

Mount Nansen January 2017

Groundwater Monitoring and Sampling

Prepared for:
Government of Yukon
Assessment and Abandoned Mines Branch
P.O. Box 2703
Whitehorse, YT Y1A 2C6

Prepared by:
Hemmera Envirochem Inc.
230 – 2237 2nd Avenue
Whitehorse, YT Y1A 0K7

and

Ecological Logistics & Research Ltd.
204 – 105 Titanium Way
Whitehorse, YT Y1A 0E7

File: 1343-005.29
March 2017

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	SITE LOCATION	1
1.2	SCOPE OF WORK	2
1.3	SAMPLE SITES	2
2.0	METHODOLOGY.....	8
2.1	PROTOCOLS.....	8
2.2	WELL MEASUREMENTS AND PURGING	8
2.3	DIRECT SAMPLING	9
2.4	FIELD PARAMETERS	10
2.5	GROUNDWATER SAMPLING	10
2.6	DATA MANAGEMENT AND ANALYSIS.....	11
2.7	QUALITY ASSURANCE AND QUALITY CONTROL	11
	2.7.1 Field QA/QC.....	11
	2.7.2 Analytical QA/QC	11
3.0	RESULTS	13
3.1	GROUNDWATER SAMPLING SUMMARY	13
3.2	ANALYTICAL RESULTS	18
	3.2.1 Dome Creek.....	18
	3.2.2 Mill Complex.....	18
	3.2.3 Brown McDade Pit	19
	3.2.4 Pony Creek	21
	3.2.5 Seepage Dam	21
	3.2.6 Tailings Facility.....	21
3.3	QUALITY ASSURANCE AND QUALITY CONTROL RESULTS	22
	3.3.1 Field and Travel Blanks	22
	3.3.2 Field Duplicates.....	22
	3.3.2.1 MW09-18 and DUP-1	22
	3.3.2.2 MW09-23 and DUP-2	22
	3.3.3 Quality Assurance and Quality Control Summary	22
4.0	RECOMMENDATIONS.....	23
5.0	CLOSURE.....	24
6.0	REFERENCES.....	25

List of Tables (*within text*)

Table 1-1	Summary of Groundwater Well Locations and Samples Collected	3
Table 2-1	Groundwater Sampling – Field Parameter Purging Criteria	9
Table 2-2	Groundwater Sampling Parameter Priority, Preservation, and Intended Analysis	10
Table 3-1	Summary of Direct Samples Collected During January 2017 Sampling Program	14
Table 3-2	Groundwater Field Parameters and Well Measurements for January 2017 Sampling Program	15
Table 3-3	Summary of CCME FAL Guideline Exceedances for January 2017 Sampling Program .	20

List of Figures

Figure 1-1	Site Location – Mount Nansen Site.....	5
Figure 1-2	Groundwater Sampling Locations – Dome Creek and Tailings Facility.....	6
Figure 1-3	Groundwater Sampling Locations – Mill Complex and Brown McDade Pit.....	7

List of Tables (*following text*)

Table A	Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program
Table B	QA/QC Analytical Data

List of Appendices

Appendix A	Site Photographs
Appendix B	Field Forms
Appendix C	Laboratory Reports
Appendix D	Response to Comments Received on Draft Report

1.0 INTRODUCTION

This Work was performed in accordance with Contract C00033455 between Hemmera Envirochem Inc. (“Hemmera”) and Government of Yukon (“Client”), dated May 13, 2016 (“Contract”). In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd. (Hemmera/ELR) were retained by the Government of Yukon (GY), Assessment and Abandoned Mines (AAM) to conduct a groundwater monitoring and sampling program at the Mount Nansen Site (the Site) in January, 2017. Hemmera/ELR’s scope of work included the monitoring of groundwater wells and collection of groundwater samples from a series of existing groundwater wells at the Site. This report summarizes the monitoring and sampling activities, a description of methodologies and field conditions encountered, a summary of field *in-situ* and laboratory analytical results including a comparison to applicable guidelines, a description of any observations and/or occurrences that may have influenced program results, and recommendations relating to sample procedures and monitoring well conditions. This report does not provide an interpretation of the results, nor does it provide recommendations relating to groundwater quality at the Site.

1.1 SITE LOCATION

The Mount Nansen site is located approximately 45 kilometres (km) west of the Town of Carmacks (70 km by road). This Type II abandoned mine site consists of three (3) primary areas of existing infrastructure: the Brown McDade Pit, a Mill Complex, and a Tailings Facility (**Figure 1-1**). Groundwater monitoring wells exist throughout the Site, a subset of which were sampled during the January 2017 groundwater monitoring and sampling program. The groundwater monitoring locations included in this program are described in **Sections 1.2** and **1.3**.

1.2 SCOPE OF WORK

The scope of work for this program included the coordination and execution of the January 2017 groundwater monitoring and sampling, analysis of samples, and the presentation of results in a report.

Groundwater sampling at the Site was conducted over a three (3) day period, between January 30 and February 1, 2017. Sampling was conducted by a team of four (4) qualified field staff from Hemmera/ELR (Jeremy Chua, Jarrod Colburne, Justin Hains, and Michelle McKay). A total of 60 groundwater wells were included in the January 2017 sampling event (**Table 1-1**). It was not possible to visit two (2) of the groundwater wells listed in the scope of work as they appeared to have been destroyed during placer mining operations in the summer of 2015 (GSI-PC-02-B and MP09-02; Hemmera, 2015).

At each well (sampling station) headspace gas concentrations were measured, well and water level parameters were measured (depth to water, depth to bottom, well diameter, and well stick-up height), the well was purged, and then prescribed *in-situ* groundwater quality parameters were measured. Lastly, groundwater samples were collected for laboratory analysis. A detailed description of the sampling methods and measured groundwater quality parameters is provided in **Section 2**.

1.3 SAMPLE SITES

The groundwater wells included in the January 2017 monitoring and sampling event were grouped into six (6) main areas of the Mount Nansen Site (**Table 1-1**). The majority of groundwater wells were located around existing infrastructure including the tailings facility and seepage dam (24 wells), the Brown McDade Pit (11 wells) and the Mill Complex (9 wells). Additional wells (primarily drive-point piezometer installations) were sampled in the vicinity of Dome Creek (9 wells) and Pony Creek (7 wells). **Table 1-1** provides the location, status, and sample recovery details for groundwater wells included in the January 2017 sampling program. The well locations are also illustrated in **Figures 1-2** and **1-3**. Photographs of each sample site visited in January 2017 are included in **Appendix A**.

Table 1-1 Summary of Groundwater Well Locations and Samples Collected

Area	Well Name	UTM (Zone 08N)		Status	Sample Collected	QA/QC Sample Collected
		Easting	Northing			
Dome Creek	GSI-DC-01B/A ⁵	387675	6881124	Frozen	-	-
	GSI-DC-02B/A ⁵	387879	6881129	Direct Sampled ¹	✓	-
	GSI-DC-03B/A ⁵	388107	6881079	Buried ⁴	-	-
	GSI-DC-05B/A ⁵	388725	6880836	Buried ⁴	-	-
	GSI-DC-06B/A ⁵	389788	6880567	Frozen	-	-
	GSI-DC-07B/A ⁵	390065	6880641	Buried ⁴	-	-
	GSI-DC-08-B/A ⁵	390311	6880583	Buried ⁴	-	-
	GSI-DC-09-B/A ⁵	390614	6880494	Buried ⁴	-	-
	GSI-DC-10-B/A ⁵	390859	6880447	Frozen	-	-
Mill Complex	GSI-HA-01A	387842	6881132	Direct Sampled ¹	✓	-
	GSI-HA-02A	387861	6881135	Frozen	-	-
	GSI-HA-03A	387878	6881131	Frozen	-	-
	GSI-HA-04A	387916	6881130	Frozen	-	-
	GSI-HA-05A	387898	6881125	Frozen	-	-
	MW09-16	387992	6881094	Frozen	-	-
	MW09-17	388075	6880970	Frozen	-	-
	MW09-18	388054	6880986	Good	✓	Duplicate
MW09-19	388051	6881016	Good	✓	Field Blank	
Brown McDade Pit	CH-P-13-01/10	388657	6881116	Frozen	-	-
	CH-P-13-03/50	389143	6881110	Direct Sampled ¹	✓	-
	CH-P-13-04/10	389138	6881472	Frozen	-	-
	CH-P-13-04/35	389138	6881472	Frozen	-	-
	CH-P-13-05/50	388954	6881466	Not Accessible ²	-	-
	GLL07-01	388851	6881783	Frozen	-	-
	GLL07-02	389069	6881703	Dry	-	-
	GLL07-03	388959	6881477	Not Accessible ²	-	-
	MW09-13	389006	6881664	Frozen	-	-
	MW09-14	389008	6881669	Frozen	-	-
MW09-15	388920	6881727	Frozen	-	-	

Area	Well Name	UTM (Zone 08N)		Status	Sample Collected	QA/QC Sample Collected
		Easting	Northing			
Pony Creek	GSI-PC-02-B/A ⁵	388907	6881786	Destroyed ³	-	-
	GSI-PC-03- B/A ⁵	389256	6881706	Buried ⁴	-	-
	GSI-PC-04-B/A ⁵	389586	6881656	Frozen	-	-
	GSI-PC-05-B/A ⁵	389713	6881661	Frozen	-	-
	MP09-02	388867	6881816	Destroyed ³	-	-
	MP09-03	388956	6881739	Frozen	-	-
	MP09-08	389160	6881718	Frozen	-	-
Seepage Dam	W14103083BH01	389522	6880669	Frozen	-	-
	W14103083BH02	389561	6880665	Frozen	-	-
	W14103083BH04	389544	6880666	Frozen	-	-
Tailings Facility	MP09-04	389575	6880609	Frozen	-	-
	MP09-05	389548	6880590	Frozen	-	-
	MP09-09	389240	6880681	Direct Sampled ¹	✓	Field Blank
	MP09-10	389241	6880684	Frozen	-	-
	MP09-11	389220	6880619	Frozen	-	-
	MP09-12	389220	6880619	Frozen	-	-
	MP09-14	389138	6880722	Frozen	-	-
	MW09-02	389393	6880562	Good	✓	Field Blank
	MW09-03	389411	6880555	Good	✓	-
	MW09-04	389420	6880557	Good	✓	-
	MW09-05	389413	6880656	Frozen	-	-
	MW09-06	389411	6880653	Good	✓	-
	MW09-07	389322	6880699	Frozen	-	-
	MW09-08	389620	6880576	Frozen	-	-
	MW09-11	389037	6880711	Dry	-	-
	MW09-20	389592	6880586	Frozen	-	-
	MW09-21	389536	6880577	Frozen	-	-
	MW09-22	389495	6880549	Direct Sampled ¹	✓	-
	MW09-23	389459	6880553	Good	✓	Duplicate
MW09-24	389561	6880624	Good	✓	-	
W14103083BH03	389132	6880730	Frozen	-	-	

Notes: ¹Direct sampling was completed at sample stations where insufficient water volumes had been encountered during the event, which limited standard purging and sampling methodologies.
² Monitoring wells CH-P-13-05/50 and GLL07-03 were not visited during the January 2017 field event due to pit wall stability safety concerns.
³ Destroyed wells are included in the scope of work and are therefore listed above in the summary table.
⁴ Groundwater well was found buried beneath ice and could therefore not be monitored.
⁵ A and B wells paired where B is monitored (headspace gases and water level measured, condition noted) and B is monitored and sampled (purged and water samples collected).

388000

389000

390000

6882000

6881000

6880000

388000

389000

390000



NOTES:
 1. Units: Meters
 2. Projection: UTM Zone 8 NAD83
 3. 2008 Quickbird imagery (courtesy of Yukon Geomatics) and spatial data provided by Yukon government.

**Mount Nansen Site - January 2017
 Groundwater Monitoring Program**

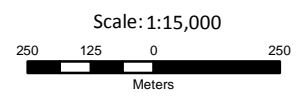
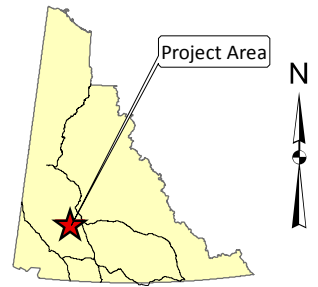


Client:



Legend

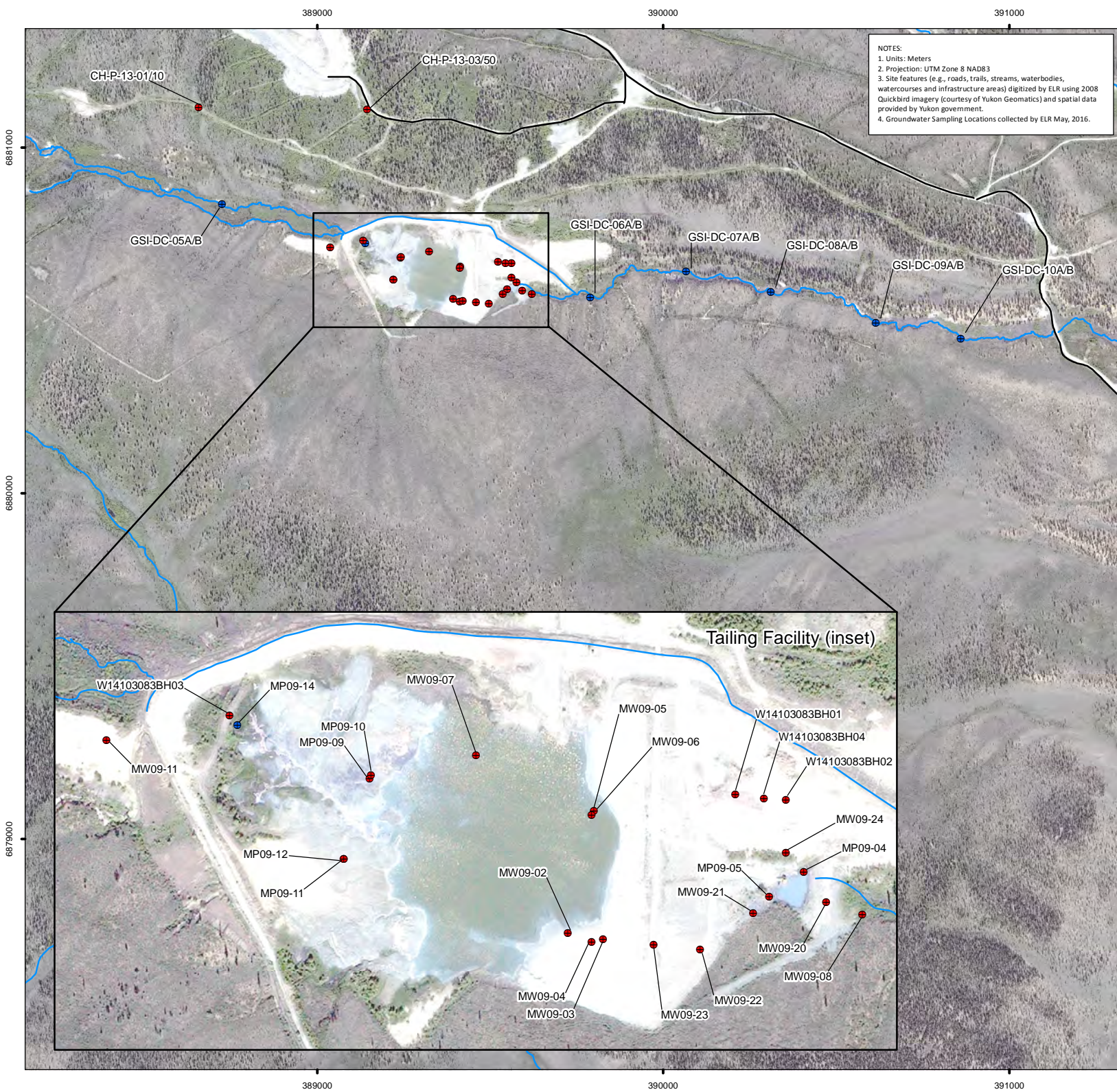
— Watercourses



March 3, 2017

Hemerra Project: 1343-005.29
 ELR Project: 16-239.3

FIGURE 1-1
 Site Location - Mount Nansen Site



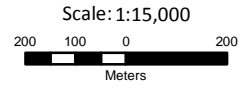
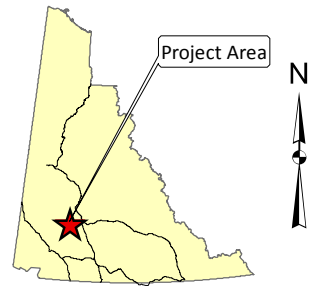
NOTES:
 1. Units: Meters
 2. Projection: UTM Zone 8 NAD83
 3. Site features (e.g., roads, trails, streams, waterbodies, watercourses and infrastructure areas) digitized by ELR using 2008 Quickbird imagery (courtesy of Yukon Geomatics) and spatial data provided by Yukon government.
 4. Groundwater Sampling Locations collected by ELR May, 2016.

**Mount Nansen Site - January 2017
 Groundwater Monitoring Program**



Client:
Yukon
 Energy, Mines and Resources
 Assessment and Abandoned Mines

- Legend**
- ⊕ Destroyed
 - ⊕ Drive Point
 - Monitoring Well
 - Watercourses



March 1, 2017

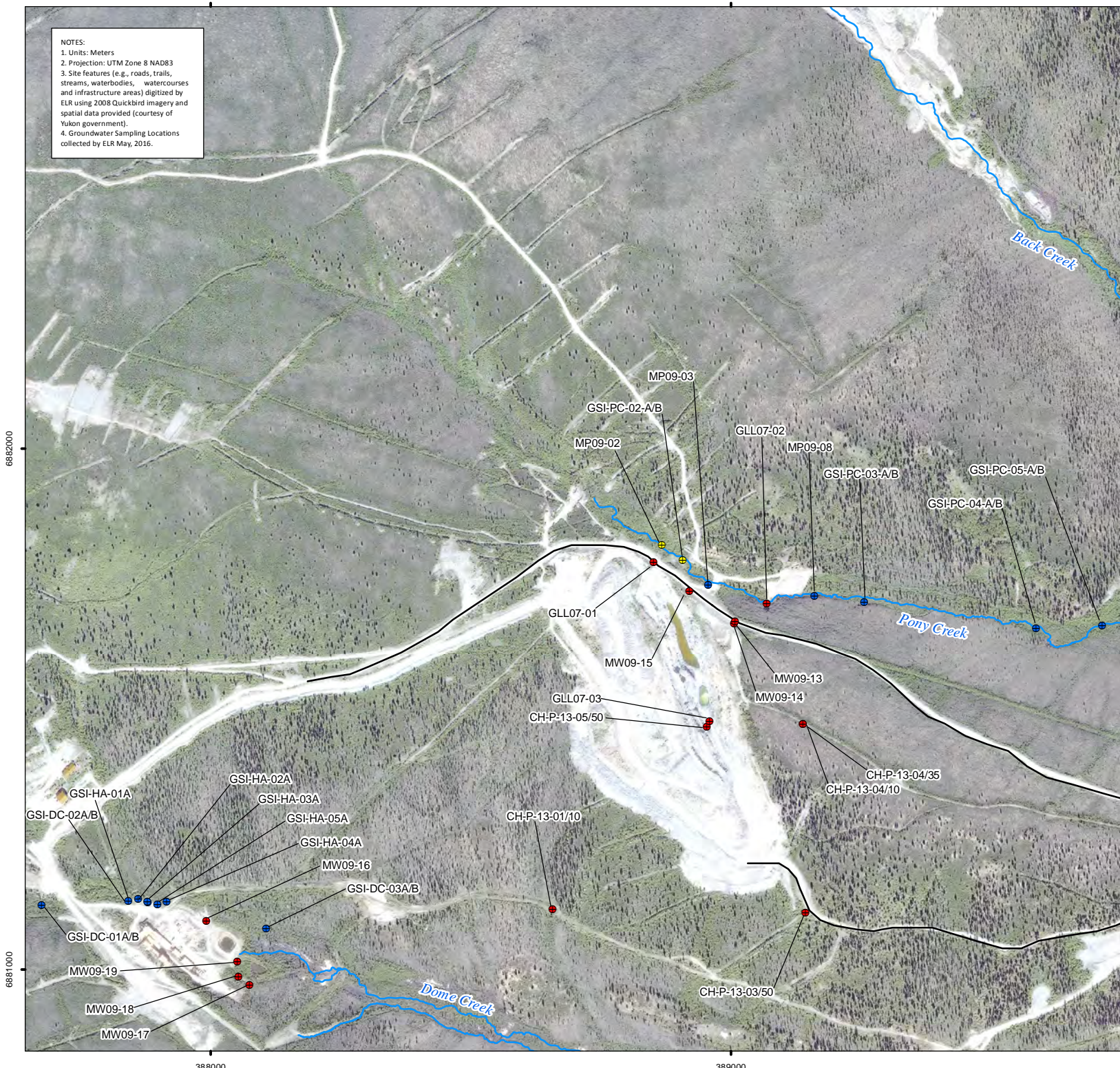
Hemmera Project: 1343-005.29
 ELR Project: 16-239.3

FIGURE 1-2
 Groundwater Sampling Locations
 Dome Creek and Tailings Facility

388000

389000

NOTES:
 1. Units: Meters
 2. Projection: UTM Zone 8 NAD83
 3. Site features (e.g., roads, trails, streams, waterbodies, watercourses and infrastructure areas) digitized by ELR using 2008 Quickbird imagery and spatial data provided (courtesy of Yukon government).
 4. Groundwater Sampling Locations collected by ELR May, 2016.



6882000

6881000

388000

389000

**Mount Nansen Site - January 2017
 Groundwater Monitoring Program**

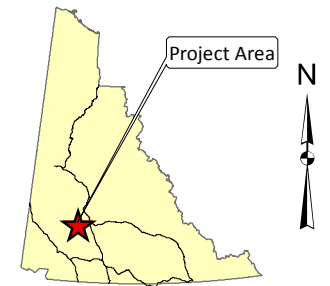


Client:

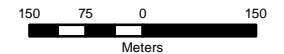


Legend

- Destroyed
- Drive Point
- Monitoring Well
- Watercourses



Scale: 1:10,000



March 3, 2017

Hemmera Project: 1343-005.29
 ELR Project: 16-239.3

FIGURE 1-3

**Groundwater Sampling Locations
 Mill Complex and Brown McDade Pit**

2.0 METHODOLOGY

2.1 PROTOCOLS

Groundwater purging, monitoring and sampling conducted by Hemmera/ELR were completed in accordance with the Groundwater Sampling Standard Operating Procedures included in the document *Scope of Work: Mount Nansen Groundwater Scope of Work*. These procedures were consistent with Environment Yukon's *Protocol for the Contaminated Sites Regulation #7 - Sampling and Decommissioning* (Government of Yukon, 2011). Methods used were also consistent with the ASTM D4448-01 *Standard Guide for Sampling Groundwater Monitoring Wells* (ASTM, 2013), and the D6452-99 *Guide for Purging Methods for Wells used for Groundwater Quality Investigations* (ASTM, 2012).

2.2 WELL MEASUREMENTS AND PURGING

Upon arriving at each sample station, headspace gases were measured prior to any other well measurements. Oxygen (%), carbon dioxide (ppm), and methane (%LEL) were measured using a Rae Systems MultiRAE Four-Gas Monitor with photoionization detector (PID).

The well structure and casing were inspected for damage, closure, and general conditions. Depth to water (DTW; m), depth to bottom (DTB; m), well diameter (cm), and well stick-up height (m) were then recorded at each well.

DTB and DTW were measured using either a Solinst - Model 102 Water Level Meter (for 2.54 cm diameter wells) or a Solinst – Model 122 Interface Meter (for wells with diameter greater than 2.54 cm). DTB and DTW were measured from (in order of preference): 1) a black mark drawn on the top of the well; 2) the bottom of the most significant notch found on the top of the PVC if a mark was not present; or 3) a line that was drawn on the highest point of the well if no distinguishable point of measure was present. Stick-up height was measured from the lowest point on the bottom of the well casing to the highest point (or distinguishing mark) on the well. Water level meters were cleaned between each sample site using Alconox low-foaming phosphate-free detergent solution and deionized water.

Following initial inspection and measurements, groundwater wells were purged and sampled using dedicated equipment. Groundwater wells were purged and sampled using one of three (3) techniques: 1) manual purging using high density polyethylene (HDPE) Waterra tubing and a footvalve, 2) GeoPump peristaltic pump with HDPE tubing, or 3) manual purging using disposable polyethylene bailers. The purging technique chosen for each well was that which would provide the most representative groundwater sample. At times the cold temperatures and wind caused the water in the peristaltic tubing to freeze, therefore sampling was not always possible with a peristaltic pump. At these times a bailer was used in lieu of peristaltic tubing.

Groundwater wells were determined to be sufficiently purged when either three (3) successive field parameter measurements were recorded to be within an allowable tolerance level (as summarized in **Table 2-1**, below) or when a volume of water equivalent to three (3) standing well volumes of water had been purged.

Groundwater turbidity measured in Nephelometric Turbidity Units (NTU) or Attenuation Units (AU¹) was also measured prior to sampling (described below in **Section 2.4**) and was used as an indication of sample quality. Where possible, samples were not collected until turbidity was less than 50 NTU. Purge volumes and purge rates were measured using a graduated container and stop watch. All well measurements, purging details, and additional field notes were recorded on customized field forms in order to minimize the potential for field errors.

Table 2-1 Groundwater Sampling – Field Parameter Purging Criteria

Field Parameter	Allowable Variance
Temperature (°C)	± 3%
pH (pH units)	± 0.1
Conductivity (µS/cm)	± 3%
Specific Conductivity (µS/cm)	± 3%

2.3 DIRECT SAMPLING

During previous events a select number of groundwater wells had insufficient volume of groundwater to sample using conventional methods, limiting the number of wells that were sampled during the event. An alternate sampling strategy was established in 2014 by AAM's consultant (AMEC) in order to obtain samples from low producing wells; this continued to be followed during the January 2017 sampling event. At wells identified as regularly having insufficient volume of water or insufficient recharge, Hemmera/ELR direct sampled (analytical samples collected prior to purging or collecting field parameter measurements), after which time field parameter measurements were collected if possible. Additionally, a priority ranking order for analytical sample collection previously established by AAM's consultant (AMEC) was used when collecting samples at these direct sampled wells (as summarized in **Table 2-2**). This ranking system was established to ensure that samples for the highest priority parameters were collected first at each well if limited recharge or volume was encountered. Where the volume or recharge limited sample collection, Hemmera/ELR also re-visited wells when feasible, to attempt to collect a more thorough or complete sample set.

¹ AU stands for Attenuation Units, which is an alternate unit of measure reported by some turbidity meters where turbidity is greater than 500 NTU. AU units are comparable with NTU units, but represent a value calculated using transmitted rather than scattered light.

In addition to the priority ranking order, Hemmera/ELR also adhered to minimum required sample volumes for laboratory procedures (provided to Hemmera/ELR by ALS Laboratories) where well volume was limited. This allowed the maximum number of program parameters to be collected when volumes were limited.

2.4 FIELD PARAMETERS

Hemmera/ELR measured *in-situ* water quality parameters using YSI Professional Plus multi-parameter field meters, Lamotte 2020we turbidity meters, and Hach DR 890 Portable Colorimeters. Flow-through cells were used with the YSI meters to minimize field parameter variability; flow-through cells improve the precision of field measurements by limiting sample water contact with air, and by continuously moving sample water across the field meter sensors. The *in-situ* groundwater quality parameters recorded at each sample station included water temperature (°C), specific conductivity (µs/cm), conductivity (µs/cm), oxidation/reduction potential (ORP; mv), pH (pH units), sulphide (mg/l), dissolved oxygen (mg/l and percent saturation), and turbidity (NTU or AU).

During purging, field parameters were monitored at 3 minute intervals, or at volume related intervals (e.g., every 500 mL) in the case of wells with slow recharge. *In-situ* measurements for reporting purposes were recorded at the conclusion of purging.

2.5 GROUNDWATER SAMPLING

Groundwater quality samples were collected and preserved in accordance with laboratory directions, and using techniques consistent with *Standard Methods for the Examination of Water and Wastewater* (Rice et al., 2012). ALS Global was the analytical laboratory chosen for this project, and a summary of the sample bottle set (including parameters analysed and preservation techniques) is provided in **Table 2-2**.

Table 2-2 Groundwater Sampling Parameter Priority, Preservation, and Intended Analysis

Priority	Bottle Type	Parameters Analyzed	Minimum Volume	Sample Treatment	Preservative Added
1a	120 ml (plastic)	Dissolved Metals	100 ml	Field Filtered and Preserved	HNO ₃
1b	40 ml (glass)	Dissolved Mercury	15 ml	Field Filtered and Preserved	HCl
2	500 ml (plastic)	General Chemistry	100 ml	-	-
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	Preserved	NaOH
4	120 ml (glass amber)	Ammonia (NH ₃)	60 ml	Preserved	H ₂ SO ₄
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	Preserved	HNO ₃
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-

2.6 DATA MANAGEMENT AND ANALYSIS

Groundwater analytical field and laboratory results were tabulated and reviewed using Hemmera/ELR's EQWin Data Manager water quality database. Data was tabulated for the report and compared to the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FAL; CCME, 2014) standards using the database application. All relevant CCME FAL guidelines are presented alongside data in **Table A**.

2.7 QUALITY ASSURANCE AND QUALITY CONTROL

2.7.1 FIELD QA/QC

Several controls were used by Hemmera/ELR staff while in the field to ensure that sample integrity was maintained and that data were recorded completely and accurately. All equipment used during the sampling process was dedicated to individual wells, including HDPE tubing and Waterra footvalves, laboratory provided pre-cleaned sample bottles, disposable filters, disposable syringes, and disposable polyethylene bailers. Field staff used dedicated disposable nitrile gloves for all measurements, purging, and sampling. Water level meters were cleaned between well locations using Alconox low-foaming phosphate-free detergent and deionized water, and field instruments (YSI field meters, turbidity meters, and portable colorimeters) were checked and calibrated before the site visit to ensure the parameters recorded were as accurate as possible.

Project-specific field data sheets were created for the sampling event to help ensure that all required measurements were taken, and that information was recorded correctly. Field data sheets have been included as **Appendix B** of this report.

2.7.2 ANALYTICAL QA/QC

Analytical QA/QC measures were included in the January 2017 sampling program as outlined in the scope of work and as per standard industry practice. This included the collection of field duplicates and field blanks, and the use of travel blanks. Duplicate samples were collected at a ratio of 10% of the regular samples (1 duplicate was collected for every 10 samples), and one (1) field blank was prepared during each day of sampling (3 field blanks collected). One travel blank accompanied the analytical supplies and samples from the laboratory to the field, and back to the laboratory again (one for a single shipment).

The variation between sample and duplicate results was calculated as relative percent difference (RPD). RPD provides a measure of the relative difference between two values in comparison to their mean value, and is calculated as the difference between a sample and its field duplicate over the average of two values. RPD values greater than 20% indicate a greater than expected variation in data that could potentially have affected the precision of sampling or analysis. RPD was calculated according to the following formula:

$$\%RPD = \left(\frac{X_1 - X_2}{\left(\frac{X_1 + X_2}{2} \right)} \right) \times 100$$

Where X_1 is the sample result and X_2 is the corresponding duplicate result. RPD is not considered valid and is therefore not calculated if either the sample or the field duplicate concentration is less than five times the detection limit.

The analytical results for field and travel blanks were reviewed to determine whether any of the parameters tested were detected (i.e., result exceeding the detection limit). In such cases, the parameter or element in question and its concentration were reviewed to determine potential sources of contamination or error.

3.0 RESULTS

A summary of laboratory analytical results in the context of CCME FAL guidelines is presented in **Table A** of this report. A summary of the QA/QC sampling results is presented in **Table B**, including analytical data for duplicates, field blanks, and travel blanks. Laboratory analytical reports are presented in **Appendix C**.

3.1 GROUNDWATER SAMPLING SUMMARY

Groundwater sampling was completed between January 30 and February 1, 2017. Weather conditions varied throughout the time of sampling with ambient air temperature ranging from -15 to -30 °C. Periods of sunshine, light snow, and heavy to light wind occurred throughout the sampling event.

Of the sixty (60) wells specified for the January 2017 sampling event, fifty (50) were located and assessed during the program. As noted in **Section 1.2**, two (2) groundwater wells listed in the scope of work had previously been reported as destroyed (GSI-PC-02B and MP09-02), two (2) were not accessible due to safety concerns at the Brown McDade Pit (GLL07-03 and CH-P-13-05/50), and six (6) were frozen beneath ice (GSI-DC-03B, GSI-DC-05B, GSI-DC-07B, GSI-DC-08B, GSI-DC-09B, and GSI-PC-03B). Further details concerning these wells are provided in **Section 3.2**.

Of the fifty (50) wells located, thirteen (13) wells were sampled; eight (8) using purging and sample methods as per the program protocols, and five (5) direct sampled without purging according to the sample priority ranking (**Table 2-2**). In one (1) of the five (5) direct sampled wells, volumes were insufficient to collect a full sample set. **Table 3-1** provides a summary of limited sample set collection.

Of the remaining thirty-seven (37) wells that were assessed but not sampled during the program, 35 wells were frozen, and two (2) well were dry. Despite not collecting water quality samples, these wells were still assessed and water/ice depth, well depth, and headspace gas measurements were collected to the extent possible. A summary of the overall condition (status) and sampling result for groundwater wells is provided in **Table 1-1**, and a summary of all well measurements, purge details, and *in-situ* parameter results is provided in **Table 3-2**.

Table 3-1 Summary of Direct Samples Collected During January 2017 Sampling Program

Well Name	Dissolved Metals	Dissolved Mercury	Physical Parameters/Anions/ Nutrients	Cyanide	Ammonia	Thiocyanate	Total Inorganic Carbon
Priority	1a	1b	2	3	4	5	6
GSI-DC-02B	✓	✓	✓	✓	✓	✓	✓
GSI-HA-01A	✓	✓	✓	✓	✓	✓	✓
CH-P-13-03/50	✓	✓	-	-	-	-	-
MP09-09	✓	✓	✓	✓	✓	✓	✓
MW09-22	✓	✓	✓	✓	✓	✓	✓

Notes: Refer to **Section 2.2** for details concerning direct sampling methodologies, including minimum volume collection. Samples were collected based on field priority ranking as specified in **Table 2-2**.

Table 3-2 Groundwater Field Parameters and Well Measurements for January 2017 Sampling Program

Area	Location ID	Sample Date	Status	Stick up Height (m)	Depth To Water (m)	Depth to Bottom (m)	Standing Water Volume (L)	Volume Purged (L)	Purge Start Time	Purge End Time	Elapsed Purge Time	Purge Rate (l/min)	Criteria ¹ (3WV/PS/DS/PDR)	Draw Down (m)	pH	Temperature (°C)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Field Sulphide (mg/L)	Methane (%LEL)	Oxygen (%)	Carbon Dioxide (ppm)	Field Turbidity (NTU)	Method Used	Well Diameter (cm)	
Dome Creek	GSI-DC-01A	1/30/17	Frozen	0.66	0.866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	0	-	-	2.54		
	GSI-DC-01B	1/30/17	Frozen	0.73	0.834	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.2	0	-	-	2.54		
	GSI-DC-02A	1/30/17	Frozen	0.35	1.864	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	17.5	2250	-	-	2.54		
	GSI-DC-02B ²	1/30/17	Direct Sampled	0.27	2.370	3.716	0.7	-	-	-	-	-	-	DS	-	-	-	-	-	-	-	0	20.9	920	920	peristaltic	2.54	
	GSI-DC-03A ⁶	1/30/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GSI-DC-03B ⁶	1/30/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-05A ⁶	2/1/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-05B ⁶	2/1/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-06A	1/31/17	Frozen	0.81	0.900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.5	0	-	-	2.54	
	GSI-DC-06B	1/31/17	Frozen	0.49	0.530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.4	0	-	-	2.54	
	GSI-DC-07A ⁶	1/31/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-07B ⁶	1/31/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-08A	1/31/17	Frozen	0.02	1.141	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.2	0	-	-	2.54	
	GSI-DC-08B ⁶	1/31/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-09A ⁶	1/31/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GSI-DC-09B ⁶	1/31/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GSI-DC-10A	1/31/17	Frozen	0.77	1.051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.7	0	-	-	2.54		
GSI-DC-10B	1/31/17	Frozen	0.76	0.203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.7	0	-	-	2.54		
Mill Complex	GSI-HA-01A ²	1/30/17	Direct Sampled	0.46	2.411	3.312	0.4	-	-	-	-	-	-	DS	-	-	-	-	-	-	0	20.9	690	-	peristaltic	2.54		
	GSI-HA-02A	1/30/17	Frozen	1.20	2.158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	490	-	-	2.54		
	GSI-HA-03A	1/30/17	Frozen	0.91	0.925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	530	-	-	2.54		
	GSI-HA-04A	1/30/17	Frozen	0.64	2.200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	780	-	-	2.54		
	GSI-HA-05A	1/30/17	Frozen	0.62	1.304	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	660	-	-	2.54		
	MW09-16	1/30/17	Frozen	1.38	2.040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.5	650	-	-	5.08		
	MW09-17	1/30/17	Frozen	0.93	5.704	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	0	-	-	5.08		
	MW09-18	1/30/17	Good	0.86	5.102	7.769	5.4	16.0	13:57	14:17	0:20	0.8	3WV	0.018	6.93	-0.7	1383	2714	49.0	2.76	0.13	0	21.2	0	49.4	Disp. Bailer	5.08	
MW09-19	1/30/17	Good	0.89	3.029	5.887	5.7	8.5	12:49	13:32	0:43	0.2	PS	1.543	6.80	-0.3	1107	2165	-63.1	1.79	0.17	0	21.3	0	29.7	Disp. Bailer	5.08		

Area	Location ID	Sample Date	Status	Stick up Height (m)	Depth To Water (m)	Depth to Bottom (m)	Standing Water Volume (L)	Volume Purged (L)	Purge Start Time	Purge End Time	Elapsed Purge Time	Purge Rate (l/min)	Criteria ¹ (3WV/PS/DS/PDR)	Draw Down (m)	pH	Temperature (°C)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Field Sulphide (mg/L)	Methane (%LEL)	Oxygen (%)	Carbon Dioxide (ppm)	Field Turbidity (NTU)	Method Used	Well Diameter (cm)
Brown McDade Pit	CH-P-13-01/10	1/30/17	Frozen	0.42	6.585	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.4	0	-	-	3.81	
	CH-P-13-03/50 ²	1/30/17	Direct Sampled	0.53	48.701	49.815	0.6	-	-	-	-	-	DS	-	-	-	-	-	-	-	-	0	20.9	550	-	Disp. Bailer	2.54
	CH-P-13-04/10	1/31/17	Frozen	0.61	6.219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	550	-	-	3.81
	CH-P-13-04/35	1/31/17	Frozen	0.60	0.562	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	550	-	-	2.54
	CH-P-13-05/50 ⁴	-	Not Accessible	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GLL07-01	1/30/17	Frozen	0.77	13.879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11.0	43700	-	-	5.08
	GLL07-02	2/1/17	Dry	1.35	-	7.045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	730	-	-	5.08
	GLL07-03 ⁴	-	Not Accessible	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MW09-13	1/30/17	Frozen	0.80	8.135	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	610	-	-	5.08
	MW09-14	1/30/17	Frozen	0.73	5.514	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	550	-	-	5.08
	MW09-15	1/30/17	Frozen	1.90	14.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	700	-	-	5.08
Pony Creek	GSI-PC-02B ⁵	-	Destroyed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GSI-PC-03A ⁶	2/1/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GSI-PC-03B ⁶	2/1/17	Buried	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GSI-PC-04A	2/1/17	Frozen	0.74	0.845	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	610	-	-	2.54
	GSI-PC-04B	2/1/17	Frozen	0.84	0.690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	630	-	-	2.54
	GSI-PC-05A	2/1/17	Frozen	0.60	0.838	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	650	-	-	2.54
	GSI-PC-05B	2/1/17	Frozen	0.65	1.770	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16.0	9100	-	-	2.54
	MP09-02 ⁵	-	Destroyed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	MP09-03	2/1/17	Frozen	0.41	1.455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	650	-	-	2.54
MP09-08	2/1/17	Frozen	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	580	-	-	2.54	
Seepage Dam	W14103083BH01	1/30/17	Frozen	0.58	6.447	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.0	0	-	-	5.08	
	W14103083BH02	1/30/17	Frozen	0.78	6.743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.9	0	-	-	5.08	
	W14103083BH04	1/30/17	Frozen	0.74	6.662	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.0	0	-	-	5.08	

Area	Location ID	Sample Date	Status	Stick up Height (m)	Depth To Water (m)	Depth to Bottom (m)	Standing Water Volume (L)	Volume Purged (L)	Purge Start Time	Purge End Time	Elapsed Purge Time	Purge Rate (l/min)	Criteria ¹ (3WV/PS/DS/PDR)	Draw Down (m)	pH	Temperature (°C)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Field Sulphide (mg/L)	Methane (%LEL)	Oxygen (%)	Carbon Dioxide (ppm)	Field Turbidity (NTU)	Method Used	Well Diameter (cm)
Tailings Facility	MP09-04	1/31/17	Frozen	1.23	1.646	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.8	0	-	-	3.81	
	MP09-05	1/31/17	Frozen	0.30	1.333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.2	0	-	-	3.81	
	MP09-09 ²	1/31/17	Direct Sampled	2.58	4.010	5.698	1.9	-	-	-	-	-	DS	-	-	-	-	-	-	-	0.8	0	20.9	550	900 ³	Disp. Bailer	3.81
	MP09-10	1/31/17	Frozen	2.21	3.238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	610	-	-	3.81
	MP09-11	1/31/17	Frozen	1.96	2.183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.6	580	-	-	3.81
	MP09-12	1/31/17	Frozen	2.09	2.070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	560	-	-	3.81
	MP09-14	1/31/17	Frozen	0.69	0.505	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	530	-	-	2.54
	MW09-02	2/1/17	Slow Recharge	0.74	3.012	6.635	5.2	3.3	15:26	15:32	0:06	0.55	PDR	3.623	6.97	0.4	1198	2261	47.3	5.69	0.03	0	20.9	550	3.65	Disp. Bailer	5.08
	MW09-03	2/1/17	Good	0.31	6.680	9.969	6.6	3.0	10:12	10:35	0:23	0.13	PS	-	7.64	0.2	1423	2722	137.6	1.9	0.01	0	20.9	0	0.91	peristaltic	5.08
	MW09-23	1/31/17	Good	0.17	12.688	15.895	6.5	25.0	17:00	17:22	0:22	1.1	PS	0.062	7.08	-0.6	643	1260	-77.2	1.63	0.26	0	21.8	0	17.7	Waterra	5.08
	MW09-24	1/31/17	Good	0.66	9.273	11.957	5.4	24.0	14:00	14:19	0:19	1.3	PS	0.004	9.01 ⁷	-0.6	296.1	579.7	85.1	9.75	0.15	0	22.2	0	106.7	Waterra	5.08
	W14103083BH03	1/31/17	Frozen	0.73	1.498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	530	-	-	5.08
	MW09-04	2/1/17	Good	0.26	4.594	7.715	6.2	1.8	9:42	9:56	0:14	0.13	PS	0.606	8.19	1.4	1335	2429	127.1	0.92	0	0	20.9	0	13.6	peristaltic	5.08
	MW09-05	1/31/17	Frozen	1.32	8.875	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18.4	3000	-	-	5.08
	MW09-06	2/1/17	Slow Recharge	2.35	4.750	6.073	2.6	3.0	14:26	14:37	0:11	0.27	PDR	1.323	6.88	1.9	878	1571	230.9	2.87	0	0	18.3	3200	1.42	Disp. Bailer	5.08
	MW09-07	1/31/17	Frozen	1.24	3.428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	860	-	-	5.08
	MW09-08	1/31/17	Frozen	1.05	1.206	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.0	0	-	-	5.08
	MW09-11	1/31/17	Dry	0.82	-	4.940	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20.9	550	-	-	5.08
	MW09-20	1/31/17	Frozen	0.94	3.670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21.9	0	-	-	2.54
	MW09-21	1/31/17	Frozen	0.41	1.338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22.1	0	-	-	5.08
MW09-22 ²	2/1/17	Direct Sampled	0.78	4.719	5.275	1.1	-	-	-	-	-	-	DS	-	-	-	-	-	-	-	0	22.1	0	-	Disp. Bailer	5.08	

Notes: To maximize the sample return for analytical analysis, field parameters were not collected at all direct sampled wells. Shaded rows indicate monitoring stations where analytical samples were collected.
¹ 3WV = Three standing well volumes purged prior to sample collection, PS = field parameters stabilized prior to sample collection, PDR = purge dry and return, and DS = sample collected directly without purging.
² Due to low well volumes (direct sampling), field parameters were not measured.
³ Turbidity measurement exceed Nephelometric Turbidity Units and was therefore measured in Attenuation Unit (AU).
⁴ Well was not accessible during the sampling event due to health and safety concerns in the Brown McDade Pit.
⁵ Well has been destroyed by placer mining activity.
⁶ Well found frozen beneath ice and therefore could not be monitored.
⁷ Field pH value was not consistent with the lab pH value, therefore field pH value may not be reliable.

3.2 ANALYTICAL RESULTS

Analytical results are summarized below, including a brief summary of CCME FAL guideline exceedances and a description of factors that may have influenced the data. Details regarding well status, including a description of damaged or underperforming wells, are also provided.

In several instances, laboratory reportable detection limits (RDL) for parameters exceeded applicable CCME FAL standards (lightly shaded values in **Table A**). In these cases, samples having elevated levels of certain parameters required laboratory dilution prior to performing the required analyses, thereby resulting in an elevated RDL. For the purpose of this report, samples where the reported RDL is greater than the applicable guideline have not been reported as CCME FAL exceedances.

3.2.1 DOME CREEK

Groundwater wells along Dome Creek were monitored between January 30 and February 1, 2017. A direct sample was collected from one (1) of the nine (9) wells located in this area (GSI-DC-02B). Of the remaining eight (8) wells, three (3) were found to be frozen (GSI-DC-01B, GSI-DC-06B, and GSI-DC-10B), and five (5) could not be located because they were buried beneath ice (GSI-DC-03B, GSI-DC-05B, GSI-DC-07B, GSI-DC-08B, and GSI-DC-09B). A summary of field measurements, including headspace gases, is provided in **Table 3-2**.

CCME FAL guideline exceedances were observed at the site sampled on Dome Creek, including exceedances for dissolved arsenic and dissolved iron. A summary of CCME FAL guideline exceedances is provided in **Table 3-3**.

Turbidity was not measured at GSI-DC-02B due to an insufficient water volume (**Table 3-2**).

3.2.2 MILL COMPLEX

Groundwater in the Mill Complex Area was sampled on January 30 and February 1, 2017. Samples were obtained from three (3) of the nine (9) wells identified in this area. Six (6) of the wells identified in this area were found frozen at the time of sampling (GSI-HA-02A, GSI-HA-03A, GSI-HA-04A, GSI-HA-05A, MW09-16, and MW09-17). Drive-point GSI-HA-01A was direct sampled without purging, while wells MW09-18 and MW09-19 were sampled according program protocols. A summary of the samples collected is provided in **Table 3-1**, and analytical results are provided in **Table A**.

CCME FAL guideline exceedances were observed at two (2) and the three (3) sites sampled in the Mill Complex area (MW09-18 and MW09-19), including dissolved arsenic (two sites), and dissolved iron (one site). Where measured (two sites), field dissolved oxygen concentrations were below the CCME FAL minimum concentration. A summary of CCME FAL guideline exceedances is provided in **Table 3-3**.

Where measured, groundwater turbidity of the samples collected was less than 50 NTU. (**Table 3-2**).

3.2.3 BROWN MCDADE PIT

Groundwater wells in the Brown McDade Pit area were sampled between January 30 and February 1. Samples were obtained from only one (1) of the eleven (11) sites identified in this area (CH-P-13-03/50), which was direct sampled without purging. One (1) site was dry (GLL07-02), and seven (7) wells were frozen during the site visit (CH-P-13-01/10, CH-P-13-04/10, CH-P-13-04/35, GLL07-01, MW09-13, MW09-14, and MW09-15). Two (2) wells (CH-P-13-05/50 and GLL07-03) were not accessible during the time of sampling due to safety concerns due to pit wall instability (access to the Brown McDade Pit was restricted by AAM). A summary of the samples collected is provided in **Table 3-2**, and analytical results are provided in **Table A**.

CCME FAL guideline exceedances were observed in the one (1) site sampled in this area, for dissolved cadmium and selenium. A summary of CCME FAL guideline exceedances is provided in **Table 3-3**.

Groundwater turbidity, among other field parameters, were not measured at CH-P-13-03/50 due to insufficient water volume (**Table 3-2**).

Table 3-3 Summary of CCME FAL Guideline Exceedances for January 2017 Sampling Program

Area	Sample ID	Date Sampled	ALS Work Number	Parameter	Field pH	Field Dissolved Oxygen	Ammonia, Total (as N)	Fluoride (F)	Cyanide, Free	Arsenic (As)	Copper (Cu)	Iron (Fe)	Mercury (Hg)	Selenium (Se)	Silver (Ag)	Zinc (Zn)		
				Units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CCME-FAL ^{1, 6}	6.5-9.0	9.5	Varies	0.12	0.005	0.005	Varies	0.3	0.000026	0.001	0.0001	0.03		
Dome Creek	GSI-DC-02B ²	1/30/2017	L1886064	Direct Sample	-	-	-	-	-	0.0333	-	17.6	-	-	-	-		
Mill Complex	MW09-18	1/30/2017	L1886064	Good	-	2.76	-	<0.40	-	0.0543	-	-	-	-	-	-		
	MW09-19	1/30/2017	L1886064	Good	-	1.79	-	<0.20	-	0.154	-	20.1	-	-	-	-		
Brown McDade Pit	CH-P-13-03/50 ³	1/30/2017	L1886064	Direct Sample	-	-	-	-	-	-	-	-	-	0.00225	-	-		
Tailings Facility	MP09-09	1/30/2017	L1886064	Direct Sample	-	-	-	1.45	0.501	26.4	0.366	-	0.0000320	0.00146	0.0107	-		
	MW09-02	2/1/2017	L1886064	Slow Recharge	-	5.69	-	0.59	-	7.46	-	12.0	-	-	-	0.379		
	MW09-03	2/1/2017	L1886064	Good	-	1.9	6.24	<0.40	-	1.98	0.0556	-	-	-	-	-		
	MW09-04	2/1/2017	L1886064	Good	-	0.92	7.47	0.42	-	3.61	-	-	-	-	-	0.766		
	MW09-06	2/1/2017	L1886064	Slow Recharge	-	2.87	-	0.23	-	0.236	0.00538	-	-	-	-	0.0867		
	MW09-22 ⁴	2/1/2017	L1886064	Direct Sample	-	-	-	-	-	0.00702	-	14.0	-	-	-	-		
	MW09-23	2/1/2017	L1886064	Good	-	1.63	-	-	-	0.0305	-	11.2	-	-	-	-		
MW09-24	2/1/2017	L1886064	Good	9.01 ⁵	-	-	-	-	-	-	0.00600	-	-	-	-			

Notes: ¹ CCME guideline exceedances shaded with dark grey. Light grey shading denotes reportable detection limit in exceedance of CCME guideline.

² Due to slow recharge and low well volumes, samples were collected from GSI-DC-02B between January 30 and 31, 2017.

³ Due to slow recharge and low well volumes, samples were collected from CH-P-13-03/50 on January 30, 2017. Only dissolved metals and dissolved mercury were collected.

⁴ Due to slow recharge and low well volumes, samples were collected from MW09-22 between January 31 and February 1, 2017. General chemistry was collected on February 1, 2017 and all other samples were collected on January 31, 2017.

⁵ Field pH value is not consistent with the lab pH value, therefore field pH is not considered to be reliable.

⁶ Refer to **Table A** for full analytical report.

“-“ indicates either no exceedance was observed or no analysis was conducted.

3.2.4 PONY CREEK

Groundwater wells along Pony Creek were monitored between on February 1, 2017. One (1) of the seven (7) groundwater wells identified in the Pony Creek area was buried beneath ice, and therefore could not be located at the time of sampling (GSI-PC-03B). Two (2) of the six (6) remaining wells identified in this area had been previously destroyed by placer mining activity (GSI-PC-02B and MP09-02) and therefore could not be monitored. The remaining four (4) wells were monitored, and found frozen at the time of sampling (GSI-PC-04B, GSI-PC-05B, MP09-03, and MP09-08) A summary of field parameters collected is provided in **Table 3-2**.

3.2.5 SEEPAGE DAM

Groundwater wells in the Seepage Dam area were monitored on January 30, 2017. All three (3) of the groundwater wells in this area were frozen at the time of sampling. A summary of field measurements collected for each site is provided **Table 3-2**.

3.2.6 TAILINGS FACILITY

Groundwater wells in the Tailings Facility area were sampled between January 30 and February 1, 2017. Samples were obtained from eight (8) of the twenty-one (21) sample sites located in this area. Twelve (12) of the twenty-one (21) groundwater wells identified in the Tailings Facility area were frozen at the time of sampling (MP09-04, MP09-05, MP09-10, MP09-11, MP09-12, MP09-14, MW09-05, MW09-07, MW09-08, MW09-20, MW09-21, and W14103083BH03), and another one (1) was dry at the time of sampling (MW09-11). Of the eight (8) wells sampled in the Tailings Facility area, two (2) were direct sampled (MP09-09, and MW09-22), while the other six (6) were purged prior to sampling (MW09-02, MW09-03, MW09-04, MW09-06, MW09-23, and MW09-24). A summary of the samples collected is provided in **Table 3-2**, and analytical results are provided in **Table A**.

CCME FAL guideline exceedances were observed at all eight (8) sites sampled in the Tailings Facility area, including exceedances of total ammonia (two sites), dissolved fluoride (four sites), free cyanide (one site), dissolved arsenic (seven sites), dissolved cadmium (three sites), dissolved copper (four sites), dissolved iron (three sites), dissolved mercury (one site), dissolved selenium (one site), dissolved silver (one site), and dissolved zinc (three sites). Field dissolved oxygen concentrations were below the minimum CCME FAL guideline level at five (5) sites where it was measured. Field pH at MW09-24 was recorded as 9.01 pH units, which is not consistent with the lab pH recorded (7.88 pH units). Field pH has been reported as greater than the maximum CCME FAL guideline level at this location, however, this field pH value is not considered to be reliable due to the large difference between the field and the lab pH at this site (1.13 pH units difference). A summary of CCME FAL guideline exceedances is provided in **Table 3-3**.

Groundwater turbidity exceeded 50 NTU at two (2) of the seven (7) sites where it was measured, MP09-09 (900 AU), and MW09-24 (106.7 NTU) (**Table 3-2**).

3.3 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

Two (2) duplicate groundwater samples were collected during the January 2017 sampling event. One (1) travel blank was provided by the laboratory and accompanied the samples throughout the sampling program, and three (3) field blanks were prepared on site during the sampling program. Detailed results of QA/QC sampling are provided in **Table B**, including RPD values for all duplicate and sample pairs.

3.3.1 FIELD AND TRAVEL BLANKS

All travel blank analytical results were reported as less than the RDL (**Table B**). In two (2) of the three (3) field blanks, analytical results were all reported as less than the RDL (**Table B**). In the other field blank (FB-3) total organic carbon was detected at 0.81 mg/L. Although detected, the observed values were very close to (less than 2 times) the RDL of 0.5 mg/L. Field notes and laboratory consultation do not identify any potential source of contamination at time of sampling.

3.3.2 FIELD DUPLICATES

3.3.2.1 MW09-18 and DUP-1

All sample and duplicate pair analytical results for MW09-18 and DUP-1 produced RPD values less than the 20% RPD threshold limit (**Table B**).

3.3.2.2 MW09-23 and DUP-2

Sample and duplicate pair analytical results for total cyanide (49.17%) were above the acceptable RPD limit. The sample result for this pair (MW09-23) was 0.0250 mg/L, which is exactly five times the RDL of 0.005 mg/L. The well in question was sampled manually with watterra tubing, which could account for variability at the time of sampling. Field notes do not indicate any other potential causes of variability in the sample.

All other sample and duplicate pair analytical results produced RPD values less than the 20% RPD threshold limit for MW09-23 and DUP-2 (**Table B**).

3.3.3 QUALITY ASSURANCE AND QUALITY CONTROL SUMMARY

Results for the QA/QC analytical program show minimal evidence of sampling variation or contamination during the field collection process and transportation, and that program results are acceptable.

The single detection of low levels (near RDL) of total organic carbon in the field blank suggests that slight contamination from the field or lab environment may have occurred, but the level of this detection suggests that this type of contamination would not affect program results. The lack of detections in the other two field blanks also suggests that it is not a systematic occurrence.

Across the results for two (2) sample and duplicate pairs, RPD threshold exceedances were observed at one (1) site. Field notes for the sample duplicate pair MW09-23 and DUP-3 did not identify any potential sources of contamination (**Table 3-2**). Generally, the number of parameters where variations were noted suggest some variability that is most likely attributable to variations in groundwater, and are not likely to represent a larger sampling bias.

4.0 RECOMMENDATIONS

Hemmera/ELR do not have program recommendations based on the observations and results of the January 2017 groundwater sampling program.

5.0 CLOSURE

We have appreciated the opportunity of working with you on this project and trust that this report is satisfactory to your requirements. Please feel free to contact the undersigned regarding any questions or further information that you may require.

Report prepared by:
ELR



Michelle McKay, B.Sc.
Environmental Scientist
michelle@elr.ca

Report senior reviewed by:
ELR



Chris Jastrebascki, M.Sc., R.P.Bio., P.Biol.
Project Manager
chris@elr.ca

Report senior reviewed by:
Hemmera Envirochem Inc.



Jason Wilkins, P.Ag., EP, CSAP
Director, Land Development and Projects
jwilkins@hemmera.com

6.0 REFERENCES

ASTM Standard D4448-01. 2013. Standard Guide for Sampling Groundwater Monitoring Wells. ASTM International, West Conshohocken, PA, 2013, www.astm.org.

ASTM Standard D6452-99 2012 Guide for Purging Methods for Wells used for Groundwater Quality Investigations. ASTM International, West Conshohocken, PA, 2012, www.astm.org.

Canadian Council of Ministers of the Environment (CCME). 2014. Canadian Water Quality Guidelines for the Protection of Aquatic Life. Accessed online at <http://st-ts.ccme.ca/>, July 2014.

Hemmera Envirochem and Ecological Logistics & Research Ltd. (Hemmera). 2015. Mount Nansen September Groundwater and Sampling Program. Report prepared for Yukon Government Assessment and Abandon Mines Branch.

Rice, E.W., Baird, R.B., Eaton, A.D., and Clesceri, L.S. 2006. Standard Methods for the Examination of Water and Wastewater. 22nd Edition. American Water Works Association.

Government of Yukon. 2011. Protocol for the Contaminated Sites Regulation under the Environment Act. Protocol No.7: Groundwater Monitoring Well Installation, Sampling and Decommissioning. Prepared pursuant to Part 6 – Administration, Section 21, Contaminated Sites Regulations, OIC 2002/171.

TABLES

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

		Dome Creek										Mill Complex								
Site Location		GSI-DC-01B	GSI-DC-02B ^{1b}	GSI-DC-03B	GSI-DC-05B	GSI-DC-06B	GSI-DC-07B	GSI-DC-08B	GSI-DC-09B	GSI-DC-10B	GSI-HA-01A ^{1b}	GSI-HA-02A	GSI-HA-03A	GSI-HA-04A	GSI-HA-05A	MW09-16	MW09-17	MW09-18	MW09-19	
Sample ID																				
Date Sampled		30/01/2017	30/01/2017	30/01/2017	01/02/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	
ALS Work Number			L1886064								L1886064							L1886064	L1886064	
Station Status		Frozen	Direct Sampled	Buried	Buried	Frozen	Buried	Buried	Buried	Frozen	Direct Sampled	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Good	Good	
Parameter	Units	CCME-FAL ^{1, 2, 3, 4}																		
Physical Tests																				
Lab pH	pH units	6.5-9.0 ^o	-	7.61	-	-	-	-	-	-	7.96	-	-	-	-	-	-	-	7.60	7.26
Field pH	pH units	6.5-9.0 ^o	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.93	6.8
Field Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0.7	-0.3
Lab Conductivity	uS/cm	-	982	-	-	-	-	-	-	-	959	-	-	-	-	-	-	-	2830	2080
Field Conductivity	uS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1383	1107
Field Specific Conductivity	uS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2714	2165
Total Hardness (as CaCO3)	mg/L	-	564	-	-	-	-	-	-	-	713	-	-	-	-	-	-	-	2190	1380
Field Dissolved Oxygen	mg/L	9.5 ^o	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.76	1.79
Field Oxidation - Redox Potent	mV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	-63.1
Field Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.4	29.7
Anions Nutrients																				
Alkalinity, Total (CaCO3)	mg/L	-	266	-	-	-	-	-	-	-	228	-	-	-	-	-	-	-	498	467
Ammonia, Total (as N)	mg/L	Varies ¹	0.636	-	-	-	-	-	-	-	0.0656	-	-	-	-	-	-	-	0.0155	4.37
Ammonia CCME-FAL	mg/L	-	- ^{1,2}	-	-	-	-	-	-	-	- ^{1,2}	-	-	-	-	-	-	-	28.8	38
Chloride (Cl)	mg/L	-	<2.5	-	-	-	-	-	-	-	<2.5	-	-	-	-	-	-	-	<10	<5.0
Fluoride (F)	mg/L	0.12	<0.10	-	-	-	-	-	-	-	<0.10	-	-	-	-	-	-	-	<0.40	<0.20
Nitrate (as N)	mg/L	13	0.135	-	-	-	-	-	-	-	<0.025	-	-	-	-	-	-	-	<0.10	0.087
Nitrite (as N)	mg/L	0.06	<0.0050	-	-	-	-	-	-	-	<0.0050	-	-	-	-	-	-	-	<0.020	<0.010
Total Kjeldahl Nitrogen	mg/L	-	1.28	-	-	-	-	-	-	-	<0.050	-	-	-	-	-	-	-	0.139	6.26
Sulfate (SO4)	mg/L	-	320	-	-	-	-	-	-	-	343	-	-	-	-	-	-	-	1620	918
Field Sulphide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.17
Anion Sum	meq/L	-	12.0	-	-	-	-	-	-	-	11.7	-	-	-	-	-	-	-	43.6	28.5
Cation Sum	meq/L	-	12.7	-	-	-	-	-	-	-	14.6	-	-	-	-	-	-	-	44.6	30.0
Cation - Anion Balance	%	-	2.9	-	-	-	-	-	-	-	11.1	-	-	-	-	-	-	-	1.2	2.6
Cyanide																				
Cyanide, Total	mg/L	-	<0.0050	-	-	-	-	-	-	-	<0.0050	-	-	-	-	-	-	-	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	-	-	-	-	-	-	-	<0.0050	-	-	-	-	-	-	-	<0.0050	<0.0050
Cyanide, Weak Acid Diss	mg/L	-	<0.0050	-	-	-	-	-	-	-	<0.0050	-	-	-	-	-	-	-	<0.0050	<0.0050
Thiocyanate (SCN)	mg/L	-	<0.50	-	-	-	-	-	-	-	<25	-	-	-	-	-	-	-	0.67	0.93
Organic/Inorganic Carbon																				
Total Inorganic Carbon	mg/L	-	62.5	-	-	-	-	-	-	-	54.6	-	-	-	-	-	-	-	121	114
Total Organic Carbon	mg/L	-	13.1	-	-	-	-	-	-	-	17.1	-	-	-	-	-	-	-	3.76	30.8

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

Site Location		Brown McDade Pit											Pony Creek						Seepage Dam			
Sample ID		CH-P-13-01/10	CH-P-13-03/50 ¹	CH-P-13-04/10	CH-P-13-04/35	CH-P-13-05/50	GLL07-01	GLL07-02	GLL07-03	MW09-13	MW09-14	MW09-15	GSI-PC-02B	GSI-PC-03B	GSI-PC-04B	GSI-PC-05B	MP09-02	MP09-03	MP09-08	W14103083BH01	W14103083BH02	W14103083BH04
Date Sampled		30/01/2017	30/01/2017	31/01/2017	31/01/2017	30/01/2017	30/01/2017	01/02/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	30/01/2017	30/01/2017	30/01/2017
ALS Work Number			L1886064																			
Station Status		Frozen	Direct Sampled	Frozen	Frozen	Not Accessible	Frozen	Dry	Not Accessible	Frozen	Frozen	Frozen	Destroyed	Buried	Frozen	Frozen	Destroyed	Frozen	Frozen	Frozen	Frozen	Frozen
Parameter	Units	CCME-FAL ^{1, 2, 3, 4}																				
Physical Tests																						
Lab pH	pH units	6.5-9.0 ⁵	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field pH	pH units	6.5-9.0 ⁵	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lab Conductivity	uS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Conductivity	uS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Specific Conductivity	uS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hardness (as CaCO3)	mg/L	-	1660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Dissolved Oxygen	mg/L	9.5 ⁶	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Oxidation - Redox Potent	mV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions Nutrients																						
Alkalinity, Total (CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia, Total (as N)	mg/L	Varies ⁷	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia CCME-FAL	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride (F)	mg/L	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (as N)	mg/L	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Sulphide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anion Sum	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Sum	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation - Anion Balance	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide																						
Cyanide, Total	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Free	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Weak Acid Diss	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic/Inorganic Carbon																						
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

Site Location		Tailings Facility																				
Sample ID		MP09-04	MP09-05	MP09-09	MP09-10	MP09-11	MP09-12	MP09-14	MW09-02	MW09-03	MW09-04	MW09-05	MW09-06	MW09-07	MW09-08	MW09-11	MW09-20	MW09-21	MW09-22 ¹⁵	MW09-23	MW09-24	W14103083BH03
Date Sampled		31/01/2017	31/01/2017	30/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	01/02/2017	01/02/2017	01/02/2017	31/01/2017	01/02/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	01/02/2017	30/01/2017	30/01/2017	31/01/2017
ALS Work Number				L1886064					L1886064	L1886064	L1886064		L1886064						L1886064	L1886064	L1886064	
Station Status		Frozen	Frozen	Direct Sampled	Frozen	Frozen	Frozen	Frozen	Slow Recharge	Good	Good	Frozen	Slow Recharge	Frozen	Frozen	Dry	Frozen	Frozen	Direct Sampled	Good	Good	Frozen
Parameter	Units	CCME-FAL ^{1,2,3,4}																				
Physical Tests																						
Lab pH	pH units	6.5-9.0 ^b	-	-	8.90	-	-	-	-	7.30	7.74	8.10	-	7.61	-	-	-	-	7.67	7.57	7.88	-
Field pH	pH units	6.5-9.0 ^b	-	-	-	-	-	-	-	6.97	7.64	8.19	-	6.88	-	-	-	-	-	7.08	9.01 ^{cd}	-
Field Temperature	C	-	-	-	-	-	-	-	-	0.4	0.2	1.4	-	1.9	-	-	-	-	-	-0.6	-0.6	-
Lab Conductivity	uS/cm	-	-	513	-	-	-	-	-	2380	2880	2490	-	1930	-	-	-	-	576	1210	576	-
Field Conductivity	uS/cm	-	-	-	-	-	-	-	-	1198	1423	1335	-	878	-	-	-	-	-	643	296.1	-
Field Specific Conductivity	uS/cm	-	-	-	-	-	-	-	-	2261	2722	2429	-	1571	-	-	-	-	-	1260	579.7	-
Total Hardness (as CaCO3)	mg/L	-	-	205	-	-	-	-	-	1520	1990	1570	-	1200	-	-	-	-	271	707	254	-
Field Dissolved Oxygen	mg/L	9.5 ^b	-	-	-	-	-	-	-	5.69	1.9	0.92	-	2.87	-	-	-	-	-	1.63	9.75	-
Field Oxidation - Redox Potent	mV	-	-	-	-	-	-	-	-	47.3	137.6	127.1	-	230.9	-	-	-	-	-	-77.2	85.1	-
Field Turbidity	NTU	-	-	900 ¹⁰	-	-	-	-	-	3.65	0.91	13.6	-	1.42	-	-	-	-	-	17.7	106.7	-
Anions Nutrients																						
Alkalinity, Total (CaCO3)	mg/L	-	-	117	-	-	-	-	-	80.6	202	127	-	79.3	-	-	-	-	208	306	165	-
Ammonia, Total (as N)	mg/L	Varies ¹	-	4.58	-	-	-	-	-	5.65	6.24	7.47	-	0.213	-	-	-	-	0.976	2.82	0.0164	-
Ammonia CCME-FAL	mg/L	-	-	- ¹³	-	-	-	-	-	23.9	5.22	1.34	-	26.0	-	-	-	-	- ¹³	20.2	0.256	-
Chloride (Cl)	mg/L	-	-	5.04	-	-	-	-	-	<10	<10	<10	-	<5.0	-	-	-	-	<0.50	<2.5	<0.50	-
Fluoride (F)	mg/L	0.12	-	1.45	-	-	-	-	-	0.59	<0.40	0.42	-	0.23	-	-	-	-	0.036	0.10	0.056	-
Nitrate (as N)	mg/L	13	-	<0.0050	-	-	-	-	-	<0.10	<0.10	0.40	-	5.08	-	-	-	-	0.0145	<0.025	3.27	-
Nitrite (as N)	mg/L	0.06	-	0.0028	-	-	-	-	-	<0.020	<0.020	0.041	-	<0.010	-	-	-	-	0.0298	0.0086	0.0011	-
Total Kjeldahl Nitrogen	mg/L	-	-	7.46	-	-	-	-	-	6.88	6.75	7.76	-	0.780	-	-	-	-	1.84	3.30	0.460	-
Sulfate (SO4)	mg/L	-	-	127	-	-	-	-	-	1560	1850	1640	-	1150	-	-	-	-	118	430	137	-
Field Sulphide	mg/L	-	-	0.8	-	-	-	-	-	0.03	0.01	0	-	0	-	-	-	-	-	0.26	0.15	-
Anion Sum	meq/L	-	-	5.21	-	-	-	-	-	34.2	42.5	36.7	-	26.0	-	-	-	-	-	15.1	6.38	-
Cation Sum	meq/L	-	-	6.00	-	-	-	-	-	33.4	44.0	34.3	-	25.2	-	-	-	-	-	16.3	5.48	-
Cation - Anion Balance	%	-	-	7.0	-	-	-	-	-	-1.2	1.8	-3.3	-	-1.5	-	-	-	-	-	4.0	-7.6	-
Cyanide																						
Cyanide, Total	mg/L	-	-	1.52	-	-	-	-	-	<0.0050	<0.0050	0.0089	-	<0.0050	-	-	-	-	0.0200	0.0250	0.0148	-
Cyanide, Free	mg/L	0.005	-	0.501	-	-	-	-	-	<0.0050	<0.0050	<0.0050	-	<0.0050	-	-	-	-	<0.0050	<0.0050	<0.0050	-
Cyanide, Weak Acid Diss	mg/L	-	-	0.592	-	-	-	-	-	<0.0050	<0.0050	<0.0050	-	<0.0050	-	-	-	-	<0.0050	<0.0050	<0.0050	-
Thiocyanate (SCN)	mg/L	-	-	1.14	-	-	-	-	-	<0.50	<0.50	<0.50	-	<0.50	-	-	-	-	<0.50	<0.50	<0.50	-
Organic/Inorganic Carbon																						
Total Inorganic Carbon	mg/L	-	-	18.1	-	-	-	-	-	16.6	43.5	26.8	-	22.1	-	-	-	-	47.7	73.1	38.1	-
Total Organic Carbon	mg/L	-	-	45.0	-	-	-	-	-	5.36	6.22	6.26	-	10.2	-	-	-	-	22.1	13.2	7.50	-

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

Site Location		Dome Creek										Mill Complex							
Sample ID		GSI-DC-01B	GSI-DC-02B ¹⁵	GSI-DC-03B	GSI-DC-05B	GSI-DC-06B	GSI-DC-07B	GSI-DC-08B	GSI-DC-09B	GSI-DC-10B	GSI-HA-01A ¹⁶	GSI-HA-02A	GSI-HA-03A	GSI-HA-04A	GSI-HA-05A	MW09-16	MW09-17	MW09-18	MW09-19
Date Sampled		30/01/2017	30/01/2017	30/01/2017	01/02/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017
ALS Work Number			L1886064								L1886064							L1886064	L1886064
Station Status		Frozen	Direct Sampled	Buried	Buried	Frozen	Buried	Buried	Buried	Frozen	Direct Sampled	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Good	Good
Parameter	Units	CCME-FAL ^{1, 2, 3, 4}																	
Dissolved Metals																			
Aluminum (Al)-Dissolved	mg/L	Varies ⁵	-	0.0054	-	-	-	-	-	-	0.0029	-	-	-	-	-	-	<0.0020	0.0119
<i>Aluminum CCME-FAL</i>	<i>mg/L</i>	-	-	0.100	-	-	-	-	-	-	0.100	-	-	-	-	-	-	0.100	0.100
Antimony (Sb)-Dissolved	mg/L	-	-	0.00025	-	-	-	-	-	-	0.00016	-	-	-	-	-	-	0.00051	0.00039
Arsenic (As)-Dissolved	mg/L	0.005	-	0.0333	-	-	-	-	-	-	0.00189	-	-	-	-	-	-	0.0543	0.154
Barium (Ba)-Dissolved	mg/L	-	-	0.168	-	-	-	-	-	-	0.159	-	-	-	-	-	-	0.0107	0.0527
Beryllium (Be)-Dissolved	mg/L	-	-	<0.000020	-	-	-	-	-	-	<0.000020	-	-	-	-	-	-	<0.000040	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.000050	-	-	-	-	-	-	<0.000050	-	-	-	-	-	-	<0.00010	<0.000050
Boron (B)-Dissolved	mg/L	1.5	-	<0.010	-	-	-	-	-	-	<0.010	-	-	-	-	-	-	<0.020	0.156
Cadmium (Cd)-Dissolved	mg/L	Varies ¹⁷	-	0.0000123	-	-	-	-	-	-	0.0000090	-	-	-	-	-	-	0.000042	<0.000050
<i>Cadmium CCME-FAL</i>	<i>mg/L</i>	-	-	0.00037	-	-	-	-	-	-	0.00037	-	-	-	-	-	-	0.00037	0.00037
Calcium (Ca)-Dissolved	mg/L	-	-	147	-	-	-	-	-	-	183	-	-	-	-	-	-	397	306
Chromium (Cr)-Dissolved	mg/L	-	-	<0.00010	-	-	-	-	-	-	<0.00010	-	-	-	-	-	-	<0.00020	0.00033
Cobalt (Co)-Dissolved	mg/L	-	-	0.00227	-	-	-	-	-	-	0.00012	-	-	-	-	-	-	0.00025	0.00229
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	-	0.00036	-	-	-	-	-	-	0.00070	-	-	-	-	-	-	0.00056	<0.00020
<i>Copper CCME-FAL</i>	<i>mg/L</i>	-	-	0.004	-	-	-	-	-	-	0.004	-	-	-	-	-	-	0.004	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	17.6	-	-	-	-	-	-	0.124	-	-	-	-	-	-	<0.020	20.1
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	-	<0.000050	-	-	-	-	-	-	0.000069	-	-	-	-	-	-	<0.00010	0.000087
<i>Lead CCME-FAL</i>	<i>mg/L</i>	-	-	0.007	-	-	-	-	-	-	0.007	-	-	-	-	-	-	0.007	0.007
Lithium (Li)-Dissolved	mg/L	-	-	<0.0010	-	-	-	-	-	-	0.0070	-	-	-	-	-	-	0.0227	0.0093
Magnesium (Mg)-Dissolved	mg/L	-	-	47.9	-	-	-	-	-	-	62.0	-	-	-	-	-	-	292	149
Manganese (Mn)-Dissolved	mg/L	-	-	3.75	-	-	-	-	-	-	0.0756	-	-	-	-	-	-	0.501	7.34
Mercury (Hg)-Dissolved	mg/L	0.000026	-	<0.000050	-	-	-	-	-	-	<0.000050	-	-	-	-	-	-	<0.000050	<0.000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.000574	-	-	-	-	-	-	0.000273	-	-	-	-	-	-	<0.00010	0.000101
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.00365	-	-	-	-	-	-	0.00073	-	-	-	-	-	-	<0.0010	0.00118
<i>Nickel CCME-FAL</i>	<i>mg/L</i>	-	-	0.15	-	-	-	-	-	-	0.15	-	-	-	-	-	-	0.15	0.15
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	-	-	-	-	-	-	<0.050	-	-	-	-	-	-	<0.10	0.110
Potassium (K)-Dissolved	mg/L	-	-	3.47	-	-	-	-	-	-	3.89	-	-	-	-	-	-	8.64	8.66
Selenium (Se)-Dissolved	mg/L	0.001	-	0.000217	-	-	-	-	-	-	<0.000050	-	-	-	-	-	-	0.00012	0.000134
Silicon (Si)-Dissolved	mg/L	-	-	8.18	-	-	-	-	-	-	7.14	-	-	-	-	-	-	5.88	10.8
Silver (Ag)-Dissolved	mg/L	0.0001	-	<0.000010	-	-	-	-	-	-	<0.000010	-	-	-	-	-	-	<0.000020	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	4.77	-	-	-	-	-	-	6.34	-	-	-	-	-	-	14.3	13.7
Strontium (Sr)-Dissolved	mg/L	-	-	0.345	-	-	-	-	-	-	0.431	-	-	-	-	-	-	1.12	0.992
Sulfur (S)-Dissolved	mg/L	-	-	113	-	-	-	-	-	-	153	-	-	-	-	-	-	620	358
Thallium (Tl)-Dissolved	mg/L	0.0008	-	<0.000010	-	-	-	-	-	-	<0.000010	-	-	-	-	-	-	0.000299	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	<0.00010	-	-	-	-	-	-	<0.00010	-	-	-	-	-	-	<0.00020	0.00022
Titanium (Ti)-Dissolved	mg/L	-	-	<0.00030	-	-	-	-	-	-	<0.00030	-	-	-	-	-	-	<0.00060	0.00123
Uranium (U)-Dissolved	mg/L	0.015	-	0.000255	-	-	-	-	-	-	0.000063	-	-	-	-	-	-	0.00814	0.000280
Vanadium (V)-Dissolved	mg/L	-	-	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	-	-	<0.0010	0.00123
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.0045	-	-	-	-	-	-	0.0034	-	-	-	-	-	-	0.0038	0.0033
Zirconium (Zr)-Dissolved	mg/L	-	-	<0.00030	-	-	-	-	-	-	<0.00030	-	-	-	-	-	-	<0.00060	<0.00030

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

Site Location		Brown McDade Pit											Pony Creek						Seepage Dam				
Sample ID		CH-P-13-01/10	CH-P-13-03/50 ¹¹	CH-P-13-04/10	CH-P-13-04/35	CH-P-13-05/50	GLL07-01	GLL07-02	GLL07-03	MW09-13	MW09-14	MW09-15	GSI-PC-02B	GSI-PC-03B	GSI-PC-04B	GSI-PC-05B	MP09-02	MP09-03	MP09-08	W14103083BH01	W14103083BH02	W14103083BH04	
Date Sampled		30/01/2017	30/01/2017	31/01/2017	31/01/2017	30/01/2017	30/01/2017	01/02/2017	30/01/2017	30/01/2017	30/01/2017	30/01/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	01/02/2017	30/01/2017	30/01/2017	30/01/2017	
ALS Work Number			L1886064																				
Station Status		Frozen	Direct Sampled	Frozen	Frozen	Not Accessible	Frozen	Dry	Not Accessible	Frozen	Frozen	Frozen	Destroyed	Buried	Frozen	Frozen	Destroyed	Frozen	Frozen	Frozen	Frozen	Frozen	
Parameter	Units	CCME-FAL ^{1, 2, 3, 4}																					
Dissolved Metals																							
Aluminum (Al)-Dissolved	mg/L	Varies ^o	0.0047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Aluminum CCME-FAL</i>	<i>mg/L</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony (Sb)-Dissolved	mg/L	-	0.00045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Arsenic (As)-Dissolved	mg/L	0.005	0.00044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium (Ba)-Dissolved	mg/L	-	0.0338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Beryllium (Be)-Dissolved	mg/L	-	<0.000040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bismuth (Bi)-Dissolved	mg/L	-	<0.00010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Boron (B)-Dissolved	mg/L	1.5	0.026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cadmium (Cd)-Dissolved	mg/L	Varies ^u	0.000371	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Cadmium CCME-FAL</i>	<i>mg/L</i>	-	0.00037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium (Ca)-Dissolved	mg/L	-	431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chromium (Cr)-Dissolved	mg/L	-	<0.00020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt (Co)-Dissolved	mg/L	-	0.00033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	0.00265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Copper CCME-FAL</i>	<i>mg/L</i>	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iron (Fe)-Dissolved	mg/L	0.3	<0.020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	<0.00010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lead CCME-FAL</i>	<i>mg/L</i>	-	0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lithium (Li)-Dissolved	mg/L	-	0.0037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium (Mg)-Dissolved	mg/L	-	142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese (Mn)-Dissolved	mg/L	-	0.433	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury (Hg)-Dissolved	mg/L	0.000026	<0.0000050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum (Mo)-Dissolved	mg/L	0.073	0.00088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	0.0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Nickel CCME-FAL</i>	<i>mg/L</i>	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Phosphorus (P)-Dissolved	mg/L	-	<0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Potassium (K)-Dissolved	mg/L	-	8.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Selenium (Se)-Dissolved	mg/L	0.001	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (Si)-Dissolved	mg/L	-	7.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silver (Ag)-Dissolved	mg/L	0.0001	<0.000020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium (Na)-Dissolved	mg/L	-	62.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Strontium (Sr)-Dissolved	mg/L	-	1.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sulfur (S)-Dissolved	mg/L	-	511	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thallium (Tl)-Dissolved	mg/L	0.0008	0.000076	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tin (Sn)-Dissolved	mg/L	-	0.00513	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Titanium (Ti)-Dissolved	mg/L	-	<0.00060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Uranium (U)-Dissolved	mg/L	0.015	0.0142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (V)-Dissolved	mg/L	-	<0.0010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Zinc (Zn)-Dissolved	mg/L	0.03	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Zirconium (Zr)-Dissolved	mg/L	-	<0.00060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table A: Groundwater Sampling Analytical Results and CCME Guideline Exceedances for 2017 January Sampling Program

Site Location		Tailings Facility																				
Sample ID		MP09-04	MP09-05	MP09-09	MP09-10	MP09-11	MP09-12	MP09-14	MW09-02	MW09-03	MW09-04	MW09-05	MW09-06	MW09-07	MW09-08	MW09-11	MW09-20	MW09-21	MW09-22 ¹⁵	MW09-23	MW09-24	W14103083BH03
Date Sampled		31/01/2017	31/01/2017	30/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	01/02/2017	01/02/2017	01/02/2017	31/01/2017	01/02/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	01/02/2017	30/01/2017	30/01/2017	31/01/2017
ALS Work Number				L1886064					L1886064	L1886064	L1886064		L1886064						L1886064	L1886064	L1886064	
Station Status		Frozen	Frozen	Direct Sampled	Frozen	Frozen	Frozen	Frozen	Slow Recharge	Good	Good	Frozen	Slow Recharge	Frozen	Frozen	Dry	Frozen	Frozen	Direct Sampled	Good	Good	Frozen
Parameter	Units	CCME-FAL ^{1,2,3,4}																				
Dissolved Metals																						
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	-	0.0058	-	-	-	-	<0.0050	<0.0050	0.0045	-	<0.0020	-	-	-	-	-	0.0558	0.0216	0.0039	-
Aluminum CCME-FAL	mg/L	-	-	0.100	-	-	-	-	0.100	0.100	0.100	-	0.100	-	-	-	-	-	0.100	0.100	0.100	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.133	-	-	-	-	0.00557	0.404	0.307	-	0.162	-	-	-	-	-	0.00013	<0.00020	0.00015	-
Arsenic (As)-Dissolved	mg/L	0.005	-	26.4	-	-	-	-	7.46	1.98	3.61	-	0.236	-	-	-	-	-	0.00702	0.0305	0.00213	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00110	-	-	-	-	0.00523	0.0313	0.0112	-	0.00687	-	-	-	-	-	0.0617	0.0427	0.161	-
Beryllium (Be)-Dissolved	mg/L	-	-	<0.00010	-	-	-	-	<0.00010	<0.00010	<0.00040	-	<0.00040	-	-	-	-	-	<0.00020	<0.00040	<0.00020	-
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00025	-	-	-	-	<0.00025	<0.00025	<0.00010	-	<0.00010	-	-	-	-	-	<0.00050	<0.00010	<0.00050	-
Boron (B)-Dissolved	mg/L	1.5	-	0.192	-	-	-	-	0.092	0.237	0.276	-	0.085	-	-	-	-	-	0.033	0.087	<0.010	-
Cadmium (Cd)-Dissolved	mg/L	Varies ⁹	-	0.000274	-	-	-	-	0.00101	0.0152	0.000017	-	0.00461	-	-	-	-	-	0.0000136	0.000020	0.000118	-
Cadmium CCME-FAL	mg/L	-	-	0.00029	-	-	-	-	0.00037	0.00037	0.00037	-	0.00037	-	-	-	-	-	0.00036	0.00037	0.00034	-
Calcium (Ca)-Dissolved	mg/L	-	-	81.0	-	-	-	-	490	596	493	-	413	-	-	-	-	-	95.0	182	71.7	-
Chromium (Cr)-Dissolved	mg/L	-	-	<0.00050	-	-	-	-	<0.00050	<0.00050	<0.00020	-	<0.00020	-	-	-	-	-	0.00106	0.00041	0.00030	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0403	-	-	-	-	0.00972	0.00309	0.00084	-	0.00152	-	-	-	-	-	0.00851	0.0101	0.00051	-
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	-	0.366	-	-	-	-	<0.0010	0.0556	<0.00040	-	0.00538	-	-	-	-	-	0.00108	<0.00040	0.00600	-
Copper CCME-FAL	mg/L	-	-	0.004	-	-	-	-	0.004	0.004	0.004	-	0.004	-	-	-	-	-	0.004	0.004	0.004	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.119	-	-	-	-	12.0	0.083	<0.020	-	<0.020	-	-	-	-	-	14.0	11.2	0.013	-
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	-	0.00130	-	-	-	-	<0.00025	0.00052	0.00031	-	0.00022	-	-	-	-	-	<0.000050	<0.00010	<0.000050	-
Lead CCME-FAL	mg/L	-	-	0.007	-	-	-	-	0.007	0.007	0.007	-	0.007	-	-	-	-	-	0.007	0.007	0.007	-
Lithium (Li)-Dissolved	mg/L	-	-	<0.0050	-	-	-	-	0.0082	<0.0050	0.0127	-	0.0081	-	-	-	-	-	<0.0010	<0.0020	<0.0010	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.63	-	-	-	-	71.7	121	81.2	-	40.4	-	-	-	-	-	8.13	61.4	18.2	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.0332	-	-	-	-	20.4	49.4	7.57	-	5.91	-	-	-	-	-	2.76	13.6	0.267	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.0000320	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-	-	-	-	-	0.0000065	<0.0000050	<0.0000050	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.0141	-	-	-	-	0.00834	0.00491	0.00388	-	0.00518	-	-	-	-	-	0.000184	0.00188	0.000405	-
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0198	-	-	-	-	0.0030	<0.0025	<0.0010	-	0.0018	-	-	-	-	-	0.00243	0.0013	<0.00050	-
Nickel CCME-FAL	mg/L	-	-	0.15	-	-	-	-	0.15	0.15	0.15	-	0.15	-	-	-	-	-	0.15	0.15	0.15	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.42	-	-	-	-	<0.25	<0.25	0.10	-	<0.10	-	-	-	-	-	<0.050	<0.10	<0.050	-
Potassium (K)-Dissolved	mg/L	-	-	9.86	-	-	-	-	15.9	37.9	53.0	-	15.1	-	-	-	-	-	2.81	6.59	1.72	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.00146	-	-	-	-	<0.00025	<0.00025	<0.00010	-	<0.00010	-	-	-	-	-	0.000195	0.00020	0.000957	-
Silicon (Si)-Dissolved	mg/L	-	-	7.74	-	-	-	-	7.71	16.8	16.3	-	6.43	-	-	-	-	-	5.40	6.88	6.15	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.0107	-	-	-	-	<0.000050	<0.000050	<0.000020	-	0.000020	-	-	-	-	-	0.000019	<0.000020	<0.000010	-
Sodium (Na)-Dissolved	mg/L	-	-	29.9	-	-	-	-	20.0	25.4	19.6	-	14.8	-	-	-	-	-	16.9	17.0	8.30	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.133	-	-	-	-	0.989	1.67	1.19	-	0.705	-	-	-	-	-	0.318	0.553	0.277	-
Sulfur (S)-Dissolved	mg/L	-	-	50.1	-	-	-	-	524	675	541	-	401	-	-	-	-	-	43.7	164	37.5	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.000050	-	-	-	-	0.000239	0.000196	0.000129	-	0.000290	-	-	-	-	-	<0.000010	<0.000020	<0.000010	-
Tin (Sn)-Dissolved	mg/L	-	-	0.00608	-	-	-	-	<0.00050	<0.00050	<0.00020	-	<0.00020	-	-	-	-	-	0.00069	<0.00020	<0.00010	-
Titanium (Ti)-Dissolved	mg/L	-	-	<0.0015	-	-	-	-	<0.0015	<0.0015	<0.00060	-	<0.00060	-	-	-	-	-	0.00173	0.00065	<0.00030	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.00281	-	-	-	-	0.00127	0.00160	0.000364	-	0.00116	-	-	-	-	-	0.000358	0.00133	0.00150	-
Vanadium (V)-Dissolved	mg/L	-	-	<0.0025	-	-	-	-	<0.0025	<0.0025	<0.0010	-	<0.0010	-	-	-	-	-	0.00182	0.0019	<0.00050	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.0093	-	-	-	-	0.379	0.0175	0.766	-	0.0867	-	-	-	-	-	0.0014	0.0179	0.0015	-
Zirconium (Zr)-Dissolved	mg/L	-	-	<0.0015	-	-	-	-	<0.0015	<0.0015	<0.00060	-	<0.00060	-	-	-	-	-	0.00059	0.00060	<0.00030	-

Notes

- (1) CCME guideline exceedences shaded with dark grey. Light grey shading denotes reportable detection limit in exceedance of CCME Guidelin
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site
based on the relevant value, and the guideline value has been noted as "varies".
- (2) - = No standard or not analyzed
- (3) CCME = Canadian Council of Ministers of the Environment, Canadian
Environmental Quality Guidelines, 1999, updated to November 2014
- (4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection
of Aquatic Life, Freshwater, updated to November 2014
- (5) CCME FAL stipulates pH not < 6.5 and not > 9
- (6) Guideline note: Lowest acceptable dissolved oxygen concentration for
cold-water biota, early life stages
- (7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria,
ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N)
When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.
If field temperature is not available ammonia standards can not be calculated.
- (8) Aluminum varies with pH as follows for CCME FAL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.
- (9) Cadmium varies with Hardness in mg/L as follows for CCME FAL:
0.00 if H<17
0.00004 - 0.00037 if H>=17 and H<=280 as follows;
 $CWQG (\mu\text{g/L}) = 10\{0.83[\ln(\text{hardness})] - 2.46\}$
0.00 if H>280
- (10) Copper varies with Hardness in mg/L as follows for CCME FAL:
0.002 if H<82
0.002 - 0.004 if H>=82 and H<=180 as follows;
 $CWQG (\mu\text{g/L}) = 0.2 * e\{0.8545[\ln(\text{hardness})] - 1.465\}$
0.004 if H>180
- (11) Lead varies with Hardness in mg/L as follows for CCME FAL:
0.001 if H<60
.001 - 0.00 if H>=60 and H<=180 as follows;
 $CWQG (\mu\text{g/L}) = e\{1.273[\ln(\text{hardness})] - 4.705\}$
0.007 if H>180
- (12) Nickel varies with Hardness in mg/L as follows for CCME FAL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows;
 $CWQG (\mu\text{g/L}) = e\{0.76[\ln(\text{hardness})] + 1.06\}$
0.15 if H>180
- (13) Ammonia standard could not be calculated as no temperature data was available.
- (14) RPD = Relative Percent Difference. The difference between a sample and its field duplicate over the average of two values.
nc = not calculated. RPD is not calculated if either the sample or the field
duplicate concentration is less than five times the detection limit.
- (15) Due to slow recharge and low well volumes, samples were collected from GSI-PC-02B between January 30 - January 31, 2017.
- (16) Due to slow recharge and low well volumes, samples were collected from GSI-HA-01A between January 30 and February 1, 2017.
- (17) Due to slow recharge and low well volumes, samples were collected from CH-P-13-03/50 on January 30, 2017
Only dissolved metals and dissolved mercury were collected.
- (18) Due to slow recharge and low well volumes, samples were collected from MW09-22 between January 31 and February 1, 2017.
General chemistry was collected on February 1, 2017; all other samples were collected on January 31, 2017.
- (19) AU = Attenuation Units - an alternate unit of turbidity measurement used where turbidity is >500. AU is equivalent to NTU, but is measured
using transmitted rather than scattered light.
- (20) Field pH value is not consistent with lab pH value, therefore field pH value may not be reliable for this sample.
- Bold** and underlined indicates values above RDL in Field Blank or Travel Blank
Bold and *Italic* Indicates QAQC values exceed expected results (i.e. RDP values exceed 20%).

APPENDIX A
Site Photographs



Photo 1: View of drive point wells GSI-DC-01A and GSI-DC-01B. Photo taken on January 30, 2017.



Photo 2: View of drive point wells GSI-DC-02A and GSI-DC-02B. Photo taken on January 30, 2017.



Photo 3: View of drive point wells GSI-DC-03A and GSI-DC-03B. Photo taken on January 30, 2017.



Photo 4: View of drive point wells GSI-DC-05A and GSI-DC-05B. Photo taken on February 1, 2017.



Photo 5: View of drive point wells GSI-DC-06A and GSI-DC-06B. Photo taken on January 31, 2017.



Photo 6: View of drive point wells GSI-DC-07A and GSI-DC-07B. Photo taken on January 31, 2017.



Photo 7: View of drive point wells GSI-DC-08A and GSI-DC-08B. Photo taken on January 31, 2017.



Photo 8: View of drive point wells GSI-DC-09A and GSI-DC-09B. Photo taken on January 31, 2017.



Photo 9: View of drive point wells GSI-DC-10A and GSI-DC-10B. Photo taken on January 31, 2017.



Photo 10: View of drive point well GSI-HA-01A. Photo taken on January 30, 2017.



Photo 11: View of drive point well GSI-HA-02A. Photo taken on January 30, 2017.



Photo 12: View of drive point well GSI-HA-03A. Photo taken on January 30, 2017.



Photo 13: View of drive point well GSI-HA-04A. Photo taken on January 30, 2017.



Photo 14: View of drive point well GSI-HA-05A. Photo taken on January 30, 2017.



Photo 15: View of well MW09-15. Photo taken on January 30, 2017.

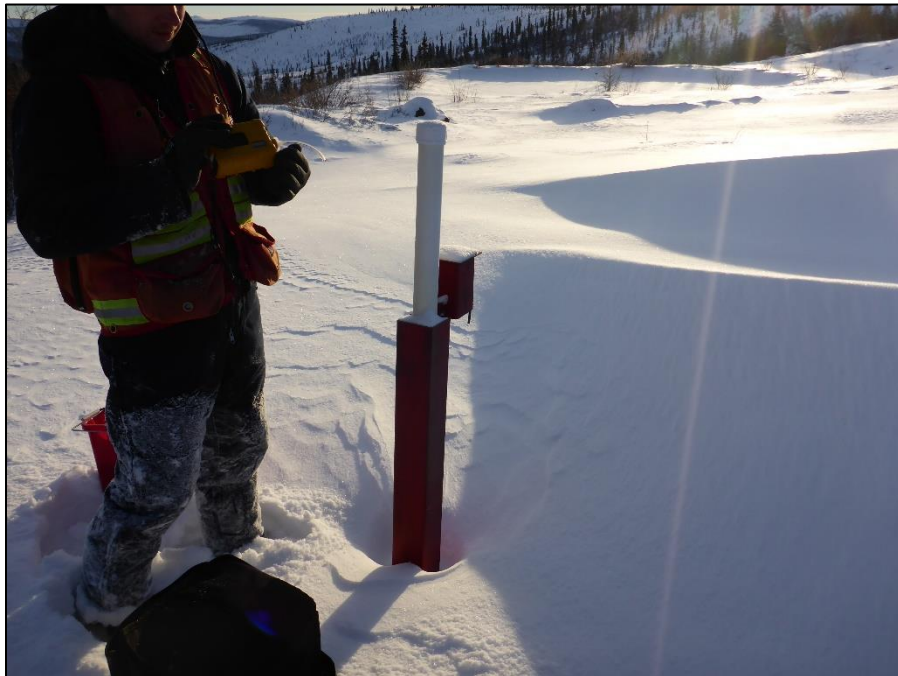


Photo 16: View of well MW09-16. Photo taken on January 30, 2017.



Photo 17: View of well MW09-17. Photo taken on January 30, 2017.



Photo 18: View of well MW09-18. Photo taken on January 30, 2017.



Photo 19: View of well MW09-19. Photo taken on January 30, 2017.



Photo 20: View of well CH-P-13-01/10. Photo taken on January 30, 2017.



Photo 21: View of wells CH-P-13-03/50. Photo taken on January 30, 2017.



Photo 22: View of wells CH-P-13-04/10 and CH-P-13-04/35. Photo taken on January 31, 2017.



Photo 23: View of well GLL07-01. Photo taken on January 30, 2017.



Photo 24: View of well GLL07-02. Photo taken on February 1, 2017.

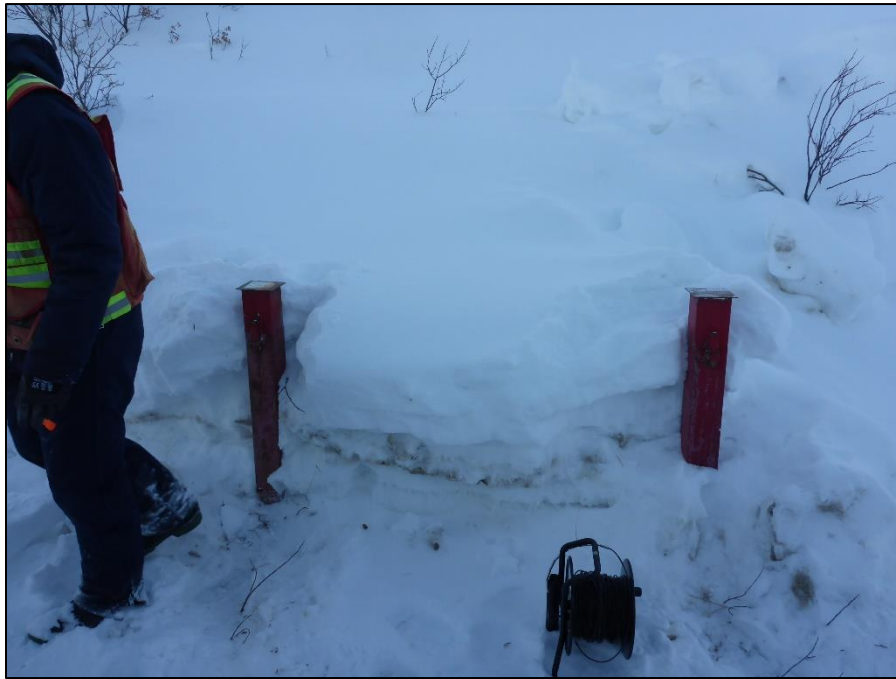


Photo 25: View of wells MW09-13 and MW09-14. Photo taken on January 30, 2017.



Photo 26: View of drive point wells GSI-PC-03A and GSI-PC-03B. Photo taken on February 1, 2017.



Photo 27: View of drive point wells GSI-PC-04A and GSI-PC-04B. Photo taken on February 1, 2017.



Photo 28: View of drive point wells GSI-PC-05A and GSI-PC-05B. Photo taken on February 1, 2017.



Photo 29: View of drive point well MP09-03. Photo taken on February 1, 2017.



Photo 30: View of drive point well MP09-08. Photo taken on February 1, 2017.



Photo 31: View of well W14103083BH01. Photo taken on January 30, 2017.



Photo 32: View of well W14103083BH02. Photo taken on January 30, 2017.



Photo 33: View of well W14103083BH04. Photo taken on January 30, 2017.



Photo 34: View of well MP09-04. Photo taken on January 31, 2017.



Photo 35: View of well MP09-05. Photo taken on January 31, 2017.



Photo 36: View of wells MP09-09 and MP09-10. Photo taken on January 31, 2017.



Photo 37: View of wells MP09-11 and MP09-12. Photo taken on January 31, 2017.



Photo 38: View of drive point well MP09-14. Photo taken on January 31, 2017.



Photo 39: View of well MW09-02. Photo taken on January 31, 2017.



Photo 40: View of well MW09-03 and MW09-04. Photo taken on January 31, 2017.

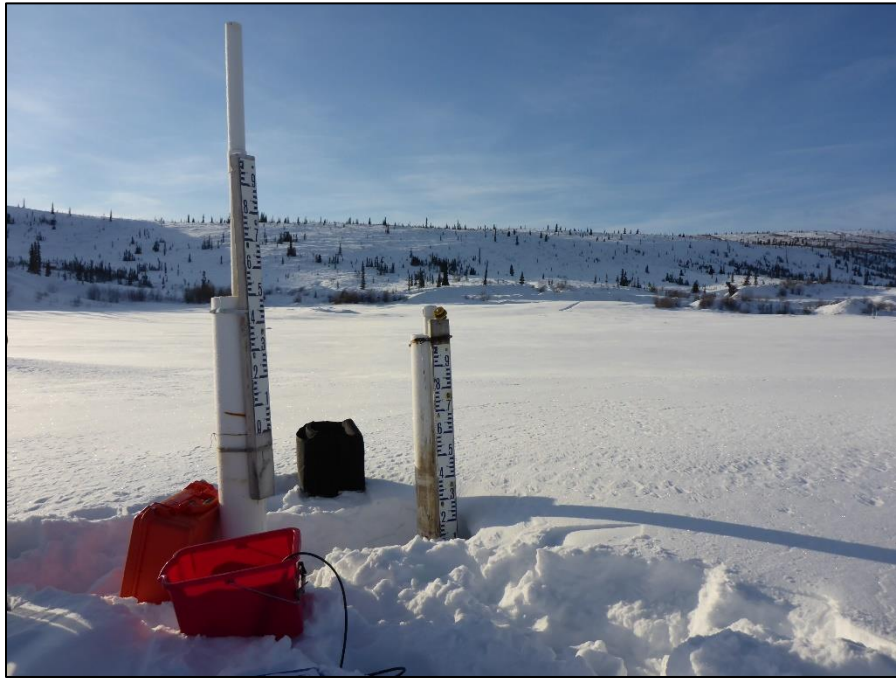


Photo 41: View of well MW09-05 and MW09-06. Photo taken on January 31, 2017.



Photo 42: View of wells MW09-07. Photo taken on January 31, 2017.



Photo 43: View of well MW09-08. Photo taken on January 31, 2017.



Photo 44: View of well MW09-11. Photo taken on January 31, 2017.



Photo 45: View of well MW09-20. Photo taken on January 31, 2017.



Photo 46: View of well MW09-21. Photo taken on January 31, 2017.



Photo 47: View of well MW09-22. Photo taken on January 31, 2017.



Photo 48: View of wells MW09-23. Photo taken on January 31, 2017.



Photo 49: View of well MW09-24. Photo taken on January 31, 2017.



Photo 50: View of well W14103083BH03. Photo taken on January 31, 2017.

APPENDIX B

Field Forms

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site		CHP-13-01/10		Project Number	1343-005.29		Date	Jan 30, 2017			
Piezometer Diameter		3" 1.5"		Client	GY - AAM		Samplers	JC + JC			
UTM Location		Z: 08 E: 0388654 N: 6881117		Project Name	Mount Nansen 2017 GW Sampling Program		Weather/Temperature	-15 sunny			
Waypoint		GPS: HEM Name: N/A					Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos		Cam: ELRI Nos: 078-080		Purge Method							
Duplicate Collected		<input type="checkbox"/> Yes Name: X		Waterra	Peristaltic	Disp. Bailer	Other				
Field Blank Collected		<input type="checkbox"/> Yes Name: X		X	X	X	X				
Initial Depth to Water (m)		FROZEN		Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input checked="" type="checkbox"/> Pen Unit		
Depth to Bottom (m)		6.585		Purge Interval							
Depth recorded from		<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Time () min / Vol. () L							
Submerged Tubing Depth (m)		N/A		Depth to water (m)							
Well Stick-up Height (m)		0.476		Temperature (°C) 3%							
Estimated Water Volume (L)		N/A		pH (pH Units) ±0.1							
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%									
		Specific Cond. (µs/cm) 3%									
		Redox (mV) 10%									
		DO (mg/L) 10%									
		DO (%) 10%									
		Appearance & Odour (Clear, Silty, HC odours, etc.)									
		Only for final readings		Sulphide (mg/L)				WELL FROZEN			
				Turbidity (NTU)							
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									
YSI ID		N/A		Sample Method:							
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other				
Time logged on YSI (24hr)		X		X	X	X	X				
Sample Time (24hr)		X		X	X	X	X				

Sample Site (Con't): CHP-13-01/10

Sample Date (Con't): Not sampled

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.4
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		_____
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- snow depth ~ 0.315m

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site CH-P-13-03/50		Project Number 1343-005.29		Date 30-Jan-17			
Piezometer Diameter 1"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 38, E: 389743 N: 6881110		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature ~ -16°C			
Waypoint GPS: ELR Name: N/A				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 516-518		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: _____		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: _____				X			
Initial Depth to Water (m) 48.701		Purge Start Time: _____	Purge End Time: _____	Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth to Bottom (m) 49.815		Purge Interval Time () min / Vol. () L					
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Depth to water (m)					
Submerged Tubing Depth (m) -		Temperature (°C) 3%					
Well Stick-up Height (m) 0.525 to surface		pH (pH Units) ±0.1					
Estimated Water Volume (L) 0.55		Cond. (µs/cm) 3%					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)		UNABLE TO SAMPLE SEE BACK	
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
		YSI ID		Sample Method:			
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)				X			
Sample Time (24hr) 15:40							

Sample Site (Con't): CH-P-B-03/50

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

*** Head Space Gas Measurements**

	Units	Values
Methane (CH4)	%LEL	
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	100	30-Jan-17
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	15	30-Jan-17
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

* PID not calibrating → constantly showing over range DO in clean air, attempts made to zero + calibrate unsuccessful ∴ will return later w/ different PID.

- Direct sample → ~~water sample was pulled from well & attempted to filter~~
~~pulls from well & attempt to collect any water from well~~
~~the sample, could potentially be a very small amount of water~~
~~keeping water in? when sample pulled up the filter was extra~~
~~weight calibrating this to see what collecting in water~~

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer 1
- 2" bailer _____
- other (describe) twine

- filled gen chem + will filter @ pump house → able to collect diss. metals, diss. mercury

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site		CH-P-13-04/10		Project Number	1343-005.29		Date	31-Jan-17		
Piezometer Diameter		1.75 1.50		Client	GY - AAM		Samplers	JH/MM		
UTM Location		Z: 08, E: 389138 N: 6881472		Project Name	Mount Nansen 2017 GW Sampling Program		Weather/Temperature	~16°C, cloudy		
Waypoint		GPS: ELR Name: NIA					Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad		
Photos		Cam: 2 Nos: 528-530		Purge Method						
Duplicate Collected		<input type="checkbox"/> Yes Name: _____		Waterra		Peristaltic		Disp. Bailer		Other
Field Blank Collected		<input type="checkbox"/> Yes Name: _____								
Initial Depth to Water (m)		FROZEN 6.019		Purge Start Time:		Purge End Time:		Pen or YSI:		<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth to Bottom (m)		FROZEN		Purge Interval						
Depth recorded from		<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Time () min / Vol. () L						
Submerged Tubing Depth (m)		/		Depth to water (m)						
Well Stick-up Height (m)		0.61		Temperature (°C) 3%						
Estimated Water Volume (L)		/		pH (pH Units) ±0.1						
(DTB - DTW) x (πr ²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations:				Cond. (µs/cm) 3%						
				Specific Cond. (µs/cm) 3%						
				Redox (mV) 10%						
				DO (mg/L) 10%						
				DO (%) 10%						
				Appearance & Odour (Clear, Silty, HC odours, etc.)						
				Only for final readings		Sulphide (mg/L)				
						Turbidity (NTU)				
						Interval Purge Volume (L)				
						Cumulative Purge Volume (L):				
YSI ID				Sample Method:						
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra		Peristaltic		Disp. Bailer		Other
Time logged on YSI (24hr)										
Sample Time (24hr)										

Sample Site (Con't): CH-9-13-04/112

 Sample Date (Con't): 31-Jan-17

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	530

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-04135	Project Number	1343-005.29	Date	31-Jan-17.	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MH	
UTM Location	Z: 08J E: 389138 N: 6881472.	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-16°C, windy	
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: 2 Nos: 528-530	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: _____	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: _____					
Initial Depth to Water (m)	FROZEN @ 0.562	Purge Start Time:		Purge End Time:		
Depth to Bottom (m)	N/A FROZEN			Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	/	Depth to water (m)				
Well Stick-up Height (m)	0.60	Temperature (°C) 3%				
Estimated Water Volume (L)	/	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²) 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Cond. (µs/cm) 3%				
			Specific Cond. (µs/cm) 3%			
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings	Sulphide (mg/L)		
				Turbidity (NTU)		
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID		Sample Method:				
Logged Field Parameters	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)	/					
Sample Time (24hr)	/					

Sample Site (Con't): HP-13-04135

 Sample Date (Con't): 31-3-17

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	530

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GLL07-01	Project Number	1343-005.29	Date	30-Jan-17
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JH/MM
UTM Location	Z: 08, E: 0388851 N: 6881782	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	~ -15°C
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ⊙ Nos: 505-527	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: /	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: /				
Initial Depth to Water (m)	13.87	Purge Start Time:	Purge End Time:	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth to Bottom (m)	13.879	Purge Interval			
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Time () min / Vol. () L			
Submerged Tubing Depth (m)	/	Depth to water (m)			
Well Stick-up Height (m)	0.77	Temperature (°C) 3%			
Estimated Water Volume (L)	/	pH (pH Units) ±0.1			
Calculations: $(DTB - DTW) \times (\pi r^2) \times 1000$ (for well diameter) = 1 well volume $(DTB - DTW) \times 8.1$ (for 4" well diameter) = 1 well volume $(DTB - DTW) \times 2$ (for 2" well diameter) = 1 well volume $(DTB - DTW) \times 1.1$ (for 1.5" diameter) = 1 well volume $(DTB - DTW) \times 0.5$ (for 1" diameter) = 1 well volume	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	<u>Only for final readings</u> Sulphide (mg/L)				
	Turbidity (NTU)				
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	/				
Sample Time (24hr)					

FROZEN

Sample Site (Con't): GLL07-01

 Sample Date (Con't): 30-Jan-17

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: slits in PVC
Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	11.0
Carbon Dioxide (CO2)	PPM %	4.37%

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

-Returned to collect gases on 31-Jan-17 @ 09:55 due to PID to working properly at time of first visit

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	G1107-02	Project Number	1343-005.29	Date	Feb. 1, 2017
Piezometer Diameter	6"	Client	GY - AAM	Samplers	JC + JH
UTM Location	Z: 08 E: 6889069 N: 6881703	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sun/clouds
Waypoint	GPS: Name:			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR2 Nos: 575-577	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	DRY	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	7.045	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit	
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	1.35	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume</p> <p>(DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume</p> <p>(DTB - DTW) x 2 (for 2" well diameter) = 1 well volume</p> <p>(DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume</p> <p>(DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)					

Sample Site (Con't): GLL07-02

 Sample Date (Con't): NOT SAMPLED

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: well sitting open
Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	130

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-01A	Project Number	1343-005.29	Date	Jan 30, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0387674 N: 6881127	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sunny	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELRI Nos: 063-065	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)	0.866	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit		
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	N/A	Depth to water (m)				
Well Stick-up Height (m)	0.66	Temperature (°C) 3%				
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr² × 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%					
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings	Sulphide (mg/L)				
		Turbidity (NTU)				
	Interval Purge Volume (L)					
	Cumulative Purge Volume (L):					
YSI ID	X	Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)	X					
Sample Time (24hr)	Not Sampled	X	X	X	X	

Sample Site (Con't): GSI-DC-01A

Sample Date (Con't): Not Sampled

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- snow is ~ 42cm deep
- Monitor only

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-01B	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 6387675 N: 6881128	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15 sunny
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELRI Nos: 066-068	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	0.834	Pen or YSI:		<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.734	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)	Not Sampled	X	X	X	X

Sample Site (Con't): GSI-DC-01B

Sample Date (Con't): Not Sampled

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.2
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Monitor only
- Approx 42cm of snow

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GI-DC-02B/A	Project Number	1343-005.29	Date	30-Jan-17
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MM
UTM Location	Z: 08v E: 0287041 N: 681132	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	~20°C, slight breeze
Waypoint	GPS: ELR Name: NIK			Recovery	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Bad
Photos	Cam: 2 Nos: 492-494	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: _____	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: _____		X/A		
Initial Depth to Water (m)	B) 2.370 A) 2.716 DRY/FROZEN	Purge Start Time:		Purge End Time:	
Depth to Bottom (m)	B) 2.716 A) 1.869			Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N 3	Depth to water (m)	DIRECT SAMPLE		
Well Stick-up Height (m)	B) 0.275 A) 0.35	Temperature (°C) 3%			
Estimated Water Volume (L)	0.67	pH (pH Units) ±0.1			
<p>Calculations:</p> $\frac{3.716}{1.346} = 2.76$		Cond. (µs/cm) 3%			
		Specific Cond. (µs/cm) 3%			
		Redox (mV) 10%			
		DO (mg/L) 10%			
		DO (%) 10%			
		Appearance & Odour (Clear, Silty, HC odours, etc.)			
	<input type="checkbox"/> Only for final readings Sulphide (mg/L) Turbidity (NTU)				
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)					
Sample Time (24hr)	12:40		X		

Sample Site (Con't): GSI-DC-02B/A

Sample Date (Con't): 30-Jan-17 @ 12:40

Well Head Seal: J-Plug PVC Cap Not Sealed Other twist cap

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values	
Methane (CH4)	%LEL	10	20
Oxygen (O2)	%	20.9	17.5
Carbon Dioxide (CO2)	PPM	900	2000

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	100	30-Jan-17 2 used
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	15	3 from
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100 250	"
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	100	"
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	60	"
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	50	"
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50	"

General Notes and Observations:

- will return to direct sample

- able to fill entire gen chem bottle @ 12:40; will filter at bunk house due to freezing conditions.

~~- return to attempt to sample more @ 16:45~~

- Returned to sample 30-Jan-17 @ 16:45 - unable to get water

- Returned to sample @ 09:30 on 31-Jan-17 - able to purge ~ 400 ml more

↳ completed sample set.

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) 8m
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing 0.5 ft 1 ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-G3B/A	Project Number	1343-005.29	Date	30-Jan-17	
Piezometer Diameter		Client	GY - AAM	Samplers	JH/MM	
UTM Location	Z: 08, E: 0888105, N: 6881089	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C	
Waypoint	GPS: EUR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: 2 Nos: 514-515	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name:					
Initial Depth to Water (m)	/	Purge Start Time:		Purge End Time:		
Depth to Bottom (m)					Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings	Sulphide (mg/L)		
				Turbidity (NTU)		
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
	YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)						
Sample Time (24hr)						

CANNOT LOCATE TO GLACIATION FROM CREEK DUE

Sample Site (Con't): GSI-DC-05B/A

Sample Date (Con't): Jan. 20, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Cannot located due to glaciation from dome creek, large amount of ice covering DP, reference to UTM.

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-05 A / B	Project Number	1343-005.29	Date	Feb 1, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JH	
UTM Location	Z: 08 E: 0388725 N: 6880836	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-10°C sun, clouds	
Waypoint	GPS: ELR Name:			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR2 Nos: 559-561	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name:	X	X	X	X	
Initial Depth to Water (m)	(A) - (B)	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)	(A) - (B)	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit		
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	X	Depth to water (m)				
Well Stick-up Height (m)	X	Temperature (°C) 3%				
Estimated Water Volume (L)	X	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Specific Cond. (µs/cm) 3%	COULD NOT LOCATE WELL, SUSPECTED OF BEING FROZEN OVER				
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings	Sulphide (mg/L)				
		Turbidity (NTU)				
	Interval Purge Volume (L)					
	Cumulative Purge Volume (L):					
	YSI ID	X	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)	X	X	X	X	X	
Sample Time (24hr)	X	X	X	X	X	

Sample Site (Con't): GSI-DC-OSA/B

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	X
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- well below ice, could not locate

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GS1-DC-06A	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389788 N: 6880567	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A	Purge Method			
Photos	Cam: ELRI Nos: 90-92	Water	Peristaltic	Disp. Bailer	Other
Duplicate Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Field Blank Collected	<input type="checkbox"/> Yes Name: X				
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	0.900	Pen or YSI:		<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.813	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Water	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)					

Sample Site (Con't): GSI-DC-06A

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.5
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

• snow depth ~ 0.41 m

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	G51-DC-06B	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389788 N: 6880567	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 93-95	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	0.530	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.488	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	<u>Only for final readings</u> Sulphide (mg/L)				
	Turbidity (NTU)				
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): G51-DC-06B

Sample Date (Con't): NOT SAMPLED

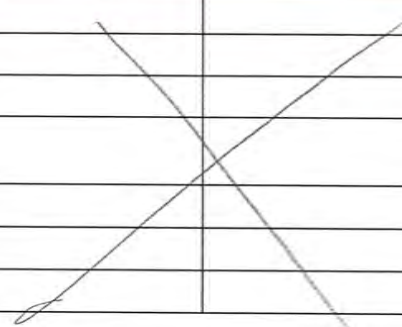
Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.4
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

• snow depth ~ 0.41 m

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-07A	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0390064 N: 688089	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR1 Nos: 96-99	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	X	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)					Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings			
			Sulphide (mg/L)			
			Turbidity (NTU)			
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)		X	X	X	X	
Sample Time (24hr)		X	X	X	X	

Sample Site (Con't): GSI-DC-07A

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Could not locate well
- Water / ice level seemed higher than normal

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-07B	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0390064 N: 6880639	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR Nos: 96-99	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	<div style="font-size: 4em; opacity: 0.5;">X</div>	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)					Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings			
			Sulphide (mg/L)			
			Turbidity (NTU)			
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID	<div style="font-size: 4em; opacity: 0.5;">X</div>	Sample Method:				
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)						
Sample Time (24hr)			X	X	X	X

NOT SAMPLED, COULD NOT LOCATE WELL SUSPECTED FROZEN OVER

Sample Site (Con't): GSI-DC-07B

Sample Date (Con't): NAT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	X
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- could not locate well
- water / ice seemed higher than normal

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-08A	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0390310 N: 6880585	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR 1 Nos: 100-102	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	1.141	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.02 (ice)	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): GSI-DC-08A

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other Bag

Seal Replaced: J-Plug PVC Cap Not required Other Glove + tape (intake)

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.2
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		XXXXXXXXXX
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- only a very small (2 cm) portion of well above ice.
- chipped ice away with hammer to confirm ID and remove cover

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-08B	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0390310 N: 6880585	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR1 Nos: 103-104	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	<div style="font-size: 4em; opacity: 0.5;">X</div>	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)					Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings			
			Sulphide (mg/L)			
			Turbidity (NTU)			
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID	<div style="font-size: 4em; opacity: 0.5;">X</div>	Sample Method:				
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)			X	X	X	X
Sample Time (24hr)			X	X	X	X

COULD NOT LOCATE WELL, BELOW ICE

Sample Site (Con't): GSI-DC-08B

 Sample Date (Con't): NOT SAMPLED

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH ₄)	%LEL	X
Oxygen (O ₂)	%	
Carbon Dioxide (CO ₂)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

could not locate well, be low ice

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-09A	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC+JC	
UTM Location	Z: 08 E: 0390614 N: 6880494	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELRI Nos: 105-107	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	<div style="font-size: 4em; opacity: 0.5;">X</div>	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)				Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings	Sulphide (mg/L)		
				Turbidity (NTU)		
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID	<div style="font-size: 4em; opacity: 0.5;">X</div>	Sample Method:				
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)			X	X	X	X
Sample Time (24hr)			X	X	X	X

COULD NOT LOCATE WELL
SUSPECTED FROZEN OVER

Sample Site (Con't): GSI-DC-09A

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	 	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Could not locate well, suspected frozen over

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves _____
- D-16 (for 1" wells, use with 5/8" foot valves _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-09B	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0390614 N: 6880494	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELRI Nos: 105-107	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	X	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)				Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%	COULD NOT LOCATE WELL SUSPECTED FROZEN OVER			
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings	Sulphide (mg/L)		
				Turbidity (NTU)		
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
	YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)		X	X	X	X	
Sample Time (24hr)						

Sample Site (Con't): GSI-DC-09B

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	
Oxygen (O2)	%	
Carbon Dioxide (CO2)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	 	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- could not locate well, suspected frozen over

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-10A	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC	
UTM Location	Z: 08 E: 0390859 N: 688 0447	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds	
Waypoint	GPS: HEM Name: N/A	Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos	Cam: ELR1 Nos: 109-111	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)	1.051	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	N/A	Depth to water (m)				
Well Stick-up Height (m)	0.77	Temperature (°C) 3%	/			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1				
<p>(DTB – DTW) x (πr²) * 1000 (for well diameter) = 1 well volume</p> <p>(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume</p> <p>(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume</p> <p>(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume</p> <p>(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%	/				
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%	WELL FROZEN				
	DO (mg/L) 10%	/				
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)	/				
	Only for final readings				Sulphide (mg/L)	
		Turbidity (NTU)				
		Interval Purge Volume (L)				
		Cumulative Purge Volume (L):				
YSI ID	X	Sample Method:				
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X	
Sample Time (24hr)		X	X	X	X	

Sample Site (Con't): GSI-DC-10A

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.7
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Snow depth ~ 0.23m
- well Frozen

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GS1-DC-106	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0390859 N: 6880447	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds
Waypoint	GPS: HEM Name: N/A	Purge Method			
Photos	Cam: ELRI Nos: 112-114	Water	Peristaltic	Disp. Bailer	Other
Duplicate Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Field Blank Collected	<input type="checkbox"/> Yes Name: X				
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	1.05 0.203	Pen or YSI:		<input type="checkbox"/> YSI-Pro Plus	<input type="checkbox"/> Pen Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.76	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:			
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Water	Peristaltic	Disp. Bailer
Time logged on YSI (24hr)					
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): GSI-DC-10B

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.7
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- snow depth ~ 0.23m

- Well Frozen

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GS1-HA-01A	Project Number	1343-005.29	Date	30-Jan-17	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/NM	
UTM Location	Z: 080 E: 0387844 N: 6881133	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C, slight breeze	
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: 2 Nos: 493-2447	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name:		N/A			
Initial Depth to Water (m)	2.411	Purge Start Time:	/	Purge End Time:	/	
Depth to Bottom (m)	3.132	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L	<div style="font-size: 2em; opacity: 0.5;">DIRECT SAMPLE</div>			
Submerged Tubing Depth (m)	~3	Depth to water (m)				
Well Stick-up Height (m)	0.445	Temperature (°C) 3%				
Estimated Water Volume (L)	0.36	pH (pH Units) ±0.1				
<p>Calculations:</p> $(DTB - DTW) \times (\pi r^2) \times 1000 \text{ (for well diameter)} = 1 \text{ well volume}$ $(DTB - DTW) \times 8.1 \text{ (for 4" well diameter)} = 1 \text{ well volume}$ $(DTB - DTW) \times 2 \text{ (for 2" well diameter)} = 1 \text{ well volume}$ $(DTB - DTW) \times 1.1 \text{ (for 1.5" diameter)} = 1 \text{ well volume}$ $(DTB - DTW) \times 0.5 \text{ (for 1" diameter)} = 1 \text{ well volume}$		Cond. (µs/cm) 3%				
						Specific Cond. (µs/cm) 3%
						Redox (mV) 10%
						DO (mg/L) 10%
						DO (%) 10%
						Appearance & Odour (Clear, Silty, HC odours, etc.)
		Only for final readings	Sulphide (mg/L)			
			Turbidity (NTU)			
		Interval Purge Volume (L)				
		Cumulative Purge Volume (L):				
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)	/					
Sample Time (24hr)	10:50		X			

Sample Site (Con't): GSI-HA-GIA

Sample Date (Con't): 30 Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other stainless cap

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	690

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	100	30-Jan-17
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	15	"
2	500 ml (plastic)	General Chemistry	100 ml	-	-	175	"
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	100	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	60	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	50	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	60	

General Notes and Observations:

- Direct sample → filled gen chem bottle w apt ~0.3L;
will filter @ dunnhouse due to freezing conditions.
→ tubing iced up fairly quickly → had to replace & purge again.
→ returned to continue sampling on 31-Jan-17 @ 09:35 → able to collect ~200ml
→ returned to collect final vol @ 09:00 on 01-Feb-17

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft ^{7.2m x 2} ~~3.4m~~ 14.4m
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing ~~1.5 ft~~ ^{1.5 ft}
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-HA-02A	Project Number	1343-005.29	Date	30-Jan-17
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MM
UTM Location	Z: 0387863 E: 0387863 N: 688128	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C, slight breeze
Waypoint	GPS: EUR Name: NIA	Purge Method			
Photos	Cam: 2 Nos: 498-500	Watera	Peristaltic	Disp. Bailer	Other
Duplicate Collected	<input type="checkbox"/> Yes Name: _____				
Field Blank Collected	<input type="checkbox"/> Yes Name: _____				
Initial Depth to Water (m)	FROZEN	Purge Start Time:		Purge End Time:	
Depth to Bottom (m)	2.158	Purge Interval Time () min / Vol. () L			
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Depth to water (m)			
Submerged Tubing Depth (m)	/	Temperature (°C) 3%			
Well Stick-up Height (m)	58.1518	pH (pH Units) ±0.1			
Estimated Water Volume (L)	/	Cond. (µs/cm) 3%			
<p>(DTB – DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB – DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%			
		Redox (mV) 10%			
		DO (mg/L) 10%			
		DO (%) 10%			
		Appearance & Odour (Clear, Silty, HC odours, etc.)			
		Only for final readings	Sulphide (mg/L)		
			Turbidity (NTU)		
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
	YSI ID	/	Sample Method:		
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Watera	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	/				
Sample Time (24hr)	/				

Sample Site (Con't): GBI-HA-02A

Sample Date (Con't): 30-Jun-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other twist

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	490

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

FROZEN

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	19 GSI-HA-03A	Project Number	1343-005.29	Date	30-Jan-17	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MM	
UTM Location	Z: 081 E: 0387882 N: 6881129	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C	
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: 2 Nos: 501-503	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name:					
Initial Depth to Water (m)	FROZEN	Purge Start Time:		Purge End Time:		
Depth to Bottom (m)	0.925	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	/	Depth to water (m)				
Well Stick-up Height (m)	0.910	Temperature (°C) 3%				
Estimated Water Volume (L)	/	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%					
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings	Sulphide (mg/L)				
		Turbidity (NTU)				
		Interval Purge Volume (L)				
		Cumulative Purge Volume (L):				
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)						
Sample Time (24hr)						

Sample Site (Con't): 651-HA-05A
651-2

Sample Date (Con't): 30-JUN-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other twist cap

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	530

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

FROZEN

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	G51-HA-04A	Project Number	1343-005.29	Date	30-Jan-17
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MM
UTM Location	Z: 081E: 0287915 N: 6881129	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C
Waypoint	GPS: ELR Name: N/A	Purge Method	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Other		
Photos	Cam: 2 Nos: 507-510	Duplicate Collected	<input type="checkbox"/> Yes Name: _____		
Field Blank Collected	<input type="checkbox"/> Yes Name: _____	Field Blank Collected	<input type="checkbox"/> Yes Name: _____		
Initial Depth to Water (m)	FROZEN	Purge Start Time:		Purge End Time:	
Depth to Bottom (m)	0.200	Purge Interval Time () min / Vol. () L		Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Depth to water (m)		FROZEN	
Submerged Tubing Depth (m)		Temperature (°C) 3%			
Well Stick-up Height (m)	0.64	pH (pH Units) ±0.1			
Estimated Water Volume (L)		Cond. (µs/cm) 3%			
Calculations: $(DTB - DTW) \times (\pi r^2) \times 1000$ (for well diameter) = 1 well volume $(DTB - DTW) \times 8.1$ (for 4" well diameter) = 1 well volume $(DTB - DTW) \times 2$ (for 2" well diameter) = 1 well volume $(DTB - DTW) \times 1.1$ (for 1.5" diameter) = 1 well volume $(DTB - DTW) \times 0.5$ (for 1" diameter) = 1 well volume	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)					
Sample Time (24hr)					

Sample Site (Con't): GD-HA-04A

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other twist cap

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	780

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

[A large diagonal line is drawn across this section, indicating no notes were recorded.]

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSL HA-05A	Project Number	1343-005.29	Date	30-Jan-17				
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JH/MM				
UTM Location	Z: 08VE:0382898 N: 588881105	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C				
Waypoint	GPS: FLR Name:	Purge Method	<table border="1"> <tr> <td>Waterra</td> <td>Peristaltic</td> <td>Disp. Bailer</td> <td>Other</td> </tr> </table>	Waterra	Peristaltic	Disp. Bailer	Other	Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Waterra	Peristaltic			Disp. Bailer	Other				
Photos	Cam: 2. Nos: 504-506								
Duplicate Collected	<input type="checkbox"/> Yes Name:								
Field Blank Collected	<input type="checkbox"/> Yes Name:								
Initial Depth to Water (m)	+304 FROZEN	Purge Start Time:	Purge End Time:	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit				
Depth to Bottom (m)	1.304	Purge Interval							
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Time () min / Vol. () L							
Submerged Tubing Depth (m)	/	Depth to water (m)							
Well Stick-up Height (m)	0.623 - twice bot	Temperature (°C) 3%							
Estimated Water Volume (L)	/	pH (pH Units) ±0.1							
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%		<div style="font-size: 2em; opacity: 0.5;">FROZEN</div>						
	Specific Cond. (µs/cm) 3%								
	Redox (mV) 10%								
	DO (mg/L) 10%								
	DO (%) 10%								
	Appearance & Odour (Clear, Silty, HC odours, etc.)								
	Only for final readings	Sulphide (mg/L)							
		Turbidity (NTU)							
	Interval Purge Volume (L)								
	Cumulative Purge Volume (L):								
YSI ID									
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Sample Method:							
Time logged on YSI (24hr)	/	<table border="1"> <tr> <td>Waterra</td> <td>Peristaltic</td> <td>Disp. Bailer</td> <td>Other</td> </tr> </table>				Waterra	Peristaltic	Disp. Bailer	Other
Waterra	Peristaltic	Disp. Bailer	Other						
Sample Time (24hr)	/								

Sample Site (Con't): GS1-HA-05A

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other twot cap.

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	660

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- FROZEN; attempted to pull tubing but stuck.

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-PC-03A/B	Project Number	1343-005.29	Date	Feb 1, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JH	
UTM Location	Z: 08 E: 0389256 N: 6881706	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sun / clouds	
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR2 Nos: 569-571	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	X	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)				Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)			Depth to water (m)			
Well Stick-up Height (m)			Temperature (°C) 3%			
Estimated Water Volume (L)			pH (pH Units) ±0.1			
			Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%			
			DO (mg/L) 10%			
			DO (%) 10%			
			Appearance & Odour (Clear, Silty, HC odours, etc.)			
			Only for final readings	Sulphide (mg/L)		
				Turbidity (NTU)		
			Interval Purge Volume (L)			
			Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:				
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	
Time logged on YSI (24hr)					Other	
Sample Time (24hr)		X	X	X	X	

COULD NOT LOCATE WELLS
SUSPECTED BELOW ICE

Sample Site (Con't): GSI-PC-03A/B

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	6
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	350

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

<p>General Notes and Observations:</p> 	<p>Consumables Used:</p> <input type="checkbox"/> 1/4" HDPE (peristaltic pump tubing) _____ ft <input type="checkbox"/> 3/8" HDPE (microwaterra tubing) _____ ft <input type="checkbox"/> 5/8" HDPE (waterra tubing) _____ ft <input type="checkbox"/> 1/4" Silicon tubing _____ ft <input type="checkbox"/> High Capacity .45 micron filters _____ <input type="checkbox"/> D-25 (for 2" wells, use with 5/8" foot valves) _____ <input type="checkbox"/> D-16 (for 1" wells, use with 5/8" foot valves) _____ <input type="checkbox"/> SS-10 (for 5/8" wells, use with 3/8" foot valves) _____ <input type="checkbox"/> 1" bailer _____ <input type="checkbox"/> 2" bailer _____ <input type="checkbox"/> other (describe) _____
---	---

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-PC-04 A/B		Project Number	1343-005.29		Date	Feb 1, 2017	
Piezometer Diameter	1"		Client	GY - AAM		Samplers	JC + JH	
UTM Location	Z: 08 E: 0389586 N: 6881656		Project Name	Mount Nansen 2017 GW Sampling Program		Weather/Temperature	-15°C sun / clouds	
Waypoint	GPS: ELR Name: N/A					Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR 2 Nos: 566-568		Purge Method					
Duplicate Collected	<input type="checkbox"/> Yes Name: X		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected	<input type="checkbox"/> Yes Name: X		X	X	X	X		
Initial Depth to Water (m)	[ⓐ] FROZEN	[ⓑ] FROZEN	Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input checked="" type="checkbox"/> Pen Unit
Depth to Bottom (m)	0.845	0.690	Purge Interval Time () min / Vol. () L					
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point		Depth to water (m)					
Submerged Tubing Depth (m)	N/A		Temperature (°C) 3%					
Well Stick-up Height (m)	[Ⓐ] 0.74	[ⓑ] 0.835	pH (pH Units) ±0.1					
Estimated Water Volume (L)	N/A		Cond. (µs/cm) 3%					
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>			Specific Cond. (µs/cm) 3%					
			Redox (mV) 10%					
			DO (mg/L) 10%					
			DO (%) 10%					
			Appearance & Odour (Clear, Silty, HC odours, etc.)					
			Only for final readings	Sulphide (mg/L)				
				Turbidity (NTU)				
			Interval Purge Volume (L)					
			Cumulative Purge Volume (L):					
	YSI ID	X		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)	X		X	X	X	X		
Sample Time (24hr)	X		X	X	X	X		

Sample Site (Con't): GSI-PC-04A/B

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other Glove

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

A - Glove
B - PVC cap

Head Space Gas Measurements

	Units	Values	
Methane (CH4)	%LEL	(A) 0	(B) 0
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (CO2)	PPM	610	630

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves _____
- D-16 (for 1" wells, use with 5/8" foot valves _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-PC-05A/B	Project Number	1343-005.29	Date	Feb 1, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389713 N: 6881661	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	sun / clouds -15°C
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR 2 Nos: 562-565	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name:	X	X	X	X
Initial Depth to Water (m)	(A) FROZEN / (B) FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	(A) 0.838 / (B) 1.770	Pen or YSI:	<input checked="" type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	(A) 0.60 / (B) 0.65	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)					

Head Space Gas Measurements

Values	Units	Methane (CH4)	Oxygen (O2)	Carbon Dioxide (CO2)
0	%LEL	0	20.9	650
0	%	0	16.0	9100

Sample Date (Cont): Not sampled

Sample Site (Cont): 9S1-PC-05A/B

Well Head Seal: J-Plug PVC Cap Not Sealed Other bag

Seal Replaced: J-Plug PVC Cap Not required Other

Well properly sealed for gas monitoring: Yes No Details: _____

A - sealed in plastic bag
B - PVC cap

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment	Preservative Added	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml				
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml		<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml		<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml		<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml				

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity 45-micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-03	Project Number	1343-005.29	Date	Feb 1, 2017	
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JH	
UTM Location	Z: 08 E: 0388956 N: 6881739	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sun/clouds	
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELR 2 Nos: 578-580	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)	1.455	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit		
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	N/A	Depth to water (m)				
Well Stick-up Height (m)	0.41	Temperature (°C) 3%				
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%					
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings	Sulphide (mg/L)				
		Turbidity (NTU)				
		Interval Purge Volume (L)				
		Cumulative Purge Volume (L):				
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)		X	X	X	X	
Sample Time (24hr)		X	X	X	X	

Sample Site (Con't): MP09-03

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other (tubing sticking out)

Seal Replaced: J-Plug PVC Cap Not required Other GLOVE

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	650

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- removed tubing to insert water level tape, ~~put back in~~

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-04	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1.5"	Client	GY - AAM	Samplers	JC + Jc
UTM Location	Z: 08 E: 0389575 N: 6880609	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun / clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 118-120	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
				Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth to Bottom (m)	1.646	Purge Interval Time () min / Vol. () L			
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Depth to water (m)			
Submerged Tubing Depth (m)	N/A	Temperature (°C) 3%			
Well Stick-up Height (m)	1.225	pH (pH Units) ±0.1			
Estimated Water Volume (L)	N/A	Cond. (µs/cm) 3%			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): MW09-04

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.8
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

snow depth ~ 0.57m

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-05	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1.5"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389548 N: 6880590	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 127-129	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name:	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	1.333	Pen or YSI:		<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.299	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)		X	X	X	X

WELL FROZEN

Sample Site (Con't): MP09-05

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.2
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity 45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-08	Project Number	1343-005.29	Date	Feb 1, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JH
UTM Location	Z: 08 E: 0389160 N: 6881718	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sun / clouds
Waypoint	GPS: ELR Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR2 Nos: 572-574	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	CAN'T GET PROBE INTO MW	Pen or YSI:		<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen/Unit
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.22	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): MP 09-08

 Sample Date (Con't): NOT SAMPLED

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other did not replace, tubing sticking out

 Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	580

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- could not get water level tape down well. 1/4" HDPE in well, could not remove as frozen into ice

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-09	Project Number	1343-005.29	Date	31-Jan-17		
Piezometer Diameter	1.5	Client	GY - AAM	Samplers	JH / MM		
UTM Location	Z: 08V E: 078938 N: 6880682	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C		
Waypoint	GPS: FLP Name: N/A	Purge Method	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Other				
Photos	Cam: 2 Nos: 345-347	Field Blank Collected	<input checked="" type="checkbox"/> Yes Name: FB-2				
Duplicate Collected	<input type="checkbox"/> Yes Name:	Initial Depth to Water (m)	4.010 FROZEN	Purge Start Time:			
		Depth to Bottom (m)	5.698	Purge End Time:			
		Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
		Submerged Tubing Depth (m)	/	Depth to water (m)			
		Well Stick-up Height (m)	2.58	Temperature (°C) 3%			
		Estimated Water Volume (L)	~ 1.9	pH (pH Units) ±0.1			
Calculations: $(DTB - DTW) \times (\pi r^2) \times 1000$ (for well diameter) = 1 well volume $(DTB - DTW) \times 8.1$ (for 4" well diameter) = 1 well volume $(DTB - DTW) \times 2$ (for 2" well diameter) = 1 well volume $(DTB - DTW) \times 1.1$ (for 1.5" diameter) = 1 well volume $(DTB - DTW) \times 0.5$ (for 1" diameter) = 1 well volume 5.698 4.010 1.688 1.1 =			Cond. (µs/cm) 3%	DIRECT WATER SAMPLE			
			Specific Cond. (µs/cm) 3%				
			Redox (mV) 10%				
			DO (mg/L) 10%				
			DO (%) 10%				
			Appearance & Odour (Clear, Silty, HC odours, etc.)				
			Only for final readings			Sulphide (mg/L)	0.80*
						Turbidity (NTU) Av	900
			Interval Purge Volume (L)				
			Cumulative Purge Volume (L):				
YSI ID		Sample Method:	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Other				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Time logged on YSI (24hr)					
Sample Time (24hr)	13:10						

Sample Site (Con't): LPOA-09

Sample Date (Con't): 31-Jan-17 @ 13:10

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	550

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	400	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

~~Sens:~~ direct sample → able to collect full sample
 get & collect turbidity & sulphide → not enough water
 for YSI parameter collection

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer 1
- 2" bailer _____
- other (describe) twice

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MPO9-10		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 1.5		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 08, E: 0380238 N: 6880682		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature - 00°C			
Waypoint GPS: ELR Name: N/A				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 345-347		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name:		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name:							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 3.238		Pen or YSI:		<input type="checkbox"/> YSI Pro Plus			
Depth recorded from <input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point		<input type="checkbox"/> Pen Unit					
Submerged Tubing Depth (m) /		Purge Interval Time () min / Vol. () L					
Well Stick-up Height (m) 2.21		Depth to water (m)					
Estimated Water Volume (L) /		Temperature (°C) 3%					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume</p> <p>(DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume</p> <p>(DTB - DTW) x 2 (for 2" well diameter) = 1 well volume</p> <p>(DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume</p> <p>(DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		pH (pH Units) ±0.1					
		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
		Cumulative Purge Volume (L):					
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)							
Sample Time (24hr)							

Sample Site (Con't): MP09-10

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9-20.3
Carbon Dioxide (CO2)	PPM	610

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

10 08V 389220 6880619

Sample Site		MPOA-11		Project Number		1343-005.29		Date		31-Jan-17			
Piezometer Diameter		1.5		Client		GY - AAM		Samplers		JH/MM			
UTM Location		Z: 080 E: 509000 N: 6880619		Project Name		Mount Nansen 2017 GW Sampling Program		Weather/Temperature		-20°C			
Waypoint		GPS: ELR Name: N/A		Purge Method				Recovery		<input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos		Cam: 2 Nos: 531-533		Watera		Peristaltic		Disp. Bailer		Other			
Duplicate Collected		<input type="checkbox"/> Yes Name:											
Field Blank Collected		<input type="checkbox"/> Yes Name:											
Initial Depth to Water (m)		FROZEN		Purge Start Time:				Purge End Time:		Pen or YSI:			
Depth to Bottom (m)		2.183								<input type="checkbox"/> YSI Pro Plus			
Depth recorded from		<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L						<input type="checkbox"/> Pen Unit			
Submerged Tubing Depth (m)				Depth to water (m)									
Well Stick-up Height (m)		1.960		Temperature (°C) 3%									
Estimated Water Volume (L)				pH (pH Units) ±0.1									
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>				Cond. (µs/cm) 3%									
				Specific Cond. (µs/cm) 3%									
				Redox (mV) 10%									
				DO (mg/L) 10%									
				DO (%) 10%									
				Appearance & Odour (Clear, Silty, HC odours, etc.)									
				Only for final readings		Sulphide (mg/L)							
						Turbidity (NTU)							
						Interval Purge Volume (L)							
						Cumulative Purge Volume (L):							
YSI ID				Sample Method:									
Logged Field Parameters		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Watera		Peristaltic		Disp. Bailer		Other			
Time logged on YSI (24hr)													
Sample Time (24hr)													

Sample Site (Con't): MPO9-11

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.6
Carbon Dioxide (CO2)	PPM	580

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MPO9-10		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 1.5		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 08U E: 880220 N: 680619		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -19°C			
Waypoint GPS: ELR Name: N/A				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 531-533		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: /		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: /							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 2.070				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) /		Depth to water (m)					
Well Stick-up Height (m) 2.085		Temperature (°C) 3%					
Estimated Water Volume (L) /		pH (pH Units) ±0.1					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID /		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr) /							
Sample Time (24hr) /							

Sample Site (Con't): MPO9-10

 Sample Date (Con't): 31-Jan-17

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	560

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MPO9-14		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 1"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 082 E: 0289130 N: 6880722		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -19°C			
Waypoint GPS: ELR Name: N/A		Purge Method		Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 539-540		Waterra		Peristaltic			
Duplicate Collected <input type="checkbox"/> Yes Name: /		Disp. Bailer		Other			
Field Blank Collected <input type="checkbox"/> Yes Name: /							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 0.505				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) /		Depth to water (m)					
Well Stick-up Height (m) 0.69		Temperature (°C) 3%					
Estimated Water Volume (L) /		pH (pH Units) ±0.1					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra		Peristaltic			
Time logged on YSI (24hr)		Disp. Bailer		Other			
Sample Time (24hr)							

Sample Site (Con't): MP09-14

 Sample Date (Con't): 31-Jan-17

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other see below

 Well properly sealed for gas monitoring: Yes No Details: no seal

↳ no cap that fits.

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	520

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

sampled
Feb 1, 2017

Sample Site	MW09-082	Project Number	1343-005.29	Date	31-Jan-17
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JH/MM
UTM Location	Z: 08 E: 0389393 N: 6880559	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-20°C
Waypoint	GPS: ELR Name: N/A	Purge Method	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Other		
Photos	Cam: 2 Nos: 555-557	Field Blank Collected	<input checked="" type="checkbox"/> Yes Name: FB-3 <small>Als batch 26 Jan 2017</small>		
Duplicate Collected	<input type="checkbox"/> Yes Name:	Initial Depth to Water (m)	3.012	Purge Start Time:	15:26
Field Blank Collected	<input checked="" type="checkbox"/> Yes Name: FB-3 <small>Als batch 26 Jan 2017</small>	Depth to Bottom (m)	5.635	Purge End Time:	15:3
Initial Depth to Water (m)	3.012	Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth to Bottom (m)	5.635	Submerged Tubing Depth (m)	N/A	Purge Interval Time () min / Vol. () L	15:27 15:28 15:32
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Well Stick-up Height (m)	0.74	Depth to water (m)	- / - / -
Submerged Tubing Depth (m)	N/A	Estimated Water Volume (L)	~5.2	Temperature (°C) 3%	8.7 8.7 0.4
Well Stick-up Height (m)	0.74	Calculations:	$\begin{matrix} 3.012 \\ \times 8.1 \\ \hline 2.623 \\ \times 2 \\ \hline 5.246 \end{matrix}$	pH (pH Units) ±0.1	7.01 6.95 6.97
Estimated Water Volume (L)	~5.2	Specific Cond. (µs/cm) 3%		Cond. (µs/cm) 3%	1130 1194 1198
		Redox (mV) 10%		Redox (mV) 10%	87.8 57.6 47.3
		DO (mg/L) 10%		DO (mg/L) 10%	6.07 5.03 5.69
		DO (%) 10%		DO (%) 10%	42.7 35.0 39.6
		Appearance & Odour (Clear, Silty, HC odours, etc.)		Appearance & Odour (Clear, Silty, HC odours, etc.)	slightly turbid.
		Only for final readings		Sulphide (mg/L)	0.03
				Turbidity (NTU)	3.65
		Interval Purge Volume (L)	1 1.5 0.8	Interval Purge Volume (L)	1 1.5 0.8
		Cumulative Purge Volume (L):	4 5.5 2.3	Cumulative Purge Volume (L):	4 5.5 2.3
YSI iD		Sample Method:	2.0		
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)				X	
Sample Time (24hr)	10:20 on Feb 1, 2017				

Sample Site (Con't): MW 09-02

Sample Date (Con't): 31-Jan-17 → Feb 1, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	550

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- well purged dry → DTW most likely not accurate because J-plug was on tight, therefore well was under pressure & most likely still dropping when DTW was taken.
- will return to sample tomorrow
- on Feb 1, 2017, DTW = 3.665m

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft 1m
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing 0.5 ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site		Project Number	Date		
MWO9-03		1343-005.29	Jan 31 / Feb 1, 2017		
Piezometer Diameter		Client	Samplers		
2"		GY - AAM	MA SH		
UTM Location		Project Name	Weather/Temperature		
Z: E: 389421 N: 6880557			Mount Nansen 2017 GW Sampling Program	Cloudy / -19°C	
Waypoint		Purge Method	Recovery		
GPS: ELR Name: 178			<input checked="" type="checkbox"/> Good <input type="checkbox"/> Bad		
Photos		Cam: ELR Nos: 558-960			
Duplicate Collected		<input type="checkbox"/> Yes Name:	<input type="checkbox"/> Bad		
Field Blank Collected		<input type="checkbox"/> Yes Name:			
Initial Depth to Water (m)		Purge Start Time:	Purge End Time:		
6.680		10:12	10:35		
Depth to Bottom (m)		Pen or YSI:			
9.965		<input checked="" type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from		Purge Interval			
<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Time () min / Vol. () L			
Submerged Tubing Depth (m)		10:20	10:23		
~ 9		10:26	10:29		
Well Stick-up Height (m)		10:32	10:35		
30.7m 6.307cm		7:005	7:020		
Estimated Water Volume (L)		7:028	7:035		
6.6		7:010	6:985		
(DTB - DTW) x (πr ²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations: $\frac{8.1}{9.965} \times 6.680 = 3.285$ $\frac{2}{9.965} \times 6.680 = 1.34$ $3.285 + 1.34 = 4.625$		Temperature (°C) 3%			
		0	0.4	0.4	0.2
		pH (pH Units) ±0.1		8.35	8.40
		8.35	8.40	8.38	8.34
		Cond. (µs/cm) 3%		1256	2408
		1256	2408	1301	1308
		Specific Cond. (µs/cm) 3%		2402	1271
		2402	1271	2455	2485
		Redox (mV) 10%		122.2	125.0
		122.2	125.0	127.2	121.1
DO (mg/L) 10%		3.68	3.55		
3.68	3.55	3.21	3.05		
DO (%) 10%		25.5	24.0		
25.5	24.0	22.4	21.2		
Appearance & Odour (Clear, Silty, HC odours, etc.)		clear	clear		
clear	clear	same	same		
Only for final readings		Sulphide (mg/L)			
		/	/		
		Turbidity (NTU)			
		/	/		
Interval Purge Volume (L)		1	0.4		
1	0.4	0.4	0.4		
Cumulative Purge Volume (L):		1	1.4		
1	1.4	1.8	2.2		
YSI ID		Sample Method:			
MWO9-03					
Logged Field Parameters		Water			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Peristaltic			
Time logged on YSI (24hr)		Disp. Bailer			
10:35		Other			
Sample Time (24hr)					
10:00 on Feb 01					

Sample Site (Con't): MW09-03

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: cap 1605c

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- Monitored on 31-Jan-17; returned to sample on 01-Feb-17.

- pH dropping drastically no need to pump speed; VSI starting to freeze up; due to ~~slow~~ recharge in well + ORP, cond being w/in range GW sample collected was representative

MW094
 ATW 4.594
 DTB 7.715
 CH4 0
 O2 20.9
 CO2 0
 stick-up 0.26m
 Photos

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

2 Feb 01, 2017

Sample Site MWO9-04		Project Number 1343-005.29		Date 31-Jan-17		
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM		
UTM Location Z: 08V E: 399401 N: 6880557		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -19°C		
Waypoint GPS: ELR Name: 128				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad <i>Clay</i>		
Photos Cam: ELR Nos: 558-560		Purge Method				
Duplicate Collected <input type="checkbox"/> Yes Name:		Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected <input type="checkbox"/> Yes Name:			X			
Initial Depth to Water (m) 4.594		Purge Start Time: 09:42	Purge End Time: 09:56	Pen or YSI:	<input checked="" type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth to Bottom (m) 7.715		Purge Interval Time (min / Vol.) L	09:44	09:47	09:50	
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		09:53	09:56			
Submerged Tubing Depth (m) ~7		Depth to water (m)	4.970	5.050	5.140	
Well Stick-up Height (m) 0.26		Temperature (°C) 3%	2.2	2.3	1.9	
Estimated Water Volume (L) 6.2		pH (pH Units) ±0.1	7.35	7.91	8.10	
<p>Calculations:</p> $\frac{7.715 \times 4.594 \times 3.1416}{3.1416} \times 0.6243 = 6.243$		Cond. (µs/cm) 3%	1395	1363	1349	
		Specific Cond. (µs/cm) 3%	2512	2402	2412	
		Redox (mV) 10%	130.1	130.6	130.2	
		DO (mg/L) 10%	5.32	1.33	1.07	
		DO (%) 10%	36.6	9.7	7.8	
		Appearance & Odour (Clear, Silty, HC odours, etc.)	Slightly Silty	same	same	
		Only for final readings	Sulphide (mg/L)	/	/	/
			Turbidity (NTU)	/	/	/
			Interval Purge Volume (L)	0.4	0.4	0.4
			Cumulative Purge Volume (L):	0.6	1.0	1.4
YSI ID MWO9-01		Sample Method:				
Logged Field Parameters <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr) 9:54			X			
Sample Time (24hr) 09:40 on 01-Feb-17						

Sample Site (Con't): KW09-04

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: cap loose

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	100	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- Monitored on 31-Jan-17; returned to sample on 01-Feb-17
 - Well drawing down, unable to purge sludges; parameters appear stable → temp is not reliable parameters due to extreme cold.

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft 8m
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing 0.5 ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MW09-05		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 68 E: 0389411 N: 6880653		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -20°C			
Waypoint GPS: ELR Name: N/A		Purge Method		Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos:		Waterra		Peristaltic			
Duplicate Collected <input type="checkbox"/> Yes Name:		Disp. Bailer		Other			
Field Blank Collected <input type="checkbox"/> Yes Name:							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 8.875				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) /		Depth to water (m)					
Well Stick-up Height (m) 1.320		Temperature (°C) 3%					
Estimated Water Volume (L) /		pH (pH Units) ±0.1					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra		Peristaltic			
Time logged on YSI (24hr)		Disp. Bailer		Other			
Sample Time (24hr)							

Sample Site (Con't): UG09-05

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	18.4
Carbon Dioxide (CO2)	PPM	3000

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml				
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

sampled
Feb 1, 2017

Sample Site: MRC9-06		Project Number: 1343-005.29		Date: 31-Jan-17			
Piezometer Diameter: 2"		Client: GY - AAM		Samplers: JH/MM			
UTM Location: Z:08, E: 0289411 N: 6080652		Project Name: Mount Nansen 2017 GW Sampling Program		Weather/Temperature: -20°C			
Waypoint: GPS: ELR Name: N/A		Purge Method:		Recovery: <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos: Cam: 2 Nos:		Watterra		Peristaltic			
Duplicate Collected: <input type="checkbox"/> Yes Name:		Disp. Bailer		Other			
Field Blank Collected: <input type="checkbox"/> Yes Name:				X			
Initial Depth to Water (m): 4.750		Purge Start Time: 14:26		Purge End Time: 14:37			
Depth to Bottom (m): 6.073		Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit					
Depth recorded from: <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m): /		14:26 14:30 14:34 14:36					
Well Stick-up Height (m): 2.35		Depth to water (m)					
Estimated Water Volume (L): 2.6		Temperature (°C) 3%		1.7 2.0 2.0 1.9			
<p>Calculations:</p> $\frac{5.673 - 4.750}{1.323} \times 2$		pH (pH Units) ±0.1		6.12 6.67 6.74 6.89			
		Cond. (µs/cm) 3%		848 851 864 878			
		Specific Cond. (µs/cm) 3%		1536 1514 1541 1571			
		Redox (mV) 10%		252 230 250.4 230.9			
		DO (mg/L) 10%		2.66 3.67 3.97 2.87			
		DO (%) 10%		26.2 25.0 22.9 20.7			
		Appearance & Odour (Clear, Silty, HC odours, etc.)		/ / / /			
		Only for final readings		Sulphide (mg/L)		/ / / / 0	
				Turbidity (NTU)		/ / / / 1.42	
				Interval Purge Volume (L)		1 1 0.5 0.5	
		Cumulative Purge Volume (L):		/ 2 2.5 3			
YSI ID		Sample Method:					
Logged Field Parameters: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Watterra		Peristaltic			
Time logged on YSI (24hr)		Disp. Bailer		Other			
Sample Time (24hr): 09:20 on Feb 1, 2017							

Sample Site (Con't): MW9-06

Sample Date (Con't): 31-Jan-17 → 01-Feb-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	18.3
Carbon Dioxide (CO2)	PPM	5000

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	110	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	250	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- Rugged auger suspended sediment thick & ~~not~~ visible; will return to sample.
- Sample clear with trace fine black sediment

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer 1
- Other (describe) twine

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MW09-07		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 08V E: 0389320 N: 68 80201		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -20°C			
Waypoint GPS: ELR Name: N/A				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 548-550		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: _____		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: _____							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 3.428				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) /		Depth to water (m)					
Well Stick-up Height (m) 1.24		Temperature (°C) 3%					
Estimated Water Volume (L) /		pH (pH Units) ±0.1					
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)							
Sample Time (24hr)							

Sample Site (Con't): MW09-07

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	860

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-			

<p>General Notes and Observations:</p> 	<p>Consumables Used:</p> <p><input type="checkbox"/> 1/4" HDPE (peristaltic pump tubing) _____ ft</p> <p><input type="checkbox"/> 3/8" HDPE (microwaterra tubing) _____ ft</p> <p><input type="checkbox"/> 5/8" HDPE (waterra tubing) _____ ft</p> <p><input type="checkbox"/> 1/4" Silicon tubing _____ ft</p> <p><input type="checkbox"/> High Capacity .45 micron filters _____</p> <p><input type="checkbox"/> D-25 (for 2" wells, use with 5/8") foot valves _____</p> <p><input type="checkbox"/> D-16 (for 1" wells, use with 5/8") foot valves _____</p> <p><input type="checkbox"/> SS-10 (for 5/8" wells, use with 3/8") foot valves _____</p> <p><input type="checkbox"/> 1" bailer _____</p> <p><input type="checkbox"/> 2" bailer _____</p> <p><input type="checkbox"/> other (describe) _____</p>
---	--

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-08	Project Number	1343-005.29	Date	Jan 31, 2017	
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC+JC	
UTM Location	Z: 08 E: 0389620 N: 6880576	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds	
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: ELRI Nos: 124-126	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X	
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X	
Depth to Bottom (m)	1.206	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit		
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	N/A	Depth to water (m)				
Well Stick-up Height (m)	1.052	Temperature (°C) 3%				
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%					
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings	Sulphide (mg/L)				
		Turbidity (NTU)				
		Interval Purge Volume (L)				
		Cumulative Purge Volume (L):				
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)		X	X	X	X	
Sample Time (24hr)		X	X	X	X	

Sample Site (Con't): MW09-08

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.0
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MR MW09-11		Project Number 1343-005.29		Date 31-Jan-17			
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 08V E: 0389037 N: 6880711		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature ~ -20°C			
Waypoint GPS: ELR Name: N/A				Recovery <input type="checkbox"/> Good <input checked="" type="checkbox"/> Bad			
Photos Cam: 2 Nos: 541-543		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: _____		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: _____							
Initial Depth to Water (m) DRY		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 4.940				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) _____		Depth to water (m)					
Well Stick-up Height (m) 0.82		Temperature (°C) 3%					
Estimated Water Volume (L) _____		pH (pH Units) ±0.1					
<p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations: _____</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)							
Sample Time (24hr)							

Sample Site (Con't): MW09-11

Sample Date (Con't): 31-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	550

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MW09-13		Project Number 1343-005.29		Date 30-Jan-17			
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM			
UTM Location Z:08 E:0389007 N:6081664		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature ~ -16c			
Waypoint GPS: ELR Name: NIA				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 500-501		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: /		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: /							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 28.135				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m) /		Depth to water (m)					
Well Stick-up Height (m) 0.80		Temperature (°C) 3%					
Estimated Water Volume (L) /		pH (pH Units) ±0.1					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)							
Sample Time (24hr)							

Sample Site (Con't): MN09-13

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: slits on side

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	610

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Returned to sample gases on 31-Jan-17 @ 10.00 due to battery issues on first day

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves _____
- D-16 (for 1" wells, use with 5/8" foot valves _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site		MW09-14	Project Number		1343-005.29	Date		30-Jan-16			
Piezometer Diameter		2"	Client		GY - AAM	Samplers		JH/MM			
UTM Location		Z:08, E:030, N:6881665	Project Name		Mount Nansen 2017 GW Sampling Program	Weather/Temperature		~16°C			
Waypoint		GPS: ELR Name: NIA	Recovery				<input type="checkbox"/> Good <input type="checkbox"/> Bad				
Photos		Cam: 2. Nos: 520-521	Purge Method								
Duplicate Collected		<input type="checkbox"/> Yes Name:	Waterra		Peristaltic		Disp. Bailer		Other		
Field Blank Collected		<input type="checkbox"/> Yes Name:									
Initial Depth to Water (m)		FROZEN	Purge Start Time:		Purge End Time:		Pen or YSI:		<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit		
Depth to Bottom (m)		5.514	Purge Interval								
Depth recorded from		<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Time () min / Vol. () L								
Submerged Tubing Depth (m)		/	Depth to water (m)								
Well Stick-up Height (m)		0.73	Temperature (°C) 3%								
Estimated Water Volume (L)		/	pH (pH Units) ±0.1								
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%		<div style="font-size: 2em; opacity: 0.5;">FROZEN</div>							
		Specific Cond. (µs/cm) 3%									
		Redox (mV) 10%									
		DO (mg/L) 10%									
		DO (%) 10%									
		Appearance & Odour (Clear, Silty, HC odours, etc.)									
		Only for final readings	Sulphide (mg/L)								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									
YSI ID		Sample Method:									
Logged Field Parameters		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Waterra		Peristaltic		Disp. Bailer		Other	
Time logged on YSI (24hr)											
Sample Time (24hr)											

Sample Site (Con't): MWO9 # 14

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: Slits on side of PVC

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	6
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	550

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field-Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Returned to sample gases on 31-Jan-17 @ 10:00 due to tubing issues w PID

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MWB9-15	Project Number	1343-005.29	Date	30-Jan-17	
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JH/MM	
UTM Location	Z:081 E:0388920 N:6881700	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	~-16°C	
Waypoint	GPS: ELR Name: N/A.			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos	Cam: 2 Nos: 500-524	Purge Method				
Duplicate Collected	<input type="checkbox"/> Yes Name: /	Waterra	Peristaltic	Disp. Bailer	Other	
Field Blank Collected	<input type="checkbox"/> Yes Name: /					
Initial Depth to Water (m)	FROZEN	Purge Start Time:		Purge End Time:		
Depth to Bottom (m)	14.050			Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth recorded from	<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L				
Submerged Tubing Depth (m)	/	Depth to water (m)				
Well Stick-up Height (m)	1.90	Temperature (°C) 3%				
Estimated Water Volume (L)	/	pH (pH Units) ±0.1				
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations: /</p>	Cond. (µs/cm) 3%	FROZEN				
	Specific Cond. (µs/cm) 3%					
	Redox (mV) 10%					
	DO (mg/L) 10%					
	DO (%) 10%					
	Appearance & Odour (Clear, Silty, HC odours, etc.)					
	Only for final readings					Sulphide (mg/L)
						Turbidity (NTU)
	Interval Purge Volume (L)					
	Cumulative Purge Volume (L):					
YSI ID		Sample Method:				
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other	
Time logged on YSI (24hr)	/					
Sample Time (24hr)	/					

Sample Site (Con't): MN09-15

Sample Date (Con't): 30-Jan-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	700

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Frozen, ~~parts~~ ~~at~~ slushion to of the ice + on the water level tip.

- Returned to sample headspace gas on 31-Jan-17 @ 09:56 due to ^{dirty} issues w PID on first visit.

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site MW09-16		Project Number 1343-005.29		Date 30-Jan-17			
Piezometer Diameter 2"		Client GY - AAM		Samplers JH/MM			
UTM Location Z: 08 E: 0387991 N: 6881099		Project Name Mount Nansen 2017 GW Sampling Program		Weather/Temperature -20°C			
Waypoint GPS: ELR Name: 51-513 N/A				Recovery <input type="checkbox"/> Good <input type="checkbox"/> Bad			
Photos Cam: 2 Nos: 511-513		Purge Method					
Duplicate Collected <input type="checkbox"/> Yes Name: _____		Waterra	Peristaltic	Disp. Bailer	Other		
Field Blank Collected <input type="checkbox"/> Yes Name: _____							
Initial Depth to Water (m) FROZEN		Purge Start Time:		Purge End Time:			
Depth to Bottom (m) 2.040				Pen or YSI: <input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit			
Depth recorded from <input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		Purge Interval Time () min / Vol. () L					
Submerged Tubing Depth (m)		Depth to water (m)					
Well Stick-up Height (m) 1.378		Temperature (°C) 3%					
Estimated Water Volume (L)		pH (pH Units) ±0.1					
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Cond. (µs/cm) 3%					
		Specific Cond. (µs/cm) 3%					
		Redox (mV) 10%					
		DO (mg/L) 10%					
		DO (%) 10%					
		Appearance & Odour (Clear, Silty, HC odours, etc.)					
		Only for final readings		Sulphide (mg/L)			
				Turbidity (NTU)			
				Interval Purge Volume (L)			
				Cumulative Purge Volume (L):			
YSI ID		Sample Method:					
Logged Field Parameters <input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra	Peristaltic	Disp. Bailer	Other		
Time logged on YSI (24hr)							
Sample Time (24hr)							

Sample Site (Con't): NW09-16

Sample Date (Con't): 3-2-2009-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: slit on side

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.5
Carbon Dioxide (CO2)	PPM	650

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field-Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH ₃)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves _____
- D-16 (for 1" wells, use with 5/8" foot valves _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-17	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389076 N: 6890970	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sun / clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELRI Nos: 075-077	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:		Purge End Time:	
Depth to Bottom (m)	5.704	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit		
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.93	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
(DTB - DTW) x (πr ²)1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations:	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)					
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): Not Sampled

Sample Date (Con't):

Well Head Seal: J-Plug PVC Cap Not Sealed Other

Seal Replaced: J-Plug PVC Cap Not required Other

Well properly sealed for gas monitoring: Yes No Details:

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	 	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- well frozen, not sampled

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-18	Project Number	1343-005.29	Date	Jan 30, 2017					
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JC + JC					
UTM Location	Z: 08 E: 0388052 N: 6890985	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sunny					
Waypoint	GPS: HEM Name: NA			Recovery	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Bad					
Photos	Cam: ELRI Nos: 072-074	Purge Method								
Duplicate Collected	<input checked="" type="checkbox"/> Yes Name: Dup-1	Waterra	Peristaltic	Disp. Bailer	Other					
Field Blank Collected	<input type="checkbox"/> Yes Name:			X						
Initial Depth to Water (m)	5.102	Purge Start Time:	13:57	Purge End Time:	14:17					
Depth to Bottom (m)	7.769			Pen or YSI:	<input checked="" type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit					
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. (2) L	13:59	14:02	14:05	14:07	14:09	14:11	14:14	14:17
Submerged Tubing Depth (m)	~7	Depth to water (m)	5.120 1.20	5.120	5.120	5.120	5.120	5.120	5.120	5.120
Well Stick-up Height (m)	0.858	Temperature (°C) 3%	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
Estimated Water Volume (L)	~5.4 L	pH (pH Units) ±0.1	7.12	7.04	6.91	6.92	6.93	6.92	6.90	6.93
(DTB - DTW) x (πr ²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations: $\frac{5.102}{7.769} \times 2.7 \times 2 \frac{L}{m} = \sim 6L$	Cond. (µs/cm) 3%	1163	1184	1409	1420	1412	1420	1254	1383	
	Specific Cond. (µs/cm) 3%	2290	2326	2767	2789	2772	2789	2462	2714	
	Redox (mV) 10%	-37.9	1.7	24.0	33.9	42.1	48.0	44.9	49.0	
	DO (mg/L) 10%	3.22	4.26	1.34	1.64	1.83	1.85	1.40	2.76	
	DO (%) 10%	21.4	28.7	8.9	11.2	12.4	12.3	9.4	18.1	
	Appearance & Odour (Clear, Silty, HC odours, etc.)	clear colourless	" "	" "	" "	" "	" "	" "	brown turbid	clear, slightly yellow-brown
	Only for final readings Sulphide (mg/L)									0.13
	Turbidity (NTU)									49.4
	Interval Purge Volume (L)	2	2	2	2	2	2	2	2	
	Cumulative Purge Volume (L):									
YSI ID	Pine 023735	Sample Method:								
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other					
Time logged on YSI (24hr)	—			X						
Sample Time (24hr)	14:18									



Sample Site (Con't): MW09-18

Sample Date (Con't): Jan 30, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.2
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer 1
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-19	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0388051 N: 6881014	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C sunny
Waypoint	GPS: Hem Name: N/A			Recovery	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Bad (not great)
Photos	Cam: ELR 1 Nos: 069-071	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input checked="" type="checkbox"/> Yes Name: FB-1		X	X	
Initial Depth to Water (m)	3.029	Purge Start Time:	12:49	Purge End Time:	13:32
Depth to Bottom (m)	5.887	Purge Interval Time (3) min / Vol. (2) L	12:54	13:23	13:25
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point		12:59	13:29	13:32
Submerged Tubing Depth (m)	~5	Temperature (°C) 3%	-0.3	-0.5	-0.5
Well Stick-up Height (m)	0.888	pH (pH Units) ±0.1	6.77	6.86	6.80
Estimated Water Volume (L)	~5.7 L	Cond. (µs/cm) 3%	1149	1094	1049
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations: $\frac{5.887}{3.029} \times 2.85 \times 2.5 = \sim 6L$</p>	Specific Cond. (µs/cm) 3%	2236	1961	2046	2121
	Redox (mV) 10%	-83.6	-60.1	-57.9	-61.5
	DO (mg/L) 10%	2.46	1.55	2.21	1.77
	DO (%) 10%	15.5	11.3	15.3	11.9
	Appearance & Odour (Clear, Silty, HC odours, etc.)	clear, yellowish	" "	" "	" "
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			0.17
	Interval Purge Volume (L)	0.5	2	2	7
	Cumulative Purge Volume (L):	0.5	2.5	4.5	6.5
	YSI ID	PINE 023735	Sample Method:		
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	-			X	
Sample Time (24hr)	13:36				

Sample Site (Con't): MW69-19

Sample Date (Con't): Jan 30, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.3
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- DI used for FBI was from ALS batch 20 Jan 2017
- Began purging with peristaltic pump, water froze in tubing and in YSI
↳ replaced tubing, thawed YSI, tried again. Got 1 reading, tubing froze
- Began purging w bailer
- well nearly totally below snow
- sulfur odour

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) 23 ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing 1 ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer 1
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-20	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	1"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389592 N: 6880586	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 121-123	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	3.67	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.935	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:			
Logged Field Parameters	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)					
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): MW 09-20

Sample Date (Con't): NOT SAMPLED

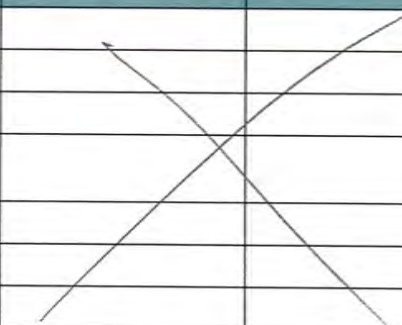
Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-21	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter		Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389536 N: 6880577	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 130-132	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name:	_____	_____	_____	_____
Initial Depth to Water (m)	FROZEN	Purge Start Time:	_____	Purge End Time:	_____
Depth to Bottom (m)	1.338	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.405	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Estimated Water Volume (L)	Cond. (µs/cm) 3%			
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	_____	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	_____	_____	_____	_____	_____
Sample Time (24hr)	_____	_____	_____	_____	_____

Sample Site (Con't): MW09-21

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: * aircraft cable going down well, cap on, slightly angled

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.1
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-22	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389497 N: 6880553	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Bad
Photos	Cam: ELR1 Nos: 133-135	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X			X	
Initial Depth to Water (m)	4.719	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	5.275	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus	<input checked="" type="checkbox"/> Pen Unit	
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time (___) min / Vol. (___) L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.777	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p>	Cond. (µs/cm) 3%				DIRECT SAMPLE MIN
	Specific Cond. (µs/cm) 3%				VOLUMES
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	<u>Only for final readings</u> Sulphide (mg/L)				
	Turbidity (NTU)				
	Interval Purge Volume (L)				
	Cumulative Purge Volume (L):				
YSI ID	N/A	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	—			X	
Sample Time (24hr)	16:02				

* + Feb 1, 2017 (Gen Chem)

Sample Site (Con't): MW 09-22

Sample Date (Con't): Jan 31, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.1
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	100 mL	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)	20 mL	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	130 mL	resampled Feb 1 2017 @09:03
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)	100 mL	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)	60 mL	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)	50 mL	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50 mL	

General Notes and Observations:

- snow depth ~ 0.312
- Gen Chem bottle very turbid, returned Feb 1, 2017 to re-collect. 09:03
- Not enough water for sulfides or turbidity

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer 1
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-23	Project Number	1343-005.29	Date	Jan 31, 2017
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC+JC
UTM Location	Z: 08 E: 0389458 N: 6880555	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-16, sun / clouds
Waypoint	GPS: HEM Name: N/A			Recovery	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR1 Nos:	Purge Method			
Duplicate Collected	<input checked="" type="checkbox"/> Yes Name: DUP-2	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X			
Initial Depth to Water (m)	12.688	Purge Start Time:	17:00	Purge End Time:	17:22
Depth to Bottom (m)	15.895			Pen or YSI:	<input checked="" type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. (5) L	17:04	17:11	17:15
Submerged Tubing Depth (m)	~ 15.395	Depth to water (m)	12.725	12.830	12.750
Well Stick-up Height (m)	0.17	Temperature (°C) 3%	-6.7	-0.6	-0.6
Estimated Water Volume (L)	6.5 L	pH (pH Units) ±0.1	7.28	7.12	7.19
(DTB - DTW) x (πr ²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations: 15.895 12.688 ~ 3.2 * 2 $\frac{L}{m}$ = 6.5 L * 3 = 19.5	Cond. (µs/cm) 3%	516	611	655	655
	Specific Cond. (µs/cm) 3%	1012	1196	1284	1283
	Redox (mV) 10%	-107.6	-98.6	-77.6	-78.3
	DO (mg/L) 10%	7.33	2.24	0.96	2.09
	DO (%) 10%	49.5	15.1	6.1	13.9
	Appearance & Odour (Clear, Silty, HC odours, etc.)	clear yellowish	" "	" "	" "
	<u>Only for final readings</u> Sulphide (mg/L)				0.26
	Turbidity (NTU)				17.7
	Interval Purge Volume (L)	5	5	5	5
	Cumulative Purge Volume (L):	5	10	15	20
YSI ID	PINE 023735	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	N/A	X			
Sample Time (24hr)	17:30				

Sample Site (Con't): MW09-23

Sample Date (Con't): Jan 31, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.8
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-24	Project Number	1343-005.29	Date	Jan 31, 2017						
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC + JC						
UTM Location	Z: 08 E: 0389132 N: 6880730	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-13°C sun/clouds						
Waypoint	GPS: HEM Name:	Purge Method									
Photos	Cam: ELR1 Nos: 115-117	Water	Peristaltic	Disp. Bailer	Other						
Duplicate Collected	<input type="checkbox"/> Yes Name: X										
Field Blank Collected	<input type="checkbox"/> Yes Name: X										
Initial Depth to Water (m)	9.273	Purge Start Time:	14:00	Purge End Time:	14:19						
Depth to Bottom (m)	11.957										
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. (4) L	14:04	14:07	14:10	14:13	14:16	14:19			
Submerged Tubing Depth (m)	~ 11.457	Depth to water (m)	9.273	9.277	9.277	9.277	9.277	9.277			
Well Stick-up Height (m)	0.663	Temperature (°C) 3%	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6			
Estimated Water Volume (L)	~5.4L	pH (pH Units) ±0.1	8.75	9.08	9.07	9.07	9.07	9.01			
(DTB - DTW) x (πr ²) 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume Calculations: 11.957 9.273 ~ 2.7 x 2 $\frac{L}{m}$ = 5.4L x 3 = ~16L	Cond. (µs/cm) 3%	286.0	311.9	302.4	269.2	253.6	296.1				
	Specific Cond. (µs/cm) 3%	562.5	610.0	592.2	526.8	496.0	579.7				
	Redox (mV) 10%	76.6	86.0	88.1	86.4	83.7	85.1				
	DO (mg/L) 10%	7.69	4.92	9.92	9.34	10.86	9.75				
	DO (%) 10%	48.2	33.1	62.1	62.6	72.8	65.2				
	Appearance & Odour (Clear, Silty, HC odours, etc.)	slightly turbid	"	"	"	"	"	"			
	Only for final readings Sulphide (mg/L)							0.15			
	Only for final readings Turbidity (NTU)							106.7			
	Interval Purge Volume (L)	4	4	4	4	4	4				
	Cumulative Purge Volume (L):	4	8	12	16	20	24				
YSI ID	PINE 023735	Sample Method:									
Logged Field Parameters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water	Peristaltic	Disp. Bailer	Other						
Time logged on YSI (24hr)	N/A										
Sample Time (24hr)	14:25										

Sample Site (Con't): MW09-24

Sample Date (Con't): Jan 31, 2017

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.2
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input checked="" type="checkbox"/> Field Filtered	<input checked="" type="checkbox"/> HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input checked="" type="checkbox"/> NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input checked="" type="checkbox"/> H ₂ SO ₄ (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input checked="" type="checkbox"/> HNO ₃ (Nitric)	120	
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- some sand in bottom of bottles

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W14103083BH01	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 038452 N: 6880671	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C clear
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELR I Nos: 81-83	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	6.447	Pen or YSI:		<input type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.575	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)	X	X	X	X	X

Sample Site (Con't): W14103083B401

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: wires in well

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.0
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		_____
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

wires and instruments down well

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W14103083 BHO2	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC + JC
UTM Location	Z: 08 E: 0389 560 N: 6880665	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C clear
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input checked="" type="checkbox"/> Bad
Photos	Cam: ELR 1 Nos: 87-89	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name:	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	6.743	Pen or YSI:	<input checked="" type="checkbox"/> YSI Pro Plus	<input type="checkbox"/> Pen Unit	
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.778	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
<p>(DTB - DTW) x (πr²) 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB - DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB - DTW) x 0.5 (for 1" diameter) = 1 well volume</p> <p>Calculations:</p>	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID		Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)		X	X	X	X

Sample Site (Con't): W14103083BH02

 Sample Date (Con't): NOT SAMPLED

 Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

 Seal Replaced: J-Plug PVC Cap Not required Other _____

 Well properly sealed for gas monitoring: Yes No Details: wires in well
Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	21.9
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:
wires and instruments down well
Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8") foot valves _____
- D-16 (for 1" wells, use with 5/8") foot valves _____
- SS-10 (for 5/8" wells, use with 3/8") foot valves _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site		W141030838703		Project Number		1343-005.29		Date		31-Jan-17	
Piezometer Diameter		2"		Client		GY - AAM		Samplers		JH/MM.	
UTM Location		Z: 08, E: 389182 N: 6880330		Project Name		Mount Nansen 2017 GW Sampling Program		Weather/Temperature		-19°C	
Waypoint		GPS: ELR Name: NIA		Purge Method				Recovery		<input type="checkbox"/> Good <input type="checkbox"/> Bad	
Photos		Cam: 2 Nos: 336-338		Waterra		Peristaltic		Disp. Bailer		Other	
Duplicate Collected		<input type="checkbox"/> Yes Name: /		Field Blank Collected		<input type="checkbox"/> Yes Name: /					
Initial Depth to Water (m)		FROZEN		Purge Start Time:		Purge End Time:		Pen or YSI:		<input type="checkbox"/> YSI Pro Plus <input type="checkbox"/> Pen Unit	
Depth to Bottom (m)		1.498		Purge Interval							
Depth recorded from		<input type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input checked="" type="checkbox"/> Highest Point		Time () min / Vol. () L							
Submerged Tubing Depth (m)		/		Depth to water (m)							
Well Stick-up Height (m)		0.73		Temperature (°C) 3%							
Estimated Water Volume (L)		/		pH (pH Units) ±0.1							
<p>Calculations:</p> <p>(DTB - DTW) x (πr²) * 1000 (for well diameter) = 1 well volume (DTB - DTW) x 8.1 (for 4" well diameter) = 1 well volume (DTB - DTW) x 2 (for 2" well diameter) = 1 well volume (DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume (DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume</p>		Specific Cond. (µs/cm) 3%		<div style="font-size: 2em; font-weight: bold; opacity: 0.5;">FROZEN</div>							
		Redox (mV) 10%									
		DO (mg/L) 10%									
		DO (%) 10%									
		Appearance & Odour (Clear, Silty, HC odours, etc.)									
		Only for final readings				Sulphide (mg/L)					
						Turbidity (NTU)					
						Interval Purge Volume (L)					
						Cumulative Purge Volume (L):					
		YSI ID				/		Sample Method:			
Logged Field Parameters		<input type="checkbox"/> Yes <input type="checkbox"/> No		Waterra		Peristaltic		Disp. Bailer		Other	
Time logged on YSI (24hr)		/									
Sample Time (24hr)		/									

Sample Site (Con't): W1410383 B403

Sample Date (Con't): 31-JAN-17

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: _____

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (CO2)	PPM	530

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

- 1/4" HDPE (peristaltic pump tubing) _____ ft
- 3/8" HDPE (microwaterra tubing) _____ ft
- 5/8" HDPE (waterra tubing) _____ ft
- 1/4" Silicon tubing _____ ft
- High Capacity .45 micron filters _____
- D-25 (for 2" wells, use with 5/8" foot valves) _____
- D-16 (for 1" wells, use with 5/8" foot valves) _____
- SS-10 (for 5/8" wells, use with 3/8" foot valves) _____
- 1" bailer _____
- 2" bailer _____
- other (describe) _____

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W14103083BH04	Project Number	1343-005.29	Date	Jan 30, 2017
Piezometer Diameter	2"	Client	GY - AAM	Samplers	JC+JC
UTM Location	Z: 08 E: 0389544 N: 6880672	Project Name	Mount Nansen 2017 GW Sampling Program	Weather/Temperature	-15°C clear
Waypoint	GPS: HEM Name: N/A			Recovery	<input type="checkbox"/> Good <input type="checkbox"/> Bad
Photos	Cam: ELRI Nos: 84-86	Purge Method			
Duplicate Collected	<input type="checkbox"/> Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	<input type="checkbox"/> Yes Name: X	X	X	X	X
Initial Depth to Water (m)	FROZEN	Purge Start Time:	X	Purge End Time:	X
Depth to Bottom (m)	6.662	Pen or YSI:	<input type="checkbox"/> YSI Pro Plus <input checked="" type="checkbox"/> Pen Unit		
Depth recorded from	<input checked="" type="checkbox"/> Black Marking <input type="checkbox"/> Bottom of Notch <input type="checkbox"/> Highest Point	Purge Interval Time () min / Vol. () L			
Submerged Tubing Depth (m)	N/A	Depth to water (m)			
Well Stick-up Height (m)	0.740	Temperature (°C) 3%			
Estimated Water Volume (L)	N/A	pH (pH Units) ±0.1			
Calculations: $(DTB - DTW) \times (\pi r^2) \times 1000$ (for well diameter) = 1 well volume $(DTB - DTW) \times 8.1$ (for 4" well diameter) = 1 well volume $(DTB - DTW) \times 2$ (for 2" well diameter) = 1 well volume $(DTB - DTW) \times 1.1$ (for 1.5" diameter) = 1 well volume $(DTB - DTW) \times 0.5$ (for 1" diameter) = 1 well volume	Cond. (µs/cm) 3%				
	Specific Cond. (µs/cm) 3%				
	Redox (mV) 10%				
	DO (mg/L) 10%				
	DO (%) 10%				
	Appearance & Odour (Clear, Silty, HC odours, etc.)				
	Only for final readings	Sulphide (mg/L)			
		Turbidity (NTU)			
		Interval Purge Volume (L)			
		Cumulative Purge Volume (L):			
YSI ID	X	Sample Method:			
Logged Field Parameters	<input type="checkbox"/> Yes <input type="checkbox"/> No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)	X	X	X	X	X

Sample Site (Con't): W14103083BH04

Sample Date (Con't): NOT SAMPLED

Well Head Seal: J-Plug PVC Cap Not Sealed Other _____

Seal Replaced: J-Plug PVC Cap Not required Other _____

Well properly sealed for gas monitoring: Yes No Details: wires in well

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	22.0
Carbon Dioxide (CO2)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment <input checked="" type="checkbox"/>	Preservative Added <input checked="" type="checkbox"/>	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HNO ₃ (Nitric)	X	
1b	40 ml (glass)	Dissolved Mercury	15 mL	<input type="checkbox"/> Field Filtered	<input type="checkbox"/> HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	<input type="checkbox"/> NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	<input type="checkbox"/> H ₂ SO ₄ (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	<input type="checkbox"/> HNO ₃ (Nitric)		
6	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:	Consumables Used:
<p><i>- wires and instruments down well</i></p>	<p><input type="checkbox"/> 1/4" HDPE (peristaltic pump tubing) _____ ft</p> <p><input type="checkbox"/> 3/8" HDPE (microwaterra tubing) _____ ft</p> <p><input type="checkbox"/> 5/8" HDPE (waterra tubing) _____ ft</p> <p><input type="checkbox"/> 1/4" Silicon tubing _____ ft</p> <p><input type="checkbox"/> High Capacity .45 micron filters _____</p> <p><input type="checkbox"/> D-25 (for 2" wells, use with 5/8") foot valves _____</p> <p><input type="checkbox"/> D-16 (for 1" wells, use with 5/8") foot valves _____</p> <p><input type="checkbox"/> SS-10 (for 5/8" wells, use with 3/8") foot valves _____</p> <p><input type="checkbox"/> 1" bailer _____</p> <p><input type="checkbox"/> 2" bailer _____</p> <p><input type="checkbox"/> other (describe) _____</p>

APPENDIX C
Laboratory Reports



HEMMERA ENVIROCHEM INC.
ATTN: Natasha Sandys
230 - 2237 2nd Avenue
Whitehorse YK Y1A 0K7

Date Received: 01-FEB-17
Report Date: 01-MAR-17 14:42 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1886064
Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.29
C of C Numbers:
Legal Site Desc:

Comments:

1-MAR-2017 This report replaces the previous version and contains an updated Sampling Date for one sample.

Brent Mack, B.Sc.
Account Manager

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

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1886064-1 Water 30-JAN-17 15:40 CH-P-13-03/50	L1886064-2 Water 30-JAN-17 13:36 MW09-19	L1886064-3 Water 30-JAN-17 14:18 MW09-18	L1886064-4 Water 30-JAN-17 12:40 GSI-DC-02B	L1886064-5 Water 30-JAN-17 14:18 DUP-1	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)		2080	2830	982	2850
	Hardness (as CaCO3) (mg/L)	1660	1380	2190	564	2150
	pH (pH)		7.26	7.60	7.61	7.59
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		467	498	266	506
	Ammonia, Total (as N) (mg/L)		4.37	0.0155	0.636	0.0152
	Bromide (Br) (mg/L)		<0.50 ^{DLDS}	<1.0 ^{DLDS}	<0.25 ^{DLDS}	<1.0 ^{DLDS}
	Chloride (Cl) (mg/L)		<5.0 ^{DLDS}	<10 ^{DLDS}	<2.5 ^{DLDS}	<10 ^{DLDS}
	Fluoride (F) (mg/L)		<0.20 ^{DLDS}	<0.40 ^{DLDS}	<0.10 ^{DLDS}	<0.40 ^{DLDS}
	Nitrate (as N) (mg/L)		0.087	<0.10 ^{DLDS}	0.135	<0.10 ^{DLDS}
	Nitrite (as N) (mg/L)		<0.010 ^{DLDS}	<0.020 ^{DLDS}	<0.0050 ^{DLDS}	<0.020 ^{DLDS}
	Total Kjeldahl Nitrogen (mg/L)		6.26	0.139	1.28	0.133
	Sulfate (SO4) (mg/L)		918	1620	320	1590
	Anion Sum (meq/L)		28.5	43.6	12.0	43.2
	Cation Sum (meq/L)		30.0	44.6	12.7	43.8
	Cation - Anion Balance (%)		2.6	1.2	2.9	0.7
Cyanides	Cyanide, Weak Acid Diss (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
	Thiocyanate (SCN) (mg/L)		0.93	0.67	<0.50	<0.50
	Cyanide, Free (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)		114	121	62.5	116
	Total Organic Carbon (mg/L)		30.8	3.76	13.1	4.76
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0047	0.0119	<0.0020 ^{DLA}	0.0054	<0.0020 ^{DLA}
	Antimony (Sb)-Dissolved (mg/L)	0.00045	0.00039	0.00051	0.00025	0.00048
	Arsenic (As)-Dissolved (mg/L)	0.00044	0.154	0.0543	0.0333	0.0541
	Barium (Ba)-Dissolved (mg/L)	0.0338	0.0527	0.0107	0.168	0.0109
	Beryllium (Be)-Dissolved (mg/L)	<0.000040 ^{DLA}	<0.000020	<0.000040 ^{DLA}	<0.000020	<0.000040 ^{DLA}
	Bismuth (Bi)-Dissolved (mg/L)	<0.00010 ^{DLA}	<0.000050	<0.00010 ^{DLA}	<0.000050	<0.00010 ^{DLA}
	Boron (B)-Dissolved (mg/L)	0.026	0.156	<0.020 ^{DLA}	<0.010	<0.020 ^{DLA}
	Cadmium (Cd)-Dissolved (mg/L)	0.000371	<0.0000050	0.000042	0.0000123	0.000065
	Calcium (Ca)-Dissolved (mg/L)	431	306	397	147	389
	Chromium (Cr)-Dissolved (mg/L)	<0.00020 ^{DLA}	0.00033	<0.00020 ^{DLA}	<0.00010	<0.00020 ^{DLA}
	Cobalt (Co)-Dissolved (mg/L)	0.00033	0.00229	0.00025	0.00227	0.00024
	Copper (Cu)-Dissolved (mg/L)	0.00265	<0.00020	0.00056	0.00036	0.00054
	Iron (Fe)-Dissolved (mg/L)	<0.020 ^{DLA}	20.1	<0.020 ^{DLA}	17.6	<0.020 ^{DLA}

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1886064-6 Water 30-JAN-17 13:36 FB-1	L1886064-7 Water 30-JAN-17 14:25 MW09-24	L1886064-8 Water 30-JAN-17 17:30 MW09-23	L1886064-9 Water 30-JAN-17 13:10 MP09-09	L1886064-10 Water 30-JAN-17 17:30 DUP-2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	576	1210	513	1200
	Hardness (as CaCO3) (mg/L)	<0.50	254	707	205	677
	pH (pH)	5.56	7.88	7.57	8.90	7.63
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<1.0	165	306	117	303
	Ammonia, Total (as N) (mg/L)	<0.0050	0.0164	2.82	4.58	2.92
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.25 ^{DLDS}	0.270	<0.25 ^{DLDS}
	Chloride (Cl) (mg/L)	<0.50	<0.50	<2.5 ^{DLDS}	5.04	<2.5 ^{DLDS}
	Fluoride (F) (mg/L)	<0.020	0.056	0.10	1.45	0.10
	Nitrate (as N) (mg/L)	<0.0050	3.27	<0.025 ^{DLDS}	<0.0050	<0.025 ^{DLDS}
	Nitrite (as N) (mg/L)	<0.0010	0.0011	0.0086	0.0028	0.0112
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.460	3.30	7.46	3.27
	Sulfate (SO4) (mg/L)	<0.30	137	430	127	434
	Anion Sum (meq/L)	<0.10	6.38	15.1	5.21	15.1
	Cation Sum (meq/L)	<0.10	5.48	16.3	6.00	15.7
	Cation - Anion Balance (%)	0.0	-7.6	4.0	7.0	1.9
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	0.592	<0.0050
	Cyanide, Total (mg/L)	<0.0050	0.0148	0.0250	1.52	0.0413
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	1.14	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	0.501	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	<0.50	38.1	73.1	18.1	73.1
	Total Organic Carbon (mg/L)	<0.50	7.50	13.2	45.0	13.9
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0039	0.0216	0.0058	0.0229
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00015	<0.00020 ^{DLA}	0.133	<0.00020 ^{DLA}
	Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00213	0.0305	26.4	0.0294
	Barium (Ba)-Dissolved (mg/L)	<0.000050	0.161	0.0427	0.00110	0.0415
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000040 ^{DLA}	<0.00010 ^{DLA}	<0.000040 ^{DLA}
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00010 ^{DLA}	<0.00025 ^{DLA}	<0.00010 ^{DLA}
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	0.087	0.192	0.083
	Cadmium (Cd)-Dissolved (mg/L)	<0.0000050	0.000118	0.000020	0.000274	0.000018
	Calcium (Ca)-Dissolved (mg/L)	<0.050	71.7	182	81.0	174
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00030	0.00041	<0.00050 ^{DLA}	0.00043
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00051	0.0101	0.0403	0.00997
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00600	<0.00040 ^{DLA}	0.366	<0.00040 ^{DLA}
	Iron (Fe)-Dissolved (mg/L)	<0.010	0.013	11.2	0.119	10.8

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1886064-11 Water 30-JAN-17 13:10 FB-2	L1886064-12 Water 30-JAN-17 16:02 MW09-22	L1886064-13 Water 01-FEB-17 09:03 MW09-22	L1886064-14 Water 01-FEB-17 09:20 MW09-06	L1886064-15 Water 01-FEB-17 10:00 MW09-03	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0		576	1930	2880
	Hardness (as CaCO3) (mg/L)	<0.50	271		1200	1990
	pH (pH)	5.98		7.67	7.61	7.74
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<1.0		208	79.3	202
	Ammonia, Total (as N) (mg/L)	<0.0050	0.976		0.213	6.24
	Bromide (Br) (mg/L)	<0.050		<0.050	<0.50 ^{DLDS}	<1.0 ^{DLDS}
	Chloride (Cl) (mg/L)	<0.50		<0.50	<5.0 ^{DLDS}	<10 ^{DLDS}
	Fluoride (F) (mg/L)	<0.020		0.036	0.23	<0.40 ^{DLDS}
	Nitrate (as N) (mg/L)	<0.0050		0.0145	5.08	<0.10 ^{DLDS}
	Nitrite (as N) (mg/L)	<0.0010 ^{HTD}		0.0298	<0.010 ^{DLDS}	<0.020 ^{DLDS}
	Total Kjeldahl Nitrogen (mg/L)	<0.050		1.84	0.780	6.75
	Sulfate (SO4) (mg/L)	<0.30		118	1150	1850
	Anion Sum (meq/L)	<0.10			26.0	42.5
	Cation Sum (meq/L)	<0.10			25.2	44.0
	Cation - Anion Balance (%)	0.0			-1.5	1.8
	Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050		<0.0050
Cyanide, Total (mg/L)		<0.0050	0.0200		<0.0050	<0.0050
Thiocyanate (SCN) (mg/L)		<0.50	<0.50		<0.50	<0.50
Cyanide, Free (mg/L)		<0.0050	<0.0050		<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	<0.50	47.7		22.1	43.5
	Total Organic Carbon (mg/L)	<0.50	22.1		10.2	6.22
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0558		<0.0020 ^{DLA}	<0.0050 ^{DLA}
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00013		0.162	0.404
	Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00702		0.236	1.98
	Barium (Ba)-Dissolved (mg/L)	<0.000050	0.0617		0.00687	0.0313
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020		<0.000040 ^{DLA}	<0.00010 ^{DLA}
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050		<0.00010 ^{DLA}	<0.00025 ^{DLA}
	Boron (B)-Dissolved (mg/L)	<0.010	0.033		0.085	0.237
	Cadmium (Cd)-Dissolved (mg/L)	<0.0000050	0.0000136		0.00461	0.0152
	Calcium (Ca)-Dissolved (mg/L)	<0.050	95.0		413	596
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00106		<0.00020 ^{DLA}	<0.00050 ^{DLA}
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00851		0.00152	0.00309
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00108		0.00538	0.0556
	Iron (Fe)-Dissolved (mg/L)	<0.010	14.0		<0.020 ^{DLA}	0.083

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1886064-16 Water 01-FEB-17 10:20 MW09-02	L1886064-17 Water 01-FEB-17 09:40 MW09-04	L1886064-18 Water 30-JAN-17 12:50 GSI-HA-01A	L1886064-19 Water 01-FEB-17 10:20 FB-3	L1886064-20 Water TRAVEL BLANK	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	2380	2490	959	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	1520	1570	713	<0.50	<0.50
	pH (pH)	7.30	8.10	7.96	5.70	5.32
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	80.6	127	228	<1.0	<1.0
	Ammonia, Total (as N) (mg/L)	5.65	7.47	0.0656	<0.0050	<0.05 ^{RRV}
	Bromide (Br) (mg/L)	<1.0 ^{DLDS}	<1.0 ^{DLDS}	<0.25 ^{DLDS}	<0.050	<0.050
	Chloride (Cl) (mg/L)	<10 ^{DLDS}	<10 ^{DLDS}	<2.5 ^{DLDS}	<0.50	<0.50
	Fluoride (F) (mg/L)	0.59 ^{DLDS}	0.42	<0.10 ^{DLDS}	<0.020	<0.020
	Nitrate (as N) (mg/L)	<0.10 ^{DLDS}	0.40	<0.025 ^{DLDS}	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.020 ^{DLDS}	0.041	<0.0050 ^{TKNI}	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	6.88	7.76	<0.050	<0.050	<0.060
	Sulfate (SO4) (mg/L)	1560	1640	343	<0.30	<0.30
	Anion Sum (meq/L)	34.2	36.7	11.7	<0.10	<0.10
	Cation Sum (meq/L)	33.4	34.3	14.6	<0.10	<0.10
	Cation - Anion Balance (%)	-1.2	-3.3	11.1	0.0	0.0
	Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total (mg/L)		<0.0050	0.0089	<0.0050 ^{DLM}	<0.0050	<0.0050
Thiocyanate (SCN) (mg/L)		<0.50	<0.50	<25	<0.50	<0.50
Cyanide, Free (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	16.6	26.8	54.6	<0.50	<0.50
	Total Organic Carbon (mg/L)	5.36	6.26	17.1	0.81	<0.50
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0050 ^{DLA}	0.0045	0.0029	<0.0010	<0.0010
	Antimony (Sb)-Dissolved (mg/L)	0.00557	0.307	0.00016	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	7.46	3.61	0.00189	<0.00010	<0.00010
	Barium (Ba)-Dissolved (mg/L)	0.00523	0.0112	0.159	<0.000050	<0.000050
	Beryllium (Be)-Dissolved (mg/L)	<0.00010 ^{DLA}	<0.000040 ^{DLA}	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.00025 ^{DLA}	<0.00010 ^{DLA}	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.092	0.276	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.00101	0.000017	0.0000090	<0.0000050	<0.0000050
	Calcium (Ca)-Dissolved (mg/L)	490	493	183	<0.050	<0.050
	Chromium (Cr)-Dissolved (mg/L)	<0.00050 ^{DLA}	<0.00020 ^{DLA}	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00972	0.00084	0.00012	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	<0.0010 ^{DLA}	<0.00040 ^{DLA}	0.00070	<0.00020	<0.00020
	Iron (Fe)-Dissolved (mg/L)	12.0	<0.020 ^{DLA}	0.124	<0.010	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1886064-1 Water 30-JAN-17 15:40 CH-P-13-03/50	L1886064-2 Water 30-JAN-17 13:36 MW09-19	L1886064-3 Water 30-JAN-17 14:18 MW09-18	L1886064-4 Water 30-JAN-17 12:40 GSI-DC-02B	L1886064-5 Water 30-JAN-17 14:18 DUP-1
Grouping	Analyte					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.00010 ^{DLA}	0.000087	<0.00010 ^{DLA}	<0.000050	<0.00010 ^{DLA}
	Lithium (Li)-Dissolved (mg/L)	0.0037	0.0093	0.0227	<0.0010	0.0206
	Magnesium (Mg)-Dissolved (mg/L)	142	149	292	47.9	287
	Manganese (Mn)-Dissolved (mg/L)	0.433	7.34	0.501	3.75	0.489
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.00088	0.000101	<0.00010 ^{DLA}	0.000574	<0.00010 ^{DLA}
	Nickel (Ni)-Dissolved (mg/L)	0.0190	0.00118	<0.0010 ^{DLA}	0.00365	<0.0010 ^{DLA}
	Phosphorus (P)-Dissolved (mg/L)	<0.10 ^{DLA}	0.110	<0.10 ^{DLA}	<0.050	<0.10 ^{DLA}
	Potassium (K)-Dissolved (mg/L)	8.90	8.66	8.64	3.47	8.55
	Selenium (Se)-Dissolved (mg/L)	0.00225	0.000134	0.00012	0.000217	0.00011
	Silicon (Si)-Dissolved (mg/L)	7.65	10.8	5.88	8.18	5.74
	Silver (Ag)-Dissolved (mg/L)	<0.000020 ^{DLA}	<0.000010	<0.000020 ^{DLA}	<0.000010	<0.000020 ^{DLA}
	Sodium (Na)-Dissolved (mg/L)	62.4	13.7	14.3	4.77	14.1
	Strontium (Sr)-Dissolved (mg/L)	1.08	0.992	1.12	0.345	1.08
	Sulfur (S)-Dissolved (mg/L)	511	358	620	113	606
	Thallium (Tl)-Dissolved (mg/L)	0.000076	<0.000010	0.000299	<0.000010	0.000293
	Tin (Sn)-Dissolved (mg/L)	0.00513	0.00022	<0.00020 ^{DLA}	<0.00010	<0.00020 ^{DLA}
	Titanium (Ti)-Dissolved (mg/L)	<0.00060 ^{DLA}	0.00123	<0.00060 ^{DLA}	<0.00030	<0.00060 ^{DLA}
	Uranium (U)-Dissolved (mg/L)	0.0142	0.000280	0.00814	0.000255	0.00805
	Vanadium (V)-Dissolved (mg/L)	<0.0010 ^{DLA}	0.00123	<0.0010 ^{DLA}	<0.00050	<0.0010 ^{DLA}
	Zinc (Zn)-Dissolved (mg/L)	0.0075	0.0033	0.0038	0.0045	0.0036
	Zirconium (Zr)-Dissolved (mg/L)	<0.00060 ^{DLA}	<0.00030	<0.00060 ^{DLA}	<0.00030	<0.00060 ^{DLA}

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1886064-6 Water 30-JAN-17 13:36 FB-1	L1886064-7 Water 30-JAN-17 14:25 MW09-24	L1886064-8 Water 30-JAN-17 17:30 MW09-23	L1886064-9 Water 30-JAN-17 13:10 MP09-09	L1886064-10 Water 30-JAN-17 17:30 DUP-2
Grouping	Analyte					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00010 ^{DLA}	0.00130 ^{DLA}	<0.00010 ^{DLA}
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0020 ^{DLA}	<0.0050 ^{DLA}	<0.0020 ^{DLA}
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	18.2	61.4	0.63	59.2
	Manganese (Mn)-Dissolved (mg/L)	<0.00010	0.0267	13.6	0.0332	13.3
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	0.0000320	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000405	0.00188	0.0141	0.00173
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.0013	0.0198	0.0013
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.10 ^{DLA}	0.42	<0.10 ^{DLA}
	Potassium (K)-Dissolved (mg/L)	<0.10	1.72	6.59	9.86	6.43
	Selenium (Se)-Dissolved (mg/L)	<0.000050	0.000957	0.00020	0.00146	0.00016
	Silicon (Si)-Dissolved (mg/L)	<0.050	6.15	6.88 ^{DLA}	7.74	6.52 ^{DLA}
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000020 ^{DLA}	0.0107	<0.000020 ^{DLA}
	Sodium (Na)-Dissolved (mg/L)	<0.050	8.30	17.0	29.9	16.4
	Strontium (Sr)-Dissolved (mg/L)	<0.00020	0.277	0.553	0.133	0.522
	Sulfur (S)-Dissolved (mg/L)	<0.50	37.5	164	50.1	158
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000020 ^{DLA}	0.000050	<0.000020 ^{DLA}
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00020 ^{DLA}	0.00608	<0.00020 ^{DLA}
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	0.00065	<0.0015 ^{DLA}	<0.00060 ^{DLA}
	Uranium (U)-Dissolved (mg/L)	<0.000010	0.00150	0.00133	0.00281	0.00120
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	0.0019	<0.0025 ^{DLA}	0.0019
Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0015	0.0179	0.0093	0.0160	
Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	0.00060	<0.0015 ^{DLA}	<0.00060 ^{DLA}	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	Description	Sampled Date	Sampled Time	Client ID	L1886064-11	L1886064-12	L1886064-13	L1886064-14	L1886064-15
					Water	Water	Water	Water	Water
		30-JAN-17	13:10	FB-2	30-JAN-17	30-JAN-17	01-FEB-17	01-FEB-17	01-FEB-17
					13:10	16:02	09:03	09:20	10:00
					FB-2	MW09-22	MW09-22	MW09-06	MW09-03
Grouping	Analyte								
WATER									
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		0.00022	0.00052 ^{DLA}			
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010		0.0081	<0.0050 ^{DLA}			
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	8.13		40.4	121			
	Manganese (Mn)-Dissolved (mg/L)	<0.00010	2.76		5.91	49.4			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	0.0000065		<0.0000050	<0.0000050			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000184		0.00518	0.00491 ^{DLA}			
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00243		0.0018	<0.0025 ^{DLA}			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		<0.10 ^{DLA}	<0.25 ^{DLA}			
	Potassium (K)-Dissolved (mg/L)	<0.10	2.81		15.1	37.9 ^{DLA}			
	Selenium (Se)-Dissolved (mg/L)	<0.000050	0.000195		<0.00010 ^{DLA}	<0.00025 ^{DLA}			
	Silicon (Si)-Dissolved (mg/L)	<0.050	5.40		6.43	16.8 ^{DLA}			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000019		0.000020	<0.000050 ^{DLA}			
	Sodium (Na)-Dissolved (mg/L)	<0.050	16.9		14.8	25.4			
	Strontium (Sr)-Dissolved (mg/L)	<0.00020	0.318		0.705	1.67			
	Sulfur (S)-Dissolved (mg/L)	<0.50	43.7		401	675			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010		0.000290 ^{DLA}	0.000196 ^{DLA}			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	0.00069		<0.00020 ^{DLA}	<0.00050 ^{DLA}			
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00173		<0.00060 ^{DLA}	<0.0015 ^{DLA}			
	Uranium (U)-Dissolved (mg/L)	<0.000010	0.000358		0.00116 ^{DLA}	0.00160 ^{DLA}			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00182		<0.0010 ^{DLA}	<0.0025 ^{DLA}			
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0014		0.0867 ^{DLA}	0.0175 ^{DLA}			
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	0.00059		<0.00060 ^{DLA}	<0.0015 ^{DLA}			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	Description	Sampled Date	Sampled Time	Client ID	L1886064-16	L1886064-17	L1886064-18	L1886064-19	L1886064-20
					Water	Water	Water	Water	Water
		01-FEB-17	10:20	MW09-02	01-FEB-17	01-FEB-17	30-JAN-17	01-FEB-17	
							12:50	10:20	
					MW09-02	MW09-04	GS1-HA-01A	FB-3	TRAVEL BLANK
Grouping	Analyte								
WATER									
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)		^{DLA}		<0.00025	0.00031	0.000069	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)				0.0082	0.0127	0.0070	<0.0010	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)				71.7	81.2	62.0	<0.10	<0.10
	Manganese (Mn)-Dissolved (mg/L)				20.4	7.57	0.0756	<0.00010	<0.00010
	Mercury (Hg)-Dissolved (mg/L)				<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)				0.00834	0.00388	0.000273	<0.000050	<0.000050
	Nickel (Ni)-Dissolved (mg/L)				0.0030	<0.0010 ^{DLA}	0.00073	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)		^{DLA}		<0.25	0.10	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)				15.9	53.0	3.89	<0.10	<0.10
	Selenium (Se)-Dissolved (mg/L)		^{DLA}		<0.00025	<0.00010 ^{DLA}	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Dissolved (mg/L)				7.71	16.3	7.14	<0.050	<0.050
	Silver (Ag)-Dissolved (mg/L)		^{DLA}		<0.000050	<0.000020 ^{DLA}	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)				20.0	19.6	6.34	<0.050	<0.050
	Strontium (Sr)-Dissolved (mg/L)				0.989	1.19	0.431	<0.00020	<0.00020
	Sulfur (S)-Dissolved (mg/L)				524	541	153	<0.50	<0.50
	Thallium (Tl)-Dissolved (mg/L)				0.000239	0.000129	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)		^{DLA}		<0.00050	<0.00020 ^{DLA}	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		^{DLA}		<0.0015	<0.00060 ^{DLA}	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)				0.00127	0.000364	0.000063	<0.000010	<0.000010
	Vanadium (V)-Dissolved (mg/L)		^{DLA}		<0.0025	<0.0010 ^{DLA}	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)				0.379	0.766	0.0034	<0.0010	<0.0010
	Zirconium (Zr)-Dissolved (mg/L)		^{DLA}		<0.0015	<0.00060 ^{DLA}	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Inorganic Carbon	MS-B	L1886064-10, -11, -12, -15, -18, -19, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Total Organic Carbon	MS-B	L1886064-10, -11, -12, -3, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1886064-15, -16, -17, -18, -19, -2, -20, -4
Matrix Spike	Total Organic Carbon	MS-B	L1886064-14
Matrix Spike	Total Organic Carbon	MS-B	L1886064-14
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1886064-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis
TKNI	TKN result is likely biased low due to Nitrate interference. Nitrate-N is > 10x TKN.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-VA	Water	Alkalinity Species by Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
BE-D-L-CCMS-VA	Water	Diss. Be (low) 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.			
BR-L-IC-N-VA	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CARBONS-TIC-VA	Water	Total inorganic carbon by CO2 purge	APHA 5310B TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310B TOTAL ORGANIC CARBON (TOC)

Reference Information

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CL-IC-N-VA Water Chloride in Water by IC EPA 300.1 (mod)
 Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CN-FREE-CFA-VA Water Free Cyanide in water by CFA ASTM 7237
 This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

CN-SCN-VA Water Thiocyanate by Colour APHA 4500-CN CYANIDE
 This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.
 Water samples containing high levels of hexavalent chromium, cyanide (together with sulfide), reducing agents, or hydrocarbons may cause negative or positive interferences with this method. Contact ALS for additional information if required.

CN-T-CFA-VA Water Total Cyanide in water by CFA ISO 14403:2002
 This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-VA Water Weak Acid Diss. Cyanide in water by CFA APHA 4500-CN CYANIDE
 This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.
 This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

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.

F-IC-N-VA 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-VA Water Hardness APHA 2340B
 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-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/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 or CVAFS.

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E
 Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$$

MET-D-CCMS-VA 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.

NH3-F-VA Water Ammonia in Water by Fluorescence APHA 4500 NH₃-NITROGEN (AMMONIA)
 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.

NH3-F-VA 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

NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-VA	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
SO4-IC-N-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
TKN-F-VA	Water	TKN in Water by Fluorescence	APHA 4500-NORG D.
This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.			

** 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
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

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.



Canada Toll Free: 1 800 668 9878

Report To		Report Format / Distribution				Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)													
Company: Hemmera Environchem Inc.		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)				R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)													
Contact: Natasha Sandys		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT													
Address: 230 - 2237 2nd Avenue Whitehorse, YT		<input type="checkbox"/> Criteria on Report - provide details below if box checked				E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT													
Phone: 867-456-4865		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge													
		Email 1 or Fax nsandys@hemmera.com				Specify Date Required for E2,E or P:													
		Email 2 chris@elr.ca				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 checked="" type="checkbox"/> MAIL <input type="checkbox"/> FAX																	
Company: Hemmera Environchem Inc.		Email 1 or Fax nsandys@hemmera.com																	
Contact: Natasha Sandys		Email 2 chris@elr.ca																	
Project Information		Oil and Gas Required Fields (client use)																	
ALS Quote #: Q58042		Approver ID:		Cost Center:															
Job #: 1343-005.29		GL Account:		Routing Code:															
PO / AFE:		Activity Code:																	
LSD:		Location:																	
ALS Lab Work Order # (lab use only)		ALS Contact:		Sampler: JC,MM,NB,AN															
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	Dissolved Metals, Hardness	Dissolved Mercury	Nitrate, Nitrite, Total Kjeldahl N (TKN)	Cl, F, Sulfate, conductivity, pH, alkalinity	Anion Sum, Cation Sum, Cation/Anion Balance	Cyanide - Weak Acid Diss., Total, Free	Ammonia N (total), Total Organic Carbon	Thiocyanate (SCN)	Total Inorganic Carbon					Number of Containers	
	CH-P-13-03/50	30-Jan-17	15:40	Water	R	R													2
	MW09-19	30-Jan-17	13:36	Water	R	R	R	R	R	R	R	R	R						7
	MW09-18	30-Jan-17	14:18	Water	R	R	R	R	R	R	R	R	R						7
	GSI-DC-02B	30-Jan-17	12:40	Water	R	R	R	R	R	R	R	R	R						7
	DUP-1	30-Jan-17	14:18	Water	R	R	R	R	R	R	R	R	R						7
	FB-1	30-Jan-17	13:36	Water	R	R	R	R	R	R	R	R	R						7
	MW09-24	31-Jan-17	14:25	Water	R	R	R	R	R	R	R	R	R						7
	MW09-23	31-Jan-17	17:30	Water	R	R	R	R	R	R	R	R	R						7
	MP09-09	31-Jan-17	13:10	Water	R	R	R	R	R	R	R	R	R						7
	DUP-2	31-Jan-17	17:30	Water	R	R	R	R	R	R	R	R	R						7
	FB-2	31-Jan-17	13:10	Water	R	R	R	R	R	R	R	R	R						7
	MW09-22	31-Jan-17	16:02	Water	R	R				R	R	R	R						6
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report (client Use)				SAMPLE CONDITION AS RECEIVED (lab use only)													
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		- Please send ELR EQWin EDD file with regular results report.				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 Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>													
						Cooling initiated <input type="checkbox"/>													
						INITIAL COOLER TEMPERATURES °C: 2.1													
						FINAL COOLER TEMPERATURES °C:													
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)													
Released by:	Date:	Time:	Received by: V.D.	Date: Feb 1 / 17	Time: 16:10	Received by:						Date:			Time:				

Short Holding Time
Rush Processing



L1886064-COFC

31

Canada Toll Free: 1 800 668 9878

Report To		Report Format / Distribution			Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)																																	
Company: Hemmera Environchem Inc.		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)																																	
Contact: Natasha Sandys		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT																																	
Address: 230 - 2237 2nd Avenue Whitehorse, YT		<input type="checkbox"/> Criteria on Report - provide details below if box checked			E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT																																	
Phone: 867-456-4865		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge																																	
		Email 1 or Fax nsandys@hemmera.com			Specify Date Required for E2,E or P:																																	
		Email 2 chris@elr.ca			Analysis Request																																	
Invoice To		Invoice Distribution			Indicate Filled (F), Preserved (P) or Filtered and Preserved (F/P) below																																	
Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input checked="" type="checkbox"/> MAIL <input type="checkbox"/> FAX			F/P F/P																																	
Copy of Invoice with Report <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Email 1 or Fax nsandys@hemmera.com			P P P																																	
Company: Hemmera Environchem Inc.		Email 2 chris@elr.ca			<table border="1"> <tr> <td rowspan="5">Dissolved Metals, Hardness</td> <td rowspan="5">Dissolved Mercury</td> <td rowspan="5">Nitrate, Nitrite, Total Kjeldahl N (TKN)</td> <td rowspan="5">Cl, F, Sulfate, conductivity, pH, alkalinity</td> <td rowspan="5">Anion Sum, Cation Sum, Cation/Anion Balance</td> <td rowspan="5">Cyanide - Weak Acid Diss., Total, Free</td> <td rowspan="5">Ammonia N (total), Total Organic Carbon</td> <td rowspan="5">Thiocyanate (SCN)</td> <td rowspan="5">Total Inorganic Carbon</td> <td colspan="3">Number of Containers</td> </tr> <tr> <td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td> </tr> </table>										Dissolved Metals, Hardness	Dissolved Mercury	Nitrate, Nitrite, Total Kjeldahl N (TKN)	Cl, F, Sulfate, conductivity, pH, alkalinity	Anion Sum, Cation Sum, Cation/Anion Balance	Cyanide - Weak Acid Diss., Total, Free	Ammonia N (total), Total Organic Carbon	Thiocyanate (SCN)	Total Inorganic Carbon	Number of Containers														
Dissolved Metals, Hardness	Dissolved Mercury	Nitrate, Nitrite, Total Kjeldahl N (TKN)	Cl, F, Sulfate, conductivity, pH, alkalinity	Anion Sum, Cation Sum, Cation/Anion Balance																				Cyanide - Weak Acid Diss., Total, Free	Ammonia N (total), Total Organic Carbon	Thiocyanate (SCN)	Total Inorganic Carbon	Number of Containers										
Contact: Natasha Sandys		Email 2 chris@elr.ca																																				
Project Information		Oil and Gas Required Fields (client use)																																				
ALS Quote #: Q56042		Approver ID: _____ Cost Center: _____																																				
Job #: 1343-005.29		GL Account: _____ Routing Code: _____																																				
PO / AFE: _____		Activity Code: _____																																				
LSD: _____		Location: _____																																				
ALS Lab Work Order # (lab use only)		ALS Contact:		Sampler: JC,MM,NB,AN																																		
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																																
	MW09-22			01-Feb-17	9:03	Water			R	R	R								1																			
	MW09-06			01-Feb-17	9:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	MW09-03			01-Feb-17	10:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	MW09-02			01-Feb-17	10:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	MW09-04			01-Feb-17	9:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	GSI-HA-01A			30-Jan-17	12:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	FB-3			01-Feb-17	10:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	7																			
	Travel Blank			-	-	Water	R	R	R	R	R	R	R	R	R	R	R	R	#9																			
Drinking Water (DW) Samples¹ (client use)				Special Instructions / Specify Criteria to add on report (client Use)				SAMPLE CONDITION AS RECEIVED (lab use only)																														
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				- Please send ELR EQWin EDD file with regular results report.				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 Yes <input type="checkbox"/> No <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																										
								2.1																														
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)																														
Released by:		Date:		Time:		Received by: VD.		Date: Feb 17		Time: 16:10.		Received by:		Date:		Time:																						

Short Holding Time
Rush Processing

APPENDIX D

Response to Comments Received on Draft Report

Response to Client Comments from Draft Report Version (as Received November 1, 2016)

Comment No.	Page	Comment	Response
1	3	I noticed quite a few instances in Table 1-1 where wells identified as 'frozen' or 'buried' are also checked as 'sample collected' (see highlighted cells). Please review and correct table where necessary	These instances have been corrected and checked against the analytical data.
2	4	I think it would be worth inserting a brief distinction between 'sampled' and 'monitored' somewhere.	Some clarifying text has been added to specify this difference.
3	9	This citation does not align with the reference included in Section 6.0. (i.e., "Environment Yukon" as citation and "Yukon Government" as reference). Please adjust.	The reference and citation have been corrected.
4	19	In Table A: Sites CH-P-13-10/50, MW09-02, MW09-03, and MW09-06 all appear to exceed the hardness-dependent guideline for cadmium, but are not highlighted as exceedances. You may want to double check the conditional formatting for this parameter.	These have been reviewed and we can confirm that there was some issue with conditional formatting or the exceedances being flagged for this parameter. We have reviewed and these instances have been corrected.
5	20	This site (GLL07-02) was indicated as 'frozen' in Table 1-1. On page 13, in the groundwater sampling summary (S3.1), it is stated that only one well was dry (MW-09-11, identified in the table). The field notes for GLL07-02 indicate that the well is dry. Please confirm and adjust where necessary.	Well GLL07-02 had become incorrectly classified, but this has been corrected. All numbers have been confirmed.
6	22	Table 3-3 indicates that only 5 sites were below this guideline.	This number has been corrected.
7	23	I noticed that the field sulphide results for the field blanks were varied – are these results typical of deionized water? (0.17, 0.8 and 0.03 mg/L for FB1, -2 and -3, respectively.)	These field measurements represent the measurements for the sample and should not have been included in the table. These instances have been removed from the QA/QC table.