

APPENDIX E.8.4

Initial and Follow-up Spill Reports

Spill Report Number:

18-492



Feb 2, 2019

Water Resources Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #18-492
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On January 03, 2019 at approximately 15:15 hrs, while conducting inspections of the MSC lift stations, housing maintenance observed liquid behind the AB wing south lift station. After investigation, it was determined the Fernco coupler had separated from the 4" gravity drain directly behind the lift station. Repairs were made to replace the Fernco coupler arresting the release. Approximately 0.2m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an approximate area of 12 m2. This spill is >100 m to the nearest water course which is currently frozen.

Immediate and Follow-Up Action:

The sewage release was immediately arrested, and the lift station holding tank pumped down to prevent further release. The contaminated snow was collected and deposited in an engineered lined containment facility. The Fernco coupling was repaired and the gravity line was subsequently reconnected.

Recommendations:

Continue daily inspections of lift stations and snow/ice removal from lines to mitigate potential releases.

Current Status:

The coupler has been repaired and the lift station is back in operation and inspected regularly.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A blue ink signature of William Bowden.

William Bowden
Environmental Superintendent

Reviewed by:

A blue ink signature of Jeff Bush.

Jeff Bush
Surface Works Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Connor Devereaux, Gerald Rogers, Francois Gaudreau (Baffinland), Fai Ndofor, Sean Joseph (QIA), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Sewage release on camp pad adjacent to AB South lift station.



Photo 2. Contaminated snow removed from camp pad adjacent to AB South lift station.



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 01-04-2019	REPORT TIME 9:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT		REPORT NUMBER 18 492
B	OCCURRENCE DATE: MONTH - DAY - YEAR 01-03-2019	OCCURRENCE TIME 15:15			
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENSE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"			
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 55		LONGITUDE DEGREES 79 MINUTES 17 SECONDS 04		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A			
H	PRODUCT SPILLED Raw Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 0.2m3	U.N. NUMBER N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A		
I	SPILL SOURCE MSC Lift Station	SPILL CAUSE pipe fitting failure	AREA OF CONTAMINATION IN SQUARE METRES Approx. 12 m2		
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, snow and ice	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A		
K	ADDITIONAL INFORMATION: COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On January 03, 2019 at approximately 15:15 hrs, while conducting inspections of the MSC lift stations, housing maintenance observed liquid behind the AB wing south lift station. The housing maintenance determined the Fernco coupler had separated from the 4" gravity drain directly behind the lift station. Repairs were made to replace the Fernco coupler arresting the release. Approximately 0.2m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an approximate area of 12 m2. This spill is >100 m to the nearest water course which is currently frozen. The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWT Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.				
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River	TELEPHONE 416 364 8820
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920 8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-007



February 07, 2019

Resource Management Officer
Nunavut Field Operations
Crown-Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.mesher@aadnc-aadnc.gc.ca

Manager, Major Projects
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-007, Reported on January 09, 2019
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On January 08, 2019 at approximately 13:30 hrs, the Site Services supervisor was notified of a sewage release that had been discovered at the Mine Site weather haven. Upon further investigation, it was determined that while clearing snow, a loader had made contact with a sewage pipe that was covered underneath snow, damaging the pipe. Approximately 2 m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an approximate area of 40 m2. The impacted material was collected and deposited in a lined engineered containment facility at the Mine Site. This spill is >100 m to the nearest water course which is currently frozen.

Immediate and Follow-Up Action:

Upon discovering the release, workers exposed the damaged pipe and preformed necessary repairs to arrest the release. The contaminated material was removed and properly disposed. New material was placed and leveled on the pad. Delineators were placed over buried utilities to help identify their location at the Mine Site weatherhaven.

Recommendations:

Before operators begin snow removal, discuss with supervisor to identify areas where buried utilities and other high risk areas. Reference piping schematics prior to working in their area.

Current Status:

The sewage pipe has been repaired and delineators are now in place marking the buried utilities.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253-0596 x6016.

Prepared By:

A handwritten signature in cursive script, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

Dean Moffett
Projects Construction Superintendent

Attach: Photos, Map, NT-NU Spill Report

cc. Tim Sewell, Grant Goddard, Sylvain Proulx, Gerald Rogers, Francois Gaudreau, William Bowden
(Baffinland), Fai Ndofo (QIA), Justin Hack, Jeremy Fraser (INAC)



Photo 1. Spill location before clean-up



Photo 2. Spill location following clean-up



Spill#19-007
2m3 Raw Sewage
Mary River
January 7th, 2019

Figure 1 – Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 01-09-2019	REPORT TIME 12:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 007
B	OCCURRENCE DATE: MONTH – DAY – YEAR 01-07-2019	OCCURRENCE TIME 13:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES: 71 MINUTES: 19 SECONDS: 32		LONGITUDE DEGREES: 79 MINUTES: 22 SECONDS: 24	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Nuna East Ltd.	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Raw Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 2 m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Weather Haven RBC plumbing	SPILL CAUSE Vehicle interaction	AREA OF CONTAMINATION IN SQUARE METRES Approx. 40 m2	
J	FACTORS AFFECTING SPILL OR RECOVERY snow and ice	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On January 08, 2019 at approximately 13:30 hrs, BIM Site Services supervisor was notified of a sewage release that was discovered at the weather haven RBC. Upon further investigation, it was determined that while clearing snow, a loader had made contact with a sewage pipe that was covered underneath snow, damaging the pipe and causing the release. Approximately 2 m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an approximate area of 40 m2. The impacted material was collected and deposited in a lined engineered containment facility at the Mine Site. This spill is >100 m to the nearest water course which is currently frozen. The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the GN EPA para. 5.1.			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC:		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2 – NT-NU Spill report

Spill Report Number:

19-034



March 4, 2019

Resource Management Officer
Nunavut Field Operations
Indigenous and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aadnc-aadnc.gc.ca

Manager, Major Projects
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-034
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

During night shift on February 02, 2019, an operator was disposing of a tote of sump water from maintenance shops at the Mine Site. The operator brought the tote to an engineered lined containment berm to drain the sump water. Upon release it was determined that approximately 0.4M3 of waste oil had also been present in the tote impacting an approximate area of 96 m2. The waste oil free product was cleaned up from inside the berm and properly disposed of. This spill is >100 m to the nearest water course which is currently frozen and occurred in a lined engineered containment facility.

Immediate and Follow-Up Action:

Upon discovery of the spill, crews cleaned up waste oil using absorbent pads and the contaminated berm cover material was removed. Clean material was then placed in the influenced areas to return the berm back to its original condition. The damaged tote was pumped out and packed for backhaul disposal.

Recommendations:

Standard Operating Procedures (SOP) have been reviewed by operators working within containment facilities.

Current Status:

The containment berm has been cleaned of all oil and contaminated material. Influenced area has been replaced with clean cover material.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253- 0596 x6016.

Prepared by:


William Bowden
Environmental Superintendent

Reviewed by:

Jeff Bush

Digitally signed by Jeff Bush
Date: 2019.03.02 14:46:58
-05'00'

Attach: Photos, Map, Baffinland NT-NU Spill Report
Connor Devereaux, Gerald Rogers, Francois Gaudreau (Baffinland), Stephen Bathory (QIA), Ian Parsons, Jeremy Fraser (INAC).



Photo 1. MS-HWB-07 oil spill



Photo 2. MS-HWB-07 after clean up



Figure 1. Map of spill location

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE MONTH - DAY - YEAR 02-03-2019	REPORT TIME 06:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 034
B	OCCURRENCE DATE MONTH - DAY - YEAR 02-02-2019	OCCURRENCE TIME 06:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 19 SECONDS 32		LONGITUDE DEGREES 79 MINUTES 22 SECONDS 05	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Waste Oil	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 0.4m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Plastic Tote	SPILL CAUSE waste oil release	AREA OF CONTAMINATION IN SQUARE METRES Approx. 96 m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Frozen ground conditions	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION COMMENTS ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS During night shift on February 02, 2019, an operator was disposing of a tote of sump water from maintenance shops at the Mine Site. The operator brought the tote to an engineered lined containment berm to drain the sump water. Upon release it was determined that approximately 0.4M3 of waste oil had also been present in the tote impacting an approximate area of 96 m2. The waste oil free product was cleaned up from inside the berm and disposed of in quatrex bags. This spill is >100 m to the nearest water course which is currently frozen and occurred in a lined engineered containment facility. The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2. Baffinland NT NU spill report

Spill Report Number:
19-045



March 7, 2019

Resource Management Officer
Nunavut Field Operations
Indigenous and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.mesher@aandc-aadnc.gc.ca

Manager, Major Projects
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-045, Reported on February 07, 2019
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On February 07, 2019 at approximately 05:40 hrs, a loader made contact with a piece of oversized ore on the Crusher Pad while tramping material from the stockpile to the crusher hopper, which damaged the fuel tank causing a subsequent fuel release. The operator immediately shut off the loader, deployed spill sorbent supplies and contained the release. Approximately 0.2M3 of diesel fuel was released to the pad, impacting an approximate area of 20m2. The remaining fuel in the loader fuel tank was drained and captured in containment drums. The contaminated material was collected and deposited in a lined engineered containment facility at the Mine Site. The spill occurred >100 m to the nearest water course which is currently frozen.

Immediate and Follow-Up Action:

The operator immediately shut off the loader, deployed spill sorbent supplies and contained the release. The contaminated material was removed and properly disposed. New material was put down and leveled to return the area back to its original state.

Recommendations:

Standard Operating Procedures (SOP) to be reviewed by operators working within crusher stockpile areas. During daily toolbox meetings, supervisors reiterating staying alert to possible contact hazards in their work area.

Current Status:

The loader's fuel tank has been repaired and loader is back in operation.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253-0596 x6016.

Prepared By:

A handwritten signature in black ink, appearing to read "William Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Chase Gilson".
March 8, 2019.

Chase Gilson
Crushing Superintendent

Attach: Photos, Map, NT-NU Spill Report

cc. cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Connor Devereaux, Gerald Rogers, Francois Gaudreau (Baffinland), Fai Ndofo, Sean Joseph (QIA), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Spill location before clean-up



Photo 2. Spill location following clean-up

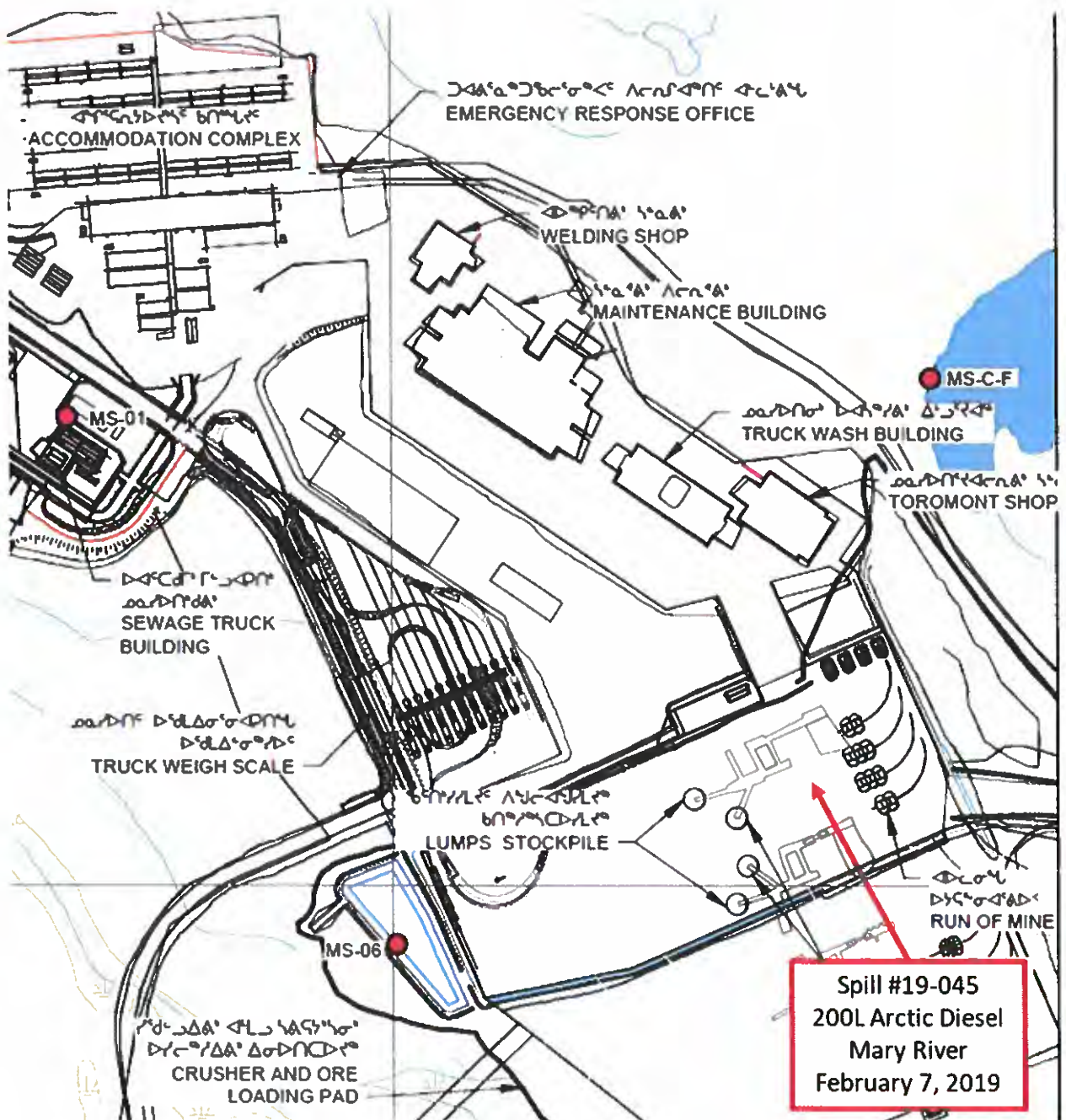


Figure 1 – Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE - MONTH - DAY - YEAR 02-07-2019	REPORT TIME 20:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT		REPORT NUMBER 19 - 045
B	OCCURRENCE DATE - MONTH - DAY - YEAR 02-07-2019	OCCURRENCE TIME 06:40			
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301		WATER LICENSE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 41		LONGITUDE DEGREES 79 MINUTES 16 SECONDS 21		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A			
H	PRODUCT SPILLED Arctic Diesel	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 0.2 M3	UN NUMBER N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	UN NUMBER N/A		
I	SPILL SOURCE Heavy Equipment	SPILL CAUSE Oversize Rock Contact	AREA OF CONTAMINATION IN SQUARE METRES 20m2		
J	FACTORS AFFECTING SPILL OR RECOVERY Dark, Frozen Conditions	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A		
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On February 07, 2019 at approximately 05:40 hrs, a loader made contact with a piece of oversized ore on the Crusher Pad while tramming material from the stockpile to the crusher hopper, which damaged the fuel tank causing a subsequent fuel release. The operator immediately shut off the loader, deployed spill sorbent supplies and contained the release. Approximately 0.2M3 of diesel fuel was released to the pad, impacting an approximate area of 20m2. The remaining fuel in the loader fuel tank was drained and captured in containment drums. The contaminated material was collected and deposited in a lined engineered containment facility at the Mine Site. The spill occurred >100 m to the nearest water course (which is currently frozen). The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.				
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River	TELEPHONE 416 364 8820
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

PAGE 1 OF 1

Figure 2 – NT-NU Spill report

Spill Report Number:
19-079



March 28, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Meshier@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-079
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On February 26, 2019 at approximately 05:30 hrs the WWTP operator observed an alarm at the WWTP. The operator noted the EQ storage tank was above capacity, and had resulted in sewage spilling over into the exhaust fan line and leaking out the vent to the adjacent WWTP pad. The operator proceeded to contact the vacuum truck and arrest the overflow. Approximately 280L of sewage was released to the WWTP pad, impacting an area of approximately 15.6m². The location is >100m to the nearest water course which is currently frozen.

Immediate and Follow-Up Action:

On arrival the operator placed a bucket under the vent line to prevent any further spillage and notified the supervisor. A vacuum truck was then used to pump down the level of waste in the EQ tank. The contaminated material was removed and properly disposed of.

Recommendations:

Continued routine inspections of system and routine checks for system alarms.

Current Status:

The wastewater treatment plant is currently operational.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "Jeff Bush".

Jeff Bush
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



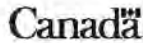
Photo 1. Overflow spill on camp pad surrounding WWTP.



Photo 2. Camp pad surrounding WWTP after spill clean up.



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR	REPORT TIME	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER	
	02-26-2019	21:00			
B	OCCURRENCE DATE: MONTH - DAY - YEAR	OCCURRENCE TIME	19 - 079		
	02-26-2019	00:20			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)			
	IOL - Commercial Lease: Q13C301	2AM-MRY1325 Type "A"			
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION			
	Mary River Milne Inlet Site, Baffin Island, NU	<input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN			
E	LATITUDE	LONGITUDE			
	DEGREES 71 MINUTES 18 SECONDS 49	DEGREES 79 MINUTES 17 SECONDS 06			
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
	Baffinland Iron Mines Corp.	2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION			
	N/A	N/A			
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER		
	Raw Sewage	Approx. 280L	N/A		
H	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER		
	N/A	N/A	N/A		
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES		
	Wastewater Treatment Plant	EQ tank overflow	15.6m2		
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT		
		N/A	N/A		
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS				
	<p>On February 26, 2019 at 05:30 Hrs an operator observed an alarm at the WWTP. The operator noted the EQ storage tank was above capacity, and had resulted in sewage spilling over into the exhaust fan line and leaking out the vent to the adjacent WWTP pad. The operator proceeded to contact the vacuum truck and arrest the overflow. Approximately 280L of sewage was released to the WWTP pad, impacting an area of approximately 15.6m2. The location is >100m to the nearest water course which is currently frozen. An investigation is underway to determine the cause and details of the cleanup will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.</p>				
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
	Connor Devereaux	Env. Superintendent	Baffinland	Mary River	416 364 8820
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT	ALTERNATE TELEPHONE
	Tim Sewell	Head of HSE	Baffinland		6016
N	REPORT LINE USE ONLY				
	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		STATION OPERATOR		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME		CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

PAGE 1 OF _____

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-084



April 2, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-084
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On March 2, 2019 at approximately 14:00 hrs, housing maintenance responded to a sewage line back up at the AC wing Mine Site Complex (MSC). A sewage release was discovered from the AC south wing lift station. After investigation, the spill was determined to be caused by both a discharge and gravity line failure from the sewage lift station. Approximately 3.2m³ of raw sewage was released impacting an area of 15m² during the initial spill and repairs of the lift station and lines. The final repairs of the system are still pending equipment and parts shipments to site.

Immediate and Follow-Up Action:

The lift station was immediately pumped down by vacuum truck to prevent any further release. Repairs were made to the gravity line; however, it was not possible to repair the discharge line with materials on site, which are on order. The contaminated material was removed and properly disposed of.

Recommendations:

Continued routine inspections of system. Final planned repairs to system pending material shipments to site.

Current Status:

The discharge line is not operational and it is required to empty this lift station using a vac truck twice per day.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in blue ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "JL Bush".

Jeff Bush
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Overflow spill on camp pad at AC wing.



Photo 2. Camp pad at AC wing after spill clean up.



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 03-03-2019	REPORT TIME 14:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT		REPORT NUMBER 19-084
B	OCCURRENCE DATE: MONTH - DAY - YEAR 03-02-2019	OCCURRENCE TIME unknown			
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"			
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 54		LONGITUDE DEGREES 79 MINUTES 16 SECONDS 59		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A			
H	PRODUCT SPILLED Raw Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 3m3	U.N. NUMBER N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A		
I	SPILL SOURCE Sewage Lift Station	SPILL CAUSE sewage line failure	AREA OF CONTAMINATION IN SQUARE METRES 15m2		
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, snow and ice	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A		
K	ADDITIONAL INFORMATION: COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS At 14:00 Hrs on March 02, 2019, housing maintenance responded to a sewage line back up at the AC wing Mine Site Complex (MSC). Arriving on scene, a sewage release was discovered from the AC south wing lift station. Upon initial investigation, the spill was determined to be caused by both a discharge and gravity line failure from the sewage lift station. The lift station was immediately pumped down by vacuum truck to prevent any further release. Repairs to the gravity and discharge lines are currently underway. Approximately 3m3 impacted the adjacent MSC pad to the lift station migrating over an area of approx. 15m2. The spill is >100 m from the nearest water body which is currently frozen. The investigation is ongoing, further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.				
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River	TELEPHONE 416 364 8820
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> FC <input type="checkbox"/> CCG <input type="checkbox"/> GSWT <input type="checkbox"/> GN <input type="checkbox"/> IA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME		CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-151



May 3, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-151
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On April 3, 2019 at approximately 10:00 hrs, housing maintenance, during routine inspections, discovered a sewage release at the West AD Mine Site Complex Wing (MSC). Upon initial investigation, the release was determine to be caused by a discharge line failure on a pipe fitting. The pumps from the AD south lift station were turned off immediately to prevent further potential release and repairs began. Approximately 4.5m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an area of approximately 90m2.

Immediate and Follow-Up Action:

The pumps from AD south lift station were immediately shut off to prevent further potential release. Repairs were made to the discharge line pipe fitting.

Recommendations:

Continue daily inspections of lift stations and sewage lines.

Current Status:

The discharge line has been repaired and is operational and inspected regularly.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A blue ink signature of William Bowden, written in a cursive style.

William Bowden
Environmental Superintendent

Reviewed by:

A blue ink signature of Jeff Bush, written in a cursive style.

Jeff Bush
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Separated Discharge Line under AD wing following insulation removal.



Photo 2. Repaired Discharge Line under AD wing prior to reinsulation.



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 04-04-2019	REPORT TIME 10:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT		REPORT NUMBER 19 151
B	OCCURRENCE DATE: MONTH - DAY - YEAR Unknown	OCCURRENCE TIME Unknown			
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301		WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 55		LONGITUDE DEGREES 79 MINUTES 17 SECONDS 01		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A			
H	PRODUCT SPILLED Raw Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 4.5 m3	U.N. NUMBER N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A		
I	SPILL SOURCE Lift Station Piping System	SPILL CAUSE Sewage Line Failure	AREA OF CONTAMINATION IN SQUARE METRES 90m2		
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, snow and ice	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A		
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS At 10:00 Hrs on April 03, 2019, housing maintenance, during routine inspections, discovered a sewage release at the West AD Mine Site Complex Wing (MSC). Upon initial investigation, the release was determine to be caused by a discharge line failure on a pipe fitting. The pumps from the AD south lift station were turned off immediately to prevent further potential release and repairs began. Approximately 4.5m3 of sewage was released and confined to the adjacent camp pad ground surface, impacting an area of approximately 90m2. The spill is >100 m from the nearest water body which is currently frozen. The investigation, repairs, and cleanup are ongoing, further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H , item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).				
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River	TELEPHONE 416 364 8820
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

2275 Upper Middle Road East, Suite 300 | Oakville, ON, Canada L6H 0C3
Main: 416.364.8820 | Fax: 416.364.0193 | www.baffinland.com

Spill Report Number:
19-162



May 18, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-162
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On April 19, 2019 at approximately 15:00 Hrs while completing routine inspections, a housing maintainer observed sewage coming from the Port Site Complex BA Wing lift station. Upon investigation the release was determined to be caused by a holding tank failure. Following the release discovery, the housing maintainer shut off the water supply to the BA Wing to prevent any further release. Approximately 500L of sewage was released to the adjacent camp pad, impacting an area of approximately 40m². The contaminated snow/ice was then removed and transported to the Polishing Waste Stabilization Pond.

Immediate and Follow-Up Action:

The water supply was shut off to the BA wing and the lift station was pumped down with a vacuum truck to prevent any further release. Repairs were made to the crack in the holding tank; however, the epoxy sealant used to repair the crack was not effective, so the float was lowered to below the damaged section. Attempts to repair the crack in the holding tank will be conducted during warmer conditions.

Recommendations:

Daily inspections of lift stations and sewage lines continue.

Current Status:

No further spills have occurred and the lift station is operational. Inspections continue on a daily frequency.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Gordon Mudryk".

Gordon Mudryk
Site Services Manager

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



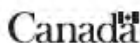
Photo 1. Spill clean up in progress at BC wing.



Photo 2. Camp pad at BC wing after spill clean up.



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 04-20-2019	REPORT TIME 13:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 162
	OCCURRENCE DATE: MONTH - DAY - YEAR 04-19-2019	OCCURRENCE TIME 15:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301		WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"	
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 53 SECONDS 02		LONGITUDE DEGREES 80 MINUTES 53 SECONDS 09	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Raw Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 500L	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Lift station holding tank	SPILL CAUSE Holding tank failure	AREA OF CONTAMINATION IN SQUARE METRES 40m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Snow and Ice, congested area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS At 15:00 Hrs on April 19, 2019, while completing routine inspections, a housing maintainer observed sewage coming from the Port Site Complex BA Wing lift station. Upon initial investigation the release was determined to be caused by a holding tank failure. Following the release discovery, the housing maintainer shut off the water supply to the BA Wing to prevent any further release. Approximately 500L of sewage was released to the adjacent camp pad, impacting an area of approximately 40m2. The contaminated snow/ice was then removed and transported to the Polishing Waste Stabilization Pond. The spill is >100 m from the nearest water body which is currently frozen. The investigation, repairs, and cleanup are ongoing, further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Director of HSES	EMPLOYER Baffinland	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NES <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			CONTACT NAME	CONTACT TIME
LEAD AGENCY			REMARKS	
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2. Baffinland NT NU spill report

Spill Report Number:
19-198



June 06, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Enforcement Officer
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-198
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On May 07, 2019, warming temperatures resulted in snowmelt runoff at the Project. The runoff contained sediment-laden water, and was observed to be flowing at the following locations at the Mary River Site (SDLT, CLSP and CLT). The source of the sedimentation was snow melt from the surrounding Project infrastructure. The event resulted in sediment-laden water flowing onto and under the ice of Camp Lake and Sheardown Lake. Tables 1 to 3 outline water quality results from monitoring conducted from May 7-9th at each respective drainage.

Sample Location	Description	Coordinates (Lat/Long)
CLSP-OUT	Camp Lake Sedimentation Ponds Outlet	N 71°19'42.2", W 079°22'55.4"
CLT-OUT	Camp Lake Tributary 1 (100m upstream of Camp Lake Outfall)	N 71°19'47.2", W 079°23'07.0"
SDLT-OUT	Sheardown Lake Tributary 1 (100m upstream of Sheardown Lake Outfall)	N 71°18'58.8", W 079°18'44.5"

Immediate and Follow-Up Action:

Upon discovery of the elevated instream TSS conditions at these drainages, personnel worked to install sedimentation mitigation measures, including earth works, check dams, silt fences and spring berms, in accordance with the Surface Water Management Plan, in an attempt to slow flow and settle sediments prior to entering the streams.

On May 9th, 2019, additional water sampling for acute toxicity was conducted at CLT-OUT, CLSP-OUT and SDLT-OUT. The samples collected were determined to be acutely non-toxic.

In the days leading up to freshet, snow pack around the inlets and outlets of select culvert locations was excavated, including the SDLT and CLT crossings, to reduce the volume of snow melt and thus, the amount of overland flow present to mobilize sediment. Rip rap and check dams were also constructed at strategic locations. Water diversion and pumping strategies were implemented to reduce potential erosion and sedimentation.

Current Status:

Conditions at CLT, CLSP and SDLT, as well as other freshet monitoring locations, are currently being sampled and assessed as per Baffinland's Freshet Monitoring Program. A more comprehensive Freshet Report will be submitted to document the water quality of water bodies and surface water drainages near Project infrastructure and summarize the corrective actions implemented to address sediment releases and other areas of concern identified during freshet 2019. Continued monitoring during freshet conditions and routine maintenance of check dams, silt fences and spring berms, where applicable.



Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in blue ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "Shawn Stevens".

Shawn Stevens
Manager of Health, Safety, Environment and Security

Attach: Photos, Map, Baffinland NT-NU Spill Report, Water Quality Results

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC), Curtis Didham (ECCC).

CLT Drainage



Photo 1. Snow clearing at the outlet of BG-01 on May 6, 2019



Photo 2. CLT Outfall on May 7, 2019



Photo 3. CLT Outfall on May 9, 2019



Photo 4. Silt Fencing at the outlet of BG-01 on May 9, 2019



Photo 5. CLT Outfall on May 13, 2019



Photo 6. CLT Outfall on June 6, 2019

CLSP Drainage



Photo 1. Camp Lake Settling Ponds prior to construction on May 2, 2019



Photo 2. Armouring upstream of the CLSP drainage valley on May 2, 2019



Photo 3. Camp Lake Settling Ponds during construction on May 8, 2019



Photo 4. CLSP Outfall into silt curtain on May 9, 2019



Photo 5. ESC measures at the CLSP Outfall on May 10, 2019



Photo 6. CLSP Outfall into silt curtain on May 10, 2019



Photo 7. CLSP Outfall construction on May 13, 2019



Photo 8. CLSP Outfall on June 6, 2019

SDLT Drainage



Photo 1. SDLT Outfall on May 7, 2019



Photo 2. Check dam construction at the outlet of CV-186 on May 8, 2019



Photo 3. SDLT Outfall on May 9, 2019



Photo 4. Silt fence installation at the outlet of CV-186 on May 18, 2019

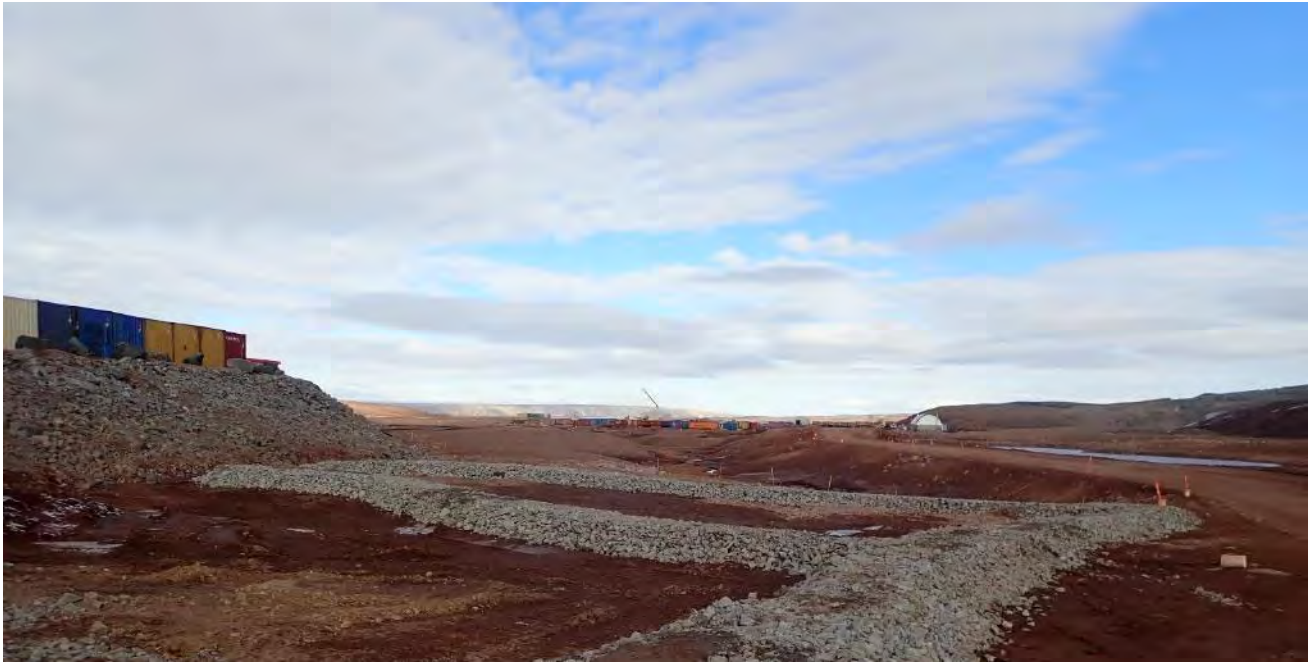


Photo 5. Check dam construction at the outlet of CV-186 on May 22, 2019



Photo 6. SDLT Outfall on June 6, 2019



Figure 1. Map of CLT and CLSP spill locations



Figure 2. Map of SDLT spill location

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 05-09-2019	REPORT TIME 21:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 198
B	OCCURRENCE DATE: MONTH - DAY - YEAR 05-07-2019	OCCURRENCE TIME 14:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease No.: Q13C301	WATER LICENSE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Project Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES MINUTES SECONDS		LONGITUDE DEGREES MINUTES SECONDS	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Sediment-laden water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Unquantified	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Melting snow, overland flow	SPILL CAUSE Rapid melt	AREA OF CONTAMINATION IN SQUARE METRES N/A	
J	FACTORS AFFECTING SPILL OR RECOVERY Snow covered area, high flow	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On May 07, 2019, warming temperatures resulting in snowmelt runoff containing sediment-laden water observed to be flowing at multiple locations at the Mary River Mine Site (SDLT, CLSP and CLT). The source of the sedimentation was snow melt from the surrounding mine site infrastructure. The event resulted in sediment-laden water flowing onto and under the ice of Camp Lake and Sheardown Lake. In accordance with the Surface Water Management Plan, sedimentation mitigation measures were implemented including; check dams, silt fences and spring berms in an attempt to settle sediments prior to discharge. With freshet conditions present, daily monitoring of the water quality is ongoing; initial water quality sample results were submitted to ALS lab for analysis. This spill is being reported as required by the conditions of Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act and as required by subsection 38(4) of the Fisheries Act.			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 647.253.0596
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Director of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION 647.253.0596
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME			REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 3. Baffinland NT NU spill report



Table 1. CLT Outfall Water Quality Results

Analyte	Sample ID			CLT-OUT	CLT-OUT	CLT-OUT
	ALS Laboratory Sample ID			L2269130-5	L2270047-2	L2270800-1
	Sample Date & Time			2019-05-07 15:00	2019-05-08 10:15	2019-05-09 13:45
	Units	LOR	Limits			
pH	pH units	0.1	6.0 - 9.5	7.81	7.83	7.68
Total Suspended Solids	mg/L	2	30	175	30.8	19.2
Total Dissolved Solids	mg/L	20	-	121	98	65
Turbidity	NTU	0.1	-	165	58.5	42.7
Acute Toxicity	-	-	Non-lethal	-	-	Non-lethal

Table 2. CLSP Outfall Water Quality Results

Analyte	Sample ID			CLSP-OUT	CSLP-OUT
	ALS Laboratory Sample ID			L2270047-1	L2270800-2
	Sample Date & Time			2019-05-08 9:25	2019-05-09 12:50
	Units	LOR	Limits		
pH	pH units	0.1	6.0 - 9.5	7.96	7.87
Total Suspended Solids	mg/L	2	30	187	187
Total Dissolved Solids	mg/L	20	-	148	122
Turbidity	NTU	0.1	-	324	279
Acute Toxicity	-	-	Non-lethal	-	Non-lethal

Table 3. SDLT Outfall Water Quality Results



Analyte	Sample ID			SDLT-OUT	SDLT-OUT	SDLT-OUT
	ALS Laboratory Sample ID			L2269130-1	L2270047-4	L2270800-5
	Sample Date & Time			2019-05-07 11:20	2019-05-08 11:55	2019-05-09 15:35
	Units	LOR	Limits			
pH	pH units	0.1	6.0 - 9.5	7.5	7.6	7.56
Total Suspended Solids	mg/L	2	30	28.8	74.4	116
Total Dissolved Solids	mg/L	20	-	62	61	74
Turbidity	NTU	0.1	-	78.1	122	142
Acute Toxicity	-	-	Non-lethal	-	-	Non-lethal

Spill Report Number:

19-201



June 11, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-201
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On May 12, 2019 at approximately 02:00 hrs, a skid steer lost traction while approaching a tote of diesel exhaust fluid, resulting in the skid steer fork puncturing the tote and the subsequent release of DEF fluid. The operator immediately placed the tote into secondary containment on its side to prevent further release. Approximately 0.6m³ of diesel exhaust fluid was released to the pad, impacting an approximate area of 60m².

Immediate and Follow-Up Action:

The tote was placed on its side in a containment berm to prevent further release. The contaminated water and soil were removed and properly disposed of. Proper fork lift operation was reviewed with operators.

Current Status:

The impacted area has been remediated and has returned to normal operation.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Al Wertz".

Al Wertz
Port and Logistics Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Gerald Rogers, Francois Gaudreau, Christopher Murray, Al Wertz (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. DEF Fluid Impacted Water on May 12, 2019



Photo 2. DEF Fluid Spill After Clean Up on June 11, 2019



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 05-12-2019	REPORT TIME 11:20	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 201
	B	OCCURRENCE DATE: MONTH - DAY - YEAR 05-12-2019		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301		WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"	
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 19 SECONDS 16		LONGITUDE DEGREES 79 MINUTES 20 SECONDS 07	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Diesel Exhaust Fluid (Urea)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 600L	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Tote	SPILL CAUSE Equipment Damage	AREA OF CONTAMINATION IN SQUARE METRES 60m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Mud and Meltwater	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On May 12, 2019 at approximately 02:00 hrs, a skid steer lost traction while approaching a tote of diesel exhaust fluid, resulting in the skid steer fork puncturing the tote and the subsequent release of DEF fluid. The operator immediately placed the tote into secondary containment on its side to prevent further release. Approximately 0.6m3 of diesel exhaust fluid was released to the pad, impacting an approximate area of 60m2. The contaminated water from the pad was collected and deposited in a lined engineered containment facility at the Mine Site. The spill occurred >100 m to the nearest water course. The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Director of HSES	EMPLOYER Baffinland	TELEPHONE 416 364 8820
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			REPORT LINE NUMBER (867) 920-8130	
SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

Spill Report Number:
19-212



June 18, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-212
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

While completing an inspection of the crawl space beneath the Port Site Weatherhaven camp, the building maintainer observed an area of pooling water below the women's bathroom. Upon initial investigation it was observed that a 2" drain line from the restroom showers had developed a leak. Approximately 1m³ of grey water was released to the adjacent camp pad, impacting an area of approximately 80m². The spill was >100 m from the nearest water body.

Immediate and Follow-Up Action:

Following the release discovery, a confined space entry permit was completed, the water was pumped out using a vac truck and the damaged pipe was replaced. The contaminated water was removed and transported to the Polishing Waste Stabilization Pond.

Recommendations:

Continued routine inspections of the bathroom drainage system.

Current Status:

The drainage pipe is operational as designed with no further leaks.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "James Martin".
James Martin
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, Connor Devereaux, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



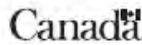
Photo 1. Damaged drain below women's bathroom.



Photo 2. Repaired drain below women's bathroom.



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 05-20-2019	REPORT TIME 14:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 212
	OCURRENCE DATE: MONTH - DAY - YEAR 05-19-2019	OCURRENCE TIME 15:30		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301		WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"	
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 53		LONGITUDE DEGREES 80 MINUTES 53 SECONDS 54	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Grey water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 1m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Drain pipe	SPILL CAUSE Pipe fitting failure	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, ice and water	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS While completing an inspection of the crawl space beneath the Port Site Weatherhaven camp, the building maintainer observed an area of pooling water below the womens bathroom. Upon initial investigation it was observed that a 2" drain line from the restroom showers had developed a leak. Following the release discovery, a confined space entry permit was completed, the water was pumped out using a vac truck and the damaged pipe was replaced. Approximately 1m3 of grey water was released to the adjacent camp pad, impacting an area of approximately 80m2. The contaminated water was removed and transported to the Polishing Waste Stabilization Pond. The spill is >100 m from the nearest water body. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Director of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NES <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME			REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

Spill Report Number:
19-219



June 23, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Meshier@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-219
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On May 23, 2019, during routine inspections, the Waste Water Treatment Operator discovered a sewage release at the Weather Haven Mine Site Complex lift station. Upon initial investigation, it was determined that the discharge line sourcing from the lift station had separated at a coupling. The pumps servicing the lift station were immediately shut off and repairs to the separated coupler were made. Approximately 1m³ of sewage was released to the adjacent camp pad ground surface, impacting an area of approximately 16m².

Immediate and Follow-Up Action:

The pumps from lift station were immediately shut off to prevent further potential release. Repairs were made to the discharge line pipe fitting.

Recommendations:

Continue daily inspections of lift stations and sewage lines.

Current Status:

The discharge line has been repaired and is operational and inspected regularly.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "J. Bush".

Jeff Bush
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, Connor Devereaux, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC) Chris Spencer, Jared Ottenhof (QIA).



Photo 1. Separated Discharge Line under Weatherhaven lift station.



Photo 2. Repaired Discharge Line under Weatherhaven lift station.



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 05-24-2019	REPORT TIME 22:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 219
B	OCCURRENCE DATE: MONTH - DAY - YEAR 05-23-2019	OCCURRENCE TIME Unknown		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 19 SECONDS 33		LONGITUDE DEGREES 79 MINUTES 22 SECONDS 26	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Sewage/ grey water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 1m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Weatherhaven Lift Station	SPILL CAUSE Pipe Fitting Failure	AREA OF CONTAMINATION IN SQUARE METRES 16m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, snow, melt water	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	<p>ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS</p> <p>On May 23, 2019, during routine inspections, the Waste Water Treatment Operator discovered a sewage release at the Weather Haven Mine Site Complex lift station. Upon initial investigation, it was determined that the discharge line sourcing from the lift station had separated at a coupling. The pumps servicing the lift station were immediately shut off and repairs to the separated coupler were made. Approximately 1m3 of sewage was released to the adjacent camp pad ground surface, impacting an area of approximately 16m2. The spill is >100 m from the nearest water body.</p> <p>The investigation is ongoing, and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).</p>			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

Spill Report Number:
19-226



June 29, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Enforcement Officer
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-226
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On May 30th 2019, runoff from the Mine Haul Road ditches and Tundra above at 108.5 and 106.5 was observed to be flowing impacted discharging onto the tundra as designed. Upon investigation, water runoff through the road's ditching and culvert system resulted in sediment impacted water traveling across the mountain tundra, entering Mary River Tributary and Mary River. Table 1 outlines water quality results from monitoring conducted May 31st and June 7th on Mary River downstream of the Project Infrastructure.

Sample Location	Description	Coordinates (Lat/Long)
E0-20	Mary River- Downstream of Project Infrastructure	71°17'45.1"N 79°16'34.5"W

Immediate and Follow-Up Action:

Upon discovery of the elevated TSS conditions, as outlined in the Surface Water Management Plan, sedimentation mitigation measures were implemented. Project personnel worked to install sedimentation mitigation measures, including check dams, gabion baskets, silt fences and ditch maintenance in an attempt to settle sediments before reaching the receiving environment. This included construction of a new check dam system at the km 108.5 location. Surface water was diverted away from problematic areas to minimize the impacted water entering Mary River.

Samples, including acute toxicity, were collected on May 31st on Mary River at E0-20, an approved Aquatic Effects Monitoring Program sample site downstream of sediment releases to evaluate the impact on the receiving environment. The samples collected were determined to be acutely non-toxic. On June 7th, 2019, E0-20 was resampled and confirmed that sedimentation mitigation measures were effectively settling suspended solids.

In the days leading up to freshet, snow pack around the Mine Haul Road culverts and ditches were excavated to reduce the volume of snow melt and thus, reduce the amount of overland flow present to mobilize sediment. Rip rap and check dams were also maintained at strategic locations. Water diversion and pumping strategies were implemented to reduce potential erosion and sedimentation.

Current Status:

Conditions at Mary River are currently being sampled and assessed as per Baffinland's Aquatic Effects Monitoring Program. Mary River is currently observed to be flowing under normal conditions and routine maintenance of check dams down gradient the road is ongoing.



Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in blue ink that reads "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink that reads "Simon L. Fleury".

Simon Fleury
Mine Manager

Attach: Photos, Map, Baffinland NT-NU Spill Report, Water Quality Results

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, Connor Devereaux, Gerald Rogers, Francois Gaudreau, Christopher Murray, Lou Kamermans (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC) Curtis Didham (ECCC).

Photos



Photo 1. Sediment impacted water traveling across the tundra on May 30, 2019



Photo 2. Sediment impacted water traveling across the tundra on May 30, 2019



Photo 3. Sediment impacted water on May 30, 2019



Photo 4. Km 108.5 Check Dam Sedimentation mitigation measure installation on June 5, 2019



Photo 5. Examples of Sedimentation mitigation measure installation on June 5, 2019



Photo 6. Examples of Sedimentation mitigation measure installation on June 7, 2019



Photo 7. Mary River, sediment impacted water on May 31, 2019



Photo 8. Mary River, normal conditions on June 7, 2019

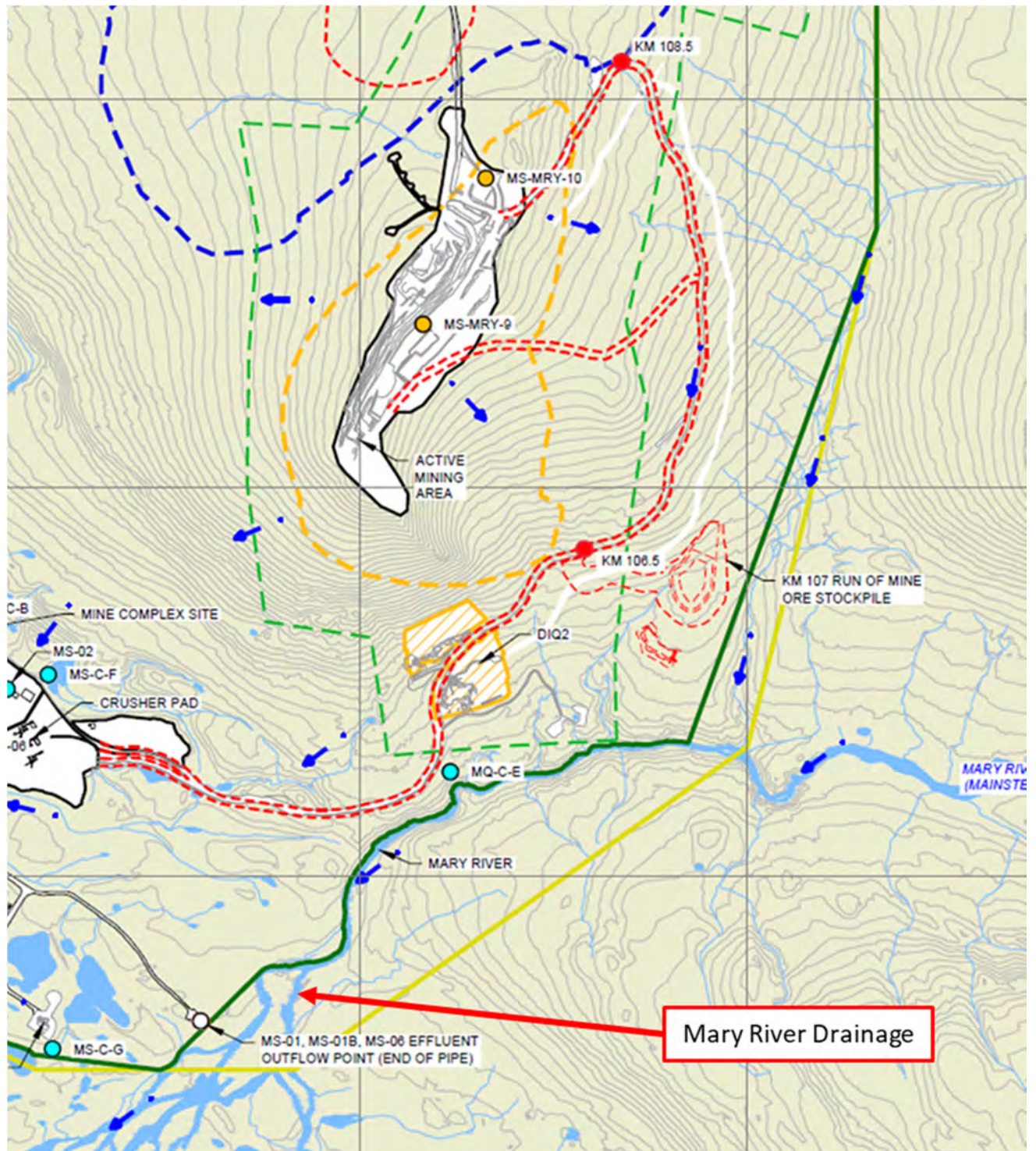


Figure 1. Map of E0-20 sample location, KM 108.5 and KM 106.5 impacted sediment locations, and site drainage

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 05-31-2019	REPORT TIME 20:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 226
B	OCCURRENCE DATE: MONTH – DAY – YEAR 05-30-2019	OCCURRENCE TIME Unknown		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Milne Inlet Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES: 71 MINUTES: 18 SECONDS: 39		LONGITUDE DEGREES: 79 MINUTES: 11 SECONDS: 56	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Sediment	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES unquantifiable	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Spring freshet/snow melt	SPILL CAUSE Rapid snow melt	AREA OF CONTAMINATION IN SQUARE METRES N/A	
J	FACTORS AFFECTING SPILL OR RECOVERY Steep embankment, poor access	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On May 29th 2019, runoff from the Mine Haul Road ditches at 108.5 and 106.5 was observed to be flowing impacted discharging onto the tundra as designed. Upon investigation, water runoff through the road's ditching and culvert system has resulted in sediment impacted water traveling across the mountain tundra, entering Mary River Tributary and Mary River. In accordance with the Surface Water Management Plan, sedimentation mitigation measures are being implemented including; check dams, silt fences and ditch maintenance in an attempt to settle sediments before discharge to the receiving environment. Surface water is also being diverted away from problematic areas to minimize the impacted water entering Mary River. A follow up report will be provided with further information on mitigation measures. This incident is being reported as required by the conditions of Water License no. 2AM-MRY1325, Part H, item 9(b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act and as required by subsection 38(4) of the Fisheries Act.			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME		CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

Figure 3. Baffinland NT NU spill report



Table 1. E0-20 Water Quality Results

Analyte	Sample ID			E0-20	E0-20
	ALS Laboratory Sample ID			L2283557-1	L2287922-1
	Sample Date & Time			2019-05-31 12:40	2019-06-07 8:35
	Units	LOR	Limits		
pH	pH units	0.1	6.0 - 9.5	7.54	7.69
Total Suspended Solids	mg/L	2	30	63.6	7.2
Total Dissolved Solids	mg/L	20	-	49	24
Turbidity	NTU	0.1	-	64.1	7.69
Acute Toxicity	-	-	Non-lethal	Non-Lethal	-

Spill Report Number:
19-246



July 18, 2019

Resource Management Officer
Nunavut Field Operations
Indigenous and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.mesher@aandc-aadnc.gc.ca

Manager, Major Projects
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-246, Reported on June 18, 2019
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

During routine inspections of the Port Site, staining was observed on an area of LP7 laydown. Upon initial investigation it was observed that a release of transmission fluid was present beneath a seacan container. Following the removal of the seacan it was observed that approximately 250L of transmission oil was released onto the laydown pad, impacting an area of approximately 50m². The source of the spill could not be verified. The contaminated material was removed, placed in quatrex bags and stored temporally in the landfarm facility until backhaul. The spill occurred >100m to the nearest water course and was confined to the immediate area.

Immediate and Follow-Up Action:

The contractor responsible for the laydown was immediately notified, the spill was inspected, and cleanup efforts were initiated. Spill sorbents were deployed and the contaminated water was pumped into totes and prepped for backhaul. The remnants of the contaminated material were removed and placed in Quatrex bags for backhaul. The laydown was remediated to its original state using clean fill material.

Recommendations:

Regular inspections of the area will continue to occur. Contractor supervisors reviewed spill reporting guidelines with their teams.

Current Status:

The laydown use continues as intended. Inspections of the area continues to ensure no further sheen or staining is observed.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253-0596 x6016.

Prepared By:

A handwritten signature in blue ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "Shawn Stevens".

Shawn Stevens
Manager Health, Safety, Environment and Security

Attach: Photos, Map, NT-NU Spill Report

cc: Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, Connor Devereaux, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC) Chris Spencer, Jared Ottenhof (QIA).



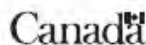
Photo 1. Spill location before clean-up



Photo 2. Spill location following clean-up



Figure 1 – Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 06-18-2019	REPORT TIME 22:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____
B	OCCURRENCE DATE: MONTH - DAY - YEAR Unknown	OCCURRENCE TIME Unknown		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 22		LONGITUDE DEGREES 80 MINUTES 53 SECONDS 34	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Transmission oil	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 250L	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE laydown area	SPILL CAUSE Unknown	AREA OF CONTAMINATION IN SQUARE METRES 50m2	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS During routine inspections of the Port Site, staining was observed on an area of a laydown. Upon initial investigation it was observed that a release of transmission fluid was present beneath a seacan container on the laydown. Following the removal of the seacan it was observed that approximately 250L of transmission oil was released on to the laydown pad, impacting an area of approximately 50m2. The source of the spill is currently under investigation and contaminated material will be removed and deposited in the landfarm facility. The spill occurred >100m to the nearest water course and was confined to the immediate laydown pad. The investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of NWB Water License no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12 (3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Tim Sewell	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE TELEPHONE ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2 – NT-NU Spill report

APPENDIX E.8.4

Initial and Follow-up Spill Reports

Spill Report Number:
19-279



August 09, 2019

Jonathan Mesher, Water Resource Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Iqaluit Office
Box 100
Iqaluit, NU X0A 0H0

Monika Trottier, Enforcement Officer
Curtis Didham, Enforcement Officer
Environment and Climate Change
Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-279, Reported on July 11, 2019, Mary River Project - Water Licence No. 2AM-MRY1325

On July 10th 2019, at approximately 14:00, during an inspection of the Crusher Facility (CF) with Environment and Climate Change Canada (ECCC) it was observed that water was flowing out of the east collection ditch at the toe in two (2) separate locations. Water entering this ditch was immediately diverted to prevent entry into the east ditch, and pumped directly from the source into the CF sedimentation pond (MS-06). It was determined that the source of water on the pad was ice and water entrained in the ore stockpile that melted as the pile was reclaimed. During this period the site was experiencing dry and warm conditions which compounded melting. Initial in situ field readings of the releases demonstrated neutral pH. Prior to this event, field monitoring completed on July 8th indicated that no water was observed entering, or pooling, in the east collection ditch.

Water quality monitoring was conducted downstream of the CF sedimentation pond at the Water License sampling location MS-C-C on June 30th, July 7th, 10th and 16th. Water quality monitoring was conducted at both release locations on July 10th and 11th. CP-SEEPAGE-1 was dry during the July 11th site visit, and was not sampled. Field monitoring was conducted on July 14th and field readings were taken at CP-SEEPAGE-1. CP-SEEPAGE-2 was dry. Lab results for all parameters analyzed were compliant with applicable regulatory criteria with the exception of total suspended solids (TSS). Field personnel noted that substrate entered bottle during sample collection due to low water level.

Appendix A outlines water quality results from monitoring conducted at the release locations and the downstream Water License location. Appendix B includes the Certificates of Analyses (COAs) for these sampling events.

As per Section 31 of the Metal and Diamond Mining Effluent Regulations (MDMER):

- a) Surface water at the CF sedimentation pond collection ditch.
- b) Unknown quantity
- c) The release was first observed at approximately 14:00 on July 10th, 2019. A summary is provided in Appendix A of the sampling events that occurred upon observation of the uncontrolled release which includes date, time and respective water quality results.
- d) The quantity of surface water released from the collection ditch is unknown. The two locations of the release are listed below.

ID	Location
CP-SEEPAGE-1	17W 561645 7912653
CP-SEEPAGE-2	17W 561580 7912914

- e) N/A. The release did not occur through a final discharge point.
- f) Sheardown Lake tributary is the receiving body of water. The release was contained to the adjacent tundra of the crusher pad which is over 1km from Sheardown Lake tributary, the nearest fish bearing waters.



- g) No acute lethality test was able to be taken at the time of deposit.
- h) See summary above for circumstances of deposit. Extent of release was minimal and prohibited proper water sampling procedures. As per Baffinland's Emergency Response Plan and Spill Contingency Plan a berm was immediately constructed to prevent water from entering the ditch and the water was pumped directly into the CF sedimentation pond (MS-06).
- i) The water from the pad continues to be diverted from the ditch and pumped directly into the CF sedimentation pond. Field monitoring continues at the crusher pad facility and no further releases have been observed. A third party engineering firm has been contracted to complete a field visit to determine corrective actions.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253-0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Shawn Stevens".

Shawn Stevens
Manager Health, Safety, Environment and Security

Attach: Photos, Map, NT-NU Spill Report, Water Quality Results, Certificates of Analyses

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Francois Gaudreau, Christopher Murray, Lou Kamermans (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC), Curtis Didham (ECCC).



Photo 1. July 8th, 2019 – Dry collection ditch.



Photo 2. July 8th, 2019 – Dry collection ditch.



Photo 3. July 10th, 2019 – CP-SEEPAGE-1 sample location.



Photo 4. July 10th, 2019 – CP-SEEPAGE-2 sample location.



Photo 5. July 10th, 2019 – Pump set up to bypass ditch.



Photo 6. July 10th, 2019 – Pump set up to bypass ditch.



Photo 7. July 11th, 2019 – Dry collection ditch.



Photo 8. July 11th, 2019 – Dry collection ditch.



Photo 9. July 11th, 2019 – CP-SEEPAGE-1 sample location.



Photo 10. July 11th, 2019 – CP-SEEPAGE-2 sample location.



Photo 11. July 11th, 2019 – Collection Ditch.



Figure 1 – Overview map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 07-11-2019	REPORT TIME 18:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 279
B	OCCURRENCE DATE: MONTH – DAY – YEAR 07-10-2019	OCCURRENCE TIME 14:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 30		LONGITUDE DEGREES 79 MINUTES 16 SECONDS 35	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Surface Water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Unknown	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Crusher Pad	SPILL CAUSE Seepage through ditch	AREA OF CONTAMINATION IN SQUARE METRES N/A	
J	FACTORS AFFECTING SPILL OR RECOVERY Drainage to tundra	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On July 10th 2019, at approx. 14:00, on an inspection of the Crusher Ore Stockpile pond with Environment and Climate Change Canada it was observed that water was flowing out of the east collection ditch at the toe in two separate locations. Water entering this ditch was immediately diverted to prevent entry into the east ditch, and pumped directly from the source into the MS-06 pond. It was determined that the source of water on the pad was from water entrained in the ore stockpile that melted as the pile was reclaimed. During this period the site was experiencing dry and warm conditions which compounded melting. Initial field readings of the releases were compliant with applicable water license criteria. During field monitoring completed on July 8th no water was observed entering, or pooling, in the east collection ditch. The incident occurred on IOL located > 1km from Sheardown Lake tributary, the nearest fish bearing waters and did not migrate from vicinity of release. Water quality monitoring and corrective actions will be presented in the follow-up report.			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME			REMARKS	
CONTACT TIME				
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2 – NT-NU Spill report

Appendix A
Water Quality Results Summary

Table 1 - Summary of Analytical Results
Crusher Facility Seepage, Mary River Project

	ALS Laboratory Sample ID			MS-C-C	MS-C-C	CP-SEEPAGE-1 ²	CP-SEEPAGE-2 ²	MS-C-C	CP-SEEPAGE-2	MS-C-C
	ALS ID			L2303454-6	L2305271-9	L2307800-2	L2307800-1	L2307800-4	L2308650-4	L2311077-14
	Sample Date & Time			6/30/2019 1:55:00 PM	7/7/2019 12:30:00 PM	7/10/2019 3:55:00 PM	7/10/2019 3:10:00 PM	7/10/2019 4:25:00 PM	7/11/2019 3:10:00 PM	7/16/2019 1:55:00 PM
	QA/QC Sample Type			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Units	LOR	MDMER Grab Sample Limits							
pH	pH units	0.1	6.0-9.5	7.48	7.71	6.94	7.32	7.63	7.27	7.88
Total Suspended Solids	mg/L	2	30	<2.0	<2.0	481.00	99.40	<2.0	6	<2.0
Total Dissolved Solids	mg/L	20	-	1400	1180	6960	4360	1290	4320	909
Turbidity	NTU	0.1	-	0.4	0.3	51.2	31.6	1.04	14.6	0.58

Notes:

¹Metal and Diamond Mining Effluent Regulations - Schedule 4

²Field personnel indicated substrate entered bottle during sample collection due to low water level

Appendix B
Certificates of Analyses



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 04-JUL-19
Report Date: 05-JUL-19 10:58 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2303454
Project P.O. #: 4500057496
Job Reference: MS SNP MONITORING
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2303454-1 MQ-C-D Sampled By: BR/JK on 30-JUN-19 @ 10:25 Matrix: WATER Physical Tests								
pH		7.91		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		6.4		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		167		20	mg/L		04-JUL-19	R4694209
Turbidity		14.5		0.10	NTU		04-JUL-19	R4693286
L2303454-2 MQ-C-D03 Sampled By: BR/JK on 30-JUN-19 @ 10:25 Matrix: WATER Physical Tests								
pH		5.28		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		<2.0		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		<20		20	mg/L		04-JUL-19	R4694209
Turbidity		<0.10		0.10	NTU		04-JUL-19	R4693286
L2303454-3 MQ-C-B Sampled By: BR/JK on 30-JUN-19 @ 11:10 Matrix: WATER Physical Tests								
pH		8.06		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		4.0		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		415		20	mg/L		04-JUL-19	R4694209
Turbidity		6.43		0.10	NTU		04-JUL-19	R4693286
L2303454-4 MS-C-E Sampled By: BR/JK on 30-JUN-19 @ 13:25 Matrix: WATER Physical Tests								
pH		8.08		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		<2.0		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		851		20	mg/L		04-JUL-19	R4694209
Turbidity		0.73		0.10	NTU		04-JUL-19	R4693286
L2303454-5 MS-C-D Sampled By: BR/JK on 30-JUN-19 @ 13:45 Matrix: WATER Physical Tests								
pH		8.39		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		<2.0		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		1040		20	mg/L		04-JUL-19	R4694209
Turbidity		2.59		0.10	NTU		04-JUL-19	R4693286
L2303454-6 MS-C-C Sampled By: BR/JK on 30-JUN-19 @ 13:55 Matrix: WATER Physical Tests								
pH		7.48		0.10	pH units		04-JUL-19	R4693283
Total Suspended Solids		<2.0		2.0	mg/L		04-JUL-19	R4694193
Total Dissolved Solids		1400		20	mg/L		04-JUL-19	R4694209

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2303454-6	MS-C-C							
	Sampled By: BR/JK on 30-JUN-19 @ 13:55 Matrix: WATER							
Physical Tests								
Turbidity		0.39		0.10	NTU		04-JUL-19	R4693286
L2303454-7	MS-MRY-13B							
	Sampled By: BR/JK on 30-JUN-19 @ 14:55 Matrix: WATER							
	Physical Tests							
	pH	8.38		0.10	pH units		04-JUL-19	R4693283
	Total Suspended Solids	2.4		2.0	mg/L		04-JUL-19	R4694193
L2303454-8	MS-MRY-13A							
	Sampled By: BR/JK on 30-JUN-19 @ 15:15 Matrix: WATER							
	Physical Tests							
L2303454-9	MS-C-A							
	Sampled By: BR/JK on 30-JUN-19 @ 16:25 Matrix: WATER							
	Physical Tests							
	pH	7.86		0.10	pH units		04-JUL-19	R4693283
L2303454-10	MS-C-A01							
	Sampled By: BR/JK on 30-JUN-19 @ 16:25 Matrix: WATER							
	Physical Tests							
	pH	7.86		0.10	pH units		04-JUL-19	R4693283
L2303454-11	MS-C-B							
	Sampled By: BR/JK on 30-JUN-19 @ 17:00 Matrix: WATER							
	Physical Tests							
	pH	7.77		0.10	pH units		04-JUL-19	R4693283
L2303454-12	MS-C-F							
	Sampled By: BR/JK on 30-JUN-19 @ 17:25 Matrix: WATER							
	Physical Tests							
	pH	7.77		0.10	pH units		04-JUL-19	R4693283

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2303454-12 MS-C-F Sampled By: BR/JK on 30-JUN-19 @ 17:25 Matrix: WATER Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 8.03 <2.0 74 3.62		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 04-JUL-19 04-JUL-19 04-JUL-19 04-JUL-19	 R4693283 R4694193 R4694209 R4693286
L2303454-13 MS-MRY-09 Sampled By: BR/JK on 01-JUL-19 @ 10:30 Matrix: WATER Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.78 <2.0 21 1.23		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 04-JUL-19 04-JUL-19 04-JUL-19 04-JUL-19	 R4693283 R4694193 R4694209 R4693286
L2303454-14 MS-D1-02 Sampled By: BR/JK on 01-JUL-19 @ 11:00 Matrix: WATER Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 8.09 <2.0 <20 1.02		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 04-JUL-19 04-JUL-19 04-JUL-19 04-JUL-19	 R4693283 R4694193 R4694209 R4693286
L2303454-15 MS-C-H Sampled By: BR/JK on 01-JUL-19 @ 11:30 Matrix: WATER Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.81 <2.0 119 0.42		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 04-JUL-19 04-JUL-19 04-JUL-19 04-JUL-19	 R4693283 R4694193 R4694209 R4693286
L2303454-16 MS-C-G Sampled By: BR/JK on 01-JUL-19 @ 15:15 Matrix: WATER Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.60 <2.0 96 0.15		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 04-JUL-19 04-JUL-19 04-JUL-19 04-JUL-19	 R4693283 R4694193 R4694209 R4693286

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2303454

Report Date: 05-JUL-19

Page 1 of 3

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-BF		Water						
Batch	R4693283							
WG3095103-2	DUP	L2303454-1						
pH		7.91	7.89	J	pH units	0.02	0.2	04-JUL-19
WG3095103-1	LCS							
pH			7.01		pH units		6.9-7.1	04-JUL-19
SOLIDS-TDS-BF		Water						
Batch	R4694209							
WG3095086-3	DUP	L2303454-1						
Total Dissolved Solids		167	159		mg/L	5.3	20	04-JUL-19
WG3095086-2	LCS							
Total Dissolved Solids			105.6		%		85-115	04-JUL-19
WG3095086-1	MB							
Total Dissolved Solids			<20		mg/L		20	04-JUL-19
SOLIDS-TSS-BF		Water						
Batch	R4694193							
WG3095085-3	DUP	L2303454-1						
Total Suspended Solids		6.4	5.2		mg/L	21	25	04-JUL-19
WG3095085-2	LCS							
Total Suspended Solids			102.0		%		85-115	04-JUL-19
WG3095085-1	MB							
Total Suspended Solids			<2.0		mg/L		2	04-JUL-19
TURBIDITY-BF		Water						
Batch	R4693286							
WG3095105-3	DUP	L2303454-1						
Turbidity		14.5	14.4		NTU	0.7	15	04-JUL-19
WG3095105-2	LCS							
Turbidity			105		%		85-115	04-JUL-19
WG3095105-1	MB							
Turbidity			<0.10		NTU		0.1	04-JUL-19

Quality Control Report

Workorder: L2303454

Report Date: 05-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 2 of 3

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.

Quality Control Report

Workorder: L2303454

Report Date: 05-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 3 of 3

Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity	1	30-JUN-19 10:25	04-JUL-19 03:00	48	89	hours	EHTR
	2	30-JUN-19 10:25	04-JUL-19 03:00	48	89	hours	EHTR
	3	30-JUN-19 11:10	04-JUL-19 03:00	48	88	hours	EHTR
	4	30-JUN-19 13:25	04-JUL-19 03:00	48	86	hours	EHTR
	5	30-JUN-19 13:45	04-JUL-19 03:00	48	85	hours	EHTR
	6	30-JUN-19 13:55	04-JUL-19 03:00	48	85	hours	EHTR
	7	30-JUN-19 14:55	04-JUL-19 03:00	48	84	hours	EHTR
	8	30-JUN-19 15:15	04-JUL-19 03:00	48	84	hours	EHTR
	9	30-JUN-19 16:25	04-JUL-19 03:00	48	83	hours	EHTR
	10	30-JUN-19 16:25	04-JUL-19 03:00	48	83	hours	EHTR
	11	30-JUN-19 17:00	04-JUL-19 03:00	48	82	hours	EHTR
	12	30-JUN-19 17:25	04-JUL-19 03:00	48	82	hours	EHTR
	13	01-JUL-19 10:30	04-JUL-19 03:00	48	65	hours	EHTR
	14	01-JUL-19 11:00	04-JUL-19 03:00	48	64	hours	EHTR
	15	01-JUL-19 11:30	04-JUL-19 03:00	48	64	hours	EHTR
	16	01-JUL-19 15:15	04-JUL-19 03:00	48	60	hours	EHTR

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2303454 were received on 04-JUL-19 01:59.

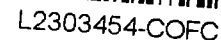
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



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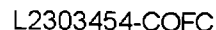
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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 07-JUL-19
Report Date: 16-JUL-19 13:58 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2305271
Project P.O. #: 4500057496
Job Reference: MS SNP MONITORING
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-1	MS-MRY-9							
Sampled By: VP/SP/BC on 07-JUL-19 @ 08:35								
Matrix: WATER								
Physical Tests								
Hardness (as CaCO3)		42.5		0.50	mg/L		11-JUL-19	
pH		7.81		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		59		20	mg/L		12-JUL-19	R4709351
Turbidity		0.79		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		47		10	mg/L		11-JUL-19	R4709474
Ammonia, Total (as N)		<0.010		0.010	mg/L		12-JUL-19	R4709000
Chloride (Cl)		0.56		0.50	mg/L		10-JUL-19	R4707156
Fluoride (F)		<0.020		0.020	mg/L		10-JUL-19	R4707156
Nitrate (as N)		0.116		0.020	mg/L		10-JUL-19	R4707156
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	11-JUL-19	12-JUL-19	R4709135
Phosphorus, Total		0.0033		0.0030	mg/L	10-JUL-19	11-JUL-19	R4707849
Sulfate (SO4)		2.31		0.30	mg/L		10-JUL-19	R4707156
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					09-JUL-19	R4700868
Dissolved Organic Carbon		2.04		0.50	mg/L	09-JUL-19	10-JUL-19	R4703168
Total Organic Carbon		2.44		0.50	mg/L		10-JUL-19	R4703169
Total Metals								
Aluminum (Al)-Total		0.0213		0.0050	mg/L	10-JUL-19	10-JUL-19	R4703429
Arsenic (As)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Calcium (Ca)-Total		9.00		0.50	mg/L	10-JUL-19	10-JUL-19	R4703429
Copper (Cu)-Total		0.0023		0.0010	mg/L	10-JUL-19	10-JUL-19	R4703429
Iron (Fe)-Total		<0.050		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Lead (Pb)-Total		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Magnesium (Mg)-Total		5.60		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Manganese (Mn)-Total		0.00077		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Mercury (Hg)-Total		<0.000010		0.000010	mg/L		10-JUL-19	R4703589
Molybdenum (Mo)-Total		0.000659		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Nickel (Ni)-Total		<0.00050		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Potassium (K)-Total		1.59		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Selenium (Se)-Total		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Sodium (Na)-Total		0.401		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Thallium (Tl)-Total		0.000015		0.000010	mg/L	10-JUL-19	10-JUL-19	R4703429
Uranium (U)-Total		0.00100		0.000010	mg/L	10-JUL-19	10-JUL-19	R4703429
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	10-JUL-19	10-JUL-19	R4703429
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					10-JUL-19	R4702349
Dissolved Metals Filtration Location		FIELD					10-JUL-19	R4702046
Aluminum (Al)-Dissolved		0.0090		0.0050	mg/L	10-JUL-19	10-JUL-19	R4706329
Arsenic (As)-Dissolved		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4706329

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-1 MS-MRY-9 Sampled By: VP/SP/BC on 07-JUL-19 @ 08:35 Matrix: WATER								
Dissolved Metals								
Cadmium (Cd)-Dissolved		<0.000010		0.000010	mg/L	10-JUL-19	10-JUL-19	R4706329
Calcium (Ca)-Dissolved		8.21		0.050	mg/L	10-JUL-19	10-JUL-19	R4706329
Copper (Cu)-Dissolved		0.00212		0.00020	mg/L	10-JUL-19	10-JUL-19	R4706329
Iron (Fe)-Dissolved		<0.010		0.010	mg/L	10-JUL-19	10-JUL-19	R4706329
Lead (Pb)-Dissolved		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4706329
Magnesium (Mg)-Dissolved		5.34		0.050	mg/L	10-JUL-19	10-JUL-19	R4706329
Manganese (Mn)-Dissolved		<0.00050		0.00050	mg/L	10-JUL-19	10-JUL-19	R4706329
Mercury (Hg)-Dissolved		<0.000010		0.000010	mg/L	10-JUL-19	10-JUL-19	R4703592
Molybdenum (Mo)-Dissolved		0.000585		0.000050	mg/L	10-JUL-19	10-JUL-19	R4706329
Nickel (Ni)-Dissolved		<0.00050		0.00050	mg/L	10-JUL-19	10-JUL-19	R4706329
Potassium (K)-Dissolved		1.57		0.050	mg/L	10-JUL-19	10-JUL-19	R4706329
Selenium (Se)-Dissolved		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4706329
Sodium (Na)-Dissolved		<0.50		0.50	mg/L	10-JUL-19	10-JUL-19	R4706329
Thallium (Tl)-Dissolved		0.000011		0.000010	mg/L	10-JUL-19	10-JUL-19	R4706329
Uranium (U)-Dissolved		0.000909		0.000010	mg/L	10-JUL-19	10-JUL-19	R4706329
Zinc (Zn)-Dissolved		<0.0010		0.0010	mg/L	10-JUL-19	10-JUL-19	R4706329
L2305271-2 MS-C-F Sampled By: VP/SP/BC on 07-JUL-19 @ 08:35 Matrix: WATER								
Physical Tests								
Conductivity		193		3.0	umhos/cm		11-JUL-19	R4709474
pH		8.10		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		120		20	mg/L		12-JUL-19	R4709351
Turbidity		3.00		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Ammonia, Total (as N)		<0.010		0.010	mg/L		12-JUL-19	R4709000
Nitrate (as N)		0.132		0.020	mg/L		10-JUL-19	R4707156
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708742
L2305271-3 MS-C-F01 Sampled By: VP/SP/BC on 07-JUL-19 @ 08:35 Matrix: WATER								
Physical Tests								
Conductivity		192		3.0	umhos/cm		11-JUL-19	R4709474
pH		8.10		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		110		20	mg/L		12-JUL-19	R4709351
Turbidity		3.26		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Ammonia, Total (as N)		0.012		0.010	mg/L		12-JUL-19	R4709000
Nitrate (as N)		0.135		0.020	mg/L		10-JUL-19	R4707156
Aggregate Organics								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-3 MS-C-F01 Sampled By: VP/SP/BC on 07-JUL-19 @ 08:35 Matrix: WATER Aggregate Organics Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708742
L2305271-4 MS-C-G Sampled By: VP/SP/BC on 07-JUL-19 @ 09:10 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		207 7.58 <2.0 124 0.16 <0.010 2.47 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.020 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19	11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	R4709474 R4701568 R4708384 R4709351 R4701590 R4709000 R4707156 R4708742
L2305271-5 MS-C-H Sampled By: VP/SP/BC on 07-JUL-19 @ 09:40 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		241 7.80 <2.0 135 0.38 <0.010 0.053 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.020 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19	11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	R4709474 R4701568 R4708384 R4709351 R4701590 R4709000 R4707156 R4708742
L2305271-6 MQ-C-B Sampled By: VP/SP/BC on 07-JUL-19 @ 09:45 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		927 7.92 <2.0 547 3.51 3.9 29.3 <2.0	 DLHC DLDS	3.0 0.10 2.0 20 0.10 1.0 0.040 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19	11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 15-JUL-19 10-JUL-19 11-JUL-19	R4709474 R4701568 R4708384 R4709351 R4701590 R4712011 R4707156 R4708001

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-7	MS-MRY-13B							
Sampled By: VP/SP/BC on 07-JUL-19 @ 10:35								
Matrix: WATER								
Physical Tests								
Conductivity		725		3.0	umhos/cm		11-JUL-19	R4709476
pH		8.23		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		402		20	mg/L		12-JUL-19	R4709351
Turbidity		0.48		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		155		10	mg/L		11-JUL-19	R4709476
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					09-JUL-19	R4700868
Dissolved Organic Carbon		5.98		0.50	mg/L	09-JUL-19	10-JUL-19	R4703168
Total Organic Carbon		6.64		0.50	mg/L		10-JUL-19	R4703169
Total Metals								
Aluminum (Al)-Total		0.0216		0.0050	mg/L	10-JUL-19	10-JUL-19	R4703429
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Arsenic (As)-Total		0.00016		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Barium (Ba)-Total		0.0510		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Boron (B)-Total		0.088		0.010	mg/L	10-JUL-19	10-JUL-19	R4703429
Cadmium (Cd)-Total		0.0000080		0.0000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Calcium (Ca)-Total		71.3		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Copper (Cu)-Total		0.0016		0.0010	mg/L	10-JUL-19	10-JUL-19	R4703429
Iron (Fe)-Total		0.048		0.010	mg/L	10-JUL-19	10-JUL-19	R4703429
Lead (Pb)-Total		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Lithium (Li)-Total		0.0190		0.0010	mg/L	10-JUL-19	10-JUL-19	R4703429
Magnesium (Mg)-Total		35.5		0.0050	mg/L	10-JUL-19	10-JUL-19	R4703429
Manganese (Mn)-Total		0.00137		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Mercury (Hg)-Total		<0.000010		0.000010	mg/L		10-JUL-19	R4703589
Molybdenum (Mo)-Total		0.000287		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Nickel (Ni)-Total		0.00898		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Potassium (K)-Total		1.99		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Selenium (Se)-Total		0.000086		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Silicon (Si)-Total		4.76		0.10	mg/L	10-JUL-19	10-JUL-19	R4703429
Silver (Ag)-Total		<0.000050		0.000050	mg/L	10-JUL-19	10-JUL-19	R4703429
Sodium (Na)-Total		14.5		0.050	mg/L	10-JUL-19	10-JUL-19	R4703429
Strontium (Sr)-Total		0.0786		0.0010	mg/L	10-JUL-19	10-JUL-19	R4703429
Thallium (Tl)-Total		0.000015		0.000010	mg/L	10-JUL-19	10-JUL-19	R4703429
Tin (Sn)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429
Titanium (Ti)-Total		0.00096		0.00030	mg/L	10-JUL-19	10-JUL-19	R4703429
Tungsten (W)-Total		<0.00010		0.00010	mg/L	10-JUL-19	10-JUL-19	R4703429

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-7 MS-MRY-13B Sampled By: VP/SP/BC on 07-JUL-19 @ 10:35 Matrix: WATER								
Total Metals								
Uranium (U)-Total		0.00192		0.000010	mg/L	10-JUL-19	10-JUL-19	R4703429
Vanadium (V)-Total		<0.00050		0.00050	mg/L	10-JUL-19	10-JUL-19	R4703429
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	10-JUL-19	10-JUL-19	R4703429
Zirconium (Zr)-Total		<0.00030		0.00030	mg/L	10-JUL-19	10-JUL-19	R4703429
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708001
Phenols (4AAP)		0.0017		0.0010	mg/L		12-JUL-19	R4708458
Hydrocarbons								
F1 (C6-C10)		<100		100	ug/L		16-JUL-19	R4712645
F2 (C10-C16)		<100		100	ug/L	09-JUL-19	10-JUL-19	R4705753
F3 (C16-C34)		<250		250	ug/L	09-JUL-19	10-JUL-19	R4705753
F4 (C34-C50)		<250		250	ug/L	09-JUL-19	10-JUL-19	R4705753
Total Hydrocarbons (C6-C50)		<380		380	ug/L		16-JUL-19	
Chrom. to baseline at nC50		YES				09-JUL-19	10-JUL-19	R4705753
Surrogate: 2-Bromobenzotrifluoride		89.4		60-140	%	09-JUL-19	10-JUL-19	R4705753
Surrogate: 3,4-Dichlorotoluene		91.2		60-140	%		16-JUL-19	R4712645
L2305271-8 MS-C-D Sampled By: VP/SP/BC on 07-JUL-19 @ 12:15 Matrix: WATER								
Physical Tests								
Conductivity		1460		3.0	umhos/cm		11-JUL-19	R4709476
pH		8.32		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		1120		20	mg/L		12-JUL-19	R4709351
Turbidity		2.87		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Ammonia, Total (as N)		0.020		0.010	mg/L		15-JUL-19	R4712011
Nitrate (as N)		11.4	DLDS	0.040	mg/L		10-JUL-19	R4707156
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708001
L2305271-9 MS-C-C Sampled By: VP/SP/BC on 07-JUL-19 @ 12:30 Matrix: WATER								
Physical Tests								
Conductivity		1530		3.0	umhos/cm		11-JUL-19	R4709476
pH		7.71		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		1180		20	mg/L		12-JUL-19	R4709351
Turbidity		0.32		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Ammonia, Total (as N)		<0.010		0.010	mg/L		15-JUL-19	R4712011
Nitrate (as N)		11.8	DLDS	0.10	mg/L		10-JUL-19	R4707156
Aggregate Organics								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-9 MS-C-C Sampled By: VP/SP/BC on 07-JUL-19 @ 12:30 Matrix: WATER Aggregate Organics Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708001
L2305271-10 MS-C-A Sampled By: VP/SP/BC on 07-JUL-19 @ 10:40 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		173 7.87 <2.0 113 0.49 <0.010 0.149 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.020 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19 11-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	11-JUL-19 11-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	R4709476 R4701568 R4708384 R4709351 R4701590 R4709000 R4707156 R4708001
L2305271-11 MS-C-B Sampled By: VP/SP/BC on 07-JUL-19 @ 11:10 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		179 7.74 <2.0 115 0.56 <0.010 0.178 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.020 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	R4709476 R4701568 R4708384 R4709351 R4701590 R4709000 R4707156 R4708001
L2305271-12 MS-C-E Sampled By: VP/SP/BC on 07-JUL-19 @ 11:50 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total		1350 8.01 <2.0 1020 0.68 <0.010 7.31 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.040 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	11-JUL-19 09-JUL-19 11-JUL-19 12-JUL-19 09-JUL-19 12-JUL-19 10-JUL-19 11-JUL-19	R4709476 R4701568 R4708384 R4709351 R4701590 R4709000 R4707156 R4708001

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305271-13	MS-C-E03							
Sampled By:	VP/SP/BC on 07-JUL-19 @ 11:50							
Matrix:	WATER							
Physical Tests								
Conductivity		<3.0		3.0	umhos/cm		11-JUL-19	R4709476
pH		5.83		0.10	pH units		09-JUL-19	R4701568
Total Suspended Solids		<2.0		2.0	mg/L		11-JUL-19	R4708384
Total Dissolved Solids		<20		20	mg/L		12-JUL-19	R4709351
Turbidity		<0.10		0.10	NTU		09-JUL-19	R4701590
Anions and Nutrients								
Ammonia, Total (as N)		<0.010		0.010	mg/L		12-JUL-19	R4709000
Nitrate (as N)		<0.020		0.020	mg/L		10-JUL-19	R4707156
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	11-JUL-19	11-JUL-19	R4708001

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2305271-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2305271-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2305271-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2305271-1, -7
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2305271-1, -7
Matrix Spike	Silicon (Si)-Total	MS-B	L2305271-1, -7
Matrix Spike	Uranium (U)-Total	MS-B	L2305271-1, -7

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
F1-F4-CALC-WT	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L
Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.			
In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.			
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.			
In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.			
Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:			
1. All extraction and analysis holding times were met.			
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.			
3. Linearity of gasoline response within 15% throughout the calibration range.			
Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:			
1. All extraction and analysis holding times were met.			
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.			
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.			
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.			
F1-HS-WT	Water	F1 (O.Reg.153/04)	E3421/CCME (HS)
Fraction F1 is determined by analyzing by headspace-GC/FID.			

F2-F4-WT	Water	Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.	
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.			
NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulfate digestion of the sample.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered through glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by			

Reference Information

sample digestion at 380 Celsius with analysis using an automated colorimetric method.

TOC-WT

Water

Total Organic Carbon

APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

TURBIDITY-BF

Water

Turbidity

APHA 2130 B

Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT		Water						
Batch	R4709474							
WG3101990-4	DUP	WG3101990-3						
Conductivity		1460	1450		umhos/cm	0.5	10	11-JUL-19
WG3101990-2	LCS							
Conductivity			98.7		%		90-110	11-JUL-19
WG3101990-1	MB							
Conductivity			<3.0		umhos/cm		3	11-JUL-19
Batch	R4709476							
WG3101993-4	DUP	WG3101993-3						
Conductivity		725	728		umhos/cm	0.4	10	11-JUL-19
WG3101993-2	LCS							
Conductivity			97.8		%		90-110	11-JUL-19
WG3101993-1	MB							
Conductivity			<3.0		umhos/cm		3	11-JUL-19
F-IC-N-WT		Water						
Batch	R4707156							
WG3100909-4	DUP	WG3100909-3						
Fluoride (F)		0.094	0.096		mg/L	1.9	20	10-JUL-19
WG3100909-2	LCS							
Fluoride (F)			105.4		%		90-110	10-JUL-19
WG3100909-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	10-JUL-19
WG3100909-5	MS	WG3100909-3						
Fluoride (F)			106.5		%		75-125	10-JUL-19
F1-HS-WT		Water						
Batch	R4712645							
WG3105835-6	LCS							
F1 (C6-C10)			107.8		%		80-120	16-JUL-19
WG3105835-7	MB							
F1 (C6-C10)			<100		ug/L		100	16-JUL-19
Surrogate: 3,4-Dichlorotoluene			104.4		%		60-140	16-JUL-19
F2-F4-WT		Water						
Batch	R4705753							
WG3100424-2	LCS							
F2 (C10-C16)			97.4		%		65-135	10-JUL-19
F3 (C16-C34)			103.0		%		65-135	10-JUL-19
F4 (C34-C50)			94.1		%		65-135	10-JUL-19
WG3100424-1	MB							



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-WT		Water						
Batch	R4705753							
WG3100424-1 MB								
F2 (C10-C16)			<100		ug/L		100	10-JUL-19
F3 (C16-C34)			<250		ug/L		250	10-JUL-19
F4 (C34-C50)			<250		ug/L		250	10-JUL-19
Surrogate: 2-Bromobenzotrifluoride			90.1		%		60-140	10-JUL-19
HG-D-CVAA-WT		Water						
Batch	R4703592							
WG3100701-4 DUP		WG3100701-3						
Mercury (Hg)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	10-JUL-19
WG3100701-2 LCS								
Mercury (Hg)-Dissolved			99.9		%		80-120	10-JUL-19
WG3100701-1 MB								
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	10-JUL-19
WG3100701-6 MS		WG3100701-5						
Mercury (Hg)-Dissolved			97.1		%		70-130	10-JUL-19
HG-T-CVAA-WT		Water						
Batch	R4703589							
WG3100694-6 DUP		WG3100694-5						
Mercury (Hg)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	10-JUL-19
WG3100694-2 LCS								
Mercury (Hg)-Total			101.0		%		80-120	10-JUL-19
WG3100694-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	10-JUL-19
WG3100694-8 MS		WG3100694-7						
Mercury (Hg)-Total			91.7		%		70-130	10-JUL-19
MET-D-CCMS-WT		Water						
Batch	R4706329							
WG3100531-4 DUP		WG3100531-3						
Aluminum (Al)-Dissolved		0.0090	0.0082		mg/L	8.9	20	10-JUL-19
Arsenic (As)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Cadmium (Cd)-Dissolved		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Calcium (Ca)-Dissolved		8.21	8.01		mg/L	2.4	20	10-JUL-19
Copper (Cu)-Dissolved		0.00212	0.00211		mg/L	0.7	20	10-JUL-19
Iron (Fe)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	10-JUL-19
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Magnesium (Mg)-Dissolved		5.34	5.39		mg/L	0.9	20	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4706329							
WG3100531-4	DUP	WG3100531-3						
Manganese (Mn)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	10-JUL-19
Molybdenum (Mo)-Dissolved		0.000585	0.000566		mg/L	3.2	20	10-JUL-19
Nickel (Ni)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	10-JUL-19
Potassium (K)-Dissolved		1.57	1.59		mg/L	1.4	20	10-JUL-19
Selenium (Se)-Dissolved		<0.000050	0.000057	RPD-NA	mg/L	N/A	20	10-JUL-19
Sodium (Na)-Dissolved		0.382	0.388		mg/L	1.6	20	10-JUL-19
Thallium (Tl)-Dissolved		0.000011	0.000010		mg/L	7.5	20	10-JUL-19
Uranium (U)-Dissolved		0.000909	0.000888		mg/L	2.4	20	10-JUL-19
Zinc (Zn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	10-JUL-19
WG3100531-2	LCS							
Aluminum (Al)-Dissolved			96.5		%		80-120	10-JUL-19
Arsenic (As)-Dissolved			94.8		%		80-120	10-JUL-19
Cadmium (Cd)-Dissolved			93.1		%		80-120	10-JUL-19
Calcium (Ca)-Dissolved			93.6		%		80-120	10-JUL-19
Copper (Cu)-Dissolved			95.4		%		80-120	10-JUL-19
Iron (Fe)-Dissolved			101.5		%		80-120	10-JUL-19
Lead (Pb)-Dissolved			101.2		%		80-120	10-JUL-19
Magnesium (Mg)-Dissolved			101.4		%		80-120	10-JUL-19
Manganese (Mn)-Dissolved			97.1		%		80-120	10-JUL-19
Molybdenum (Mo)-Dissolved			94.9		%		80-120	10-JUL-19
Nickel (Ni)-Dissolved			95.7		%		80-120	10-JUL-19
Potassium (K)-Dissolved			98.5		%		80-120	10-JUL-19
Selenium (Se)-Dissolved			98.3		%		80-120	10-JUL-19
Sodium (Na)-Dissolved			101.8		%		80-120	10-JUL-19
Thallium (Tl)-Dissolved			102.1		%		80-120	10-JUL-19
Uranium (U)-Dissolved			100.4		%		80-120	10-JUL-19
Zinc (Zn)-Dissolved			96.2		%		80-120	10-JUL-19
WG3100531-1	MB							
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	10-JUL-19
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	10-JUL-19
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	10-JUL-19
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	10-JUL-19
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	10-JUL-19
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4706329							
WG3100531-1 MB								
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	10-JUL-19
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	10-JUL-19
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	10-JUL-19
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	10-JUL-19
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	10-JUL-19
Potassium (K)-Dissolved			<0.050		mg/L		0.05	10-JUL-19
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	10-JUL-19
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	10-JUL-19
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	10-JUL-19
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	10-JUL-19
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	10-JUL-19
WG3100531-5 MS		WG3100531-3						
Aluminum (Al)-Dissolved			94.6		%		70-130	10-JUL-19
Arsenic (As)-Dissolved			105.3		%		70-130	10-JUL-19
Cadmium (Cd)-Dissolved			98.8		%		70-130	10-JUL-19
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Copper (Cu)-Dissolved			94.4		%		70-130	10-JUL-19
Iron (Fe)-Dissolved			97.2		%		70-130	10-JUL-19
Lead (Pb)-Dissolved			97.0		%		70-130	10-JUL-19
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Manganese (Mn)-Dissolved			95.4		%		70-130	10-JUL-19
Molybdenum (Mo)-Dissolved			92.6		%		70-130	10-JUL-19
Nickel (Ni)-Dissolved			93.6		%		70-130	10-JUL-19
Potassium (K)-Dissolved			98.5		%		70-130	10-JUL-19
Selenium (Se)-Dissolved			122.4		%		70-130	10-JUL-19
Sodium (Na)-Dissolved			99.7		%		70-130	10-JUL-19
Thallium (Tl)-Dissolved			97.9		%		70-130	10-JUL-19
Uranium (U)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Zinc (Zn)-Dissolved			108.3		%		70-130	10-JUL-19
MET-T-CCMS-WT		Water						
Batch	R4703429							
WG3100488-4 DUP		WG3100488-3						
Aluminum (Al)-Total		0.0213	0.0206		mg/L	3.2	20	10-JUL-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4703429							
WG3100488-4 DUP		WG3100488-3						
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Barium (Ba)-Total		0.00715	0.00695		mg/L	2.8	20	10-JUL-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	10-JUL-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Calcium (Ca)-Total		9.00	8.94		mg/L	0.7	20	10-JUL-19
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	10-JUL-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Copper (Cu)-Total		0.0023	0.0023		mg/L	3.4	20	10-JUL-19
Iron (Fe)-Total		0.026	0.025		mg/L	3.6	20	10-JUL-19
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	10-JUL-19
Magnesium (Mg)-Total		5.60	5.43		mg/L	3.0	20	10-JUL-19
Manganese (Mn)-Total		0.00077	0.00065		mg/L	17	20	10-JUL-19
Molybdenum (Mo)-Total		0.000659	0.000651		mg/L	1.1	20	10-JUL-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	10-JUL-19
Potassium (K)-Total		1.59	1.56		mg/L	1.7	20	10-JUL-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Silicon (Si)-Total		0.70	0.68		mg/L	1.9	20	10-JUL-19
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-19
Sodium (Na)-Total		0.401	0.392		mg/L	2.3	20	10-JUL-19
Strontium (Sr)-Total		0.0056	0.0056		mg/L	0.6	20	10-JUL-19
Thallium (Tl)-Total		0.000015	0.000015		mg/L	2.6	20	10-JUL-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Titanium (Ti)-Total		0.00070	0.00064		mg/L	8.3	20	10-JUL-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-19
Uranium (U)-Total		0.00100	0.00101		mg/L	0.8	20	10-JUL-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	10-JUL-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	10-JUL-19
Zirconium (Zr)-Total		0.00021	0.00021		mg/L	3.4	20	10-JUL-19
WG3100488-2 LCS								
Aluminum (Al)-Total			104.0		%		80-120	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4703429							
WG3100488-2	LCS							
Antimony (Sb)-Total			103.2		%		80-120	10-JUL-19
Arsenic (As)-Total			99.9		%		80-120	10-JUL-19
Barium (Ba)-Total			101.6		%		80-120	10-JUL-19
Beryllium (Be)-Total			101.9		%		80-120	10-JUL-19
Bismuth (Bi)-Total			98.2		%		80-120	10-JUL-19
Boron (B)-Total			98.7		%		80-120	10-JUL-19
Cadmium (Cd)-Total			100.5		%		80-120	10-JUL-19
Calcium (Ca)-Total			100.9		%		80-120	10-JUL-19
Chromium (Cr)-Total			99.9		%		80-120	10-JUL-19
Cobalt (Co)-Total			98.0		%		80-120	10-JUL-19
Copper (Cu)-Total			99.0		%		80-120	10-JUL-19
Iron (Fe)-Total			96.9		%		80-120	10-JUL-19
Lead (Pb)-Total			98.4		%		80-120	10-JUL-19
Lithium (Li)-Total			102.8		%		80-120	10-JUL-19
Magnesium (Mg)-Total			101.4		%		80-120	10-JUL-19
Manganese (Mn)-Total			100.1		%		80-120	10-JUL-19
Molybdenum (Mo)-Total			99.4		%		80-120	10-JUL-19
Nickel (Ni)-Total			98.5		%		80-120	10-JUL-19
Potassium (K)-Total			97.6		%		80-120	10-JUL-19
Selenium (Se)-Total			98.4		%		80-120	10-JUL-19
Silicon (Si)-Total			101.5		%		60-140	10-JUL-19
Silver (Ag)-Total			101.6		%		80-120	10-JUL-19
Sodium (Na)-Total			103.3		%		80-120	10-JUL-19
Strontium (Sr)-Total			103.0		%		80-120	10-JUL-19
Thallium (Tl)-Total			100.2		%		80-120	10-JUL-19
Tin (Sn)-Total			99.3		%		80-120	10-JUL-19
Titanium (Ti)-Total			97.4		%		80-120	10-JUL-19
Tungsten (W)-Total			99.5		%		80-120	10-JUL-19
Uranium (U)-Total			103.0		%		80-120	10-JUL-19
Vanadium (V)-Total			100.4		%		80-120	10-JUL-19
Zinc (Zn)-Total			99.1		%		80-120	10-JUL-19
Zirconium (Zr)-Total			98.4		%		80-120	10-JUL-19
WG3100488-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4703429							
WG3100488-1 MB								
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	10-JUL-19
Boron (B)-Total			<0.010		mg/L		0.01	10-JUL-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	10-JUL-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	10-JUL-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	10-JUL-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	10-JUL-19
Iron (Fe)-Total			<0.010		mg/L		0.01	10-JUL-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	10-JUL-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	10-JUL-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	10-JUL-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	10-JUL-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	10-JUL-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	10-JUL-19
Potassium (K)-Total			<0.050		mg/L		0.05	10-JUL-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	10-JUL-19
Silicon (Si)-Total			<0.10		mg/L		0.1	10-JUL-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	10-JUL-19
Sodium (Na)-Total			<0.050		mg/L		0.05	10-JUL-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	10-JUL-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	10-JUL-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	10-JUL-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	10-JUL-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	10-JUL-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	10-JUL-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	10-JUL-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	10-JUL-19
WG3100488-5 MS		WG3100488-3						
Aluminum (Al)-Total			95.4		%		70-130	10-JUL-19



Quality Control Report

Workorder: L2305271

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT		Water						
Batch	R4709000							
WG3103451-19	DUP	L2305271-1						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	12-JUL-19
WG3103451-18	LCS							
Ammonia, Total (as N)			95.7		%		85-115	12-JUL-19
WG3103451-17	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	12-JUL-19
WG3103451-20	MS	L2305271-1						
Ammonia, Total (as N)			92.4		%		75-125	12-JUL-19
Batch	R4712011							
WG3105265-3	DUP	L2305271-8						
Ammonia, Total (as N)		0.020	0.021		mg/L	4.8	20	15-JUL-19
WG3105265-2	LCS							
Ammonia, Total (as N)			102.8		%		85-115	15-JUL-19
WG3105265-1	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	15-JUL-19
WG3105265-4	MS	L2305271-8						
Ammonia, Total (as N)			103.5		%		75-125	15-JUL-19
NO3-IC-WT		Water						
Batch	R4707156							
WG3100909-4	DUP	WG3100909-3						
Nitrate (as N)		1.70	1.70		mg/L	0.2	20	10-JUL-19
WG3100909-2	LCS							
Nitrate (as N)			102.0		%		90-110	10-JUL-19
WG3100909-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	10-JUL-19
WG3100909-5	MS	WG3100909-3						
Nitrate (as N)			100.5		%		75-125	10-JUL-19
OGG-TOT-WT		Water						
Batch	R4708001							
WG3102010-2	LCS							
Oil and Grease, Total			85.1		%		70-130	11-JUL-19
WG3102010-1	MB							
Oil and Grease, Total			<2.0		mg/L		2	11-JUL-19
Batch	R4708742							
WG3101776-2	LCS							
Oil and Grease, Total			92.1		%		70-130	11-JUL-19
WG3101776-1	MB							



Quality Control Report

Workorder: L2305271

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-TOT-WT		Water						
Batch	R4708742							
WG3101776-1 MB								
Oil and Grease, Total			<2.0		mg/L		2	11-JUL-19
P-T-COL-WT		Water						
Batch	R4707849							
WG3101589-3 DUP		L2305272-1						
Phosphorus, Total		0.0054	0.0069	J	mg/L	0.0016	0.006	11-JUL-19
WG3101589-2 LCS								
Phosphorus, Total			100.3		%		80-120	11-JUL-19
WG3101589-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	11-JUL-19
WG3101589-4 MS		L2305272-1						
Phosphorus, Total			93.3		%		70-130	11-JUL-19
PH-BF		Water						
Batch	R4701568							
WG3100344-2 DUP		L2305271-1						
pH		7.81	7.83	J	pH units	0.02	0.2	09-JUL-19
WG3100344-1 LCS								
pH			7.02		pH units		6.9-7.1	09-JUL-19
PHENOLS-4AAP-WT		Water						
Batch	R4708458							
WG3102168-3 DUP		L2305271-7						
Phenols (4AAP)		0.0017	0.0019		mg/L	12	20	12-JUL-19
WG3102168-2 LCS								
Phenols (4AAP)			107.4		%		85-115	12-JUL-19
WG3102168-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	12-JUL-19
WG3102168-4 MS		L2305271-7						
Phenols (4AAP)			107.2		%		75-125	12-JUL-19
SO4-IC-N-WT		Water						
Batch	R4707156							
WG3100909-4 DUP		WG3100909-3						
Sulfate (SO4)		18.0	18.0		mg/L	0.0	20	10-JUL-19
WG3100909-2 LCS								
Sulfate (SO4)			102.3		%		90-110	10-JUL-19
WG3100909-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	10-JUL-19



Quality Control Report

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	Water							
Batch R4707156								
WG3100909-5 MS		WG3100909-3						
Sulfate (SO4)			103.9		%		75-125	10-JUL-19
SOLIDS-TDS-BF	Water							
Batch R4709351								
WG3102972-3 DUP		L2305271-13						
Total Dissolved Solids		<20	<20	RPD-NA	mg/L	N/A	20	12-JUL-19
WG3102972-2 LCS								
Total Dissolved Solids			100.7		%		85-115	12-JUL-19
WG3102972-1 MB								
Total Dissolved Solids			<20		mg/L		20	12-JUL-19
SOLIDS-TSS-BF	Water							
Batch R4708384								
WG3102894-3 DUP		L2305271-4						
Total Suspended Solids		<2.0	<2.0	RPD-NA	mg/L	N/A	25	11-JUL-19
WG3102894-2 LCS								
Total Suspended Solids			101.2		%		85-115	11-JUL-19
WG3102894-1 MB								
Total Suspended Solids			<2.0		mg/L		2	11-JUL-19
TKN-WT	Water							
Batch R4709135								
WG3101807-3 DUP		L2305271-1						
Total Kjeldahl Nitrogen		<0.15	<0.15	RPD-NA	mg/L	N/A	20	12-JUL-19
WG3101807-2 LCS								
Total Kjeldahl Nitrogen			97.5		%		75-125	12-JUL-19
WG3101807-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	12-JUL-19
WG3101807-4 MS		L2305271-1						
Total Kjeldahl Nitrogen			97.3		%		70-130	12-JUL-19
TOC-WT	Water							
Batch R4703169								
WG3100605-3 DUP		L2305882-1						
Total Organic Carbon		3.65	3.68		mg/L	0.8	20	10-JUL-19
WG3100605-2 LCS								
Total Organic Carbon			102.7		%		80-120	10-JUL-19
WG3100605-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	10-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TOC-WT		Water						
Batch	R4703169							
WG3100605-4	MS	L2305882-1						
Total Organic Carbon			112.4		%		70-130	10-JUL-19
TURBIDITY-BF		Water						
Batch	R4701590							
WG3100350-3	DUP	L2305271-1						
Turbidity		0.79	0.80		NTU	1.3	15	09-JUL-19
WG3100350-2	LCS							
Turbidity			103.0		%		85-115	09-JUL-19
WG3100350-1	MB							
Turbidity			<0.10		NTU		0.1	09-JUL-19

Quality Control Report

Workorder: L2305271

Report Date: 16-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

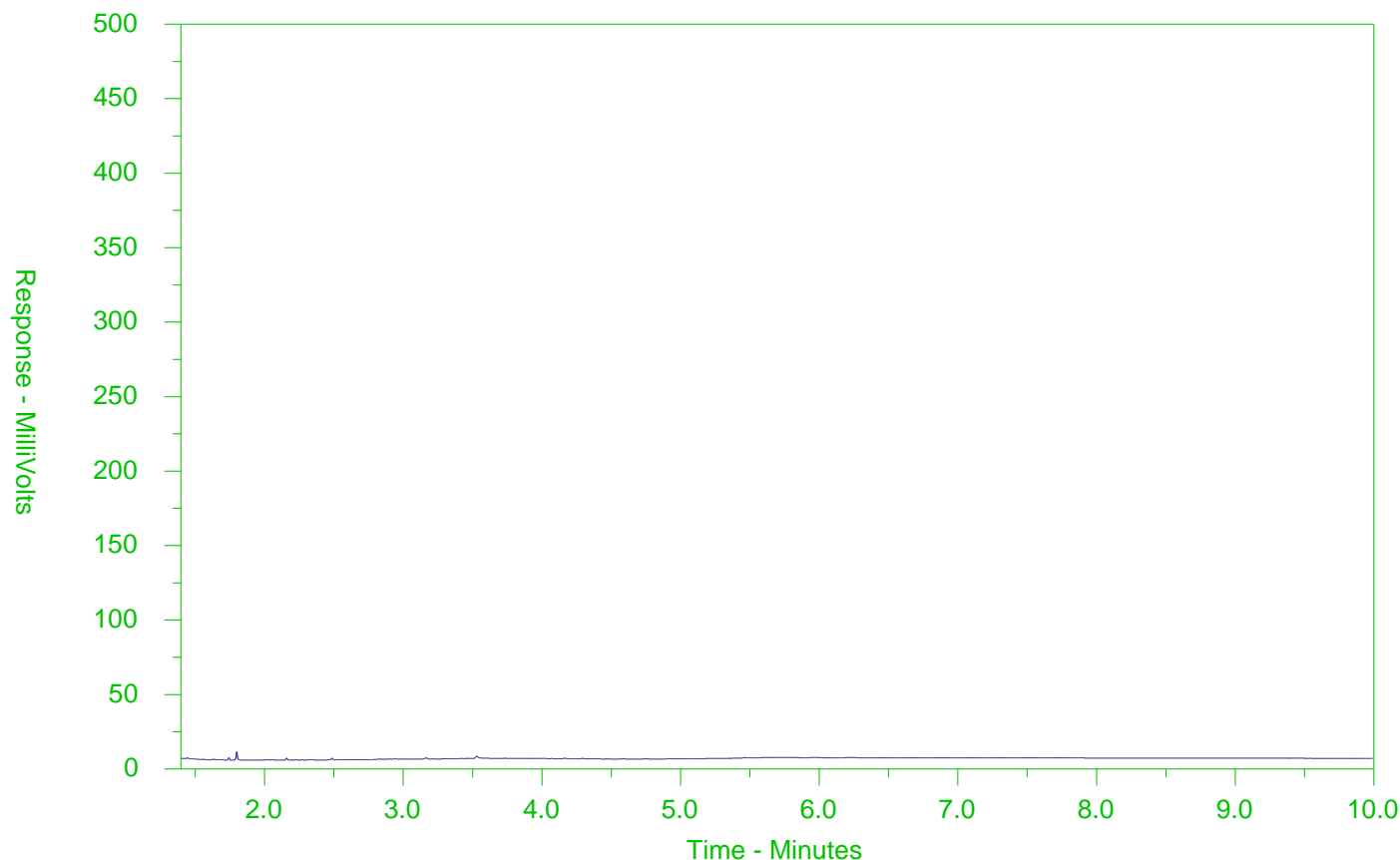
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2305271-7
Client Sample ID: MS-MRY-13B



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



www.alsglobal.com

Report To Contact and company name below will appear on the final report			Report Format / Distribution			Confirm all E&P TATs with your AM - surcharges will apply																																																																																																																																																																								
Company: Baffinland Iron Mines Corp.			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply						<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: x-small;">PRIORITY (Business Days)</td> <td colspan="4">4 day [P4] <input type="checkbox"/></td> <td rowspan="3" style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: x-small;">EMERGENCY</td> <td colspan="4">1 Business day [E1] <input type="checkbox"/></td> </tr> <tr> <td colspan="4">3 day [P3] <input type="checkbox"/></td> <td colspan="4">Same Day, Weekend or Statutory holiday [E0] <input type="checkbox"/></td> </tr> <tr> <td colspan="4">2 day [P2] <input type="checkbox"/></td> <td colspan="4"></td> </tr> </table>						PRIORITY (Business Days)	4 day [P4] <input type="checkbox"/>				EMERGENCY	1 Business day [E1] <input type="checkbox"/>				3 day [P3] <input type="checkbox"/>				Same Day, Weekend or Statutory holiday [E0] <input type="checkbox"/>				2 day [P2] <input type="checkbox"/>																																																																																																																																										
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Street: 2275 Upper Middle Rd. E., Suite #300			Email 1 or Fax bimcore@alsglobal.com			Date and Time Required for all E&P TATs: 01-03-2019 10:00																																																																																																																																																																								
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Project Information			Oil and Gas Required Fields (client use)																																																																																																																																																																											
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ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Group 7	Group 6	Group 8																																																																																																																																																																							
	MS-MRY-9	7-Jul-19	8:35	Water	R													7																																																																																																																																																												
	MS-C-F	7-Jul-19	8:35	Water			R											5																																																																																																																																																												
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Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																																																																																																																																																									
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="6" style="text-align: center; font-size: x-small;">INITIAL COOLER TEMPERATURES °C</td> <td colspan="6" style="text-align: center; font-size: x-small;">FINAL COOLER TEMPERATURES °C</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="6"></td> <td colspan="6" style="text-align: center;">11.6</td> </tr> </table>														INITIAL COOLER TEMPERATURES °C						FINAL COOLER TEMPERATURES °C																								11.6																																																																																																																													
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Are samples for human drinking water use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO																																																																																																																																																																														
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																																																																																																																																																																								
Released by: Kendra Button		Release Date: 7-Jul-19		Time: 20:20		Received by:		Date:		Time:		Received by: <i>AP</i>		Date: <i>9-7-19</i>		Time: <i>10:00</i>																																																																																																																																																														

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



L2305271-COFC

COC Number: 15 -

Page 2 of 2

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Report To Contact and company name below will appear on the final report			Report Format / Distribution			confirm all E&P TATs with your AM - surcharges will apply															
Company: Baffinland Iron Mines Corp.			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply															
Contact: Wiliam Bowden and Connor Devereaux			Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		4 day [P4] <input type="checkbox"/>				EMERGENCY		1 Business day [E1] <input type="checkbox"/>							
Phone: 647-253-0596 EXT 6016			<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked					3 day [P3] <input type="checkbox"/>						Same Day, Weekend or Statutory holiday [E0] <input type="checkbox"/>							
Company address below will appear on the final report			Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																		
Street: 2275 Upper Middle Rd. E., Suite #300			Email 1 or Fax bimcore@alsglobal.com			Date and Time Required for all E&P TATs: 24 business hours															
City/Province: Oakville, ON			Email 2 bimww@alsglobal.com			For tests that can not be performed according to the service level selected, you will be contacted.															
Postal Code: L6H 0C3			Email 3			Analysis Request															
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below															
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Number of Containers															
Company:			Email 1 or Fax ap@baffinland.com																		
Contact:			Email 2 commercial@baffinland.com																		
Project Information			Oil and Gas Required Fields (client use)																		
ALS Account # / Quote #: 23642 / Q42455			AFE/Cost Center: PO#																		
Job #: MS SNP Monitoring			Major/Minor Code: Routing Code:																		
PO / AFE: 4500057496			Requisitioner:																		
LSD:			Location:																		
ALS Lab Work Order # (lab use only)			ALS Contact:																		
			Sampler: VP/SP/BC																		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Group 8															
	MS-C-E03		7-Jul-19	11:50	Water	R															
Drinking Water (DW) Samples¹ (client use)			Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>															
						Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>															
Are samples for human drinking water use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Cooling Initiated <input type="checkbox"/>															
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)															
Released by: Kendra Button		Release Date: 7-Jul-19	Time: 20:20	Received by:		Date:	Time:	Received by: <i>AP</i>		Date: 9-7-19	Time: 10:00										

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 10-JUL-19
Report Date: 12-JUL-19 10:01 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2307800
Project P.O. #: 4500057496
Job Reference: CRUSHER PERIMETER
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2307800-1 CP-SEEPAGE-2 Sampled By: KB/LM on 10-JUL-19 @ 15:10 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.32 99.4 4360 31.6		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 10-JUL-19 11-JUL-19 11-JUL-19 11-JUL-19	 R4705949 R4708445 R4708370 R4706129
L2307800-2 CP-SEEPAGE-1 Sampled By: KB/LM on 10-JUL-19 @ 15:55 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 6.94 481 6960 51.2		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 10-JUL-19 11-JUL-19 11-JUL-19 11-JUL-19	 R4705949 R4708445 R4708370 R4706129
L2307800-3 CP-CONDUIT-CULVERT Sampled By: KB/LM on 10-JUL-19 @ 16:10 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.96 47.6 2910 59.2		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 10-JUL-19 11-JUL-19 11-JUL-19 11-JUL-19	 R4705949 R4706168 R4708370 R4706129
L2307800-4 MS-C-C Sampled By: KB/LM on 10-JUL-19 @ 16:25 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	 7.63 <2.0 1290 1.04		 0.10 2.0 20 0.10	 pH units mg/L mg/L NTU		 10-JUL-19 11-JUL-19 11-JUL-19 11-JUL-19	 R4705949 R4706168 R4708370 R4706129

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2307800

Report Date: 12-JUL-19

Page 1 of 2

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-BF		Water						
Batch	R4705949							
WG3101666-2	DUP	L2307800-4						
pH		7.63	7.64	J	pH units	0.01	0.2	10-JUL-19
WG3101666-1	LCS							
pH			7.02		pH units		6.9-7.1	10-JUL-19
SOLIDS-TDS-BF		Water						
Batch	R4708370							
WG3101718-3	DUP	L2306750-1						
Total Dissolved Solids		1960	1990		mg/L	1.1	20	11-JUL-19
WG3101718-2	LCS							
Total Dissolved Solids			103.4		%		85-115	11-JUL-19
WG3101718-1	MB							
Total Dissolved Solids			<20		mg/L		20	11-JUL-19
SOLIDS-TSS-BF		Water						
Batch	R4706168							
WG3101667-3	DUP	L2307801-2						
Total Suspended Solids		9.2	10.0		mg/L	8.3	25	11-JUL-19
WG3101667-2	LCS							
Total Suspended Solids			98.6		%		85-115	11-JUL-19
WG3101667-1	MB							
Total Suspended Solids			<2.0		mg/L		2	11-JUL-19
Batch	R4708445							
WG3103079-3	DUP	L2307800-2						
Total Suspended Solids		481	416		mg/L	14	25	11-JUL-19
WG3103079-2	LCS							
Total Suspended Solids			100.8		%		85-115	11-JUL-19
WG3103079-1	MB							
Total Suspended Solids			<2.0		mg/L		2	11-JUL-19
TURBIDITY-BF		Water						
Batch	R4706129							
WG3101708-3	DUP	L2307800-1						
Turbidity		31.6	31.9		NTU	0.9	15	11-JUL-19
WG3101708-2	LCS							
Turbidity			103.0		%		85-115	11-JUL-19
WG3101708-1	MB							
Turbidity			<0.10		NTU		0.1	11-JUL-19

Quality Control Report

Workorder: L2307800

Report Date: 12-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 2 of 2

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



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Page 1 of 1

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Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 11-JUL-19
Report Date: 15-JUL-19 08:42 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2308650
Project P.O. #: 4500057496
Job Reference: CRUSHER PAD PERIMETER
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2308650-1 CRUSHERPAD-SW Sampled By: RH/AZ/CP on 11-JUL-19 @ 13:50 Matrix: Water Physical Tests								
pH		7.96		0.10	pH units		12-JUL-19	R4708382
Total Suspended Solids		<2.0		2.0	mg/L		12-JUL-19	R4708422
Total Dissolved Solids		231		20	mg/L		12-JUL-19	R4709355
Turbidity		1.36		0.10	NTU		12-JUL-19	R4708383
L2308650-2 CRUSHERPAD-SOUTHSUMP Sampled By: RH/AZ/CP on 11-JUL-19 @ 14:10 Matrix: Water Physical Tests								
pH		7.39		0.10	pH units		12-JUL-19	R4708382
Total Suspended Solids		<2.0		2.0	mg/L		12-JUL-19	R4708422
Total Dissolved Solids		790		20	mg/L		12-JUL-19	R4709355
Turbidity		3.16		0.10	NTU		12-JUL-19	R4708383
L2308650-3 CP-CONDUIT-CULVERT Sampled By: RH/AZ/CP on 11-JUL-19 @ 15:30 Matrix: Water Physical Tests								
pH		7.59		0.10	pH units		12-JUL-19	R4708382
Total Suspended Solids		4.4		2.0	mg/L		12-JUL-19	R4708422
Total Dissolved Solids		2330		20	mg/L		12-JUL-19	R4709355
Turbidity		30.2		0.10	NTU		12-JUL-19	R4708383
L2308650-4 CP-SEEPAGE-2 Sampled By: RH/AZ/CP on 11-JUL-19 @ 15:10 Matrix: Water Physical Tests								
pH		7.27		0.10	pH units		12-JUL-19	R4708382
Total Suspended Solids		6.0		2.0	mg/L		12-JUL-19	R4708422
Total Dissolved Solids		4320		20	mg/L		12-JUL-19	R4709355
Turbidity		14.6		0.10	NTU		12-JUL-19	R4708383
L2308650-5 CP-SEEPAGE-3 Sampled By: RH/AZ/CP on 11-JUL-19 @ 16:10 Matrix: Water Physical Tests								
pH		7.25		0.10	pH units		12-JUL-19	R4708382
Total Suspended Solids		13.6		2.0	mg/L		12-JUL-19	R4708422
Total Dissolved Solids		4830		20	mg/L		12-JUL-19	R4709355
Turbidity		39.9		0.10	NTU		12-JUL-19	R4708383

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

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Quality Control Report

Workorder: L2308650

Report Date: 15-JUL-19

Page 1 of 2

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-BF		Water						
Batch	R4708382							
WG3102933-2	DUP	L2308632-1						
pH		4.53	4.51	J	pH units	0.02	0.2	12-JUL-19
WG3102933-1	LCS							
pH			7.02		pH units		6.9-7.1	12-JUL-19
SOLIDS-TDS-BF		Water						
Batch	R4709355							
WG3102987-3	DUP	L2306752-2						
Total Dissolved Solids		80	82		mg/L	2.4	20	12-JUL-19
WG3102987-2	LCS							
Total Dissolved Solids			99.8		%		85-115	12-JUL-19
WG3102987-1	MB							
Total Dissolved Solids			<20		mg/L		20	12-JUL-19
SOLIDS-TSS-BF		Water						
Batch	R4708422							
WG3102895-3	DUP	L2308632-1						
Total Suspended Solids		3.4	3.4		mg/L	0.0	25	12-JUL-19
WG3102895-2	LCS							
Total Suspended Solids			100.2		%		85-115	12-JUL-19
WG3102895-1	MB							
Total Suspended Solids			<2.0		mg/L		2	12-JUL-19
TURBIDITY-BF		Water						
Batch	R4708383							
WG3102936-3	DUP	L2308632-1						
Turbidity		24.0	24.4		NTU	1.7	15	12-JUL-19
WG3102936-2	LCS							
Turbidity			105.0		%		85-115	12-JUL-19
WG3102936-1	MB							
Turbidity			<0.10		NTU		0.1	12-JUL-19

Quality Control Report

Workorder: L2308650

Report Date: 15-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 2 of 2

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
-----------	-------------

J	Duplicate results and limits are expressed in terms of absolute difference.
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Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 16-JUL-19
Report Date: 24-JUL-19 08:51 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2311077
Project P.O. #: 4500057496
Job Reference: MS SNP MONITORING
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2311077-1 MQ-C-A Sampled By: AM/BC/JK on 15-JUL-19 @ 14:15 Matrix: Water								
Physical Tests								
pH		8.19		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		<2.0		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		147		20	mg/L		17-JUL-19	R4715007
Turbidity		0.50		0.10	NTU		17-JUL-19	R4713144
L2311077-2 MQ-C-A03 Sampled By: AM/BC/JK on 15-JUL-19 @ 14:15 Matrix: Water								
Physical Tests								
pH		5.92		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		<2.0		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		24		20	mg/L		17-JUL-19	R4715007
Turbidity		0.12		0.10	NTU		17-JUL-19	R4713144
L2311077-3 MQ-C-D Sampled By: AM/BC/JK on 15-JUL-19 @ 14:25 Matrix: Water								
Physical Tests								
pH		8.12		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		3.6		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		214		20	mg/L		17-JUL-19	R4715007
Turbidity		9.43		0.10	NTU		17-JUL-19	R4713144
L2311077-4 MS-C-A Sampled By: AM/BC/JK on 15-JUL-19 @ 15:15 Matrix: Water								
Physical Tests								
pH		7.91		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		<2.0		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		102		20	mg/L		17-JUL-19	R4715007
Turbidity		2.22		0.10	NTU		17-JUL-19	R4713144
L2311077-5 MS-C-B Sampled By: AM/BC/JK on 15-JUL-19 @ 14:40 Matrix: Water								
Physical Tests								
pH		7.91		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		<2.0		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		94		20	mg/L		17-JUL-19	R4715007
Turbidity		2.75		0.10	NTU		17-JUL-19	R4713144
L2311077-6 MS-C-F Sampled By: AM/BC/JK on 15-JUL-19 @ 16:15 Matrix: Water								
Physical Tests								
pH		7.94		0.10	pH units		17-JUL-19	R4713120
Total Suspended Solids		<2.0		2.0	mg/L		16-JUL-19	R4713148
Total Dissolved Solids		96		20	mg/L		17-JUL-19	R4715007

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2311077-6 MS-C-F Sampled By: AM/BC/JK on 15-JUL-19 @ 16:15 Matrix: Water Physical Tests Turbidity		5.28		0.10	NTU		17-JUL-19	R4713144
L2311077-7 MS-C-F01 Sampled By: AM/BC/JK on 15-JUL-19 @ 16:15 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity		7.95 <2.0 103 5.19		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-8 MS-MRY-9 Sampled By: AM/BC/JK on 15-JUL-19 @ 14:00 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity		7.92 <2.0 68 0.70		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-9 MQ-C-B Sampled By: AM/BC/JK on 16-JUL-19 @ 09:25 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity		8.19 <2.0 206 1.65		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-10 MS-C-G Sampled By: AM/BC/JK on 16-JUL-19 @ 10:00 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity		8.02 <2.0 128 0.33		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-11 MS-C-H Sampled By: AM/BC/JK on 16-JUL-19 @ 10:45 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity		8.16 <2.0 143 0.46		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-12 MS-C-D Sampled By: AM/BC/JK on 16-JUL-19 @ 13:45 Matrix: Water								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2311077-12 MS-C-D Sampled By: AM/BC/JK on 16-JUL-19 @ 13:45 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	8.21 2.8 830 7.07		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-13 MS-C-E Sampled By: AM/BC/JK on 16-JUL-19 @ 13:20 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	8.03 <2.0 872 0.92		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-14 MS-C-C Sampled By: AM/BC/JK on 16-JUL-19 @ 14:00 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	7.88 <2.0 909 0.58		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-15 MS-MRY-13B Sampled By: AM/BC/JK on 16-JUL-19 @ 11:40 Matrix: Water Physical Tests pH Total Suspended Solids Total Dissolved Solids Turbidity	8.10 <2.0 680 0.23		0.10 2.0 20 0.10	pH units mg/L mg/L NTU		17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19	R4713120 R4713148 R4715007 R4713144
L2311077-16 MS-MRY-13A Sampled By: AM/BC/JK on 16-JUL-19 @ 11:55 Matrix: Water Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Anions and Nutrients Alkalinity, Total (as CaCO3) Organic / Inorganic Carbon Dissolved Carbon Filtration Location Dissolved Organic Carbon Total Organic Carbon Total Metals	476 8.09 <2.0 297 178 LAB 4.82 5.25		3.0 0.10 2.0 20 10 0.50 0.50	umhos/cm pH units mg/L mg/L mg/L mg/L mg/L	 18-JUL-19	18-JUL-19 17-JUL-19 16-JUL-19 17-JUL-19 18-JUL-19 18-JUL-19 19-JUL-19 23-JUL-19	R4716090 R4713120 R4713148 R4715007 R4716090 R4715019 R4719664 R4722414

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2311077-16 MS-MRY-13A								
Sampled By: AM/BC/JK on 16-JUL-19 @ 11:55								
Matrix: Water								
Total Metals								
Aluminum (Al)-Total		0.0066		0.0050	mg/L	18-JUL-19	19-JUL-19	R4715311
Antimony (Sb)-Total		0.00019		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Arsenic (As)-Total		0.00020		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Barium (Ba)-Total		0.0307		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Boron (B)-Total		0.029		0.010	mg/L	18-JUL-19	19-JUL-19	R4715311
Cadmium (Cd)-Total		0.0000072		0.0000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Calcium (Ca)-Total		41.9		0.050	mg/L	18-JUL-19	19-JUL-19	R4715311
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	18-JUL-19	19-JUL-19	R4715311
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Copper (Cu)-Total		0.0014		0.0010	mg/L	18-JUL-19	19-JUL-19	R4715311
Iron (Fe)-Total		0.014		0.010	mg/L	18-JUL-19	19-JUL-19	R4715311
Lead (Pb)-Total		<0.000050		0.000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Lithium (Li)-Total		0.0029		0.0010	mg/L	18-JUL-19	19-JUL-19	R4715311
Magnesium (Mg)-Total		32.2		0.0050	mg/L	18-JUL-19	19-JUL-19	R4715311
Manganese (Mn)-Total		0.00405		0.00050	mg/L	18-JUL-19	19-JUL-19	R4715311
Mercury (Hg)-Total		<0.000010		0.000010	mg/L		19-JUL-19	R4716330
Molybdenum (Mo)-Total		0.000346		0.000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Nickel (Ni)-Total		0.00954		0.00050	mg/L	18-JUL-19	19-JUL-19	R4715311
Potassium (K)-Total		1.66		0.050	mg/L	18-JUL-19	19-JUL-19	R4715311
Selenium (Se)-Total		0.000056		0.000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Silicon (Si)-Total		4.54		0.10	mg/L	18-JUL-19	19-JUL-19	R4715311
Silver (Ag)-Total		<0.000050		0.000050	mg/L	18-JUL-19	19-JUL-19	R4715311
Sodium (Na)-Total		7.36		0.050	mg/L	18-JUL-19	19-JUL-19	R4715311
Strontium (Sr)-Total		0.0343		0.0010	mg/L	18-JUL-19	19-JUL-19	R4715311
Thallium (Tl)-Total		0.000013		0.000010	mg/L	18-JUL-19	19-JUL-19	R4715311
Tin (Sn)-Total		<0.00010		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Titanium (Ti)-Total		<0.00030		0.00030	mg/L	18-JUL-19	19-JUL-19	R4715311
Tungsten (W)-Total		<0.00010		0.00010	mg/L	18-JUL-19	19-JUL-19	R4715311
Uranium (U)-Total		0.00106		0.000010	mg/L	18-JUL-19	19-JUL-19	R4715311
Vanadium (V)-Total		<0.00050		0.00050	mg/L	18-JUL-19	19-JUL-19	R4715311
Zinc (Zn)-Total		0.0041		0.0030	mg/L	18-JUL-19	19-JUL-19	R4715311
Zirconium (Zr)-Total		<0.00030		0.00030	mg/L	18-JUL-19	19-JUL-19	R4715311
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	22-JUL-19	22-JUL-19	R4721008
Phenols (4AAP)		0.0029		0.0010	mg/L		19-JUL-19	R4719699
Hydrocarbons								
F1 (C6-C10)		<100		100	ug/L		24-JUL-19	R4720754
F2 (C10-C16)		<100		100	ug/L	18-JUL-19	19-JUL-19	R4719837
F3 (C16-C34)		<250		250	ug/L	18-JUL-19	19-JUL-19	R4719837

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2311077-16 MS-MRY-13A Sampled By: AM/BC/JK on 16-JUL-19 @ 11:55 Matrix: Water Hydrocarbons F4 (C34-C50) Total Hydrocarbons (C6-C50) Chrom. to baseline at nC50 Surrogate: 2-Bromobenzotrifluoride Surrogate: 3,4-Dichlorotoluene	<250 <380 YES 91.6 104.1		250 380 60-140 60-140	ug/L ug/L % %	18-JUL-19 18-JUL-19 18-JUL-19 24-JUL-19	19-JUL-19 24-JUL-19 19-JUL-19 19-JUL-19 24-JUL-19	R4719837 R4719837 R4719837 R4720754
L2311077-17 MQ-C-A Sampled By: AM/BC/JK on 16-JUL-19 @ 09:05 Matrix: Water Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Nitrate (as N) Aggregate Organics Oil and Grease, Total	255 8.18 <2.0 171 0.43 <0.010 <0.020 <2.0		3.0 0.10 2.0 20 0.10 0.010 0.020 2.0	umhos/cm pH units mg/L mg/L NTU mg/L mg/L mg/L	 22-JUL-19	23-JUL-19 17-JUL-19 16-JUL-19 17-JUL-19 17-JUL-19 22-JUL-19 19-JUL-19 22-JUL-19	R4720571 R4713120 R4713148 R4715007 R4713144 R4719920 R4719726 R4721008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2311077-16
Matrix Spike	Calcium (Ca)-Total	MS-B	L2311077-16
Matrix Spike	Copper (Cu)-Total	MS-B	L2311077-16
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2311077-16
Matrix Spike	Potassium (K)-Total	MS-B	L2311077-16
Matrix Spike	Silicon (Si)-Total	MS-B	L2311077-16
Matrix Spike	Sodium (Na)-Total	MS-B	L2311077-16
Matrix Spike	Strontium (Sr)-Total	MS-B	L2311077-16

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F1-F4-CALC-WT	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L
Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.			
In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.			
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.			
In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.			
Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:			
1. All extraction and analysis holding times were met.			
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.			
3. Linearity of gasoline response within 15% throughout the calibration range.			
Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:			
1. All extraction and analysis holding times were met.			
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.			
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.			
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.			
F1-HS-WT	Water	F1 (O.Reg.153/04)	E3421/CCME (HS)
Fraction F1 is determined by analyzing by headspace-GC/FID.			
F2-F4-WT	Water	F2-F4 (O.Reg.153/04)	MOE DECPH-E3421/CCME TIER 1
Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT Water Oil and Grease, Total APHA 5520 B
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PH-BF Water pH APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.

PHENOLS-4AAP-WT Water Phenol (4AAP) EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SOLIDS-TDS-BF Water Total Dissolved Solids APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.

SOLIDS-TSS-BF Water Suspended solids APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.

TOC-WT Water Total Organic Carbon APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

TURBIDITY-BF Water Turbidity APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg wwt - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.
- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2311077

Report Date: 24-JUL-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT Water								
Batch	R4716090							
WG3108626-4 DUP		WG3108626-3						
Alkalinity, Total (as CaCO3)		52	56		mg/L	7.5	20	18-JUL-19
WG3108626-2 LCS								
Alkalinity, Total (as CaCO3)			102.9		%		85-115	18-JUL-19
WG3108626-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	18-JUL-19
DOC-WT Water								
Batch	R4719664							
WG3109390-3 DUP		L2311626-1						
Dissolved Organic Carbon		5.86	5.92		mg/L	1.0	25	19-JUL-19
WG3109390-2 LCS								
Dissolved Organic Carbon			102.0		%		70-130	19-JUL-19
WG3109390-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	19-JUL-19
WG3109390-4 MS		L2311626-1						
Dissolved Organic Carbon			105.1		%		70-130	19-JUL-19
EC-WT Water								
Batch	R4716090							
WG3108626-4 DUP		WG3108626-3						
Conductivity		2020	2020		umhos/cm	0.0	10	18-JUL-19
WG3108626-2 LCS								
Conductivity			98.7		%		90-110	18-JUL-19
WG3108626-1 MB								
Conductivity			<3.0		umhos/cm		3	18-JUL-19
Batch	R4720571							
WG3112605-4 DUP		WG3112605-3						
Conductivity		748	746		umhos/cm	0.3	10	23-JUL-19
WG3112605-2 LCS								
Conductivity			100.6		%		90-110	23-JUL-19
WG3112605-1 MB								
Conductivity			<3.0		umhos/cm		3	23-JUL-19
F1-HS-WT Water								
Batch	R4720754							
WG3112475-4 DUP		WG3112475-3						
F1 (C6-C10)		<100	<100	RPD-NA	ug/L	N/A	50	23-JUL-19
WG3112475-1 LCS								
F1 (C6-C10)			103.2		%		80-120	23-JUL-19



Quality Control Report

Workorder: L2311077

Report Date: 24-JUL-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-WT	Water							
Batch	R4720754							
WG3112475-2 MB								
F1 (C6-C10)			<100		ug/L		100	23-JUL-19
Surrogate: 3,4-Dichlorotoluene			130.6		%		60-140	23-JUL-19
WG3112475-5 MS		WG3112475-3						
F1 (C6-C10)			79.0		%		50-150	23-JUL-19
F2-F4-WT	Water							
Batch	R4719837							
WG3109410-2 LCS								
F2 (C10-C16)			97.0		%		65-135	19-JUL-19
F3 (C16-C34)			101.1		%		65-135	19-JUL-19
F4 (C34-C50)			104.8		%		65-135	19-JUL-19
WG3109410-1 MB								
F2 (C10-C16)			<100		ug/L		100	19-JUL-19
F3 (C16-C34)			<250		ug/L		250	19-JUL-19
F4 (C34-C50)			<250		ug/L		250	19-JUL-19
Surrogate: 2-Bromobenzotrifluoride			88.5		%		60-140	19-JUL-19
HG-T-CVAA-WT	Water							
Batch	R4716330							
WG3108866-3 DUP		L2311819-1						
Mercury (Hg)-Total		0.000042	0.000044		mg/L	4.4	20	19-JUL-19
WG3108866-2 LCS								
Mercury (Hg)-Total			100.0		%		80-120	19-JUL-19
WG3108866-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	19-JUL-19
WG3108866-4 MS		L2311819-2						
Mercury (Hg)-Total			107.4		%		70-130	19-JUL-19
MET-T-CCMS-WT	Water							
Batch	R4715311							
WG3109048-4 DUP		WG3109048-3						
Aluminum (Al)-Total		15.5	15.5		mg/L	0.3	20	18-JUL-19
Antimony (Sb)-Total		0.0050	0.0049		mg/L	1.6	20	18-JUL-19
Arsenic (As)-Total		0.0017	0.0016		mg/L	12	20	18-JUL-19
Barium (Ba)-Total		0.0766	0.0749		mg/L	2.2	20	18-JUL-19
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-JUL-19
Bismuth (Bi)-Total		0.00053	0.00052		mg/L	1.4	20	18-JUL-19
Boron (B)-Total		0.44	0.45		mg/L	3.5	20	18-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4715311							
WG3109048-4 DUP		WG3109048-3						
Cadmium (Cd)-Total		0.000993	0.00100		mg/L	1.0	20	18-JUL-19
Calcium (Ca)-Total		106	107		mg/L	1.5	20	18-JUL-19
Chromium (Cr)-Total		0.0259	0.0257		mg/L	0.9	20	18-JUL-19
Cobalt (Co)-Total		0.0120	0.0123		mg/L	2.8	20	18-JUL-19
Copper (Cu)-Total		0.067	0.067		mg/L	0.8	20	18-JUL-19
Iron (Fe)-Total		16.8	16.4		mg/L	2.6	20	18-JUL-19
Lead (Pb)-Total		0.0959	0.0965		mg/L	0.6	20	18-JUL-19
Lithium (Li)-Total		0.082	0.085		mg/L	3.4	20	18-JUL-19
Magnesium (Mg)-Total		21.9	22.0		mg/L	0.7	20	18-JUL-19
Manganese (Mn)-Total		0.336	0.337		mg/L	0.1	20	18-JUL-19
Molybdenum (Mo)-Total		0.0371	0.0370		mg/L	0.2	20	18-JUL-19
Nickel (Ni)-Total		0.0333	0.0323		mg/L	3.0	20	18-JUL-19
Potassium (K)-Total		15.0	15.2		mg/L	1.0	20	18-JUL-19
Selenium (Se)-Total		0.00150	0.00145		mg/L	3.2	20	18-JUL-19
Silicon (Si)-Total		31.2	30.4		mg/L	2.7	20	18-JUL-19
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-JUL-19
Sodium (Na)-Total		69.1	69.1		mg/L	0.1	20	18-JUL-19
Strontium (Sr)-Total		0.554	0.587		mg/L	5.8	20	18-JUL-19
Thallium (Tl)-Total		0.00017	0.00016		mg/L	4.7	20	18-JUL-19
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-JUL-19
Titanium (Ti)-Total		0.852	0.849		mg/L	0.5	20	18-JUL-19
Tungsten (W)-Total		0.0296	0.0296		mg/L	0.2	20	18-JUL-19
Uranium (U)-Total		0.00517	0.00521		mg/L	0.9	20	18-JUL-19
Vanadium (V)-Total		0.0453	0.0460		mg/L	1.5	20	18-JUL-19
Zinc (Zn)-Total		0.172	0.166		mg/L	3.4	20	18-JUL-19
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	18-JUL-19
WG3109048-2 LCS								
Aluminum (Al)-Total			104.6		%		80-120	18-JUL-19
Antimony (Sb)-Total			106.0		%		80-120	18-JUL-19
Arsenic (As)-Total			99.6		%		80-120	18-JUL-19
Barium (Ba)-Total			100.2		%		80-120	18-JUL-19
Beryllium (Be)-Total			102.8		%		80-120	18-JUL-19
Bismuth (Bi)-Total			98.7		%		80-120	18-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4715311							
WG3109048-2	LCS							
Boron (B)-Total			102.4		%		80-120	18-JUL-19
Cadmium (Cd)-Total			103.1		%		80-120	18-JUL-19
Calcium (Ca)-Total			101.2		%		80-120	18-JUL-19
Chromium (Cr)-Total			100.4		%		80-120	18-JUL-19
Cobalt (Co)-Total			100.7		%		80-120	18-JUL-19
Copper (Cu)-Total			99.8		%		80-120	18-JUL-19
Iron (Fe)-Total			94.5		%		80-120	18-JUL-19
Lead (Pb)-Total			101.7		%		80-120	18-JUL-19
Lithium (Li)-Total			106.7		%		80-120	18-JUL-19
Magnesium (Mg)-Total			103.3		%		80-120	18-JUL-19
Manganese (Mn)-Total			99.5		%		80-120	18-JUL-19
Molybdenum (Mo)-Total			102.6		%		80-120	18-JUL-19
Nickel (Ni)-Total			100.1		%		80-120	18-JUL-19
Potassium (K)-Total			94.1		%		80-120	18-JUL-19
Selenium (Se)-Total			99.8		%		80-120	18-JUL-19
Silicon (Si)-Total			105.8		%		60-140	18-JUL-19
Silver (Ag)-Total			101.5		%		80-120	18-JUL-19
Sodium (Na)-Total			106.0		%		80-120	18-JUL-19
Strontium (Sr)-Total			101.1		%		80-120	18-JUL-19
Thallium (Tl)-Total			101.5		%		80-120	18-JUL-19
Tin (Sn)-Total			102.8		%		80-120	18-JUL-19
Titanium (Ti)-Total			99.7		%		80-120	18-JUL-19
Tungsten (W)-Total			101.5		%		80-120	18-JUL-19
Uranium (U)-Total			107.3		%		80-120	18-JUL-19
Vanadium (V)-Total			102.1		%		80-120	18-JUL-19
Zinc (Zn)-Total			95.1		%		80-120	18-JUL-19
Zirconium (Zr)-Total			96.1		%		80-120	18-JUL-19
WG3109048-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	18-JUL-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	18-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4715311							
WG3109048-1	MB							
Boron (B)-Total			<0.010		mg/L		0.01	18-JUL-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	18-JUL-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	18-JUL-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	18-JUL-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	18-JUL-19
Iron (Fe)-Total			<0.010		mg/L		0.01	18-JUL-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	18-JUL-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	18-JUL-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	18-JUL-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	18-JUL-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	18-JUL-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	18-JUL-19
Potassium (K)-Total			<0.050		mg/L		0.05	18-JUL-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	18-JUL-19
Silicon (Si)-Total			<0.10		mg/L		0.1	18-JUL-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	18-JUL-19
Sodium (Na)-Total			<0.050		mg/L		0.05	18-JUL-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	18-JUL-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	18-JUL-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	18-JUL-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	18-JUL-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	18-JUL-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	18-JUL-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	18-JUL-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	18-JUL-19
WG3109048-5	MS	WG3109048-6						
Aluminum (Al)-Total			95.3		%		70-130	18-JUL-19
Antimony (Sb)-Total			108.8		%		70-130	18-JUL-19
Arsenic (As)-Total			100.7		%		70-130	18-JUL-19
Barium (Ba)-Total			N/A	MS-B	%		-	18-JUL-19
Beryllium (Be)-Total			99.9		%		70-130	18-JUL-19
Bismuth (Bi)-Total			102.5		%		70-130	18-JUL-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT	Water							
Batch R4719920								
WG3111652-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	22-JUL-19
WG3111652-8 MS		L2311077-17						
Ammonia, Total (as N)			92.8		%		75-125	22-JUL-19
NO3-IC-WT	Water							
Batch R4719726								
WG3110151-4 DUP		WG3110151-3						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	19-JUL-19
WG3110151-2 LCS								
Nitrate (as N)			101.2		%		90-110	19-JUL-19
WG3110151-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	19-JUL-19
WG3110151-5 MS		WG3110151-3						
Nitrate (as N)			97.9		%		75-125	19-JUL-19
OGG-TOT-WT	Water							
Batch R4721008								
WG3111791-2 LCS								
Oil and Grease, Total			88.2		%		70-130	22-JUL-19
WG3111791-1 MB								
Oil and Grease, Total			<2.0		mg/L		2	22-JUL-19
PH-BF	Water							
Batch R4713120								
WG3106961-2 DUP		L2311077-17						
pH		8.18	8.19	J	pH units	0.01	0.2	17-JUL-19
WG3106961-1 LCS								
pH			7.01		pH units		6.9-7.1	17-JUL-19
PHENOLS-4AAP-WT	Water							
Batch R4719699								
WG3109768-3 DUP		L2307302-2						
Phenols (4AAP)		0.0021	0.0021		mg/L	0.8	20	19-JUL-19
WG3109768-2 LCS								
Phenols (4AAP)			105.9		%		85-115	19-JUL-19
WG3109768-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	19-JUL-19
WG3109768-4 MS		L2307302-2						
Phenols (4AAP)			109.5		%		75-125	19-JUL-19
SOLIDS-TDS-BF	Water							



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-BF	Water							
Batch	R4715007							
WG3108230-3 DUP		L2311077-16						
Total Dissolved Solids		297	279		mg/L	6.1	20	17-JUL-19
WG3108230-2 LCS								
Total Dissolved Solids			101.1		%		85-115	17-JUL-19
WG3108230-1 MB								
Total Dissolved Solids			<20		mg/L		20	17-JUL-19
SOLIDS-TSS-BF	Water							
Batch	R4713148							
WG3106971-3 DUP		L2311077-5						
Total Suspended Solids		<2.0	<2.0	RPD-NA	mg/L	N/A	25	16-JUL-19
WG3106971-2 LCS								
Total Suspended Solids			99.2		%		85-115	16-JUL-19
WG3106971-1 MB								
Total Suspended Solids			<2.0		mg/L		2	16-JUL-19
TOC-WT	Water							
Batch	R4722414							
WG3112422-3 DUP		L2312192-21						
Total Organic Carbon		<0.50	<0.50	RPD-NA	mg/L	N/A	20	23-JUL-19
WG3112422-2 LCS								
Total Organic Carbon			106.7		%		80-120	23-JUL-19
WG3112422-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	23-JUL-19
WG3112422-4 MS		L2312192-21						
Total Organic Carbon			110.0		%		70-130	23-JUL-19
TURBIDITY-BF	Water							
Batch	R4713144							
WG3106975-3 DUP		L2311077-17						
Turbidity		0.43	0.50	J	NTU	0.080	0.2	17-JUL-19
WG3106975-2 LCS								
Turbidity			101.0		%		85-115	17-JUL-19
WG3106975-1 MB								
Turbidity			<0.10		NTU		0.1	17-JUL-19

Quality Control Report

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Report Date: 24-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

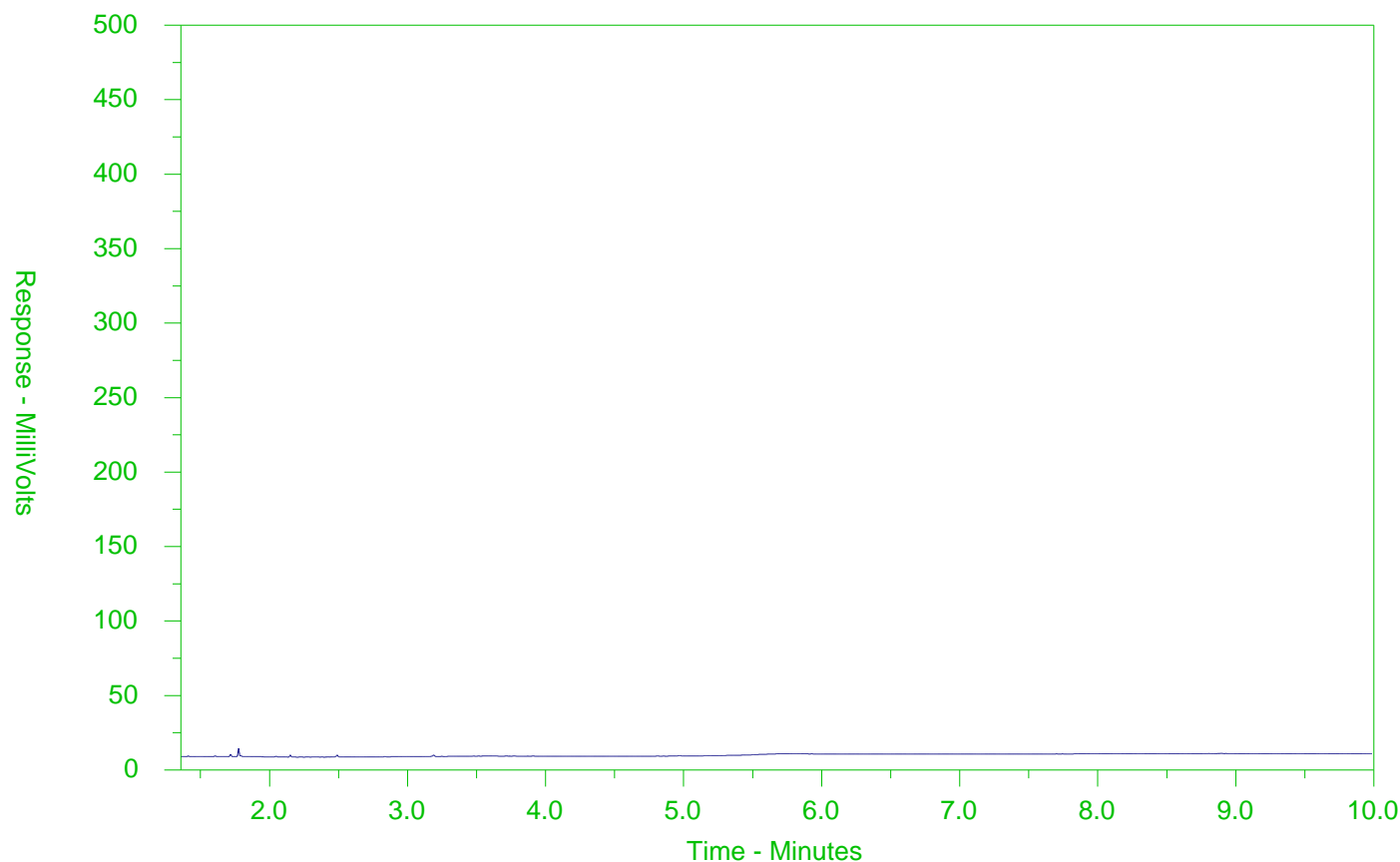
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2311077-16
Client Sample ID: MS-MRY-13A



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



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COC Number: 15 -

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www.alsglobal.com

Canada Toll Free: 1 800 668 9878

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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FROM



September 29, 2019

Jonathan Mesher, Water Resource Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Iqaluit Office
Box 100
Iqaluit, NU X0A 0H0

Monika Trottier, Enforcement Officer
Curtis Didham, Enforcement Officer
Environment and Climate Change
Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-279 – Update 1, Reported on September 01, 2019, Mary River Project - Water Licence No. 2AM-MRY1325

On August 31st, during inspections at the Crusher Facility, personnel observed runoff from the crusher pad entering the east collection ditch. The runoff sourced from the water pooling in the area of the ring road that originated from the ice and water entrained in the ore stockpile that was being reclaimed and was being disturbed from increased equipment traffic through the area at the time. Additional vehicle traffic was present due to the initiation of remedial earthworks in response to Spill No. 19-279. Upon further investigation, it was observed that water was flowing out of the east collection ditch at the toe, in the same location (CP-SEEPAGE-1) as reported on July 11th. The runoff from the crusher pad was immediately arrested from entering the ditch with a reinforced berm and equipment traffic was eliminated from the area with additional berms. Preliminary pH results at the release location at the ditch toe indicate pH levels below 6.0. Water quality monitoring conducted downstream of the release indicate neutral pH in the receiving environment.

Water quality monitoring was conducted at the release location CP-SEEPAGE-1 on August 31st. CP-SEEPAGE-1 was dry on subsequent site visits, and was not sampled. Lab results for CP-SEEPAGE-1 were non-compliant with applicable regulatory criteria for total suspended solids (TSS) and pH. Field personnel noted that substrate entered the sample bottle during sample collection due to low water level and could not be mitigated by sampling technique. Water quality monitoring was conducted downstream of the Crusher Facility at the Water Licence sampling location MS-C-C on August 31st and September 2nd, MS-C-E September 1st and 2nd. Lab results for all parameters analyzed at MS-C-C and MS-C-E, including acute toxicity, were compliant with applicable regulatory criteria.

Appendix A outlines water quality results from monitoring conducted at the release location and the downstream Water License location.

Repairs completed on the ditch were tested on September 6th with treated lake water. The water migrated approximately 50m along the ditch before draining downward emerging at the toe. This test confirmed the ditch was still compromised and Baffinland continues to contain and pump the Crusher Facility water on the pad to the pond.

Further ditch repairs and remedial actions are still under investigation by Golder Associates. Baffinland intends to repair the ditch and restore functionality prior to Freshet 2020.

As per Section 31 of the Metal and Diamond Mining Effluent Regulations (MDMER):

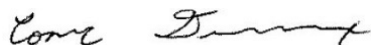
- a) Surface water at the CF sedimentation pond collection ditch.
- b) Unknown quantity
- c) The release was first observed at approximately 14:00 on July 10th, 2019 (Spill No. 19-279), and again on August 31st, 2019. A summary is provided in Appendix A of the sampling events that occurred upon observation of the uncontrolled release which includes date, time and respective water quality results.
- d) The quantity of surface water released from the collection ditch is unknown. The location of the release is listed below.

ID	Location
CP-SEEPAGE-1	17W 561645 7912653

- e) N/A. The release did not occur through a final discharge point.
- f) Sheardown Lake tributary is the receiving body of water. The release was contained to the adjacent tundra of the crusher pad which is over 1km from Sheardown Lake tributary, the nearest fish bearing waters.
- g) No acute lethality test was able to be taken at the time of deposit from the release location itself. An acute lethality test was taken from the receiving environment (MS-C-E) and was determined to be not acutely lethal.
- h) See summary above for circumstances of deposit. Extent of release was minimal and prohibited proper water sampling procedures. As per Baffinland's Emergency Response Plan and Spill Contingency Plan a berm was immediately constructed to prevent water from entering the ditch and the water was pumped directly into the CF sedimentation pond (MS-06).
- i) The water from the pad continues to be diverted from the ditch and pumped directly into the CF sedimentation pond. Field monitoring continues at the crusher pad facility and no further releases have been observed. A third party engineering firm continues with field investigations and corrective actions will occur prior to Freshet 2020.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253-0596 x6016.

Prepared by:



Connor Devereaux
Environmental Superintendent

Reviewed by:



Christopher Murray
Environmental & Regulatory Compliance Manager

Attach: Photos, Map, NT-NU Spill Report, Water Quality Results, Certificates of Analyses

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, Francois Gaudreau, Lou Kamermans (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC), Curtis Didham (ECCC).



Photo 1. August 31st, 2019 – Crusher Facility runoff into ditch.



Photo 2. August 31st, 2019 – CP-SEEPAGE-1 sample location.



Photo 3. September 1st, 2019 – Crusher Facility runoff berm.



Photo 4. September 1st, 2019 – MS-C-E water quality sampling.



Photo 5. September 3rd, 2019 – Crusher Facility ditch repairs.



Photo 6. September 6th, 2019 – CP-SEEPAGE-1



Photo 7. September 6th, 2019 – Crusher Facility ditch treated lake water test.



Photo 8. September 12th, 2019 – Crusher Facility ditch dry.



Photo 9. September 14th, 2019 – Crusher Facility pump set up to bypass ditch.



Figure 1 – Overview map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 09-01-2019	REPORT TIME 22:00	<input type="checkbox"/> ORIGINAL SPILL REPORT; OR <input checked="" type="checkbox"/> UPDATE # 19-279 TO THE ORIGINAL SPILL REPORT	REPORT NUMBER
B	OCCURRENCE DATE: MONTH - DAY - YEAR 08-31-2019	OCCURRENCE TIME 15:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 30		LONGITUDE DEGREES 79 MINUTES 16 SECONDS 35	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Surface Water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Unknown	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Crusher Pad	SPILL CAUSE Seepage through ditch	AREA OF CONTAMINATION IN SQUARE METRES N/A	
J	FACTORS AFFECTING SPILL OR RECOVERY Drainage to tundra	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On August 31st, during inspections at the Crusher Facility, personnel observed runoff from the crusher pad entering the east collection ditch. The runoff sourced from the water pooling in the area of the ring road that originated from the ice and water entrained in the ore stockpile that was being reclaimed and was being disturbed from increased equipment traffic through the area at the time. Additional vehicle traffic was present due to the initiation of remedial earthworks in response to Spill No. 19-279. Upon further investigation, it was observed that water was flowing out of the east collection ditch at the toe, in the same location (CP-SEEPAGE-1) as reported on July 11th. The runoff from the crusher pad was immediately arrested from entering the ditch with a reinforced berm and equipment traffic was eliminated from the area with additional berms. Preliminary pH results at the release location at the ditch toe indicate pH levels below 6.0. Water quality monitoring conducted downstream of the release indicate neutral pH in the receiving environment.			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			CONTACT NAME	
CONTACT TIME			REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2 – NT-NU Spill report

Appendix A
Water Quality Results Summary

Summary of Analytical Results

	ALS Laboratory Sample ID			CP-SEEPAGE-1 ²	MS-C-C	MS-C-E	MS-C-C	MS-C-E
	ALS ID			L2339962-1	L2339962-2	L2339830-1	L2340254-7	L2340254-5
	Sample Date & Time			8/31/2019 14:35:00 PM	8/31/2019 15:20:00 PM	9/1/2019 10:00:00 AM	9/2/2019 11:35:00 AM	9/2/2019 11:00:00 AM
	QA/QC Sample Type			N/A	N/A	N/A	N/A	N/A
	Units	LOR	MDMER Grab Sample Limits ¹					
Conductivity	umhos/cm	3	-	-	-	1280	1390	1240
pH	pH units	0.1	6.0-9.5	5.85	8.01	7.91	7.99	7.94
Total Suspended Solids	mg/L	2	30	2890	3	3.7	<2.0	4.0
Total Dissolved Solids	mg/L	10	-	4850	1030	922	1030	885
Turbidity	NTU	0.1	-	4500	1	1.71	0.58	0.96
Ammonia, Total (as N)	mg/L	0.02	-	-	-	<0.010	<0.010	<0.010
Nitrate (as N)	mg/L	0.02	-	-	-	9.27	16.7	11.3
Oil and Grease, Total	mg/L	2	-	-	-	-	<2.0	<2.0
Acute Lethality	-	-	Not acutely toxic	-	-	Not acutely toxic	-	-

Notes:

¹Metal and Diamond Mining Effluent Regulations - Schedule 4

²Field personnel indicated substrate entered bottle during sample collection due to low water level

Spill Report Number:

19-292



August 19, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
Jonathan.Mesher@aandc-aadnc.gc.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-292
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

While completing a walk around the Waste Water Treatment Plant (WWTP) being commissioned in Milne Port, the water treatment operator discovered a biological foam overflow on the 380man camp pad, which upon initial investigation had originated from the irritation tank and migrated through the vent to the pad. Approximately 1.5m³ of the greywater / foam was released to the adjacent camp pad, impacting an area of approximately 7m². The release is >500m from Phillips Creek and was confined to the immediate WWTP pad.

Immediate and Follow-Up Action:

The operator added an anti-foaming agent to the tank which started to dissipate the foam immediately, arresting the spill. The foam was removed with a vacuum truck and transported to the Polishing Waste Stabilization Pond.

Recommendations:

Continued and increased frequency of routine inspections of the 380M WWTP to mitigate the potential for future releases from occurring, and the rerouting of the irritation vent to a secondary holding tank has been actioned.

Current Status:

The irritation tank vent has been routed into the sludge tank to prevent a future foam over from reaching the environment and is operating as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Vern Shaver".

Vern Shaver
Project Site Manager

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Sylvain Proulx, Tim Sewell, Shawn Stevens, Connor Devereaux, Gerald Rogers, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Irritation tank vent foam over location



Photo 2. Foam over spill on 380M WWTP Pad



Photo 3. 380M WWTP Pad after spill clean up

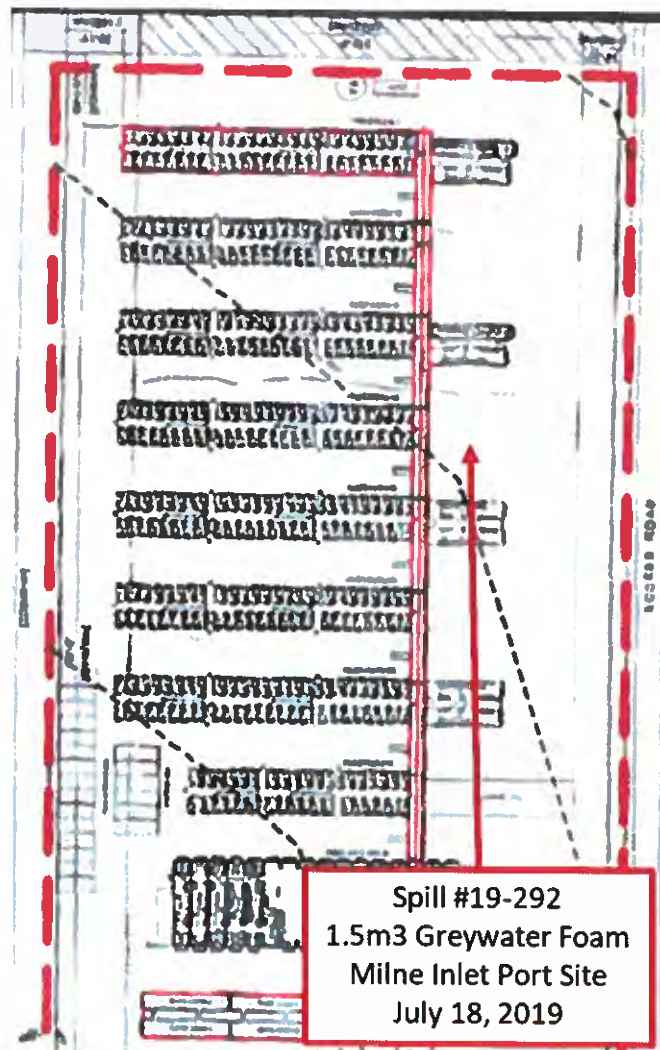


Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spill@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 07-19-2019	REPORT TIME 19:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT. OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 _____
B	OCCURRENCE DATE: MONTH - DAY - YEAR 07-18-2019	OCCURRENCE TIME 23:30		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 33		LONGITUDE DEGREES 80 MINUTES 54 SECONDS 16	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Horizon North	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Greywater / Foam	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 1.5m3	UN. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	UN. NUMBER N/A	
I	SPILL SOURCE Irritation Tank	SPILL CAUSE Plant Upset	AREA OF CONTAMINATION IN SQUARE METRES 7m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested Area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS While completing a walk around of the Waste Water Treatment Plant (WWTP) currently being commissioned in Milne Port, the water treatment operator discovered a biological foam overflow on the 380man camp pad, which upon initial investigation had originated from the irritation tank and migrated through the vent to the pad. The operator added an anti-foaming agent to the tank which started to dissipate the foam immediately, arresting the spill. The foam was removed with a vacuum truck and transported to the Polishing Waste Stabilization Pond. The release is >500m from Phillips Creek and is confined to the immediate WWTP pad. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE TELEPHONE Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME		CONTACT TIME	REMARKS
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

Figure 2. Baffinland NT NU spill report

2275 Upper Middle Road East, Suite 300 | Oakville, ON, Canada L6H 0C3
Main: 416.364.8820 | Fax: 416.364.0193 | www.baffinland.com

Spill Report Number:

19-317



September 8, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-317
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

While completing daily tasks at the Milne Port Waste Water Treatment Plant (WWTP), the water treatment operator was notified of a sewage spill originating from the plant, upon investigation it was determined that sludge being pumped into the sludge press for dehydration had reached capacity and overflowed the press tank. This resulted in approximately 1 cubic meter of sewage sludge to spill onto the surrounding camp pad. The release was >100m from the closest water body and was confined to the immediate WWTP pad.

Immediate and Follow-Up Action:

The operator immediately turned off the valve and contacted the supervisor who initiated clean up of the spill. The sludge liquid was removed with a vacuum truck and pumped into totes and the contaminated gravel was removed and placed into Quatex bags for disposal.

Recommendations:

It was recommended that the waste water treatment operator is present during the filling stage of the sludge pressing operations.

Current Status:

The sludge pressing operations continue with no further incidents.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "James Martin".
James Martin
Site Services Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Sewage spill before clean up



Photo 2. Sewage spill following clean up



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 08-10-2019	REPORT TIME 14:30	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 317
B	OCCURRENCE DATE: MONTH – DAY – YEAR 08-09-2019	OCCURRENCE TIME 15:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 53 SECONDS 02		LONGITUDE DEGREES 80 MINUTES 53 SECONDS 27	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Sutie 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Qikiqtaaluk Environmental	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage sludge	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 1.0m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Sludge tank	SPILL CAUSE Operator error	AREA OF CONTAMINATION IN SQUARE METRES 8m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested Area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS While completing daily tasks at the Milne Port Waste Water Treatment Plant (WWTP), the water treatment operator was notified of a sewage spill originating from the plant, upon initial investigation it was determined that sludge being pumped into the sludge press for dehydration had reached capacity and overflowed the press tank. The operator immediately turned off the valve and contacted the supervisor who initiated clean up of the spill. The sludge liquid was removed with a vacuum truck and pumped into totes and the contaminated gravel was removed and placed into Quatrex bags. The release is >100m from the closest water body and was confined to the immediate WWTP pad. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC		SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-323



September 11, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-323
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On August 12, 2019 while completing daily tasks at the Port Site 380 person camp, the Horizon North waste water treatment plant operator observed lift station LGM-883 discharging sewage from the enclosed housing. The operator halted all flow to the lift station and notified their supervisor of the release. Crews were dispatched to complete clean up of the affected area. All contaminated gravel was removed and placed into Quatrex bags. The release was >100m from the closest water body and is confined to the immediate camp pad.

Immediate and Follow-Up Action:

All flow to the lift station was immediately halted to prevent any further release while the cause was investigated. Upon investigation it was determined that additional sewage was added to the lift station by a vac truck which resulted in the system reaching capacity and overflowing.

Recommendations:

Only sewage from the wing is to flow into the lift station with no additional sewage to be added to the system.

Current Status:

No further additional sewage has been added to the lift station. The lift station is currently operating as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux or William Bowden at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Marlon Coakley".

For Marlon Coakley
Marlon Coakley
Hatch Site Manager

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



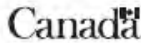
Photo 1. Lift station LGM-883



Photo 2. Spill location following clean up



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 08-13-2019	REPORT TIME 21:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 323
B	OCCURRENCE DATE: MONTH – DAY – YEAR 08-12-2019	OCCURRENCE TIME 12:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU	REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 35	LONGITUDE DEGREES 80 MINUTES 54 SECONDS 17		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Horizon North	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage sludge	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 200L	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Lift station	SPILL CAUSE Overflow	AREA OF CONTAMINATION IN SQUARE METRES 8m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested Area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On August 12, 2019 while completing daily tasks at the Port Site 380 person camp, the Horizon North waste water treatment plant operator observed lift station LGM-883 discharging sewage from the enclosed housing. The operator halted all flow to the lift station and notified their supervisor of the release. Crews were dispatched to complete clean up of the affected area. All contaminated gravel was removed and placed into Quatrex bags. The release is >100m from the closest water body and is confined to the immediate camp pad. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			CONTACT NAME	CONTACT TIME
LEAD AGENCY			REMARKS	
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-326



September 15, 2019

Jonathan Mesher, Water Resource Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Iqaluit Office
Box 100
Iqaluit, NU X0A 0H0

Monika Trottier, Enforcement Officer
Curtis Didham, Enforcement Officer
Environment and Climate Change
Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-326, Reported on August 17, 2019, Mary River Project - Water Licence No. 2AM-MRY1325

On August 16 2019, at approximately 14:00, on inspection of the Crusher Ore Stockpile Facility, it was observed that clear cold (6C) water was flowing out of the toe of the crusher pad where it meets the tundra. The collection ditches were dry at the time of discovery. The source of the clear cold water exiting the crusher pad berm is presently undetermined. Golder Associates Inc. were engaged for external expert advice following the discovery of the seep to advise on the source. There is no indication at this time that the water is sourced from the Crusher Pad Sedimentation Pond. This investigation is still ongoing. The pH and temperature of the observed seep has differed from the chemistry of water resident within the Crusher Sedimentation pond. The prolonged dry, warm conditions of summer at site leading up to and during the occurrence potentially contributed to the observed seep. The observed seeping water occurred on IOL located > 1km from Sheardown Lake tributary, the nearest fish bearing waters.

ID	Location
MS-06-SEEPAGE1 /CP-SEEPAGE-3	N 71° 18' 38" W 79° 16' 49"

Full suite analytical monitoring was actioned on August 16 upon discovery of the water exiting the toe of the crusher pad berm. Water samples were taken from the seep location at the toe of the berm (MS-06-Seepage1/CP-Seepage-3) as well as at the nearest down gradient Water Licence SNP site (MS-C-E) just upstream of fish bearing waters. It was determined that both sample locations on August 16th were compliant with Metal and Diamond Mining Effluent Regulations (MDMER) and Baffinland's Water Licence No. 2AM-MRY1325 criteria (Table 1). An Acute Lethality toxicity test was taken at MS-C-E, which demonstrated non-lethal results.

Follow up general chemistry and metals monitoring was conducted on August 31 of the ongoing seep location. The results were compliant with applicable regulatory criteria with the exception of the TSS criteria under Water licence 2AM-MRY1325 (TSS 23.8 mg/L). However, the low flow conditions and substrate of the tundra at the seep location result in poor sampling conditions, resulting in elevated TSS measurements from disturbance of the substrate during sampling that could not be mitigated by sampling technique. This occurrence has been observed from field personnel.

Appendix A outlines water quality results from monitoring conducted at the release locations and the downstream Water License location. Appendix B includes the Certificates of Analyses (COAs) for these sampling events.



Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Connor Devereaux at (647) 253-0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Bill Bowden".

William Bowden
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Chris Murray".

Christopher Murray
Environmental and Regulatory Compliance Manager

Attach: Photos, Map, NT-NU Spill Report, Water Quality Results, Certificates of Analyses

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, William Bowden, Francois Gaudreau, Christopher Murray, Lou Kamermans (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC), Curtis Didham (ECCC).

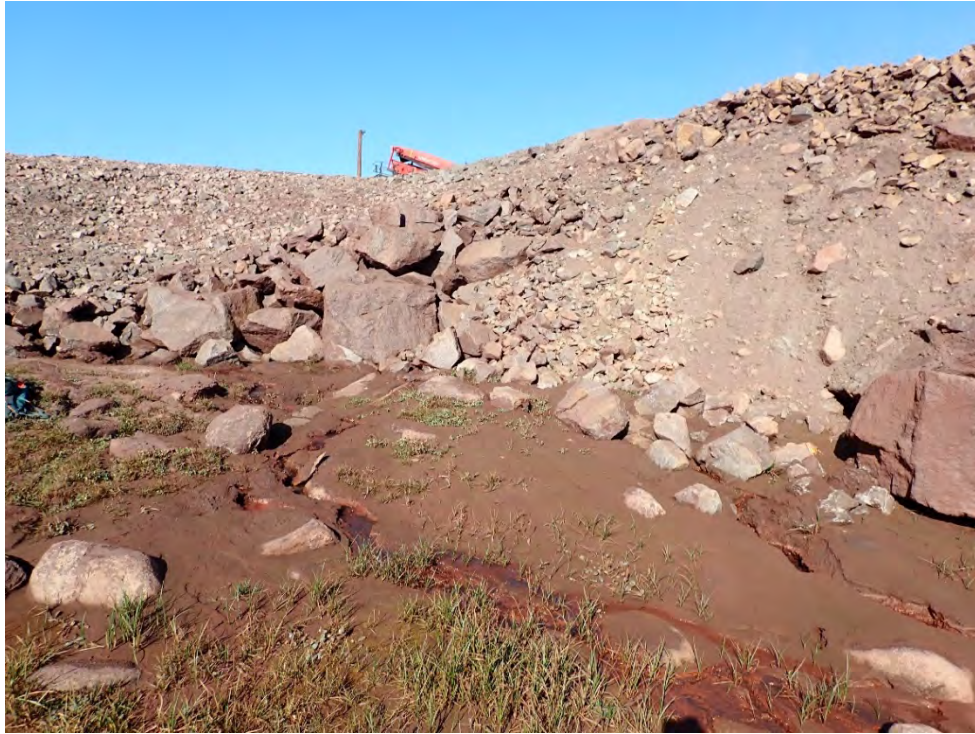


Photo 1. August 16th, 2019 – MS-06-SEEPAGE1/CP-SEEPAGE-3 sample location.



Photo 2. September 15th, 2019 – MS-06-SEEPAGE1/CP-SEEPAGE-3 sample location.



Photo 3. August 16th, 2019 – MS-06-SEEPAGE1/CP-SEEPAGE-3 sample location.



Photo 4. September 15th, 2019 – MS-06-SEEPAGE1/CP-SEEPAGE-3 sampling location.



Photo 5. August 16th, 2019 – Dry ditch above seepage location.



Photo 6. September 14th, 2019 – Water sample from MS-06-SEEPAGE1/CP-SEEPAGE-3 location.



Photo 7. September 15th, 2019 – Dry ditch above seepage location.



Figure 1 – Overview map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 08-17-2019	REPORT TIME 14:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 326
B	OCCURRENCE DATE: MONTH – DAY – YEAR 08-16-2019	OCCURRENCE TIME 14:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 38		LONGITUDE DEGREES 79 MINUTES 16 SECONDS 49	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED surface water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Unknown	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Crusher Pad	SPILL CAUSE under investigation	AREA OF CONTAMINATION IN SQUARE METRES observed flowing area 2m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Drainage to tundra and access	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On August 16th 2019, at approx. 14:00, on inspection of the Crusher Ore Stockpile Facility, it was observed that clear cold (6C) water was flowing out of the toe of the crusher pad where it meets the tundra at one discrete location. The collection ditches were dry at the time. Monitoring was immediately actioned and it was determined that the water had a pH of 6.77 and TSS of 12.8, compliant with the Water Licence and MDMR criteria. The investigation is ongoing to determine the source, but there is no indication at this time that the water is sourced from the surface of the Crusher Ore Stockpile Facility. During this period the site has been experiencing prolonged dry, warm conditions leading up to the occurrence. Baffinland is currently characterizing the release and will continue to monitor. The observed seeping water occurred on IOL located > 1km from Sheardown Lake tributary, the nearest fish bearing waters.			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> DTC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME			REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2 – NT-NU Spill report

Appendix A
Water Quality Results Summary

Table 1- Summary of Analytical Results

	Sample ID				MS-06-SEEPAGE1 ¹	MS-C-E	CP-SEEPAGE-3 ¹
	ALS Laboratory Sample ID				L2330787	L2330787	L2339962
	Sample Date & Time				8/16/2019 18:40:00 PM	8/16/2019 20:00:00 PM	8/31/2019 12:45:00 PM
	QA/QC Sample Type				N/A	N/A	N/A
	Units	LOR	MDMER Grab Sample Limits ²	Water Licence Criteria ³			
pH	pH units	0.1	6.0 - 9.5	6.0 - 9.5	6.77	8.00	7.05
Total Suspended Solids	mg/L	2	30	15	12.8	<2.0	23.8
Arsenic	mg/L	0.001	1	0.5	<0.0010	<0.0010	<0.0010
Copper	mg/L	0.01	0.6	0.3	<0.010	<0.010	<0.010
Lead	mg/L	0.0005	0.4	0.2	0.00066	<0.00050	0.00056
Nickel	mg/L	0.005	1	0.5	0.119	<0.0050	0.106
Zinc	mg/L	0.03	1	0.5	<0.030	<0.030	<0.030

Notes:

¹Samples MS-06-SEEPAGE1 and CP-SEEPAGE-3 are taken from the same sampling location

²Metal and Diamond Mining Effluent Regulations - Schedule 4

³Type A Water Licence (2AM-MRY1325 - Amend. 1)

Appendix B
Certificates of Analyses



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 16-AUG-19
Report Date: 09-SEP-19 07:36 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2330787
Project P.O. #: 4500057496
Job Reference: MS-06 WT
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 19-AUG-19 10:40

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-1	MS-C-E							
Sampled By: ML/BR/LM on 16-AUG-19 @ 20:00								
Matrix: Water								
Physical Tests								
Conductivity		1250		3.0	umhos/cm		20-AUG-19	R4760530
Hardness (as CaCO3)		671		1.3	mg/L		21-AUG-19	
pH		8.00		0.10	pH units		17-AUG-19	R4757984
Total Suspended Solids		<2.0		2.0	mg/L		17-AUG-19	R4758002
Total Dissolved Solids		962		20	mg/L		17-AUG-19	R4758289
Turbidity		0.44		0.10	NTU		17-AUG-19	R4757986
Anions and Nutrients								
Acidity (as CaCO3)		3.6		1.0	mg/L		22-AUG-19	R4765263
Alkalinity, Total (as CaCO3)		156		10	mg/L		20-AUG-19	R4760530
Ammonia, Total (as N)		<0.010		0.010	mg/L		20-AUG-19	R4761973
Chloride (Cl)		43.9		0.50	mg/L		20-AUG-19	R4762548
Fluoride (F)		0.048		0.020	mg/L		20-AUG-19	R4762548
Nitrate (as N)		9.02		0.020	mg/L		20-AUG-19	R4762548
Total Kjeldahl Nitrogen		0.23		0.15	mg/L	20-AUG-19	21-AUG-19	R4762150
Phosphorus, Total		<0.0030		0.0030	mg/L	20-AUG-19	21-AUG-19	R4762388
Sulfate (SO4)		482		0.30	mg/L		20-AUG-19	R4762548
Cyanides								
Cyanide, Total		<0.0020		0.0020	mg/L		20-AUG-19	R4759942
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB	PEHR				20-AUG-19	R4761739
Dissolved Organic Carbon		3.73		0.50	mg/L	20-AUG-19	21-AUG-19	R4762500
Total Organic Carbon		3.09		0.50	mg/L		20-AUG-19	R4761943
Total Metals								
Aluminum (Al)-Total		<0.050	DLHC	0.050	mg/L	21-AUG-19	21-AUG-19	R4762053
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Barium (Ba)-Total		0.0446	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Boron (B)-Total		<0.10	DLHC	0.10	mg/L	21-AUG-19	21-AUG-19	R4762053
Cadmium (Cd)-Total		<0.000050	DLHC	0.000050	mg/L	21-AUG-19	21-AUG-19	R4762053
Calcium (Ca)-Total		113	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Cesium (Cs)-Total		<0.00010	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Cobalt (Co)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Iron (Fe)-Total		<0.10	DLHC	0.10	mg/L	21-AUG-19	21-AUG-19	R4762053
Lead (Pb)-Total		<0.00050	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Lithium (Li)-Total		<0.010	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Magnesium (Mg)-Total		103	DLHC	0.050	mg/L	21-AUG-19	21-AUG-19	R4762053
Manganese (Mn)-Total		0.0055	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		21-AUG-19	R4762089

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-1	MS-C-E							
Sampled By:	ML/BR/LM on 16-AUG-19 @ 20:00							
Matrix:	Water							
Total Metals								
Molybdenum (Mo)-Total		0.00241	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Nickel (Ni)-Total		<0.0050	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Potassium (K)-Total		5.86	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Rubidium (Rb)-Total		0.0102	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Selenium (Se)-Total		0.00082	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Silicon (Si)-Total		2.2	DLHC	1.0	mg/L	21-AUG-19	21-AUG-19	R4762053
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Sodium (Na)-Total		22.9	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Strontium (Sr)-Total		0.064	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Sulfur (S)-Total		173	DLHC	5.0	mg/L	21-AUG-19	21-AUG-19	R4762053
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Thallium (Tl)-Total		<0.00010	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Titanium (Ti)-Total		<0.0030	DLHC	0.0030	mg/L	21-AUG-19	21-AUG-19	R4762053
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Uranium (U)-Total		0.0140	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	21-AUG-19	21-AUG-19	R4762053
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					20-AUG-19	R4759672
Dissolved Metals Filtration Location		FIELD					20-AUG-19	R4760152
Aluminum (Al)-Dissolved		<0.050	DLHC	0.050	mg/L	20-AUG-19	20-AUG-19	R4762029
Antimony (Sb)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Arsenic (As)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Barium (Ba)-Dissolved		0.0447	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Beryllium (Be)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Bismuth (Bi)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Boron (B)-Dissolved		<0.10	DLHC	0.10	mg/L	20-AUG-19	21-AUG-19	R4762029
Cadmium (Cd)-Dissolved		<0.000050	DLHC	0.000050	mg/L	20-AUG-19	20-AUG-19	R4762029
Calcium (Ca)-Dissolved		110	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Cesium (Cs)-Dissolved		<0.00010	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Chromium (Cr)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Cobalt (Co)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Copper (Cu)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Iron (Fe)-Dissolved		<0.10	DLHC	0.10	mg/L	20-AUG-19	20-AUG-19	R4762029
Lead (Pb)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Lithium (Li)-Dissolved		<0.010	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Magnesium (Mg)-Dissolved		96.2	DLHC	0.050	mg/L	20-AUG-19	20-AUG-19	R4762029

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-1 MS-C-E Sampled By: ML/BR/LM on 16-AUG-19 @ 20:00 Matrix: Water								
Dissolved Metals								
Manganese (Mn)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	20-AUG-19	20-AUG-19	R4759841
Molybdenum (Mo)-Dissolved		0.00266	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Nickel (Ni)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Phosphorus (P)-Dissolved		<0.50	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Potassium (K)-Dissolved		5.70	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Rubidium (Rb)-Dissolved		0.0100	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Selenium (Se)-Dissolved		0.00067	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Silicon (Si)-Dissolved		2.10	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Silver (Ag)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Sodium (Na)-Dissolved		21.3	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Strontium (Sr)-Dissolved		0.063	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Sulfur (S)-Dissolved		171	DLHC	5.0	mg/L	20-AUG-19	20-AUG-19	R4762029
Tellurium (Te)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Thallium (Tl)-Dissolved		<0.00010	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Thorium (Th)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Tin (Sn)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Titanium (Ti)-Dissolved		<0.0030	DLHC	0.0030	mg/L	20-AUG-19	20-AUG-19	R4762029
Tungsten (W)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Uranium (U)-Dissolved		0.0140	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Vanadium (V)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Zinc (Zn)-Dissolved		<0.010	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Zirconium (Zr)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Radiological Parameters								
Ra-226		0.012		0.0081	Bq/L	27-AUG-19	04-SEP-19	R4780785
L2330787-2 MS-06-SEEPAGE1 Sampled By: ML/BR/LM on 16-AUG-19 @ 18:40 Matrix: Water								
Physical Tests								
Conductivity		4240		3.0	umhos/cm		20-AUG-19	R4760530
Hardness (as CaCO3)		2870		1.3	mg/L		21-AUG-19	
pH		6.77		0.10	pH units		17-AUG-19	R4757984
Total Suspended Solids		12.8		2.0	mg/L		17-AUG-19	R4758002
Total Dissolved Solids		4420		20	mg/L		17-AUG-19	R4758289
Turbidity		14.6		0.10	NTU		17-AUG-19	R4757986
Anions and Nutrients								
Acidity (as CaCO3)		9.4		1.0	mg/L		22-AUG-19	R4765263
Alkalinity, Total (as CaCO3)		87		10	mg/L		20-AUG-19	R4760530
Ammonia, Total (as N)		4.05	DLHC	0.50	mg/L		20-AUG-19	R4761973
Chloride (Cl)		69.2	DLDS	2.5	mg/L		20-AUG-19	R4762548
Fluoride (F)		<0.10	DLDS	0.10	mg/L		20-AUG-19	R4762548
Nitrate (as N)		62.5	DLDS	0.10	mg/L		20-AUG-19	R4762548

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-2	MS-06-SEEPAGE1							
Sampled By:	ML/BR/LM on 16-AUG-19 @ 18:40							
Matrix:	Water							
Anions and Nutrients								
Total Kjeldahl Nitrogen		4.87		0.15	mg/L	20-AUG-19	21-AUG-19	R4762150
Phosphorus, Total		0.019	DLM	0.015	mg/L	20-AUG-19	21-AUG-19	R4762388
Sulfate (SO4)		2790	DLDS	1.5	mg/L		20-AUG-19	R4762548
Cyanides								
Cyanide, Total		0.0189		0.0020	mg/L		20-AUG-19	R4759942
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB	PEHR				20-AUG-19	R4761739
Dissolved Organic Carbon		3.68		0.50	mg/L	20-AUG-19	21-AUG-19	R4762500
Total Organic Carbon		3.89		0.50	mg/L		20-AUG-19	R4761943
Total Metals								
Aluminum (Al)-Total		0.531	DLHC	0.050	mg/L	21-AUG-19	21-AUG-19	R4762053
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Barium (Ba)-Total		0.0224	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Boron (B)-Total		0.14	DLHC	0.10	mg/L	21-AUG-19	21-AUG-19	R4762053
Cadmium (Cd)-Total		0.00105	DLHC	0.000050	mg/L	21-AUG-19	21-AUG-19	R4762053
Calcium (Ca)-Total		272	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Cesium (Cs)-Total		0.00017	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Cobalt (Co)-Total		0.118	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Iron (Fe)-Total		0.88	DLHC	0.10	mg/L	21-AUG-19	21-AUG-19	R4762053
Lead (Pb)-Total		0.00066	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Lithium (Li)-Total		0.047	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Magnesium (Mg)-Total		566	DLHC	0.050	mg/L	21-AUG-19	21-AUG-19	R4762053
Manganese (Mn)-Total		31.9	DLHC	0.050	mg/L	21-AUG-19	21-AUG-19	R4762053
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		21-AUG-19	R4762089
Molybdenum (Mo)-Total		0.00265	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Nickel (Ni)-Total		0.119	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Potassium (K)-Total		26.9	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Rubidium (Rb)-Total		0.0285	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Selenium (Se)-Total		0.00915	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Silicon (Si)-Total		4.5	DLHC	1.0	mg/L	21-AUG-19	21-AUG-19	R4762053
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	21-AUG-19	21-AUG-19	R4762053
Sodium (Na)-Total		55.8	DLHC	0.50	mg/L	21-AUG-19	21-AUG-19	R4762053
Strontium (Sr)-Total		0.468	DLHC	0.010	mg/L	21-AUG-19	21-AUG-19	R4762053
Sulfur (S)-Total		981	DLHC	5.0	mg/L	21-AUG-19	21-AUG-19	R4762053
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Thallium (Tl)-Total		0.00026	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-2	MS-06-SEEPAGE1							
Sampled By:	ML/BR/LM on 16-AUG-19 @ 18:40							
Matrix:	Water							
Total Metals								
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Titanium (Ti)-Total		0.0255	DLHC	0.0030	mg/L	21-AUG-19	21-AUG-19	R4762053
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	21-AUG-19	21-AUG-19	R4762053
Uranium (U)-Total		0.0743	DLHC	0.00010	mg/L	21-AUG-19	21-AUG-19	R4762053
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	21-AUG-19	21-AUG-19	R4762053
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	21-AUG-19	21-AUG-19	R4762053
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	21-AUG-19	21-AUG-19	R4762053
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					20-AUG-19	R4759672
Dissolved Metals Filtration Location		FIELD					20-AUG-19	R4760152
Aluminum (Al)-Dissolved		<0.050	DLHC	0.050	mg/L	20-AUG-19	20-AUG-19	R4762029
Antimony (Sb)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Arsenic (As)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Barium (Ba)-Dissolved		0.0208	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Beryllium (Be)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Bismuth (Bi)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Boron (B)-Dissolved		0.15	DLHC	0.10	mg/L	20-AUG-19	21-AUG-19	R4762029
Cadmium (Cd)-Dissolved		0.000978	DLHC	0.000050	mg/L	20-AUG-19	20-AUG-19	R4762029
Calcium (Ca)-Dissolved		272	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Cesium (Cs)-Dissolved		0.00013	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Chromium (Cr)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Cobalt (Co)-Dissolved		0.113	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Copper (Cu)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Iron (Fe)-Dissolved		<0.10	DLHC	0.10	mg/L	20-AUG-19	20-AUG-19	R4762029
Lead (Pb)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Lithium (Li)-Dissolved		0.043	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Magnesium (Mg)-Dissolved		533	DLHC	0.050	mg/L	20-AUG-19	20-AUG-19	R4762029
Manganese (Mn)-Dissolved		30.8	DLHC	0.050	mg/L	20-AUG-19	20-AUG-19	R4762029
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	20-AUG-19	20-AUG-19	R4759841
Molybdenum (Mo)-Dissolved		0.00270	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Nickel (Ni)-Dissolved		0.114	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Phosphorus (P)-Dissolved		<0.50	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Potassium (K)-Dissolved		26.4	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Rubidium (Rb)-Dissolved		0.0272	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Selenium (Se)-Dissolved		0.00967	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Silicon (Si)-Dissolved		3.51	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Silver (Ag)-Dissolved		<0.00050	DLHC	0.00050	mg/L	20-AUG-19	20-AUG-19	R4762029
Sodium (Na)-Dissolved		52.7	DLHC	0.50	mg/L	20-AUG-19	20-AUG-19	R4762029
Strontium (Sr)-Dissolved		0.469	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Sulfur (S)-Dissolved		981	DLHC	5.0	mg/L	20-AUG-19	20-AUG-19	R4762029

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2330787-2	MS-06-SEEPAGE1							
Sampled By:	ML/BR/LM on 16-AUG-19 @ 18:40							
Matrix:	Water							
Dissolved Metals								
Tellurium (Te)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Thallium (Tl)-Dissolved		0.00025	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Thorium (Th)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Tin (Sn)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Titanium (Ti)-Dissolved		<0.0030	DLHC	0.0030	mg/L	20-AUG-19	20-AUG-19	R4762029
Tungsten (W)-Dissolved		<0.0010	DLHC	0.0010	mg/L	20-AUG-19	20-AUG-19	R4762029
Uranium (U)-Dissolved		0.0746	DLHC	0.00010	mg/L	20-AUG-19	20-AUG-19	R4762029
Vanadium (V)-Dissolved		<0.0050	DLHC	0.0050	mg/L	20-AUG-19	20-AUG-19	R4762029
Zinc (Zn)-Dissolved		0.015	DLHC	0.010	mg/L	20-AUG-19	20-AUG-19	R4762029
Zirconium (Zr)-Dissolved		<0.0020	DLHC	0.0020	mg/L	20-AUG-19	20-AUG-19	R4762029
Radiological Parameters								
Ra-226		0.11		0.0063	Bq/L	27-AUG-19	04-SEP-19	R4780785

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Boron (B)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Lithium (Li)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Tungsten (W)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2330787-1, -2
Matrix Spike	Barium (Ba)-Total	MS-B	L2330787-1, -2
Matrix Spike	Boron (B)-Total	MS-B	L2330787-1, -2
Matrix Spike	Calcium (Ca)-Total	MS-B	L2330787-1, -2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2330787-1, -2
Matrix Spike	Potassium (K)-Total	MS-B	L2330787-1, -2
Matrix Spike	Silicon (Si)-Total	MS-B	L2330787-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L2330787-1, -2
Matrix Spike	Strontium (Sr)-Total	MS-B	L2330787-1, -2
Matrix Spike	Sulfur (S)-Total	MS-B	L2330787-1, -2

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			

When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference

DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2330787

Report Date: 09-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT		Water						
Batch	R4762089							
WG3138765-4	DUP	WG3138765-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	21-AUG-19
WG3138765-2	LCS							
Mercury (Hg)-Total			98.7		%		80-120	21-AUG-19
WG3138765-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	21-AUG-19
WG3138765-6	MS	WG3138765-5						
Mercury (Hg)-Total			90.2		%		70-130	21-AUG-19
MET-D-CCMS-WT		Water						
Batch	R4762029							
WG3138130-4	DUP	WG3138130-3						
Aluminum (Al)-Dissolved		<0.50	<0.50	RPD-NA	mg/L	N/A	20	20-AUG-19
Antimony (Sb)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Arsenic (As)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Barium (Ba)-Dissolved		0.036	0.033		mg/L	9.3	20	20-AUG-19
Beryllium (Be)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Bismuth (Bi)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-AUG-19
Boron (B)-Dissolved		20.4	17.4		mg/L	16	20	20-AUG-19
Cadmium (Cd)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-AUG-19
Calcium (Ca)-Dissolved		158	158		mg/L	0.5	20	20-AUG-19
Cesium (Cs)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	20-AUG-19
Chromium (Cr)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-AUG-19
Cobalt (Co)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Copper (Cu)-Dissolved		<0.020	<0.020	RPD-NA	mg/L	N/A	20	20-AUG-19
Iron (Fe)-Dissolved		<1.0	<1.0	RPD-NA	mg/L	N/A	20	20-AUG-19
Lead (Pb)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-AUG-19
Lithium (Li)-Dissolved		0.37	0.38		mg/L	4.0	20	20-AUG-19
Magnesium (Mg)-Dissolved		20.1	20.1		mg/L	0.1	20	20-AUG-19
Manganese (Mn)-Dissolved		0.068	0.063		mg/L	7.6	20	20-AUG-19
Molybdenum (Mo)-Dissolved		0.640	0.641		mg/L	0.1	20	20-AUG-19
Nickel (Ni)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-AUG-19
Phosphorus (P)-Dissolved		<5.0	<5.0	RPD-NA	mg/L	N/A	20	20-AUG-19
Potassium (K)-Dissolved		29.1	29.3		mg/L	0.8	20	20-AUG-19
Rubidium (Rb)-Dissolved		0.026	0.025		mg/L	3.5	20	20-AUG-19
Selenium (Se)-Dissolved		0.0060	0.0069		mg/L	14	20	20-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4762029							
WG3138130-4 DUP		WG3138130-3						
Silicon (Si)-Dissolved		<5.0	<5.0	RPD-NA	mg/L	N/A	20	20-AUG-19
Silver (Ag)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-AUG-19
Sodium (Na)-Dissolved		112	112		mg/L	0.4	20	20-AUG-19
Strontium (Sr)-Dissolved		4.29	4.23		mg/L	1.4	20	20-AUG-19
Sulfur (S)-Dissolved		224	224		mg/L	0.1	20	20-AUG-19
Tellurium (Te)-Dissolved		<0.020	<0.020	RPD-NA	mg/L	N/A	20	20-AUG-19
Thallium (Tl)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	20-AUG-19
Thorium (Th)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Tin (Sn)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
Titanium (Ti)-Dissolved		<0.030	<0.030	RPD-NA	mg/L	N/A	20	20-AUG-19
Tungsten (W)-Dissolved		0.030	0.031		mg/L	1.8	20	20-AUG-19
Uranium (U)-Dissolved		0.0011	0.0010		mg/L	8.1	20	20-AUG-19
Vanadium (V)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-AUG-19
Zinc (Zn)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	20-AUG-19
Zirconium (Zr)-Dissolved		<0.020	<0.020	RPD-NA	mg/L	N/A	20	20-AUG-19
WG3138130-2 LCS								
Aluminum (Al)-Dissolved			100.2		%		80-120	20-AUG-19
Antimony (Sb)-Dissolved			97.6		%		80-120	20-AUG-19
Arsenic (As)-Dissolved			98.5		%		80-120	20-AUG-19
Barium (Ba)-Dissolved			102.0		%		80-120	20-AUG-19
Beryllium (Be)-Dissolved			92.6		%		80-120	20-AUG-19
Bismuth (Bi)-Dissolved			96.9		%		80-120	20-AUG-19
Boron (B)-Dissolved			95.3		%		80-120	20-AUG-19
Cadmium (Cd)-Dissolved			99.4		%		80-120	20-AUG-19
Calcium (Ca)-Dissolved			99.4		%		80-120	20-AUG-19
Cesium (Cs)-Dissolved			103.3		%		80-120	20-AUG-19
Chromium (Cr)-Dissolved			100.3		%		80-120	20-AUG-19
Cobalt (Co)-Dissolved			99.4		%		80-120	20-AUG-19
Copper (Cu)-Dissolved			99.3		%		80-120	20-AUG-19
Iron (Fe)-Dissolved			105.5		%		80-120	20-AUG-19
Lead (Pb)-Dissolved			99.8		%		80-120	20-AUG-19
Lithium (Li)-Dissolved			90.5		%		80-120	20-AUG-19
Magnesium (Mg)-Dissolved			98.0		%		80-120	20-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4762029							
WG3138130-2		LCS						
Manganese (Mn)-Dissolved			101.7		%		80-120	20-AUG-19
Molybdenum (Mo)-Dissolved			103.1		%		80-120	20-AUG-19
Nickel (Ni)-Dissolved			100.4		%		80-120	20-AUG-19
Phosphorus (P)-Dissolved			103.0		%		80-120	20-AUG-19
Potassium (K)-Dissolved			101.9		%		80-120	20-AUG-19
Rubidium (Rb)-Dissolved			104.7		%		80-120	20-AUG-19
Selenium (Se)-Dissolved			98.1		%		80-120	20-AUG-19
Silicon (Si)-Dissolved			104.7		%		60-140	20-AUG-19
Silver (Ag)-Dissolved			103.3		%		80-120	20-AUG-19
Sodium (Na)-Dissolved			99.0		%		80-120	20-AUG-19
Strontium (Sr)-Dissolved			100.6		%		80-120	20-AUG-19
Sulfur (S)-Dissolved			100.6		%		80-120	20-AUG-19
Tellurium (Te)-Dissolved			97.3		%		80-120	20-AUG-19
Thallium (Tl)-Dissolved			98.8		%		80-120	20-AUG-19
Thorium (Th)-Dissolved			98.7		%		80-120	20-AUG-19
Tin (Sn)-Dissolved			100.8		%		80-120	20-AUG-19
Titanium (Ti)-Dissolved			98.6		%		80-120	20-AUG-19
Tungsten (W)-Dissolved			100.7		%		80-120	20-AUG-19
Uranium (U)-Dissolved			101.8		%		80-120	20-AUG-19
Vanadium (V)-Dissolved			100.5		%		80-120	20-AUG-19
Zinc (Zn)-Dissolved			98.2		%		80-120	20-AUG-19
Zirconium (Zr)-Dissolved			99.7		%		80-120	20-AUG-19
WG3138130-1		MB						
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	20-AUG-19
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	20-AUG-19
Boron (B)-Dissolved			<0.010		mg/L		0.01	20-AUG-19
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	20-AUG-19
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	20-AUG-19
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	20-AUG-19
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	20-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4762029							
WG3138130-1 MB								
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	20-AUG-19
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	20-AUG-19
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	20-AUG-19
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	20-AUG-19
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	20-AUG-19
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	20-AUG-19
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	20-AUG-19
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	20-AUG-19
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	20-AUG-19
Potassium (K)-Dissolved			<0.050		mg/L		0.05	20-AUG-19
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	20-AUG-19
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	20-AUG-19
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	20-AUG-19
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	20-AUG-19
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	20-AUG-19
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	20-AUG-19
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	20-AUG-19
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	20-AUG-19
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	20-AUG-19
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	20-AUG-19
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	20-AUG-19
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	20-AUG-19
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	20-AUG-19
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	20-AUG-19
Zirconium (Zr)-Dissolved			<0.00020		mg/L		0.0002	20-AUG-19
WG3138130-5 MS		WG3138130-6						
Aluminum (Al)-Dissolved			N/A	MS-B	%		-	20-AUG-19
Antimony (Sb)-Dissolved			90.9		%		70-130	20-AUG-19
Arsenic (As)-Dissolved			90.6		%		70-130	20-AUG-19
Barium (Ba)-Dissolved			N/A	MS-B	%		-	20-AUG-19
Beryllium (Be)-Dissolved			89.5		%		70-130	20-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4762053							
WG3138585-4 DUP		WG3138585-3						
Aluminum (Al)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	21-AUG-19
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Barium (Ba)-Total		0.0206	0.0208		mg/L	1.3	20	21-AUG-19
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-19
Boron (B)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	21-AUG-19
Cadmium (Cd)-Total		<0.000050	0.000051	RPD-NA	mg/L	N/A	20	21-AUG-19
Calcium (Ca)-Total		92.9	93.8		mg/L	0.9	20	21-AUG-19
Chromium (Cr)-Total		1.21	1.22		mg/L	0.9	20	21-AUG-19
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Copper (Cu)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	21-AUG-19
Iron (Fe)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	21-AUG-19
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-19
Lithium (Li)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	21-AUG-19
Magnesium (Mg)-Total		18.7	18.7		mg/L	0.0	20	21-AUG-19
Manganese (Mn)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-AUG-19
Molybdenum (Mo)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-19
Nickel (Ni)-Total		0.0069	0.0066		mg/L	4.4	20	21-AUG-19
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	21-AUG-19
Potassium (K)-Total		4.22	4.23		mg/L	0.1	20	21-AUG-19
Rubidium (Rb)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	21-AUG-19
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-19
Silicon (Si)-Total		3.1	3.1		mg/L	1.0	20	21-AUG-19
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-19
Sodium (Na)-Total		136	137		mg/L	0.7	20	21-AUG-19
Strontium (Sr)-Total		0.154	0.157		mg/L	1.8	20	21-AUG-19
Sulfur (S)-Total		10.4	10.6		mg/L	2.2	25	21-AUG-19
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	21-AUG-19
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	21-AUG-19
Tin (Sn)-Total		<0.0010	<0.0010		mg/L			21-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4762053							
WG3138585-4	DUP	WG3138585-3						
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Titanium (Ti)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	21-AUG-19
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-AUG-19
Uranium (U)-Total		0.00073	0.00072		mg/L	1.1	20	21-AUG-19
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-AUG-19
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	21-AUG-19
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	21-AUG-19
WG3138585-2	LCS							
Aluminum (Al)-Total			101.6		%		80-120	21-AUG-19
Antimony (Sb)-Total			103.4		%		80-120	21-AUG-19
Arsenic (As)-Total			99.5		%		80-120	21-AUG-19
Barium (Ba)-Total			100.9		%		80-120	21-AUG-19
Beryllium (Be)-Total			97.4		%		80-120	21-AUG-19
Bismuth (Bi)-Total			99.2		%		80-120	21-AUG-19
Boron (B)-Total			95.6		%		80-120	21-AUG-19
Cadmium (Cd)-Total			100.1		%		80-120	21-AUG-19
Calcium (Ca)-Total			99.0		%		80-120	21-AUG-19
Chromium (Cr)-Total			101.0		%		80-120	21-AUG-19
Cesium (Cs)-Total			99.99		%		80-120	21-AUG-19
Cobalt (Co)-Total			101.0		%		80-120	21-AUG-19
Copper (Cu)-Total			101.0		%		80-120	21-AUG-19
Iron (Fe)-Total			105.7		%		80-120	21-AUG-19
Lead (Pb)-Total			100.7		%		80-120	21-AUG-19
Lithium (Li)-Total			96.9		%		80-120	21-AUG-19
Magnesium (Mg)-Total			101.1		%		80-120	21-AUG-19
Manganese (Mn)-Total			100.8		%		80-120	21-AUG-19
Molybdenum (Mo)-Total			101.6		%		80-120	21-AUG-19
Nickel (Ni)-Total			100.3		%		80-120	21-AUG-19
Phosphorus (P)-Total			101.8		%		70-130	21-AUG-19
Potassium (K)-Total			100.8		%		80-120	21-AUG-19
Rubidium (Rb)-Total			100.4		%		80-120	21-AUG-19
Selenium (Se)-Total			98.1		%		80-120	21-AUG-19
Silicon (Si)-Total			104.6		%		60-140	21-AUG-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4762053							
WG3138585-2		LCS						
Silver (Ag)-Total			100.6		%		80-120	21-AUG-19
Sodium (Na)-Total			101.8		%		80-120	21-AUG-19
Strontium (Sr)-Total			98.3		%		80-120	21-AUG-19
Sulfur (S)-Total			99.7		%		80-120	21-AUG-19
Thallium (Tl)-Total			98.8		%		80-120	21-AUG-19
Tellurium (Te)-Total			95.6		%		80-120	21-AUG-19
Thorium (Th)-Total			100.2		%		70-130	21-AUG-19
Tin (Sn)-Total			100.9		%		80-120	21-AUG-19
Titanium (Ti)-Total			98.8		%		80-120	21-AUG-19
Tungsten (W)-Total			100.7		%		80-120	21-AUG-19
Uranium (U)-Total			101.9		%		80-120	21-AUG-19
Vanadium (V)-Total			102.4		%		80-120	21-AUG-19
Zinc (Zn)-Total			101.3		%		80-120	21-AUG-19
Zirconium (Zr)-Total			98.4		%		80-120	21-AUG-19
WG3138585-1		MB						
Aluminum (Al)-Total			<0.0050		mg/L		0.005	21-AUG-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Boron (B)-Total			<0.010		mg/L		0.01	21-AUG-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-AUG-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-AUG-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	21-AUG-19
Iron (Fe)-Total			<0.010		mg/L		0.01	21-AUG-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	21-AUG-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	21-AUG-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	21-AUG-19



Quality Control Report

Workorder: L2330787

Report Date: 09-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4762053							
WG3138585-1	MB							
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	21-AUG-19
Potassium (K)-Total			<0.050		mg/L		0.05	21-AUG-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Silicon (Si)-Total			<0.10		mg/L		0.1	21-AUG-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Sodium (Na)-Total			<0.050		mg/L		0.05	21-AUG-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	21-AUG-19
Sulfur (S)-Total			<0.50		mg/L		0.5	21-AUG-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-AUG-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-AUG-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-AUG-19
WG3138585-5	MS	WG3138585-6						
Aluminum (Al)-Total			107.1		%		70-130	21-AUG-19
Antimony (Sb)-Total			103.3		%		70-130	21-AUG-19
Arsenic (As)-Total			99.0		%		70-130	21-AUG-19
Barium (Ba)-Total			N/A	MS-B	%		-	21-AUG-19
Beryllium (Be)-Total			102.0		%		70-130	21-AUG-19
Bismuth (Bi)-Total			88.2		%		70-130	21-AUG-19
Boron (B)-Total			N/A	MS-B	%		-	21-AUG-19
Cadmium (Cd)-Total			95.4		%		70-130	21-AUG-19
Calcium (Ca)-Total			N/A	MS-B	%		-	21-AUG-19
Chromium (Cr)-Total			103.6		%		70-130	21-AUG-19
Cesium (Cs)-Total			99.9		%		70-130	21-AUG-19
Cobalt (Co)-Total			100.3		%		70-130	21-AUG-19
Copper (Cu)-Total			95.7		%		70-130	21-AUG-19



Quality Control Report

Workorder: L2330787

Report Date: 09-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4762053							
WG3138585-5 MS		WG3138585-6						
Iron (Fe)-Total			109.9		%		70-130	21-AUG-19
Lead (Pb)-Total			92.0		%		70-130	21-AUG-19
Lithium (Li)-Total			103.9		%		70-130	21-AUG-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-AUG-19
Manganese (Mn)-Total			102.6		%		70-130	21-AUG-19
Molybdenum (Mo)-Total			107.0		%		70-130	21-AUG-19
Nickel (Ni)-Total			95.5		%		70-130	21-AUG-19
Phosphorus (P)-Total			107.3		%		70-130	21-AUG-19
Potassium (K)-Total			N/A	MS-B	%		-	21-AUG-19
Rubidium (Rb)-Total			100.3		%		70-130	21-AUG-19
Selenium (Se)-Total			95.7		%		70-130	21-AUG-19
Silicon (Si)-Total			N/A	MS-B	%		-	21-AUG-19
Silver (Ag)-Total			94.5		%		70-130	21-AUG-19
Sodium (Na)-Total			N/A	MS-B	%		-	21-AUG-19
Strontium (Sr)-Total			N/A	MS-B	%		-	21-AUG-19
Sulfur (S)-Total			N/A	MS-B	%		-	21-AUG-19
Thallium (Tl)-Total			91.1		%		70-130	21-AUG-19
Tellurium (Te)-Total			92.0		%		70-130	21-AUG-19
Thorium (Th)-Total			98.6		%		70-130	21-AUG-19
Tin (Sn)-Total			100.7		%		70-130	21-AUG-19
Titanium (Ti)-Total			106.3		%		70-130	21-AUG-19
Tungsten (W)-Total			99.9		%		70-130	21-AUG-19
Uranium (U)-Total			99.2		%		70-130	21-AUG-19
Vanadium (V)-Total			108.3		%		70-130	21-AUG-19
Zinc (Zn)-Total			96.7		%		70-130	21-AUG-19
Zirconium (Zr)-Total			103.7		%		70-130	21-AUG-19
NH3-F-WT		Water						
Batch	R4761973							
WG3138000-11 DUP		L2329749-1						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-AUG-19
WG3138000-10 LCS								
Ammonia, Total (as N)			93.4		%		85-115	20-AUG-19
WG3138000-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	20-AUG-19



Quality Control Report

Workorder: L2330787

Report Date: 09-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT								
Water								
Batch	R4761973							
WG3138000-12 MS		L2329749-1						
Ammonia, Total (as N)			94.1		%		75-125	20-AUG-19
NO3-IC-WT								
Water								
Batch	R4762548							
WG3137786-18 DUP		L2331265-1						
Nitrate (as N)		0.226	0.227		mg/L	0.7	20	20-AUG-19
WG3137786-17 LCS								
Nitrate (as N)			101.8		%		90-110	20-AUG-19
WG3137786-16 MB								
Nitrate (as N)			<0.020		mg/L		0.02	20-AUG-19
WG3137786-19 MS		L2331265-1						
Nitrate (as N)			98.1		%		75-125	20-AUG-19
P-T-COL-WT								
Water								
Batch	R4762388							
WG3138454-3 DUP		L2330787-1						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	21-AUG-19
WG3138454-2 LCS								
Phosphorus, Total			100.1		%		80-120	21-AUG-19
WG3138454-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	21-AUG-19
WG3138454-4 MS		L2330787-1						
Phosphorus, Total			92.8		%		70-130	21-AUG-19
PH-BF								
Water								
Batch	R4757984							
WG3135635-2 DUP		L2330787-1						
pH		8.00	8.01	J	pH units	0.01	0.2	17-AUG-19
WG3135635-1 LCS								
pH			7.01		pH units		6.9-7.1	17-AUG-19
SO4-IC-N-WT								
Water								
Batch	R4762548							
WG3137786-18 DUP		L2331265-1						
Sulfate (SO4)		29.9	29.8		mg/L	0.0	20	20-AUG-19
WG3137786-17 LCS								
Sulfate (SO4)			103.0		%		90-110	20-AUG-19
WG3137786-16 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	20-AUG-19



Quality Control Report

Workorder: L2330787

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	Water							
Batch R4762548								
WG3137786-19 MS		L2331265-1						
Sulfate (SO4)			99.2		%		75-125	20-AUG-19
SOLIDS-TDS-BF	Water							
Batch R4758289								
WG3135644-3 DUP		L2330788-4						
Total Dissolved Solids		1970	1970		mg/L	0.2	20	17-AUG-19
WG3135644-2 LCS								
Total Dissolved Solids			103.2		%		85-115	17-AUG-19
WG3135644-1 MB								
Total Dissolved Solids			<20		mg/L		20	17-AUG-19
SOLIDS-TSS-BF	Water							
Batch R4758002								
WG3135636-3 DUP		L2330787-1						
Total Suspended Solids		<2.0	<2.0	RPD-NA	mg/L	N/A	25	17-AUG-19
WG3135636-2 LCS								
Total Suspended Solids			100.2		%		85-115	17-AUG-19
WG3135636-1 MB								
Total Suspended Solids			<2.0		mg/L		2	17-AUG-19
TKN-WT	Water							
Batch R4762150								
WG3138211-3 DUP		L2330244-1						
Total Kjeldahl Nitrogen		0.29	0.36	J	mg/L	0.07	0.3	21-AUG-19
WG3138211-2 LCS								
Total Kjeldahl Nitrogen			102.8		%		75-125	21-AUG-19
WG3138211-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	21-AUG-19
WG3138211-4 MS		L2330244-1						
Total Kjeldahl Nitrogen			103.3		%		70-130	21-AUG-19
TOC-WT	Water							
Batch R4761943								
WG3138127-3 DUP		L2330787-1						
Total Organic Carbon		3.09	3.14		mg/L	1.7	20	20-AUG-19
WG3138127-2 LCS								
Total Organic Carbon			97.6		%		80-120	20-AUG-19
WG3138127-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	20-AUG-19



Quality Control Report

Workorder: L2330787

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TOC-WT		Water						
Batch	R4761943							
WG3138127-4	MS	L2330787-1						
Total Organic Carbon			97.1		%		70-130	20-AUG-19
TURBIDITY-BF		Water						
Batch	R4757986							
WG3135638-3	DUP	L2330788-4						
Turbidity		3.83	3.98		NTU	3.8	15	17-AUG-19
WG3135638-2	LCS							
Turbidity			109.0		%		85-115	17-AUG-19
WG3135638-1	MB							
Turbidity			<0.10		NTU		0.1	17-AUG-19

Quality Control Report

Workorder: L2330787

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2330787

Report Date: 09-SEP-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 17 of 17

Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Organic / Inorganic Carbon							
Dissolved Organic Carbon							
	1	16-AUG-19 20:00	20-AUG-19 21:00	3	4	days	EHT
	2	16-AUG-19 18:40	20-AUG-19 21:00	3	4	days	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2330787 were received on 16-AUG-19 23:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Thursday, September 05, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1908486
Project Name:
Project Number: L2330787

Dear Mr. Hawthorne:

Two water samples were received from ALS Environmental, on 8/21/2019. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1908486

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1908486

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2330787

Client PO Number: L2330787

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2330787-1	1908486-1		WATER	16-Aug-19	
L2330787-2	1908486-2		WATER	16-Aug-19	

**L2330787**

WATERLOO

Subcontract Request Form

1908486

Subcontract To:**ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524**NOTES:** Please reference on final report and invoice: PO# L2330787
ALS requires QC data to be provided with your final results.

Please see enclosed 2 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
① L2330787-1 MS-C-E		8/16/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	9/6/2019	
② L2330787-2 MS-06-SEEPAGE1		8/16/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	9/6/2019	

Subcontract Info Contact:

Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne

60 NORTHLAND ROAD, UNIT 1

WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to:

Rick.Hawthorne@alsglobal.com

Shipped By: _____

Date Shipped: _____

Received By: _____

Date Received: _____

Verified By: _____

Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Waterloo Workorder No: 1908486
Project Manager: KMO Initials: K9 Date: 8-22-19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<u>YES</u>	NO
2. Are custody seals on shipping containers intact?		<u>NONE</u>	YES	NO *
3. Are custody seals on sample containers intact?		<u>NONE</u>	YES	NO *
4. Is there a COC (chain-of-custody) present?			<u>YES</u>	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			YES	<u>NO</u>
6. Are short-hold samples present?			YES	<u>NO</u>
7. Are all samples within holding times for the requested analyses?			<u>YES</u>	NO *
8. Were all sample containers received intact? (not broken or leaking)			<u>YES</u>	NO *
9. Is there sufficient sample for the requested analyses?			<u>YES</u>	NO *
10. Are all samples in the proper containers for the requested analyses?			<u>YES</u>	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<u>YES</u>	NO *
12. Are all aqueous non-preserved samples pH 4-9?		<u>N/A</u>	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<u>N/A</u>	YES	NO
14. Were the samples shipped on ice?			<u>YES</u>	NO
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#1	<u>#3</u>	#4
			<u>RAD ONLY</u>	YES
				<u>NO</u>
Cooler #:	<u>1</u>			
Temperature (°C):	<u>11.6</u>			
No. of custody seals on cooler:	<u>0</u>			
External µR/hr reading:	<u>11</u>			
Background µR/hr reading:	<u>13</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)				

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

5) Sample 1 time on bottle = 20:00 } no times listed
Sample 2 time on bottle = 18:40 } on COC.

All client bottle ID's vs ALS lab ID's double-checked by: [Signature]

If applicable, was the client contacted? YES / NO / NA Contact: _____

Date/Time: _____

Project Manager Signature / Date: _____

1908480

EXPRESS WORLDWIDE WPX -DHL-

2010-08-20 NYDHL + 1.0 / *30-0821*

From: ALS Environmental
Ed Hill
60 Northland Rd
Unit 1

Origin:
YHM

N2V 288 WATERLOO ON
Canada

Contact: +15198866910

To: ALS Environmental Fort Collins
Sample Login
225 Commerce Drive

Contact:
Sample Login
+1604431511

80524 FORT COLLINS CO
United States of America

US - DEN - DEN

C [Redacted] Day Time

Ref:

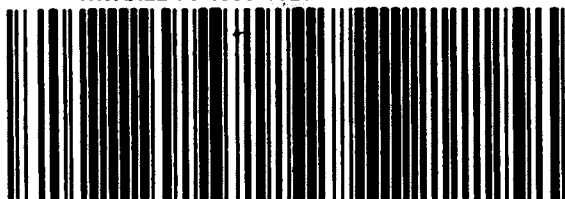
Per/Net Weight Piece
12.6 lbs 1/1

11-0-11.6°C



Contents: Water
Sample

WAYBILL 70 1933 8826



(2L)US80524+48000001



M

Client: ALS Environmental

Date: 05-Sep-19

Project: L2330787

Work Order: 1908486

Sample ID: L2330787-1

Lab ID: 1908486-1

Legal Location:

Matrix: WATER

Collection Date: 8/16/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 8/27/2019

PrepBy: JXH

Ra-226 0.012 (+/- 0.0069)

0.0081 BQ/l

NA

9/4/2019 12:38

Carr: BARIUM

89

40-110 %REC

DL = NA

9/4/2019 12:38

Client: ALS Environmental

Date: 05-Sep-19

Project: L2330787

Work Order: 1908486

Sample ID: L2330787-2

Lab ID: 1908486-2

Legal Location:

Matrix: WATER

Collection Date: 8/16/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 8/27/2019

PrepBy: JXH

Ra-226	0.11 (+/- 0.029)		0.0063	BQ/l	NA	9/4/2019 12:38
Carr: BARIUM	96.9		40-110	%REC	DL = NA	9/4/2019 12:38

Client: ALS Environmental

Date: 05-Sep-19

Project: L2330787

Work Order: 1908486

Sample ID: L2330787-2

Lab ID: 1908486-2

Legal Location:

Matrix: WATER

Collection Date: 8/16/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

ALS -- Fort Collins

Date: 9/5/2019 7:49:2

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1908486

Project: L2330787

Batch ID: RE190827-2-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE190827-2				Units: BQ/I		Analysis Date: 9/4/2019 12:38				
Client ID:	Run ID: RE190827-2A				Prep Date: 8/27/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.61 (+/- 0.403)	0.00994	1.72		93.5	67-120					P
Carr: BARIUM	15700		16410		95.5	40-110					

LCSD	Sample ID: RE190827-2				Units: BQ/I		Analysis Date: 9/4/2019 12:38				
Client ID:	Run ID: RE190827-2A				Prep Date: 8/27/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.64 (+/- 0.411)	0.00879	1.72		95.3	67-120		1.61	0.05	2.1	P
Carr: BARIUM	16100		16350		98.3	40-110		15700			

MB	Sample ID: RE190827-2				Units: BQ/I		Analysis Date: 9/4/2019 12:02				
Client ID:	Run ID: RE190827-2A				Prep Date: 8/27/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0044 (+/- 0.0044)	0.0064									U
Carr: BARIUM	15700		16350		95.8	40-110					

The following samples were analyzed in this batch:

1908486-1	1908486-2
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AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna

EPS 1/RM/14

Page 1 of 2

Work Order : 240059

Sample Number : 60350

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-08-16
Location :	Waterloo ON	Time Collected :	20:00
Job Number :	L2330787-1	Date Received :	2019-08-20
Substance :	MS-C-E L2330787-1	Time Received :	11:30
Sampling Method :	Grab	Temperature on Receipt :	8.0 °C
Sampled By :	KB/ML	Date Tested :	2019-08-20
Sample Description :	Clear, colourless, odourless		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	<i>Daphnia magna</i>	Time to First Brood :	8.6 days
Organism Batch :	Dm19-16	Average Brood Size :	39.5 young
Culture Mortality :	1.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Pre-aeration Time :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2019-08-20	Warning Limits (\pm 2SD) :	5.7 - 7.2 g/L
LC50 :	6.4 g/L	Organism Batch :	Dm19-16
95% Confidence Limits :	6.2 - 6.6 g/L	Analyst(s) :	RK, AW, NM
Statistical Method :	Spearman-Kärber		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Date :

2019-08-26
yyyy-mm-dd

Approved By :


Project Manager

Work Order : 240059

Sample Number : 60350

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Water Chemistry (100%) :	8.1	10.5	1314	20.0	121	710 mg/L

0 HOURS

Date & Time 2019-08-20 13:50

Analyst(s) : RK/AW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation (%)*	Hardness
100	A	0	0	8.1	9.3	1319	20.0	105	710
100	B	0	0	8.1	9.3	1319	20.0	105	710
100	C	0	0	8.1	9.3	1319	20.0	105	710
Control	A	0	0	8.6	8.8	791	20.0	100	210
Control	B	0	0	8.6	8.8	791	20.0	100	210
Control	C	0	0	8.6	8.8	791	20.0	100	210

Notes:

24 HOURS

Date & Time 2019-08-21 13:50

Analyst(s) : RK/AW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	—	0	—	—	—	20.0
100	B	—	0	—	—	—	20.0
100	C	—	0	—	—	—	20.0
Control	A	—	0	—	—	—	20.0
Control	B	—	0	—	—	—	20.0
Control	C	—	0	—	—	—	20.0

Notes:

48 HOURS

Date & Time 2019-08-22 13:50

Analyst(s) : SV/NM (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.4	8.3	1317	20.0
100	B	0	0	8.4	8.4	1321	20.0
100	C	0	0	8.4	8.3	1318	20.0
Control	A	0	0	8.5	8.5	800	20.0
Control	B	0	0	8.5	8.5	798	20.0
Control	C	0	0	8.5	8.5	800	20.0

Notes:

Number immobile does not include number dead.

— = not measured/not required

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2019-08-22



AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout

EPS 1/RM/13

Page 1 of 2

Work Order : 240059

Sample Number : 60350

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-08-16
Location :	Waterloo ON	Time Collected :	20:00
Job Number :	L2330787-1	Date Received :	2019-08-20
Substance :	MS-C-E L2330787-1	Time Received :	11:30
Sampling Method :	Grab	Temperature on Receipt :	8.0 °C
Sampled By :	KB/ML	Date Tested :	2019-08-20
Sample Description :	Clear, colourless, odourless		
Test Method(s) :	Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments), with deviation(s) as noted.		

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	49.6 mm (± 12.1)
Organism Batch :	T19-15	Range of Fork Lengths :	38 - 56 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	1.20 g (± 0.83)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.48 - 1.77 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.7 g/L ¹

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	17
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 \pm 1 mL/min/L	Organisms Per Test Level :	10
Total Pre-Aeration Time :	115 minutes	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2019-08-09
Organism Batch :	T19-15	Historical Mean LC50 :	3755 mg/L
LC50 :	4086 mg/L	Warning Limits (± 2 SD) :	3139 - 4492 mg/L
95% Confidence Limits :	3752 - 4449 mg/L	Analyst(s) :	ALC, SV, TA
Statistical Method :	Spearman-Kärber		

COMMENTS

¹Noted Deviation(s) : Due to technical error, the maximum organism loading rate of 0.5 g/L was exceeded. Since test validity criteria were satisfied, it is unlikely that this deviation had a significant impact on the outcome of the test, and the test is considered to be valid. There were no other unusual conditions or deviations from the test method.

•All test validity criteria as specified in the test method were satisfied.

Date :

2019-08-26
yyyy-mm-dd

Approved By :


Project Manager

Work Order : 240059

Sample Number : 60350

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*
Initial Water Chemistry (100%) :	7.7	9.9	1352	14.0	104
After 30 min pre-aeration :	7.3	9.9	1364	14.5	104

0 HOURS

Date & Time	2019-08-20	15:25					
Analyst(s) :	FS/MJT						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*
100%	0	0	7.4	9.2	1366	15.5	99
Control	0	0	8.0	9.2	862	16.0	99
Notes:							

24 HOURS

Date & Time	2019-08-21	15:25					
Analyst(s) :	TA						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.1	—	—	15.0	
Control	0	0	—	—	—	15.0	
Notes:							

48 HOURS

Date & Time	2019-08-22	15:25					
Analyst(s) :	TA						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.1	—	—	15.0	
Control	0	0	—	—	—	15.0	
Notes:							

72 HOURS

Date & Time	2019-08-23	15:25					
Analyst(s) :	TA						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.1	—	—	15.0	
Control	0	0	—	—	—	15.0	
Notes:							

96 HOURS

Date & Time	2019-08-24	15:25					
Analyst(s) :	TL						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.2	9.5	1358	14.5	
Control	0	0	8.1	9.3	820	14.5	
Notes:							

"—" = not measured/not required

Number impaired does not include number dead.

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2019-08-24

AQUATOX

Voice: (519) 763-4412 **Fax:** (519) 763-4419

Contact: Rick Hawthorne (ALS) / Martina Rendas (Aquatox)

Date/Time Shipped: 17-Aug-19/14:00

For Lab Use Only	NDH/CG/1NM
Received By:	
Date:	2019-08-20
Time:	11:30
Storage Location:	
Storage Temp.(C):	

Report Distribution: bimcore@alsglobal.com, rick.hawthorne@alsglobal.com

**L2330787**

WATERLOO

Subcontract Request Form**Subcontract To:****AQUATOX TESTING AND CONSULTING**

11B NICHOLAS BEAVER ROAD
RR3
GUELPH, ON N1H 6H9

NOTES: Please reference on final report and invoice: PO# L2330787
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 0 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2330787-1 MS-C-E		8/16/2019	E
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	8/26/2019	
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	8/26/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne

60 NORTHLAND ROAD, UNIT 1

WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: **Rick.Hawthorne@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2330787-COFC

COC Number: 15 -

Page 1 of 1

Report To Contact and company name below will appear on the final report		Report Format / Distribution		confirm all E&P TATs with your AM - surcharges will apply		
Company:	Baffinland Iron Mines Corp.	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R] <input type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply		
Contact:	William Bowden and Connor Devereaux	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PRIORITY (Business Days)	4 day [P4] <input type="checkbox"/>	
Phone:	647-253-0596 EXT 6016	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3] <input type="checkbox"/>	1 Business day [E1] <input type="checkbox"/>	
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	2 day [P2] <input type="checkbox"/>	Same Day, Weekend or Statutory holiday [E0] <input checked="" type="checkbox"/>	
Street:	2275 Upper Middle Rd. E., Suite #300	Email 1 or Fax	bimcore@alsglobal.com	Date and Time Required for all E&P TATs: 10-08-19 10:45		
City/Province:	Oakville, ON	Email 2		For tests that can not be performed according to the service level selected, you will be contacted.		
Postal Code:	L6H 0C3	Email 3		Analysis Request		
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below		
	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	F/P		
Company:		Email 1 or Fax	ap@baffinland.com	BIM-MMER-WT Group 3	Number of Containers	
Contact:		Email 2	commercial@baffinland.com			
Project Information		Oil and Gas Required Fields (client use)				
ALS Account # / Quote #:	23642 /Q42455	AFE/Cost Center:	PO#			
Job #:	MS-06 WT	Major/Minor Code:	Routing Code:			
PO / AFE:	4500057496	Requisitioner:				
LSD:		Location:				
ALS Lab Work Order # (lab use only)	L2330787	ALS Contact:				
		Sampler:	ML/BR/LM			
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)			Sample Type
1	MS-C-E	16-Aug-19	20:00	Water	E0 E1	
2	MS-06-SEEPAGE1	16-Aug-19	18:40	Water	E0	
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		
Are samples for human drinking water use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>		
				Cooling Initiated <input type="checkbox"/>		
				INITIAL COOLER TEMPERATURES °C		
				FINAL COOLER TEMPERATURES °C		
				4C 10.1		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)		
Released By: Megan LaCarte	Date: 16-Aug-19	Time: 22:15	Received by: CV	Date: Aug 16, 2019	Time: 11pm	
				Received by: AP		
				Date: 20-8-19		
				Time: 10:45		

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 04-SEP-19
Report Date: 05-SEP-19 11:42 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2339962
Project P.O. #: 4500057496
Job Reference: CRUSHER PAD PERIMETER
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2339962-5 CP-SEEPAGE-3 Sampled By: CP/RH/AZ on 31-AUG-19 @ 12:45 Matrix: WATER Physical Tests Conductivity pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Ammonia, Total (as N) Total Metals	3880 7.05 23.8 4020 7.82 11.3	 DLHC	3.0 0.10 2.0 20 0.10 0.50	umhos/cm pH units mg/L mg/L NTU mg/L		04-SEP-19 02-SEP-19 03-SEP-19 03-SEP-19 01-SEP-19 04-SEP-19	R4783364 R4781648 R4781863 R4781901 R4781777 R4783457

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2339962-5 CP-SEEPAGE-3								
Sampled By: CP/RH/AZ on 31-AUG-19 @ 12:45								
Matrix: WATER								
Total Metals								
Aluminum (Al)-Total		0.466	DLHC	0.050	mg/L	04-SEP-19	04-SEP-19	R4783321
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Barium (Ba)-Total		0.0176	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	04-SEP-19	04-SEP-19	R4783321
Boron (B)-Total		0.14	DLHC	0.10	mg/L	04-SEP-19	04-SEP-19	R4783321
Cadmium (Cd)-Total		0.000961	DLHC	0.000050	mg/L	04-SEP-19	04-SEP-19	R4783321
Calcium (Ca)-Total		243	DLHC	0.50	mg/L	04-SEP-19	04-SEP-19	R4783321
Cesium (Cs)-Total		0.00017	DLHC	0.00010	mg/L	04-SEP-19	04-SEP-19	R4783321
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	04-SEP-19	04-SEP-19	R4783321
Cobalt (Co)-Total		0.106	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	04-SEP-19	04-SEP-19	R4783321
Iron (Fe)-Total		0.81	DLHC	0.10	mg/L	04-SEP-19	04-SEP-19	R4783321
Lead (Pb)-Total		0.00056	DLHC	0.00050	mg/L	04-SEP-19	04-SEP-19	R4783321
Lithium (Li)-Total		0.054	DLHC	0.010	mg/L	04-SEP-19	04-SEP-19	R4783321
Magnesium (Mg)-Total		524	DLHC	0.050	mg/L	04-SEP-19	04-SEP-19	R4783321
Manganese (Mn)-Total		27.5	DLHC	0.050	mg/L	04-SEP-19	04-SEP-19	R4783321
Molybdenum (Mo)-Total		0.00457	DLHC	0.00050	mg/L	04-SEP-19	04-SEP-19	R4783321
Nickel (Ni)-Total		0.106	DLHC	0.0050	mg/L	04-SEP-19	04-SEP-19	R4783321
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	04-SEP-19	04-SEP-19	R4783321
Potassium (K)-Total		28.4	DLHC	0.50	mg/L	04-SEP-19	04-SEP-19	R4783321
Rubidium (Rb)-Total		0.0268	DLHC	0.0020	mg/L	04-SEP-19	04-SEP-19	R4783321
Selenium (Se)-Total		0.00801	DLHC	0.00050	mg/L	04-SEP-19	04-SEP-19	R4783321
Silicon (Si)-Total		4.0	DLHC	1.0	mg/L	04-SEP-19	04-SEP-19	R4783321
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	04-SEP-19	04-SEP-19	R4783321
Sodium (Na)-Total		52.9	DLHC	0.50	mg/L	04-SEP-19	04-SEP-19	R4783321
Strontium (Sr)-Total		0.432	DLHC	0.010	mg/L	04-SEP-19	04-SEP-19	R4783321
Sulfur (S)-Total		895	DLHC	5.0	mg/L	04-SEP-19	04-SEP-19	R4783321
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	04-SEP-19	04-SEP-19	R4783321
Thallium (Tl)-Total		0.00017	DLHC	0.00010	mg/L	04-SEP-19	04-SEP-19	R4783321
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Titanium (Ti)-Total		0.0238	DLHC	0.0030	mg/L	04-SEP-19	04-SEP-19	R4783321
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	04-SEP-19	04-SEP-19	R4783321
Uranium (U)-Total		0.130	DLHC	0.00010	mg/L	04-SEP-19	04-SEP-19	R4783321
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	04-SEP-19	04-SEP-19	R4783321
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	04-SEP-19	04-SEP-19	R4783321
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	04-SEP-19	04-SEP-19	R4783321

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Aluminum (Al)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Barium (Ba)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Boron (B)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Calcium (Ca)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Cobalt (Co)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Copper (Cu)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Iron (Fe)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Lithium (Li)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Manganese (Mn)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Nickel (Ni)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Potassium (K)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Silicon (Si)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Sodium (Na)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Strontium (Sr)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Sulfur (S)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Uranium (U)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Zinc (Zn)-Total	MS-B	L2339962-3, -4, -5
Matrix Spike	Ammonia, Total (as N)	MS-B	L2339962-3, -4, -5

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			
** ALS test methods may incorporate modifications from specified reference methods to improve performance.			

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg wwwt - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.
- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT		Water						
Batch	R4783364							
WG3151116-4	DUP	WG3151116-3						
Conductivity		1930	1930		umhos/cm	0.3	10	04-SEP-19
WG3151116-2	LCS							
Conductivity			100.3		%		90-110	04-SEP-19
WG3151116-1	MB							
Conductivity			<3.0		umhos/cm		3	04-SEP-19
MET-T-CCMS-WT		Water						
Batch	R4783321							
WG3151399-4	DUP	WG3151399-3						
Aluminum (Al)-Total		3.97	4.13		mg/L	4.1	20	04-SEP-19
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-SEP-19
Arsenic (As)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-SEP-19
Barium (Ba)-Total		0.033	0.034		mg/L	5.1	20	04-SEP-19
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-SEP-19
Bismuth (Bi)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-SEP-19
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	20	04-SEP-19
Cadmium (Cd)-Total		0.00081	0.00105	J	mg/L	0.00024	0.001	04-SEP-19
Calcium (Ca)-Total		101	101		mg/L	0.4	20	04-SEP-19
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	04-SEP-19
Cesium (Cs)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	04-SEP-19
Cobalt (Co)-Total		1.64	1.72		mg/L	4.4	20	04-SEP-19
Copper (Cu)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	04-SEP-19
Iron (Fe)-Total		850	876		mg/L	3.0	20	04-SEP-19
Lead (Pb)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-SEP-19
Lithium (Li)-Total		0.19	0.18		mg/L	7.1	20	04-SEP-19
Magnesium (Mg)-Total		1040	1090		mg/L	4.7	20	04-SEP-19
Manganese (Mn)-Total		73.1	74.9		mg/L	2.4	20	04-SEP-19
Molybdenum (Mo)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-SEP-19
Nickel (Ni)-Total		1.52	1.56		mg/L	3.0	20	04-SEP-19
Phosphorus (P)-Total		<5.0	<5.0	RPD-NA	mg/L	N/A	20	04-SEP-19
Potassium (K)-Total		11.6	12.0		mg/L	3.6	20	04-SEP-19
Rubidium (Rb)-Total		0.039	0.045		mg/L	15	20	04-SEP-19
Selenium (Se)-Total		0.0068	0.0055	J	mg/L	0.0013	0.01	04-SEP-19
Silicon (Si)-Total		<10	<10	RPD-NA	mg/L	N/A	20	04-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4783321							
WG3151399-4	DUP	WG3151399-3						
Silver (Ag)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-SEP-19
Sodium (Na)-Total		8.8	9.2		mg/L	3.6	20	04-SEP-19
Strontium (Sr)-Total		0.20	0.21		mg/L	2.8	20	04-SEP-19
Sulfur (S)-Total		2070	2090		mg/L	1.1	25	04-SEP-19
Thallium (Tl)-Total		0.0016	0.0017		mg/L	3.2	20	04-SEP-19
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/L	N/A	20	04-SEP-19
Thorium (Th)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	25	04-SEP-19
Tin (Sn)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-SEP-19
Titanium (Ti)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	04-SEP-19
Tungsten (W)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-SEP-19
Uranium (U)-Total		0.0030	0.0030		mg/L	0.5	20	04-SEP-19
Vanadium (V)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	04-SEP-19
Zinc (Zn)-Total		0.32	0.35		mg/L	6.9	20	04-SEP-19
Zirconium (Zr)-Total		<0.020	<0.020	RPD-NA	mg/L	N/A	20	04-SEP-19
WG3151399-2	LCS							
Aluminum (Al)-Total			109.6		%		80-120	04-SEP-19
Antimony (Sb)-Total			104.5		%		80-120	04-SEP-19
Arsenic (As)-Total			103.6		%		80-120	04-SEP-19
Barium (Ba)-Total			100.5		%		80-120	04-SEP-19
Beryllium (Be)-Total			103.0		%		80-120	04-SEP-19
Bismuth (Bi)-Total			100.8		%		80-120	04-SEP-19
Boron (B)-Total			100.3		%		80-120	04-SEP-19
Cadmium (Cd)-Total			100.4		%		80-120	04-SEP-19
Calcium (Ca)-Total			98.9		%		80-120	04-SEP-19
Chromium (Cr)-Total			104.6		%		80-120	04-SEP-19
Cesium (Cs)-Total			99.8		%		80-120	04-SEP-19
Cobalt (Co)-Total			100.2		%		80-120	04-SEP-19
Copper (Cu)-Total			100.8		%		80-120	04-SEP-19
Iron (Fe)-Total			99.9		%		80-120	04-SEP-19
Lead (Pb)-Total			104.1		%		80-120	04-SEP-19
Lithium (Li)-Total			106.1		%		80-120	04-SEP-19
Magnesium (Mg)-Total			111.3		%		80-120	04-SEP-19
Manganese (Mn)-Total			106.2		%		80-120	04-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4783321							
WG3151399-2		LCS						
Molybdenum (Mo)-Total			98.0		%		80-120	04-SEP-19
Nickel (Ni)-Total			102.5		%		80-120	04-SEP-19
Phosphorus (P)-Total			105.1		%		70-130	04-SEP-19
Potassium (K)-Total			109.8		%		80-120	04-SEP-19
Rubidium (Rb)-Total			102.6		%		80-120	04-SEP-19
Selenium (Se)-Total			100.3		%		80-120	04-SEP-19
Silicon (Si)-Total			108.8		%		60-140	04-SEP-19
Silver (Ag)-Total			99.6		%		80-120	04-SEP-19
Sodium (Na)-Total			109.3		%		80-120	04-SEP-19
Strontium (Sr)-Total			104.9		%		80-120	04-SEP-19
Sulfur (S)-Total			104.1		%		80-120	04-SEP-19
Thallium (Tl)-Total			101.1		%		80-120	04-SEP-19
Tellurium (Te)-Total			95.8		%		80-120	04-SEP-19
Thorium (Th)-Total			99.0		%		70-130	04-SEP-19
Tin (Sn)-Total			102.1		%		80-120	04-SEP-19
Titanium (Ti)-Total			103.7		%		80-120	04-SEP-19
Tungsten (W)-Total			102.0		%		80-120	04-SEP-19
Uranium (U)-Total			102.3		%		80-120	04-SEP-19
Vanadium (V)-Total			105.5		%		80-120	04-SEP-19
Zinc (Zn)-Total			96.1		%		80-120	04-SEP-19
Zirconium (Zr)-Total			97.5		%		80-120	04-SEP-19
WG3151399-1		MB						
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-SEP-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	04-SEP-19
Boron (B)-Total			<0.010		mg/L		0.01	04-SEP-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	04-SEP-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	04-SEP-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-SEP-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	04-SEP-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	04-SEP-19



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Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4783321							
WG3151399-1	MB							
Copper (Cu)-Total			<0.0010		mg/L		0.001	04-SEP-19
Iron (Fe)-Total			<0.010		mg/L		0.01	04-SEP-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	04-SEP-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	04-SEP-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	04-SEP-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	04-SEP-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	04-SEP-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-SEP-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-SEP-19
Potassium (K)-Total			<0.050		mg/L		0.05	04-SEP-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	04-SEP-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	04-SEP-19
Silicon (Si)-Total			<0.10		mg/L		0.1	04-SEP-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	04-SEP-19
Sodium (Na)-Total			<0.050		mg/L		0.05	04-SEP-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	04-SEP-19
Sulfur (S)-Total			<0.50		mg/L		0.5	04-SEP-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	04-SEP-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	04-SEP-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	04-SEP-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	04-SEP-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	04-SEP-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-SEP-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-SEP-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	04-SEP-19
WG3151399-5	MS	WG3151399-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	04-SEP-19
Antimony (Sb)-Total			104.7		%		70-130	04-SEP-19
Arsenic (As)-Total			101.9		%		70-130	04-SEP-19
Barium (Ba)-Total			N/A	MS-B	%		-	04-SEP-19
Beryllium (Be)-Total			112.8		%		70-130	04-SEP-19
Bismuth (Bi)-Total			103.8		%		70-130	04-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
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Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4783321							
WG3151399-5 MS		WG3151399-3						
Boron (B)-Total			N/A	MS-B	%	-		04-SEP-19
Cadmium (Cd)-Total			107.8		%		70-130	04-SEP-19
Calcium (Ca)-Total			N/A	MS-B	%	-		04-SEP-19
Chromium (Cr)-Total			106.7		%		70-130	04-SEP-19
Cesium (Cs)-Total			104.1		%		70-130	04-SEP-19
Cobalt (Co)-Total			N/A	MS-B	%	-		04-SEP-19
Copper (Cu)-Total			N/A	MS-B	%	-		04-SEP-19
Iron (Fe)-Total			N/A	MS-B	%	-		04-SEP-19
Lead (Pb)-Total			104.9		%		70-130	04-SEP-19
Lithium (Li)-Total			N/A	MS-B	%	-		04-SEP-19
Magnesium (Mg)-Total			N/A	MS-B	%	-		04-SEP-19
Manganese (Mn)-Total			N/A	MS-B	%	-		04-SEP-19
Molybdenum (Mo)-Total			103.2		%		70-130	04-SEP-19
Nickel (Ni)-Total			N/A	MS-B	%	-		04-SEP-19
Phosphorus (P)-Total			81.4		%		70-130	04-SEP-19
Potassium (K)-Total			N/A	MS-B	%	-		04-SEP-19
Rubidium (Rb)-Total			N/A	MS-B	%	-		04-SEP-19
Selenium (Se)-Total			102.5		%		70-130	04-SEP-19
Silicon (Si)-Total			N/A	MS-B	%	-		04-SEP-19
Silver (Ag)-Total			97.7		%		70-130	04-SEP-19
Sodium (Na)-Total			N/A	MS-B	%	-		04-SEP-19
Strontium (Sr)-Total			N/A	MS-B	%	-		04-SEP-19
Sulfur (S)-Total			N/A	MS-B	%	-		04-SEP-19
Thallium (Tl)-Total			102.4		%		70-130	04-SEP-19
Tellurium (Te)-Total			87.5		%		70-130	04-SEP-19
Thorium (Th)-Total			93.3		%		70-130	04-SEP-19
Tin (Sn)-Total			102.0		%		70-130	04-SEP-19
Titanium (Ti)-Total			72.0		%		70-130	04-SEP-19
Tungsten (W)-Total			93.1		%		70-130	04-SEP-19
Uranium (U)-Total			N/A	MS-B	%	-		04-SEP-19
Vanadium (V)-Total			104.0		%		70-130	04-SEP-19
Zinc (Zn)-Total			N/A	MS-B	%	-		04-SEP-19
Zirconium (Zr)-Total			89.5		%		70-130	04-SEP-19



Quality Control Report

Workorder: L2339962

Report Date: 05-SEP-19

Page 7 of 8

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-BF	Water							
Batch	R4781777							
WG3150397-7 MB								
Turbidity			<0.10		NTU		0.1	01-SEP-19

Quality Control Report

Workorder: L2339962

Report Date: 05-SEP-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 8 of 8

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

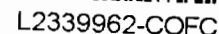
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Canada Toll Free: 1 800 668 9878



Page 1 of 1

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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 9, 2015 EPC

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Spill Report Number:

19-374



October 11, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-374
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On September 11th 2019, during the routine nightly inspection at the 380man Milne Port Waste Water Treatment Plant (WWTP), the water treatment operator noticed that sewage was being released from the plant overflow piping system. Upon further investigation, it was determined that sewage and foam was being released from both the aeration tank and grates on the plant floor onto the 380man camp pad. It was estimated that approximately 2m³ of sewage was released. At the time of the incident, the system was experiencing peak/high influent flows. The release is >500m from Phillips Creek and was confined to the immediate WWTP pad.

Immediate and Follow-Up Action:

The operator added an anti-foaming agent to the tank which started to dissipate the foam and sewage and prevent further release. A detailed investigation was conducted and the spilled material was contained, cleaned-up and area remediated.

Recommendations:

Continued and increased frequency of routine inspections of the 380M WWTP to mitigate the potential for future releases from occurring. Baffinland has brought a specialist in to further assess the design of WWTP system and is examining options for installation of an additional buffer tank to prevent future overflow spills from occurring.

Current Status:

Currently the plant is operating as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253- 0596 x6016 or Shawn Stevens at (647) 253- 0596 x 6006.

A handwritten signature in blue ink, appearing to read "Shawn Stevens".

Shawn Stevens
Manager Health, Safety, Environment and Security

Attachments: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



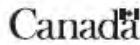
Photo 1. Sept 11th spill before clean up.



Photo 2. Sept 11th spill following clean up.



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 09-12-2019	REPORT TIME 22:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 374
B	OCCURRENCE DATE: MONTH - DAY - YEAR 09-11-2019	OCCURRENCE TIME 23:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 32		LONGITUDE DEGREES 80 MINUTES 54 SECONDS 18	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Horizon North	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approximately 2 m3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Aeration Tank	SPILL CAUSE Overflow	AREA OF CONTAMINATION IN SQUARE METRES 16m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Access to area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS During the routine nightly inspection at the 380man Milne Port Waste Water Treatment Plant (WWTP), the water treatment operator noticed that sewage was being released from the plant overflow piping system. Upon further investigation, it was determined that sewage and foam was being released from both the aeration tank and grates on the plant floor onto the 380man camp pad. At the time of the incident, the system was experiencing peak/high influent flows. The operator added an anti-foaming agent to the tank which started to dissipate the foam and sewage and prevent further release. The release is >500m from Phillips Creek and is confined to the immediate WWTP pad. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY STATION OPERATOR	POSITION STATION OPERATOR	EMPLOYER STATION OPERATOR	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME		CONTACT TIME		REMARKS
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

Figure 2. Baffinland NT NU spill report

Spill Report Number:

19-391



October 19, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: **Follow-up to Spill # 19-391**
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On September 19, 2019, during inspection at the Sailivik Waste Water Treatment Plant (WWTP) at the Mary River Mine Site, it was observed that a sea container was slowly dripping water with an odour onto the camp pad. Upon further investigation, it was determined that the sea container was storing WWTP pressed cake that was contained within individual sealed plastic bags. Select bags had broken and released waste water to the floor of the sea container which then migrated through damaged areas of the sea container floor. The release was greater than 150m from Sheardown Lake NW and was confined to the immediate WWTP pad.

Immediate and Follow-Up Action:

The sea container was emptied of pressed cake bags and the waste water cleaned up. A new lined sea container was sourced for containment. The soil under and adjacent to the sea container was remediated and placed in quatrex bags for storage to be backhauled for disposal offsite. Follow up sampling confirmed remediation.

Recommendations:

Initiated use of lined sea container and quatrex bags to provide tertiary containment of the WWTP cake bags. Routine inspections of the Sailivik WWTP to mitigate the potential for future releases from occurring.

Current Status:

The tertiary sea containment system is operating as intended.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253-0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in black ink, appearing to read "Vern Shaver".

Vern Shaver
Project Site Manager

Attachments: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Francois Gaudreau, Shawn Stevens, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).

2275 Upper Middle Road East, Suite 300 | Oakville, ON, Canada L6H 0C3
Main: 416.364.8820 | Fax: 416.364.0193 | www.baffinland.com



Photo #1 September 19th Before Clean Up



Photo #2 September 21st Spill Cleaned Up



Photo #3 September 21st Spill Cleaned Up



Photo #4 September 21st Tertiary Containment

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Main: 416.364.8820 | Fax: 416.364.0193 | www.baffinland.com



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 09-20-2019	REPORT TIME 13:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 391
B	OCCURRENCE DATE: MONTH - DAY - YEAR 09-19-2019	OCCURRENCE TIME 15:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENSE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 53		LONGITUDE DEGREES 79 MINUTES 18 SECONDS 04	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Horizon North	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Grey Water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approximately 0.5M3	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE WWTP processed sludge	SPILL CAUSE Inadequate containment	AREA OF CONTAMINATION IN SQUARE METRES 50m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Seacan	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS During inspection at the Sailivik Waste Water Treatment Plant (WWTP) at the Mine Site, it was observed that a seacan was slowly dripping water with an odour onto the camp pad. Upon further investigation, it was determined that the seacan was storing WWTP pressed sludge that was contained within individual sealed plastic bags. Select bags had broken and released impacted water to the floor of the seacan which then migrated through damaged areas of the seacan floor. The WWTP pressed sludge bags are being moved to competent secondary containment and the release clean up is ongoing. The release is >1km from the fish bearing waters and is confined to the immediate WWTP pad. Further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
			REPORT LINE NUMBER (867) 920-8130	
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF _____

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Baffinland Iron Mine's Corporation
(Oakville)
ATTN: Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 10-OCT-19
Report Date: 18-OCT-19 15:43 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2363308

Project P.O. #: 4500057496

Job Reference: MS-01B SOIL

C of C Numbers:

Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2363308-1MS-01B-01 (TCLP) Sampled By: BC/BM on 08-OCT-19 @ 16:00 Matrix: SOIL								
Sample Preparation								
Initial pH		7.65		0.10	pH units		18-OCT-19	R4874206
Final pH		4.93		0.10	pH units		18-OCT-19	R4874206
TCLP Metals								
Arsenic (As)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Barium (Ba)		<0.50		0.50	mg/L		18-OCT-19	R4874331
Boron (B)		<2.5		2.5	mg/L		18-OCT-19	R4874331
Cadmium (Cd)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331
Chromium (Cr)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Lead (Pb)		0.067		0.050	mg/L		18-OCT-19	R4874331
Mercury (Hg)		<0.00010		0.00010	mg/L		18-OCT-19	R4873986
Selenium (Se)		<0.025		0.025	mg/L		18-OCT-19	R4874331
Silver (Ag)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331
Uranium (U)		<0.25		0.25	mg/L		18-OCT-19	R4874331
Zinc (Zn)-Total		<1.0		1.0	mg/L		18-OCT-19	R4874331
L2363308-2MS-01B-01 (BULK) Sampled By: BC/BM on 08-OCT-19 @ 16:00 Matrix: SOIL								
Physical Tests								
% Moisture		9.99		0.25	%	10-OCT-19	11-OCT-19	R4866924
Leachable Anions & Nutrients								
Ammonia as N		<10		10	mg/kg	11-OCT-19	15-OCT-19	R4868908
Total Kjeldahl Nitrogen		0.034		0.020	%	16-OCT-19	18-OCT-19	R4874384
Bacteriological Tests								
E. Coli		<10		10	CFU/g dwt	10-OCT-19	10-OCT-19	R4867462
Fecal Coliform		<10		10	CFU/g dwt		10-OCT-19	R4867490
Metals								
Phosphorus (P)		210		50	ug/g	17-OCT-19	17-OCT-19	R4872830
L2363308-3MS-01B-02 (TCLP) Sampled By: BC/BM on 08-OCT-19 @ 16:00 Matrix: SOIL								
Sample Preparation								
Initial pH		6.56		0.10	pH units		18-OCT-19	R4874206
Final pH		4.95		0.10	pH units		18-OCT-19	R4874206
TCLP Metals								
Arsenic (As)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Barium (Ba)		<0.50		0.50	mg/L		18-OCT-19	R4874331
Boron (B)		<2.5		2.5	mg/L		18-OCT-19	R4874331
Cadmium (Cd)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331
Chromium (Cr)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Lead (Pb)		0.060		0.050	mg/L		18-OCT-19	R4874331
Mercury (Hg)		<0.00010		0.00010	mg/L		18-OCT-19	R4873986
Selenium (Se)		<0.025		0.025	mg/L		18-OCT-19	R4874331
Silver (Ag)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2363308-3 MS-01B-02 (TCLP) Sampled By: BC/BM on 08-OCT-19 @ 16:00 Matrix: SOIL TCLP Metals	Uranium (U)	<0.25		0.25	mg/L		18-OCT-19	R4874331
	Zinc (Zn)-Total	<1.0		1.0	mg/L		18-OCT-19	R4874331
L2363308-4 MS-01B-02 (BULK) Sampled By: BC/BM on 08-OCT-19 @ 16:00 Matrix: SOIL Physical Tests	% Moisture	8.59		0.25	%	10-OCT-19	11-OCT-19	R4866924
	Leachable Anions & Nutrients							
	Ammonia as N	<10		10	mg/kg	11-OCT-19	15-OCT-19	R4868908
	Total Kjeldahl Nitrogen	<0.020		0.020	%	16-OCT-19	18-OCT-19	R4874384
	Bacteriological Tests							
	E. Coli	<10		10	CFU/g dwt	10-OCT-19	10-OCT-19	R4867462
	Fecal Coliform	<10		10	CFU/g dwt		10-OCT-19	R4867490
	Metals							
	Phosphorus (P)	187		50	ug/g	17-OCT-19	17-OCT-19	R4873313
L2363308-5 MS-01B-03 (TCLP) Sampled By: BC/BM on 08-OCT-19 @ 16:15 Matrix: SOIL Sample Preparation	Initial pH	8.69		0.10	pH units		18-OCT-19	R4874206
	Final pH	4.97		0.10	pH units		18-OCT-19	R4874206
	TCLP Metals							
	Arsenic (As)	<0.050		0.050	mg/L		18-OCT-19	R4874331
	Barium (Ba)	<0.50		0.50	mg/L		18-OCT-19	R4874331
	Boron (B)	<2.5		2.5	mg/L		18-OCT-19	R4874331
	Cadmium (Cd)	<0.0050		0.0050	mg/L		18-OCT-19	R4874331
	Chromium (Cr)	<0.050		0.050	mg/L		18-OCT-19	R4874331
	Lead (Pb)	<0.050		0.050	mg/L		18-OCT-19	R4874331
	Mercury (Hg)	<0.00010		0.00010	mg/L		18-OCT-19	R4873986
	Selenium (Se)	<0.025		0.025	mg/L		18-OCT-19	R4874331
	Silver (Ag)	<0.0050		0.0050	mg/L		18-OCT-19	R4874331
	Uranium (U)	<0.25		0.25	mg/L		18-OCT-19	R4874331
	Zinc (Zn)-Total	<1.0		1.0	mg/L		18-OCT-19	R4874331
L2363308-6 MS-01B-03 (BULK) Sampled By: BC/BM on 08-OCT-19 @ 16:15 Matrix: SOIL Physical Tests	% Moisture	7.79		0.25	%	10-OCT-19	11-OCT-19	R4866924
	Leachable Anions & Nutrients							
	Ammonia as N	<10		10	mg/kg	11-OCT-19	15-OCT-19	R4868908
	Total Kjeldahl Nitrogen	<0.020		0.020	%	16-OCT-19	18-OCT-19	R4874384
	Bacteriological Tests							
	E. Coli	<10		10	CFU/g dwt	10-OCT-19	10-OCT-19	R4867462

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2363308-6 MS-01B-03 (BULK) Sampled By: BC/BM on 08-OCT-19 @ 16:15 Matrix: SOIL								
Bacteriological Tests								
Fecal Coliform		<10		10	CFU/g dwt		10-OCT-19	R4867490
Metals								
Phosphorus (P)		171		50	ug/g	17-OCT-19	17-OCT-19	R4873313
L2363308-7 MS-01B-04 (TCLP) Sampled By: BC/BM on 08-OCT-19 @ 16:20 Matrix: SOIL								
Sample Preparation								
Initial pH		8.46		0.10	pH units		18-OCT-19	R4874206
Final pH		4.95		0.10	pH units		18-OCT-19	R4874206
TCLP Metals								
Arsenic (As)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Barium (Ba)		<0.50		0.50	mg/L		18-OCT-19	R4874331
Boron (B)		<2.5		2.5	mg/L		18-OCT-19	R4874331
Cadmium (Cd)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331
Chromium (Cr)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Lead (Pb)		<0.050		0.050	mg/L		18-OCT-19	R4874331
Mercury (Hg)		<0.00010		0.00010	mg/L		18-OCT-19	R4873986
Selenium (Se)		<0.025		0.025	mg/L		18-OCT-19	R4874331
Silver (Ag)		<0.0050		0.0050	mg/L		18-OCT-19	R4874331
Uranium (U)		<0.25		0.25	mg/L		18-OCT-19	R4874331
Zinc (Zn)-Total		<1.0		1.0	mg/L		18-OCT-19	R4874331
L2363308-8 MS-01B-04 (BULK) Sampled By: BC/BM on 08-OCT-19 @ 16:20 Matrix: SOIL								
Physical Tests								
% Moisture		6.46		0.25	%	10-OCT-19	11-OCT-19	R4866924
Leachable Anions & Nutrients								
Ammonia as N		<10		10	mg/kg	11-OCT-19	15-OCT-19	R4868908
Total Kjeldahl Nitrogen		<0.020		0.020	%	16-OCT-19	18-OCT-19	R4874384
Bacteriological Tests								
E. Coli		<10		10	CFU/g dwt	10-OCT-19	10-OCT-19	R4867462
Fecal Coliform		<10		10	CFU/g dwt		10-OCT-19	R4867490
Metals								
Phosphorus (P)		234		50	ug/g	17-OCT-19	17-OCT-19	R4873313

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Ammonia as N	MS-B	L2363308-2, -4, -6, -8

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EC-SOLID-MF-WT	Soil	E. coli on sludge or solid	E3433
A biosolid sub-sample is transferred into buffered dilution water blank. The sample is manually shaken and an aliquot of the sample is then filtered through the membrane filter. The filter is then placed on mFC-BCIG agar and incubated at 44.5 – 0.2 °C for 24 – 2 hours. Method ID: WT-TM-1200. Results are reported on a dry weight basis. Moisture is required.			
FC-SOLID-MF-WT	Soil	Fecal Coliform on sludge or solid	SM 9222D
HG-TCLP-WT	Waste	Mercury (CVAA) for O.Reg 347	EPA 1631E
This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using atomic absorption spectrophotometry (EPA 1631E).			
LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).			
MET-200.2-CCMS-WT	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
Soil/sediment is dried, disaggregated, and sieved (2 mm). For tests intended to support Ontario regulations, the <2mm fraction is ground to pass through a 0.355 mm sieve. Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.			
Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).			
MET-TCLP-EXTRA-WT	Waste	O. Reg 347 Extra Metals on TCLP Leachate	EPA 200.8
MET-TCLP-WT	Waste	O.Reg 347 TCLP Leachable Metals	EPA 6020B
This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter. Instrumental analysis of the digested extract is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020B).			
MOISTURE-WT	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)
N-TOTKJ-COL-SK	Soil	Total Kjeldahl Nitrogen	CSSS (2008) 22.2.3
The soil is digested with sulfuric acid in the presence of CuSO4 and K2SO4 catalysts. Ammonia in the soil extract is determined colorimetrically at 660 nm.			
NH3-WT	Soil	Ammonia as N	EPA 350.1
Sample is distilled into a solution of boric acid and measured colorimetrically.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg ww - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.
- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2363308

Report Date: 18-OCT-19

Page 1 of 5

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-SOLID-MF-WT								
Batch R4867462								
WG3187992-3	DUP	L2363308-8						
E. Coli		<10	<10	RPD-NA	CFU/g dwt	N/A	65	10-OCT-19
WG3187992-1	MB							
E. Coli			<10		CFU/g dwt		10	10-OCT-19
FC-SOLID-MF-WT								
Batch R4867490								
WG3188027-3	DUP	L2363308-2						
Fecal Coliform		<10	<10	RPD-NA	CFU/g dwt	N/A	50	10-OCT-19
WG3188027-1	MB							
Fecal Coliform			<10		CFU/g dwt		10	10-OCT-19
MET-200.2-CCMS-WT								
Batch R4872830								
WG3193015-2	CRM	WT-CANMET-TILL2						
Phosphorus (P)			111.8		%		70-130	17-OCT-19
WG3193015-6	DUP	WG3193015-5						
Phosphorus (P)		756	737		ug/g	2.6	30	17-OCT-19
WG3193015-4	LCS							
Phosphorus (P)			111.9		%		80-120	17-OCT-19
WG3193015-1	MB							
Phosphorus (P)			<50		mg/kg		50	17-OCT-19
Batch R4873313								
WG3193009-2	CRM	WT-CANMET-TILL2						
Phosphorus (P)			103.3		%		70-130	17-OCT-19
WG3193009-6	DUP	WG3193009-5						
Phosphorus (P)		730	796		ug/g	8.6	30	17-OCT-19
WG3193009-4	LCS							
Phosphorus (P)			99.8		%		80-120	17-OCT-19
WG3193009-1	MB							
Phosphorus (P)			<50		mg/kg		50	17-OCT-19
MOISTURE-WT								
Batch R4866924								
WG3187672-3	DUP	L2363466-1						
% Moisture		14.8	15.6		%	5.4	20	11-OCT-19
WG3187672-2	LCS							
% Moisture			100.9		%		90-110	11-OCT-19
WG3187672-1	MB							
% Moisture			<0.25		%		0.25	11-OCT-19



Quality Control Report

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N-TOTKJ-COL-SK		Soil						
Batch	R4874384							
WG3191369-1	DUP	L2364284-1						
Total Kjeldahl Nitrogen		4.99	4.82		%	3.4	20	18-OCT-19
WG3191369-2	IRM	08-109_SOIL						
Total Kjeldahl Nitrogen			105.6		%		80-120	18-OCT-19
WG3191369-3	LCS							
Total Kjeldahl Nitrogen			100.0		%		80-120	18-OCT-19
WG3191369-4	MB							
Total Kjeldahl Nitrogen			<0.020		%		0.02	18-OCT-19
NH3-WT		Soil						
Batch	R4868908							
WG3189010-3	DUP	L2363308-8						
Ammonia as N		<10	<10	RPD-NA	mg/kg	N/A	20	15-OCT-19
WG3189010-2	LCS							
Ammonia as N			117.3		%		70-130	11-OCT-19
WG3189010-1	MB							
Ammonia as N			<10		mg/kg		10	11-OCT-19
WG3189010-4	MS	L2363308-8						
Ammonia as N			N/A	MS-B	%		-	15-OCT-19
HG-TCLP-WT		Waste						
Batch	R4873986							
WG3194786-3	DUP	L2363308-1						
Mercury (Hg)		<0.00010	<0.00010	RPD-NA	mg/L	N/A	50	18-OCT-19
WG3194786-2	LCS							
Mercury (Hg)			111.0		%		70-130	18-OCT-19
WG3194786-1	MB							
Mercury (Hg)			<0.00010		mg/L		0.0001	18-OCT-19
WG3194786-4	MS	L2363308-1						
Mercury (Hg)			112.7		%		50-140	18-OCT-19
MET-TCLP-EXTRA-WT		Waste						
Batch	R4874331							
WG3194722-4	DUP	WG3194722-3						
Zinc (Zn)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	30	18-OCT-19
WG3194722-2	LCS							
Zinc (Zn)-Total			90.6		%		70-130	18-OCT-19
WG3194722-1	MB							
Zinc (Zn)-Total			<1.0		mg/L		1	18-OCT-19
WG3194722-5	MS	WG3194722-3						



Quality Control Report

Workorder: L2363308

Report Date: 18-OCT-19

Page 3 of 5

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TCLP-EXTRA-WT		Waste						
Batch	R4874331							
WG3194722-5 MS		WG3194722-3						
Zinc (Zn)-Total			90.2		%		70-130	18-OCT-19
MET-TCLP-WT		Waste						
Batch	R4874331							
WG3194722-4 DUP		WG3194722-3						
Silver (Ag)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	50	18-OCT-19
Arsenic (As)		<0.050	<0.050	RPD-NA	mg/L	N/A	50	18-OCT-19
Boron (B)		<2.5	<2.5	RPD-NA	mg/L	N/A	50	18-OCT-19
Barium (Ba)		<0.50	<0.50	RPD-NA	mg/L	N/A	50	18-OCT-19
Cadmium (Cd)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	50	18-OCT-19
Chromium (Cr)		<0.050	<0.050	RPD-NA	mg/L	N/A	50	18-OCT-19
Lead (Pb)		0.067	0.067		mg/L	0.4	50	18-OCT-19
Selenium (Se)		<0.025	<0.025	RPD-NA	mg/L	N/A	50	18-OCT-19
Uranium (U)		<0.25	<0.25	RPD-NA	mg/L	N/A	50	18-OCT-19
WG3194722-2 LCS								
Silver (Ag)			93.2		%		70-130	18-OCT-19
Arsenic (As)			95.0		%		70-130	18-OCT-19
Boron (B)			87.0		%		70-130	18-OCT-19
Barium (Ba)			95.7		%		70-130	18-OCT-19
Cadmium (Cd)			94.6		%		70-130	18-OCT-19
Chromium (Cr)			95.3		%		70-130	18-OCT-19
Lead (Pb)			94.6		%		70-130	18-OCT-19
Selenium (Se)			93.6		%		70-130	18-OCT-19
Uranium (U)			94.2		%		70-130	18-OCT-19
WG3194722-1 MB								
Silver (Ag)			<0.0050		mg/L		0.005	18-OCT-19
Arsenic (As)			<0.050		mg/L		0.05	18-OCT-19
Boron (B)			<2.5		mg/L		2.5	18-OCT-19
Barium (Ba)			<0.50		mg/L		0.5	18-OCT-19
Cadmium (Cd)			<0.0050		mg/L		0.005	18-OCT-19
Chromium (Cr)			<0.050		mg/L		0.05	18-OCT-19
Lead (Pb)			<0.050		mg/L		0.05	18-OCT-19
Selenium (Se)			<0.025		mg/L		0.025	18-OCT-19
Uranium (U)			<0.25		mg/L		0.25	18-OCT-19



Quality Control Report

Workorder: L2363308

Report Date: 18-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TCLP-WT	Waste							
Batch	R4874331							
WG3194722-5	MS	WG3194722-3						
Silver (Ag)			101.1		%		50-140	18-OCT-19
Arsenic (As)			95.6		%		50-140	18-OCT-19
Boron (B)			87.5		%		50-140	18-OCT-19
Barium (Ba)			94.6		%		50-140	18-OCT-19
Cadmium (Cd)			94.6		%		50-140	18-OCT-19
Chromium (Cr)			97.7		%		50-140	18-OCT-19
Lead (Pb)			95.9		%		50-140	18-OCT-19
Selenium (Se)			97.1		%		50-140	18-OCT-19
Uranium (U)			94.2		%		50-140	18-OCT-19

Quality Control Report

Workorder: L2363308

Report Date: 18-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2363308-COFC

[illegible]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA FMA 03266 v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Spill Report Number:

19-354



October 23, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Enforcement Officer
Environment and Climate Change Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill # 19-354
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On September 23, 2019, during routine marine monitoring in Milne Port a sheen was observed on the ocean's surface in the local area of the Freight Dock. Spill response procedures were initiated and vessels were dispatched to investigate. Upon initial investigation, no free product or point source was identified, however a sheen was observed to be localized around the Port's Freight Dock. The small sheen was observed rapidly dissipating from wave action. To contain the sheen, an oil absorbent boom was deployed around the east face of the Freight Dock. It is estimated that approximately 5 litres of an unknown hydrocarbon was observed impacting an approximate area of 500 m².

Immediate and Follow-Up Action:

An absorbent boom was deployed on the east side of the Freight Dock where the sheen was present providing containment. Appendix A outlines water quality results from monitoring conducted at the following locations:

Sample ID	Location
HC-01	17 W 0503935 7976652
HC-02	17 W 0504011 7976652

Recommendations:

Continue routine marine monitoring.

Current Status:

No further sheen has been observed in Milne Port.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253- 0596 x6016.

Prepared by:

Connor Devereaux
Environmental Superintendent

Reviewed by:

Christopher Murray
Environmental and Regulatory Compliance Manager

Attachments: Photos, Map, Baffinland NT-NU Spill Report, Water Quality Results, Certificates of Analyses

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Francois Gaudreau, Shawn Stevens, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC) Curtis Didham (ECCC).



Photo #1 September 23rd Sheen Containment

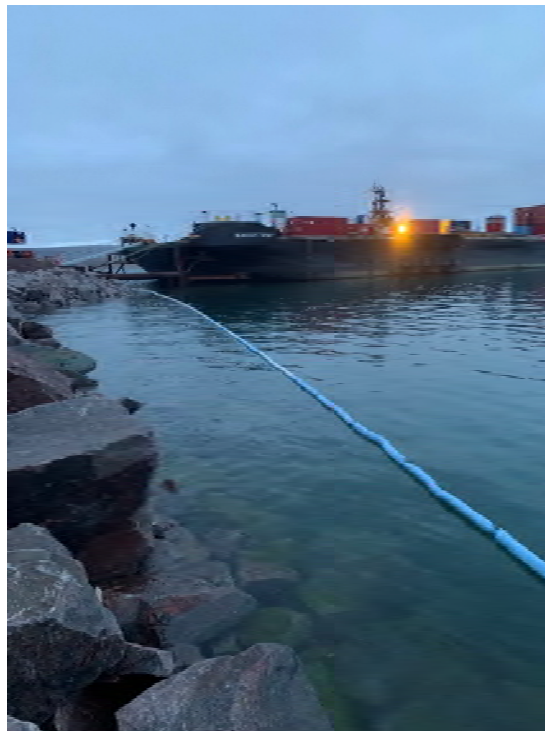


Photo #2 September 23rd Sheen Containment



Figure 1. Map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 09-24-2019	REPORT TIME 15:00	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 354
B	OCCURRENCE DATE: MONTH - DAY - YEAR 09-23-2019	OCCURRENCE TIME 17:00		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Milne Inlet Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 53 SECONDS 23		LONGITUDE DEGREES 80 MINUTES 53 SECONDS 04	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Hatch	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED hydrocarbons	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 5 litres	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Freight Dock	SPILL CAUSE unknown	AREA OF CONTAMINATION IN SQUARE METRES 500 m2	
J	FACTORS AFFECTING SPILL OR RECOVERY spill on water	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On September 23, 2019 at 17:00 during routine marine monitoring in Milne Inlet a minor sheen was observed on the ocean's surface in the local area of the Freight Dock. Spill response procedures were initialized and vessels were dispatched to investigate. Upon initial investigations, no free product or point source was identified, however a sheen was observed to be localized around the Port's Freight Dock dissipating rapidly from wave action. An oil absorbent boom was deployed around the East face of the Freight Dock where the sheen was present providing containment. It is estimated that approximately 5 litres of an unknown hydrocarbon, impacting an approximate area of 500 m2, was released prior to boom containment. No sheen was observed the following morning in Milne Inlet or within the containment booms. The investigation is ongoing and further details will be provided in the follow-up report. Reporting as required by Water Licence 2AM-MRY1325, Part H, Items 9 & 10. Arctic Waters Pollution Prevention Act S. 5(1), and Fisheries Act subsection 34(1).			
L	REPORTED TO SPILL LINE BY William Bowden	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> SN <input type="checkbox"/> ILA <input type="checkbox"/> NAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME		CONTACT TIME	REMARKS	
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				



Appendix A

Water Quality Results Summary



Summary of Analytical Results

	ALS Laboratory Sample ID		HC-01	HC-02	HC-03
	ALS ID		L2355389-1	L2355389-2	L2355389-3
	Sample Date & Time		9/23/2019 19:20:00 PM	9/23/2019 19:35:00 PM	9/23/2019 20:00:00 PM
	QA/QC Sample Type		N/A	N/A	N/A
	Units	LOR			
Physical Tests (Water)					
pH	pH units	0.1	7.52	7.79	7.83
Total Suspended Solids	mg/L	2	18.10	29.10	17.30
Total Dissolved Solids	mg/L	80	20800	22400	25800
Turbidity	NTU	0.1	0.41	0.31	0.23
Aggregate Organics (Water)					
Oil and Grease, Total	mg/L	2	<2.0	<2.0	<2.0
Volatile Organic Compounds (Water)					
Benzene	ug/L	0.5	<0.50	<0.50	<0.50
Ethylbenzene	ug/L	0.5	<0.50	<0.50	<0.50
Toluene	ug/L	0.5	<0.50	<0.50	<0.50
o-Xylene	ug/L	0.3	<0.30	<0.30	<0.30
m+p-Xylenes	ug/L	0.4	<0.40	<0.40	<0.40
Xylenes (Total)	ug/L	0.5	<0.50	<0.50	<0.50



Appendix B

Certificate of Analyses



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 27-SEP-19
Report Date: 02-OCT-19 14:04 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2355389
Project P.O. #: 4500057496
Job Reference: FREIGHT DOCK EXPLORE
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2355389-1 HC-01 Sampled By: CD/LC on 23-SEP-19 @ 19:20 Matrix: WATER								
Physical Tests								
pH		7.52		0.10	pH units		27-SEP-19	R4849575
Total Suspended Solids		18.1		2.0	mg/L	30-SEP-19	01-OCT-19	R4851050
Total Dissolved Solids		20800	DLDS	80	mg/L		29-SEP-19	R4850389
Turbidity		0.41		0.10	NTU	27-SEP-19	27-SEP-19	R4849001
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	27-SEP-19	27-SEP-19	R4850795
Animal/Veg Oil & Grease		<2.0		2.0	mg/L		30-SEP-19	
Mineral Oil and Grease		<1.0		1.0	mg/L	27-SEP-19	27-SEP-19	R4850795
Volatile Organic Compounds								
Benzene		<0.50		0.50	ug/L		02-OCT-19	R4855849
Ethylbenzene		<0.50		0.50	ug/L		02-OCT-19	R4855849
Toluene		<0.50		0.50	ug/L		02-OCT-19	R4855849
o-Xylene		<0.30		0.30	ug/L		02-OCT-19	R4855849
m+p-Xylenes		<0.40		0.40	ug/L		02-OCT-19	R4855849
Xylenes (Total)		<0.50		0.50	ug/L		02-OCT-19	
Surrogate: 4-Bromofluorobenzene		95.6		70-130	%		02-OCT-19	R4855849
Surrogate: 1,4-Difluorobenzene		96.6		70-130	%		02-OCT-19	R4855849
L2355389-2 HC-02 Sampled By: CD/LC on 23-SEP-19 @ 19:35 Matrix: WATER								
Physical Tests								
pH		7.79		0.10	pH units		27-SEP-19	R4849575
Total Suspended Solids		29.1		2.0	mg/L	30-SEP-19	01-OCT-19	R4851291
Total Dissolved Solids		22400	DLDS	80	mg/L		30-SEP-19	R4851707
Turbidity		0.31		0.10	NTU	27-SEP-19	27-SEP-19	R4849001
Aggregate Organics								
Oil and Grease, Total		<2.0		2.0	mg/L	27-SEP-19	27-SEP-19	R4850795
Animal/Veg Oil & Grease		<2.0		2.0	mg/L		30-SEP-19	
Mineral Oil and Grease		<1.0		1.0	mg/L	27-SEP-19	27-SEP-19	R4850795
Volatile Organic Compounds								
Benzene		<0.50		0.50	ug/L		02-OCT-19	R4855849
Ethylbenzene		<0.50		0.50	ug/L		02-OCT-19	R4855849
Toluene		<0.50		0.50	ug/L		02-OCT-19	R4855849
o-Xylene		<0.30		0.30	ug/L		02-OCT-19	R4855849
m+p-Xylenes		<0.40		0.40	ug/L		02-OCT-19	R4855849
Xylenes (Total)		<0.50		0.50	ug/L		02-OCT-19	
Surrogate: 4-Bromofluorobenzene		95.8		70-130	%		02-OCT-19	R4855849
Surrogate: 1,4-Difluorobenzene		96.9		70-130	%		02-OCT-19	R4855849
L2355389-3 HC-03 Sampled By: CD/LC on 23-SEP-19 @ 20:00 Matrix: WATER								
Physical Tests								
pH		7.83		0.10	pH units		27-SEP-19	R4849575

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-511-HS-WT	Water	BTEX by Headspace	SW846 8260 (511)
BTX is determined by analyzing by headspace-GC/MS.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.			
OGG-SPEC-WT	Water	Speciated Oil and Grease-Gravimetric	APHA 5520 B
The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.			
PH-WT	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days			
SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-WT	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample*
- mg/kg wwwt - milligrams per kilogram based on wet weight of sample*
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample*
- mg/L - unit of concentration based on volume, parts per million.*
- < - Less than.*
- D.L. - The reporting limit.*
- N/A - Result not available. Refer to qualifier code and definition for explanation.*

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2355389

Report Date: 02-OCT-19

Page 3 of 5

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WT		Water						
Batch	R4849001							
WG3175100-3	DUP	L2354876-1						
Turbidity		19.3	19.9		NTU	3.1	15	27-SEP-19
WG3175100-2	LCS							
Turbidity			101.5		%		85-115	27-SEP-19
WG3175100-1	MB							
Turbidity			<0.10		NTU		0.1	27-SEP-19

Quality Control Report

Workorder: L2355389

Report Date: 02-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 4 of 5

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2355389

Report Date: 02-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 5 of 5

Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity	1	23-SEP-19 19:20	27-SEP-19 14:07	48	91	hours	EHTR
	2	23-SEP-19 19:35	27-SEP-19 14:07	48	90	hours	EHTR
	3	23-SEP-19 20:00	27-SEP-19 14:07	48	90	hours	EHTR

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2355389 were received on 27-SEP-19 10:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Chain of Custody (COC) / Analytical Request Form



L2355389-COFC

COC Number: 15 -

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Report To Contact and company name below will appear on the final report			Report Format / Distribution			Select Service Level Below - please confirm all E&P TATs with your AM - surcharges will apply																																																																															
Company: Baffinland Iron Mines Corp.			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																															
Contact: William Bowden and Connor Devereaux			Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days) 4 day [P4] <input type="checkbox"/> 3 day [P3] <input type="checkbox"/> 2 day [P2] <input type="checkbox"/>			EMERGENCY 1 Business day [E1] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E0] <input type="checkbox"/>																																																																												
Phone: 647-253-0596 EXT 6016			<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked																																																																																		
Company address below will appear on the final report			Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:																																																																															
Street: 2275 Upper Middle Rd. E., Suite #300			Email 1 or Fax bimcore@alsglobal.com			For tests that can not be performed according to the service level selected, you will be contacted.																																																																															
City/Province: Oakville, ON			Email 2 bimww@alsglobal.com			Analysis Request																																																																															
Postal Code: L6H 0C3			Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																															
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			Invoice Distribution			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">pH, TSS, TDS, Turbidity</td> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">Oil and Grease</td> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">BTEX</td> <td colspan="16"></td> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">Number of Containers</td> </tr> <tr><td colspan="16"></td></tr> <tr><td colspan="16"></td></tr> <tr><td colspan="16"></td></tr> </table>												pH, TSS, TDS, Turbidity	Oil and Grease	BTEX																	Number of Containers																																																
pH, TSS, TDS, Turbidity	Oil and Grease	BTEX																			Number of Containers																																																																
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																																																																		
Company:			Email 1 or Fax ap@baffinland.com																																																																																		
Contact:			Email 2 commercial@baffinland.com																																																																																		
Project Information			Oil and Gas Required Fields (client use)																																																																																		
ALS Account # / Quote #: 23642 / Q42455			AFE/Cost Center: PO#																																																																																		
Job #: Freight Dock Explore			Major/Minor Code: Routing Code:																																																																																		
PO / AFE: 4500057496			Requisitioner:																																																																																		
LSD:			Location:																																																																																		
ALS Lab Work Order # (lab use only) L2355389			ALS Contact:			Sampler: CD/LC																																																																															
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type																																																																																
	HC-01		23-Sep-19	19:20	Water																																																																																
	HC-02		23-Sep-19	19:35	Water																																																																																
	HC-03		23-Sep-19	20:00	Water																																																																																
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human drinking water use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO												Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)																																																																									
SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/>												INITIAL COOLER TEMPERATURES °C: 14.8 FINAL COOLER TEMPERATURES °C: 10.30																																																																									
SHIPMENT RELEASE (client use)						INITIAL SHIPMENT RECEPTION (lab use only)						FINAL SHIPMENT RECEPTION (lab use only)																																																																									
Released By: C. Devereaux		Release Date: 24-Sep-19		Time: 15:00		Received by:		Date:		Time:		Received by: AP		Date: 27-9-19		Time: 10:30																																																																					

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Spill Report Number:

19-404



October 28, 2019

Water Resources Officer
Nunavut Region
Crown Indigenous Relations and Northern Affairs Canada
Box 100
Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-404
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On September 28th 2019, the Waste Water Treatment Plant (WWTP) operator was notified that a spill was observed at the 380man Milne Port Waste Water Treatment Plant. The water treatment operator noticed that sewage foam from the aeration tank had overflowed onto the surrounding camp pad. At the time of the incident, the plant was experiencing a high volume of influent. It was estimated that approximately 3m³ of sewage was released. The release is >500m from Phillips Creek and was confined to the immediate WWTP pad.

Immediate and Follow-Up Action:

An anti-foaming agent was added to the aeration tank to dissipate the foam and prevent further release. The spilled material was contained, cleaned-up and area remediated. Baffinland retained a specialist to further assess the design of the WWTP system. As recommended by the specialist, an equalization tank has been installed and will be operational once commissioning is complete. Operators have received additional training to update their knowledge of the system, and to prevent further releases from occurring.

Recommendations:

Continued and increased frequency of routine inspections of the 380M WWTP to mitigate the potential for future releases from occurring.

Current Status:

Currently the plant is operating as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253- 0596 x6016.

Prepared by:

A handwritten signature in black ink, appearing to read "Connor Devereaux".

Connor Devereaux
Environmental Superintendent

Reviewed by:

A handwritten signature in blue ink, appearing to read "Marlon Coakley".

Marlon Coakley
Hatch Site Manager

Attachments: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Francois Gaudreau, Christopher Murray (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



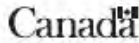
Photo 1. Sept 28th spill before clean up.



Photo 2. Sept 28th spill following clean up.



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spillis@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 09-28-2019	REPORT TIME 21:40	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19-404
B	OCCURRENCE DATE: MONTH - DAY - YEAR 09-27-2019	OCCURRENCE TIME 21:55		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES 71 MINUTES 52 SECONDS 32		LONGITUDE DEGREES 80 MINUTES 54 SECONDS 18	
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED Horizon North	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approximately 3m3	U.N. NUMBER N/A	
H	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Aeration Tank	SPILL CAUSE Increased volume	AREA OF CONTAMINATION IN SQUARE METRES Approximately 40m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested Area	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS An employee observed a spill originating from the 380 person camp Waste Water Treatment Plant (WWTP). The WWTP operator was notified of the situation and responded to the spill. Upon further investigation, it was determined that sewage and foam from the aeration tank had overflowed onto the surrounding camp pad. At the time of the incident the plant was experiencing high volume of influent. An anti-foaming agent was added to the aeration tank to dissipate the foam and prevent further release. The immediate cause of the spill is still being investigated. The release is >500m from Phillips Creek and is confined to the immediate WWTP pad. An investigation is ongoing and further details will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM Mary River TELEPHONE 416 364 8820
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT LOCATION Ext. 6016
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	
AGENCY			FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
CONTACT NAME		REMARKS		
CONTACT TIME				
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

PAGE 1 OF 1

Figure 2. Baffinland NT NU spill report

APPENDIX E.8.4

Initial and Follow-up Spill Reports

Spill Report Number:

19-409



November 1, 2019

Jonathan Mesher, Water Resource Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Iqaluit Office
Box 100
Iqaluit, NU X0A 0H0

Monika Trottier, Enforcement Officer
Curtis Didham, Enforcement Officer
Environment and Climate Change
Canada
933 Mivvik Street
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-409, Reported on October 2, 2019, Mary River Project - Water Licence No. 2AM-MRY1325

On September 28th, 2019, discharge recommenced from MS-08 due to warm conditions and a rain event after ceasing discharge on September 7th due to initial freeze up. Deleterious substances water quality monitoring was conducted from the MS-08 Final Discharge Point (FDP) on September 28th and 30th and lab results indicated total suspended solids (TSS) in exceedance of the grab limit. Monitoring on October 1st indicated a return of the TSS to below the grab limit, and the discharge continued until October 2nd, 2019.

Deleterious substances water quality monitoring was conducted on September 28th, and effluent characterization was conducted on September 30th and October 1st from the MS-08 FDP. Acute lethality samples were collected on October 1st from the MS-08 FDP. Water quality monitoring was conducted at the reference and exposure sites on September 30th and October 1st. The location of the MS-08 FDP and reference and exposure sites are listed below.

ID	Location
Final Discharge Point MS-08	71° 20' 41.6" 79° 13' 44.5"
MS-08-US (Reference)	71° 18' 37.8" 79° 11' 13.5"
MS-08-DS (Effluent-Exposed)	71° 18' 38.9" 79° 12' 09.4"

MS-08 FDP lab results for all parameters analyzed from the September 28th and 30th samples were compliant with applicable regulatory criteria with the exception of total suspended solids. October 1st samples indicated a return of TSS to below applicable regulatory criteria. Reference and exposure site samples from September 30th and October 1st returned compliant samples for all parameters analyzed with applicable regulatory criteria.

Appendix A outlines water quality results from monitoring conducted at the MS-08 FDP and reference and exposure sites. Appendix B includes the Certificates of Analyses (COAs) for these sampling events.

As per Section 31 of the *Metal and Diamond Mining Effluent Regulations* (MDMER):

- Total Suspended Solids (TSS) grab sample concentration exceedances of 40.5 and 55.5 mg/L on September 28th and 30th, respectively, at the Waste Rock Facility Pond FDP (MS-08). The mean monthly concentration of TSS for September was 35 mg/L.
- Discharge volume for the month of September was 9617m³. This was measured using a 4" GPI TM400 turbine flow meter.
- A summary is provided in Appendix A of the sampling events during the month of September which includes date, time and respective water quality results.
- N/A. All effluent was discharged through the MS-08 FDP.
- Appendix A outlines the concentrations of total suspended solids in effluent discharged through the MS-08 FDP in September.
- Mary River Tributary F (MRTF) and Mary River would be the receiving bodies of water. The effluent is discharged through approximately 475 m of layflat hose overland (no defined channel)

and flows eastnortheast over boulder-cobble till material for approximately 475 m before entering a headwater depression that contains intermittent natural flow. The gradient of the depression continues eastward, eventually forming a clearly defined channel approximately 1,170 m down gradient of the end of the lay-flat hose line. This defined channel drains southeast approximately 740 m before discharging into MRTF. From this confluence, MRTF flows south approximately 3.3 km) before discharging into the Mary River.

- g) Acute toxicity samples were collected on October 1st and test results were non-lethal. Certificate of Analyses is attached in Appendix B.
- h) See summary above for circumstances of deposit. Extent of release occurred for approximately three days until mitigation measures reduced the elevated TSS to compliant levels. As per Baffinland's Emergency Response Plan and Spill Contingency Plan, bag filters were installed on the discharge line in an effort to reduce TSS concentrations.
- i) Bag filters were installed in the discharge line prior to the MS-08 FDP.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253-0596 x6016.

Prepared by:



Connor Devereaux
Environmental Superintendent

Reviewed by:



Daniel Janusauskas
Technical Services Superintendent

Attach: Photos, Map, NT-NU Spill Report, Water Quality Results, Certificates of Analyses

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Shawn Stevens, Francois Gaudreau, Christopher Murray, Lou Kamermans (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC), Curtis Didham (ECCC).



Photo 1. September 27th, 2019 – MS-08 pond.



Photo 2. September 29th, 2019 – MS-08 Exposure Area.



Photo 3. September 30th, 2019 – Bag Filters Installed.



Photo 4. October 1st, 2019 – Geotube pond utilized.

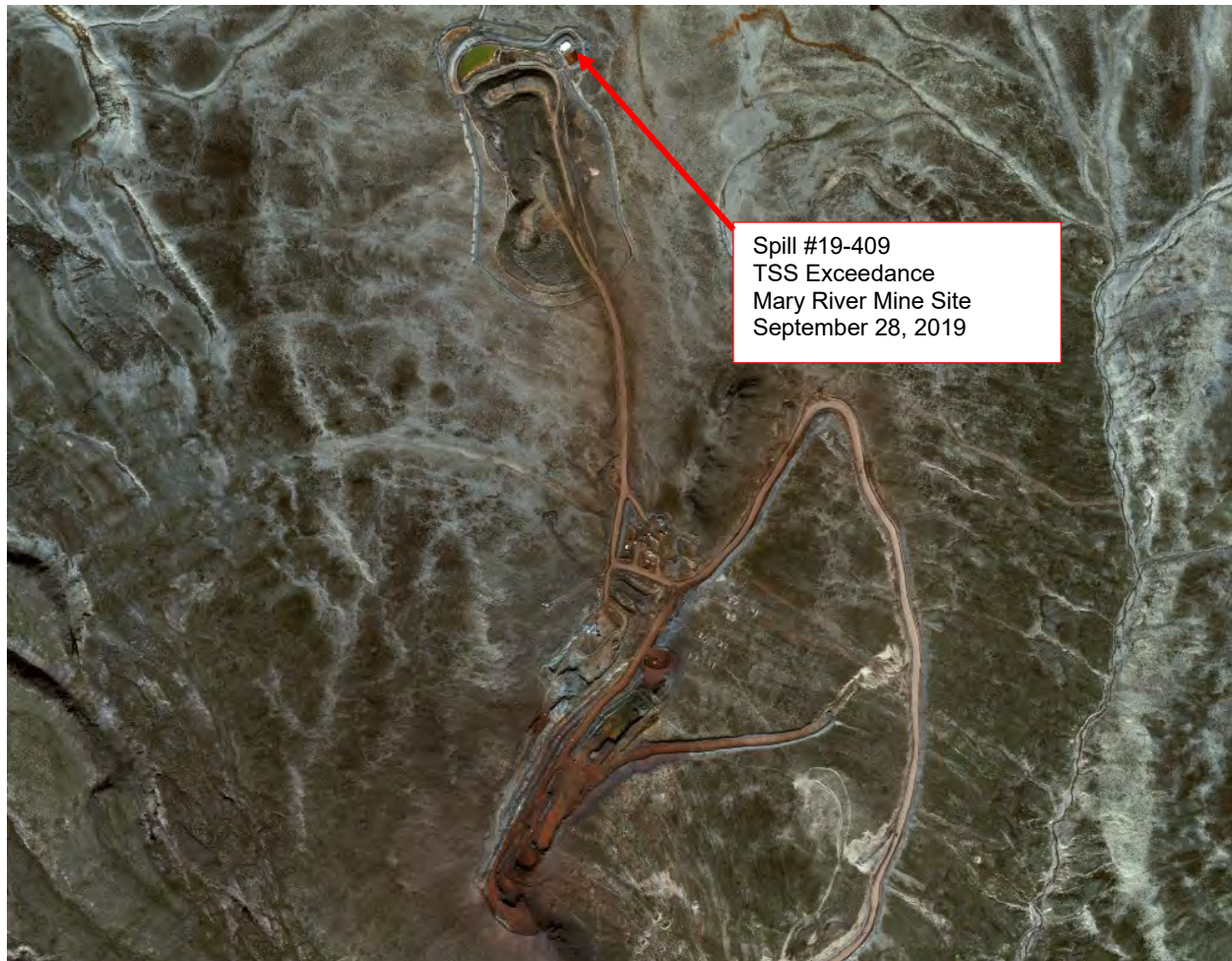


Figure 1 – Overview map of spill location



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 10-02-2019	REPORT TIME 22:30	<input checked="" type="checkbox"/> ORIGINAL SPILL REPORT OR: <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT		REPORT NUMBER 19 409
B	OCCURRENCE DATE: MONTH - DAY - YEAR 09-28-2019	OCCURRENCE TIME 13:30			
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENCE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"			
D	GEOGRAPHIC PLACE NAME, OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU		REGION <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 20 SECONDS 42		LONGITUDE DEGREES 79 MINUTES 13 SECONDS 45		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3			
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A			
H	PRODUCT SPILLED Effluent	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A		
I	SPILL SOURCE Waste rock facility pond	SPILL CAUSE Rain event, rapid melt	AREA OF CONTAMINATION IN SQUARE METRES N/A		
J	FACTORS AFFECTING SPILL OR RECOVERY Drainage to tundra	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A		
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS. On September 28th, 2019, discharge recommenced from MS-08 due to warm conditions and a rain event after ceasing discharge on September 7th due to initial freeze up. Deleterious substances water quality monitoring was conducted from the MS-08 FDP. Preliminary lab results from this monitoring indicate total suspended solids (TSS) in exceedance of the grab limit. The discharge continues to be sampled and monitored. Lab analysis of effluent characterization and acute toxicity parameters are in progress and will be presented in the follow-up report. The incident occurred on IOL located > 3km from fish bearing water. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9(b); section 31 of the Metal and Diamond Mining Effluent Regulations under the Fisheries Act; and the Government of Nunavut's Environmental Protection Act paragraph 5.1(a).				
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820	TELEPHONE ext. 6016
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Manager of HSES	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820	ALTERNATE TELEPHONE ext. 6006
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		
AGENCY			CONTACT NAME		
CONTACT TIME			REMARKS		
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

Figure 2 – NT-NU Spill report

Appendix A
Water Quality Results Summary

	ALS Laboratory Sample ID			MS-08	MS-08	MS-08	MS-08-DS	MS-08-US
	ALS ID			L2339839-1	L2356235-1	L2356892-1	L2356925-1	L2356925-2
	Sample Date & Time			9/2/2019 2:25:00 PM	9/28/2019 1:30:00 PM	9/30/2019 9:20:00 AM	9/30/2019 12:50:00 PM	9/30/2019 1:20:00 PM
	QA/QC Sample Type			N/A	N/A	N/A	N/A	N/A
	Units	LOR	MDMER Grab Sample Limits					
Conductivity	umhos/cm	3	-	3180	1390	870	170	167
Hardness (as CaCO3)	mg/L	10	-	2350	-	479	73.2	72.2
pH	pH units	0.1	6.0-9.5	8.47	6.91	6.92	7.94	7.97
Total Suspended Solids	mg/L	2	30	10	40.5	55.5	3.2	2.4
Total Dissolved Solids	mg/L	20	-	3190	1080	643	96	107
Turbidity	NTU	0.1	-	9.32	42.1	72.1	3.38	3.32
Acidity (as CaCO3)	mg/L	2	-	5	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	10	-	63	-	25	72	73
Ammonia, Total (as N)	mg/L	0.1	-	1.43	0.5	0.39	0.013	<0.010
Chloride (Cl)	mg/L	0.5	-	11	-	2.21	6.98	7.2
Fluoride (F)	mg/L	0.02	-	<0.40	-	0.047	0.025	0.027
Nitrate (as N)	mg/L	0.02	-	10.4	-	2.71	0.074	0.074
Total Kjeldahl Nitrogen	mg/L	0.15	-	1.31	-	<1.5	<0.15	<0.15
Phosphorus, Total	mg/L	0.03	-	0.0036	-	0.052	0.0073	0.0084
Sulfate (SO4)	mg/L	0.3	-	2490	-	424	6.8	4.48
Cyanide, Total	mg/L	0.002	2	<0.0020	<0.020	0.0065	-	-
Dissolved Organic Carbon	mg/L	0.5	-	2.9	-	1.33	2.31	2.24
Total Organic Carbon	mg/L	0.5	-	3.51	-	2.22	2.42	2.47
Aluminum (Al)-Total	mg/L	0.05	-	0.092	1.02	1.88	0.144	0.123
Antimony (Sb)-Total	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.001	1	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	0.001	-	0.015	0.0148	0.0175	0.00999	0.0102
Beryllium (Be)-Total	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	0.0005	-	<0.00050	<0.00050	<0.00050	<0.000050	<0.000050
Boron (B)-Total	mg/L	0.1	-	<0.10	<0.10	<0.10	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00005	-	<0.000050	0.000133	0.000066	<0.000050	<0.000050
Calcium (Ca)-Total	mg/L	0.5	-	199	44.6	30.5	14.7	14.7
Cesium (Cs)-Total	mg/L	0.0001	-	<0.00010	<0.00010	0.00015	0.000019	0.000019
Chromium (Cr)-Total	mg/L	0.005	-	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050
Cobalt (Co)-Total	mg/L	0.001	-	0.0366	0.0691	0.0359	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	0.01	0.6	<0.010	<0.010	<0.010	0.0012	0.0011
Iron (Fe)-Total	mg/L	0.1	-	0.96	4.43	6.55	0.14	0.121
Lead (Pb)-Total	mg/L	0.0005	0.4	<0.00050	0.0012	0.00227	0.000128	0.000099
Lithium (Li)-Total	mg/L	0.01	-	0.026	<0.010	<0.010	<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	0.05	-	462	169	97.8	8.88	8.62
Manganese (Mn)-Total	mg/L	0.005	-	9.41	5.85	3.33	0.00469	0.00215
Mercury (Hg)-Total	mg/L	0.00001	-	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0005	-	0.00082	0.00072	0.00121	0.000286	0.000289
Nickel (Ni)-Total	mg/L	0.005	1	0.0442	0.0774	0.0384	0.00072	0.00055
Phosphorus (P)-Total	mg/L	0.5	-	<0.50	<0.50	<0.50	<0.050	<0.050
Potassium (K)-Total	mg/L	0.5	-	7.38	2.76	3.85	1.01	1.02
Rubidium (Rb)-Total	mg/L	0.002	-	0.0078	0.0051	0.0069	0.00156	0.00151
Selenium (Se)-Total	mg/L	0.0005	-	0.00525	0.00243	0.00123	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	1	-	1.1	2.3	3.6	1.26	1.24
Silver (Ag)-Total	mg/L	0.0005	-	<0.00050	<0.00050	<0.00050	<0.000050	<0.000050
Sodium (Na)-Total	mg/L	0.5	-	5.64	1.52	1.56	2.95	3.13
Strontium (Sr)-Total	mg/L	0.01	-	0.337	0.033	0.027	0.0147	0.0148
Sulfur (S)-Total	mg/L	5	-	781	258	146	2.38	1.66
Tellurium (Te)-Total	mg/L	0.002	-	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	0.0001	-	<0.00010	<0.00010	<0.00010	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	0.001	-	<0.0010	<0.0010	0.0013	0.00012	0.00013
Tin (Sn)-Total	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	0.003	-	0.006	0.0547	0.0893	0.00799	0.00718
Tungsten (W)-Total	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	0.0001	-	0.00397	0.00151	0.00263	0.00331	0.00358
Vanadium (V)-Total	mg/L	0.005	-	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	1	<0.030	<0.030	<0.030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	0.003	-	<0.0020	<0.0020	<0.0020	0.00031	0.00034
Aluminum (Al)-Dissolved	mg/L	0.05	-	<0.050	-	-	-	-
Antimony (Sb)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Arsenic (As)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Barium (Ba)-Dissolved	mg/L	0.001	-	0.0151	-	-	-	-
Beryllium (Be)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Bismuth (Bi)-Dissolved	mg/L	0.0005	-	<0.00050	-	-	-	-
Boron (B)-Dissolved	mg/L	0.1	-	<0.10	-	-	-	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	<0.000050	-	-	-	-
Calcium (Ca)-Dissolved	mg/L	0.5	-	201	-	-	-	-
Cesium (Cs)-Dissolved	mg/L	0.0001	-	<0.00010	-	-	-	-
Chromium (Cr)-Dissolved	mg/L	0.005	-	<0.0050	-	-	-	-
Cobalt (Co)-Dissolved	mg/L	0.001	-	0.0328	-	-	-	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0036	-	-	-	-
Iron (Fe)-Dissolved	mg/L	0.1	-	<0.10	-	-	-	-
Lead (Pb)-Dissolved	mg/L	0.0005	-	<0.00050	-	-	-	-
Lithium (Li)-Dissolved	mg/L	0.01	-	0.024	-	-	-	-
Magnesium (Mg)-Dissolved	mg/L	0.05	-	449	-	-	-	-
Manganese (Mn)-Dissolved	mg/L	0.005	-	8.84	-	-	-	-
Mercury (Hg)-Dissolved	mg/L	0.00001	-	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	0.00082	-	-	-	-
Nickel (Ni)-Dissolved	mg/L	0.005	-	0.0404	-	-	-	-
Phosphorus (P)-Dissolved	mg/L	0.5	-	<0.50	-	-	-	-
Potassium (K)-Dissolved	mg/L	0.5	-	7.44	-	-	-	-
Rubidium (Rb)-Dissolved	mg/L	0.002	-	0.0074	-	-	-	-
Selenium (Se)-Dissolved	mg/L	0.0005	-	0.00467	-	-	-	-
Silicon (Si)-Dissolved	mg/L	0.5	-	0.92	-	-	-	-
Silver (Ag)-Dissolved	mg/L	0.0005	-	<0.00050	-	-	-	-
Sodium (Na)-Dissolved	mg/L	0.5	-	5.61	-	-	-	-
Strontium (Sr)-Dissolved	mg/L	0.01	-	0.333	-	-	-	-
Sulfur (S)-Dissolved	mg/L	5	-	769	-	-	-	-
Tellurium (Te)-Dissolved	mg/L	0.002	-	<0.0020	-	-	-	-
Thallium (Tl)-Dissolved	mg/L	0.0001	-	<0.00010	-	-	-	-
Thorium (Th)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Tin (Sn)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Titanium (Ti)-Dissolved	mg/L	0.003	-	<0.0030	-	-	-	-
Tungsten (W)-Dissolved	mg/L	0.001	-	<0.0010	-	-	-	-
Uranium (U)-Dissolved	mg/L	0.0001	-	0.00381	-	-	-	-
Vanadium (V)-Dissolved	mg/L	0.005	-	<0.0050	-	-	-	-
Zinc (Zn)-Dissolved	mg/L	0.01	-	<0.010	-	-	-	-
Zirconium (Zr)-Dissolved	mg/L	0.003	-	<0.0020	-	-	-	-
Ra-226	Bq/L	0.0044	1.11	0.02	0.017	<0.0068	<0.0080	<0.0069
Acute Toxicity			Not acutely toxic	Not acutely toxic	-	-	-	-

Notes:

¹Metal and Diamond Mining Effluent Regulations - Schedule 4

	ALS Laboratory Sample ID			MS-08	MS-08-DS	MS-08-US
	ALS ID			L2357232-1	L2357716-1	L2357716-2
	Sample Date & Time			10/1/2019 9:15:00 AM	10/1/2019 5:30:00 PM	10/1/2019 6:00:00 PM
	QA/QC Sample Type			N/A	N/A	N/A
	Units	LOR	MDMER Grab Sample Limits			
Conductivity	umhos/cm	3	-	5040	199	192
Hardness (as CaCO3)	mg/L	10	-	3990	83	81.1
pH	pH units	0.1	6.0-9.5	8.79	8.08	8.08
Total Suspended Solids	mg/L	2	30	6	2.8	2
Total Dissolved Solids	mg/L	20	-	5620	90	85
Turbidity	NTU	0.1	-	4.52	3.36	1.88
Acidity (as CaCO3)	mg/L	2	-	2.3	-	-
Alkalinity, Total (as CaCO3)	mg/L	10	-	39	85	85
Ammonia, Total (as N)	mg/L	0.1	-	3.79	<0.010	<0.010
Chloride (Cl)	mg/L	0.5	-	17.2	8.2	8.41
Fluoride (F)	mg/L	0.02	-	<0.20	0.027	0.03
Nitrate (as N)	mg/L	0.02	-	16.7	0.082	0.074
Total Kjeldahl Nitrogen	mg/L	0.15	-	4.38	<0.15	<0.15
Phosphorus, Total	mg/L	0.03	-	<0.0030	0.005	0.0042
Sulfate (SO4)	mg/L	0.3	-	4070	7.65	5.26
Cyanide, Total	mg/L	0.002	2	0.0128	-	-
Dissolved Organic Carbon	mg/L	0.5	-	3.82	1.6	1.68
Total Organic Carbon	mg/L	0.5	-	4.16	2.19	2.22
Aluminum (Al)-Total	mg/L	0.05	-	0.082	0.118	0.0844
Antimony (Sb)-Total	mg/L	0.001	-	<0.0010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.001	1	<0.0010	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	0.001	-	0.012	0.0112	0.0111
Beryllium (Be)-Total	mg/L	0.001	-	<0.0010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	0.0005	-	<0.00050	<0.000050	<0.000050
Boron (B)-Total	mg/L	0.1	-	<0.10	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00005	-	<0.000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	0.5	-	507	16.5	16.6
Cesium (Cs)-Total	mg/L	0.0001	-	<0.00010	0.000014	0.000011
Chromium (Cr)-Total	mg/L	0.005	-	<0.0050	<0.00050	<0.00050
Cobalt (Co)-Total	mg/L	0.001	-	0.005	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	0.01	0.6	<0.010	<0.0010	0.001
Iron (Fe)-Total	mg/L	0.1	-	0.42	0.117	0.066
Lead (Pb)-Total	mg/L	0.0005	0.4	<0.00050	0.000077	0.000062
Lithium (Li)-Total	mg/L	0.01	-	0.03	<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	0.05	-	664	10.2	9.63
Manganese (Mn)-Total	mg/L	0.005	-	1.12	0.00247	0.00121
Mercury (Hg)-Total	mg/L	0.00001	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0005	-	0.00141	0.000321	0.000364
Nickel (Ni)-Total	mg/L	0.005	1	0.0071	0.00058	<0.00050
Phosphorus (P)-Total	mg/L	0.5	-	<0.50	<0.050	<0.050
Potassium (K)-Total	mg/L	0.5	-	6.91	1.09	1.1
Rubidium (Rb)-Total	mg/L	0.002	-	0.0082	0.00154	0.00161
Selenium (Se)-Total	mg/L	0.0005	-	0.00642	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	1	-	<1.0	1.26	1.31
Silver (Ag)-Total	mg/L	0.0005	-	<0.00050	<0.000050	<0.000050
Sodium (Na)-Total	mg/L	0.5	-	6.41	3.41	3.68
Strontium (Sr)-Total	mg/L	0.01	-	1.58	0.0167	0.017
Sulfur (S)-Total	mg/L	5	-	1350	2.64	1.92
Tellurium (Te)-Total	mg/L	0.002	-	<0.0020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	0.0001	-	<0.00010	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	0.001	-	<0.0010	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	0.001	-	<0.0010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	0.003	-	0.0037	0.00541	0.00375
Tungsten (W)-Total	mg/L	0.001	-	<0.0010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	0.0001	-	0.0019	0.00415	0.0045
Vanadium (V)-Total	mg/L	0.005	-	<0.0050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	1	<0.030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	0.003	-	<0.0020	0.00026	0.00026
Aluminum (Al)-Dissolved	mg/L	0.05	-	<0.050	-	-
Antimony (Sb)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Arsenic (As)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Barium (Ba)-Dissolved	mg/L	0.001	-	0.0117	-	-
Beryllium (Be)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Bismuth (Bi)-Dissolved	mg/L	0.0005	-	<0.00050	-	-
Boron (B)-Dissolved	mg/L	0.1	-	<0.10	-	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	<0.000050	-	-
Calcium (Ca)-Dissolved	mg/L	0.5	-	509	-	-
Cesium (Cs)-Dissolved	mg/L	0.0001	-	<0.00010	-	-
Chromium (Cr)-Dissolved	mg/L	0.005	-	<0.0050	-	-
Cobalt (Co)-Dissolved	mg/L	0.001	-	0.0046	-	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.005	-	-
Iron (Fe)-Dissolved	mg/L	0.1	-	<0.10	-	-
Lead (Pb)-Dissolved	mg/L	0.0005	-	<0.00050	-	-
Lithium (Li)-Dissolved	mg/L	0.01	-	0.033	-	-
Magnesium (Mg)-Dissolved	mg/L	0.05	-	661	-	-
Manganese (Mn)-Dissolved	mg/L	0.005	-	1.1	-	-
Mercury (Hg)-Dissolved	mg/L	0.00001	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	0.00156	-	-
Nickel (Ni)-Dissolved	mg/L	0.005	-	0.0067	-	-
Phosphorus (P)-Dissolved	mg/L	0.5	-	<0.50	-	-
Potassium (K)-Dissolved	mg/L	0.5	-	6.97	-	-
Rubidium (Rb)-Dissolved	mg/L	0.002	-	0.0079	-	-
Selenium (Se)-Dissolved	mg/L	0.0005	-	0.0069	-	-
Silicon (Si)-Dissolved	mg/L	0.5	-	<0.50	-	-
Silver (Ag)-Dissolved	mg/L	0.0005	-	<0.00050	-	-
Sodium (Na)-Dissolved	mg/L	0.5	-	6.41	-	-
Strontium (Sr)-Dissolved	mg/L	0.01	-	1.63	-	-
Sulfur (S)-Dissolved	mg/L	5	-	1370	-	-
Tellurium (Te)-Dissolved	mg/L	0.002	-	<0.0020	-	-
Thallium (Tl)-Dissolved	mg/L	0.0001	-	<0.00010	-	-
Thorium (Th)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Tin (Sn)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Titanium (Ti)-Dissolved	mg/L	0.003	-	<0.0030	-	-
Tungsten (W)-Dissolved	mg/L	0.001	-	<0.0010	-	-
Uranium (U)-Dissolved	mg/L	0.0001	-	0.00185	-	-
Vanadium (V)-Dissolved	mg/L	0.005	-	<0.0050	-	-
Zinc (Zn)-Dissolved	mg/L	0.01	-	<0.010	-	-
Zirconium (Zr)-Dissolved	mg/L	0.003	-	<0.0020	-	-
Ra-226	Bq/L	0.0044	1.11	0.018	0.0094	0.0081
Acute Toxicity			Not acutely toxic	Not Acutely Toxic	-	-

Notes:

¹Metal and Diamond Mining Effluent Regulations - Schedule 4

Appendix B
Certificates of Analyses



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 03-SEP-19
Report Date: 24-SEP-19 11:40 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2339839
Project P.O. #: 4500057496
Job Reference: MS-08 WT TOX
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2339839-1	MS-08							
Sampled By: KB/CP on 02-SEP-19 @ 14:25								
Matrix: WATER								
Physical Tests								
Conductivity		3180		3.0	umhos/cm		04-SEP-19	R4782545
Hardness (as CaCO3)		2350		1.3	mg/L		03-SEP-19	
pH		8.47		0.10	pH units		03-SEP-19	R4781669
Total Suspended Solids		10.0		2.0	mg/L		03-SEP-19	R4781869
Total Dissolved Solids		3190		20	mg/L		03-SEP-19	R4782348
Turbidity		9.32		0.10	NTU		02-SEP-19	R4782363
Anions and Nutrients								
Acidity (as CaCO3)		5.0		5.0	mg/L		05-SEP-19	R4784118
Alkalinity, Total (as CaCO3)		63		10	mg/L		04-SEP-19	R4782545
Ammonia, Total (as N)		1.43	DLHC	0.10	mg/L		03-SEP-19	R4781881
Chloride (Cl)		11	DLDS	10	mg/L		03-SEP-19	R4782656
Fluoride (F)		<0.40	DLDS	0.40	mg/L		03-SEP-19	R4782656
Nitrate (as N)		10.4	DLDS	0.40	mg/L		03-SEP-19	R4782656
Total Kjeldahl Nitrogen		1.31		0.15	mg/L	03-SEP-19	04-SEP-19	R4782526
Phosphorus, Total		0.0036		0.0030	mg/L	03-SEP-19	04-SEP-19	R4782483
Sulfate (SO4)		2490	DLDS	6.0	mg/L		03-SEP-19	R4782656
Cyanides								
Cyanide, Total		<0.0020	SP	0.0020	mg/L		04-SEP-19	R4783059
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					03-SEP-19	R4782235
Dissolved Organic Carbon		2.90		0.50	mg/L	03-SEP-19	04-SEP-19	R4782677
Total Organic Carbon		3.51		0.50	mg/L		04-SEP-19	R4782674
Total Metals								
Aluminum (Al)-Total		0.092	DLHC	0.050	mg/L	03-SEP-19	03-SEP-19	R4782041
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Barium (Ba)-Total		0.0150	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782041
Boron (B)-Total		<0.10	DLHC	0.10	mg/L	03-SEP-19	03-SEP-19	R4782041
Cadmium (Cd)-Total		<0.000050	DLHC	0.000050	mg/L	03-SEP-19	03-SEP-19	R4782041
Calcium (Ca)-Total		199	DLHC	0.50	mg/L	03-SEP-19	03-SEP-19	R4782041
Cesium (Cs)-Total		<0.00010	DLHC	0.00010	mg/L	03-SEP-19	03-SEP-19	R4782041
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	03-SEP-19	03-SEP-19	R4782041
Cobalt (Co)-Total		0.0366	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	03-SEP-19	03-SEP-19	R4782041
Iron (Fe)-Total		0.96	DLHC	0.10	mg/L	03-SEP-19	03-SEP-19	R4782041
Lead (Pb)-Total		<0.00050	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782041
Lithium (Li)-Total		0.026	DLHC	0.010	mg/L	03-SEP-19	03-SEP-19	R4782041
Magnesium (Mg)-Total		462	DLHC	0.050	mg/L	03-SEP-19	03-SEP-19	R4782041
Manganese (Mn)-Total		9.41	DLHC	0.0050	mg/L	03-SEP-19	03-SEP-19	R4782041
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		04-SEP-19	R4782727

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2339839-1	MS-08							
Sampled By: KB/CP on 02-SEP-19 @ 14:25								
Matrix: WATER								
Total Metals								
Molybdenum (Mo)-Total		0.00082	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782041
Nickel (Ni)-Total		0.0442	DLHC	0.0050	mg/L	03-SEP-19	03-SEP-19	R4782041
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	03-SEP-19	03-SEP-19	R4782041
Potassium (K)-Total		7.38	DLHC	0.50	mg/L	03-SEP-19	03-SEP-19	R4782041
Rubidium (Rb)-Total		0.0078	DLHC	0.0020	mg/L	03-SEP-19	03-SEP-19	R4782041
Selenium (Se)-Total		0.00525	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782041
Silicon (Si)-Total		1.1	DLHC	1.0	mg/L	03-SEP-19	03-SEP-19	R4782041
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782041
Sodium (Na)-Total		5.64	DLHC	0.50	mg/L	03-SEP-19	03-SEP-19	R4782041
Strontium (Sr)-Total		0.337	DLHC	0.010	mg/L	03-SEP-19	03-SEP-19	R4782041
Sulfur (S)-Total		781	DLHC	5.0	mg/L	03-SEP-19	03-SEP-19	R4782041
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	03-SEP-19	03-SEP-19	R4782041
Thallium (Tl)-Total		<0.00010	DLHC	0.00010	mg/L	03-SEP-19	03-SEP-19	R4782041
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Titanium (Ti)-Total		0.0060	DLHC	0.0030	mg/L	03-SEP-19	03-SEP-19	R4782041
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782041
Uranium (U)-Total		0.00397	DLHC	0.00010	mg/L	03-SEP-19	03-SEP-19	R4782041
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	03-SEP-19	03-SEP-19	R4782041
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	03-SEP-19	03-SEP-19	R4782041
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	03-SEP-19	03-SEP-19	R4782041
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					03-SEP-19	R4781089
Dissolved Metals Filtration Location		FIELD					03-SEP-19	R4781204
Aluminum (Al)-Dissolved		<0.050	DLHC	0.050	mg/L	03-SEP-19	03-SEP-19	R4782250
Antimony (Sb)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782250
Arsenic (As)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782250
Barium (Ba)-Dissolved		0.0151	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782250
Beryllium (Be)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782250
Bismuth (Bi)-Dissolved		<0.00050	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782250
Boron (B)-Dissolved		<0.10	DLHC	0.10	mg/L	03-SEP-19	03-SEP-19	R4782250
Cadmium (Cd)-Dissolved		<0.000050	DLHC	0.000050	mg/L	03-SEP-19	03-SEP-19	R4782250
Calcium (Ca)-Dissolved		201	DLHC	0.50	mg/L	03-SEP-19	03-SEP-19	R4782250
Cesium (Cs)-Dissolved		<0.00010	DLHC	0.00010	mg/L	03-SEP-19	03-SEP-19	R4782250
Chromium (Cr)-Dissolved		<0.0050	DLHC	0.0050	mg/L	03-SEP-19	03-SEP-19	R4782250
Cobalt (Co)-Dissolved		0.0328	DLHC	0.0010	mg/L	03-SEP-19	03-SEP-19	R4782250
Copper (Cu)-Dissolved		0.0036	DLHC	0.0020	mg/L	03-SEP-19	03-SEP-19	R4782250
Iron (Fe)-Dissolved		<0.10	DLHC	0.10	mg/L	03-SEP-19	03-SEP-19	R4782250
Lead (Pb)-Dissolved		<0.00050	DLHC	0.00050	mg/L	03-SEP-19	03-SEP-19	R4782250
Lithium (Li)-Dissolved		0.024	DLHC	0.010	mg/L	03-SEP-19	03-SEP-19	R4782250
Magnesium (Mg)-Dissolved		449	DLHC	0.050	mg/L	03-SEP-19	03-SEP-19	R4782250

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Chloride (Cl)	MS-B	L2339839-1
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2339839-1
Matrix Spike	Boron (B)-Dissolved	MS-B	L2339839-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2339839-1
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L2339839-1
Matrix Spike	Lithium (Li)-Dissolved	MS-B	L2339839-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2339839-1
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2339839-1
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L2339839-1
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2339839-1
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2339839-1
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2339839-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2339839-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2339839-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2339839-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2339839-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2339839-1
Matrix Spike	Boron (B)-Total	MS-B	L2339839-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2339839-1
Matrix Spike	Copper (Cu)-Total	MS-B	L2339839-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2339839-1
Matrix Spike	Lithium (Li)-Total	MS-B	L2339839-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2339839-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2339839-1
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2339839-1
Matrix Spike	Potassium (K)-Total	MS-B	L2339839-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2339839-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2339839-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2339839-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2339839-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2339839-1
Matrix Spike	Titanium (Ti)-Total	MS-B	L2339839-1
Matrix Spike	Uranium (U)-Total	MS-B	L2339839-1
Matrix Spike	Zinc (Zn)-Total	MS-B	L2339839-1
Matrix Spike	Phosphorus, Total	MS-B	L2339839-1

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SP	Sample was Preserved at the laboratory

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-TITR-TB	Water	Acidity	APHA 2310 B modified
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT		Water						
Batch	R4782727							
WG3150240-3 DUP		L2339830-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	04-SEP-19
WG3150240-2 LCS			97.6		%		80-120	04-SEP-19
WG3150240-1 MB			<0.0000050		mg/L		0.000005	04-SEP-19
WG3150240-4 MS		L2339839-1	90.9		%		70-130	04-SEP-19
MET-D-CCMS-WT		Water						
Batch	R4782250							
WG3150303-4 DUP		WG3150303-3						
Aluminum (Al)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	03-SEP-19
Antimony (Sb)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Arsenic (As)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Barium (Ba)-Dissolved		0.0199	0.0206		mg/L	3.5	20	03-SEP-19
Beryllium (Be)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Bismuth (Bi)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Boron (B)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	03-SEP-19
Cadmium (Cd)-Dissolved		0.000338	0.000374		mg/L	10	20	03-SEP-19
Calcium (Ca)-Dissolved		107	106		mg/L	1.1	20	03-SEP-19
Cesium (Cs)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-SEP-19
Chromium (Cr)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-SEP-19
Cobalt (Co)-Dissolved		0.0816	0.0823		mg/L	0.9	20	03-SEP-19
Copper (Cu)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-SEP-19
Iron (Fe)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	03-SEP-19
Lead (Pb)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Lithium (Li)-Dissolved		0.063	0.059		mg/L	5.4	20	03-SEP-19
Magnesium (Mg)-Dissolved		277	278		mg/L	0.6	20	03-SEP-19
Manganese (Mn)-Dissolved		14.1	14.0		mg/L	0.6	20	03-SEP-19
Molybdenum (Mo)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Nickel (Ni)-Dissolved		0.0918	0.0931		mg/L	1.5	20	03-SEP-19
Phosphorus (P)-Dissolved		<0.50	<0.50	RPD-NA	mg/L	N/A	20	03-SEP-19
Potassium (K)-Dissolved		11.4	11.6		mg/L	1.6	20	03-SEP-19
Rubidium (Rb)-Dissolved		0.0153	0.0156		mg/L	1.9	20	03-SEP-19
Selenium (Se)-Dissolved		0.00232	0.00227		mg/L	2.3	20	03-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4782250							
WG3150303-4 DUP		WG3150303-3						
Silicon (Si)-Dissolved		2.11	2.13		mg/L	1.3	20	03-SEP-19
Silver (Ag)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Sodium (Na)-Dissolved		6.81	6.77		mg/L	0.6	20	03-SEP-19
Strontium (Sr)-Dissolved		0.200	0.200		mg/L	0.1	20	03-SEP-19
Sulfur (S)-Dissolved		480	467		mg/L	2.6	20	03-SEP-19
Tellurium (Te)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-SEP-19
Thallium (Tl)-Dissolved		0.00013	0.00012		mg/L	1.9	20	03-SEP-19
Thorium (Th)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Tin (Sn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Titanium (Ti)-Dissolved		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	03-SEP-19
Tungsten (W)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Uranium (U)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-SEP-19
Vanadium (V)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-SEP-19
Zinc (Zn)-Dissolved		0.013	0.012		mg/L	4.5	20	03-SEP-19
Zirconium (Zr)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-SEP-19
WG3150303-2 LCS								
Aluminum (Al)-Dissolved			104.9		%		80-120	03-SEP-19
Antimony (Sb)-Dissolved			100.8		%		80-120	03-SEP-19
Arsenic (As)-Dissolved			99.0		%		80-120	03-SEP-19
Barium (Ba)-Dissolved			99.9		%		80-120	03-SEP-19
Beryllium (Be)-Dissolved			100.4		%		80-120	03-SEP-19
Bismuth (Bi)-Dissolved			101.0		%		80-120	03-SEP-19
Boron (B)-Dissolved			100.1		%		80-120	03-SEP-19
Cadmium (Cd)-Dissolved			95.7		%		80-120	03-SEP-19
Calcium (Ca)-Dissolved			102.1		%		80-120	03-SEP-19
Cesium (Cs)-Dissolved			100.2		%		80-120	03-SEP-19
Chromium (Cr)-Dissolved			101.2		%		80-120	03-SEP-19
Cobalt (Co)-Dissolved			98.9		%		80-120	03-SEP-19
Copper (Cu)-Dissolved			97.0		%		80-120	03-SEP-19
Iron (Fe)-Dissolved			96.9		%		80-120	03-SEP-19
Lead (Pb)-Dissolved			102.2		%		80-120	03-SEP-19
Lithium (Li)-Dissolved			98.9		%		80-120	03-SEP-19
Magnesium (Mg)-Dissolved			101.5		%		80-120	03-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4782250							
WG3150303-2		LCS						
Manganese (Mn)-Dissolved			101.2		%		80-120	03-SEP-19
Molybdenum (Mo)-Dissolved			103.8		%		80-120	03-SEP-19
Nickel (Ni)-Dissolved			97.6		%		80-120	03-SEP-19
Phosphorus (P)-Dissolved			98.1		%		80-120	03-SEP-19
Potassium (K)-Dissolved			101.0		%		80-120	03-SEP-19
Rubidium (Rb)-Dissolved			100.2		%		80-120	03-SEP-19
Selenium (Se)-Dissolved			99.8		%		80-120	03-SEP-19
Silicon (Si)-Dissolved			102.0		%		60-140	03-SEP-19
Silver (Ag)-Dissolved			99.2		%		80-120	03-SEP-19
Sodium (Na)-Dissolved			104.4		%		80-120	03-SEP-19
Strontium (Sr)-Dissolved			99.96		%		80-120	03-SEP-19
Sulfur (S)-Dissolved			105.1		%		80-120	03-SEP-19
Tellurium (Te)-Dissolved			95.8		%		80-120	03-SEP-19
Thallium (Tl)-Dissolved			102.1		%		80-120	03-SEP-19
Thorium (Th)-Dissolved			96.9		%		80-120	03-SEP-19
Tin (Sn)-Dissolved			98.1		%		80-120	03-SEP-19
Titanium (Ti)-Dissolved			97.3		%		80-120	03-SEP-19
Tungsten (W)-Dissolved			99.99		%		80-120	03-SEP-19
Uranium (U)-Dissolved			99.0		%		80-120	03-SEP-19
Vanadium (V)-Dissolved			101.0		%		80-120	03-SEP-19
Zinc (Zn)-Dissolved			95.9		%		80-120	03-SEP-19
Zirconium (Zr)-Dissolved			98.1		%		80-120	03-SEP-19
WG3150303-1		MB						
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	03-SEP-19
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	03-SEP-19
Boron (B)-Dissolved			<0.010		mg/L		0.01	03-SEP-19
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	03-SEP-19
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	03-SEP-19
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	03-SEP-19
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	03-SEP-19



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Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4782250							
WG3150303-1 MB								
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	03-SEP-19
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	03-SEP-19
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	03-SEP-19
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	03-SEP-19
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	03-SEP-19
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	03-SEP-19
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	03-SEP-19
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	03-SEP-19
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	03-SEP-19
Potassium (K)-Dissolved			<0.050		mg/L		0.05	03-SEP-19
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	03-SEP-19
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	03-SEP-19
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	03-SEP-19
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	03-SEP-19
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	03-SEP-19
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	03-SEP-19
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	03-SEP-19
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	03-SEP-19
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	03-SEP-19
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	03-SEP-19
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	03-SEP-19
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	03-SEP-19
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	03-SEP-19
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	03-SEP-19
Zirconium (Zr)-Dissolved			<0.00020		mg/L		0.0002	03-SEP-19
WG3150303-5 MS		WG3150303-3						
Aluminum (Al)-Dissolved			96.0		%		70-130	03-SEP-19
Antimony (Sb)-Dissolved			97.4		%		70-130	03-SEP-19
Arsenic (As)-Dissolved			98.8		%		70-130	03-SEP-19
Barium (Ba)-Dissolved			N/A	MS-B	%		-	03-SEP-19
Beryllium (Be)-Dissolved			96.0		%		70-130	03-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4782041							
WG3150225-4	DUP	WG3150225-3						
Aluminum (Al)-Total		1.11	1.15		mg/L	3.7	20	03-SEP-19
Antimony (Sb)-Total		0.0022	0.0022		mg/L	0.0	20	03-SEP-19
Arsenic (As)-Total		0.0034	0.0037		mg/L	8.9	20	03-SEP-19
Barium (Ba)-Total		0.0565	0.0582		mg/L	2.8	20	03-SEP-19
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Boron (B)-Total		0.86	0.89		mg/L	3.0	20	03-SEP-19
Cadmium (Cd)-Total		0.000098	0.000099		mg/L	0.8	20	03-SEP-19
Calcium (Ca)-Total		71.6	73.0		mg/L	1.9	20	03-SEP-19
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-SEP-19
Cesium (Cs)-Total		0.00018	0.00018		mg/L	2.9	20	03-SEP-19
Cobalt (Co)-Total		0.0013	0.0013		mg/L	0.2	20	03-SEP-19
Copper (Cu)-Total		0.021	0.022		mg/L	3.3	20	03-SEP-19
Iron (Fe)-Total		1.56	1.56		mg/L	0.0	20	03-SEP-19
Lead (Pb)-Total		0.00317	0.00327		mg/L	3.1	20	03-SEP-19
Lithium (Li)-Total		0.136	0.138		mg/L	1.3	20	03-SEP-19
Magnesium (Mg)-Total		20.7	21.2		mg/L	2.5	20	03-SEP-19
Manganese (Mn)-Total		0.0947	0.0954		mg/L	0.7	20	03-SEP-19
Molybdenum (Mo)-Total		0.325	0.319		mg/L	1.8	20	03-SEP-19
Nickel (Ni)-Total		<0.0050	0.0065	RPD-NA	mg/L	N/A	20	03-SEP-19
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	03-SEP-19
Potassium (K)-Total		32.8	33.1		mg/L	0.9	20	03-SEP-19
Rubidium (Rb)-Total		0.0188	0.0191		mg/L	1.7	20	03-SEP-19
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Silicon (Si)-Total		4.1	4.5		mg/L	10	20	03-SEP-19
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-SEP-19
Sodium (Na)-Total		112	115		mg/L	3.1	20	03-SEP-19
Strontium (Sr)-Total		0.398	0.383		mg/L	3.7	20	03-SEP-19
Sulfur (S)-Total		19.7	19.3		mg/L	1.6	25	03-SEP-19
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-SEP-19
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-SEP-19
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	03-SEP-19
Tin (Sn)-Total		<0.0010	<0.0010		mg/L			03-SEP-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4782041							
WG3150225-4	DUP	WG3150225-3						
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Titanium (Ti)-Total		0.0476	0.0471		mg/L	1.1	20	03-SEP-19
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-SEP-19
Uranium (U)-Total		0.0106	0.0106		mg/L	0.3	20	03-SEP-19
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-SEP-19
Zinc (Zn)-Total		0.137	0.137		mg/L	0.2	20	03-SEP-19
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-SEP-19
WG3150225-2	LCS							
Aluminum (Al)-Total			103.1		%		80-120	03-SEP-19
Antimony (Sb)-Total			98.0		%		80-120	03-SEP-19
Arsenic (As)-Total			100.4		%		80-120	03-SEP-19
Barium (Ba)-Total			98.8		%		80-120	03-SEP-19
Beryllium (Be)-Total			97.2		%		80-120	03-SEP-19
Bismuth (Bi)-Total			96.9		%		80-120	03-SEP-19
Boron (B)-Total			96.3		%		80-120	03-SEP-19
Cadmium (Cd)-Total			95.4		%		80-120	03-SEP-19
Calcium (Ca)-Total			96.3		%		80-120	03-SEP-19
Chromium (Cr)-Total			98.2		%		80-120	03-SEP-19
Cesium (Cs)-Total			96.2		%		80-120	03-SEP-19
Cobalt (Co)-Total			97.3		%		80-120	03-SEP-19
Copper (Cu)-Total			97.6		%		80-120	03-SEP-19
Iron (Fe)-Total			95.4		%		80-120	03-SEP-19
Lead (Pb)-Total			98.9		%		80-120	03-SEP-19
Lithium (Li)-Total			92.9		%		80-120	03-SEP-19
Magnesium (Mg)-Total			100.6		%		80-120	03-SEP-19
Manganese (Mn)-Total			102.0		%		80-120	03-SEP-19
Molybdenum (Mo)-Total			98.2		%		80-120	03-SEP-19
Nickel (Ni)-Total			97.5		%		80-120	03-SEP-19
Phosphorus (P)-Total			102.8		%		70-130	03-SEP-19
Potassium (K)-Total			100.3		%		80-120	03-SEP-19
Rubidium (Rb)-Total			93.5		%		80-120	03-SEP-19
Selenium (Se)-Total			100.5		%		80-120	03-SEP-19
Silicon (Si)-Total			102.2		%		60-140	03-SEP-19



Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4782041							
WG3150225-2		LCS						
Silver (Ag)-Total			95.4		%		80-120	03-SEP-19
Sodium (Na)-Total			106.3		%		80-120	03-SEP-19
Strontium (Sr)-Total			95.3		%		80-120	03-SEP-19
Sulfur (S)-Total			99.1		%		80-120	03-SEP-19
Thallium (Tl)-Total			98.7		%		80-120	03-SEP-19
Tellurium (Te)-Total			92.7		%		80-120	03-SEP-19
Thorium (Th)-Total			93.9		%		70-130	03-SEP-19
Tin (Sn)-Total			94.5		%		80-120	03-SEP-19
Titanium (Ti)-Total			99.1		%		80-120	03-SEP-19
Tungsten (W)-Total			96.0		%		80-120	03-SEP-19
Uranium (U)-Total			96.0		%		80-120	03-SEP-19
Vanadium (V)-Total			99.6		%		80-120	03-SEP-19
Zinc (Zn)-Total			96.3		%		80-120	03-SEP-19
Zirconium (Zr)-Total			94.6		%		80-120	03-SEP-19
WG3150225-1		MB						
Aluminum (Al)-Total			<0.0050		mg/L		0.005	03-SEP-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	03-SEP-19
Boron (B)-Total			<0.010		mg/L		0.01	03-SEP-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	03-SEP-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-SEP-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	03-SEP-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	03-SEP-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	03-SEP-19
Iron (Fe)-Total			<0.010		mg/L		0.01	03-SEP-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-SEP-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	03-SEP-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-SEP-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	03-SEP-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	03-SEP-19



Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4782041							
WG3150225-1	MB							
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-SEP-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	03-SEP-19
Potassium (K)-Total			<0.050		mg/L		0.05	03-SEP-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	03-SEP-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	03-SEP-19
Silicon (Si)-Total			<0.10		mg/L		0.1	03-SEP-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	03-SEP-19
Sodium (Na)-Total			<0.050		mg/L		0.05	03-SEP-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	03-SEP-19
Sulfur (S)-Total			<0.50		mg/L		0.5	03-SEP-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	03-SEP-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	03-SEP-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	03-SEP-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	03-SEP-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	03-SEP-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	03-SEP-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-SEP-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	03-SEP-19
WG3150225-5	MS	WG3150225-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	03-SEP-19
Antimony (Sb)-Total			98.6		%		70-130	03-SEP-19
Arsenic (As)-Total			103.6		%		70-130	03-SEP-19
Barium (Ba)-Total			N/A	MS-B	%		-	03-SEP-19
Beryllium (Be)-Total			109.4		%		70-130	03-SEP-19
Bismuth (Bi)-Total			98.2		%		70-130	03-SEP-19
Boron (B)-Total			N/A	MS-B	%		-	03-SEP-19
Cadmium (Cd)-Total			104.8		%		70-130	03-SEP-19
Calcium (Ca)-Total			N/A	MS-B	%		-	03-SEP-19
Chromium (Cr)-Total			103.3		%		70-130	03-SEP-19
Cesium (Cs)-Total			102.0		%		70-130	03-SEP-19
Cobalt (Co)-Total			102.6		%		70-130	03-SEP-19
Copper (Cu)-Total			N/A	MS-B	%		-	03-SEP-19



Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4782041							
WG3150225-5 MS		WG3150225-3						
Iron (Fe)-Total			N/A	MS-B	%		-	03-SEP-19
Lead (Pb)-Total			99.1		%		70-130	03-SEP-19
Lithium (Li)-Total			N/A	MS-B	%		-	03-SEP-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	03-SEP-19
Manganese (Mn)-Total			N/A	MS-B	%		-	03-SEP-19
Molybdenum (Mo)-Total			N/A	MS-B	%		-	03-SEP-19
Nickel (Ni)-Total			102.8		%		70-130	03-SEP-19
Phosphorus (P)-Total			90.1		%		70-130	03-SEP-19
Potassium (K)-Total			N/A	MS-B	%		-	03-SEP-19
Rubidium (Rb)-Total			N/A	MS-B	%		-	03-SEP-19
Selenium (Se)-Total			100.8		%		70-130	03-SEP-19
Silicon (Si)-Total			N/A	MS-B	%		-	03-SEP-19
Silver (Ag)-Total			94.3		%		70-130	03-SEP-19
Sodium (Na)-Total			N/A	MS-B	%		-	03-SEP-19
Strontium (Sr)-Total			N/A	MS-B	%		-	03-SEP-19
Sulfur (S)-Total			N/A	MS-B	%		-	03-SEP-19
Thallium (Tl)-Total			98.3		%		70-130	03-SEP-19
Tellurium (Te)-Total			98.3		%		70-130	03-SEP-19
Tin (Sn)-Total			98.5		%		70-130	03-SEP-19
Titanium (Ti)-Total			N/A	MS-B	%		-	03-SEP-19
Tungsten (W)-Total			98.7		%		70-130	03-SEP-19
Uranium (U)-Total			N/A	MS-B	%		-	03-SEP-19
Vanadium (V)-Total			104.1		%		70-130	03-SEP-19
Zinc (Zn)-Total			N/A	MS-B	%		-	03-SEP-19
NH3-F-WT		Water						
Batch	R4781881							
WG3150401-7 DUP		L2339522-6						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	03-SEP-19
WG3150401-6 LCS			97.3		%		85-115	03-SEP-19
Ammonia, Total (as N)								
WG3150401-5 MB			<0.010		mg/L		0.01	03-SEP-19
Ammonia, Total (as N)								
WG3150401-8 MS		L2339522-6						
Ammonia, Total (as N)			93.2		%		75-125	03-SEP-19



Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-BF	Water							
Batch R4782348								
WG3151105-3 DUP		L2339753-2						
Total Dissolved Solids		3310	3210		mg/L	3.1	20	03-SEP-19
WG3151105-2 LCS								
Total Dissolved Solids			101.9		%		85-115	03-SEP-19
WG3151105-1 MB								
Total Dissolved Solids			<20		mg/L		20	03-SEP-19
SOLIDS-TSS-BF	Water							
Batch R4781869								
WG3150478-3 DUP		L2339918-2						
Total Suspended Solids		94.0	92.0		mg/L	2.2	25	03-SEP-19
WG3150478-2 LCS								
Total Suspended Solids			100.8		%		85-115	03-SEP-19
WG3150478-1 MB								
Total Suspended Solids			<2.0		mg/L		2	03-SEP-19
TKN-WT	Water							
Batch R4782526								
WG3150802-3 DUP		L2334143-2						
Total Kjeldahl Nitrogen		<0.15	<0.15	RPD-NA	mg/L	N/A	20	04-SEP-19
WG3150802-2 LCS								
Total Kjeldahl Nitrogen			95.3		%		75-125	04-SEP-19
WG3150802-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	04-SEP-19
WG3150802-4 MS		L2334143-2						
Total Kjeldahl Nitrogen			102.8		%		70-130	04-SEP-19
TOC-WT	Water							
Batch R4782674								
WG3151130-3 DUP		L2339830-1						
Total Organic Carbon		3.06	3.15		mg/L	2.8	20	04-SEP-19
WG3151130-2 LCS								
Total Organic Carbon			97.0		%		80-120	04-SEP-19
WG3151130-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	04-SEP-19
WG3151130-4 MS		L2339830-1						
Total Organic Carbon			95.8		%		70-130	04-SEP-19
TURBIDITY-BF	Water							



Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-BF		Water						
Batch	R4782363							
WG3151144-3	DUP	L2339839-1						
Turbidity		9.32	9.32		NTU	0.0	15	02-SEP-19
WG3151144-2	LCS							
Turbidity			110.0		%		85-115	02-SEP-19
WG3151144-1	MB							
Turbidity			<0.10		NTU		0.1	02-SEP-19

Quality Control Report

Workorder: L2339839

Report Date: 24-SEP-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Thursday, September 19, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1909038
Project Name:
Project Number: L2339839

Dear Mr. Hawthorne:

One water sample was received from ALS Environmental, on 9/4/2019. The sample was scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1909038

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2339839

Client PO Number: L2339839

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2339839-1	1909038-1		WATER	02-Sep-19	



1909038

Radium-226:

The sample was prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

**L2339839**

WATERLOO

1909038

Subcontract Request Form**Subcontract To:****ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524

1 x ILP

NOTES: Please reference on final report and invoice: PO# L2339839
ALS requires QC data to be provided with your final results.Please see enclosed 1 sample(s) in 1 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2339839-1 MS-08		9/2/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	9/20/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne
60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: **Rick.Hawthorne@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By:  Date Received: 9/4/19 1620

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Waterloo

Workorder No: 1909038

Project Manager: KMO

Initials: EE

Date: 9/5/19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<input checked="" type="checkbox"/> YES	NO
2. Are custody seals on shipping containers intact?		NONE	<input checked="" type="checkbox"/> YES	NO *
3. Are custody seals on sample containers intact?		NONE	<input checked="" type="checkbox"/> YES	NO *
4. Is there a COC (chain-of-custody) present?			<input checked="" type="checkbox"/> YES	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<input checked="" type="checkbox"/> YES	NO *
6. Are short-hold samples present?			YES	<input checked="" type="checkbox"/> NO
7. Are all samples within holding times for the requested analyses?			<input checked="" type="checkbox"/> YES	NO *
8. Were all sample containers received intact? (not broken or leaking)			<input checked="" type="checkbox"/> YES	NO *
9. Is there sufficient sample for the requested analyses?			<input checked="" type="checkbox"/> YES	NO *
10. Are all samples in the proper containers for the requested analyses?			<input checked="" type="checkbox"/> YES	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<input checked="" type="checkbox"/> YES	NO *
12. Are all aqueous non-preserved samples pH 4-9?		<input checked="" type="checkbox"/> N/A	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<input checked="" type="checkbox"/> N/A	YES	NO
14. Were the samples shipped on ice?			<input checked="" type="checkbox"/> YES	NO
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #1 #3 #4	RAD ONLY	YES	<input checked="" type="checkbox"/> NO

Cooler #: <u>1</u> Temperature (°C): <u>7.6</u> No. of custody seals on cooler: <u>3</u> External µR/hr reading: <u>11</u> Background µR/hr reading: <u>13</u>	DOT Survey/ Acceptance Information Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)
--	---

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: EE

If applicable, was the client contacted? YES / NO / NA Contact: _____

Date/Time: _____

Project Manager Signature / Date: _____

[Signature] 9/6/19

909038

EXPRESS WORLDWIDE WPX **DHL**

2011-09-03 MON, 10:30-0001

From: ALS Environmental
Ed Hill
60 Northland Rd
Unit 1
Canada
Origin: YHM

11-3
N2V/288 WATERLOO ON
Contact: +15198666910

To: ALS Environmental Fort Collins
Sample Login
226 Commerce Drive
Contact: Sample Login
+18004431511

7.60

80524 FORT COLLINS Colorado
United States of America

US-DEN-DEN

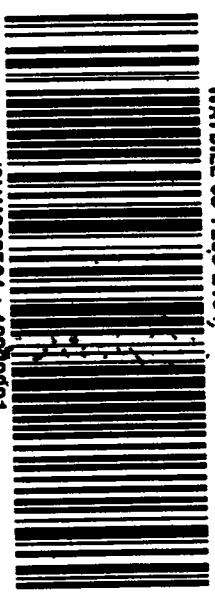
C Day Time

Rel: 39.8 lbs 1/1
Pkg/Ship Weight Piece

Contents: Water
Samples



WAYBILL 63 7295 2104



(2)US80524+48000001

11 11 11

11 11 11

Client: ALS Environmental

Date: 19-Sep-19

Project: L2339839

Work Order: 1909038

Sample ID: L2339839-1

Lab ID: 1909038-1

Legal Location:

Matrix: WATER

Collection Date: 9/2/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 9/9/2019

PrepBy: JXH

Ra-226 0.020 (+/- 0.0088)

0.0075 BQ/l

NA

9/19/2019 12:00

Carr: BARIUM

96.6

40-110 %REC

DL = NA

9/19/2019 12:00

Client: ALS Environmental

Date: 19-Sep-19

Project: L2339839

Work Order: 1909038

Sample ID: L2339839-1

Lab ID: 1909038-1

Legal Location:

Matrix: WATER

Collection Date: 9/2/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS -- Fort Collins

Client: ALS Environmental

Work Order: 1909038

Project: L2339839

Date: 9/19/2019 6:41:

QC BATCH REPORT

Batch ID: RE190909-1-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE190909-1				Units: BQ/I		Analysis Date: 9/19/2019 12:32				
Client ID:		Run ID: RE190909-1A				Prep Date: 9/9/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.77 (+/- 0.442)	0.0116	1.72		103	67-120					P,M3
Carr: BARIUM	15500		16020		96.7	40-110					

LCSD	Sample ID: RE190909-1				Units: BQ/I		Analysis Date: 9/19/2019 12:32				
Client ID:	Run ID: RE190909-1A				Prep Date: 9/9/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.83 (+/- 0.457)	0.012	1.72		106	67-120		1.77	0.1	2.1	P,M3
Carr: BARIUM	15700		16020		98.3	40-110		15500			

MB	Sample ID: RE190909-1				Units: BQ/I		Analysis Date: 9/19/2019 12:00				
Client ID:	Run ID: RE190909-1A				Prep Date: 9/9/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0021 (+/- 0.0039)	0.0068									U
Carr: BARIUM	15400		16020		95.9	40-110					

The following samples were analyzed in this batch:

1909038-1



AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna

EPS 1/RM/14

Page 1 of 2

Work Order : 240166

Sample Number : 60495

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-09-02
Location :	Waterloo ON	Time Collected :	14:25
Job Number :	L2339839	Date Received :	2019-09-03
Substance :	MS-08	Time Received :	11:55
Sampling Method :	Grab	Temperature on Receipt :	9.0 °C
Sampled By :	KB/CP	Date Tested :	2019-09-03
Sample Description :	Clear, light brown, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	<i>Daphnia magna</i>	Time to First Brood :	8.4 days
Organism Batch :	Dm19-17	Average Brood Size :	42.0 young
Culture Mortality :	0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Pre-aeration Time :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2019-09-03	Warning Limits (\pm 2SD) :	5.8 - 7.2 g/L
LC50 :	6.2 g/L	Organism Batch :	Dm19-17
95% Confidence Limits :	6.0 - 6.4 g/L	Analyst(s) :	MJT, RK
Statistical Method :	Spearman-Kärber		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Date :

2019-09-09
yyyy-mm-dd

Approved By :


Project Manager

Work Order : 240166

Sample Number : 60495

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃) >1000 mg/L
Initial Water Chemistry (100%) :	8.4	10.0	3240	20.0	116	

0 HOURS

 Date & Time 2019-09-03 14:20
 Analyst(s) : KP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation (%)*	Hardness
100	A	0	0	8.3	9.5	3240	20.0	110	>1000
100	B	0	0	8.3	9.5	3240	20.0	110	>1000
100	C	0	0	8.3	9.5	3240	20.0	110	>1000
Control	A	0	0	8.5	8.8	780	20.0	100	220
Control	B	0	0	8.5	8.8	780	20.0	100	220
Control	C	0	0	8.5	8.8	780	20.0	100	220

Notes:

24 HOURS

 Date & Time 2019-09-04 14:20
 Analyst(s) : RK (MJT)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	—	0	—	—	—	19.0
100	B	—	0	—	—	—	19.0
100	C	—	0	—	—	—	19.0
Control	A	—	0	—	—	—	19.0
Control	B	—	0	—	—	—	19.0
Control	C	—	0	—	—	—	19.0

Notes:

48 HOURS

 Date & Time 2019-09-05 14:20
 Analyst(s) : KP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.0	8.5	3280	19.0
100	B	0	0	8.0	8.5	3260	19.0
100	C	0	0	8.0	8.5	3260	19.0
Control	A	0	0	8.5	8.5	795	19.0
Control	B	0	0	8.5	8.5	795	19.0
Control	C	0	0	8.5	8.5	790	19.0

Notes:

Number immobile does not include number dead.

— = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : FS

Date : 2019-09-09



AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout

EPS 1/RM/13

Page 1 of 2

Work Order : 240166

Sample Number : 60495

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-09-02
Location :	Waterloo ON	Time Collected :	14:25
Job Number :	L2339839	Date Received :	2019-09-03
Substance :	MS-08	Time Received :	11:55
Sampling Method :	Grab	Temperature on Receipt :	9.0 °C
Sampled By :	KB/CP	Date Tested :	2019-09-03
Sample Description :	Clear, light brown, odourless.		

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	44.1 mm (± 8.0)
Organism Batch :	T19-16	Range of Fork Lengths :	39 - 50 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.73 g (± 0.45)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.46 - 1.04 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.4 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 \pm 1 mL/min/L	Organisms Per Test Level :	10
Total Pre-Aeration Time :	120 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2019-09-03
Organism Batch :	T19-16	Historical Mean LC50 :	3760 mg/L
LC50 :	3661 mg/L	Warning Limits (± 2 SD) :	3139 - 4503 mg/L
95% Confidence Limits :	3264 - 4089 mg/L	Analyst(s) :	MDH, ALC, KTL, FS
Statistical Method :	Linear Regression (MLE)		

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Date :

2019-09-09
yyyy-mm-dd

Approved By :

[Signature]
Project Manager

Work Order : 240166

Sample Number : 60495

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*
Initial Water Chemistry (100%) :	8.4	10.1	3430	14.0	105
After 30 min pre-aeration :	8.4	9.9	3417	14.0	103

0 HOURS

Date & Time	2019-09-03	15:50					
Analyst(s) :	MDH						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*
100%	0	0	8.4	9.5	3408	14.0	100
Control	0	0	8.1	9.6	927	14.5	100

Notes:

24 HOURS

Date & Time	2019-09-04	15:50					
Analyst(s) :	FS						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.8	—	—	15.0	
Control	0	0	—	—	—	15.0	

Notes:

48 HOURS

Date & Time	2019-09-05	15:50					
Analyst(s) :	MDH						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.6	—	—	15.0	
Control	0	0	8.2	—	—	15.0	

Notes:

72 HOURS

Date & Time	2019-09-06	15:50					
Analyst(s) :	TL						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.6	—	—	15.0	
Control	0	0	8.2	—	—	15.0	

Notes:

96 HOURS

Date & Time	2019-09-07	15:50					
Analyst(s) :	MDH						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.7	9.2	3409	14.5	
Control	0	0	8.2	9.3	910	14.5	

Notes:

"—" = not measured/not required

Number impaired does not include number dead.

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : FS

 Date : 2019-09-09

AQUATOX

Voice: (519) 763-4412 **Fax:** (519) 763-4419

Quote # (2019): 162705399-19

Fax: (519) 886-9047

Contact: Rick Hawthorne (ALS) / Martina Rendas (Aquatox)

Field Sampler Name (print): KB/CP

Affiliation:
Baffinland Iron Mine / ALS Environmental

Custody Relinquished by: **Kendra Button**

Date/Time Shipped: 2-Sep-19/ 20:00

[illegible]

Storage Temp (°C)

Please list any special requests or instructions:

~~Rush TAT w/~~ Daily updates. PH required.

Report Distribution: bimcore@alsglobal.com, rick.hawthorne@alsglobal.com

**L2339839**

WATERLOO

Subcontract Request Form**Subcontract To:****AQUATOX TESTING AND CONSULTING**

11B NICHOLAS BEAVER ROAD
RR3
GUELPH, ON N1H 6H9

NOTES: Please reference on final report and invoice: PO# L2339839
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 0 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2339839-1 MS-08		9/ 2/ 2019	E
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	9/9/2019	
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	9/9/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact: Rick Hawthorne
60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910 Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: **Rick.Hawthorne@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



Page 1 of 1

[illegible]

OCTOBER 2015 FRONT



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 28-SEP-19
Report Date: 21-OCT-19 11:03 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2356235
Project P.O. #: 4500057496
Job Reference: MS-08 DEL
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356235-1	MS-08							
Sampled By: KB/LM on 28-SEP-19 @ 13:30								
Matrix: WATER								
Physical Tests								
Conductivity		1390		3.0	umhos/cm		02-OCT-19	R4857597
pH		6.91		0.10	pH units		29-SEP-19	R4849880
Total Suspended Solids		40.5		2.0	mg/L		29-SEP-19	R4849883
Total Dissolved Solids		1080		20	mg/L		29-SEP-19	R4849913
Turbidity		42.1		0.10	NTU		29-SEP-19	R4849881
Anions and Nutrients								
Ammonia, Total (as N)		0.50	DLHC	0.10	mg/L		02-OCT-19	R4856571
Cyanides								
Cyanide, Total		<0.020	DLM	0.020	mg/L		03-OCT-19	R4857913
Total Metals								
Aluminum (Al)-Total		1.02	DLHC	0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Barium (Ba)-Total		0.0148	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Boron (B)-Total		<0.10	DLHC	0.10	mg/L	02-OCT-19	02-OCT-19	R4854170
Cadmium (Cd)-Total		0.000133	DLHC	0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Calcium (Ca)-Total		44.6	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Cesium (Cs)-Total		<0.00010	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Cobalt (Co)-Total		0.0691	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Iron (Fe)-Total		4.43	DLHC	0.10	mg/L	02-OCT-19	02-OCT-19	R4854170
Lead (Pb)-Total		0.00120	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Lithium (Li)-Total		<0.010	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Magnesium (Mg)-Total		169	DLHC	0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Manganese (Mn)-Total		5.85	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Molybdenum (Mo)-Total		0.00072	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Nickel (Ni)-Total		0.0774	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Potassium (K)-Total		2.76	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Rubidium (Rb)-Total		0.0051	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Selenium (Se)-Total		0.00243	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Silicon (Si)-Total		2.3	DLHC	1.0	mg/L	02-OCT-19	02-OCT-19	R4854170
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Sodium (Na)-Total		1.52	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Strontium (Sr)-Total		0.033	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Sulfur (S)-Total		258	DLHC	5.0	mg/L	02-OCT-19	02-OCT-19	R4854170
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Thallium (Tl)-Total		<0.00010	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356235-1	MS-08							
Sampled By:	KB/LM on 28-SEP-19 @ 13:30							
Matrix:	WATER							
Total Metals								
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Titanium (Ti)-Total		0.0547	DLHC	0.0030	mg/L	02-OCT-19	02-OCT-19	R4854170
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Uranium (U)-Total		0.00151	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	02-OCT-19	02-OCT-19	R4854170
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Radiological Parameters								
Ra-226		0.017		0.0048	Bq/L	08-OCT-19	17-OCT-19	R4851666

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Sample Parameter Qualifier key listed:			
Qualifier	Description		
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).		
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).		

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2356235

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-TOT-WT		Water						
Batch	R4857913							
WG3180527-3	DUP	L2357043-2						
Cyanide, Total		0.025	0.037	J	mg/L	0.013	0.04	03-OCT-19
WG3180527-2	LCS							
Cyanide, Total			102.1		%		80-120	02-OCT-19
WG3180527-1	MB							
Cyanide, Total			<0.0020		mg/L		0.002	02-OCT-19
WG3180527-4	MS	L2357043-2						
Cyanide, Total			89.7		%		70-130	03-OCT-19
EC-WT		Water						
Batch	R4857597							
WG3179309-4	DUP	WG3179309-3						
Conductivity		2090	2080		umhos/cm	0.5	10	02-OCT-19
WG3179309-2	LCS							
Conductivity			100.2		%		90-110	02-OCT-19
WG3179309-1	MB							
Conductivity			<3.0		umhos/cm		3	02-OCT-19
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-4	DUP	WG3179173-3						
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Barium (Ba)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Calcium (Ca)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Copper (Cu)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-19
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-4 DUP		WG3179173-3						
Magnesium (Mg)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-19
Manganese (Mn)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Potassium (K)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Rubidium (Rb)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Silicon (Si)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	02-OCT-19
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Sodium (Na)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Strontium (Sr)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	25	02-OCT-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	02-OCT-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	02-OCT-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	02-OCT-19
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
WG3179173-2 LCS								
Aluminum (Al)-Total			103.6		%		80-120	02-OCT-19
Antimony (Sb)-Total			101.1		%		80-120	02-OCT-19
Arsenic (As)-Total			98.7		%		80-120	02-OCT-19
Barium (Ba)-Total			99.7		%		80-120	02-OCT-19
Beryllium (Be)-Total			95.9		%		80-120	02-OCT-19
Bismuth (Bi)-Total			96.5		%		80-120	02-OCT-19
Boron (B)-Total			93.0		%		80-120	02-OCT-19
Cadmium (Cd)-Total			95.4		%		80-120	02-OCT-19
Calcium (Ca)-Total			95.8		%		80-120	02-OCT-19



Quality Control Report

Workorder: L2356235

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-2	LCS							
Chromium (Cr)-Total			99.6		%		80-120	02-OCT-19
Cesium (Cs)-Total			96.1		%		80-120	02-OCT-19
Cobalt (Co)-Total			97.0		%		80-120	02-OCT-19
Copper (Cu)-Total			95.7		%		80-120	02-OCT-19
Iron (Fe)-Total			96.4		%		80-120	02-OCT-19
Lead (Pb)-Total			99.6		%		80-120	02-OCT-19
Lithium (Li)-Total			95.9		%		80-120	02-OCT-19
Magnesium (Mg)-Total			106.9		%		80-120	02-OCT-19
Manganese (Mn)-Total			100.5		%		80-120	02-OCT-19
Molybdenum (Mo)-Total			96.7		%		80-120	02-OCT-19
Nickel (Ni)-Total			95.8		%		80-120	02-OCT-19
Phosphorus (P)-Total			102.6		%		70-130	02-OCT-19
Potassium (K)-Total			98.4		%		80-120	02-OCT-19
Rubidium (Rb)-Total			99.6		%		80-120	02-OCT-19
Selenium (Se)-Total			98.8		%		80-120	02-OCT-19
Silicon (Si)-Total			100.1		%		60-140	02-OCT-19
Silver (Ag)-Total			95.8		%		80-120	02-OCT-19
Sodium (Na)-Total			104.7		%		80-120	02-OCT-19
Strontium (Sr)-Total			101.5		%		80-120	02-OCT-19
Sulfur (S)-Total			96.5		%		80-120	02-OCT-19
Thallium (Tl)-Total			97.4		%		80-120	02-OCT-19
Tellurium (Te)-Total			95.3		%		80-120	02-OCT-19
Thorium (Th)-Total			97.1		%		70-130	02-OCT-19
Tin (Sn)-Total			98.4		%		80-120	02-OCT-19
Titanium (Ti)-Total			98.3		%		80-120	02-OCT-19
Tungsten (W)-Total			96.2		%		80-120	02-OCT-19
Uranium (U)-Total			93.5		%		80-120	02-OCT-19
Vanadium (V)-Total			101.1		%		80-120	02-OCT-19
Zinc (Zn)-Total			96.4		%		80-120	02-OCT-19
Zirconium (Zr)-Total			93.6		%		80-120	02-OCT-19
WG3179173-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	02-OCT-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-OCT-19



Quality Control Report

Workorder: L2356235

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-1	MB							
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Boron (B)-Total			<0.010		mg/L		0.01	02-OCT-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	02-OCT-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-OCT-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-OCT-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	02-OCT-19
Iron (Fe)-Total			<0.010		mg/L		0.01	02-OCT-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-OCT-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-OCT-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-OCT-19
Potassium (K)-Total			<0.050		mg/L		0.05	02-OCT-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-OCT-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Silicon (Si)-Total			<0.10		mg/L		0.1	02-OCT-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Sodium (Na)-Total			<0.050		mg/L		0.05	02-OCT-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	02-OCT-19
Sulfur (S)-Total			<0.50		mg/L		0.5	02-OCT-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-OCT-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-OCT-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-OCT-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-1 MB								
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-OCT-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	02-OCT-19
WG3179173-5 MS		WG3179173-3						
Aluminum (Al)-Total			100.4		%		70-130	02-OCT-19
Antimony (Sb)-Total			101.1		%		70-130	02-OCT-19
Arsenic (As)-Total			98.9		%		70-130	02-OCT-19
Barium (Ba)-Total			98.2		%		70-130	02-OCT-19
Beryllium (Be)-Total			97.5		%		70-130	02-OCT-19
Bismuth (Bi)-Total			97.4		%		70-130	02-OCT-19
Boron (B)-Total			95.9		%		70-130	02-OCT-19
Cadmium (Cd)-Total			98.9		%		70-130	02-OCT-19
Calcium (Ca)-Total			98.1		%		70-130	02-OCT-19
Chromium (Cr)-Total			99.9		%		70-130	02-OCT-19
Cesium (Cs)-Total			95.8		%		70-130	02-OCT-19
Cobalt (Co)-Total			98.8		%		70-130	02-OCT-19
Copper (Cu)-Total			99.3		%		70-130	02-OCT-19
Iron (Fe)-Total			98.4		%		70-130	02-OCT-19
Lead (Pb)-Total			101.9		%		70-130	02-OCT-19
Lithium (Li)-Total			97.7		%		70-130	02-OCT-19
Magnesium (Mg)-Total			106.9		%		70-130	02-OCT-19
Manganese (Mn)-Total			103.3		%		70-130	02-OCT-19
Molybdenum (Mo)-Total			95.3		%		70-130	02-OCT-19
Nickel (Ni)-Total			97.5		%		70-130	02-OCT-19
Phosphorus (P)-Total			103.3		%		70-130	02-OCT-19
Potassium (K)-Total			98.3		%		70-130	02-OCT-19
Rubidium (Rb)-Total			100.8		%		70-130	02-OCT-19
Selenium (Se)-Total			100.3		%		70-130	02-OCT-19
Silicon (Si)-Total			99.4		%		70-130	02-OCT-19
Silver (Ag)-Total			96.2		%		70-130	02-OCT-19
Sodium (Na)-Total			105.7		%		70-130	02-OCT-19
Strontium (Sr)-Total			100.7		%		70-130	02-OCT-19
Sulfur (S)-Total			99.8		%		70-130	02-OCT-19
Thallium (Tl)-Total			99.4		%		70-130	02-OCT-19



Quality Control Report

Workorder: L2356235

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-BF		Water						
Batch	R4849883							
WG3176170-3	DUP	L2356235-1						
Total Suspended Solids		40.5	40.5		mg/L	0.0	25	29-SEP-19
WG3176170-2	LCS							
Total Suspended Solids			99.4		%		85-115	29-SEP-19
WG3176170-1	MB							
Total Suspended Solids			<2.0		mg/L		2	29-SEP-19
TURBIDITY-BF		Water						
Batch	R4849881							
WG3176166-3	DUP	L2356119-2						
Turbidity		22.2	22.2		NTU	0.0	15	29-SEP-19
WG3176166-2	LCS							
Turbidity			110.0		%		85-115	29-SEP-19
WG3176166-1	MB							
Turbidity			<0.10		NTU		0.1	29-SEP-19

Quality Control Report

Workorder: L2356235

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Friday, October 18, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1910088
Project Name:
Project Number: L2356235

Dear Mr. Hawthorne:

One water sample was received from ALS Environmental, on 10/3/2019. The sample was scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1910088

Radium-226:

The sample was prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1910088

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2356235

Client PO Number: L2356235

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2356235-1	1910088-1		WATER	28-Sep-19	

**L2356235**

WATERLOO

1910088

Subcontract Request Form**Subcontract To:****ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524**NOTES:** Please reference on final report and invoice: PO# L2356235
ALS requires QC data to be provided with your final results.Please see enclosed 1 sample(s) in 1 Container(s)**SAMPLE
NUMBER****ANALYTICAL REQUIRED****DATE SAMPLED
DUE DATE****Priority
Flag****L2356235-1 MS-08**

9/28/2019

E

Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1) 10/18/2019

Subcontract Info Contact:

Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne

60 NORTHLAND ROAD, UNIT 1

WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to:**Rick.Hawthorne@alsglobal.com**

Shipped By:

Date Shipped:

Received By:

Date Received:

Verified By:

Date Verified:

Temperature:

Sample Integrity Issues:



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS-Waterloo Workorder No: 1910088
Project Manager: KMO Initials: Em Date: 10.03.19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<u>YES</u>	NO
2. Are custody seals on shipping containers intact?		<u>NONE</u>	YES	NO *
3. Are custody seals on sample containers intact?		<u>NONE</u>	YES	NO *
4. Is there a COC (chain-of-custody) present?			<u>YES</u>	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<u>YES</u>	NO *
6. Are short-hold samples present?			YES	<u>NO</u>
7. Are all samples within holding times for the requested analyses?			<u>YES</u>	NO *
8. Were all sample containers received intact? (not broken or leaking)			<u>YES</u>	NO *
9. Is there sufficient sample for the requested analyses?			<u>YES</u>	NO *
10. Are all samples in the proper containers for the requested analyses?			<u>YES</u>	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<u>YES</u>	NO *
12. Are all aqueous non-preserved samples pH 4-9?		<u>N/A</u>	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<u>N/A</u>	YES	NO
14. Were the samples shipped on ice?			<u>YES</u>	NO
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #1 <u>#3</u> #4	<u>RAD ONLY</u>	YES	NO
Cooler #: <u>1</u>				
Temperature (°C): <u>11.8</u>				
No. of custody seals on cooler: <u>0</u>				
External µR/hr reading: <u>12</u>				
Background µR/hr reading: <u>14</u>				
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)				

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: Em

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/4/19

1910088

EXPRESS WORLDWIDE WPX DHL

2010-10-02 NYDHL + 1.07 *20-0021*

From : ALS Environmental
Ed Hill
60 Northland Rd
Unit 1

Origin:
YHM

N2V 288 WATERLOO ON
Canada

Contact: +15198866910

To : ALS Environmental Fort Collins
Sample Login
225 Commerce Drive

Contact:
Sample Login
+18004433511

12-8
1168

80524 FORT COLLINS Colorado
United States of America

US - DEN - DEN

	Day	Time
C		
Rel:	Pos/Ship Weight 12.0-lbs	Piece 1/1



WAYBILL 78 8403 8456

Contents: Water
Samples



(2L)US80524 + 48000001

811 100 100

100 100

Client: ALS Environmental

Date: 18-Oct-19

Project: L2356235

Work Order: 1910088

Sample ID: L2356235-1

Lab ID: 1910088-1

Legal Location:

Matrix: WATER

Collection Date: 9/28/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 10/8/2019

PrepBy: TRW

Ra-226	0.017 (+/- 0.0070)	Y1	0.0048	BQ/l	NA	10/17/2019 14:05
Carr: BARIUM	102	Y1	40-110	%REC	DL = NA	10/17/2019 14:05

Client: ALS Environmental

Date: 18-Oct-19

Project: L2356235

Work Order: 1910088

Sample ID: L2356235-1

Lab ID: 1910088-1

Legal Location:

Matrix: WATER

Collection Date: 9/28/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS -- Fort Collins

Date: 10/18/2019 11:1

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1910088

Project: L2356235

Batch ID: RE191008-2-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:	Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.58 (+/- 0.393)	0.0155	1.72		91.6	67-120					P,Y1,M3
Carr: BARIUM	16500		16380		101	40-110					Y1

LCSD	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:	Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.49 (+/- 0.373)	0.0178	1.72		86.7	67-120		1.58	0.2	2.1	P,Y1,M3
Carr: BARIUM	16500		16390		101	40-110		16500			Y1

MB	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:		Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0023 (+/- 0.0027)	0.0041									Y1,U
Carr: BARIUM	16600		16380		102	40-110					Y1

The following samples were analyzed in this batch:

1910088-1



Canada Toll Free: 1 800 668 9878

L2356235-COFC

Page 1 of

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 30-SEP-19
Report Date: 21-OCT-19 11:04 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2356892
Project P.O. #: 4500057496
Job Reference: MS-08 EFF CHARACTERIZATION
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 02-OCT-19 07:45

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356892-1 MS-08								
Sampled By: KB/AZ on 30-SEP-19 @ 09:20								
Matrix: WATER								
Physical Tests								
Conductivity		870		3.0	umhos/cm		02-OCT-19	R4857597
Hardness (as CaCO3)		479	HTC	1.3	mg/L		03-OCT-19	
pH		6.92		0.10	pH units		01-OCT-19	R4851198
Total Suspended Solids		55.5		2.0	mg/L		01-OCT-19	R4851221
Total Dissolved Solids		643		20	mg/L		01-OCT-19	R4851401
Turbidity		72.1		0.10	NTU		01-OCT-19	R4851213
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		25		10	mg/L		02-OCT-19	R4857597
Ammonia, Total (as N)		0.39	DLHC	0.10	mg/L		02-OCT-19	R4856571
Chloride (Cl)		2.21		0.50	mg/L		02-OCT-19	R4857755
Fluoride (F)		0.047		0.020	mg/L		02-OCT-19	R4857755
Nitrate (as N)		2.71		0.020	mg/L		02-OCT-19	R4857755
Total Kjeldahl Nitrogen		<1.5	DLM	1.5	mg/L	02-OCT-19	03-OCT-19	R4858209
Phosphorus, Total		0.052	DLM	0.030	mg/L	02-OCT-19	03-OCT-19	R4858093
Sulfate (SO4)		424		0.30	mg/L		02-OCT-19	R4857755
Cyanides								
Cyanide, Total		0.0065		0.0020	mg/L		02-OCT-19	R4857913
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					02-OCT-19	R4857502
Dissolved Organic Carbon		1.33		0.50	mg/L	02-OCT-19	03-OCT-19	R4857987
Total Organic Carbon		2.22		0.50	mg/L		02-OCT-19	R4855629
Total Metals								
Aluminum (Al)-Total		1.88	DLHC	0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Barium (Ba)-Total		0.0175	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Boron (B)-Total		<0.10	DLHC	0.10	mg/L	02-OCT-19	02-OCT-19	R4854170
Cadmium (Cd)-Total		0.000066	DLHC	0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Calcium (Ca)-Total		30.5	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Cesium (Cs)-Total		0.00015	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Cobalt (Co)-Total		0.0359	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Iron (Fe)-Total		6.55	DLHC	0.10	mg/L	02-OCT-19	02-OCT-19	R4854170
Lead (Pb)-Total		0.00227	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Lithium (Li)-Total		<0.010	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Magnesium (Mg)-Total		97.8	DLHC	0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Manganese (Mn)-Total		3.33	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		02-OCT-19	R4855211
Molybdenum (Mo)-Total		0.00121	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356892-1MS-08 Sampled By: KB/AZ on 30-SEP-19 @ 09:20 Matrix: WATER								
Total Metals								
Nickel (Ni)-Total		0.0384	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Potassium (K)-Total		3.85	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Rubidium (Rb)-Total		0.0069	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Selenium (Se)-Total		0.00123	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Silicon (Si)-Total		3.6	DLHC	1.0	mg/L	02-OCT-19	02-OCT-19	R4854170
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Sodium (Na)-Total		1.56	DLHC	0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Strontium (Sr)-Total		0.027	DLHC	0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Sulfur (S)-Total		146	DLHC	5.0	mg/L	02-OCT-19	02-OCT-19	R4854170
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Thallium (Tl)-Total		<0.00010	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Thorium (Th)-Total		0.0013	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Titanium (Ti)-Total		0.0893	DLHC	0.0030	mg/L	02-OCT-19	02-OCT-19	R4854170
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Uranium (U)-Total		0.00263	DLHC	0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	02-OCT-19	02-OCT-19	R4854170
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	02-OCT-19	02-OCT-19	R4854170
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					02-OCT-19	R4854329
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	02-OCT-19	02-OCT-19	R4855218
Radiological Parameters								
Ra-226		<0.0068		0.0068	Bq/L	08-OCT-19	17-OCT-19	R4851666
L2356892-2MS-0802 Sampled By: KB/AZ on 30-SEP-19 @ 09:20 Matrix: WATER								
Physical Tests								
Conductivity		<3.0	HTC	3.0	umhos/cm		02-OCT-19	R4857597
Hardness (as CaCO3)		<0.50		0.50	mg/L		03-OCT-19	
pH		5.77		0.10	pH units		02-OCT-19	R4857597
Total Suspended Solids		<2.0	PEHT	2.0	mg/L	02-OCT-19	03-OCT-19	R4857622
Total Dissolved Solids		<10		10	mg/L		02-OCT-19	R4857823
Turbidity		0.16		0.10	NTU	03-OCT-19	03-OCT-19	R4858080
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		<10		10	mg/L		02-OCT-19	R4857597
Ammonia, Total (as N)		<0.010		0.010	mg/L		02-OCT-19	R4856571
Chloride (Cl)		<0.50		0.50	mg/L		02-OCT-19	R4857755
Fluoride (F)		<0.020		0.020	mg/L		02-OCT-19	R4857755
Nitrate (as N)		<0.020		0.020	mg/L		02-OCT-19	R4857755
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	02-OCT-19	03-OCT-19	R4858209

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356892-2 MS-0802								
Sampled By: KB/AZ on 30-SEP-19 @ 09:20								
Matrix: WATER								
Anions and Nutrients								
Phosphorus, Total		<0.0030		0.0030	mg/L	02-OCT-19	03-OCT-19	R4858093
Sulfate (SO4)		<0.30		0.30	mg/L		02-OCT-19	R4857755
Cyanides								
Cyanide, Total		<0.0020		0.0020	mg/L		02-OCT-19	R4857913
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					02-OCT-19	R4857502
Dissolved Organic Carbon		<0.50		0.50	mg/L	02-OCT-19	03-OCT-19	R4857987
Total Organic Carbon		<0.50		0.50	mg/L		02-OCT-19	R4855629
Total Metals								
Aluminum (Al)-Total		<0.0050		0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Arsenic (As)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Barium (Ba)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Boron (B)-Total		<0.010		0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Calcium (Ca)-Total		<0.050		0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Cesium (Cs)-Total		<0.000010		0.000010	mg/L	02-OCT-19	02-OCT-19	R4854170
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Copper (Cu)-Total		<0.0010		0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Iron (Fe)-Total		<0.010		0.010	mg/L	02-OCT-19	02-OCT-19	R4854170
Lead (Pb)-Total		<0.000050		0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Lithium (Li)-Total		<0.0010		0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Magnesium (Mg)-Total		<0.0050		0.0050	mg/L	02-OCT-19	02-OCT-19	R4854170
Manganese (Mn)-Total		<0.00050		0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		02-OCT-19	R4855211
Molybdenum (Mo)-Total		<0.000050		0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Nickel (Ni)-Total		<0.00050		0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Phosphorus (P)-Total		<0.050		0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Potassium (K)-Total		<0.050		0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Rubidium (Rb)-Total		<0.00020		0.00020	mg/L	02-OCT-19	02-OCT-19	R4854170
Selenium (Se)-Total		<0.000050		0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Silicon (Si)-Total		<0.10		0.10	mg/L	02-OCT-19	02-OCT-19	R4854170
Silver (Ag)-Total		<0.000050		0.000050	mg/L	02-OCT-19	02-OCT-19	R4854170
Sodium (Na)-Total		<0.050		0.050	mg/L	02-OCT-19	02-OCT-19	R4854170
Strontium (Sr)-Total		<0.0010		0.0010	mg/L	02-OCT-19	02-OCT-19	R4854170
Sulfur (S)-Total		<0.50		0.50	mg/L	02-OCT-19	02-OCT-19	R4854170
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	02-OCT-19	02-OCT-19	R4854170
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	02-OCT-19	02-OCT-19	R4854170
Thorium (Th)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356892-2	MS-0802							
Sampled By:	KB/AZ on 30-SEP-19 @ 09:20							
Matrix:	WATER							
Total Metals								
Tin (Sn)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Titanium (Ti)-Total		<0.00030		0.00030	mg/L	02-OCT-19	02-OCT-19	R4854170
Tungsten (W)-Total		<0.00010		0.00010	mg/L	02-OCT-19	02-OCT-19	R4854170
Uranium (U)-Total		<0.000010		0.000010	mg/L	02-OCT-19	02-OCT-19	R4854170
Vanadium (V)-Total		<0.00050		0.00050	mg/L	02-OCT-19	02-OCT-19	R4854170
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	02-OCT-19	02-OCT-19	R4854170
Zirconium (Zr)-Total		<0.00020		0.00020	mg/L	02-OCT-19	02-OCT-19	R4854170
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					02-OCT-19	R4854329
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	02-OCT-19	02-OCT-19	R4855218
Radiological Parameters								
Ra-226		0.018		0.0078	Bq/L	08-OCT-19	17-OCT-19	R4851666

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Sample Parameter Qualifier key listed:			
Qualifier	Description		
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).		
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).		
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).		
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis		

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			

Reference Information

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.			
PH-BF	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
PH-WT	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			
TURBIDITY-WT	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-4	DUP	WG3179173-3						
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Barium (Ba)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Calcium (Ca)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Copper (Cu)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-19
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19
Magnesium (Mg)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-19
Manganese (Mn)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Potassium (K)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Rubidium (Rb)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Silicon (Si)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	02-OCT-19
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-19
Sodium (Na)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-OCT-19
Strontium (Sr)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-19
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	25	02-OCT-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	02-OCT-19
Tin (Sn)-Total		<0.00010	<0.00010		mg/L			02-OCT-19



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-4	DUP	WG3179173-3						
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	02-OCT-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-19
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-OCT-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	02-OCT-19
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-OCT-19
WG3179173-2	LCS							
Aluminum (Al)-Total			103.6		%		80-120	02-OCT-19
Antimony (Sb)-Total			101.1		%		80-120	02-OCT-19
Arsenic (As)-Total			98.7		%		80-120	02-OCT-19
Barium (Ba)-Total			99.7		%		80-120	02-OCT-19
Beryllium (Be)-Total			95.9		%		80-120	02-OCT-19
Bismuth (Bi)-Total			96.5		%		80-120	02-OCT-19
Boron (B)-Total			93.0		%		80-120	02-OCT-19
Cadmium (Cd)-Total			95.4		%		80-120	02-OCT-19
Calcium (Ca)-Total			95.8		%		80-120	02-OCT-19
Chromium (Cr)-Total			99.6		%		80-120	02-OCT-19
Cesium (Cs)-Total			96.1		%		80-120	02-OCT-19
Cobalt (Co)-Total			97.0		%		80-120	02-OCT-19
Copper (Cu)-Total			95.7		%		80-120	02-OCT-19
Iron (Fe)-Total			96.4		%		80-120	02-OCT-19
Lead (Pb)-Total			99.6		%		80-120	02-OCT-19
Lithium (Li)-Total			95.9		%		80-120	02-OCT-19
Magnesium (Mg)-Total			106.9		%		80-120	02-OCT-19
Manganese (Mn)-Total			100.5		%		80-120	02-OCT-19
Molybdenum (Mo)-Total			96.7		%		80-120	02-OCT-19
Nickel (Ni)-Total			95.8		%		80-120	02-OCT-19
Phosphorus (P)-Total			102.6		%		70-130	02-OCT-19
Potassium (K)-Total			98.4		%		80-120	02-OCT-19
Rubidium (Rb)-Total			99.6		%		80-120	02-OCT-19
Selenium (Se)-Total			98.8		%		80-120	02-OCT-19
Silicon (Si)-Total			100.1		%		60-140	02-OCT-19



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-2		LCS						
Silver (Ag)-Total			95.8		%		80-120	02-OCT-19
Sodium (Na)-Total			104.7		%		80-120	02-OCT-19
Strontium (Sr)-Total			101.5		%		80-120	02-OCT-19
Sulfur (S)-Total			96.5		%		80-120	02-OCT-19
Thallium (Tl)-Total			97.4		%		80-120	02-OCT-19
Tellurium (Te)-Total			95.3		%		80-120	02-OCT-19
Thorium (Th)-Total			97.1		%		70-130	02-OCT-19
Tin (Sn)-Total			98.4		%		80-120	02-OCT-19
Titanium (Ti)-Total			98.3		%		80-120	02-OCT-19
Tungsten (W)-Total			96.2		%		80-120	02-OCT-19
Uranium (U)-Total			93.5		%		80-120	02-OCT-19
Vanadium (V)-Total			101.1		%		80-120	02-OCT-19
Zinc (Zn)-Total			96.4		%		80-120	02-OCT-19
Zirconium (Zr)-Total			93.6		%		80-120	02-OCT-19
WG3179173-1		MB						
Aluminum (Al)-Total			<0.0050		mg/L		0.005	02-OCT-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Boron (B)-Total			<0.010		mg/L		0.01	02-OCT-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	02-OCT-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-OCT-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-OCT-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	02-OCT-19
Iron (Fe)-Total			<0.010		mg/L		0.01	02-OCT-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-OCT-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-OCT-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-OCT-19



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-1 MB								
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-OCT-19
Potassium (K)-Total			<0.050		mg/L		0.05	02-OCT-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-OCT-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Silicon (Si)-Total			<0.10		mg/L		0.1	02-OCT-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	02-OCT-19
Sodium (Na)-Total			<0.050		mg/L		0.05	02-OCT-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	02-OCT-19
Sulfur (S)-Total			<0.50		mg/L		0.5	02-OCT-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-OCT-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-OCT-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-OCT-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-OCT-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-OCT-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-OCT-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-OCT-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	02-OCT-19
WG3179173-5 MS		WG3179173-3						
Aluminum (Al)-Total			100.4		%		70-130	02-OCT-19
Antimony (Sb)-Total			101.1		%		70-130	02-OCT-19
Arsenic (As)-Total			98.9		%		70-130	02-OCT-19
Barium (Ba)-Total			98.2		%		70-130	02-OCT-19
Beryllium (Be)-Total			97.5		%		70-130	02-OCT-19
Bismuth (Bi)-Total			97.4		%		70-130	02-OCT-19
Boron (B)-Total			95.9		%		70-130	02-OCT-19
Cadmium (Cd)-Total			98.9		%		70-130	02-OCT-19
Calcium (Ca)-Total			98.1		%		70-130	02-OCT-19
Chromium (Cr)-Total			99.9		%		70-130	02-OCT-19
Cesium (Cs)-Total			95.8		%		70-130	02-OCT-19
Cobalt (Co)-Total			98.8		%		70-130	02-OCT-19
Copper (Cu)-Total			99.3		%		70-130	02-OCT-19



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

Page 7 of 13

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4854170							
WG3179173-5 MS		WG3179173-3						
Iron (Fe)-Total			98.4		%		70-130	02-OCT-19
Lead (Pb)-Total			101.9		%		70-130	02-OCT-19
Lithium (Li)-Total			97.7		%		70-130	02-OCT-19
Magnesium (Mg)-Total			106.9		%		70-130	02-OCT-19
Manganese (Mn)-Total			103.3		%		70-130	02-OCT-19
Molybdenum (Mo)-Total			95.3		%		70-130	02-OCT-19
Nickel (Ni)-Total			97.5		%		70-130	02-OCT-19
Phosphorus (P)-Total			103.3		%		70-130	02-OCT-19
Potassium (K)-Total			98.3		%		70-130	02-OCT-19
Rubidium (Rb)-Total			100.8		%		70-130	02-OCT-19
Selenium (Se)-Total			100.3		%		70-130	02-OCT-19
Silicon (Si)-Total			99.4		%		70-130	02-OCT-19
Silver (Ag)-Total			96.2		%		70-130	02-OCT-19
Sodium (Na)-Total			105.7		%		70-130	02-OCT-19
Strontium (Sr)-Total			100.7		%		70-130	02-OCT-19
Sulfur (S)-Total			99.8		%		70-130	02-OCT-19
Thallium (Tl)-Total			99.4		%		70-130	02-OCT-19
Tellurium (Te)-Total			93.3		%		70-130	02-OCT-19
Thorium (Th)-Total			95.3		%		70-130	02-OCT-19
Tin (Sn)-Total			96.3		%		70-130	02-OCT-19
Titanium (Ti)-Total			99.9		%		70-130	02-OCT-19
Tungsten (W)-Total			97.7		%		70-130	02-OCT-19
Uranium (U)-Total			94.6		%		70-130	02-OCT-19
Vanadium (V)-Total			101.3		%		70-130	02-OCT-19
Zinc (Zn)-Total			96.6		%		70-130	02-OCT-19
Zirconium (Zr)-Total			93.6		%		70-130	02-OCT-19
NH3-F-WT		Water						
Batch	R4856571							
WG3179170-15 DUP		L2356892-2						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-19
WG3179170-19 DUP		L2356009-15						
Ammonia, Total (as N)		0.035	0.039		mg/L	11	20	02-OCT-19
WG3179170-14 LCS								
Ammonia, Total (as N)			101.2		%		85-115	02-OCT-19



Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-BF	Water							
Batch	R4851221							
WG3178016-1 MB								
Total Suspended Solids			<2.0		mg/L		2	01-OCT-19
SOLIDS-TSS-WT	Water							
Batch	R4857622							
WG3179644-3 DUP		L2355710-11						
Total Suspended Solids		386	404		mg/L	4.6	20	03-OCT-19
WG3179644-2 LCS								
Total Suspended Solids			100.5		%		85-115	03-OCT-19
WG3179644-1 MB								
Total Suspended Solids			<2.0		mg/L		2	03-OCT-19
TKN-WT	Water							
Batch	R4858209							
WG3179864-3 DUP		WG3179864-5						
Total Kjeldahl Nitrogen		0.50	0.57		mg/L	12	20	03-OCT-19
WG3179864-2 LCS								
Total Kjeldahl Nitrogen			95.2		%		75-125	03-OCT-19
WG3179864-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	03-OCT-19
WG3179864-4 MS		WG3179864-5						
Total Kjeldahl Nitrogen			99.3		%		70-130	03-OCT-19
TOC-WT	Water							
Batch	R4855629							
WG3179001-3 DUP		L2353445-1						
Total Organic Carbon		4.68	4.62		mg/L	1.3	20	02-OCT-19
WG3179001-2 LCS								
Total Organic Carbon			106.1		%		80-120	02-OCT-19
WG3179001-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	02-OCT-19
WG3179001-4 MS		L2353445-1						
Total Organic Carbon			94.0		%		70-130	02-OCT-19
TURBIDITY-BF	Water							
Batch	R4851213							
WG3177999-3 DUP		L2356874-1						
Turbidity		14.2	13.9		NTU	2.1	15	01-OCT-19
WG3177999-2 LCS								
Turbidity			114.0		%		85-115	01-OCT-19



Quality Control Report

Workorder: L2356892 Report Date: 21-OCT-19 Page 11 of 13

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-BF		Water						
Batch R4851213								
WG3177999-1 MB								
Turbidity			<0.10		NTU		0.1	01-OCT-19
TURBIDITY-WT		Water						
Batch R4858080								
WG3180753-3 DUP		L2358675-2						
Turbidity		8.40	8.64		NTU	2.8	15	03-OCT-19
WG3180753-2 LCS								
Turbidity			103.0		%		85-115	03-OCT-19
WG3180753-1 MB								
Turbidity			<0.10		NTU		0.1	03-OCT-19

Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2356892

Report Date: 21-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 13 of 13

Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity	2	30-SEP-19 09:20	03-OCT-19 14:30	48	77	hours	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2356892 were received on 30-SEP-19 15:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Friday, October 18, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1910087
Project Name:
Project Number: L2356892

Dear Mr. Hawthorne:

Two water samples were received from ALS Environmental, on 10/3/2019. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1910087

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1910087

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2356892

Client PO Number: L2356892

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2356892-1	1910087-1		WATER	30-Sep-19	
L2356892-2	1910087-2		WATER	30-Sep-19	

**L2356892**

WATERLOO

Subcontract Request Form

1910087

Subcontract To:**ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524**NOTES:** Please reference on final report and invoice: PO# L2356892
ALS requires QC data to be provided with your final results.

Please see enclosed 2 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
1 L2356892-1 MS-08	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	9/ 30/ 2019	E
		10/22/2019	
2 L2356892-2 MS-0802	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	9/ 30/ 2019	E
		10/22/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact: Rick Hawthorne
60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: Rick.Hawthorne@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: Emily Yans Date Received: 10-03-19 1005

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS-Waterloo Workorder No: 1910087
Project Manager: KMO Initials: Em Date: 10.03.19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<u>YES</u>	NO
2. Are custody seals on shipping containers intact?		<u>NONE</u>	YES	NO *
3. Are custody seals on sample containers intact?		<u>NONE</u>	YES	NO *
4. Is there a COC (chain-of-custody) present?			<u>YES</u>	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<u>YES</u>	NO *
6. Are short-hold samples present?			YES	<u>NO</u>
7. Are all samples within holding times for the requested analyses?			<u>YES</u>	NO *
8. Were all sample containers received intact? (not broken or leaking)			<u>YES</u>	NO *
9. Is there sufficient sample for the requested analyses?			<u>YES</u>	NO *
10. Are all samples in the proper containers for the requested analyses?			<u>YES</u>	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<u>YES</u>	NO *
12. Are all aqueous non-preserved samples pH 4-9?		<u>N/A</u>	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<u>N/A</u>	YES	NO
14. Were the samples shipped on ice?			<u>YES</u>	NO
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #1 <u>#3</u> #4	<u>RAD ONLY</u>	YES	NO
Cooler #: <u>1</u>				
Temperature (°C): <u>11.8</u>				
No. of custody seals on cooler: <u>0</u>				
External µR/hr reading: <u>12</u>				
Background µR/hr reading: <u>14</u>				
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)				

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: Em

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/4/19

1910087

EXPRESS WORLDWIDE WPX -DHL-

2018-10-02 MYDHL + 1.0 / "30-0021"

From: ALS Environmental
Ed Hill
60 Northland Rd
Unit 1

Origin:
YHM

N2V 288 WATERLOO ON
Canada

Contact: +15198866910

To: ALS Environmental Fort Collins
Sample Login
225 Commerce Drive

Contact:
Sample Login
+18004431511

12-8
E168

80524 FORT COLLINS Colorado
United States of America

US - DEN - DEN

	Day	Time
C		

Ref:	Par/Shpt Weight	Piece
	12.0 lbs	1/1

Contents: Water
Samples



WAYBILL 78 8403 8456



(2L)US80524 + 48000001

011 100 100

011 100 100

Client: ALS Environmental

Date: 18-Oct-19

Project: L2356892

Work Order: 1910087

Sample ID: L2356892-1

Lab ID: 1910087-1

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1**SOP 783**

Prep Date: 10/8/2019

PrepBy: TRW

Ra-226	0.0047 (+/- 0.0045)	Y1,U	0.0068	BQ/l	NA	10/17/2019 14:05
Carr: BARIUM	100	Y1	40-110	%REC	DL = NA	10/17/2019 14:05

Client: ALS Environmental

Date: 18-Oct-19

Project: L2356892

Work Order: 1910087

Sample ID: L2356892-2

Lab ID: 1910087-2

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 10/8/2019

PrepBy: TRW

Ra-226	0.018 (+/- 0.0082)	Y1	0.0078	BQ/l	NA	10/17/2019 14:05
Carr: BARIUM	100	Y1	40-110	%REC	DL = NA	10/17/2019 14:05

Client: ALS Environmental

Date: 18-Oct-19

Project: L2356892

Work Order: 1910087

Sample ID: L2356892-2

Lab ID: 1910087-2

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS -- Fort Collins

Date: 10/18/2019 11:1

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1910087

Project: L2356892

Batch ID: RE191008-2-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:		Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.58 (+/- 0.393)	0.0155	1.72		91.6	67-120					P,Y1,M3
Carr: BARIUM	16500		16380		101	40-110					Y1

LCSD	Sample ID: RE191008-2			Units: BQ/I			Analysis Date: 10/17/2019 14:40				
Client ID:	Run ID: RE191008-2A						Prep Date: 10/8/2019		DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.49 (+/- 0.373)	0.0178	1.72		86.7	67-120		1.58	0.2	2.1	P,Y1,M3
Carr: BARIUM	16500		16390		101	40-110		16500			Y1

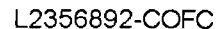
MB	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:	Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0023 (+/- 0.0027)	0.0041									Y1,U
Carr: BARIUM	16600		16380		102	40-110					Y1

The following samples were analyzed in this batch:

1910087-1 1910087-2



Canada Toll Free: 1 800 668 9878



Page 1 of 1

www.alsglobal.com

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 01-OCT-19
Report Date: 24-OCT-19 13:49 (MT)
Version: FINAL REV. 2

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2356925
Project P.O. #: 4500057496
Job Reference: MS-08 REFERENCE AND EXPOSURE
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 02-OCT-19 09:49
24-OCT-2019 With Full Package reporting

Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356925-1	MS-08-DS							
Sampled By: AZ/LM on 30-SEP-19 @ 12:50								
Matrix: WATER								
Physical Tests								
Conductivity		170	HTC	3.0	umhos/cm		05-OCT-19	R4860539
Hardness (as CaCO3)		73.2		0.50	mg/L		04-OCT-19	
pH		7.94		0.10	pH units		01-OCT-19	R4851198
Total Suspended Solids		3.2		2.0	mg/L		01-OCT-19	R4851221
Total Dissolved Solids		96		20	mg/L		01-OCT-19	R4851401
Turbidity		3.38		0.10	NTU		01-OCT-19	R4851213
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		72		10	mg/L		05-OCT-19	R4860539
Ammonia, Total (as N)		0.013		0.010	mg/L		07-OCT-19	R4860725
Chloride (Cl)		6.98		0.50	mg/L		04-OCT-19	R4859139
Fluoride (F)		0.025		0.020	mg/L		04-OCT-19	R4859139
Nitrate (as N)		0.074		0.020	mg/L		04-OCT-19	R4859139
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	07-OCT-19	07-OCT-19	R4860925
Phosphorus, Total		0.0073		0.0030	mg/L	04-OCT-19	07-OCT-19	R4860606
Sulfate (SO4)		6.80		0.30	mg/L		04-OCT-19	R4859139
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					04-OCT-19	R4859597
Dissolved Organic Carbon		2.31		0.50	mg/L	04-OCT-19	07-OCT-19	R4860638
Total Organic Carbon		2.42		0.50	mg/L		07-OCT-19	R4860639
Total Metals								
Aluminum (Al)-Total		0.144		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Arsenic (As)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Barium (Ba)-Total		0.00999		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Boron (B)-Total		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Calcium (Ca)-Total		14.7		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cesium (Cs)-Total		0.000019		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Copper (Cu)-Total		0.0012		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Iron (Fe)-Total		0.140		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Lead (Pb)-Total		0.000128		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Lithium (Li)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Magnesium (Mg)-Total		8.88		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Manganese (Mn)-Total		0.00469		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		07-OCT-19	R4860448
Molybdenum (Mo)-Total		0.000286		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Nickel (Ni)-Total		0.00072		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Phosphorus (P)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356925-1 MS-08-DS Sampled By: AZ/LM on 30-SEP-19 @ 12:50 Matrix: WATER								
Total Metals								
Potassium (K)-Total		1.01		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Rubidium (Rb)-Total		0.00156		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Selenium (Se)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Silicon (Si)-Total		1.26		0.10	mg/L	04-OCT-19	04-OCT-19	R4859637
Silver (Ag)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Sodium (Na)-Total		2.95		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Strontium (Sr)-Total		0.0147		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Sulfur (S)-Total		2.38		0.50	mg/L	04-OCT-19	04-OCT-19	R4859637
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Thorium (Th)-Total		0.00012		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Tin (Sn)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Titanium (Ti)-Total		0.00799		0.00030	mg/L	04-OCT-19	04-OCT-19	R4859637
Tungsten (W)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Uranium (U)-Total		0.00331		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Vanadium (V)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	04-OCT-19	04-OCT-19	R4859637
Zirconium (Zr)-Total		0.00031		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					04-OCT-19	R4859193
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	04-OCT-19	07-OCT-19	R4860451
Radiological Parameters								
Ra-226		<0.0080		0.0080	Bq/L	10-OCT-19	21-OCT-19	R4851666
L2356925-2 MS-08-US Sampled By: AZ/LM on 30-SEP-19 @ 13:20 Matrix: WATER								
Physical Tests								
Conductivity		167	HTC	3.0	umhos/cm		05-OCT-19	R4860539
Hardness (as CaCO3)		72.2		0.50	mg/L		04-OCT-19	
pH		7.97		0.10	pH units		01-OCT-19	R4851198
Total Suspended Solids		2.4		2.0	mg/L		01-OCT-19	R4851221
Total Dissolved Solids		107		20	mg/L		01-OCT-19	R4851401
Turbidity		3.32		0.10	NTU		01-OCT-19	R4851213
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		73		10	mg/L		05-OCT-19	R4860539
Ammonia, Total (as N)		<0.010		0.010	mg/L		07-OCT-19	R4860725
Chloride (Cl)		7.20		0.50	mg/L		04-OCT-19	R4859139
Fluoride (F)		0.027		0.020	mg/L		04-OCT-19	R4859139
Nitrate (as N)		0.074		0.020	mg/L		04-OCT-19	R4859139
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	07-OCT-19	07-OCT-19	R4860925
Phosphorus, Total		0.0084		0.0030	mg/L	04-OCT-19	07-OCT-19	R4860606
Sulfate (SO4)		4.48		0.30	mg/L		04-OCT-19	R4859139

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356925-2	MS-08-US							
Sampled By: AZ/LM on 30-SEP-19 @ 13:20								
Matrix: WATER								
Anions and Nutrients								
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					04-OCT-19	R4859597
Dissolved Organic Carbon		2.24		0.50	mg/L	04-OCT-19	07-OCT-19	R4860638
Total Organic Carbon		2.47		0.50	mg/L		07-OCT-19	R4860639
Total Metals								
Aluminum (Al)-Total		0.123		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Arsenic (As)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Barium (Ba)-Total		0.0102		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Boron (B)-Total		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Calcium (Ca)-Total		14.7		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cesium (Cs)-Total		0.000019		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Copper (Cu)-Total		0.0011		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Iron (Fe)-Total		0.121		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Lead (Pb)-Total		0.000099		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Lithium (Li)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Magnesium (Mg)-Total		8.62		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Manganese (Mn)-Total		0.00215		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		07-OCT-19	R4860448
Molybdenum (Mo)-Total		0.000289		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Nickel (Ni)-Total		0.00055		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Phosphorus (P)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Potassium (K)-Total		1.02		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Rubidium (Rb)-Total		0.00151		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Selenium (Se)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Silicon (Si)-Total		1.24		0.10	mg/L	04-OCT-19	04-OCT-19	R4859637
Silver (Ag)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Sodium (Na)-Total		3.13		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Strontium (Sr)-Total		0.0148		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Sulfur (S)-Total		1.66		0.50	mg/L	04-OCT-19	04-OCT-19	R4859637
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Thorium (Th)-Total		0.00013		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Tin (Sn)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Titanium (Ti)-Total		0.00718		0.00030	mg/L	04-OCT-19	04-OCT-19	R4859637
Tungsten (W)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356925-2 MS-08-US Sampled By: AZ/LM on 30-SEP-19 @ 13:20 Matrix: WATER Total Metals Uranium (U)-Total Vanadium (V)-Total Zinc (Zn)-Total Zirconium (Zr)-Total Dissolved Metals Dissolved Mercury Filtration Location Mercury (Hg)-Dissolved Radiological Parameters Ra-226								
		0.00358		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.0030		0.0030	mg/L	04-OCT-19	04-OCT-19	R4859637
		0.00034		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
		FIELD					04-OCT-19	R4859193
		<0.0000050		0.0000050	mg/L	04-OCT-19	07-OCT-19	R4860451
		<0.0069		0.0069	Bq/L	10-OCT-19	21-OCT-19	R4851666
L2356925-3 MS-08-US02 Sampled By: AZ/LM on 30-SEP-19 @ 13:20 Matrix: WATER Physical Tests Conductivity Hardness (as CaCO3) pH Total Suspended Solids Total Dissolved Solids Turbidity Anions and Nutrients Alkalinity, Total (as CaCO3) Ammonia, Total (as N) Chloride (Cl) Fluoride (F) Nitrate (as N) Total Kjeldahl Nitrogen Phosphorus, Total Sulfate (SO4) Organic / Inorganic Carbon Dissolved Carbon Filtration Location Dissolved Organic Carbon Total Organic Carbon Total Metals Aluminum (Al)-Total Antimony (Sb)-Total Arsenic (As)-Total Barium (Ba)-Total Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Calcium (Ca)-Total			HTC					
		<3.0		3.0	umhos/cm		05-OCT-19	R4860539
		<0.50		0.50	mg/L		04-OCT-19	
		6.13		0.10	pH units		01-OCT-19	R4851198
		<2.0		2.0	mg/L		01-OCT-19	R4851221
		24		20	mg/L		01-OCT-19	R4851401
		<0.10		0.10	NTU		01-OCT-19	R4851213
		<10		10	mg/L		05-OCT-19	R4860539
		<0.010		0.010	mg/L		07-OCT-19	R4860725
		<0.50		0.50	mg/L		04-OCT-19	R4859139
		<0.020		0.020	mg/L		04-OCT-19	R4859139
		<0.020		0.020	mg/L		04-OCT-19	R4859139
		<0.15		0.15	mg/L	07-OCT-19	07-OCT-19	R4860925
		<0.0030		0.0030	mg/L	04-OCT-19	07-OCT-19	R4860606
		<0.30		0.30	mg/L		04-OCT-19	R4859139
		LAB					04-OCT-19	R4859597
		<0.50		0.50	mg/L	04-OCT-19	07-OCT-19	R4860638
		0.72		0.50	mg/L		07-OCT-19	R4860639
		<0.0050		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4859637
		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2356925-3	MS-08-US02							
Sampled By:	AZ/LM on 30-SEP-19 @ 13:20							
Matrix:	WATER							
Total Metals								
Cesium (Cs)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Copper (Cu)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Iron (Fe)-Total		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Lead (Pb)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Lithium (Li)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Magnesium (Mg)-Total		<0.0050		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Manganese (Mn)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		07-OCT-19	R4860448
Molybdenum (Mo)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Nickel (Ni)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Phosphorus (P)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Potassium (K)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Rubidium (Rb)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Selenium (Se)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Silicon (Si)-Total		<0.10		0.10	mg/L	04-OCT-19	04-OCT-19	R4859637
Silver (Ag)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Sodium (Na)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Strontium (Sr)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Sulfur (S)-Total		<0.50		0.50	mg/L	04-OCT-19	04-OCT-19	R4859637
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Thorium (Th)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Tin (Sn)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Titanium (Ti)-Total		<0.00030		0.00030	mg/L	04-OCT-19	04-OCT-19	R4859637
Tungsten (W)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Uranium (U)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Vanadium (V)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	04-OCT-19	04-OCT-19	R4859637
Zirconium (Zr)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					04-OCT-19	R4859193
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	04-OCT-19	07-OCT-19	R4860451
Radiological Parameters								
Ra-226		<0.0066		0.0066	Bq/L	10-OCT-19	21-OCT-19	R4851666

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Iron (Fe)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Silicon (Si)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L2356925-1, -2, -3
Matrix Spike	Uranium (U)-Total	MS-B	L2356925-1, -2, -3

Sample Parameter Qualifier key listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental			

Reference Information

Protection Act (July 1, 2011).

NH3-F-WT Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

PH-BF Water pH APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

RA226-MMER-FC Water Ra226 by Alpha Scint, MDC=0.01 Bq/L EPA 903.1

SO4-IC-N-WT Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-BF Water Total Dissolved Solids APHA 2540C

A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.

SOLIDS-TSS-BF Water Suspended solids APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.

TKN-WT Water Total Kjeldahl Nitrogen APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

TOC-WT Water Total Organic Carbon APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

TURBIDITY-BF Water Turbidity APHA 2130 B

Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2356925

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R4859139							
WG3181734-24	DUP	WG3181734-23						
Fluoride (F)		0.025	0.025		mg/L	0.1	20	04-OCT-19
WG3181734-22	LCS							
Fluoride (F)			103.8		%		90-110	04-OCT-19
WG3181734-21	MB							
Fluoride (F)			<0.020		mg/L		0.02	04-OCT-19
WG3181734-25	MS	WG3181734-23						
Fluoride (F)			101.9		%		75-125	04-OCT-19
HG-D-CVAA-WT		Water						
Batch	R4860451							
WG3182354-3	DUP	L2357716-1						
Mercury (Hg)-Dissolved		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3182354-2	LCS							
Mercury (Hg)-Dissolved			99.8		%		80-120	07-OCT-19
WG3182354-1	MB							
Mercury (Hg)-Dissolved			<0.0000050		mg/L		0.000005	07-OCT-19
WG3182354-4	MS	L2357716-2						
Mercury (Hg)-Dissolved			95.8		%		70-130	07-OCT-19
HG-T-CVAA-WT		Water						
Batch	R4860448							
WG3182348-3	DUP	L2357716-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3182348-2	LCS							
Mercury (Hg)-Total			98.3		%		80-120	07-OCT-19
WG3182348-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	07-OCT-19
WG3182348-4	MS	L2357716-2						
Mercury (Hg)-Total			98.8		%		70-130	07-OCT-19
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4	DUP	WG3182336-3						
Aluminum (Al)-Total		0.118	0.114		mg/L	3.4	20	04-OCT-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Barium (Ba)-Total		0.0112	0.0109		mg/L	2.4	20	04-OCT-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4	DUP	WG3182336-3						
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-OCT-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Calcium (Ca)-Total		16.5	16.5		mg/L	0.4	20	04-OCT-19
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-OCT-19
Cesium (Cs)-Total		0.000014	0.000015		mg/L	4.3	20	04-OCT-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Copper (Cu)-Total		<0.0010	0.0010	RPD-NA	mg/L	N/A	20	04-OCT-19
Iron (Fe)-Total		0.117	0.115		mg/L	2.2	20	04-OCT-19
Lead (Pb)-Total		0.000077	0.000080		mg/L	4.1	20	04-OCT-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	04-OCT-19
Magnesium (Mg)-Total		10.2	10.1		mg/L	1.0	20	04-OCT-19
Manganese (Mn)-Total		0.00247	0.00246		mg/L	0.2	20	04-OCT-19
Molybdenum (Mo)-Total		0.000321	0.000323		mg/L	0.8	20	04-OCT-19
Nickel (Ni)-Total		0.00058	0.00057		mg/L	1.0	20	04-OCT-19
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	04-OCT-19
Potassium (K)-Total		1.09	1.09		mg/L	0.1	20	04-OCT-19
Rubidium (Rb)-Total		0.00154	0.00158		mg/L	2.1	20	04-OCT-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Silicon (Si)-Total		1.26	1.29		mg/L	2.6	20	04-OCT-19
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Sodium (Na)-Total		3.41	3.39		mg/L	0.5	20	04-OCT-19
Strontium (Sr)-Total		0.0167	0.0167		mg/L	0.2	20	04-OCT-19
Sulfur (S)-Total		2.64	2.70		mg/L	2.2	25	04-OCT-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	04-OCT-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	04-OCT-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	04-OCT-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Titanium (Ti)-Total		0.00541	0.00550		mg/L	1.5	20	04-OCT-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Uranium (U)-Total		0.00415	0.00407		mg/L	2.0	20	04-OCT-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-OCT-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	04-OCT-19
Zirconium (Zr)-Total		0.00026	0.00028		mg/L			04-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4 DUP		WG3182336-3						
Zirconium (Zr)-Total		0.00026	0.00028		mg/L	5.3	20	04-OCT-19
WG3182336-2 LCS								
Aluminum (Al)-Total			106.5		%		80-120	04-OCT-19
Antimony (Sb)-Total			103.5		%		80-120	04-OCT-19
Arsenic (As)-Total			100.9		%		80-120	04-OCT-19
Barium (Ba)-Total			104.0		%		80-120	04-OCT-19
Beryllium (Be)-Total			100.9		%		80-120	04-OCT-19
Bismuth (Bi)-Total			98.0		%		80-120	04-OCT-19
Boron (B)-Total			98.7		%		80-120	04-OCT-19
Cadmium (Cd)-Total			102.5		%		80-120	04-OCT-19
Calcium (Ca)-Total			100.1		%		80-120	04-OCT-19
Chromium (Cr)-Total			102.0		%		80-120	04-OCT-19
Cesium (Cs)-Total			99.3		%		80-120	04-OCT-19
Cobalt (Co)-Total			101.5		%		80-120	04-OCT-19
Copper (Cu)-Total			101.0		%		80-120	04-OCT-19
Iron (Fe)-Total			101.2		%		80-120	04-OCT-19
Lead (Pb)-Total			100.9		%		80-120	04-OCT-19
Lithium (Li)-Total			99.9		%		80-120	04-OCT-19
Magnesium (Mg)-Total			102.4		%		80-120	04-OCT-19
Manganese (Mn)-Total			102.1		%		80-120	04-OCT-19
Molybdenum (Mo)-Total			101.4		%		80-120	04-OCT-19
Nickel (Ni)-Total			99.9		%		80-120	04-OCT-19
Phosphorus (P)-Total			106.9		%		70-130	04-OCT-19
Potassium (K)-Total			103.1		%		80-120	04-OCT-19
Rubidium (Rb)-Total			105.0		%		80-120	04-OCT-19
Selenium (Se)-Total			99.4		%		80-120	04-OCT-19
Silicon (Si)-Total			105.9		%		60-140	04-OCT-19
Silver (Ag)-Total			102.5		%		80-120	04-OCT-19
Sodium (Na)-Total			101.8		%		80-120	04-OCT-19
Strontium (Sr)-Total			102.1		%		80-120	04-OCT-19
Sulfur (S)-Total			102.9		%		80-120	04-OCT-19
Thallium (Tl)-Total			99.3		%		80-120	04-OCT-19
Tellurium (Te)-Total			100.8		%		80-120	04-OCT-19
Thorium (Th)-Total			98.0		%		70-130	04-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-2	LCS							
Tin (Sn)-Total			101.0		%		80-120	04-OCT-19
Titanium (Ti)-Total			98.3		%		80-120	04-OCT-19
Tungsten (W)-Total			100.5		%		80-120	04-OCT-19
Uranium (U)-Total			101.6		%		80-120	04-OCT-19
Vanadium (V)-Total			103.3		%		80-120	04-OCT-19
Zinc (Zn)-Total			99.2		%		80-120	04-OCT-19
Zirconium (Zr)-Total			101.2		%		80-120	04-OCT-19
WG3182336-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-OCT-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Boron (B)-Total			<0.010		mg/L		0.01	04-OCT-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	04-OCT-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	04-OCT-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	04-OCT-19
Iron (Fe)-Total			<0.010		mg/L		0.01	04-OCT-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	04-OCT-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	04-OCT-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-OCT-19
Potassium (K)-Total			<0.050		mg/L		0.05	04-OCT-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	04-OCT-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Silicon (Si)-Total			<0.10		mg/L		0.1	04-OCT-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	04-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-1	MB							
Sodium (Na)-Total			<0.050		mg/L		0.05	04-OCT-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	04-OCT-19
Sulfur (S)-Total			<0.50		mg/L		0.5	04-OCT-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	04-OCT-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	04-OCT-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-OCT-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	04-OCT-19
WG3182336-5	MS	WG3182336-6						
Aluminum (Al)-Total			90.4		%		70-130	04-OCT-19
Antimony (Sb)-Total			98.3		%		70-130	04-OCT-19
Arsenic (As)-Total			95.7		%		70-130	04-OCT-19
Barium (Ba)-Total			91.9		%		70-130	04-OCT-19
Beryllium (Be)-Total			94.8		%		70-130	04-OCT-19
Bismuth (Bi)-Total			90.8		%		70-130	04-OCT-19
Boron (B)-Total			92.9		%		70-130	04-OCT-19
Cadmium (Cd)-Total			94.9		%		70-130	04-OCT-19
Calcium (Ca)-Total			N/A	MS-B	%		-	04-OCT-19
Chromium (Cr)-Total			96.5		%		70-130	04-OCT-19
Cesium (Cs)-Total			95.9		%		70-130	04-OCT-19
Cobalt (Co)-Total			94.9		%		70-130	04-OCT-19
Copper (Cu)-Total			93.1		%		70-130	04-OCT-19
Iron (Fe)-Total			N/A	MS-B	%		-	04-OCT-19
Lead (Pb)-Total			94.3		%		70-130	04-OCT-19
Lithium (Li)-Total			91.4		%		70-130	04-OCT-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	04-OCT-19
Manganese (Mn)-Total			94.5		%		70-130	04-OCT-19
Molybdenum (Mo)-Total			96.8		%		70-130	04-OCT-19
Nickel (Ni)-Total			93.1		%		70-130	04-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-5 MS		WG3182336-6						
Phosphorus (P)-Total			104.2		%		70-130	04-OCT-19
Potassium (K)-Total			93.6		%		70-130	04-OCT-19
Rubidium (Rb)-Total			95.8		%		70-130	04-OCT-19
Selenium (Se)-Total			94.7		%		70-130	04-OCT-19
Silicon (Si)-Total			N/A	MS-B	%		-	04-OCT-19
Silver (Ag)-Total			95.9		%		70-130	04-OCT-19
Sodium (Na)-Total			N/A	MS-B	%		-	04-OCT-19
Strontium (Sr)-Total			N/A	MS-B	%		-	04-OCT-19
Sulfur (S)-Total			93.4		%		70-130	04-OCT-19
Thallium (Tl)-Total			91.6		%		70-130	04-OCT-19
Tellurium (Te)-Total			91.9		%		70-130	04-OCT-19
Thorium (Th)-Total			95.1		%		70-130	04-OCT-19
Tin (Sn)-Total			96.3		%		70-130	04-OCT-19
Titanium (Ti)-Total			94.8		%		70-130	04-OCT-19
Tungsten (W)-Total			95.7		%		70-130	04-OCT-19
Uranium (U)-Total			N/A	MS-B	%		-	04-OCT-19
Vanadium (V)-Total			97.5		%		70-130	04-OCT-19
Zinc (Zn)-Total			90.2		%		70-130	04-OCT-19
Zirconium (Zr)-Total			93.6		%		70-130	04-OCT-19
NH3-F-WT		Water						
Batch	R4860725							
WG3183728-3 DUP		L2357716-1						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3183728-2 LCS			99.9		%		85-115	07-OCT-19
WG3183728-1 MB			<0.010		mg/L		0.01	07-OCT-19
WG3183728-4 MS		L2357716-1	104.4		%		75-125	07-OCT-19
Ammonia, Total (as N)								
NO3-IC-WT		Water						
Batch	R4859139							
WG3181734-24 DUP		WG3181734-23						
Nitrate (as N)		0.073	0.074		mg/L	0.3	20	04-OCT-19
WG3181734-22 LCS			101.5				90-110	
Nitrate (as N)								



Quality Control Report

Workorder: L2356925

Report Date: 24-OCT-19

Page 9 of 12

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-BF	Water							
Batch	R4851401							
WG3178028-2	LCS							
Total Dissolved Solids			104.5		%		85-115	01-OCT-19
WG3178028-1	MB							
Total Dissolved Solids			<20		mg/L		20	01-OCT-19
SOLIDS-TSS-BF	Water							
Batch	R4851221							
WG3178016-3	DUP	L2356874-2						
Total Suspended Solids		72.0	73.0		mg/L	1.4	25	01-OCT-19
WG3178016-2	LCS							
Total Suspended Solids			101.0		%		85-115	01-OCT-19
WG3178016-1	MB							
Total Suspended Solids			<2.0		mg/L		2	01-OCT-19
TKN-WT	Water							
Batch	R4860925							
WG3183637-3	DUP	L2357716-1						
Total Kjeldahl Nitrogen		<0.15	<0.15	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3183637-2	LCS							
Total Kjeldahl Nitrogen			100.3		%		75-125	07-OCT-19
WG3183637-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	07-OCT-19
WG3183637-4	MS	L2357716-1						
Total Kjeldahl Nitrogen			88.9		%		70-130	07-OCT-19
TOC-WT	Water							
Batch	R4860639							
WG3183590-3	DUP	L2356925-1						
Total Organic Carbon		2.42	2.45		mg/L	1.1	20	07-OCT-19
WG3183590-2	LCS							
Total Organic Carbon			106.7		%		80-120	07-OCT-19
WG3183590-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	07-OCT-19
WG3183590-4	MS	L2356925-1						
Total Organic Carbon			101.6		%		70-130	07-OCT-19
TURBIDITY-BF	Water							
Batch	R4851213							
WG3177999-3	DUP	L2356874-1						
Turbidity		14.2	13.9		NTU	2.1	15	01-OCT-19
WG3177999-2	LCS							



Quality Control Report

Workorder: L2356925

Report Date: 24-OCT-19

Page 10 of 12

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-BF		Water						
Batch	R4851213							
WG3177999-2	LCS							
Turbidity			114.0		%		85-115	01-OCT-19
WG3177999-1	MB							
Turbidity			<0.10		NTU		0.1	01-OCT-19

Quality Control Report

Workorder: L2356925

Report Date: 24-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 11 of 12

Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2356925

Report Date: 24-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Page 12 of 12

Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Organic / Inorganic Carbon							
Dissolved Organic Carbon							
	1	30-SEP-19 12:50	04-OCT-19 18:00	3	4	days	EHT
	2	30-SEP-19 13:20	04-OCT-19 18:00	3	4	days	EHT
	3	30-SEP-19 13:20	04-OCT-19 18:00	3	4	days	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2356925 were received on 01-OCT-19 06:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Tuesday, October 22, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1910177
Project Name:
Project Number: L2356925

Dear Mr. Hawthorne:

Three water samples were received from ALS Environmental, on 10/8/2019. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1910177

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1910177

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2356925

Client PO Number: L2356925

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2356925-1	1910177-1		WATER	30-Sep-19	
L2356925-2	1910177-2		WATER	30-Sep-19	
L2356925-3	1910177-3		WATER	30-Sep-19	

**L2356925**

WATERLOO

1210177

Subcontract Request Form**Subcontract To:****ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524**NOTES:** Please reference on final report and invoice: PO# L2356925
ALS requires QC data to be provided with your final results.Please see enclosed **3** sample(s) in **3** Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2356925-1 MS-08-DS		9/30/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	
L2356925-2 MS-08-US		9/30/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	
L2356925-3 MS-08-US02		9/30/2019	E
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne

60 NORTHLAND ROAD, UNIT 1

WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to:

Rick.Hawthorne@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: [Signature] Date Received: 10/3/19 12:00

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Aus Waterloo Workorder No: 1210177
Project Manager: KMD Initials: TEM Date: 10/28/19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<u>YES</u>	NO			
2. Are custody seals on shipping containers intact?		<u>NONE</u>	YES	NO *			
3. Are custody seals on sample containers intact?		<u>NONE</u>	YES	NO *			
4. Is there a COC (chain-of-custody) present?			<u>YES</u>	NO *			
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<u>YES</u>	NO *			
6. Are short-hold samples present?			YES	<u>NO</u>			
7. Are all samples within holding times for the requested analyses?			<u>YES</u>	NO *			
8. Were all sample containers received intact? (not broken or leaking)			<u>YES</u>	NO *			
9. Is there sufficient sample for the requested analyses?			<u>YES</u>	NO *			
10. Are all samples in the proper containers for the requested analyses?			<u>YES</u>	NO *			
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<u>YES</u>	NO *			
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<u>N/A</u>	YES	NO			
13. Were the samples shipped on ice?			<u>YES</u>	NO			
14. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#1	<u>(#3)</u>	#4	<u>RAD ONLY</u>	<u>YES</u>	NO
Cooler #: <u>1</u>							
Temperature (°C): <u>5.7</u>							
No. of custody seals on cooler: <u>0</u>							
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>						
	Background µR/hr reading: <u>13</u>						
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)							

*** Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

All client bottle ID's vs ALS lab ID's double-checked by: TEM

If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/9/19

1210177

12-0
S.A

EXPRESS WORLDWIDE

WPX

DHL

2019-10-07 DCV8 3.0.1 / "12-1403"

80524 FORT COLLINS, UNITED STATES OF AMERICA

Origin:
YHM

US - DEN - DEN

C

Day Time

Date:
2019-10-07

Pce/Shpt Weight
J24.2 LB

Piece
1/1

Content Description
Water Sample



WAYBILL 74 1380 5184



(2L)US60524+48000001



(J)JD01 4600 0071 2459 3321

Client: ALS Environmental

Date: 22-Oct-19

Project: L2356925

Work Order: 1910177

Sample ID: L2356925-1

Lab ID: 1910177-1

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		SOP 783		Prep Date: 10/10/2019		PrepBy: TRW
Ra-226	0.0066 (+/- 0.0056)	U	0.008	BQ/l	NA	10/21/2019 13:40
Carr: BARIUM	96.4		40-110	%REC	DL = NA	10/21/2019 13:40

Client: ALS Environmental

Date: 22-Oct-19

Project: L2356925

Work Order: 1910177

Sample ID: L2356925-2

Lab ID: 1910177-2

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1**SOP 783**

Prep Date: 10/10/2019

PrepBy: TRW

Ra-226 0.0047 (+/- 0.0047)

U

0.0069 BQ/l

NA

10/21/2019 13:40

Carr: BARIUM

94.3

40-110 %REC

DL = NA

10/21/2019 13:40

Client: ALS Environmental

Date: 22-Oct-19

Project: L2356925

Work Order: 1910177

Sample ID: L2356925-3

Lab ID: 1910177-3

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1**SOP 783**

Prep Date: 10/10/2019

PrepBy: TRW

Ra-226 0.00044 (+/- 0.0034)

U

0.0066 BQ/l

NA

10/21/2019 13:40

Carr: BARIUM

97.4

40-110 %REC

DL = NA

10/21/2019 13:40

Client: ALS Environmental

Date: 22-Oct-19

Project: L2356925

Work Order: 1910177

Sample ID: L2356925-3

Lab ID: 1910177-3

Legal Location:

Matrix: WATER

Collection Date: 9/30/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

ALS -- Fort Collins

Date: 10/22/2019 12:5

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1910177

Project: L2356925

Batch ID: RE191010-1-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE191010-1			Units: BQ/I		Analysis Date: 10/21/2019 14:15					
Client ID:		Run ID: RE191010-1A			Prep Date: 10/10/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.85 (+/- 0.461)	0.00675	1.72		108	67-120					P
Carr: BARIUM	16800		17940		93.7	40-110					

LCSD	Sample ID: RE191010-1				Units: BQ/I		Analysis Date: 10/21/2019 14:15				
Client ID:	Run ID: RE191010-1A				Prep Date: 10/10/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.71 (+/- 0.427)	0.0152	1.72		99.2	67-120		1.85	0.2	2.1	P,M3
Carr: BARIUM	17300		17930		96.6	40-110		16800			

MB	Sample ID: RE191010-1				Units: BQ/I		Analysis Date: 10/21/2019 14:15				
Client ID:		Run ID: RE191010-1A				Prep Date: 10/10/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.00045 (+/- 0.0030)		0.0059								U
Carr: BARIUM	17800		17930		99.1	40-110					

The following samples were analyzed in this batch:

1910177-1 1910177-2 1910177-3



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 01-OCT-19
Report Date: 24-OCT-19 13:52 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2357232
Project P.O. #: 4500057496
Job Reference: MS-08 WT TOX
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 02-OCT-19 09:46

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357232-1	MS-08							
Sampled By: KB/LM on 01-OCT-19 @ 09:15								
Matrix: WATER								
Physical Tests								
Conductivity		5040		3.0	umhos/cm		03-OCT-19	R4858920
Hardness (as CaCO3)		3990		1.3	mg/L		03-OCT-19	
pH		8.79		0.10	pH units		02-OCT-19	R4853590
Total Suspended Solids		6.0		2.0	mg/L		01-OCT-19	R4853597
Total Dissolved Solids		5620		20	mg/L		02-OCT-19	R4854358
Turbidity		4.52		0.10	NTU		02-OCT-19	R4853592
Anions and Nutrients								
Acidity (as CaCO3)		2.3		2.0	mg/L		06-OCT-19	R4860194
Alkalinity, Total (as CaCO3)		39		10	mg/L		03-OCT-19	R4858920
Ammonia, Total (as N)		3.79	DLHC	0.10	mg/L		03-OCT-19	R4858766
Chloride (Cl)		17.2	DLDS	5.0	mg/L		03-OCT-19	R4858736
Fluoride (F)		<0.20	DLDS	0.20	mg/L		03-OCT-19	R4858736
Nitrate (as N)		16.7	DLDS	0.20	mg/L		03-OCT-19	R4858736
Total Kjeldahl Nitrogen		4.38		0.15	mg/L	03-OCT-19	04-OCT-19	R4859216
Phosphorus, Total		<0.0030		0.0030	mg/L	03-OCT-19	04-OCT-19	R4858789
Sulfate (SO4)		4070	DLDS	3.0	mg/L		03-OCT-19	R4858736
Cyanides								
Cyanide, Total		0.0128		0.0020	mg/L		03-OCT-19	R4857839
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					03-OCT-19	R4858483
Dissolved Organic Carbon		3.82		0.50	mg/L	03-OCT-19	04-OCT-19	R4858934
Total Organic Carbon		4.16		0.50	mg/L		04-OCT-19	R4858932
Total Metals								
Aluminum (Al)-Total		0.082	DLHC	0.050	mg/L	03-OCT-19	03-OCT-19	R4857778
Antimony (Sb)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Arsenic (As)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Barium (Ba)-Total		0.0120	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Beryllium (Be)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Bismuth (Bi)-Total		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857778
Boron (B)-Total		<0.10	DLHC	0.10	mg/L	03-OCT-19	03-OCT-19	R4857778
Cadmium (Cd)-Total		<0.000050	DLHC	0.000050	mg/L	03-OCT-19	03-OCT-19	R4857778
Calcium (Ca)-Total		507	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857778
Cesium (Cs)-Total		<0.00010	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857778
Chromium (Cr)-Total		<0.0050	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857778
Cobalt (Co)-Total		0.0050	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Copper (Cu)-Total		<0.010	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857778
Iron (Fe)-Total		0.42	DLHC	0.10	mg/L	03-OCT-19	03-OCT-19	R4857778
Lead (Pb)-Total		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857778
Lithium (Li)-Total		0.030	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857778
Magnesium (Mg)-Total		664	DLHC	0.050	mg/L	03-OCT-19	03-OCT-19	R4857778
Manganese (Mn)-Total		1.12	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857778
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		04-OCT-19	R4858970

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357232-1	MS-08							
Sampled By: KB/LM on 01-OCT-19 @ 09:15								
Matrix: WATER								
Total Metals								
Molybdenum (Mo)-Total		0.00141	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857778
Nickel (Ni)-Total		0.0071	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857778
Phosphorus (P)-Total		<0.50	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857778
Potassium (K)-Total		6.91	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857778
Rubidium (Rb)-Total		0.0082	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857778
Selenium (Se)-Total		0.00642	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857778
Silicon (Si)-Total		<1.0	DLHC	1.0	mg/L	03-OCT-19	03-OCT-19	R4857778
Silver (Ag)-Total		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857778
Sodium (Na)-Total		6.41	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857778
Strontium (Sr)-Total		1.58	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857778
Sulfur (S)-Total		1350	DLHC	5.0	mg/L	03-OCT-19	03-OCT-19	R4857778
Tellurium (Te)-Total		<0.0020	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857778
Thallium (Tl)-Total		<0.00010	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857778
Thorium (Th)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Tin (Sn)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Titanium (Ti)-Total		0.0037	DLHC	0.0030	mg/L	03-OCT-19	03-OCT-19	R4857778
Tungsten (W)-Total		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857778
Uranium (U)-Total		0.00190	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857778
Vanadium (V)-Total		<0.0050	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857778
Zinc (Zn)-Total		<0.030	DLHC	0.030	mg/L	03-OCT-19	03-OCT-19	R4857778
Zirconium (Zr)-Total		<0.0020	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857778
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					04-OCT-19	R4858748
Dissolved Metals Filtration Location		FIELD					03-OCT-19	R4857747
Aluminum (Al)-Dissolved		<0.050	DLHC	0.050	mg/L	03-OCT-19	03-OCT-19	R4857779
Antimony (Sb)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Arsenic (As)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Barium (Ba)-Dissolved		0.0117	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Beryllium (Be)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Bismuth (Bi)-Dissolved		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857779
Boron (B)-Dissolved		<0.10	DLHC	0.10	mg/L	03-OCT-19	03-OCT-19	R4857779
Cadmium (Cd)-Dissolved		<0.000050	DLHC	0.000050	mg/L	03-OCT-19	03-OCT-19	R4857779
Calcium (Ca)-Dissolved		509	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857779
Cesium (Cs)-Dissolved		<0.00010	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857779
Chromium (Cr)-Dissolved		<0.0050	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857779
Cobalt (Co)-Dissolved		0.0046	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Copper (Cu)-Dissolved		0.0050	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857779
Iron (Fe)-Dissolved		<0.10	DLHC	0.10	mg/L	03-OCT-19	03-OCT-19	R4857779
Lead (Pb)-Dissolved		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857779
Lithium (Li)-Dissolved		0.033	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857779
Magnesium (Mg)-Dissolved		661	DLHC	0.050	mg/L	03-OCT-19	03-OCT-19	R4857779

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357232-1 MS-08 Sampled By: KB/LM on 01-OCT-19 @ 09:15 Matrix: WATER								
Dissolved Metals								
Manganese (Mn)-Dissolved		1.10	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857779
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4858972
Molybdenum (Mo)-Dissolved		0.00156	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857779
Nickel (Ni)-Dissolved		0.0067	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857779
Phosphorus (P)-Dissolved		<0.50	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857779
Potassium (K)-Dissolved		6.97	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857779
Rubidium (Rb)-Dissolved		0.0079	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857779
Selenium (Se)-Dissolved		0.00690	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857779
Silicon (Si)-Dissolved		<0.50	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857779
Silver (Ag)-Dissolved		<0.00050	DLHC	0.00050	mg/L	03-OCT-19	03-OCT-19	R4857779
Sodium (Na)-Dissolved		6.41	DLHC	0.50	mg/L	03-OCT-19	03-OCT-19	R4857779
Strontium (Sr)-Dissolved		1.63	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857779
Sulfur (S)-Dissolved		1370	DLHC	5.0	mg/L	03-OCT-19	03-OCT-19	R4857779
Tellurium (Te)-Dissolved		<0.0020	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857779
Thallium (Tl)-Dissolved		<0.00010	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857779
Thorium (Th)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Tin (Sn)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Titanium (Ti)-Dissolved		<0.0030	DLHC	0.0030	mg/L	03-OCT-19	03-OCT-19	R4857779
Tungsten (W)-Dissolved		<0.0010	DLHC	0.0010	mg/L	03-OCT-19	03-OCT-19	R4857779
Uranium (U)-Dissolved		0.00185	DLHC	0.00010	mg/L	03-OCT-19	03-OCT-19	R4857779
Vanadium (V)-Dissolved		<0.0050	DLHC	0.0050	mg/L	03-OCT-19	03-OCT-19	R4857779
Zinc (Zn)-Dissolved		<0.010	DLHC	0.010	mg/L	03-OCT-19	03-OCT-19	R4857779
Zirconium (Zr)-Dissolved		<0.0020	DLHC	0.0020	mg/L	03-OCT-19	03-OCT-19	R4857779
Radiological Parameters								
Ra-226		0.018		0.0035	Bq/L	08-OCT-19	17-OCT-19	R4851666

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2357232-1
Matrix Spike	Lithium (Li)-Dissolved	MS-B	L2357232-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2357232-1
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2357232-1
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2357232-1
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2357232-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2357232-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2357232-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2357232-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2357232-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2357232-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2357232-1
Matrix Spike	Lithium (Li)-Total	MS-B	L2357232-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2357232-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2357232-1
Matrix Spike	Potassium (K)-Total	MS-B	L2357232-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2357232-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2357232-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2357232-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2357232-1
Matrix Spike	Uranium (U)-Total	MS-B	L2357232-1
Matrix Spike	Ammonia, Total (as N)	MS-B	L2357232-1
Matrix Spike	Phosphorus, Total	MS-B	L2357232-1

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-TITR-TB	Water	Acidity	APHA 2310 B modified
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Reference Information

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B
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Water samples can be measured directly by immersing the conductivity cell into the sample.

F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
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Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
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Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
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This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

PH-BF	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
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SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-BF	Water	Total Dissolved Solids	APHA 2540C
A well-mixed sample is filtered though glass fibres filter. A known volume of the filtrate is evaporated and dried at 180 +/- 2C for 1hr.			
SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
TURBIDITY-BF	Water	Turbidity	APHA 2130 B
Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

Page 1 of 16

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ACY-TITR-TB		Water						
Batch	R4860194							
WG3183287-8	LCS							
Acidity (as CaCO3)			94.7		%		85-115	06-OCT-19
WG3183287-7	MB							
Acidity (as CaCO3)			<2.0		mg/L		2	06-OCT-19
ALK-WT		Water						
Batch	R4858920							
WG3181643-4	DUP	WG3181643-3						
Alkalinity, Total (as CaCO3)		39	39		mg/L	0.6	20	03-OCT-19
WG3181643-2	LCS							
Alkalinity, Total (as CaCO3)			104.4		%		85-115	03-OCT-19
WG3181643-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	03-OCT-19
CL-IC-N-WT		Water						
Batch	R4858736							
WG3180434-14	DUP	L2358193-2						
Chloride (Cl)		1.07	1.07		mg/L	0.5	20	03-OCT-19
WG3180434-12	LCS							
Chloride (Cl)			102.0		%		90-110	03-OCT-19
WG3180434-11	MB							
Chloride (Cl)			<0.50		mg/L		0.5	03-OCT-19
WG3180434-15	MS	L2358193-2						
Chloride (Cl)			99.4		%		75-125	03-OCT-19
CN-TOT-WT		Water						
Batch	R4857839							
WG3177861-3	DUP	L2355354-9						
Cyanide, Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-OCT-19
WG3177861-2	LCS							
Cyanide, Total			97.4		%		80-120	03-OCT-19
WG3177861-1	MB							
Cyanide, Total			<0.0020		mg/L		0.002	03-OCT-19
WG3177861-4	MS	L2355354-9						
Cyanide, Total			96.8		%		70-130	03-OCT-19
DOC-WT		Water						
Batch	R4858934							
WG3181358-3	DUP	L2357232-1						
Dissolved Organic Carbon		3.82	3.99		mg/L	4.3	20	04-OCT-19
WG3181358-2	LCS							



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT		Water						
Batch	R4858970							
WG3181845-4	DUP	WG3181845-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	04-OCT-19
WG3181845-2	LCS							
Mercury (Hg)-Total			106.0		%		80-120	04-OCT-19
WG3181845-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	04-OCT-19
WG3181845-6	MS	WG3181845-5						
Mercury (Hg)-Total			97.3		%		70-130	04-OCT-19
MET-D-CCMS-WT		Water						
Batch	R4857779							
WG3180561-4	DUP	WG3180561-3						
Aluminum (Al)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	03-OCT-19
Antimony (Sb)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Arsenic (As)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Barium (Ba)-Dissolved		0.0117	0.0118		mg/L	0.5	20	03-OCT-19
Beryllium (Be)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Bismuth (Bi)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Boron (B)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	03-OCT-19
Cadmium (Cd)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-OCT-19
Calcium (Ca)-Dissolved		509	495		mg/L	2.9	20	03-OCT-19
Cesium (Cs)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-OCT-19
Chromium (Cr)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-OCT-19
Cobalt (Co)-Dissolved		0.0046	0.0045		mg/L	2.5	20	03-OCT-19
Copper (Cu)-Dissolved		0.0050	0.0047		mg/L	6.7	20	03-OCT-19
Iron (Fe)-Dissolved		<0.10	<0.10	RPD-NA	mg/L	N/A	20	03-OCT-19
Lead (Pb)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Lithium (Li)-Dissolved		0.033	0.030		mg/L	9.0	20	03-OCT-19
Magnesium (Mg)-Dissolved		661	651		mg/L	1.5	20	03-OCT-19
Manganese (Mn)-Dissolved		1.10	1.09		mg/L	1.5	20	03-OCT-19
Molybdenum (Mo)-Dissolved		0.00156	0.00160		mg/L	2.6	20	03-OCT-19
Nickel (Ni)-Dissolved		0.0067	0.0066		mg/L	1.8	20	03-OCT-19
Phosphorus (P)-Dissolved		<0.50	<0.50	RPD-NA	mg/L	N/A	20	03-OCT-19
Potassium (K)-Dissolved		6.97	6.84		mg/L	1.8	20	03-OCT-19
Rubidium (Rb)-Dissolved		0.0079	0.0080		mg/L	1.8	20	03-OCT-19
Selenium (Se)-Dissolved		0.00690	0.00635		mg/L	8.3	20	03-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4857779							
WG3180561-4 DUP		WG3180561-3						
Silicon (Si)-Dissolved		<0.50	<0.50	RPD-NA	mg/L	N/A	20	03-OCT-19
Silver (Ag)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Sodium (Na)-Dissolved		6.41	6.30		mg/L	1.8	20	03-OCT-19
Strontium (Sr)-Dissolved		1.63	1.59		mg/L	2.7	20	03-OCT-19
Sulfur (S)-Dissolved		1370	1350		mg/L	1.8	20	03-OCT-19
Tellurium (Te)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-OCT-19
Thallium (Tl)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-OCT-19
Thorium (Th)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Tin (Sn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Titanium (Ti)-Dissolved		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	03-OCT-19
Tungsten (W)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Uranium (U)-Dissolved		0.00185	0.00186		mg/L	0.2	20	03-OCT-19
Vanadium (V)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-OCT-19
Zinc (Zn)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	03-OCT-19
Zirconium (Zr)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-OCT-19
WG3180561-2 LCS								
Aluminum (Al)-Dissolved			107.8		%		80-120	03-OCT-19
Antimony (Sb)-Dissolved			100.7		%		80-120	03-OCT-19
Arsenic (As)-Dissolved			103.2		%		80-120	03-OCT-19
Barium (Ba)-Dissolved			99.2		%		80-120	03-OCT-19
Beryllium (Be)-Dissolved			98.7		%		80-120	03-OCT-19
Bismuth (Bi)-Dissolved			98.0		%		80-120	03-OCT-19
Boron (B)-Dissolved			98.3		%		80-120	03-OCT-19
Cadmium (Cd)-Dissolved			105.7		%		80-120	03-OCT-19
Calcium (Ca)-Dissolved			99.1		%		80-120	03-OCT-19
Cesium (Cs)-Dissolved			98.3		%		80-120	03-OCT-19
Chromium (Cr)-Dissolved			105.9		%		80-120	03-OCT-19
Cobalt (Co)-Dissolved			104.1		%		80-120	03-OCT-19
Copper (Cu)-Dissolved			102.7		%		80-120	03-OCT-19
Iron (Fe)-Dissolved			100.7		%		80-120	03-OCT-19
Lead (Pb)-Dissolved			102.9		%		80-120	03-OCT-19
Lithium (Li)-Dissolved			95.7		%		80-120	03-OCT-19
Magnesium (Mg)-Dissolved			111.1		%		80-120	03-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4857779							
WG3180561-2		LCS						
Manganese (Mn)-Dissolved			104.4		%		80-120	03-OCT-19
Molybdenum (Mo)-Dissolved			96.1		%		80-120	03-OCT-19
Nickel (Ni)-Dissolved			102.6		%		80-120	03-OCT-19
Phosphorus (P)-Dissolved			108.5		%		80-120	03-OCT-19
Potassium (K)-Dissolved			100.9		%		80-120	03-OCT-19
Rubidium (Rb)-Dissolved			107.6		%		80-120	03-OCT-19
Selenium (Se)-Dissolved			103.3		%		80-120	03-OCT-19
Silicon (Si)-Dissolved			103.6		%		60-140	03-OCT-19
Silver (Ag)-Dissolved			95.6		%		80-120	03-OCT-19
Sodium (Na)-Dissolved			108.8		%		80-120	03-OCT-19
Strontium (Sr)-Dissolved			100.5		%		80-120	03-OCT-19
Sulfur (S)-Dissolved			102.6		%		80-120	03-OCT-19
Tellurium (Te)-Dissolved			95.3		%		80-120	03-OCT-19
Thallium (Tl)-Dissolved			100.1		%		80-120	03-OCT-19
Thorium (Th)-Dissolved			102.2		%		80-120	03-OCT-19
Tin (Sn)-Dissolved			105.4		%		80-120	03-OCT-19
Titanium (Ti)-Dissolved			101.7		%		80-120	03-OCT-19
Tungsten (W)-Dissolved			98.6		%		80-120	03-OCT-19
Uranium (U)-Dissolved			97.1		%		80-120	03-OCT-19
Vanadium (V)-Dissolved			106.3		%		80-120	03-OCT-19
Zinc (Zn)-Dissolved			102.3		%		80-120	03-OCT-19
Zirconium (Zr)-Dissolved			96.3		%		80-120	03-OCT-19
WG3180561-1		MB						
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	03-OCT-19
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	03-OCT-19
Boron (B)-Dissolved			<0.010		mg/L		0.01	03-OCT-19
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	03-OCT-19
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	03-OCT-19
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	03-OCT-19
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	03-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4857779							
WG3180561-1 MB								
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	03-OCT-19
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	03-OCT-19
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	03-OCT-19
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	03-OCT-19
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	03-OCT-19
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	03-OCT-19
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	03-OCT-19
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	03-OCT-19
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	03-OCT-19
Potassium (K)-Dissolved			<0.050		mg/L		0.05	03-OCT-19
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	03-OCT-19
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	03-OCT-19
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	03-OCT-19
Silver (Ag)-Dissolved			<0.000050		mg/L		0.00005	03-OCT-19
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	03-OCT-19
Strontium (Sr)-Dissolved			<0.0010		mg/L		0.001	03-OCT-19
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	03-OCT-19
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	03-OCT-19
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	03-OCT-19
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	03-OCT-19
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	03-OCT-19
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	03-OCT-19
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	03-OCT-19
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	03-OCT-19
Zirconium (Zr)-Dissolved			<0.00020		mg/L		0.0002	03-OCT-19
WG3180561-5 MS		WG3180561-3						
Aluminum (Al)-Dissolved			89.9		%		70-130	03-OCT-19
Antimony (Sb)-Dissolved			92.6		%		70-130	03-OCT-19
Arsenic (As)-Dissolved			100.5		%		70-130	03-OCT-19
Beryllium (Be)-Dissolved			91.1		%		70-130	03-OCT-19
Bismuth (Bi)-Dissolved			90.3		%		70-130	03-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT		Water						
Batch	R4857779							
WG3180561-5 MS		WG3180561-3						
Cadmium (Cd)-Dissolved			89.7		%		70-130	03-OCT-19
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Cesium (Cs)-Dissolved			91.7		%		70-130	03-OCT-19
Chromium (Cr)-Dissolved			100.1		%		70-130	03-OCT-19
Iron (Fe)-Dissolved			79.7		%		70-130	03-OCT-19
Lead (Pb)-Dissolved			93.9		%		70-130	03-OCT-19
Lithium (Li)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Molybdenum (Mo)-Dissolved			82.1		%		70-130	03-OCT-19
Nickel (Ni)-Dissolved			72.8		%		70-130	03-OCT-19
Phosphorus (P)-Dissolved			106.7		%		70-130	03-OCT-19
Potassium (K)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Rubidium (Rb)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Selenium (Se)-Dissolved			89.5		%		70-130	03-OCT-19
Silver (Ag)-Dissolved			85.9		%		70-130	03-OCT-19
Sodium (Na)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Sulfur (S)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Tellurium (Te)-Dissolved			86.1		%		70-130	03-OCT-19
Thallium (Tl)-Dissolved			93.4		%		70-130	03-OCT-19
Thorium (Th)-Dissolved			92.0		%		70-130	03-OCT-19
Tin (Sn)-Dissolved			96.2		%		70-130	03-OCT-19
Titanium (Ti)-Dissolved			97.2		%		70-130	03-OCT-19
Tungsten (W)-Dissolved			95.3		%		70-130	03-OCT-19
Uranium (U)-Dissolved			N/A	MS-B	%		-	03-OCT-19
Vanadium (V)-Dissolved			102.9		%		70-130	03-OCT-19
Zinc (Zn)-Dissolved			92.6		%		70-130	03-OCT-19
Zirconium (Zr)-Dissolved			91.9		%		70-130	03-OCT-19
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-4 DUP		WG3180546-3						
Aluminum (Al)-Total		0.082	0.096		mg/L	16	20	03-OCT-19
Antimony (Sb)-Total		<0.0010	<0.0010					



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-4 DUP		WG3180546-3						
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Barium (Ba)-Total		0.0120	0.0124		mg/L	3.9	20	03-OCT-19
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Boron (B)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	03-OCT-19
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-OCT-19
Calcium (Ca)-Total		507	514		mg/L	1.4	20	03-OCT-19
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-OCT-19
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-OCT-19
Cobalt (Co)-Total		0.0050	0.0056		mg/L	9.9	20	03-OCT-19
Copper (Cu)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	03-OCT-19
Iron (Fe)-Total		0.42	0.44		mg/L	4.3	20	03-OCT-19
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Lithium (Li)-Total		0.030	0.031		mg/L	2.0	20	03-OCT-19
Magnesium (Mg)-Total		664	696		mg/L	4.7	20	03-OCT-19
Manganese (Mn)-Total		1.12	1.17		mg/L	4.6	20	03-OCT-19
Molybdenum (Mo)-Total		0.00141	0.00150		mg/L	6.0	20	03-OCT-19
Nickel (Ni)-Total		0.0071	0.0108	J	mg/L	0.0037	0.01	03-OCT-19
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	03-OCT-19
Potassium (K)-Total		6.91	7.28		mg/L	5.2	20	03-OCT-19
Rubidium (Rb)-Total		0.0082	0.0089		mg/L	8.4	20	03-OCT-19
Selenium (Se)-Total		0.00642	0.00677		mg/L	5.4	20	03-OCT-19
Silicon (Si)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	20	03-OCT-19
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	03-OCT-19
Sodium (Na)-Total		6.41	6.70		mg/L	4.4	20	03-OCT-19
Strontium (Sr)-Total		1.58	1.64		mg/L	3.7	20	03-OCT-19
Sulfur (S)-Total		1350	1420		mg/L	4.8	25	03-OCT-19
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-OCT-19
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-OCT-19
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	03-OCT-19
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Titanium (Ti)-Total		0.0037	0.0033		mg/L			03-OCT-19



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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-4 DUP		WG3180546-3						
Titanium (Ti)-Total		0.0037	0.0033		mg/L	10	20	03-OCT-19
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-OCT-19
Uranium (U)-Total		0.00190	0.00192		mg/L	1.2	20	03-OCT-19
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	03-OCT-19
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	03-OCT-19
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	03-OCT-19
WG3180546-2 LCS								
Aluminum (Al)-Total			103.5		%		80-120	03-OCT-19
Antimony (Sb)-Total			97.8		%		80-120	03-OCT-19
Arsenic (As)-Total			97.5		%		80-120	03-OCT-19
Barium (Ba)-Total			96.1		%		80-120	03-OCT-19
Beryllium (Be)-Total			91.3		%		80-120	03-OCT-19
Bismuth (Bi)-Total			90.9		%		80-120	03-OCT-19
Boron (B)-Total			89.6		%		80-120	03-OCT-19
Cadmium (Cd)-Total			99.9		%		80-120	03-OCT-19
Calcium (Ca)-Total			94.2		%		80-120	03-OCT-19
Chromium (Cr)-Total			98.5		%		80-120	03-OCT-19
Cesium (Cs)-Total			95.1		%		80-120	03-OCT-19
Cobalt (Co)-Total			97.4		%		80-120	03-OCT-19
Copper (Cu)-Total			96.7		%		80-120	03-OCT-19
Iron (Fe)-Total			95.0		%		80-120	03-OCT-19
Lead (Pb)-Total			95.2		%		80-120	03-OCT-19
Lithium (Li)-Total			90.5		%		80-120	03-OCT-19
Magnesium (Mg)-Total			102.0		%		80-120	03-OCT-19
Manganese (Mn)-Total			99.1		%		80-120	03-OCT-19
Molybdenum (Mo)-Total			92.0		%		80-120	03-OCT-19
Nickel (Ni)-Total			96.8		%		80-120	03-OCT-19
Phosphorus (P)-Total			98.2		%		70-130	03-OCT-19
Potassium (K)-Total			95.9		%		80-120	03-OCT-19
Rubidium (Rb)-Total			99.2		%		80-120	03-OCT-19
Selenium (Se)-Total			99.0		%		80-120	03-OCT-19
Silicon (Si)-Total			98.6		%		60-140	03-OCT-19
Silver (Ag)-Total			92.0		%		80-120	03-OCT-19



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-2		LCS						
Sodium (Na)-Total			104.1		%		80-120	03-OCT-19
Strontium (Sr)-Total			99.7		%		80-120	03-OCT-19
Sulfur (S)-Total			92.6		%		80-120	03-OCT-19
Thallium (Tl)-Total			94.8		%		80-120	03-OCT-19
Tellurium (Te)-Total			90.8		%		80-120	03-OCT-19
Thorium (Th)-Total			95.5		%		70-130	03-OCT-19
Tin (Sn)-Total			97.2		%		80-120	03-OCT-19
Titanium (Ti)-Total			96.3		%		80-120	03-OCT-19
Tungsten (W)-Total			93.2		%		80-120	03-OCT-19
Uranium (U)-Total			91.0		%		80-120	03-OCT-19
Vanadium (V)-Total			100.4		%		80-120	03-OCT-19
Zinc (Zn)-Total			94.8		%		80-120	03-OCT-19
Zirconium (Zr)-Total			91.6		%		80-120	03-OCT-19
WG3180546-1		MB						
Aluminum (Al)-Total			<0.0050		mg/L		0.005	03-OCT-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	03-OCT-19
Boron (B)-Total			<0.010		mg/L		0.01	03-OCT-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	03-OCT-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-OCT-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	03-OCT-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	03-OCT-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	03-OCT-19
Iron (Fe)-Total			<0.010		mg/L		0.01	03-OCT-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-OCT-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	03-OCT-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-OCT-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	03-OCT-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	03-OCT-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-OCT-19



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

Page 11 of 16

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-1	MB							
Phosphorus (P)-Total			<0.050		mg/L		0.05	03-OCT-19
Potassium (K)-Total			<0.050		mg/L		0.05	03-OCT-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	03-OCT-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	03-OCT-19
Silicon (Si)-Total			<0.10		mg/L		0.1	03-OCT-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	03-OCT-19
Sodium (Na)-Total			<0.050		mg/L		0.05	03-OCT-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	03-OCT-19
Sulfur (S)-Total			<0.50		mg/L		0.5	03-OCT-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	03-OCT-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	03-OCT-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	03-OCT-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	03-OCT-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	03-OCT-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	03-OCT-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-OCT-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	03-OCT-19
WG3180546-5	MS	WG3180546-3						
Aluminum (Al)-Total			108.9		%		70-130	03-OCT-19
Antimony (Sb)-Total			98.3		%		70-130	03-OCT-19
Arsenic (As)-Total			103.3		%		70-130	03-OCT-19
Barium (Ba)-Total			105.3		%		70-130	03-OCT-19
Beryllium (Be)-Total			94.7		%		70-130	03-OCT-19
Bismuth (Bi)-Total			93.6		%		70-130	03-OCT-19
Boron (B)-Total			90.1		%		70-130	03-OCT-19
Cadmium (Cd)-Total			99.5		%		70-130	03-OCT-19
Calcium (Ca)-Total			N/A	MS-B	%		-	03-OCT-19
Chromium (Cr)-Total			103.7		%		70-130	03-OCT-19
Cesium (Cs)-Total			97.2		%		70-130	03-OCT-19
Cobalt (Co)-Total			104.1		%		70-130	03-OCT-19
Copper (Cu)-Total			101.5		%		70-130	03-OCT-19
Iron (Fe)-Total			N/A	MS-B	%		-	03-OCT-19



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4857778							
WG3180546-5 MS		WG3180546-3						
Lead (Pb)-Total			95.4		%		70-130	03-OCT-19
Lithium (Li)-Total			N/A	MS-B	%		-	03-OCT-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	03-OCT-19
Manganese (Mn)-Total			N/A	MS-B	%		-	03-OCT-19
Molybdenum (Mo)-Total			98.0		%		70-130	03-OCT-19
Nickel (Ni)-Total			101.8		%		70-130	03-OCT-19
Phosphorus (P)-Total			98.6		%		70-130	03-OCT-19
Potassium (K)-Total			N/A	MS-B	%		-	03-OCT-19
Rubidium (Rb)-Total			N/A	MS-B	%		-	03-OCT-19
Selenium (Se)-Total			106.8		%		70-130	03-OCT-19
Silicon (Si)-Total			108.3		%		70-130	03-OCT-19
Silver (Ag)-Total			90.0		%		70-130	03-OCT-19
Sodium (Na)-Total			N/A	MS-B	%		-	03-OCT-19
Strontium (Sr)-Total			N/A	MS-B	%		-	03-OCT-19
Sulfur (S)-Total			N/A	MS-B	%		-	03-OCT-19
Thallium (Tl)-Total			95.5		%		70-130	03-OCT-19
Tellurium (Te)-Total			84.7		%		70-130	03-OCT-19
Thorium (Th)-Total			90.4		%		70-130	03-OCT-19
Tin (Sn)-Total			98.7		%		70-130	03-OCT-19
Titanium (Ti)-Total			93.8		%		70-130	03-OCT-19
Tungsten (W)-Total			101.0		%		70-130	03-OCT-19
Uranium (U)-Total			N/A	MS-B	%		-	03-OCT-19
Vanadium (V)-Total			108.0		%		70-130	03-OCT-19
Zinc (Zn)-Total			100.9		%		70-130	03-OCT-19
Zirconium (Zr)-Total			87.0		%		70-130	03-OCT-19
NH3-F-WT		Water						
Batch	R4858766							
WG3181797-15 DUP		L2357232-1						
Ammonia, Total (as N)		3.79	3.77		mg/L	0.4	20	03-OCT-19
WG3181797-14 LCS								
Ammonia, Total (as N)			99.5		%		85-115	03-OCT-19
WG3181797-13 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	03-OCT-19
WG3181797-16 MS		L2357232-1						



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT	Water							
Batch R4858766								
WG3181797-16 MS		L2357232-1						
Ammonia, Total (as N)			N/A	MS-B	%		-	03-OCT-19
NO3-IC-WT	Water							
Batch R4858736								
WG3180434-14 DUP		L2358193-2						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	03-OCT-19
WG3180434-12 LCS			101.4		%		90-110	03-OCT-19
Nitrate (as N)								
WG3180434-11 MB			<0.020		mg/L		0.02	03-OCT-19
Nitrate (as N)								
WG3180434-15 MS		L2358193-2	96.8		%		75-125	03-OCT-19
Nitrate (as N)								
P-T-COL-WT	Water							
Batch R4858789								
WG3181368-3 DUP		L2356976-1						
Phosphorus, Total		0.331	0.328		mg/L	0.9	20	04-OCT-19
WG3181368-2 LCS			98.7		%		80-120	04-OCT-19
Phosphorus, Total								
WG3181368-1 MB			<0.0030		mg/L		0.003	04-OCT-19
Phosphorus, Total								
WG3181368-4 MS		L2356976-1	N/A	MS-B	%		-	04-OCT-19
Phosphorus, Total								
PH-BF	Water							
Batch R4853590								
WG3178736-2 DUP		L2356948-1						
pH		6.82	6.83	J	pH units	0.01	0.2	02-OCT-19
WG3178736-1 LCS			7.02		pH units		6.9-7.1	02-OCT-19
pH								
SO4-IC-N-WT	Water							
Batch R4858736								
WG3180434-14 DUP		L2358193-2						
Sulfate (SO4)		12.0	12.0		mg/L	0.1	20	03-OCT-19
WG3180434-12 LCS			102.4		%		90-110	03-OCT-19
Sulfate (SO4)								
WG3180434-11 MB			<0.30		mg/L		0.3	03-OCT-19
Sulfate (SO4)								



Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	Water							
Batch R4858736								
WG3180434-15 MS		L2358193-2						
Sulfate (SO4)			100.7		%		75-125	03-OCT-19
SOLIDS-TDS-BF	Water							
Batch R4854358								
WG3178747-3 DUP		L2356948-3						
Total Dissolved Solids		519	463		mg/L	11	20	02-OCT-19
WG3178747-2 LCS								
Total Dissolved Solids			97.5		%		85-115	02-OCT-19
WG3178747-1 MB								
Total Dissolved Solids			<20		mg/L		20	02-OCT-19
SOLIDS-TSS-BF	Water							
Batch R4853597								
WG3178742-3 DUP		L2357326-1						
Total Suspended Solids		122	124		mg/L	1.6	25	01-OCT-19
WG3178742-2 LCS								
Total Suspended Solids			98.4		%		85-115	01-OCT-19
WG3178742-1 MB								
Total Suspended Solids			<2.0		mg/L		2	01-OCT-19
TKN-WT	Water							
Batch R4859216								
WG3181133-3 DUP		L2355174-4						
Total Kjeldahl Nitrogen		0.20	0.21		mg/L	7.8	20	04-OCT-19
WG3181133-2 LCS								
Total Kjeldahl Nitrogen			107.3		%		75-125	04-OCT-19
WG3181133-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	04-OCT-19
WG3181133-4 MS		L2355174-4						
Total Kjeldahl Nitrogen			102.2		%		70-130	04-OCT-19
TOC-WT	Water							
Batch R4858932								
WG3181671-3 DUP		L2357232-1						
Total Organic Carbon		4.16	4.25		mg/L	2.1	20	04-OCT-19
WG3181671-2 LCS								
Total Organic Carbon			106.3		%		80-120	04-OCT-19
WG3181671-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	04-OCT-19



Quality Control Report

Workorder: L2357232 Report Date: 24-OCT-19 Page 15 of 16

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TOC-WT	Water							
Batch	R4858932							
WG3181671-4 MS		L2357232-1						
Total Organic Carbon			104.4		%		70-130	04-OCT-19
TURBIDITY-BF	Water							
Batch	R4853592							
WG3178737-3 DUP		L2357383-1						
Turbidity		4.36	4.34		NTU	0.5	15	02-OCT-19
WG3178737-2 LCS								
Turbidity			110.0		%		85-115	02-OCT-19
WG3178737-1 MB								
Turbidity			<0.10		NTU		0.1	02-OCT-19

Quality Control Report

Workorder: L2357232

Report Date: 24-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Monday, October 21, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1910111
Project Name:
Project Number: L2357232

Dear Mr. Hawthorne:

One water sample was received from ALS Environmental, on 10/4/2019. The sample was scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1910111

Radium-226:

The sample was prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1910111

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2357232

Client PO Number: L2357232

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2357232-1	1910111-1		WATER	01-Oct-19	



1910111

L2357232

WATERLOO

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA

225 COMMERCE DRIVE
FORT COLLINS, CO 80524

NOTES: Please reference on final report and invoice: PO# L2357232
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 1 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2357232-1 MS-08		10/ 1/ 2019	E
①	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910
Analysis and reporting info contact: Rick Hawthorne
60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910 Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: Rick.Hawthorne@alsglobal.com

Shipped By: _____ Date Shipped: _____
Received By: C. J. Mable Date Received: 10-4-19 13:10
Verified By: _____ Date Verified: _____
Temperature: _____

Sample Integrity Issues: _____



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS-Waterloo Workorder No: 191011
Project Manager: KO Initials: CDK Date: 10-4-19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<u>YES</u>	NO
2. Are custody seals on shipping containers intact?		NONE	<u>YES</u>	NO *
3. Are custody seals on sample containers intact?		<u>NONE</u>	YES	NO *
4. Is there a COC (chain-of-custody) present?			<u>YES</u>	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<u>YES</u>	NO *
6. Are short-hold samples present?			YES	<u>NO</u>
7. Are all samples within holding times for the requested analyses?			<u>YES</u>	NO *
8. Were all sample containers received intact? (not broken or leaking)			<u>YES</u>	NO *
9. Is there sufficient sample for the requested analyses?			<u>YES</u>	NO *
10. Are all samples in the proper containers for the requested analyses?			<u>YES</u>	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<u>YES</u>	NO *
12. Are all aqueous non-preserved samples pH 4-9?		<u>N/A</u>	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<u>N/A</u>	YES	NO
14. Were the samples shipped on ice?			<u>YES</u>	NO
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #1 <u>#3</u> #4	<u>RAD ONLY</u>	YES	<u>NO</u>
Cooler #: <u>1</u>				
Temperature (°C): <u>9.6</u>				
No. of custody seals on cooler: <u>2</u>				
External µR/hr reading: <u>12</u>				
Background µR/hr reading: <u>13</u>				
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)				

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All ice was melted.

All client bottle ID's vs ALS lab ID's double-checked by: EE

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/7/19

1910111

EXPRESS WORLDWIDE WPX -DHL-
2018-10-03 MYDHL+ 1.0 / *30-0021*

From: **ALS Environmental**
Ed Hill
60 Northland Rd
Unit 1
N2V 2B8 WATERLOO ON
Canada

Origin: **YHM**

To: **ALS Environmental Fort Collins**
Sample Login
225 Commerce Drive

Contact: +15198866910
Contact: Sample Login
+18004431511

80524 FORT COLLINS Colorado
United States of America

US - DEN - DEN

C [Redacted] Day Time

Ref: [Redacted]

Post/Ship Weight: **7.2 lbs** Piece: **1/1**

91

Contents: Water sample

WAYBILL 21 7450 8003

(2L)US80524+48000001

[Barcode]

Client: ALS Environmental

Date: 21-Oct-19

Project: L2357232

Work Order: 1910111

Sample ID: L2357232-1

Lab ID: 1910111-1

Legal Location:

Matrix: WATER

Collection Date: 10/1/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 10/8/2019

PrepBy: TRW

Ra-226 0.018 (+/- 0.0075)

0.0035 BQ/l

NA

10/17/2019 14:05

Carr: BARIUM

99.8

40-110 %REC

DL = NA

10/17/2019 14:05

Client: ALS Environmental

Date: 21-Oct-19

Project: L2357232

Work Order: 1910111

Sample ID: L2357232-1

Lab ID: 1910111-1

Legal Location:

Matrix: WATER

Collection Date: 10/1/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS -- Fort Collins

Date: 10/21/2019 8:25

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1910111

Project: L2357232

Batch ID: RE191008-2-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE191008-2			Units: BQ/I		Analysis Date: 10/17/2019 14:40					
Client ID:	Run ID: RE191008-2A			Prep Date: 10/8/2019			DF: NA				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.58 (+/- 0.393)	0.0155	1.72		91.6	67-120					P,Y1,M3
Carr: BARIUM	16500		16380		101	40-110					Y1

LCSD	Sample ID: RE191008-2			Units: BQ/I			Analysis Date: 10/17/2019 14:40				
Client ID:	Run ID: RE191008-2A						Prep Date: 10/8/2019		DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.49 (+/- 0.373)	0.0178	1.72		86.7	67-120		1.58	0.2	2.1	P,Y1,M3
Carr: BARIUM	16500		16390		101	40-110		16500			Y1

MB	Sample ID: RE191008-2				Units: BQ/I		Analysis Date: 10/17/2019 14:40				
Client ID:		Run ID: RE191008-2A				Prep Date: 10/8/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0023 (+/- 0.0027)	0.0041									Y1,U
Carr: BARIUM	16600		16380		102	40-110					Y1

The following samples were analyzed in this batch:

1910111-1



AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna

EPS 1/RM/14

Page 1 of 2

Work Order : 240458
Sample Number : 60925

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-10-01
Location :	Waterloo ON	Time Collected :	09:15
Job Number :	L2357232-1	Date Received :	2019-10-03
Substance :	L2357232-1 MS-08	Time Received :	11:00
Sampling Method :	Grab	Temperature on Receipt :	6.0 °C
Sampled By :	KB/LM	Date Tested :	2019-10-03
Sample Description :	Clear, light yellow, odourless.		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	<i>Daphnia magna</i>	Time to First Brood :	8.2 days
Organism Batch :	Dm19-19	Average Brood Size :	40.1 young
Culture Mortality :	1.9% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Pre-aeration Time :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2019-10-01	Warning Limits (\pm 2SD) :	5.8 - 7.1 g/L
LC50 :	6.9 g/L	Organism Batch :	Dm19-19
95% Confidence Limits :	6.4 - 7.4 g/L	Analyst(s) :	KJW, SV
Statistical Method :	Linear Regression (MLE)		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Date :

2019-10-08
yyyy-mm-dd

Approved By :

[Signature]
Project Manager

Work Order : 240458

Sample Number : 60925

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Water Chemistry (100%) :	8.7	10.4	5030	20.0	123	468 mg/L

0 HOURS

Date & Time 2019-10-03 14:45
Analyst(s) : SV/KJW (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation (%)*	Hardness
100	A	0	0	8.6	9.2	5040	20.0	108	468
100	B	0	0	8.6	9.2	5040	20.0	108	468
100	C	0	0	8.6	9.2	5040	20.0	108	468
Control	A	0	0	8.5	8.6	763	20.0	100	220
Control	B	0	0	8.5	8.6	763	20.0	100	220
Control	C	0	0	8.5	8.6	763	20.0	100	220

Notes:

24 HOURS

Date & Time 2019-10-04 14:45
Analyst(s) : KJW (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	—	0	—	—	—	20.0
100	B	—	1	—	—	—	20.0
100	C	—	0	—	—	—	20.0
Control	A	—	0	—	—	—	20.0
Control	B	—	0	—	—	—	20.0
Control	C	—	0	—	—	—	20.0

Notes: Test organisms in the 100% concentration appeared to be adhered to gas bubbles on the sides and bottom of the test chamber.

48 HOURS

Date & Time 2019-10-05 14:45
Analyst(s) : SV

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	7.8	8.1	5030	20.0
100	B	0	0	7.9	8.3	5020	20.0
100	C	0	0	7.8	8.3	5020	20.0
Control	A	0	0	8.5	8.4	777	20.0
Control	B	0	0	8.5	8.4	778	20.0
Control	C	0	0	8.5	8.5	789	20.0

Notes: Test organisms in the 100% concentration appeared to be adhered to gas bubbles on the sides and bottom of the test chamber. SV

Number immobile does not include number dead.

— = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JL

Date : 2019-10-07



AquaTox Testing & Consulting Inc.
8-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout

EPS 1/RM/13

Page 1 of 2

Work Order : 240458

Sample Number : 60925

SAMPLE IDENTIFICATION

Company :	ALS Laboratory Group, Waterloo	Date Collected :	2019-10-01
Location :	Waterloo ON	Time Collected :	09:15
Job Number :	L2357232-1	Date Received :	2019-10-03
Substance :	L2357232-1 MS-08	Time Received :	11:00
Sampling Method :	Grab	Temperature on Receipt :	6.0 °C
Sampled By :	KB/LM	Date Tested :	2019-10-03
Sample Description :	Clear, light yellow, odourless.		

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	39.8 mm (± 2.3)
Organism Batch :	T19-18	Range of Fork Lengths :	38 - 42 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.49 g (± 0.12)
Cumulative stock tank mortality rate :	0.1% (previous 7 days)	Range of Wet Weights :	0.38 - 0.58 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	21
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 \pm 1 mL/min/L	Organisms Per Test Level :	10
Total Pre-Aeration Time :	120 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2019-10-01
Organism Batch :	T19-18	Historical Mean LC50 :	3769 mg/L
LC50 :	3375 mg/L	Warning Limits (± 2 SD) :	3141 - 4522 mg/L
95% Confidence Limits :	3021 - 3683 mg/L	Analyst(s) :	KP, ALC, AW
Statistical Method :	Linear Regression (MLE)		

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Date :

2019-10-08
yyyy-mm-dd

Approved By :

[Signature]
Project Manager

Work Order : 240458

Sample Number : 60925

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*
Initial Water Chemistry (100%) :	8.9	10.6	5085	14.0	111
After 30 min pre-aeration :	8.7	9.5	5070	14.0	101

0 HOURS

Date & Time	2019-10-03	14:30					
Analyst(s) :	MDH						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*
100%	0	0	8.6	9.3	5072	14.5	100
Control	0	0	8.2	9.3	793	15.0	98
Notes:							

24 HOURS

Date & Time	2019-10-04	14:30				
Analyst(s) :	MDH					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	—	—	—	15.0
Control	0	0	—	—	—	15.0
Notes:						

48 HOURS

Date & Time	2019-10-05	14:30				
Analyst(s) :	AW					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	—	—	—	15.0
Control	0	0	—	—	—	15.0
Notes:						

72 HOURS

Date & Time	2019-10-06	14:30				
Analyst(s) :	AW					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	—	—	—	15.0
Control	0	0	—	—	—	15.0
Notes:						

96 HOURS

Date & Time	2019-10-07	14:30				
Analyst(s) :	ALC(TL)					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	7.5	9.5	5087	14.5
Control	0	0	8.2	9.7	743	14.5
Notes:						

"—" = not measured/not required

Number impaired does not include number dead.

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2019-10-07

AQUATOX

Voice: (519) 763-4412
Fax: (519) 763-4419

Date/Time Shipped: 01-Oct-19/19:00

Contact: Rick Hawthorne (ALS) / Martina Rendas (Aquatox)

For Lab Use Only	2V/CA/AG/ALC
Received By	2019-10-03
Date	11:00
Time	
Storage Location	
Storage Temp (°C)	

Report Distribution: bimcore@alsglobal.com, rick.hawthorne@alsglobal.com



L2357232

WATERLOO

Subcontract Request Form

Subcontract To:

AQUATOX TESTING AND CONSULTING

11B NICHOLAS BEAVER ROAD
RR3
GUELPH, ON N1H 6H9

NOTES: Please reference on final report and invoice: PO# L2357232
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 1 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2357232-1 MS-08		10/ 1/ 2019	E
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	10/8/2019	
	Special Request Aquatox (SPECIAL REQUEST-AQT 14)	10/8/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910
Analysis and reporting info contact: Rick Hawthorne
60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910 Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to: **Rick.Hawthorne@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

[illegible]

Page 1 of 1

Report To		Contact and company name below will appear on the final report		Report Format / Distribution				.firm all E&P TATs with your AM - surcharges will apply													
Company:		Baffinland Iron Mines Corp.		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)				Regular [R] <input type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply													
Contact:		William Bowden and Connor Devereaux		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				PRIORITY (Business Days) 4 day [P4] <input type="checkbox"/> 3 day [P3] <input type="checkbox"/> 2 day [P2] <input type="checkbox"/> EMERGENCY 1 Business day [E1] <input checked="" type="checkbox"/> Same Day, Weekend or Statutory holiday [E0] <input checked="" type="checkbox"/>													
Phone:		647-253-0596 EXT 6016		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked																	
Company address below will appear on the final report				Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				Date and Time Required for all E&P TATs:													
Street:		2275 Upper Middle Rd. E., Suite #300		Email 1 or Fax bimcore@alsglobal.com				For tests that can not be performed according to the service level selected, you will be contacted.													
City/Province:		Oakville, ON		Email 2				Analysis Request													
Postal Code:		L6H 0C3		Email 3				Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
Invoice To		Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution				F/P													
		Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																	
Company:				Email 1 or Fax ap@baffinland.com																	
Contact:				Email 2 commercial@baffinland.com																	
Project Information				Oil and Gas Required Fields (client use)																	
ALS Account # / Quote #: 23642 /Q42455				AFE/Cost Center: PO#																	
Job #: MS-08 WT TOX				Major/Minor Code: Routing Code:																	
PO / AFE: 4500057496				Requisitioner:																	
LSD:				Location:																	
ALS Lab Work Order # (lab use only) 12357232				ALS Contact: Sampler: KB/LM																	
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)		Time (hh:mm)		Sample Type		BIM-MMER-WT Group 3											
1		MS-08		1-Oct-19		9:15		Water													
Drinking Water (DW) Samples ¹ (client use)				Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)				SAMPLE CONDITION AS RECEIVED (lab use only)													
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				1 extra gen chem included.				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/>													
Are samples for human drinking water use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO								INITIAL COOLER TEMPERATURES °C FINAL COOLER TEMPERATURES °C 12.2													
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)													
Released By: Kendra Button		Date: 01-Oct-19		Time: 13:10		Received by:		Date:		Time:		Received by: JKH		Date: 30 OCT 19		Time: 900					

OCTOBER 2015 FRONT

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



Baffinland Iron Mine's Corporation (Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 01-OCT-19
Report Date: 24-OCT-19 13:53 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2357716
Project P.O. #: 4500057496
Job Reference: MS-08 REFERENCE AND EXPOSURE
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 02-OCT-19 09:37

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357716-1 MS-08-DS								
Sampled By: KB/CD on 01-OCT-19 @ 17:30								
Matrix: WATER								
Physical Tests								
Conductivity		199		3.0	umhos/cm		05-OCT-19	R4860731
Hardness (as CaCO3)		83.0	HTC	0.50	mg/L		04-OCT-19	
pH		8.08		0.10	pH units		02-OCT-19	R4853590
Total Suspended Solids		2.8		2.0	mg/L		01-OCT-19	R4853597
Total Dissolved Solids		90	DLDS	13	mg/L		06-OCT-19	R4860417
Turbidity		3.36	PEHT	0.10	NTU		05-OCT-19	R4860048
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		85		10	mg/L		05-OCT-19	R4860731
Ammonia, Total (as N)		<0.010		0.010	mg/L		07-OCT-19	R4860725
Chloride (Cl)		8.20		0.50	mg/L		04-OCT-19	R4859139
Fluoride (F)		0.027		0.020	mg/L		04-OCT-19	R4859139
Nitrate (as N)		0.082		0.020	mg/L		04-OCT-19	R4859139
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	07-OCT-19	07-OCT-19	R4860925
Phosphorus, Total		0.0050		0.0030	mg/L	04-OCT-19	07-OCT-19	R4860606
Sulfate (SO4)		7.65		0.30	mg/L		04-OCT-19	R4859139
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					04-OCT-19	R4859599
Dissolved Organic Carbon		1.60		0.50	mg/L	04-OCT-19	07-OCT-19	R4860640
Total Organic Carbon		2.19		0.50	mg/L		07-OCT-19	R4860639
Total Metals								
Aluminum (Al)-Total		0.118		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Arsenic (As)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Barium (Ba)-Total		0.0112		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Boron (B)-Total		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Calcium (Ca)-Total		16.5		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cesium (Cs)-Total		0.000014		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Copper (Cu)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Iron (Fe)-Total		0.117		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Lead (Pb)-Total		0.000077		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Lithium (Li)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Magnesium (Mg)-Total		10.2		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Manganese (Mn)-Total		0.00247		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		07-OCT-19	R4860448
Molybdenum (Mo)-Total		0.000321		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Nickel (Ni)-Total		0.00058		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Phosphorus (P)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357716-1 MS-08-DS Sampled By: KB/CD on 01-OCT-19 @ 17:30 Matrix: WATER								
Total Metals								
Potassium (K)-Total		1.09		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Rubidium (Rb)-Total		0.00154		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Selenium (Se)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Silicon (Si)-Total		1.26		0.10	mg/L	04-OCT-19	04-OCT-19	R4859637
Silver (Ag)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Sodium (Na)-Total		3.41		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Strontium (Sr)-Total		0.0167		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Sulfur (S)-Total		2.64		0.50	mg/L	04-OCT-19	04-OCT-19	R4859637
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Thorium (Th)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Tin (Sn)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Titanium (Ti)-Total		0.00541		0.00030	mg/L	04-OCT-19	04-OCT-19	R4859637
Tungsten (W)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Uranium (U)-Total		0.00415		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Vanadium (V)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Zinc (Zn)-Total		<0.0030		0.0030	mg/L	04-OCT-19	04-OCT-19	R4859637
Zirconium (Zr)-Total		0.00026		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Dissolved Metals								
Dissolved Mercury Filtration Location		FIELD					04-OCT-19	R4859193
Mercury (Hg)-Dissolved		<0.0000050		0.0000050	mg/L	04-OCT-19	07-OCT-19	R4860451
Radiological Parameters								
Ra-226		0.0094		0.0046	Bq/L	10-OCT-19	21-OCT-19	R4851666
L2357716-2 MS-08-US Sampled By: KB/CD on 01-OCT-19 @ 18:00 Matrix: WATER								
Physical Tests								
Conductivity		192		3.0	umhos/cm		05-OCT-19	R4860731
Hardness (as CaCO3)		81.1	HTC	0.50	mg/L		04-OCT-19	
pH		8.08		0.10	pH units		02-OCT-19	R4853590
Total Suspended Solids		2.0		2.0	mg/L		01-OCT-19	R4853597
Total Dissolved Solids		85	DLDS	13	mg/L		06-OCT-19	R4860417
Turbidity		1.88	PEHT	0.10	NTU		05-OCT-19	R4860048
Anions and Nutrients								
Alkalinity, Total (as CaCO3)		85		10	mg/L		05-OCT-19	R4860731
Ammonia, Total (as N)		<0.010		0.010	mg/L		07-OCT-19	R4860725
Chloride (Cl)		8.41		0.50	mg/L		04-OCT-19	R4859139
Fluoride (F)		0.030		0.020	mg/L		04-OCT-19	R4859139
Nitrate (as N)		0.074		0.020	mg/L		04-OCT-19	R4859139
Total Kjeldahl Nitrogen		<0.15		0.15	mg/L	07-OCT-19	07-OCT-19	R4860925
Phosphorus, Total		0.0042		0.0030	mg/L	04-OCT-19	07-OCT-19	R4860606
Sulfate (SO4)		5.26		0.30	mg/L		04-OCT-19	R4859139

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2357716-2 MS-08-US								
Sampled By: KB/CD on 01-OCT-19 @ 18:00								
Matrix: WATER								
Anions and Nutrients								
Organic / Inorganic Carbon								
Dissolved Carbon Filtration Location		LAB					04-OCT-19	R4859599
Dissolved Organic Carbon		1.68		0.50	mg/L	04-OCT-19	07-OCT-19	R4860640
Total Organic Carbon		2.22		0.50	mg/L		07-OCT-19	R4860639
Total Metals								
Aluminum (Al)-Total		0.0844		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Antimony (Sb)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Arsenic (As)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Barium (Ba)-Total		0.0111		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Beryllium (Be)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Bismuth (Bi)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Boron (B)-Total		<0.010		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Calcium (Ca)-Total		16.6		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cesium (Cs)-Total		0.000011		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Chromium (Cr)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Copper (Cu)-Total		0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Iron (Fe)-Total		0.066		0.010	mg/L	04-OCT-19	04-OCT-19	R4859637
Lead (Pb)-Total		0.000062		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Lithium (Li)-Total		<0.0010		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Magnesium (Mg)-Total		9.63		0.0050	mg/L	04-OCT-19	04-OCT-19	R4859637
Manganese (Mn)-Total		0.00121		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L		07-OCT-19	R4860448
Molybdenum (Mo)-Total		0.000364		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Nickel (Ni)-Total		<0.00050		0.00050	mg/L	04-OCT-19	04-OCT-19	R4859637
Phosphorus (P)-Total		<0.050		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Potassium (K)-Total		1.10		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Rubidium (Rb)-Total		0.00161		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Selenium (Se)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Silicon (Si)-Total		1.31		0.10	mg/L	04-OCT-19	04-OCT-19	R4859637
Silver (Ag)-Total		<0.000050		0.000050	mg/L	04-OCT-19	04-OCT-19	R4859637
Sodium (Na)-Total		3.68		0.050	mg/L	04-OCT-19	04-OCT-19	R4859637
Strontium (Sr)-Total		0.0170		0.0010	mg/L	04-OCT-19	04-OCT-19	R4859637
Sulfur (S)-Total		1.92		0.50	mg/L	04-OCT-19	04-OCT-19	R4859637
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	04-OCT-19	04-OCT-19	R4859637
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	04-OCT-19	04-OCT-19	R4859637
Thorium (Th)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Tin (Sn)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637
Titanium (Ti)-Total		0.00375		0.00030	mg/L	04-OCT-19	04-OCT-19	R4859637
Tungsten (W)-Total		<0.00010		0.00010	mg/L	04-OCT-19	04-OCT-19	R4859637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2357716-1, -2
Matrix Spike	Iron (Fe)-Total	MS-B	L2357716-1, -2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2357716-1, -2
Matrix Spike	Silicon (Si)-Total	MS-B	L2357716-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L2357716-1, -2
Matrix Spike	Strontium (Sr)-Total	MS-B	L2357716-1, -2
Matrix Spike	Uranium (U)-Total	MS-B	L2357716-1, -2

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WT	Water	Conductivity	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
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This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

PH-BF	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
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SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

SOLIDS-TSS-BF	Water	Suspended solids	APHA 2540 D-Gravimetric
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A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104 +/- 1C for a minimum of four hours or until a constant weight is achieved.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
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This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

TOC-WT	Water	Total Organic Carbon	APHA 5310B
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Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

TURBIDITY-WT	Water	Turbidity	APHA 2130 B
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Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
BF	ALS ENVIRONMENTAL - BAFFIN ISLAND, NUNAVUT, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R4859139							
WG3181734-24	DUP	WG3181734-23						
Fluoride (F)		0.025	0.025		mg/L	0.1	20	04-OCT-19
WG3181734-22	LCS							
Fluoride (F)			103.8		%		90-110	04-OCT-19
WG3181734-21	MB							
Fluoride (F)			<0.020		mg/L		0.02	04-OCT-19
WG3181734-25	MS	WG3181734-23						
Fluoride (F)			101.9		%		75-125	04-OCT-19
HG-D-CVAA-WT		Water						
Batch	R4860451							
WG3182354-3	DUP	L2357716-1						
Mercury (Hg)-Dissolved		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3182354-2	LCS							
Mercury (Hg)-Dissolved			99.8		%		80-120	07-OCT-19
WG3182354-1	MB							
Mercury (Hg)-Dissolved			<0.0000050		mg/L		0.000005	07-OCT-19
WG3182354-4	MS	L2357716-2						
Mercury (Hg)-Dissolved			95.8		%		70-130	07-OCT-19
HG-T-CVAA-WT		Water						
Batch	R4860448							
WG3182348-3	DUP	L2357716-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3182348-2	LCS							
Mercury (Hg)-Total			98.3		%		80-120	07-OCT-19
WG3182348-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	07-OCT-19
WG3182348-4	MS	L2357716-2						
Mercury (Hg)-Total			98.8		%		70-130	07-OCT-19
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4	DUP	WG3182336-3						
Aluminum (Al)-Total		0.118	0.114		mg/L	3.4	20	04-OCT-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Barium (Ba)-Total		0.0112	0.0109		mg/L	2.4	20	04-OCT-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4	DUP	WG3182336-3						
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-OCT-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Calcium (Ca)-Total		16.5	16.5		mg/L	0.4	20	04-OCT-19
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-OCT-19
Cesium (Cs)-Total		0.000014	0.000015		mg/L	4.3	20	04-OCT-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Copper (Cu)-Total		<0.0010	0.0010	RPD-NA	mg/L	N/A	20	04-OCT-19
Iron (Fe)-Total		0.117	0.115		mg/L	2.2	20	04-OCT-19
Lead (Pb)-Total		0.000077	0.000080		mg/L	4.1	20	04-OCT-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	04-OCT-19
Magnesium (Mg)-Total		10.2	10.1		mg/L	1.0	20	04-OCT-19
Manganese (Mn)-Total		0.00247	0.00246		mg/L	0.2	20	04-OCT-19
Molybdenum (Mo)-Total		0.000321	0.000323		mg/L	0.8	20	04-OCT-19
Nickel (Ni)-Total		0.00058	0.00057		mg/L	1.0	20	04-OCT-19
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	04-OCT-19
Potassium (K)-Total		1.09	1.09		mg/L	0.1	20	04-OCT-19
Rubidium (Rb)-Total		0.00154	0.00158		mg/L	2.1	20	04-OCT-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Silicon (Si)-Total		1.26	1.29		mg/L	2.6	20	04-OCT-19
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-OCT-19
Sodium (Na)-Total		3.41	3.39		mg/L	0.5	20	04-OCT-19
Strontium (Sr)-Total		0.0167	0.0167		mg/L	0.2	20	04-OCT-19
Sulfur (S)-Total		2.64	2.70		mg/L	2.2	25	04-OCT-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	04-OCT-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	04-OCT-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	04-OCT-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Titanium (Ti)-Total		0.00541	0.00550		mg/L	1.5	20	04-OCT-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-OCT-19
Uranium (U)-Total		0.00415	0.00407		mg/L	2.0	20	04-OCT-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-OCT-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	04-OCT-19
Zirconium (Zr)-Total		0.00026	0.00028		mg/L			04-OCT-19



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-4 DUP		WG3182336-3						
Zirconium (Zr)-Total		0.00026	0.00028		mg/L	5.3	20	04-OCT-19
WG3182336-2 LCS								
Aluminum (Al)-Total			106.5		%		80-120	04-OCT-19
Antimony (Sb)-Total			103.5		%		80-120	04-OCT-19
Arsenic (As)-Total			100.9		%		80-120	04-OCT-19
Barium (Ba)-Total			104.0		%		80-120	04-OCT-19
Beryllium (Be)-Total			100.9		%		80-120	04-OCT-19
Bismuth (Bi)-Total			98.0		%		80-120	04-OCT-19
Boron (B)-Total			98.7		%		80-120	04-OCT-19
Cadmium (Cd)-Total			102.5		%		80-120	04-OCT-19
Calcium (Ca)-Total			100.1		%		80-120	04-OCT-19
Chromium (Cr)-Total			102.0		%		80-120	04-OCT-19
Cesium (Cs)-Total			99.3		%		80-120	04-OCT-19
Cobalt (Co)-Total			101.5		%		80-120	04-OCT-19
Copper (Cu)-Total			101.0		%		80-120	04-OCT-19
Iron (Fe)-Total			101.2		%		80-120	04-OCT-19
Lead (Pb)-Total			100.9		%		80-120	04-OCT-19
Lithium (Li)-Total			99.9		%		80-120	04-OCT-19
Magnesium (Mg)-Total			102.4		%		80-120	04-OCT-19
Manganese (Mn)-Total			102.1		%		80-120	04-OCT-19
Molybdenum (Mo)-Total			101.4		%		80-120	04-OCT-19
Nickel (Ni)-Total			99.9		%		80-120	04-OCT-19
Phosphorus (P)-Total			106.9		%		70-130	04-OCT-19
Potassium (K)-Total			103.1		%		80-120	04-OCT-19
Rubidium (Rb)-Total			105.0		%		80-120	04-OCT-19
Selenium (Se)-Total			99.4		%		80-120	04-OCT-19
Silicon (Si)-Total			105.9		%		60-140	04-OCT-19
Silver (Ag)-Total			102.5		%		80-120	04-OCT-19
Sodium (Na)-Total			101.8		%		80-120	04-OCT-19
Strontium (Sr)-Total			102.1		%		80-120	04-OCT-19
Sulfur (S)-Total			102.9		%		80-120	04-OCT-19
Thallium (Tl)-Total			99.3		%		80-120	04-OCT-19
Tellurium (Te)-Total			100.8		%		80-120	04-OCT-19
Thorium (Th)-Total			98.0		%		70-130	04-OCT-19



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-2	LCS							
Tin (Sn)-Total			101.0		%		80-120	04-OCT-19
Titanium (Ti)-Total			98.3		%		80-120	04-OCT-19
Tungsten (W)-Total			100.5		%		80-120	04-OCT-19
Uranium (U)-Total			101.6		%		80-120	04-OCT-19
Vanadium (V)-Total			103.3		%		80-120	04-OCT-19
Zinc (Zn)-Total			99.2		%		80-120	04-OCT-19
Zirconium (Zr)-Total			101.2		%		80-120	04-OCT-19
WG3182336-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-OCT-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Boron (B)-Total			<0.010		mg/L		0.01	04-OCT-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	04-OCT-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	04-OCT-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	04-OCT-19
Iron (Fe)-Total			<0.010		mg/L		0.01	04-OCT-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	04-OCT-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	04-OCT-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-OCT-19
Potassium (K)-Total			<0.050		mg/L		0.05	04-OCT-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	04-OCT-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	04-OCT-19
Silicon (Si)-Total			<0.10		mg/L		0.1	04-OCT-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	04-OCT-19



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-1 MB								
Sodium (Na)-Total			<0.050		mg/L		0.05	04-OCT-19
Strontium (Sr)-Total			<0.0010		mg/L		0.001	04-OCT-19
Sulfur (S)-Total			<0.50		mg/L		0.5	04-OCT-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	04-OCT-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	04-OCT-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	04-OCT-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	04-OCT-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-OCT-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-OCT-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	04-OCT-19
WG3182336-5 MS		WG3182336-6						
Aluminum (Al)-Total			90.4		%		70-130	04-OCT-19
Antimony (Sb)-Total			98.3		%		70-130	04-OCT-19
Arsenic (As)-Total			95.7		%		70-130	04-OCT-19
Barium (Ba)-Total			91.9		%		70-130	04-OCT-19
Beryllium (Be)-Total			94.8		%		70-130	04-OCT-19
Bismuth (Bi)-Total			90.8		%		70-130	04-OCT-19
Boron (B)-Total			92.9		%		70-130	04-OCT-19
Cadmium (Cd)-Total			94.9		%		70-130	04-OCT-19
Calcium (Ca)-Total			N/A	MS-B	%		-	04-OCT-19
Chromium (Cr)-Total			96.5		%		70-130	04-OCT-19
Cesium (Cs)-Total			95.9		%		70-130	04-OCT-19
Cobalt (Co)-Total			94.9		%		70-130	04-OCT-19
Copper (Cu)-Total			93.1		%		70-130	04-OCT-19
Iron (Fe)-Total			N/A	MS-B	%		-	04-OCT-19
Lead (Pb)-Total			94.3		%		70-130	04-OCT-19
Lithium (Li)-Total			91.4		%		70-130	04-OCT-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	04-OCT-19
Manganese (Mn)-Total			94.5		%		70-130	04-OCT-19
Molybdenum (Mo)-Total			96.8		%		70-130	04-OCT-19
Nickel (Ni)-Total			93.1		%		70-130	04-OCT-19



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4859637							
WG3182336-5 MS		WG3182336-6						
Phosphorus (P)-Total			104.2		%		70-130	04-OCT-19
Potassium (K)-Total			93.6		%		70-130	04-OCT-19
Rubidium (Rb)-Total			95.8		%		70-130	04-OCT-19
Selenium (Se)-Total			94.7		%		70-130	04-OCT-19
Silicon (Si)-Total			N/A	MS-B	%		-	04-OCT-19
Silver (Ag)-Total			95.9		%		70-130	04-OCT-19
Sodium (Na)-Total			N/A	MS-B	%		-	04-OCT-19
Strontium (Sr)-Total			N/A	MS-B	%		-	04-OCT-19
Sulfur (S)-Total			93.4		%		70-130	04-OCT-19
Thallium (Tl)-Total			91.6		%		70-130	04-OCT-19
Tellurium (Te)-Total			91.9		%		70-130	04-OCT-19
Thorium (Th)-Total			95.1		%		70-130	04-OCT-19
Tin (Sn)-Total			96.3		%		70-130	04-OCT-19
Titanium (Ti)-Total			94.8		%		70-130	04-OCT-19
Tungsten (W)-Total			95.7		%		70-130	04-OCT-19
Uranium (U)-Total			N/A	MS-B	%		-	04-OCT-19
Vanadium (V)-Total			97.5		%		70-130	04-OCT-19
Zinc (Zn)-Total			90.2		%		70-130	04-OCT-19
Zirconium (Zr)-Total			93.6		%		70-130	04-OCT-19
NH3-F-WT		Water						
Batch	R4860725							
WG3183728-3 DUP		L2357716-1						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3183728-2 LCS			99.9		%		85-115	07-OCT-19
WG3183728-1 MB			<0.010		mg/L		0.01	07-OCT-19
WG3183728-4 MS		L2357716-1	104.4		%		75-125	07-OCT-19
Ammonia, Total (as N)								
NO3-IC-WT		Water						
Batch	R4859139							
WG3181734-24 DUP		WG3181734-23						
Nitrate (as N)		0.073	0.074		mg/L	0.3	20	04-OCT-19
WG3181734-22 LCS			101.5				90-110	
Nitrate (as N)								



Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-WT	Water							
Batch	R4860417							
WG3183481-2	LCS							
Total Dissolved Solids			95.3		%		85-115	06-OCT-19
WG3183481-1	MB							
Total Dissolved Solids			<10		mg/L		10	06-OCT-19
SOLIDS-TSS-BF	Water							
Batch	R4853597							
WG3178742-3	DUP	L2357326-1						
Total Suspended Solids		122	124		mg/L	1.6	25	01-OCT-19
WG3178742-2	LCS							
Total Suspended Solids			98.4		%		85-115	01-OCT-19
WG3178742-1	MB							
Total Suspended Solids			<2.0		mg/L		2	01-OCT-19
TKN-WT	Water							
Batch	R4860925							
WG3183637-3	DUP	L2357716-1						
Total Kjeldahl Nitrogen		<0.15	<0.15	RPD-NA	mg/L	N/A	20	07-OCT-19
WG3183637-2	LCS							
Total Kjeldahl Nitrogen			100.3		%		75-125	07-OCT-19
WG3183637-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	07-OCT-19
WG3183637-4	MS	L2357716-1						
Total Kjeldahl Nitrogen			88.9		%		70-130	07-OCT-19
TOC-WT	Water							
Batch	R4860639							
WG3183590-3	DUP	L2356925-1						
Total Organic Carbon		2.42	2.45		mg/L	1.1	20	07-OCT-19
WG3183590-2	LCS							
Total Organic Carbon			106.7		%		80-120	07-OCT-19
WG3183590-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	07-OCT-19
WG3183590-4	MS	L2356925-1						
Total Organic Carbon			101.6		%		70-130	07-OCT-19
TURBIDITY-WT	Water							
Batch	R4860048							
WG3183230-3	DUP	L2358825-1						
Turbidity		207	216		NTU	4.3	15	05-OCT-19
WG3183230-2	LCS							



Quality Control Report

Workorder: L2357716

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: William Bowden/Connor Devereaux

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WT		Water						
Batch	R4860048							
WG3183230-2	LCS							
Turbidity			102.0		%		85-115	05-OCT-19
WG3183230-1	MB							
Turbidity			<0.10		NTU		0.1	05-OCT-19

Quality Control Report

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Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2357716

Report Date: 24-OCT-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: William Bowden/Connor Devereaux

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity	1	01-OCT-19 17:30	05-OCT-19 00:00	48	78	hours	EHT
	2	01-OCT-19 18:00	05-OCT-19 00:00	48	78	hours	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2357716 were received on 01-OCT-19 20:20.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Tuesday, October 22, 2019

Rick Hawthorne
ALS Environmental
60 Northland Rd, Unit 1
Waterloo Canada, ON N2V 2B8

Re: ALS Workorder: 1910179
Project Name:
Project Number: L2357716

Dear Mr. Hawthorne:

Two water samples were received from ALS Environmental, on 10/8/2019. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1910179

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1910179

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L2357716

Client PO Number: L2357716

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2357716-1	1910179-1		WATER	01-Oct-19	
L2357716-2	1910179-2		WATER	01-Oct-19	

**L2357716**

WATERLOO

121079-

Subcontract Request Form**Subcontract To:****ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA**225 COMMERCE DRIVE
FORT COLLINS, CO 80524**NOTES:** Please reference on final report and invoice: PO# L2357716
ALS requires QC data to be provided with your final results.

Please see enclosed 2 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L2357716-1 MS-08-DS		10/1/2019	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	
L2357716-2 MS-08-US		10/1/2019	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	10/22/2019	

Subcontract Info Contact: Mary-Lynn Pike (519) 886-6910

Analysis and reporting info contact:

Rick Hawthorne

60 NORTHLAND ROAD, UNIT 1

WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Email: Rick.Hawthorne@alsglobal.com

Please email confirmation of receipt to:

Rick.Hawthorne@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: [Signature] Date Received: 10/2/19 12:00

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Water 600 Workorder No: 1910179
Project Manager: KMD Initials: TEM Date: 10/3/19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<input checked="" type="radio"/> YES	NO
2. Are custody seals on shipping containers intact?		<input checked="" type="radio"/> NONE	YES	NO *
3. Are custody seals on sample containers intact?		<input checked="" type="radio"/> NONE	YES	NO *
4. Is there a COC (chain-of-custody) present?			<input checked="" type="radio"/> YES	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<input checked="" type="radio"/> YES	NO *
6. Are short-hold samples present?			YES	<input checked="" type="radio"/> NO
7. Are all samples within holding times for the requested analyses?			<input checked="" type="radio"/> YES	NO *
8. Were all sample containers received intact? (not broken or leaking)			<input checked="" type="radio"/> YES	NO *
9. Is there sufficient sample for the requested analyses?			<input checked="" type="radio"/> YES	NO *
10. Are all samples in the proper containers for the requested analyses?			<input checked="" type="radio"/> YES	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<input checked="" type="radio"/> YES	NO *
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<input checked="" type="radio"/> N/A	YES	NO
13. Were the samples shipped on ice?			<input checked="" type="radio"/> YES	NO
14. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #1 <input checked="" type="radio"/> #3 #4 <input checked="" type="radio"/>	<input checked="" type="radio"/> RAD ONLY	<input checked="" type="radio"/> YES	NO
Cooler #: <u>1</u>				
Temperature (°C): <u>5.7</u>				
No. of custody seals on cooler: <u>0</u>				
External µR/hr reading: <u>12</u>				
Background µR/hr reading: <u>13</u>				
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)				

* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: TEM

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 10/9/19

1210179

12-0
S. A

EXPRESS WORLDWIDE

2019-10-07 DCV6 3.0.1 / "12-1403"

WPX

DHL

80524 FORT COLLINS, UNITED STATES OF AMERICA

Origin:
YHM

US - DEN - DEN

C

Day Time

Date:
2019-10-07

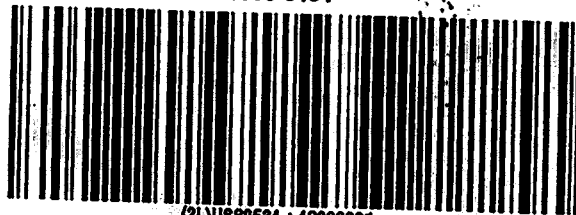
Pcs/Shpt Weight
24.2 LB

Piece
1/1

Content Description
Water Sample



WAYBILL 74 1380 5184



(2L)U660524+48000001



(J) JD01 4600 0071 2459 3321

Client: ALS Environmental

Date: 22-Oct-19

Project: L2357716

Work Order: 1910179

Sample ID: L2357716-1

Lab ID: 1910179-1

Legal Location:

Matrix: WATER

Collection Date: 10/1/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	-----------------	-------	--------------------	---------------

Radium-226 by Radon Emanation - Method 903.1

SOP 783

Prep Date: 10/10/2019

PrepBy: TRW

Ra-226 0.0094 (+/- 0.0053)

0.0046 BQ/l

NA

10/21/2019 13:40

Carr: BARIUM

89.1

40-110 %REC

DL = NA

10/21/2019 13:40

Client: ALS Environmental

Date: 22-Oct-19

Project: L2357716

Work Order: 1910179

Sample ID: L2357716-2

Lab ID: 1910179-2

Legal Location:

Matrix: WATER

Collection Date: 10/1/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1			SOP 783		Prep Date: 10/10/2019	PrepBy: TRW
Ra-226	0.0081 (+/- 0.0051)		0.0059	BQ/l	NA	10/21/2019 13:40
Carr: <i>BARIUM</i>	<i>94</i>		<i>40-110</i>	<i>%REC</i>	DL = NA	10/21/2019 13:40

Client: ALS Environmental

Date: 22-Oct-19

Project: L2357716

Work Order: 1910179

Sample ID: L2357716-2

Lab ID: 1910179-2

Legal Location:

Matrix: WATER

Collection Date: 10/1/2019

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS -- Fort Collins

Date: 10/22/2019 12:5

Client: ALS Environmental

QC BATCH REPORT

Work Order: 1910179

Project: L2357716

Batch ID: RE191010-1-1

Instrument ID Alpha Scin

Method: Radium-226 by Radon Emanation

LCS	Sample ID: RE191010-1				Units: BQ/I		Analysis Date: 10/21/2019 14:15				
Client ID:		Run ID: RE191010-1A				Prep Date: 10/10/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.85 (+/- 0.461)	0.00675	1.72		108	67-120					P
Carr: BARIUM	16800		17940		93.7	40-110					

LCSD	Sample ID: RE191010-1				Units: BQ/I		Analysis Date: 10/21/2019 14:15				
Client ID:	Run ID: RE191010-1A				Prep Date: 10/10/2019			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.71 (+/- 0.427)	0.0152	1.72		99.2	67-120		1.85	0.2	2.1	P,M3
Carr: BARIUM	17300		17930		96.6	40-110		16800			

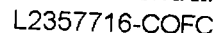
MB	Sample ID: RE191010-1				Units: BQ/I		Analysis Date: 10/21/2019 14:15				
Client ID:		Run ID: RE191010-1A				Prep Date: 10/10/2019			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.00045 (+/- 0.0030)		0.0059								U
Carr: BARIUM	17800		17930		99.1	40-110					

The following samples were analyzed in this batch:

1910179-1 1910179-2



Canada Toll Free: 1 800 668 9878



Page 1 of

www.alsglobal.com

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FROM

Spill Report Number:

19-460



December 10, 2019

Water Resources Officer
Nunavut Field Operations
Crown Indigenous Relations and Northern Affairs Canada
Box 100, Iqaluit, NU X0A 0H0
jonathan.mesher@canada.ca

Regulatory Manager
Qikiqtani Inuit Association
P.O. Box 219
Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #19-460
Mary River Project - Water Licence No. 2AM-MRY1325

Summary:

On 11 November 2019, a site services worker noticed sewage coming out of the bottom of the laundry lift station at the Mine Site Complex (MSC). On investigation, it was determined that the flotation switch which turns on the lift station pump had failed to trigger, causing the holding tank to overflow. On discovery of the release, flow to the lift station was immediately shut-off and the lift station was pumped down by vacuum truck to prevent further release. Approximately 0.25 m³ of sewage was released to the adjacent camp pad ground surface. This location is greater than >100 m from the nearest watercourse.

Immediate and Follow-Up Action:

The sewage release was immediately arrested and the lift station holding tank pumped down to prevent further release. The flotation switch was subsequently repaired. Contaminated snow was collected and deposited in an engineered lined containment facility.

Recommendations:

Continue routine operator inspections of lift stations.

Current Status:

The flotation switch has been repaired and the lift station is operating as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Connor Devereaux at (647) 253- 0596 x6016.

Prepared by:

Connor Devereaux

Connor Devereaux
Environmental Superintendent

Reviewed by:

Kash Baker

Surface Works Superintendent

Attach: Photos, Map, Baffinland NT-NU Spill Report

cc. Grant Goddard, Megan Lord-Hoyle, Sylvain Proulx, Tim Sewell, Francois Gaudreau, Brian Marshall, Christopher Murray, Shawn Stevens, Shawn Parry (Baffinland), Justin Hack, Jeremy Fraser (CIRNAC).



Photo 1. Sewage release on camp pad adjacent to MSC laundry lift station



Photo 2. Contaminated snow removed from camp pad adjacent to MSC laundry lift station



Figure 1. Map of spill location



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR 11-11-2019	REPORT TIME	<input type="checkbox"/> ORIGINAL SPILL REPORT OR <input type="checkbox"/> UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER 19 - 460
	B	OCCURRENCE DATE: MONTH - DAY - YEAR 11-11-2019		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301	WATER LICENSE NUMBER (IF APPLICABLE) 2AM-MRY1325 Type "A"		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Mary River Mine Site, Baffin Island, NU	REGION: <input type="checkbox"/> NWT <input checked="" type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 71 MINUTES 18 SECONDS 52	LONGITUDE DEGREES 079 MINUTES 16 SECONDS 57		
F	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Suite 300, Oakville, ON L6H 0C3		
G	ANY CONTRACTOR INVOLVED N/A	CONTRACTOR ADDRESS OR OFFICE LOCATION N/A		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Approx. 250 L	U.N. NUMBER N/A	
	SECOND PRODUCT SPILLED (IF APPLICABLE) N/A	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES N/A	U.N. NUMBER N/A	
I	SPILL SOURCE Lift Station	SPILL CAUSE Flotation switch failure	AREA OF CONTAMINATION IN SQUARE METRES 35 m2	
J	FACTORS AFFECTING SPILL OR RECOVERY Congested area, snow and ice	DESCRIBE ANY ASSISTANCE REQUIRED N/A	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT N/A	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS: On November 11, 2019 at 04:00 HRS, a site services worker noticed sewage coming out of the bottom of the laundry lift station at the Mine Site Complex. Upon initial investigation, it was determined that the flotation switch used to turn on the pump had failed to trigger, causing the holding tank to overflow. The lift station was immediately pumped down by a vacuum truck to prevent further release. Approximately 250 L of sewage was released to the adjacent camp pad ground surface, impacting approximately 35 m2 area. This location is greater than >100 m to the nearest water course (currently frozen). The investigation of the incident is being completed and the results will be provided in the follow-up report. This spill is being reported as required by the conditions of water license no. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the GN EPA paragraph 5.1(a).			
L	REPORTED TO SPILL LINE BY Connor Devereaux	POSITION Env. Superintendent	EMPLOYER Baffinland	LOCATION CALLING FROM 416-364-8820 TELEPHONE ext. 6016
M	ANY ALTERNATE CONTACT Shawn Stevens	POSITION Head of HSE	EMPLOYER Baffinland	ALTERNATE CONTACT 416-364-8820 ALTERNATE TELEPHONE ext. 6006
REPORT LINE USE ONLY				
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR:	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC:			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN	FILE STATUS: <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME		CONTACT TIME	REMARKS
LEAD AGENCY				
FIRST SUPPORT AGENCY				
SECOND SUPPORT AGENCY				
THIRD SUPPORT AGENCY				

Figure 2. Baffinland NT NU spill report