

Memo

To:	Oliver Curran, VP Environmental Affairs	Client:	TMAC Resources Inc.
From:	Megan Miller, PEng Iozsef Miskolczi, MASc, PEng	Project No:	1CT022.022
Reviewed By:	Maritz Rykaart, PhD, PEng	Date:	April 25, 2018
Subject:	Follow-up response to INAC Recommendation #21 received March 29, 2018 regarding the Boston and Doris-Madrid Closure and Reclamation Costs Estimate		

1 Introduction

As part of the supporting documents for the Boston Type A water license application, TMAC Resources Inc. (TMAC) submitted the following:

- TMAC Resources Inc. (2017). Hope Bay Project, Phase 2 Boston Conceptual Closure and Reclamation Plan, November;
- SRK Consulting (Canada) Inc. (2017a). Hope Bay Project Boston Conceptual Closure and Reclamation Plan, Detailed Cost Estimate. Memo prepared for TMAC Resources Inc. Project No. 1CT022.013. November; and
- RECLAIM ESTIMATE (Excel format) for the Boston Project, as prepared by SRK and submitted February 26, 2018.

Similarly, as part of the supporting documents for the Doris-Madrid Type A water licence amendment application TMAC submitted the following:

- TMAC Resources Inc. (2017b). Hope Bay Project, Doris-Madrid Interim Closure and Reclamation Plan, November;
- SRK Consulting (Canada) Inc. 2017b. Hope Bay Project Doris-Madrid Interim Closure and Reclamation Plan. Detailed Cost Estimate. Memo prepared for TMAC Resources Inc. Project No. 1CT022.013. November; and
- RECLAIM ESTIMATE (Excel format) for the Doris-Madrid Project, as prepared by SRK and submitted February 26, 2018.

Subsequently INAC retained Arcadis Canada Inc. to provide independent closure cost estimates for the Boston and Doris-Madrid Projects, and in this regard the following documents were submitted:

- Indigenous and Northern Affairs Canada, Water Resources Division (2018). Indigenous and Northern Affairs Canada's technical review of TMAC Resources Inc.'s new water license application 2AM-BOS--- and renewal-amendment no.2 application for water license 2AM-DOH1323, both for Phase 2 of the Hope Bay Project. Letter sent to Nunavut Water Board. File No. CIDM#1213786. March 29.
- Arcadis Canada Inc. (2018). Reclaim Estimate for Hope Bay Project Doris-Madrid Sites Water Licence Application 2AM-DOH1323. Report prepared for Indigenous and Northern Affairs Canada, Ref. 702774-000, March 22.
- Arcadis Canada Inc. (2018). Reclaim Estimate for Boston Mine Site Water Licence Application 2AM-BOS---. Report prepared for Indigenous and Northern Affairs Canada, Ref. 702774-000, March 22.
- RECLAIM Estimate (Excel format) for both Boston and Doris-Madrid Projects, as prepared by Arcadis submitted March 30, 2018.

Table 1-1 summarize the differences between the TMAC November 2017 (as prepared by SRK) and INAC March 2018 (as prepared by Arcadis) closure and reclamation cost estimates.

Table 1-1. TMAC November 2017 and INAC March 2018 closure and reclamation cost estimates

Site	TMAC November 2017 Estimate	INAC March 2018 Estimate	Difference
Boston	\$35,485,139	\$41,934,353	\$ 6,449,214
Doris-Madrid	\$58,966,301*	\$75,373,137	\$16,406,836

Note:

* The discrepancy (\$62,048) between the current TMAC estimate (\$58,904,253, Table 3.2) and the original November 2017 TMAC estimate (\$58,966,301) is due to two reasons:

1. Rounding errors between the prior and current TMAC estimates (\$5,515); and
2. The quanta for water management (\$277,151) being moved from the Capital Costs category to the Indirect Costs to match the INAC estimate structure caused the Contingency to be calculated as a percentage of a lesser number, adding further to the discrepancy (\$56,533).

Based on the March 2018 independent estimate prepared by Arcadis on behalf of INAC, INAC submitted Recommendation #21 in their March 29, 2018 (INAC 2018) submission to the Nunavut Water Board recommending that the NWB adopt INAC's closure and reclamation costs as presented in Table 1-1.

TMAC provided a preliminary response to INAC's Recommendation #21 in TMAC's response to Technical comments dated April 4, 2018. [TMAC Resources Inc (2018) Hope Bay Project Proponent's Response to Technical Comments on the 2AM-BOS and 2AM-DOS1323 Water Licence Applications, April]. This preliminary response identified a few possible errors or

omissions in the TMAC closure and reclamation costs estimate and advised that following a comprehensive review of INAC's cost estimate, TMAC will submit a formal response. This memo is that response.

This memo documents the comparison between the INAC and TMAC cost estimate and explains the reason for the differences as determined by SRK on behalf of TMAC. Finally, based on this assessment, the memo summarizes TMAC's recommendation regarding the quantum of the closure and reclamation costs for the Boston and Madrid-Doris project respectively to be adopted by the NWB.

This memo is a high-level summary of the cost comparison, and should be read in conjunction with the submitted Excel sheets which provides explicit line-by-line details.

2 Cost Comparison Methodology

INAC's costs estimates were completed by Arcadis using the RECLAIM 7.0 template. Although TMAC provided INAC with a RECLAIM 7.0 version of the costs estimate, Arcadis chose to assign closure task and activities under different pre-set categories within RECLAIM than TMAC. This complicated the cost comparison, so to allow for a direct comparison, TMAC re-arranged their costs estimate to match the categories, tasks and activities as determined by Arcadis. Furthermore, TMAC combined the INAC and TMAC estimates into one spreadsheet such that each task could be compared on a line-by-line basis.

In some instances, to simplify work, INAC chose to group several tasks into one activity, as opposed to the original detailed task list used by TMAC. Where this was the done, SRK matched the activity and added the complete list of tasks under that activity by adding additional lines and summing up the tasks at the activity level.

Once the two estimates were aligned, the differences in cost between the two estimates were compared. Where the calculated quanta differed, the reason for the difference was evaluated, and a new cost was proposed to be carried forward.

3 Cost Comparison Overview

Table 3-1 and Table 3-2 provides summaries of the cost estimate comparisons for Boston and Doris-Madrid project respectively. Comprehensive details concerning the differences between the cost estimates and the reason for TMAC's proposed costs are explained in each tab of the cost comparison spreadsheets, the observed differences in the INAC and TMAC costs, on a task level, can be grouped into several categories as follows:

- Errors or omissions in the TMAC estimate. In these instances, the INAC cost was carried forward, or SRK proposed a new cost.
- Minor differences (<\$2,000) between the estimates. Cost differences of this magnitude were not examined in detail as the difference is typically due to rounding error, both in unit rates and quantities, and not significant based on the overall magnitude of the estimated costs. In

these instances, the TMAC cost was carried forward as the level of detail provided by TMAC is in all cases significantly more granular.

- The INAC cost estimate grouped several tasks into a single task and SRK understands what assumptions were made to develop the unit costs and quantities associated with the grouped task. Grouping several tasks together is an oversimplification, as often the tasks grouped together do not have the same material quantities. The TMAC estimate is more granular and therefore TMAC costs were carried forward.
- SRK does not understand what assumptions were used to develop the quantities and unit rates in the INAC cost. It is believed that most of these differences are due to INAC grouping tasks from the TMAC estimate, however SRK could not determine which tasks were grouped to result in the INAC quantities and unit rates. Since the source of the INAC cost was not understood, in these cases, the TMAC costs were carried forward.
- Erroneous or different assumptions were used in the INAC cost estimate, in these cases the TMAC cost estimate was carried forward.

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The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

Table 3-1: Boston Project Cost Comparison Summary Table

CAPITAL COSTS	INAC COST (March 2018)	TMAC COST (November 2017)	COST DIFFERENCE	PROPOSED COST (April 2018)	REMAINING COST DIFFERENCE
Open Pit	\$0	\$0	\$0	\$0	\$0
Underground Mine	\$63,094	\$62,427	\$666	\$62,427	\$666
Tailings Facility	\$15,267,745	\$15,266,954	\$791	\$15,266,954	\$791
Rock Pile	\$73,985	\$71,969	\$2,015	\$71,969	\$2,015
Buildings and Equipment	\$6,144,260	\$5,317,823	\$826,437	\$5,344,932	\$799,327
Chemicals and Contaminated Soil Management	\$636,123	\$465,745	\$170,378	\$473,245	\$162,878
Surface and Groundwater Management	\$46,772	\$43,717	\$3,055	\$43,717	\$3,055
Interim Care and Maintenance	\$4,786,320	\$2,427,027	\$2,359,293	\$2,429,277	\$2,357,043
Incorrectly Included Task		\$1,145	-\$1,145	\$0	\$0
	\$27,018,298	\$23,656,809	\$3,361,490	\$23,692,523	\$3,325,775
INDIRECT COSTS	COST	TMAC COST (November 2017)	COST DIFFERENCE	PROPOSED COST (April 2018)	REMAINING COST DIFFERENCE
Mobilization/Demobilization	\$5,464,605	\$5,138,110	\$326,495	\$5,138,110	\$326,495
Post-Closure Monitoring and Maintenance	\$1,345,961	\$1,125,561	\$220,399	\$1,125,561	\$220,399
Engineering	\$1,350,915	\$0	\$1,350,915	\$1,184,626	\$166,289
Project Management	\$1,350,915	\$833,298	\$517,617	\$833,298	\$517,617
Health and Safety Plans/Monitoring & QA/QC	\$0	\$0	\$0	\$0	\$0
Bonding/Insurance	\$0	\$0	\$0	\$0	\$0
Contingency	\$5,403,660	\$4,731,362	\$672,298	\$4,738,505	\$665,155
Market Price Factor Adjustment	\$0	\$0	\$0		\$0
	\$14,934,353	\$11,828,330	\$3,087,725	\$13,020,099	\$1,895,956
TOTAL COSTS	\$41,934,353	\$35,485,139	\$6,449,214	\$36,712,622	\$5,221,731

Source: \\srk.ad\dfs\Ina\van\Projects\01_SITES\Hope.Bay\1CT022.022_2018 FEIS Post-Submission Support\Cost Estimates\702774-000 Hope Bay P2 Boston RECLAIM_MODEL_VER_2_Mar_27_2018_Comparision_20180424.xlsx]

Note(s):

(1) Details in cost differences explained in cost estimate spreadsheet.

Table 3-2: Doris-Madrid Cost Comparison Summary Table

CAPITAL COSTS	INAC COST (March 2018)	TMAC COST (November 2017)	COST DIFFERENCE	PROPOSED COST (April 2018)	REMAINING COST DIFFERENCE
Open Pit	\$0	\$0	\$0.00	\$0	\$0
Underground Mine	\$329,785	\$303,604	\$26,181	\$303,826	\$25,959
Tailings Facility	\$20,481,445	\$18,851,737	\$1,629,708	\$18,851,737	\$1,629,708
Rock Pile	\$290,126	\$189,067	\$101,058	\$189,067	\$101,058
Buildings and Equipment	\$14,598,548	\$13,264,472	\$1,334,075	\$13,335,404	\$1,263,143
Chemicals and Contaminated Soil Management	\$3,610,542	\$2,515,824	\$1,094,718	\$2,565,126	\$1,045,416
Surface and Groundwater Management	\$660,059	\$509,665	\$150,394	\$656,165	\$3,893
Interim Care and Maintenance	\$7,119,300	\$3,098,609	\$4,020,691	\$3,098,609	\$4,020,691
	\$47,089,803	\$38,732,978	\$8,356,825	\$38,999,934	\$8,089,869
INDIRECT COSTS	INAC COST (March 2018)	TMAC COST (November 2017)	COST DIFFERENCE	PROPOSED COSTS (April 2018)	PROPOSED COST DIFFERENCE
Mobilization/Demobilization	\$9,805,516	\$9,178,098	\$627,417	\$9,178,098	\$627,417
Post-Closure Monitoring and Maintenance	\$4,350,877	\$1,347,152	\$3,003,724	\$1,347,152	\$3,003,724
Engineering	\$2,354,490	\$0	\$2,354,490	\$1,949,997	\$404,493
Project Management	\$2,354,490	\$1,899,428	\$455,062	\$1,899,428	\$455,062
Health and Safety Plans/Monitoring & QA/QC	\$0	\$0	\$0	\$0	\$0
Bonding/Insurance	\$0	\$0	\$0	\$0	\$0
Contingency	\$9,417,961	\$7,746,596	\$1,671,365	\$7,799,987	\$1,617,974
Market Price Factor Adjustment	\$0	\$0	\$0	\$0	\$0
	\$28,283,333	\$20,171,274	\$8,112,059	\$22,174,662	\$6,108,671
TOTAL COSTS	\$75,373,137	\$58,904,253	\$16,468,884	\$61,174,597	\$14,198,540

Source: \\srk.ad\dfs\salvan\Projects\01_SITES\Hope.Bay\1CT022.022_2018 FEIS Post-Submission Support\Cost Estimates\702774-000 Hope Bay Roberts Bay DOH RECLAIM_MODEL_VER_2_Mar_20_2018_SRK_Comparison_IM_KNK_sw_01.xlsm]

Note(s):

- (1) Details in cost differences explained in cost estimate spreadsheet.