

Memo

To:	Chris Hanks	Date:	December 31, 2012
Company:	Hope Bay Mining Limited	From:	Iozsef Miskolczi Tom Sharp
Copy to:		Project #:	1CH008.069
Subject:	Hope Bay Project - Comparison Between RECLAIM and SRK Cost Estimating Models NWB Licenses 2AM-DOH0713, 2BB-BOS1217, and 2BE-HOP1222		

1 Introduction

The Hope Bay Project is an advanced exploration site, including the partially constructed Doris North mine, which is owned by Hope Bay Mining Limited (HBML) in Nunavut. In 2012, the site was placed into care and maintenance. The water licences (2AM-DOH0713 (NWB 2007), 2BB-BOS1217 (NWB 2012a), and 2BE-HOP1222 (NWB 2012b)) and project certificate have conditions requiring HBML to prepare closure plans that include estimated closure costs. HBML retained SRK Consulting (Canada) Inc. to update the liability estimates for the property.

SRK has updated the cost estimates associated with the closure plans that were submitted to the Nunavut Water Board (SRK 2012a, 2012b, 2012c). These cost estimates were prepared using a spreadsheet model developed by SRK for estimating closure costs at mines in northern Canada.

Aboriginal Affairs and Northern Development Canada (AANDC) requires closure cost estimates to be prepared using the RECLAIM 6.1 spreadsheet model.

The purpose of this memorandum is to present the cost estimation method used by SRK and to show that this method is similar to that used in the RECLAIM 6.1 model.

2 Closure Cost Estimate Models

2.1 RECLAIM 6.1 Model

The RECLAIM model spreadsheet was originally developed by SRK in 1992 and has subsequently been modified by Brodie Consulting. The model has pre-set worksheets that can be expanded to describe a specific project.

The model template includes a default list of unit costs for most tasks and materials used in closure work, along with typical labour and equipment rates. Low and high unit rates are suggested. The default unit rates in RECLAIM 6.1 were updated in May 2011, but known unit rates can be used instead of the default rates. Some indirect costs (project management and engineering) are estimated as a user-specified percentage of direct costs. Mobilization and demobilization costs are calculated based on unit rates.

Costs for the closure of various facilities are provided on a summary sheet. This sheet splits land and water into separate liability components as required by permits and licences (NIRB 2006, NWB 2007, and NWB 2012a, 2012b).

2.2 SRK Cost Estimation Model

SRK uses a cost spreadsheet model similar to RECLAIM to estimate closure costs. Closure plans submitted to the Nunavut Water Board (NWB) included cost estimates that were initially prepared using the SRK model (SRK 2012a, 2012b, 2012c). Recently, these estimates were updated to account for changes in quantities resulting from work performed over the 2012 season. Equipment mobilization costs were also revised.

Unit rates (e.g., equipment, labour, materials, supplies, etc.), task costs (e.g., individual construction or closure activities), and quantities are used in the closure cost estimation. These costs are presented on separate worksheets.

Most cost estimating occurs on a single cost estimate sheet that contains calculations for all detailed tasks by facility or closure component. If more complicated cost calculations are needed, a separate worksheet is used and linked to the cost estimate sheet.

3 Basis of SRK Cost Estimate

3.1 Quantities

Material quantities were estimated by standard engineering calculations based on topographic maps, as-built surveys, and aerial photographs. The details of the quantity estimates are provided in separate worksheets.

3.2 Unit Costs

3.2.1 Equipment Rates

Equipment rates are based on actual 2012 contractor rates obtained from a contractor familiar with this type of work. The rates included ownership, maintenance, overhead and profit, excluding maintenance labour. Maintenance labour, overhead and profit were included in line items elsewhere in the estimate.

3.2.2 Labour Rates

2012 Labour rates were also provided by the contractor and included overhead and profit. The labour rates did not include the costs of camp accommodation, but these were included elsewhere as an indirect cost.

3.2.3 Material Costs

Actual material costs were obtained from the following sources:

- Specific vendor quotes;
- Specific costs from third party consultants;
- Cost Mine 2011;
- Environmental Remediation Cost Data—Unit Price (Means 2005); and
- Recent experience on other projects.

Older material quotes were adjusted to 2012 dollars by indexing the cost by 5% on a yearly basis.

Material costs were factored up by 15% to include freight and shipping costs to site.

3.2.4 Task Unit Rates and Costs

The Task Unit Rate worksheet calculates the cost per unit based on the labour, equipment, and materials required to complete the task. The productivity for each task was obtained from the following sources:

- Equipment specifications obtained from manufacturer's data—in this case the Caterpillar Handbook;
- Environmental Remediation Cost Data—Unit Price (Means 2005); and
- Recent experience on other projects.

The calculations used to estimate unit rates for each task are summarized below:

- The equipment cost (\$/unit) is calculated as the sum of equipment hourly rates divided by task productivity (unit/hr).
- The labour cost (\$/unit) is calculated as the sum of labourer and operator rates for each piece of equipment, divided by unit productivity (unit/hr).
- The material cost (\$/unit) is calculated as the sum of the material unit rate multiplied by the material multiplier factor (material quantity per task unit).
- The total unit rate is equal to the sum of equipment, labour, and material costs.

3.2.5 Relocation Unit Costs

Relocation unit costs are for the transport of materials to Roberts Bay over winter or all-weather roads. The equipment chosen for relocation matches the equipment used during the construction phase. A SnowCAT pulling 20 foot cargo containers (Seacans) on skids was assumed for transport on winter roads. The skids and Seacans were assumed to be available onsite for use. Transport costs were calculated on a kilometre basis using an average travel speed of 9 km/hr and a cargo capacity of 33.2 m³ for each Seacan.

Regular haul trucks or Seacans on trailers were assumed for all-weather road transport. Trailers were assumed to be available onsite. The tractor head would be mobilized from offsite.

Details for these calculations are provided in the Relocation Unit Cost worksheet. Costs for loading and unloading the Seacans are included elsewhere in the estimate.

3.3 Indirect Costs

Indirect costs are defined as any costs that cannot be directly associated with individual tasks.

Many of indirect costs depend on project duration. Therefore, the project duration was estimated to be the summation of the individual task quantities (units) divided by the task productivity (units/hr). The work was assumed to occur over a 10 hour work day.

3.3.1 Mobilization and Demobilization

Mobilization and demobilization costs were included as a lump sum in the cost estimate. Details for these costs are provided in the MobDemob worksheet.

The following assumptions were made for estimating mobilization and demobilization costs:

- Mobilized equipment was assumed to originate in Edmonton, AB.;
- Equipment was hauled by truck to Hay River, NT, and shipped by barge to Roberts Bay, NU; and
- A lump sum cost was included for the trucking, while the barging costs were calculated based on the footprint area for each piece of equipment.

Standby costs were also included. Standby costs cover time equipment was idle waiting for winter road construction required for access to the Boston and Patch Lake areas. It also covers time waiting for demobilization by the sealift after closure was completed. Sealift is assumed to occur once a year in September.

3.3.2 Winter Road Construction

A 59 km winter road between Boston Camp and Doris Camp is required. Winter road costs were estimated at \$14,500 per km based on communications with an ice road contractor in 2009. Costs were updated by 15% to reflect 2012 costs and include road construction and maintenance for a period of two months.

3.3.3 General and Administration Costs

Labour benefits (e.g., overtime, travel allowance, worker compensation, etc.) were included in the labour unit costs.

Travel allowance of \$750 per person per flight or \$10,000 per charter flight (for crews larger than 12) was included in the estimate.

Camp costs were included at a rate of \$150 per person per day in addition to a camp management rate of \$677 per day, for the duration of the project. Camp rental of \$400,000 per year was also included, based on supplier quotes for a 20-man, self-sufficient camp.

3.3.4 Field Support

It was assumed that a supervisor would be onsite throughout the duration of the project. An allowance for equipment maintenance support was included. A mechanic was assumed to be onsite for 10% of the project.

Helicopter support for travel between Doris Camp and Boston Camp was assumed to be required for six hours per day (four trips) for the duration of the project at a rate of \$2,000 per hour. A helicopter would also be used for three days during the Doris Mountain demolition work.

3.3.5 Other

Contractor profit was included in the equipment and labour unit costs. Freight costs of 15% of the material costs were included in the material unit rates.

3.3.6 Engineering and Consultants Services

The costs associated with site visits, sample analysis, and reporting were included in this category. An engineering design cost was included for the ore stockpile covers and the hydrocarbon soils remediation.

3.3.7 Contingency

A contingency of 20% of direct costs was added to the estimate. This contingency was not applied to the cost of shipping and disposing of the demolition waste offsite, because these costs were known.

3.3.8 Post-closure Monitoring

Post-closure monitoring and reporting costs were assumed to be \$40,000 per year for five years.

4 Model Comparison

This section compares the basis of the RECLAIM 6.1 and SRK models. The summary sheets for both methods are similar. The SRK summary sheet is organized such that the closure components were grouped by facility type, similar to the RECLAIM model. Table 1 compares how closure costs are summarized in the RECLAIM 6.1 and SRK spreadsheets.

Table 1: Table of concordance for the RECLAIM 6.1 and SRK cost estimate models for Hope Bay Closure.

RECLAIM 6.1	SRK Cost Estimate
Direct Costs	
Open Pit	N/A
Underground Mine	Portals/Adits
Tailings	Tailings Storage Facility
Rock Pile	Dumps, Stockpiles, Landfills
Buildings and Equipment	Transportation Infrastructure Borrow Areas Non-Process Ponds and Reservoirs Drill Sites/Drill Hole Abandonment Drainage/Diversion Channels Facilities Demolition Hydrocarbon Soils Remediation Off-site Shipping for Disposal Off-site Disposal Fees
Chemicals and Soil Management	Hydrocarbon Impacted Soil Remediation
Post-closure Monitoring	Post-closure Monitoring
Indirect Costs	
Mobilization/Demobilization	Mobilization and Demobilization
Project Management	General and Administration Costs Field Support
Engineering	Engineering and Consultant Services
Contingency	Contingency
Market Price Factor Adjustment	Not used

5 Conclusion

In conclusion, the methods used by RECLAIM 6.1 and SRK models to estimate costs are similar. The primary difference in the methods lies in the customization of the SRK model towards the specific project as opposed to the more generic RECLAIM approach. This customization includes developing site specific unit rates which is significantly more defensible than selecting unit rates from a pre-defined picklist as offered by RECLAIM. Should a user choose to use his own unit rates as offered in RECLAIM, there is no backup required for those user selected rates. SRK's approach bridges this shortcoming by providing complete and transparent backup to the entire cost estimating process. Because of this, the SRK cost estimate is, at minimum, an adequate alternative to the RECLAIM 6.1 estimate.

6 References

NIRB 2006. Nunavut Impact Review Board. Doris North Gold Mine Project Certificate. Issued to Miramar Hope Bay Limited. September 15, 2006.

NWB 2007. Nunavut Water Board Water Licence No. 2AM-DOH0713 Type "A". Granted to Hope Bay Mining Ltd. September 19, 2007.

NWB 2012a. Nunavut Water Board Water Licence No. 2BB-BOS1217. Granted to Hope Bay Mining Ltd. August 2, 2012.

NWB 2012b. Nunavut Water Board Water Licence No. 2BE-HOP1222. Granted to Hope Bay Mining Ltd. June 30, 2012.

[Means] R.S. Means Company, Inc. 2005. Environmental Remediation Cost Data—Unit Price. 11th Annual Edition.

SRK 2012a. SRK Consulting (Canada) Inc. June 2012. Hope Bay Project Boston Camp Revised Interim Closure Plan. Report prepared for Hope Bay Mining Limited. SRK Project # 1CH008.065.

SRK 2012b. SRK Consulting (Canada) Inc. June 2012. Hope Bay Project Windy Camp and Patch Lake Facility Final Reclamation Plan. Report prepared for Hope Bay Mining Limited. SRK Project # 1CH008.065.

SRK 2012c. SRK Consulting (Canada) Inc. August 2012. Doris North Closure and Reclamation Plan. Report prepared for Hope Bay Mining Limited. SRK Project # 1CH008.065.

Regards

SRK Consulting (Canada) Inc.

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Ioazef Miskolczi, MASc, EIT
Consultant



31 Dec 2012

Tom Sharp, PhD, PE, PEng
Principal Consultant

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