

RECEIVED

JAN 29 2003

MACKENZIE VALLEY
ENVIRONMENTAL IMPACT
BOARD

RECLAMATION COST ESTIMATING MODEL (Version 4)

Prepared for:
Water Resources Division
Department of Indian Affairs and Northern Development (DIAND)

Prepared by:
Steffen Robertson and Kirsten (Canada) Inc. (SRK)
M. John Brodie and Patrick J. Bryan
R .C. Olauson and R.W. Chambers

Version 1.1 Lotus 123
Version 2.1 Lotus 123

April '92
- '94

Brodie Consulting Ltd.
M. John Brodie and Kitty Brodie

Version 3.1 Quattro Pro

Nov. '97

Brodie Consulting Ltd.
M. John Brodie and Kitty Brodie

Version 4.0 Excel

Mar. '01

108

Conf. PR?

CONDITIONS OF USE

This Reclamation Cost Estimating Model was prepared to serve as a guide for Government Agencies, mining companies, and others to estimate the cost of mine reclamation. It is recognized that one model can not cover the full range of possibilities encountered during reclamation. It is expected, however, that this model is sufficiently comprehensive and flexible to provide the user with a forecasting tool to meet most reclamation situations. 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.

DIAND, SRK and Brodie Consulting 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.

For program limitations, please see the worksheet titled "Limitations", which is the last worksheet in the program.

SUMMARY OF COSTS**Capital Costs**

COMPONENT TYPE	COMPONENT NAME	TOTAL COST
OPEN PIT	0	\$102,500
UNDERGROUND MINE	0	\$34,906
TAILINGS	0	\$4,296,543
ROCK PILE	0	\$113,264
BUILDINGS AND EQUIPMENT	0	\$1,587,580
CHEMICALS AND SOIL MANAGEMENT	0	\$372,091
WATER MANAGEMENT	0	\$1,500,000
MOBILIZATION/DEMOBILIZATION	0	\$1,390,238
MONITORING AND MAINTENANCE	0	\$0
POST-CLOSURE SITE MAINTENANCE		\$16,921,894
	Ongoing Water Treatment Costs	\$496,335
	Annual post-closure cost	\$509,035
	Discount % #Years	
	0.03 200	
SUBTOTAL		<u><u>\$26,319,016</u></u>
PROJECT MANAGEMENT	3 % of subtotal	\$789,570
ENGINEERING	3 % of subtotal	\$789,570
CONTINGENCY	25 % of subtotal	\$6,579,754
GRAND TOTAL - CAPITAL COSTS		<u><u>\$34,477,912</u></u>

WATER TREATMENT COSTS

ANNUAL VOLUME OF WATER (m3) 410000

Reagent addition rates

Reagent	kg reagent/m3 water	cost in \$/kg, FOB site	Annual reagent cost
H2O2	0 kg/m3	1.5	\$0
lime	1.5 kg/m3	0.32	\$196,800
ferric sulphate	kg/m3		\$0
ferrous sulphate	kg/m3		\$0
flocculents	0.01 kg/m3	7.35	\$30,135
TOTAL			\$226,935

Supplies and Labour

power, \$/m3	0.04	\$16,400
misc. supplies, hoses, tools		\$20,000
sampling equip.		\$5,000
equip. maintenance and parts		\$25,000
water analysis		\$14,400
reporting		\$10,000
truck rental		\$12,000
annual mileage		\$0
road maintenace & snow plowing		\$15,000
electrician/mechanic for treatment plant & power supply		\$16,000
Annual cost		\$133,800
labor, hourly rate	35	
men per day for water treatment work		1
on site, days per year		365
spring/fall maintenance, extra work		30
hours worked per year		3160
annual labor cost		\$110,600
Total, labour and supplie		\$244,400
Camp and camp fuel cost		25000
TOTAL ANNUAL COSTS, reagents plus labour and supplies		\$496,335
Average treatment cost, \$/m3		\$1.21

Water analyses	
samples per month	10
analysis cost/sample	100
shipping	200
Total Water Sampling	1200

Site Access	
annual site access cost	
road	\$0
air	\$0
winter road	\$0

Certain Limitations must be followed in using the Reclaim Program as described below.

The Reclaim Program will NOT work if the worksheets are changed such that these assumptions are no longer true.

WorkSheet Names be inserted only if Workbook Protection is turned off using the default menu.

Defined Names Certain ranges have defined names, which must not be changed. These names appear in the "Name Box" to the left of the formula bar.

First line of data The first line of data for any component starts on line 4. Do not change the first 4 lines of a component worksheet, ie the name and column titles.

Cell A1 Cell A1 on the component sheet MUST always contain the count of that component. This is programmatically controlled. DO NOT CHANGE.

Column A This must have an entry in every row until the subtotal, for the calculation of where the subtotal is

L,H, Spec The 3 fields to the right of this cell must not be touched. They are required, to make the lookup function work in Unit Costs.

L
H
SPEC

Printing A component will only be printed if its sub-total is greater than zero. In addition, a component and the summary sheet cannot be printed if there is an error.

Project Name:

Cantung Mine

Reclaim Model - Overview of Program

All Users are urged to read the Guide for Using the Reclaim Model Spreadsheet.

Note the WorkSheet tabs at the bottom of your Window.

Please scroll down for more information

Information covered on this worksheet:

- The reclaim menu
- What's on the various worksheets
- Assumptions made by the Reclaim program

Reclaim Menu	The default menu bar has been replaced with a menu bar specific to the Reclaim Model.
Dfit Menu	This restores the default Excel menu bar, but with an option to return to the Reclaim menu
Clear	This option deletes all data input, deletes any duplicated elements and blanks out the project name
Duplicate	This option Duplicates components of the project. E.g. if there is more than one Open Pit, use duplicate to add a second Open Pit. Quantities for the new Open Pit are erased, but the Cost Codes are carried over from the original Open Pit. The new Open Pit subtotal is added to the Summary page.
Unit Costs	This option works like a toggle to show either 1 or 2 windows. If there is only 1 window open, this option splits the screen into 2 windows and selects the Unit Costs worksheet in the bottom window. If the Unit Costs are already showing, then this option closes the active window, and maximizes the other window. Be sure to select the window you want to close before selecting this option the second time.
Protection	This option toggles protection on and off for a worksheet. When Reclaim is opened, all worksheets are protected except the worksheet "Ongoing Water".
Print All	This option prints the Summary Worksheet, Unit Cost Worksheet, and all the component worksheets. Individual worksheets can be printed directly using regular printing methods, such as Ctl - P.
Quit	You can press Quit from the menu, or you can exit using regular windows methods, such as alt - F4
Help	Displays this page.

Project Name:

cantung Mine

Reclaim Model - Overview of Program

All Users are urged to read the Guide for Using the Reclaim Model Spreadsheet.

Note the WorkSheet tabs at the bottom of your Window.

WorkSheets
WorkSheets
WorkSheets
WorkSheets

WorkSheets The reclaim model makes use of separate **worksheets** to organize the information.
There are 3 overview type worksheets, followed by 1 worksheet for each component of reclamation. After the component worksheets, there is a Summary Worksheet, a list of the Unit Costs, and finally the assumptions of the reclaim model.

Title Authors, and history of revisions
Conditions Conditions of use and Limitations
Overview This overview page

Components This is where the component cost information is entered. Optionally, you can edit, add, or delete activities from the components. This should be done with care as it requires that protection be disabled.

Any worksheet can be printed individually. Use the Print All function on the menu to print all component worksheets.

Please do not change the column width, or the contents of the first column on the component worksheets.

The component worksheets are layed out in the following sequence. You can navigate between the worksheets by selecting the worksheet's tab, at the bottom of your screen.

Open Pit, UG Mine, Tailings, Rock Pile, Bldgs & Equip, Chemicals, Water, Mobilization, Monitor, Post Closure, Ongoing Water

Summary This contains the cost for each component, and the ongoing Post Closure costs. The model sums all the reclamation costs and presents the totals according to component type in the Reclamation Cost Summary table. Capital costs are presented separately from ongoing costs, such as monitoring, maintenance and water treatment.

Unit Costs This contains the look up table with costs for typical work

Limitations The last Worksheet lists the assumptions of the Reclaim program. To quickly access this sheet, press the >| tab navigator button.