

**Power Lines**

remove/dispose on site	POWR	each	25.50	
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**Process Chemicals**

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

Filter by unit

Remove from site	PCR	kg	0.45	2.50		Low: shipping, handling & disposal from Yellowknife
<b>Pumps</b>						
Pump capital cost	PC	each	195000.00			
Pump shipping	PS	each	2500.00			
Pump operating cost	POC	m3	0.18			pump operating costs should be calculated based on pump capacity, fuel cos
Pump maintenance	PM	allow	25000.00			
<b>Pump sand BackFill</b>						
	BF	m3	85.00	300.00		
<b>Scarify - road/mine site</b>						
	SCFY	ha	4300	6030	2150	
<b>Shaft, Raise &amp; Portal Closures</b>						
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: insta
<b>Site Inspection Report</b>						
	RPT	each	10000.00	20000.00		
<b>SpillWay - Clear</b>						
	CSW	each	3000.00	7000.00		
<b>Survey/Instrumentation</b>						
	SI	each	1800.00	3600.00		2 person crew
<b>Treatment Plant - Construct</b>						
Small (< 1000 m3/d)	BTPS	lump sum	9000000	15000000		
Large (> 1000 m3/d)	BTPL	lump sum	15000000	46000000		
Constructed Wetland	CWTS	ha	200000	300000		
<b>Treatment Plant - Operate</b>						
	OTP	m3	0.35	2.00		
<b>Treatment Chemicals</b>						
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			
<b>Vegetation</b>						
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-l
<b>Water Sampling/Analysis/Reporting</b>						
	WS	each	7000.00	10000.00		
<b>Winter Road</b>						
Construction	WRC	km	2000.00	11500.00		
Usage	WRU	kmtonne	0.29			

friable asbestos

ing

n construction)





ts, etc.

lled pressure plug

local, biochar and fertilizer, woodchips)

**Unit Cost Estimator**

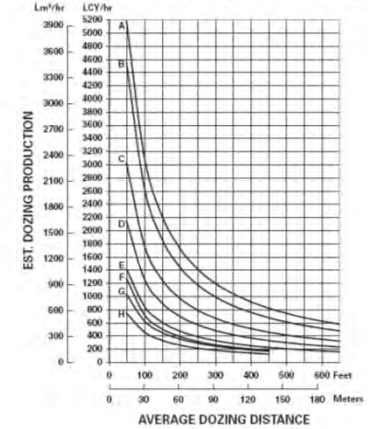
1 Equipment Productivity Figures and Graphs have been reproduced from Caterpillar Performance Handbook - Edition 42

EXCAVATION	
<b>Productivity</b>	
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
<b>Operating Costs</b>	
- 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	
<b>Productivity</b>	
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% %
Hourly productivity	13.7 ve. min/cycle
Hourly productivity	88.0 m3/hr
<b>Operating Costs</b>	
- 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	
<b>Productivity</b>	
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
<b>Operating Costs</b>	
- 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 \$/m3
Spreading/Dozing Cost - select contractor or owner rate (N22 or N31)	\$/m3

ESTIMATED DOZING PRODUCTION • Universal Blades • D7G through D11T CD



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 conditions that would be made under varying job conditions. Refer to correction factors following these charts.

Excavator			
heaped bucket capacity, m3	Cat 320 1.5	Cat 325B 2.2	Cat 375 5.4
easy digging, shallow digging, small swing angle	Typical Cycle Times (seconds)		
med. to hard digging, rocky soil, swing angle to 90 deg.	16	18	20
tough digging, sandstone, caliche, at max. machine depth, swing angle > 120 deg.	23	23	25
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			
Truck capacity - heaped, m3	Cat 771 D 27.5	Cat 777D 60.5	Cat 789C 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	0.80
JOB EFFICIENCY -	
50 min/hr	0.83
45 min/hr	0.87
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 60-75% of straight blade production.	

% Grade vs. Dozing Factor  
 (-) Downhill  
 (+) Uphill

