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December 3, 2018

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Christopher Murray
Environmental & Regulatory Compliance Manager
Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

Assol Kubeisinova
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

Dear Sir/Madam:

Re: Licence No. 2AM-MRY1325 Type "A"; Mary River Project, Baffinland Iron Mines Corporation, Annual Security Review Associated with 2019 Work Plan

Pursuant to Section 9 of the Qikiqtani Inuit Association (QIA) – Baffinland Iron Mines Corporation (Baffinland) Commercial Production Lease Q13C301, dated September 6, 2013, and at the request of the Nunavut Water Board (NWB), the QIA completed a review of Baffinland's 2019 Marginal Closure and Reclamation Financial Security Estimate Rev. 0 (Baffinland's Estimate) and 2019 Work Plan. The attached report provides QIA's written submission regarding Baffinland's Estimate.

As summarized in the attached report, QIA requests Baffinland provide response(s) to the items listed in Table 1 below as they relate to Baffinland's Estimate.

Table 1: List of Items Requiring Responses from Baffinland

No.	Item
1	Present the Indirect Costs for items to be reconciled as described in Section 3.0 of the attached report.
2	Confirm if the Concrete Batch Plant should be listed as Fold-Away Building Teardown – Contaminated. If yes, please provide the corresponding area of the Concrete Batch Plant. If Baffinland disagrees, evidence is required to illustrate that the Concrete Batch Plant is not Fold-Away Building Teardown – Contaminated.



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Table 1: List of Items Requiring Responses from Baffinland

No.	Item
3	Confirm the classification of the Western Star Unit is a Heavy Mobile Equipment. If Baffinland disagrees, evidence is required to illustrate how the Western Star Unit is classified.
4	Confirm the Deloupe float trailer and Kenworth Unit were included in previous reclamation security estimates prior to removing from reclamation security.
5	Confirm that totals match those shown in Table 3-5 of the attached report, and are incorporated in Baffinland's reclamation security estimate. If there is an omission or items misreported, please identify what needs to be removed.
6	Validate and confirm inventory data provided to reconcile the reclamation security as noted in Section 3.4 of the attached report.
7	Confirms E-house requires a contaminated reclamation. If Baffinland disagrees, evidence is required to illustrate E-houses do not require a contaminated designation.
8	Confirm that the unit cost for the Fuel/Lube Truck should be Heavy Mobile Equipment. If Baffinland disagrees, please provide validation as to why the Fuel/Lube Truck requires a smaller unit rate.
9	Confirm and update the Direct Cost associated with the 3 rd Party Medium Mobile Equipment for the presented costs does compute correctly.
10	Confirm and verify that 2,850 m ² of grade and recontour work is sufficient to cover the extents of the Milne Port Camp Pad Natural Stream Diversion.
11	Confirm the unit rate for the Crusher Pad Expansion is Grade and Re-Contour, not Grade and Re-Contour with Liner.
13	Confirm and update the Direct Cost associated with "Contaminated Snow dump/oily water containment – new 2019", for the presented costs does compute correctly. This may be a result of rounding.
14	Provide verification for the length of the piping for the Mine Site Raw Water Intake.
15	Confirm and update the Direct Cost associated with Fill Application for 2018 Estimate Addendum for the presented cost does not compute correctly.
16	Detail why contaminated soil remediation is not included in their 2019 submissions.



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Table 1: List of Items Requiring Responses from Baffinland

No.	Item
17	Clarify if 614,000 L or 616,192 L of fuel is used to calculate the reclamation security.
18	Justify the increase of hazardous waste materials associated with the Water Treatment Plant at the Waste Rock Facility.

Additionally, QIA requests Baffinland provide a response to the items listed in Table 2 below in regards to Baffinland's 2019 Work Plan.

Table 2: List of Items Requiring Responses from Baffinland

No.	Page	Reference	Item
1	-	General	Provide a general timeline on the submission of the updated Roads Management Plan and the corresponding TRAN's described in the 2019 Work Plan.
2	4	Introduction	Confirm that the 2019 Work Plan Addendum will only be submitted following the successful receipt of the amended Project Certificate and amended Type 'A' Water Licence.
3	8	Table 3-1: Scope of Work for 2019. #1.	Provide the Quarry Management Plans for the proposed quarries 60 days prior to quarry operation. The Quarry Management Plans are subject to QIA review and approval.
4	26	Table 8-2: Mobile and Mechanical Equipment to be received during 2019	Detail what work item in Table 3-1 that the Besix Vanpile JV contract, listed in Table 8-2, is for.
5	27	Table 8-2: Mobile and Mechanical Equipment to be received during 2019	Detail the components listed in 20 ft and 40 ft Container. For example, "40' x CONTAINER – material for offices, site small facility tools" provides sufficient detail, however, "40' Container" does not.
6	28	Table 8-2: Mobile and Mechanical	Explain why there are rail components listed in Table 8-2, such as but not limited to, "Rail Operations Concrete",



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Table 2: List of Items Requiring Responses from Baffinland

No.	Page	Reference	Item
		Equipment to be received during 2019	"Rail car mover" and "Diesel Rail Heater Drapeau 2". If these components are not for use until Phase 2 approval, why are they not in a module instead of being unpacked on Site.
7	31	Table 8-2: Mobile and Mechanical Equipment to be received during 2019	Confirm why Calcium Chloride is listed as owned by a contractor. If the Calcium Chloride being brought up is for dust suppression, does that mean Baffinland doesn't own it?
8	43	Milne Port Site Plan – Figure 1 - (2019-7) STACKER /RECLAIMER STORAGE STRUCTURE	Provide reasoning for the location of the Stacker/Disclaimer Storage Structure, given that it is not in the vicinity of the Stockpile Facility.

QIA looks forward to reviewing Baffinland's response to the items referenced in Tables 1 and 2 above and participating in the next steps for this Annual Security Review process.

Sincerely,

Diff

Fai Ndofor
Regulatory Manager

Attachment: ARKTIS (2018). 2019 Mary River Reclamation Security Report – DRAFT.
November 30, 2018.

2019 MARY RIVER RECLAMATION SECURITY REPORT - DRAFT

November 30, 2018

Jamie Van Gulck, Ph.D., P.Eng..
Principal, ARKTIS Solutions Inc.
vangulck@arktissolutions.com

Phone: 867.446.4129
Facsimile: 866.475.1147

November 30, 2018

Qikiqtani Inuit Association
P.O. Box 1340
Iqaluit, NU, X0A 0H0

ATTENTION: Fai Ndofor, Regulatory Manager

RE: 2019 MARY RIVER RECLAMATION SECURITY REPORT

ARKTIS Solutions Inc. is pleased to provide the 2019 Mary River Reclamation Security Report, which was completed on behalf of the Qikiqtani Inuit Association under the terms of the Commercial Lease No.: Q13C301 with Baffinland Iron Mines Corporation (Baffinland).

We trust that the information presented in this report satisfies the requirements of the project; however, it is recommended that further information is sought from Baffinland to reduce the use of assumptions herein. The assumptions on High Uncertainty items and action items from the 2018 meeting is provided under separate cover^{1, 2}. Please do not hesitate to contact the undersigned if there are any questions or comments regarding this report.

Sincerely,
ARKTIS Solutions Inc.

Jamie Van Gulck, Ph.D., P.Eng.
Principal

¹ Baffinland (2018). 180201-Lease Security High Uncertainty Memo (BIM). February 1, 2018.

² ARKTIS (2018). October 17, 2018 Record of Meeting – High Uncertainty Items. November 7, 2018.

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1.0 INTRODUCTION

ARKTIS Solutions Inc. (ARKTIS) submits this Draft 2019 Mary River Security Report (Draft Report) to the Qikiqtani Inuit Association (QIA) that summarizes Baffinland's 2019 Marginal Closure and Reclamation Financial Security Estimate Rev. 0³ (Baffinland's Estimate) for the Mary River Project (Project) and recommendations for QIA's reclamation security. Adjustments to Baffinland's annual reclamation security, are required as per Section 9.2, Item (d), of the Lease⁴ as well as by the Nunavut Water Board (NWB) for Baffinland's Type 'A' Water Licence No. 2AM-MRY1325.⁵ This Draft Report requests additional information to inform QIA's Final Report. QIA's Final Report will be the update to this document which will consider Baffinland's responses to the information requests and will include the updated reclamation security estimate.

The structure of this report is as follows:

Section 3.0 outlines the methodology and assumptions used in the analysis.

Section 4.0 presents the Direct Costs to be reconciled from previous work plans.

Section 5.0 presents the Direct Costs in the reclamation security estimate.

Section 6.0 presents the Indirect Costs in the reclamation security estimate.

Section 7.0 provides a summary of recommendations.

Section 8.0 provides a disclaimer and a closure of the document.

Appendix A presents a summary table of the Direct Cost line items added.

Appendix B presents a summary table of the Indirect Cost line items added.

Appendix C presents the general terms and conditions.

³ Baffinland (2018). 2019 Marginal Closure and Reclamation Financial Security Estimate Rev. 0. November 1, 2018.

⁴ QIA and Baffinland (2013). Commercial Lease No. Q13C301. September 6, 2013.

⁵ NWB (2015). Type 'A' Water Licence No.: 2AM-MRY1325, Amendment No. 1. July 31, 2015.

2.0 METHODOLOGY

The evaluation of reclamation security for the Project continued to use the methodologies detailed in the QIA 2014 Comprehensive Security Estimate,⁶ the QIA Abandonment and Reclamation Policy,⁷ and generally applies the principles outlined by Indigenous and Northern Affairs Canada (INAC).⁸ Any updates to the assumptions or methods are described in this section. The resultant change in reclamation security is presented in Sections 3.0-5.0.

The reclamation security estimate incorporates information from previous QIA reclamation security estimates (2014,⁶ 2015,⁹ 2015 Addendum¹⁰, 2016¹¹, 2016 Update¹², 2017¹³, 2017 Addendum¹⁴, 2018¹⁵, 2018 Addendum¹⁶), and an analysis of the changes to planned activities as listed in Baffinland's Estimate.³

The reclamation security does not include activities on Crown Lands (e.g., Steensby Inlet, Ore dock), nor does it address the Type 'B' Exploration Water Licence No. 2BE-MRY1421.¹⁷ It is ARKTIS' understanding that QIA does not evaluate liability on behalf of other landowners, nor does QIA intend to take a position on whether the amount of security held by other parties is adequate to fulfill their interests.

For 2019 activities, Baffinland's quantities for each reclamation line, except where noted, were adopted by ARKTIS as QIA is unable to complete an audit on future works. Quantity values may be reconciled in future security reports. As such, differences in Direct Costs between Baffinland and QIA are typically a result of differences in unit rates applied by each party.

As directed by QIA, ARKTIS has updated the quantities for select reclamation items based on the 2018 Environment Audit¹⁸ and subsequent meetings (e.g., High Uncertainty Meetings¹⁹ and relevant correspondences²⁰). Various summary tables are presented throughout this report to describe the various reclamation items. Within these tables, items not originally identified in Baffinland's Estimate are highlighted in yellow.

⁶ ARKTIS (2014). QIA 2014 Comprehensive Security Estimate. December 12, 2014.

⁷ QIA (n.d.) Abandonment and Reclamation Policy for Inuit Owned Lands. V. 2.0.

⁸ INAC (2002) Mine Site Reclamation Policy for Nunavut.

⁹ ARKTIS (2014). QIA 2015 Comprehensive Security Estimate. December 5, 2014.

¹⁰ ARKTIS (2015). QIA Revised 2015 Comprehensive Security Estimate. January 13, 2015.

¹¹ ARKITS (2015). QIA 2016 Comprehensive Security Estimate. December 2, 2015.

¹² ARKTIS (2016). 2016 Comprehensive Security Estimate Update. January 8, 2016.

¹³ ARKTIS (2016). QIA 2017 Comprehensive Security Estimate. December 2, 2016.

¹⁴ ARKTIS (2017). Baffinland Iron Mines Corporation, Mary River Project, QIA 2017 Addendum Reclamation Security Update Draft. July 19, 2017.

¹⁵ ARKTIS (2018). QIA 2018 Mary River Reclamation Security Report. February 1, 2018

¹⁶ ARKTIS (2018). QIA 2018 Mary River Reclamation Security Report Addendum. July 18, 2018

¹⁷ NWB (2014). Type 'B' Water Licence No.: 2BE-MRY-1421. April 17, 2014.

¹⁸ QIA (2018). 2018 Environmental Audit Report. November 22, 2018.

¹⁹ ARKTIS (2018) High Uncertainty Items Meeting. October 17, 2018.

²⁰ QIA (2018). RE: DELIVERABLE:1801016-QIA-UncertaintyItems-ENG DRAFT V1.pptx. November 15, 2018. Email from Fai Ndofo to Nick Jewitt.

2.1 Unit Rate Update

As directed by QIA,²⁰ ARKTIS has commenced an update to the reclamation unit rates from 2014 to 2018 values. ARKTIS followed the same methodology used in QIA's 2014 Comprehensive Security Report;

1. Acquiring RS Means contractor data and unit rates;
2. Converting US\$/hour RS Means unit rates to Ottawa index CDN\$/hour using the Ottawa City Cost Index from RS Means; and,
3. Using known contractor unit rates in Nunavut to provide an average factor to convert from Ottawa index CDN\$/hour to Nunavut index CDN\$/hour.

At the time of this writing, Nunavut contractor data is being collected and analyzed for use in calculating the Nunavut Cost Index. The Final Report will document the outcomes of this work and the associated updated unit costs. Steps one and two above have been summarized in Table 2-1.

Table 2-1: 2018 RS Means unit rates converted to Nunavut CDN\$/hour.

Equipment or Labour Item	2018 RS Means US\$/Hour	Ottawa City Cost Index	Ottawa CDN\$/Hour	Nunavut CDN\$/Hour	Nunavut Cost Index
<i>Labour</i>					
Blast Foreman (outside)	\$41.85	1.144	\$47.88	TBD	TBD
Driller	\$39.85	1.144	\$45.59	TBD	TBD
Equipment Operator (light)	\$51.30	1.144	\$58.69	TBD	TBD
Equipment Operator (medium)	\$53.75	1.144	\$61.49	TBD	TBD
Equipment Operator (oiler)	\$48.60	1.144	\$55.60	TBD	TBD
Labour Foreman (outside)	\$41.85	1.144	\$47.88	TBD	TBD
Labourer	\$38.85	1.144	\$44.44	TBD	TBD
Pipe Fitter	\$63.00	1.144	\$72.07	TBD	TBD
Skilled Worker	\$52.35	1.144	\$59.89	TBD	TBD
Skilled Worker Foreman (outside)	\$54.35	1.144	\$62.18	TBD	TBD
Structural Steel Foreman (outside)	\$56.65	1.144	\$64.81	TBD	TBD
Structural Steel Worker	\$54.65	1.144	\$62.52	TBD	TBD
Truck Driver (light)	\$44.50	1.144	\$50.91	TBD	TBD
<i>Equipment</i>					
Air Track Drill, 4"	\$124.18	1.216	\$151.00	TBD	TBD

Equipment or Labour Item	2018 RS Means US\$/Hour	Ottawa City Cost Index	Ottawa CDN\$/Hour	Nunavut CDN\$/Hour	Nunavut Cost Index
Backhoe Loader, 48 H.P.	\$39.05	1.216	\$47.48	TBD	TBD
Crane, Flatbed Mounted, 3 Ton	\$29.48	1.216	\$35.84	TBD	TBD
Crawler Loader, 3 C.Y.	\$150.50	1.216	\$183.01	TBD	TBD
Cutting Torches	\$1.58	1.216	\$1.92	TBD	TBD
Dozer, 105 H.P.	\$76	1.216	\$92.42	TBD	TBD
Dozer, 200 H.P.	\$159.13	1.216	\$193.50	TBD	TBD
Dump Truck, 8 C.Y., 220 H.P.	\$84.65	1.216	\$102.93	TBD	TBD
Dump Truck, Off Hwy., 50 Ton	\$207.75	1.216	\$252.62	TBD	TBD
Dump Trucks, 12 C.Y., 400 H.P.	\$67.85	1.216	\$82.51	TBD	TBD
F.E. Loader, W.M., 2.5 C.Y.	\$65.40	1.216	\$79.53	TBD	TBD
Flatbed Trailer, 40 Ton	\$22.50	1.216	\$27.36	TBD	TBD
Flatbed Truck, Gas, 3 Ton	\$29.75	1.216	\$36.18	TBD	TBD
Hydraulic Crane, 12 Ton (Daily)	\$ 68.20	1.216	\$ 82.93	TBD	TBD
Hydraulic Crane, 12 Ton	\$62.00	1.216	\$75.39	TBD	TBD
Hydraulic Crane, 25 Ton	\$73.83	1.216	\$98.77	TBD	TBD
Hydraulic Excavator, 1.5 C.Y.	\$111.70	1.216	\$135.83	TBD	TBD
Lattice Boom Crane, 90 Ton	\$210.88	1.216	\$256.42	TBD	TBD
Sets of Gases	\$21.00	1.216	\$25.54	TBD	TBD
Tank Trailer, 5000 Gal.	\$18.54	1.216	\$22.44	TBD	TBD
Truck Tractor, 6x4, 450 H.P.	\$72.93	1.216	\$88.68	TBD	TBD
Vibrating Roller, Towed, 12 Ton	\$72.05	1.216	\$87.61	TBD	TBD

2.2 Sea Containers

QIA has directed ARKTIS to increase reclamation security to account for the maximum number of sea containers observed in 2018.¹⁸ This is a change to the assumption described in QIA's 2014 Comprehensive Reclamation Security Estimate.⁶

In 2014, 1,158 Twenty Equivalent Units (TEU) of sea containers were observed on-site.⁶ Baffinland considered this number to be an extreme case, stating Baffinland would not operate with such a high level of TEUs on-site. Thus, QIA accepted reclamation security with the assumption that half of the observed sea containers would be on-site. This agreement was made on the basis that Baffinland would implement an enterprise level accounting system to supply sufficient data to determine an average number of sea containers at any time. Since then, Baffinland has not provided an average count of sea containers nor provided evidence that an enterprise level accounting system has been implemented. The 2018 Environmental Audit identified the amount of sea containers has increased from the maximum observed in 2014.¹⁸

2.3 Culverts

QIA has directed ARKTIS to use a unit rate of \$50/m of culvert for the 2019 reclamation security which is consistent with the Baffinland Estimate. However, QIA will be updating their unit rate for culverts on a \$/m basis once the 2019 Annual Security Review Process is completed to ensure actual culvert length is accounted for in assessing security. As agreed between QIA and Baffinland at the October 17, 2018 High Uncertainty Items Meeting¹⁹ all previous calculations for existing culverts would not be updated.

2.4 Assessment of Disturbed Areas

QIA and Baffinland have agreed to acquire annual satellite surveys of the mine. An objective of these satellite surveys is to assess the actual disturbed area at the mine for use in updating the reclamation costs for the following locations:

1. Area of waste rock facility to quantify cover extents to manage potentially acid generating (PAG) rock;
2. Mine site raw water intake;
3. Crusher maintenance building;
4. Tote Road abandoned road areas;
5. Tote Road current road areas;
6. Tote Road reclamation of historical borrow areas;
7. Tote Road permitted quarries and borrows; and,
8. Tote Road laydowns.

Baffinland has provided²¹ the satellite imagery that require further assessment. The assessment of the surveys will not be completed in time for the 2019 Annual Security Review process. Associated changes in reclamation security resulting from this assessment will be determined at a future date.¹⁸

²¹ Baffinland (2018). Baffinland – 2018 Satellite Photography. November 13, 2018. Email from Andrew Vermeer to Fai Ndofo.

3.0 SECURITY RECONCILIATION

Baffinland's Estimate includes a list of items that are to be reconciled as a result of items that have either been removed from their previous work plans or previously omitted. Baffinland has presented Direct Costs for these items but has not presented Indirect Costs. The following sub-sections describe the items proposed to be reconciled in the 2019 ASR.

ARKTIS recommends Baffinland present the Indirect Costs and Total Costs for items to be reconciled, in addition to the Direct Costs.

3.1 Unit Rate Update

Baffinland has provided a summary of changes to reclamation security based on updating unit rates from 2014 to 2018 values. ARKTIS will provide a comparison and assessment of unit rates in the Final Report.

3.2 Buildings and Foundations

Table 3-1 shows a summary of Baffinland's Estimate for reclamation security for grade and re-contour with allocated security but is no longer planned.

Table 3-1 Summary of grade and re-contour reconciliation.

Description	Quantity (m ²)	Unit Rate (\$)		Direct Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
Laydown LP1	-13,000	1.49	TBD	(19,434)	TBD	TBD

3.3 Mechanical and Mobile Equipment

Table 3-2 shows a summary of Baffinland's Estimate for mechanical equipment brought to Site but not previously allocated.

Baffinland's Estimate has used the Heavy Equipment unit rate for the Concrete Batch Plant. Baffinland described in the 2019 Work Plan³ that the Concrete Batch Plant is a Service Building that was completed as of March 31, 2018 (Table 4.1). Historically, the Concrete Batch Plant has used the Fold-Away Building Teardown – Contaminated unit rate.¹⁴

ARKTIS recommends Baffinland confirm if the Concrete Batch Plant should be listed as Fold-Away Building Teardown – Contaminated. If yes, please provide the corresponding area of the Concrete Batch Plant. If Baffinland disagrees, evidence is required to illustrate that the Concrete Batch Plant is not Fold-Away Building Teardown – Contaminated.

Table 3-2 Summary of Mechanical and Mobile Equipment not previously allocated security reconciliation.

Description	Unit Rate Type	Quantity (pcs)	Unit Rate (\$/pcs)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Used conveyors	Heavy Equipment	4	\$32,950	TBD	\$131,800	TBD	TBD
Grizzly unit 11-0702	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD

Description	Unit Rate Type	Quantity (pcs)	Unit Rate (\$/pcs)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Concrete Batch Plant	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD
Hydraulic Rock Crusher - Tramac	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD
Grizzly unit 11-0702	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD
Jaw Crusher 11-0701	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD
Screener Unit 10-0701	Heavy Equipment	1	\$32,950	TBD	\$32,950	TBD	TBD
1 X D65 ATLAS COPCO DRILL S/N TMG185ED00269	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
30000 L Fuel Tanker Trailer	REMOVE MEDIUM MOBILE FUEL TANKS	1	\$1,163	TBD	\$1,163	TBD	TBD
1988 MACK Service Truck	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
345 D Excavator	Heavy Mobile Equipment	2	\$2,075	TBD	\$4,150	TBD	TBD
PV-271 Drill	Heavy Mobile Equipment	2	\$2,075	TBD	\$4,150	TBD	TBD
Cat 793 Mining Truck	Heavy Mobile Equipment	2	\$2,075	TBD	\$4,150	TBD	TBD
Kubota RTV-X1100c	Light Mobile Equipment	2	\$729	TBD	\$1,458	TBD	TBD
Used Light Plant	Light Mobile Equipment	2	\$729	TBD	\$1,458	TBD	TBD
Used conveyors	Heavy Equipment	4	\$32,950	TBD	\$131,800	TBD	TBD
Western Star Ore Haul Truck	Heavy Mobile Equipment	11	\$2,075	TBD	\$22,825	TBD	TBD
Side Dumper Lead or trailer	Medium Mobile Equipment	19	\$1,163	TBD	\$22,088	TBD	TBD

Table 3-3 shows a summary of Baffinland's Estimate of reclamation security for mechanical equipment either no longer being brought to Site or has been backhauled from Site. Items backhauled have been identified in the description of each item. Baffinland's Estimate reports the Western Star Unit as Medium Mobile Equipment in their 2018 Reconciliation (Table 3-3), and as Heavy Equipment in their Direct Costs (Table 4-2).

ARKTIS recommends Baffinland confirms the classification of the Western Star Unit is a Heavy Mobile Equipment. If Baffinland disagrees, evidence is required to illustrate how the Western Star Unit is classified.

ARKTIS does not have a "Deloupe float trailer" or "Kenworth Unit" in the current reclamation security estimate. Therefore, it is not reasonable to remove these line items from this security estimate.

ARKTIS recommends Baffinland confirm the Deloupe float trailer and Kenworth Unit were included in previous reclamation security estimates prior to removing from reclamation security.

Table 3-3 Mechanical and Mobile Equipment not previously allocated security comparison, no longer on-site.

Description	Unit Rate Type	Quantity (pcs)	Unit Rate (\$/pcs)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Backhaul deloupe float trailer	Medium Mobile Equipment	-1	\$1,163	TBD	(\$1,163)	TBD	TBD
Backhaul Ford Pickup	Light Mobile Equipment	-1	\$729	TBD	(\$729)	TBD	TBD
Backhaul GMC Sierra	Light Mobile Equipment	-1	\$729	TBD	(\$729)	TBD	TBD
Backhaul Kenworth Unit	Medium Mobile Equipment	-2	\$1,163	TBD	(\$2,325)	TBD	TBD
Backhaul Western Star Unit	Medium Mobile Equipment	-3	\$1,163	TBD	(\$3,488)	TBD	TBD
745C Rock Truck	Heavy Mobile Equipment	-5	\$2,075	TBD	(\$10,375)	TBD	TBD

It is ARKTIS' opinion that 3rd Party Equipment at the Project cannot be landfilled in a reclamation scenario as it is not the property of Baffinland. It is assumed that only items with "3rd party" in the description of the equipment is not owned by Baffinland.

There is no Direct Cost associated with 3rd party owned mobile equipment in this estimate because 3rd Party Equipment is considered an Indirect Cost, associated with demobilization, and is discussed in Section 5.2. Table 3-4 shows the summary of Baffinland's Estimate of Direct Cost reconciliation for 3rd party equipment. ARKTIS has included the 3rd party owned mobile equipment reconciliation with the Indirect Cost update in Section 5.5.

Table 3-4 3rd party mobile equipment Direct Cost reconciliation.

Description	Quantity (pcs)	Unit Rate (\$/pcs)		Direct Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
3rd Party Heavy Mobile Equipment (make up for typical)	16	\$2,075	-	\$33,200	-	\$33,200
3rd Party Medium Mobile Equipment (make up for typical)	-30	\$1,163	-	(\$34,875)	-	(\$34,875)
3rd Party Light Mobile Equipment (make up for typical)	41	\$729	-	\$29,896	-	\$29,896

The sum of items listed in Table 2-2, Section 2.3.2 in Baffinland's Estimate is greater than is reported. Table 3-5 shows a comparison in total items and reclamation security provided in Baffinland's Estimate.

ARKTIS recommends Baffinland confirm the totals match those that ARKTIS has shown and is incorporated in their reclamation security estimate. If there is an omission or items are misreported, please identify what needs to be adjusted.

Table 3-5 Reconciliation Totals

	Total Items	Total
Baffinland as provided in 2019 Work Plan	65	\$374,000
Baffinland as totaled by ARKTIS ²²	114	\$535,392
DIFFERENCE	(49)	(\$161,392)

ARKTIS is concerned with the amount of reconciliation to security estimates in 2018¹⁴ and 2019.³ The cumulative estimate for reconciled items from Baffinland is over \$3 million²³ where 2019 is a smaller fraction at \$535,000. Given the past history of reconciliation, it is justifiable to include an allocation in the security estimate to account for changes that may occur between security estimates.

Further assessment/consideration is needed to decide if there should be a lump sum allocation to account for “reconciliation” items within the security estimate. This will be addressed in the Final Report.

3.4 Equipment Inventory

There is currently no known inventory of items that are stored on-site, including where on-site items are stored until used. Baffinland provided preliminary inventories for Baffinland owned mobile and non-mobile equipment, as well as 3rd Party equipment from select contractors. The assessment of these preliminary inventories, using the agreed classifications for mechanical equipment provided for reference in Table 3-6, show gaps in what is on-site and what is being communicated through annual work plans. Table 3-7 to Table 3-9 compare Baffinland’s preliminary inventory, to QIA’s current security estimate based on quantities reported in the annual work plans. Baffinland’s response to the 2018 Environmental Audit is pending to finalize equipment inventory and associated reclamation security.

QIA requests Baffinland validate and confirm inventory data provided to reconcile the reclamation security.

²² This total was done with all the same items as Baffinland used in their 2019 Work Plan and includes 3rd Party Mobile Equipment that is not otherwise included in Reconciliation, but that can be found in Indirect Costs.

²³ The cumulative number is solely based on Baffinland’s estimate, though should be noted the unit rate decrease for the 2019 Baffinland Estimate.

Table 3-6 Equipment Classification Descriptions

Equipment Classification	Equipment Description and Examples
Light Equipment	Pumps, fuel dispenser, laboratory equipment, and sample bins
Medium Equipment	Aerodrome equipment, generators, shop / maintenance equipment, screens, and chutes.
Heavy Equipment	Crusher, feeder, power plant generators, large screens, conveyors, and stackers
Light Mobile Equipment	Forklifts, picks up, vehicles around five (5) tonnes and under, scissor lift, man lifts, and small bin trucks. NOTE: Weight thresholds not always determining factor. Examples of Light Mobile Equipment include: Skid Steer P10000, Ford F-350 Pick-Up Truck.
Medium Mobile Equipment	Vehicles around 10 tonnes, trailers, buses, tow trucks, large garbage bins and water trucks. NOTE: Weight thresholds not always determining factor. Examples of Medium Mobile Equipment include: D6 Dozer, Kenworth T800 Fuel/Lube Truck, CAT P20000, Passenger Buses, Secondary Drills, Rock Drills, D6 Wheel Dozer, Dump Trailers.
Heavy Mobile Equipment	Vehicles over 10 tonnes, boom trucks, large front-end loaders, dump trucks, graders and cranes. NOTE: Weight thresholds not always determining factor. Examples of Heavy Mobile Equipment include: D9 Dozer, CAT 740 EFLT Fuel/Lube Truck, CAT 824H Wheel Dozer, Production Drills.

Table 3-7 Light Equipment Inventory

Type	2018 Audit IR	QIA	Differential
Baffinland Fixed Mechanical Equipment	0	149	149
Baffinland Mobile Mechanical Equipment	843	262	-581
3 rd Party Mechanical Equipment	229	81	-148

Table 3-8 Medium Equipment Inventory

Type	2018 Audit IR	QIA	Differential
Baffinland Fixed Mechanical Equipment	19	142	123
Baffinland Mobile Mechanical Equipment	318	294	-24
3 rd Party Mechanical Equipment	167	137	-30

Table 3-9 Heavy Equipment Inventory

Type	2018 Audit IR	QIA	Differential
Baffinland Fixed Mechanical Equipment	43	19	-24
Baffinland Mobile Mechanical Equipment	244	235	-9
3 rd Party Mechanical Equipment	96	138	42

4.0 DIRECT COSTS ANALYSIS

The following sections describe, by reclamation activity, changes to Direct Costs.

4.1 Buildings and Foundations

Table 4-1 shows a summary of Baffinland's Estimate for Buildings and Foundations. Baffinland's Report identified new E-Houses requiring the unit rate for modular building not contaminated. Historically, E-houses have been considered to be contaminated¹⁰ or were considered to be heavy equipment with a unit rate per item.¹³ ARKTIS suggests maintaining the historical use of the unit rate for special modular building teardown – contaminated for E-Houses.

ARKTIS recommends Baffinland confirm if E-house requires a contaminated reclamation unit cost. If Baffinland disagrees, evidence is required to illustrate E-houses do not require a contaminated designation.

Table 4-1 Buildings and foundations security comparison.

Item	Location	Quantity (m²)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Modular Building Not Contaminated							
Office trailers (2 x 36 m2)	Milne Port	72	\$48	TBD	\$3,430	TBD	TBD
Office trailers (2 x 36 m2)	Milne Port	72	\$48	TBD	\$3,430	TBD	TBD
Crusher services trailer (2 x 36 m2)	Milne Port	72	\$48	TBD	\$3,430	TBD	TBD
Site Construction Office (2 x 36 m2)	Milne Port	72	\$48	TBD	\$3,430	TBD	TBD
Offices and Lunchrooms (5x36m2)	Milne Port	180	\$48	TBD	\$8,574	TBD	TBD
Quonset hut	Mine Site	100	\$48	TBD	\$4,764	TBD	TBD
Contractor lunchroom	Mine Site	36	\$48	TBD	\$1,715	TBD	TBD
Contractor office	Mine Site	36	\$48	TBD	\$1,715	TBD	TBD
Rail Operations offices (2 x 36 m2)	Mine Site	72	\$48	TBD	\$3,430	TBD	TBD
Office Trailer (60 x 60)	Mine Site	334	\$48	TBD	\$15,910	TBD	TBD
Office Trailer (24 x 60)	Mine Site	132	\$48	TBD	\$6,288	TBD	TBD
Office Trailer (12 x 60)	Mine Site	66	\$48	TBD	\$3,144	TBD	TBD
Lunchtrailer (44 x 10)	Mine Site	40	\$48	TBD	\$1,905	TBD	TBD
Container lunchroom (2 x 36 m2)	Mine Site	72	\$48	TBD	\$3,430	TBD	TBD
Container Office (4 x 36 m2)	Mine Site	144	\$48	TBD	\$6,860	TBD	TBD
Lunchroom	Mine Site	36	\$48	TBD	\$1,715	TBD	TBD
Modular Building Contaminated							
Washroom facility for Tote Road	Mine Site	36	\$115	TBD	\$4,100	TBD	TBD
Washcar	Mine Site	36	\$115	TBD	\$4,100	TBD	TBD

Item	Location	Quantity (m ²)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
E-House	Milne Port	37	\$48	TBD	\$1,771	TBD	TBD
<i>Fold Away Building Contaminated</i>							
Heated Maintenance shop for pit equipment at KM110.5 laydown	Mine Site	1500	\$114	TBD	\$171,067	TBD	TBD
TOTAL		3,145		TBD	\$254,000	TBD	TBD

4.2 Mechanical and Mobile Equipment

Table 4-2 shows a summary of Baffinland's Estimate for mechanical and mobile equipment. Baffinland's Estimate has included the unit rate for a Fuel/Lube Truck as being Medium Mobile Equipment. Historically, Fuel/Lube Trucks have been considered to be Heavy Mobile Equipment.¹³ ARKTIS will use the unit cost of Heavy Mobile Equipment for Fuel/Lube Truck unless Baffinland provides additional verification.

ARKTIS recommends Baffinland confirm that the unit cost for the Fuel/Lube Truck should be Heavy Mobile Equipment. If Baffinland disagrees, please provide validation as to why the Fuel/Lube Truck requires a smaller unit rate.

Table 4-2 Mechanical and mobile equipment security estimate comparison.

Item	Unit Rate Type	Quantity (pcs)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Bucket Wheel Stacker Reclaimer	Heavy Equipment	2	\$32,950	TBD	\$65,900	TBD	TBD
Generator Sets	Heavy Equipment	4	\$32,950	TBD	\$131,800	TBD	TBD
Screen Metso FS353	Heavy Equipment	2	\$32,950	TBD	\$65,900	TBD	TBD
30,000 L Fuel Tanker Truck	Heavy Mobile Equipment	12	\$2,075	TBD	\$24,900	TBD	TBD
374 Excavator	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
740B ARTICULATING WATER TRUCK	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
745C Rock Truck	Heavy Mobile Equipment	2	\$2,075	TBD	\$4,150	TBD	TBD
793 Haul Truck	Heavy Mobile Equipment	3	\$2,075	TBD	\$6,225	TBD	TBD
922K Wheel Loader	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
950M Loader	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
CONVEYING - Conveyor Feeder	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
CONVEYING - Jump Conveyor	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
D10 Dozer	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD

Item	Unit Rate Type	Quantity (pcs)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Excavator - cat 349	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Feeder Dolly	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Fines Mobile Stacker	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Fuel Tanker and tractor	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Fuel/Lube Truck	Heavy Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Heavy Duty Shunt Truck Heavy Mobile Equipment	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Jet A Truck	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
MOBILE EQUIPMENT - MINE SITE WHEEL DOZER - CAT 824H	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Mobile Primary Crusher Unit	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Pumper fire truck	Heavy Mobile Equipment	1	\$2,075	TBD	\$2,075	TBD	TBD
Generator/Air Compressor	Light Equipment	2	\$1,584	TBD	\$3,168	TBD	TBD
Light Plant	Light Equipment	27	\$1,584	TBD	\$42,761	TBD	TBD
F250 Passenger Van	Light Mobile Equipment	1	\$729	TBD	\$729	TBD	TBD
Frost Fighter Heater	Light Mobile Equipment	7	\$729	TBD	\$5,104	TBD	TBD
Genie Manlift s135x	Light Mobile Equipment	3	\$729	TBD	\$2,188	TBD	TBD
Light ERT utility vehicle	Light Mobile Equipment	1	\$729	TBD	\$729	TBD	TBD
Off Road Tracked Rescue Vehicle	Light Mobile Equipment	1	\$729	TBD	\$729	TBD	TBD
Pickup truck (F350 or similar)	Light Mobile Equipment	15	\$729	TBD	\$10,938	TBD	TBD
Portable water pump	Light Mobile Equipment	2	\$729	TBD	\$1,458	TBD	TBD
Skid Steer, Cat 247B or 275D	Light Mobile Equipment	1	\$729	TBD	\$729	TBD	TBD
Genie Manlift z60	Light Mobile Equipment	2	\$729	TBD	\$1,458	TBD	TBD
Generator (medium)	Medium Equipment	1	\$3,393	TBD	\$3,393	TBD	TBD
4x4 hotseating bus	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Boom Truck	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD

Item	Unit Rate Type	Quantity (pcs)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Freightliner Highway Truck	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Passenger Bus	Medium Mobile Equipment	4	\$1,163	TBD	\$4,650	TBD	TBD
Pressure washing truck	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Telehandler	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Telehandler	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Tri-Trombone flat trailer	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
Zoom Boom 12,000 lbs	Medium Mobile Equipment	1	\$1,163	TBD	\$1,163	TBD	TBD
TOTAL		117		TBD	\$420,576	TBD	TBD

Table 4-3 shows Baffinland's summary of Direct Costs for 3rd party equipment. It is ARKTIS' opinion that 3rd Party Equipment at the Project cannot be landfilled in a reclamation scenario as it is not the property of Baffinland. It is assumed that only items with "3rd party" in the description of the equipment is not owned by Baffinland.

There is no Direct Cost associated with 3rd party owned mobile equipment in this estimate because 3rd Party Equipment is considered an Indirect Cost, associated with demobilization 3rd Party Equipment is discussed in Section 5.5.

Table 4-3 3rd party mobile equipment security estimate comparison.

Item	Quantity (pcs)	Unit Cost		Direct Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
3rd Party Heavy Mobile Equipment (make up for 'typical' fleet)	34	2,075		\$70,550		
3rd Party Light Mobile Equipment (make up for 'typical' fleet)	49	729		\$44,479		
3rd Party Medium Mobile Equipment (make up for 'typical' fleet)	61	1,163		\$56,963		
TOTAL				\$171,992		

ARKTIS recommends Baffinland confirm and update the Direct Cost associated with the 3rd Party Medium Mobile Equipment for the presented costs does compute correctly.

4.3 Site Works

Table 4-4 shows a summary of Baffinland's grade and re-contour quantity estimate. As directed by QIA, there has been the addition of 2,850 m² of grade and re-contour for the Milne Port Camp Pad Natural Stream Diversion included in Table 4-4.¹⁸

ARKTIS recommends Baffinland confirmation and verification that 2,850 m² of grade and recontour work is sufficient to cover the extents of the Milne Port Camp Pad Natural Stream Diversion.

Baffinland's Estimate listed the unit rate type for Crusher Pad Expansion 2019 as Grade and Re-Contour With Liner, but the unit rate used was that of Grade and Re-Contour. Baffinland's Estimate Breakdown Structure (EBS) lists the unit rate type and unit rate as that of Grade and Re-Contour. ARKTIS will use the unit rate of Grade and Re-Contour as that is what was provided in Baffinland's EBS.

ARKTIS recommends Baffinland confirm the unit rate for the Crusher Pad Expansion is Grade and Re-Contour, not Grade and Re-Contour with Liner.

Baffinland's Estimate has proposed a 2,000 m² expansion of the crusher maintenance shop laydown area for seacan and rebuilt equipment storage, stating no security adjustment is needed as it is an existing disturbed area.

ARKTIS recommends QIA increase security for the expansion of the crusher maintenance shop laydown area and reconcile with satellite surveys when available.

Table 4-4 Site works security estimate comparison.

Item	Location	Quantity (m ²)	Unit Rate (\$/m ²)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Laydown LP2	Milne Port	30,000	\$1.49	TBD	\$44,847	TBD	TBD
Ore Stockpile Pad Expansion 2019	Milne Port	140,000	\$1.49	TBD	\$209,287	TBD	TBD
Q1 Quarry (additional marginal increase in 2019)	Milne Port	226,000	\$1.49	TBD	\$337,849	TBD	TBD
Laydown 2 - 2019	Tote Road	55,800	\$1.49	TBD	\$83,333	TBD	TBD
Laydown 4 - 2019	Tote Road	66,300	\$1.49	TBD	\$99,014	TBD	TBD
Laydown 7 - 2019	Tote Road	28,900	\$1.49	TBD	\$43,160	TBD	TBD
Laydown 9 - 2019	Tote Road	92,500	\$1.49	TBD	\$138,141	TBD	TBD
Laydown 10 - 2019	Tote Road	34,500	\$1.49	TBD	\$51,523	TBD	TBD
Laydown 13 - 2019	Tote Road	7,000	\$1.49	TBD	\$10,454	TBD	TBD
PQ2a quarry	Tote Road	345,500	\$1.49	TBD	\$516,491	TBD	TBD
PQ4a quarry	Tote Road	105,000	\$1.49	TBD	\$156,965	TBD	TBD
PQ6a quarry	Tote Road	194,000	\$1.49	TBD	\$290,012	TBD	TBD
PQ12a quarry	Tote Road	232,200	\$1.49	TBD	\$347,118	TBD	TBD
Q5 Quarry Expansion 2019	Tote Road	1,225,587	\$1.49	TBD	\$1,832,140	TBD	TBD
Expansion of 800p camp laydown	Mine Site	12,000	\$1.49	TBD	\$17,939	TBD	TBD
WRF Water Treatment plant laydown 2019	Mine Site	3,500	\$1.49	TBD	\$5,232	TBD	TBD
KM107.5 Laydown for haul road parking	Mine Site	91,000	\$1.49	TBD	\$136,037	TBD	TBD
Km107 Stockpile and access Road	Mine Site	133,400	\$1.49	TBD	\$199,421	TBD	TBD

Item	Location	Quantity (m ²)	Unit Rate (\$/m ²)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Mine Site Fuel Tank Farm 2019 Footprint	Mine Site	21,620	\$1.49	TBD	\$32,288	TBD	TBD
Ore Stockpile Sedimentation - New 2019	Milne Port	15,000	\$4.12	TBD	\$62,134	TBD	TBD
Ore Stockpile Sedimentation Pond 2a	Milne Port	4,400	\$4.12	TBD	\$18,226	TBD	TBD
Contaminated Snow dump/oily water containment - new 2019	Milne Port	2,700	\$4.12	TBD	\$11,116	TBD	TBD
New Hazardous Waste Berm 2019	Milne Port	360	\$4.12	TBD	\$1,482	TBD	TBD
KM110.5 Laydown for Mine Ops	Mine Site	180,000	\$1.49	TBD	\$269,084	TBD	TBD
New PWSP 2019	Mine Site	4,180	\$4.12	TBD	\$17,209	TBD	TBD
Crusher Pad Expansion 2019	Mine Site	12,000	\$1.49	TBD	\$17,939	TBD	TBD
KM107 Sedimentation Pond	Mine Site	7,400	\$4.12	TBD	\$30,653	TBD	TBD
Crusher Pad Sedimentation Pond 2019	Mine Site	2,000	\$4.12	TBD	\$8,285	TBD	TBD
Landfarm	Mine Site	9,000	\$4.12	TBD	\$37,280	TBD	TBD
Hazardous Waste Berm - New 2019	Mine Site	360	\$4.12	TBD	\$1,482	TBD	TBD
Fuel Tank Containment Area	Mine Site	12,000	\$4.12	TBD	\$49,707	TBD	TBD
SUBTOTAL		3,294,207		TBD	\$5,076,000	TBD	TBD
Milne Port Camp Pad Natural Stream Diversion	Milne Port	2,850		TBD		TBD	TBD
Crusher Maintenance Shop Laydown Area Expansion	Mine Site	2,000		TBD		TBD	TBD

ARKTIS recommends Baffinland confirm and update the Direct Cost associated with “Contaminated Snow dump/oily water containment – new 2019”, for the presented costs does compute correctly. This may be a result of rounding.

4.4 Storage Tanks

Table 4-5 shows a summary of Baffinland's storage tanks security estimate. A comparison will be provided in the Final Report.

Table 4-5 Storage tanks security estimate comparison.

Description	Quantity (ea)	Unit Rate (\$/ea)		Direct Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
Water Tanks – Light Tank	6	\$1,710	TBD	\$10,263	TBD	TBD
Fuel Tanks – Light Diesel Tank	5	\$2,950	TBD	\$14,750	TBD	TBD
Fuel Tanks – Medium Mobile Diesel Tank	7	\$8,381	TBD	\$58,669	TBD	TBD
Fuel Tanks – Largest Diesel Tank	2	\$137,278	TBD	\$274,555	TBD	TBD
TOTAL				\$358,000	TBD	TBD

4.5 Culverts

Table 4-6 shows a summary of Baffinland's Estimate. The 2017 – NWB Annual Report²⁴ described the following culverts as being modified: BG01, BG03, BG04, BG11, BG11-B&C, BG14-B, BG14-C, BG17, BG19, BG19-B-DS, BG19-C-DS, BG25 (A&B), and BG27. As-builts for these culverts have not been provided. Previously culverts BG01, BG04, BG29, BG32, CV049 A&B, CV099, CV106, CV112, CV186, CV187, and CV224 were listed in a security estimate.¹³ QIA has directed ARKTIS to increase security for each culvert with an assumed 20 m length and then this length to be verified by as-builts or alternative methods. Additional analysis is needed to understand if the security has been issued by Baffinland during previous security review for the culverts, or if the culverts need to be included in Final Report. Table 4-6 is a placeholder for the outcome of this analysis.

but QIA did not accept security as they were not approved along the Tote Road. ARKTIS has included additional security, as directed by QIA, in Table 4-6.

Table 4-6 Culvert security estimate comparison.

Description	Location	Quantity (m)	Unit Rate (\$/ea)		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Culverts for Quarry Access Roads	Tote Road	80	\$50	TBD	\$4,000	TBD	TBD
Culverts for KM107 Stockpile Access Road	Mine Site	225	\$50	TBD	\$11,250	TBD	TBD
Culverts for 800p Camp Discharge Line	Mine Site	60	\$50	TBD	\$3,000	TBD	TBD
SUBTOTAL					\$18,250	TBD	TBD

²⁴ Baffinland (2018). 2017 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report for Operations. March 31, 2018.

25 Culverts		500		TBD		TBD	TBD
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4.6 Piping

QIA has directed ARKTIS to increase reclamation security by 750 m of piping for the Mine Site Raw Water Intake per the 2018 Environmental Audit Report.¹⁸

ARKTIS recommends Baffinland provide verification for the length of the piping for the Mine Site Raw Water Intake.

4.7 Fill Application

Table 4-7 shows a summary of Baffinland fill application security estimate. As QIA used Baffinland's quantity estimate, the difference in costs will be based on unit cost.

Table 4-7 Fill application security estimate comparison.

Item	Location	Quantity (m ²)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Fill Application for 2018 Estimate Addendum	Mine Site	2,534	\$39	TBD	\$98,378	TBD	TBD

ARKTIS recommends Baffinland confirm and update the Direct Cost associated with Fill Application for 2018 Estimate Addendum for the presented cost does not compute correctly.

4.8 Contaminated Soil Removal

Consistent with the 2014 Security Estimate,⁶ ARKTIS has assumed that any contaminated buildings will result in contaminated soil. The volume of contaminated soil removal is calculated by multiplying the area of the contaminated building by 0.5 m in depth. Baffinland's Estimate excluded contaminated soil.

The Geotechnical Inspection²⁵ identified that liners have degraded, so the 2018 Environmental Audit¹⁸ recommended increasing the reclamation security for contaminated soil removal beneath containment facilities as is done beneath contaminated buildings. QIA has requested Baffinland describe how Baffinland proposes to validate the degrading liners are not leading to contamination below containment facilities and identify how this issue is to be addressed in the reclamation security. As Baffinland has yet to respond to the 2018 Environmental Audit,¹⁸ ARKTIS has not changed security for contaminated soil removal under containment facilities.

ARKTIS recommends Baffinland detail why contaminated soil remediation is not included in their 2019 submissions.

²⁵ Baffinland (2018). Submission of 2018 Geotechnical Inspection Report No. 1 (Jul/Aug. 2018). October 2, 2018.

Table 4-8 Contaminated soil removal security estimate comparison.

Item	Location	Quantity (m ³)	Unit Cost		Direct Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Washroom facility for Tote Road	Mine Site	18		TBD		TBD	TBD
Washcar	Mine Site	18		TBD		TBD	TBD
E-House	Milne Port	18.5		TBD		TBD	TBD
Heated Maintenance shop for pit equipment at KM110.5 laydown	Mine Site	750		TBD		TBD	TBD
Total		804.5			0	TBD	TBD

5.0 INDIRECT COSTS ANALYSIS

The following section is limited in detail as Indirect Costs are based on final Direct Costs that will be included in the Final Report.

5.1 Contaminated Soil Treatment

Table 5-1 summarizes the volumes determined in Section 4.8 Contaminated Soil Removal, and consistent with the 2014 Security Estimate Report, ARKTIS has included the Indirect Cost for contaminated soil treatment. Baffinland's Estimate excluded this Indirect Cost.

Table 5-1 QIA's contaminated soil treatment security estimate.

Item	Location	Quantity (m ³)	Unit Cost		Indirect Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Washroom facility for Tote Road	Mine Site	18		TBD		TBD	TBD
Washcar	Mine Site	18		TBD		TBD	TBD
E-House	Milne Port	18.5		TBD		TBD	TBD
Heated Maintenance shop for pit equipment at KM110.5 laydown	Mine Site	750		TBD		TBD	TBD
Total		804.5		TBD		TBD	TBD

5.2 Explosives

Table 5-2 provides a summary of Baffinland's Estimate for demobilization of Ammonium Nitrate. Baffinland has increased their reclamation security for Ammonium Nitrate by 9,800 m³.

Table 5-2 Demobilization of Ammonium Nitrate

Item	Quantity (m ³)	Unit Cost		Indirect Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
Ammonium Nitrate	9,800	\$358	TBD	\$3,508,000	TBD	TBD

5.3 Hazardous Substances

As an outcome from the 2018 Environmental Audit, QIA will be increasing security to a total volume of 6,500 m³ to cover the costs for shipping peak volumes Hazardous Substances off-site.¹⁸

QIA will also be increasing reclamation security to include a volume of 90 TEUs of sea containers associated with demobilization of Calcium Chloride and will be presented in the Final Report. This increase is to cover the reclamation costs for shipping peak volumes of Calcium Chloride off-site.¹⁸ To date, QIA has not held security for Calcium Chloride. Calcium Chloride fits the description of a Hazardous Substance as defined in the Lease but does not warrant the designation of a dangerous good that incurs a higher demobilization cost. Since large quantities were observed during the 2017 and 2018 Environmental Audit on-site visit, the 2018 Environmental Audit¹⁸ recommended security be held to demobilize this material from site. Using the 2017 Shipping Manifests and Audit Information Requests, ARKTIS calculated the maximum amount of Calcium Chloride to be 3,070 m³ that should fit within 90 sea containers for demobilization.

5.4 Sea Containers

As directed by QIA as an outcome from the 2018 Environmental Audit, and further described in Section 2.2, QIA will be increasing reclamation security for the demobilization of sea containers to reflect the maximum observed on site. This will be presented in the Final Report.¹⁸ Based on the visual count conducted in the 2018 Environmental Audit,¹⁸ there are 1999 TEU of sea containers at Site. There is potential that a portion of the sea containers will be contaminated because of the materials stored within them. An assessment of the quantity of contaminated sea containers and unit costs for their reclamation will be completed after the 2019 ASR.⁶

5.5 3rd Party Owned Equipment

Table 5-3 summarizes the quantities of 3rd party mobile equipment in Baffinland's Estimate. As discussed in Section 3.2 Mechanical and Mobile Equipment, Baffinland has included 3rd party owned equipment as a Direct Cost as the equipment is landfilled rather than backhauled. Baffinland's Estimate includes an Indirect Cost associated with the mobilization and demobilization of equipment based calculated as 10% of the Direct Costs³ with a total allocation of \$676,460.

Table 5-3 QIA's mobile equipment (3rd party owned) security estimate.

Item	Quantity (pcs)	Unit Cost		Indirect Cost		
		Baffinland	QIA	Baffinland	QIA	Diff
3rd Party Heavy Mobile Equipment (make up for 'typical' fleet)	34		TBD		TBD	TBD
3rd Party Light Mobile Equipment (make up for 'typical' fleet)	49		TBD		TBD	TBD
3rd Party Medium Mobile Equipment (make up for 'typical' fleet)	61		TBD		TBD	TBD
SUBTOTAL				\$676,460		
3rd Party Heavy Mobile Equipment 2019 ASR Reconciliation (make up for typical)	16		TBD		TBD	TBD
3rd Party Medium Mobile Equipment 2019 ASR Reconciliation (make up for typical)	-30		TBD		TBD	TBD
3rd Party Light Mobile Equipment 2019 ASR Reconciliation (make up for typical)	41		TBD		TBD	TBD

5.6 Worker Mobilization

A position on worker mobilization remains to be completed and will be presented in the Final Report. The calculation of worker mobilization is based on reclamation work completed, which is dependent on the information requested from Baffinland in the Draft Report.

5.7 Fuel

Table 5-4 shows Baffinland's Estimate for the Indirect Cost for fuel. Baffinland has stated that an additional 5,312 person-days are required on-site at a consumption rate of 116 L per person-day. Baffinland reports this as 614,000 L where ARKTIS calculates this to be 616,192 L. ARKTIS has applied 616,192 L in the calculations associated with Table 5-4.

ARKTIS recommends Baffinland clarify if 614,000 L or 616,192 L of fuel is used to calculate the reclamation security.

The following three assumptions will be included in QIA's Final Report.

1. QIA takes the conservative assumption that fuel abandoned on-site will not be available for use for reclamation activities, as there is no guarantee QIA will have access to the fuel, as another creditor may be awarded this asset.
2. QIA assumes that 50% of total fuel storage capacity will be left at closure and will need to be demobilized from Site. As Baffinland did not include additional fuel capacity, additional abandoned fuel was not added in to this estimate.
3. QIA assumes that all fuel required for reclamation will have to be mobilized to Site. Contrarily, Baffinland typically assumes it will only need to bring half of the required fuel to complete reclamation activities. In Baffinland's Estimate, only the total lump sum number was provided.

Table 5-4 Fuel security comparison.

Item	Quantity (m ³)		Unit Cost		Indirect Cost		
	Baffinland	QIA	Baffinland	QIA	Baffinland	QIA	Diff
Fuel Demobilization	15,000		\$1,500,000	TBD		TBD	TBD
Fuel Mobilization	590		\$236,000	TBD		TBD	TBD
TOTAL	15,295		\$1,736,000	TBD		TBD	TBD

5.8 Short-Term Care and Maintenance, Closure Monitoring And Reporting

A position on the short-term care and maintenance, closure monitoring and reporting costs remains to be completed and will be presented in the Final Report. QIA will be increasing security for the costs associated with operational and maintenance of the Waste Rock Treatment Plant during closure for a minimum of five years.¹⁸

5.9 Mobilization And Demobilization Of Equipment And Materials

ARKTIS has assumed that items included in Baffinland's Estimate Section 3.3.2.5 Mobilization and Demobilization of Equipment and Materials may be stored on-site while seeking NIRB and NWB approval.

ARKTIS has calculated the Indirect Cost to mobilize the expansion project equipment and materials based on the cubic meters for the equipment designated as Phase 2 Expansion Project Materials and Equipment submitted by Baffinland.³

During the 2018 Annual Security Review process, ARKTIS estimated²⁶ that it costs approximately **\$2,000,000 per ship** that can carry approximately 27,000 cubic meters. Therefore, it would require approximately 8.5 ships to demobilize all Phase II materials and equipment. As there would require equipment mobilized to load the Phase 2 Expansion Project Materials and Equipment, ARKTIS has

²⁶ Nunavut Eastern Arctic Shipping (2018). Phone correspondence on February 19, 2018.

assumed that 9 total ships are sufficient for the equipment listed in Baffinland's Estimate for a total of **\$18,000,000**. QIA's cost was estimated using a per ship calculation in lieu of a unit cost approach.

Table 5-5 summarizes Baffinland's Estimate for mobilization and demobilization of equipment and materials. In Baffinland's Estimate, there was discussion of increasing reclamation security by \$13,300 for the demobilization of hazardous waste materials associated with the Water Treatment Plant at the Waste Rock Facility. This addition was omitted in Table 3-7 of Baffinland's Estimate but has been included in Table 5-5..

ARKTIS recommends Baffinland justify the increase of hazardous waste materials associated with the Water Treatment Plant at the Waste Rock Facility.

Table 5-5 Phase 2 Expansion project equipment demobilization security estimate comparison.

Item	Location	Quantity	Unit Cost (\$/m ³)		Indirect Cost		
			Baffinland	QIA	Baffinland	QIA	Diff
Crushing Module	Milne Port	18,172	\$68	TBD	\$1,483,420	TBD	TBD
Screening Module	Milne Port	49,868	\$68	TBD	\$2,262,904	TBD	TBD
Car Dumper Module	Milne Port	24,756	\$68	TBD	\$1,683,408	TBD	TBD
BMH Conveyors	Milne Port	33,278	\$68	TBD	\$3,391.024	TBD	TBD
Rail Construction Materials	Milne Port	81,400	\$68	TBD	\$1,235,696	TBD	TBD
Shiploader Module		21,815	\$68	TBD	\$1,483,420	TBD	TBD
Water Treatment Plant Materials				TBD	\$13,300	TBD	TBD
Total		229,289			\$15,605,300		

5.10 Contingency

The Final Report will include a contingency value. Historically, ARKTIS has used a factor of 15% of the total Direct Costs, contaminated soil treatment costs, care and maintenance costs, and closure monitoring/reporting costs as established in QIA's 2014 Comprehensive Reclamation Security Report⁶. QIA has taken the position that contingency may be increased based on Baffinland's response to the 2018 Environmental Audit.¹⁸

Baffinland's Report includes an additional contingency of \$3,038,000 or 12.5% of the total Direct Costs, mobilization and demobilization of equipment and materials costs, worker accommodation and camp operation costs, mobilization of workers costs, care and maintenance costs, and closure monitoring/reporting costs.



5.11 Supervision, Project Management and Contract Administration

The Final Report will include a project supervision, management and contract administration Indirect Cost of 9.4% of the total direct costs, contaminated soil treatment costs, care and maintenance costs, and closure monitoring/reporting costs. The difference between QIA's and Baffinland's estimate is anticipated to be based on the difference in total Direct Costs.

5.12 Engineering Fees

The Final Report will include an engineering, design and execution planning Indirect Cost allowance of 3.9% of the total Direct Costs. The difference between QIA's and Baffinland's estimate is anticipated to be on the difference in total Direct Costs.

6.0 RECOMMENDATIONS

Table 6-1 lists the recommendations presented by ARKTIS in the Draft Report.

Table 6-1 Summary of recommendations.

No.	Recommendation
1	ARKTIS recommends Baffinland present the Indirect Costs for items to be reconciled.
2	ARKTIS recommends Baffinland confirm if the Concrete Batch Plant should be listed as Fold-Away Building Teardown – Contaminated. If yes, please provide the corresponding area of the Concrete Batch Plant. If Baffinland disagrees, evidence is required to illustrate that the Concrete Batch Plant is not Fold-Away Building Teardown – Contaminated.
3	ARKTIS recommends Baffinland confirms the classification of the Western Star Unit is a Heavy Mobile Equipment. If Baffinland disagrees, evidence is required to illustrate how the Western Star Unit is classified.
4	ARKTIS recommends Baffinland confirm the Deloupe float trailer and Kenworth Unit were included in previous reclamation security estimates prior to removing from reclamation security.
5	ARKTIS recommends Baffinland confirms the totals match those that ARKTIS has shown and is incorporated in their reclamation security estimate. If there is an omission or items are misreported, please identify what needs to be removed.
6	QIA requests Baffinland validate and confirm inventory data provided to reconcile the reclamation security.
7	ARKTIS recommends Baffinland confirms E-house requires a contaminated reclamation. If Baffinland disagrees, evidence is required to illustrate E-houses do not require a contaminated designation.
8	ARKTIS recommends Baffinland confirm that the unit cost for the Fuel/Lube Truck should be Heavy Mobile Equipment. If Baffinland disagrees, please provide validation as to why the Fuel/Lube Truck requires a smaller unit rate.
9	ARKTIS recommends Baffinland confirm and update the Direct Cost associated with the 3 rd Party Medium Mobile Equipment for the presented costs does compute correctly.
10	ARKTIS recommends Baffinland confirmation and verification that 2,850 m ² of grade and recontour work is sufficient to cover the extents of the Milne Port Camp Pad Natural Stream Diversion.
11	ARKTIS recommends Baffinland confirm the unit rate for the Crusher Pad Expansion is Grade and Re-Contour, not Grade and Re-Contour with Liner.
12	ARKTIS recommends QIA increase security for the expansion of the crusher maintenance shop laydown area and reconcile with satellite surveys when available.
13	ARKTIS recommends Baffinland confirm and update the Direct Cost associated with “Contaminated Snow dump/oily water containment – new 2019”, for the presented costs does compute correctly. This may be a result of rounding
14	ARKTIS recommends Baffinland provide verification for the length of the piping for the Mine Site Raw Water Intake.

No.	Recommendation
15	ARKTIS recommends Baffinland confirm and update the Direct Cost associated with Fill Application for 2018 Estimate Addendum for the presented cost does not compute correctly.
16	ARKTIS recommends Baffinland detail why contaminated soil remediation is not included in their 2019 submissions.
17	ARKTIS recommends Baffinland clarify if 614,000 L or 616,192 L of fuel is used to calculate the reclamation security.
18	ARKTIS recommends Baffinland justify the increase of hazardous waste materials associated with the Water Treatment Plant at the Waste Rock Facility.

7.0 CLOSURE

This report has been prepared exclusively for the use of the QIA for the specific application described within this report. The details provided in this report are for general information purposes only. The information and recommendations contained in this report should not be used for any other purpose, at another location, or by any other parties. Any use of, or reliance on this report by any third party is at that party's sole risk. ARKTIS assumes no responsibility for inappropriate use of the contents of this report, and disclaims all liability arising from negligence or otherwise. General terms and conditions are provided in Appendix A.

ARKTIS SOLUTIONS INC.

Nick Jewitt
M.A.Sc.

Reviewed by
Jamie Van Gulck, P.Eng, P.h.D.

APPENDIX A – SUMMARY OF DIRECT COST ADJUSTMENTS

THIS APPENDIX WILL BE PRESENTED IN THE FINAL 2019 MARY RIVER SECURITY REPORT.

APPENDIX B – SUMMARY OF INDIRECT COST ADJUSTMENTS

THIS APPENDIX WILL BE PRESENTED IN THE FINAL 2019 MARY RIVER SECURITY REPORT.

APPENDIX C – GENERAL TERMS AND CONDITIONS

USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

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This report is based solely on the conditions which existed on site at the time of ARKTIS' investigation. The client, and any other parties using this report with the express written consent of the clients and ARKTIS, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and ARKTIS, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that ARKTIS is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

During the performance of the work and the preparation of this report, ARKTIS may have relied on the information provided by persons other than the client. While ARKTIS endeavors to verify the accuracy of such information when instructed to do so by the client, ARKTIS accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

STANDARD OF CARE

Services performed by ARKTIS for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and financial and physical constraints applicable to the services. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

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Where ARKTIS submits both electronic file and hard copy versions of reports, drawings and other project related documents and deliverables (collectively termed instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by ARKTIS shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by ARKTIS shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of instruments of professional services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except ARKTIS. The Client warrants that instruments of professional services will be used only and exactly as submitted by ARKTIS.