HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-01/10	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	GR / JH
UTM Location	Z: 08V E: 0388656 N: 6881117	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -11°c
Waypoint	GPS: ECR Name: —			**Recovery**	☐ Good ☐ Bad /
Photos	Cam: CUM 1X Nos: 263 - 265	**Purge Method**			
Duplicate Collected	☐ Yes Name: /	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: /				

Initial Depth to Water (m)	6.678 FROZEN?	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	—	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	~~0.49~~	**Depth to water (m)**									
Well Stick-up Height (m)	0.49	**Temperature (°C) 3%**									
Estimated Water Volume (L)	—	**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

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

Sample Date (Con't): FEB 2 2016

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 (C02)	PPM	50

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

FROZEN

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-02/10	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	2" PVC.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E:0388924 N:6881012	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -11°C
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: Nos: 260-262	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	DRY/FROZEN/BLOCKED. 8.238.	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	—	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	—	**Depth to water (m)**									
Well Stick-up Height (m)	0.64.	**Temperature (°C) 3%**									
Estimated Water Volume (L)	—	**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

DRY/ BLOCKED.

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): ~~GW~~ CH-P-13-02/10

Sample Date (Con't): FEB 2 2016

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)	%	19.1
Carbon Dioxide (C02)	PPM	> 10,000 ALARM OVER RANGE.

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	~~DRY~~	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)	DRY / BLOCKED	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

CLAY / BENTONITE ON BOTTOM OF LIKELY WATER LEVEL TAPE, ~~POSSIBLY~~ WELL HAS ~~FREE~~ CLOGGED UP WITH BENTONITE (~ 1-8m)

Consumables Used:

54

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-03/10	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1.5" PVC	**Client**	GY - AAM	**Samplers**	GR + JH.
UTM Location	Z: 08V E: 0389145 N: 6881109	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 269-272	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	4.922 FROZEN	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	/	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	0.59	**Depth to water (m)**									
Well Stick-up Height (m)		**Temperature (°C) 3%**									
Estimated Water Volume (L)		**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): CH-P-13-03/10

Sample Date (Con't): FEB 2 2016

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 (C02)	PPM	5125

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		FROZEN
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-03/50	**Project Number**	1343-005.14	**Date**	Feb 2, 2016
Piezometer Diameter	1" PVC	**Client**	GY - AAM	**Samplers**	GR + SH
UTM Location	Z:08V E:0389145 N: 6881109	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Cloudy, -13°C
Waypoint	GPS: ECR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 269-272	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☒ Yes Name: FB16-200				

Initial Depth to Water (m)	48.985	**Purge Start Time:**		**Purge End Time:**				**Pen or YSI:**		☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	50.555	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)	—	**Depth to water (m)**											
Well Stick-up Height (m)	0.54	**Temperature (°C) 3%**			Direct								
Estimated Water Volume (L)	0.785	**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**			Sample								
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**	0.80									
			Turbidity (NTU)	1146 AU									
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

YSI ID	X	**Sample Method:**			
Logged Field Parameters	☐ Yes ☒ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	X				
Sample Time (24hr)	14:30			1" X	

HEMMERA

Sample Site (Con't): CH-P-13-03/50

Sample Date (Con't): FEB 2 2016

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)	%	20.3
Carbon Dioxide (C02)	PPM	2750

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	30	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	60	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	60	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50	

General Notes and Observations:

TURBID WATER

WATER GENERALLY BECAME MORE TURBID WITH EACH BAILER. GOT MINIMUM VOLUMES AS WEREN'T SURE HOW ~~MUCH~~ WELL THE SAMPLING WOULD GO.

Consumables Used:

1" bailer
1 roll of twine

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-04/10	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	1.5" PVC.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: E: N:	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C
Waypoint	GPS: Name:			**Recovery**	☐ Good ☐ Bad
Photos	Cam: Nos:	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	6.045 ICE/ BLOCKAGE.	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit										
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**															
Submerged Tubing Depth (m)		**Depth to water (m)**															
Well Stick-up Height (m)	0.54	**Temperature (°C) 3%**															
Estimated Water Volume (L)		**pH (pH Units) ±0.1**															
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**															
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**															
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**															
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**															
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**															
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**															
		Only for final readings	**Sulphide (mg/L)**														
			Turbidity (NTU)														
		Interval Purge Volume (L)															
		Cumulative Purge Volume (L):															

FROZEN W/ BLOCKED.

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): CH-P-13-04/10.

Sample Date (Con't): FEB 3 2016

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: NOT TIGHT.

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	Ø
Oxygen (O2)	%	20.9
Carbon Dioxide (C02)	PPM	Ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	CH-P-13-04/35	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	1" PVC	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389135 N: 6881472	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: OLYMPUS Nos: 273-276	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	6.408 FROZEN BLOCKAGE	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	—	**Purge Interval 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		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN / BLOCKED

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): CH-P-13-04/35

Sample Date (Con't): _____

WRONG CAP ~~CAP~~ ON WELL

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: NOT TIGHT.

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	20.9
Carbon Dioxide (C02)	PPM	25

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	FROZEN	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GLC07-01	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	2" PVC.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E:0388853 N: 6881780	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C OVERCAST
Waypoint	GPS: GLR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 307 – 309	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	~~TD~~ 13.745 TO ICE	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	—	**Purge Interval Time (____) min / Vol. (____) L**										
Submerged Tubing Depth (m)		**Depth to water (m)**										
Well Stick-up Height (m)	0.79	**Temperature (°C) 3%**										
Estimated Water Volume (L)		**pH (pH Units) ±0.1**										
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**										
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**										
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**										
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**										
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**										
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**										
		Only for final readings	**Sulphide (mg/L)**									
			Turbidity (NTU)									
		Interval Purge Volume (L)										
		Cumulative Purge Volume (L):										

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GLO7-01

Sample Date (Con't): FEB 3 2016

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	Ø
Oxygen (O2)	%	10.5
Carbon Dioxide (C02)	PPM	10,000 OVER RANGE

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

5/8" WATERLA FROZEN IN WELL.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GLL-07-02	Project Number	1343-005.14	Date	FEB 3 2016
Piezometer Diameter	6" STEEL	Client	GY - AAM	Samplers	GR + JH
UTM Location	Z: 08V E: 0389070 N: 6881705	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	~ -12°C
Waypoint	GPS: ELR Name: /			Recovery	☐ Good ☐ Bad
Photos	Cam: UNIX Nos: 289-291	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	7.100 TO BLOCKAGE/ FROZEN	Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit
Depth to Bottom (m)		Purge Interval Time (____) min / Vol. (____) L					
Submerged Tubing Depth (m)		Depth to water (m)					
Well Stick-up Height (m)	1.34	Temperature (°C) 3%					
Estimated Water Volume (L)		pH (pH Units) ±0.1	FROZEN/ DRY.				

(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:

Parameter							
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)							
Only for final readings: Turbidity (NTU)							
Interval Purge Volume (L)							
Cumulative Purge Volume (L):							

YSI ID		Sample Method:			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		Waterra	Peristaltic	Disp. Bailer	Other
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GL07-02

Sample Date (Con't): FEB 3 2016

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

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☐ Other LEFT AS IS

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

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	18.5
Carbon Dioxide (C02)	PPM	~~7500~~ 8350

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-01A	Project Number	1343-005.14	Date	February 1, 2016
Piezometer Diameter	1"	Client	GY - AAM	Samplers	DC JH
UTM Location	Z: 08 E: 0387674 N: 6881127	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	Broken clouds, -16
Waypoint	GPS: HEM Name: GSI-DC-01A *			Recovery	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 006-008	Purge Method			
Duplicate Collected	☐ Yes Name: X	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name: X		X		

~~Initial Depth to Water (m)~~ FROZEN AT	0.795 m	Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	☒ YSI Pro Plus ☒ Pen Unit
Depth to Bottom (m)	N/A	Purge Interval Time (____) min / Vol. (____) L					
Submerged Tubing Depth (m)	N/A	Depth to water (m)	Not Sampled Monitor only				
Well Stick-up Height (m)	0.64 m	Temperature (^{0}C) 3%					
Estimated Water Volume (L)	—	pH (pH Units) ±0.1					

(DTB – DTW) x ($\pi r^{2)}$*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:

N/A

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)	
Only for final readings: Turbidity (NTU)	
Interval Purge Volume (L)	
Cumulative Purge Volume (L):	

YSI ID	
Logged Field Parameters	☐ Yes ☐ No (X)
Time logged on YSI (24hr)	
Sample Time (24hr)	Not Sampled

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
	X		

HEMMERA

Sample Site (Con't): GS1-DC-01A

Sample Date (Con't): ~~FEBRUARY 1, 2016~~ Not sampled

Well Head Seal: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ 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% LEL
Oxygen (O2)	%	18.9 %
Carbon Dioxide (C02)	PPM	350 ppm

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Monitor only
- 20cm of snow
- Had to cut plastic well cap off. It is still usable.

Consumables Used:

None

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI – DC-01B
Piezometer Diameter	1"
UTM Location	Z: 08 E: 0387675 N: 6881128
Waypoint	GPS: HEM Name: GSI-DC-01B*
Photos	Cam: HEM Nos: 009-011
Duplicate Collected	☐ Yes Name:
Field Blank Collected	☐ Yes Name:

Project Number	1343-005.14	Date	FEBRUARY 1, 2016
Client	GY - AAM	Samplers	DC JH
Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	Broken clouds, -16
		Recovery	☐ Good ☐ Bad

Purge Method

Waterra	Peristaltic	Disp. Bailer	Other
	X		

Initial Depth to ~~Water~~ Ice (m)	1.456
Depth to Bottom (m)	–
Submerged Tubing Depth (m)	–
Well Stick-up Height (m)	0.67
Estimated Water Volume (L)	–

(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

Calculations:

N/A

Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	☐ YSI Pro Plus ☒ Pen Unit
Purge Interval Time (____) min / Vol. (____) L					
Depth to water (m)	Well Frozen				
Temperature (°C) 3%					
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)					
Only for final readings: Turbidity (NTU)					
Interval Purge Volume (L)					
Cumulative Purge Volume (L):					

YSI ID	
Logged Field Parameters	☐ Yes ☐ No (crossed out)
Time logged on YSI (24hr)	
Sample Time (24hr)	Not sampled

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
	X		

HEMMERA

Sample Site (Con't): GS1-DC-01B

Sample Date (Con't): Feb 1, 2016 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)	%	19.1
Carbon Dioxide (C02)	PPM	325

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Well Frozen
- 20cm of snow on ground
- Had to cut Pvc cap off. It is still usable

Consumables Used:

None

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-02B
Piezometer Diameter	~~0.5"~~ 1"
UTM Location	Z:08V E:0387836 N: 6881129
Waypoint	GPS: ELR Name: /
Photos	Cam: Nos: 0228 – 0231
Duplicate Collected	☐ Yes Name: (struck through)
Field Blank Collected	☐ Yes Name: (struck through)

Project Number	1343-005.14
Client	GY - AAM
Project Name	Mount Nansen 2016 GW Sampling Program
Date	Feb. 1/2016.
Samplers	AN, GR.
Weather/Temperature	Overcast ~ -10°C
Recovery	☐ Good ☒ Bad

Purge Method

Waterra	Peristaltic	Disp. Bailer	Other
	X		

	(B)	(A)
Initial Depth to Water (m)	2.300	1.815
Depth to Bottom (m)	~~2.090~~ 3.717	~~POSS. BCY ICE~~ 1.864
Submerged Tubing Depth (m)	~3.7	
Well Stick-up Height (m)	0.805	0.940
Estimated Water Volume (L)	0.85	—

(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: ~

Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit

Purge Interval Time (____) min / Vol. (____) L								
Depth to water (m)								
Temperature (°C) 3%								
pH (pH Units) ±0.1								
Cond. (µs/cm) 3%		DIRECT						
Specific Cond. (µs/cm) 3%		SAMPLE						
Redox (mV) 10%								
DO (mg/L) 10%								
DO (%) 10%								
Appearance & Odour (Clear, Silty, HC odours, etc.)								
Only for final readings: Sulphide (mg/L)								
Only for final readings: Turbidity (NTU)								
Interval Purge Volume (L)								
Cumulative Purge Volume (L):								

YSI ID	/
Logged Field Parameters	/ ☐ Yes ☐ No
Time logged on YSI (24hr)	/
Sample Time (24hr)	/ 15-30

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
	X		

HEMMERA

Sample Site (Con't): GS1-DC-02

Sample Date (Con't): Feb.1/2016

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 A	Values B
Methane (CH4)	%LEL	0	0
Oxygen (O2)	%	17.7	17.7
Carbon Dioxide (C02)	PPM	720	1700

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	120	Feb 1
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	~~40~~ ~~30~~ 140	Feb 1 + 2
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100	Feb 1
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100	Feb 1
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60	Feb 1 16
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	50	Feb 2 @ 16:00
6	120 ml (plastic)	Sulphide	60 ml	-	☑ Zinc Acetate, then NaOH	60	Feb 2 @ 16:00
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	~~40~~ 38	Feb 2 @ 16:00

General Notes and Observations:

Initially hit ice in drive point but broke through with tubing. New reading taken

~~FOR~~ 'B' CO_2 READING ROSE QUICKLY THEN ~~FELL~~ DECREASED QUICKLY.

-Returned to site Feb 2 to collect remaining samples (Gen chem, SCN, sulphide, TIC)

Consumables Used:

2 m waterra (breaking ice)

6" silicone tubing.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-03A	**Project Number**	1343-005.14	**Date**	FEB 1 2016
Piezometer Diameter	1"	**Client**	GY - AAM	**Samplers**	DC + SH
UTM Location	Z: 08 E: 0388098 N: 6881075	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	BROKEN CLOUD -11
Waypoint	GPS: HEM Name: GSI-DC-03A*			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 21 - 23	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to ~~Water~~ ICE (m)	0.978	**Purge Start Time:**	—	**Purge End Time:**	—	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**									
Well Stick-up Height (m)	0.68	**Temperature (°C) 3%**									
Estimated Water Volume (L)	—	**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**		FROZEN							
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**		NOT SAMPLED							
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

YSI ID	F	**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): GS1-DC-03A

Sample Date (Con't): FEB 1, 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap ☐ Not Sealed ☒ Other PLASTIC BAG

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☒ Other PLASTIC BAG

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 (C02)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

SNOW DEPTH 25 cm

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-03B	**Project Number**	1343-005.14	**Date**	FEB 1 2016
Piezometer Diameter	1"	**Client**	GY - AAM	**Samplers**	DC JH
UTM Location	Z: 08 E: 0388104 N: 6881075	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	B. sky Clouds -11°C
Waypoint	GPS: HEM Name: GSI-DC-03B			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 24-26	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	–	–	–	–

Initial Depth to Water (m)	0.945	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☑ Pen Unit								
Depth to Bottom (m)	N/A	**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**													
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**													
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**													
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**													
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**													
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**													
Calculations: N/A		**Appearance & Odour (Clear, Silty, HC odours, etc.)**													
		Only for final readings **Sulphide (mg/L)**													
		Only for final readings **Turbidity (NTU)**													
		Interval Purge Volume (L)													
		Cumulative Purge Volume (L):													

FROZEN SAMPLED NOT

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): GSI-DC-03B

Sample Date (Con't): FEB 1, 2016

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 (C02)	PPM	275

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

SNOW DEPTH 25 cm

- CAP NEEDED TO BE CUT TO ACCESS WELL BUT STILL USABLE

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI - DC - 05 A/B.	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1" STEEL O/D.	**Client**	GY - AAM	**Samplers**	GR / JH
UTM Location	Z: 08V E: 0388722 N: 6880828	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -11°C
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 266 - 268	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: /				

Initial Depth to Water (m)	GLACIATED AREA. DRIVE POINTS NOT LOCATED.	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)		**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**									
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

AREA GLACIATED OVER.

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-OC-05 A/B

Sample Date (Con't): FEB 2 2016

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 (C02)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-	GLACIATED	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)	OVER	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

DRIVEPOINTS NOT LOCATED GLACIATION!

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GS1 - DC - 06 A/B	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1" STEEL OD.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389788 N: 6880569.	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -15°C
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad ?
Photos	Cam: Lumix Nos: 256 - 259	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	A TO ICE 0.841	B TO ICE 0.534	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	FROZEN		**Purge Interval Time (____) min / Vol. (____) L**								
Submerged Tubing Depth (m)	/		**Depth to water (m)**								
Well Stick-up Height (m)	0.81	0.410	**Temperature (°C) 3%**								
Estimated Water Volume (L)	/		**pH (pH Units) ±0.1**								
(DTB – DTW) x ($\pi r^{2)}$*1000 (for well diameter) = 1 well volume			**Cond. (µs/cm) 3%**								
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume			**Specific Cond. (µs/cm) 3%**								
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume			**Redox (mV) 10%**								
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume			**DO (mg/L) 10%**								
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume			**DO (%) 10%**								
Calculations:			**Appearance & Odour (Clear, Silty, HC odours, etc.)**								
			Only for final readings	**Sulphide (mg/L)**							
				Turbidity (NTU)							
			Interval Purge Volume (L)								
			Cumulative Purge Volume (L):								

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-DC-06A/B.

Sample Date (Con't): FEB 2 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap (B) ☐ Not Sealed ☐ Other _____ A-HAD GLOVE CAP. REPLACED W/ 1" CAP.

Seal Replaced: ☐ J-Plug ☒ PVC Cap (FOR A.) ☐ Not required ☐ Other _____

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

Head Space Gas Measurements

	Units	Values A	Values B
Methane (CH4)	%LEL	Ø	Ø
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (C02)	PPM	25	75

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

1 X 1" CAP.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-DC-07A/B	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1" OD.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0390062 N: 6880639	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Cloudy -16°C
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: Lumix Nos: 252 - 255	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)		**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)		**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**									
(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		**Cond. (µs/cm) 3%**									
		Specific Cond. (µs/cm) 3%									
		Redox (mV) 10%									
		DO (mg/L) 10%									
		DO (%) 10%									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN
GLACIATED

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-DC-07 N/B

Sample Date (Con't): FEB 2 2016

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 (C02)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

GLACIATED OVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI - DC - 08A/B	Project Number	1343-005.14	Date	FEB 2 2016
Piezometer Diameter	1" OD	Client	GY - AAM	Samplers	GR + JH
UTM Location	Z: 08V E: 0390311 N: 6880582	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	~ -15°C
Waypoint	GPS: ELR Name: —			Recovery	☐ Good ☐ Bad ?
Photos	Cam: Lumix Nos: 246 - 249	Purge Method			
Duplicate Collected	☐ Yes Name: /	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name: /				

Initial Depth to Water (m)	
Depth to Bottom (m)	
Submerged Tubing Depth (m)	
Well Stick-up Height (m)	
Estimated Water Volume (L)	

(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

Calculations:

Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit		
Purge Interval Time (____) min / Vol. (____) L							
Depth to water (m)							
Temperature (°C) 3%							
pH (pH Units) ±0.1			FROZEN				
Cond. (µs/cm) 3%							
Specific Cond. (µs/cm) 3%							
Redox (mV) 10%							
DO (mg/L) 10%			GLACIATED				
DO (%) 10%							
Appearance & Odour (Clear, Silty, HC odours, etc.)			OVER				
Only for final readings: Sulphide (mg/L)							
Only for final readings: Turbidity (NTU)							
Interval Purge Volume (L)							
Cumulative Purge Volume (L):							

YSI ID	
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	

Sample Method:			
Waterra	Peristaltic	Disp. Bailer	Other

HEMMERA

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

Sample Date (Con't): FEB 2 2016

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 (C02)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

GLACIATED OVER

General Notes and Observations:

GUIDE FLAGGING LOCATED BUT DRIVEPOINTS GLACIATED OVER AND NOT ACTUALLY OBSERVED

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

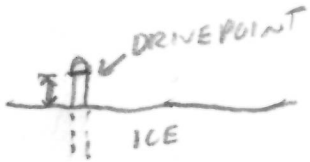
Sample Site	GSI - DC - 09 A/B	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1" OD	**Client**	GY - AAM	**Samplers**	GR / JH
UTM Location	Z:08V E: 0390612 N: 6880493	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	-15°C APPROX
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad ?
Photos	Cam: LUMIX Nos: 242 - 245.	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

	A	B
Initial Depth to Water (m)	FROZEN 1.055	1.026
Depth to Bottom (m)	/	
Submerged Tubing Depth (m)		
Well Stick-up Height (m)	GLACIATED	GLACIATED.
Estimated Water Volume (L)		

(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: A: 0.210 B: 0.210

ICE TO TOP OF 1" TUBE (NOT CAP)



Purge Start Time:		**Purge End Time:**				**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Purge Interval Time (____) min / Vol. (____) L										
Depth to water (m)										
Temperature (°C) 3%										
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)**										
Only for final readings **Turbidity (NTU)**										
Interval Purge Volume (L)										
Cumulative Purge Volume (L):										

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☒ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-DC-09 A/B

Sample Date (Con't): FEB 2 2016

Well Head Seal: ☐ J-Plug ☐ PVC Cap ☐ Not Sealed ☐ Other A. BAG - SEALED

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

Well properly sealed for gas monitoring: ☐ Yes ☐ No Details: B HAD PVC CAP.

Head Space Gas Measurements

	Units	Values	
Methane (CH4)	%LEL	(A) Ø	(B) 0
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (C02)	PPM	25	Ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	FROZEN	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

NEW 1" CAP FOR A.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GS1-DC-10 A/B	**Project Number**	1343-005.14	**Date**	FEB 2 2016
Piezometer Diameter	1" OD.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E:0390859 N:6880447	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~
Waypoint	GPS: ELR. Name: /			**Recovery**	☐ Good ☐ Bad ?
Photos	Cam: LUMIX Nos: 238-241	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	(A) 1.032 FROZEN.	(B) 0.951	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit		
Depth to Bottom (m)	FROZEN	FROZEN	**Purge Interval** Time (____) min / Vol. (____) L								
Submerged Tubing Depth (m)	/	/	**Depth to water (m)**								
Well Stick-up Height (m)	0.850	0.770	**Temperature (°C) 3%**								
Estimated Water Volume (L)	/	/	**pH (pH Units) ±0.1**								
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume			**Cond. (µs/cm) 3%**								
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume			**Specific Cond. (µs/cm) 3%**								
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume			**Redox (mV) 10%**								
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume			**DO (mg/L) 10%**								
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume			**DO (%) 10%**								
Calculations:			**Appearance & Odour (Clear, Silty, HC odours, etc.)**								
			Only for final readings	**Sulphide (mg/L)**							
				Turbidity (NTU)							
			Interval Purge Volume (L)								
			Cumulative Purge Volume (L):								

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	/				
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-DC-10 A/B

Sample Date (Con't): FEB 2 2016

Well Head Seal: ☐ J-Plug ☐ PVC Cap ☐ Not Sealed ☐ Other GLOVE + PLASTIC BAG (B) (A)

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

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

Head Space Gas Measurements

	Units	Values A	Values B
Methane (CH4)	%LEL	0	0
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (C02)	PPM	ø	ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-	FROZEN	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

BOTH CAPS REPLACED.

Consumables Used:

2 X 1" IPEX SCREW CAPS

STICK-UPS ARE 1" OD

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-HA-01A	Project Number	1343-005.14	Date	FEB 1 2016
Piezometer Diameter	1"	Client	GY - AAM	Samplers	GR + AN
UTM Location	Z08V E: 0387842 N: 6881129	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	~ -11°C
Waypoint	GPS: ELR Name: /			Recovery	☐ Good ☒ Bad
Photos	Cam: LUMIX Nos: 232-234	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:		DIRECT · SAMPLE		

Initial Depth to Water (m)	~ 2.500
Depth to Bottom (m)	2.[illegible]785.
Submerged Tubing Depth (m)	2.78
Well Stick-up Height (m)	1.10
Estimated Water Volume (L)	0.182

(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:

~ 182 ml

Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit

Parameter								
Purge Interval Time (____) min / Vol. (____) L								
Depth to water (m)								
Temperature (°C) 3%								
pH (pH Units) ±0.1		DIRECT SAMPLE.						
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)								
Only for final readings: Turbidity (NTU)								
Interval Purge Volume (L)								
Cumulative Purge Volume (L):								

YSI ID	/
Logged Field Parameters	/ ☐ Yes ☐ No
Time logged on YSI (24hr)	/
Sample Time (24hr)	~ 1635

Sample Method:			
Waterra	Peristaltic	Disp. Bailer	Other
	✓		

HEMMERA

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

Sample Date (Con't): FEB 1 2016

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

NO B

	Units	Values A	Values B
Methane (CH4)	%LEL	0	
Oxygen (O2)	%	18.0	
Carbon Dioxide (C02)	PPM	320	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☐ HCL (Hydrochloric)	40 ml	ALL WE COULD GET.
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

ALTHOUGH ABOUT 180 ML AVAILABLE, COULD ONLY DRAW OUT ABOUT 50 ml OF TURBID WATER— ENOUGH TO GET ONE DISS. MERCURY SAMPLE.

Consumables Used:

PERI TUBING 3.5 m

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-HA-02A	**Project Number**	1343-005.14	**Date**	FEB 1 2016
Piezometer Diameter	1" OD	**Client**	GY - AAM	**Samplers**	AN, GR.
UTM Location	Z: 8 E: 0387861 N: 6881131	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	overcast ~ -15°C
Waypoint	GPS: Name:			**Recovery**	☐ Good ☐ Bad ?
Photos	Cam: ELR. Nos: 235-237	**Purge Method**			
Duplicate Collected	☐ Yes Name: /	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: /				

Initial Depth to Water (m)	2.114 (ICE/BLOCK)	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit					
Depth to Bottom (m)	FROZEN	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)		**Depth to water (m)**											
Well Stick-up Height (m)	1.46	**Temperature (°C) 3%**											
Estimated Water Volume (L)		**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-HA-02A

Sample Date (Con't): FEB 1 2016

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
Carbon Dioxide (C02)	PPM	340

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	FROZEN	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Tubing frozen in well (peri. tubing). Could not remove. Depth to ice or blockage recorded @ 2.114 m. Used slimy level meter to measure. Meter tip may have been getting stuck on drive point connection lip.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-HA-03A	**Project Number**	1343-005.14	**Date**	FEB 1, 2016
Piezometer Diameter	1"	**Client**	GY - AAM	**Samplers**	DL JM
UTM Location	Z: 08 E: 0387881 N: 6881133	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	BROKEN CLOUD -13
Waypoint	GPS: HEM Name: GSI-HA-03A			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos:	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	X	X	X	X

Initial Depth to Water (m)	0.985	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**									
Well Stick-up Height (m)	0.94	**Temperature (^{0}C) 3%**									
Estimated Water Volume (L)	N/A	**pH (pH Units) ±0.1**									
(DTB – DTW) x ($\pi r^{2)}$*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**			FROZEN						
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations: X		**Appearance & Odour (Clear, Silty, HC odours, etc.)**			NOT SAMPLED						
		Only for final readings **Sulphide (mg/L)**									
		Only for final readings **Turbidity (NTU)**									
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): GSI-HA-03A

Sample Date (Con't): FEB 1 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ Not Sealed ☐ Other _____

Seal Replaced: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ 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 (C02)	PPM	200

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

CAP NEEDED TO BE CUT TO ACCESS STILL USABLE

35 cm OF SNOW COVER

Consumables Used:

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-HA-04A	Project Number	1343-005.14	Date	FEB 1, 2016
Piezometer Diameter	1"	Client	GY - AAM	Samplers	DC+JH
UTM Location	Z: 08 E: 0387915 N: 6881131	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	BROKEN CLOUD, -14
Waypoint	GPS: HEM Name: GSI-HA-04A~~X~~			Recovery	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 037-039	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	1.816	Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit						
Depth to Bottom (m)	2.110	Purge Interval Time (____) min / Vol. (____) L											
Submerged Tubing Depth (m)	1.9	Depth to water (m)											
Well Stick-up Height (m)	0.51	Temperature (°C) 3%											
Estimated Water Volume (L)	0.294	pH (pH Units) ±0.1											
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		Cond. (µs/cm) 3%											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		Specific Cond. (µs/cm) 3%											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		Redox (mV) 10%											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		DO (mg/L) 10%											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		DO (%) 10%											
Calculations: ½ · 2.110 − 1.816 = 0.294		Appearance & Odour (Clear, Silty, HC odours, etc.)											
		Only for final readings: Sulphide (mg/L)											
		Only for final readings: Turbidity (NTU)											
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

DIRECT SAMPLE

YSI ID	X	Sample Method:			
Logged Field Parameters	☐ Yes ☒ No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X				
Sample Time (24hr)	17:15		X		

HEMMERA

Sample Site (Con't): GS1-HA-04A

Sample Date (Con't): FEB 1, 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ Not Sealed ☐ Other _____

Seal Replaced: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ 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 (C02)	PPM	160

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100mL	Feb 1
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	15mL	Feb 1
2	500 ml (plastic)	General Chemistry	100 ml	-	-	~~25mL~~ 80mL	Feb 1 + Feb 2
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

15 cm OF SNOW COVER

THREADED CAP NEEDED TO BE CUT TO ACCESS, RELSEED

-Returned to location Feb 2 to continue filling Gen Chem bottle.

Consumables Used:

~~6m~~ 1/4 tubing

1.5' Silicone

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-MA-05A	**Project Number**	1343-005.14	**Date**	FEB 1, 2016
Piezometer Diameter	1"	**Client**	GY - AAM	**Samplers**	DC + JH
UTM Location	Z: 08 E: 0387898 N: 6881122	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	BROKEN CLOUD, -11
Waypoint	GPS: HEM Name: GSI-HA-05A			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 30-32	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:	X	X	X	X

Initial Depth to Water (m)	0.400	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit						
Depth to Bottom (m)	N/A	**Purge Interval** Time (____) min / Vol. (____) L											
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**											
Well Stick-up Height (m)	0.675	**Temperature (°C) 3%**											
Estimated Water Volume (L)	—	**pH (pH Units) ±0.1**											
		Cond. (µs/cm) 3%											
		Specific Cond. (µs/cm) 3%	FROZEN										
		Redox (mV) 10%											
		DO (mg/L) 10%											
		DO (%) 10%											
		Appearance & Odour (Clear, Silty, HC odours, etc.)	NOT SAMPLED										
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

(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:

YSI ID	X	**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

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

Sample Date (Con't): FEB 1, 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap (THREADED) ☐ 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 (C02)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- THREADED CAP WAS CUT TO ACCESS WELL STILL FUNCTIONAL.
- AT AT SURFACE

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-02 + GSI-PC-02A/B	**Project Number**	1343-005.14	**Date**	Feb 3, 2016
Piezometer Diameter		**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: E: N:	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Cloudy, -13°C
Waypoint	GPS: Name:			**Recovery**	☐ Good ☐ Bad
Photos	Cam: Lumix Nos: 281-285	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)		**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)		**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**									
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

Wells Destroyed
- MP09-02
- GSI-PC-02A/B

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MP09-02 + GSI-PC-02A/B

Sample Date (Con't): Feb 3, 2016

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 (C02)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Wells have been destroyed by placer mining activities at upper part of Pony Creek. We confirmed this visually with the use of GPS coordinates, the presence of mining equipment, and observations of active mining during the Sept 2015 sampling event.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-PC-03 A/B.	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	~	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E: 0389254 N: 68[illegible]81707	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: Lumix Nos: 295 - 298.	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)		**Purge Start Time:**		**Purge End Time:**				**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit						
Depth to Bottom (m)		**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**			NOT FOUND.										
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**													
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**													
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**			GLACIATED										
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**													
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**													
Calculations:		**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	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-PE-03 N/B

Sample Date (Con't): FEB 3 2016

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 (C02)	PPM	

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

GLACIATED OVER

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI-PC-04 A/B	Project Number	1343-005.14	Date	FEB 3 2016
Piezometer Diameter	1" STEEL.	Client	GY - AAM	Samplers	GR + JH
UTM Location	Z: 08V E: 0389586 N: 6881660	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	~ -12°C OVERCAST
Waypoint	GPS: ELR Name: /			Recovery	☐ Good ☐ Bad
Photos	Cam: Lumix Nos: 299 - 302	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:				

	A	B
Initial Depth to Water (m)	0.817 FROZEN	1.419 TO ICE
Depth to Bottom (m)		
Submerged Tubing Depth (m)		
Well Stick-up Height (m)	0.68 TO ICE	0.77 TO ICE
Estimated Water Volume (L)		

(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

Calculations:

Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit
Purge Interval Time (____) min / Vol. (____) L					
Depth to water (m)					
Temperature (°C) 3%	FROZEN				
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)					
Only for final readings: Turbidity (NTU)					
Interval Purge Volume (L)					
Cumulative Purge Volume (L):					

YSI ID	
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	

Sample Method:			
Waterra	Peristaltic	Disp. Bailer	Other

HEMMERA

Sample Site (Con't): GS1 - PC - 04 A/B

Sample Date (Con't): FEB 3 2016

Well Head Seal: ☐ J-Plug ☐ PVC Cap ☐ Not Sealed ☐ Other BAG ON A. CAP ON B.

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

Well properly sealed for gas monitoring: ☒ Yes ☐ No Details: ON A.

Head Space Gas Measurements

	Units	Values A	Values B
Methane (CH4)	%LEL	0	0
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (C02)	PPM	25	525

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

1" CAP PUT ON A

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	GSI - PC - 05 A/B	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	1" STEEL	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389709 N: 6881661	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C OVERCAST
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 303 - 306	**Purge Method**			
Duplicate Collected	☐ Yes Name: —	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: —				

	A	B
Initial Depth to Water (m)	0.838 TO ~~0.73~~ ICE	0.839 TO ~~0.76~~ ICE
Depth to Bottom (m)	—	—
Submerged Tubing Depth (m)		
Well Stick-up Height (m)	0.73 TO ICE	0.75 TO ICE
Estimated Water Volume (L)		

(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:

Purge Start Time:		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Purge Interval Time (____) min / Vol. (____) L									
Depth to water (m)									
Temperature (°C) 3%									
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)**									
Only for final readings **Turbidity (NTU)**									
Interval Purge Volume (L)									
Cumulative Purge Volume (L):									

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): GS1-PC-05 A/B

Sample Date (Con't): FEB 3 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap ☐ Not Sealed ☐ Other B HAS CAP A HAS PLASTIC BAG.

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☒ Other * A NEEDS CAP.

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

Head Space Gas Measurements

	Units	Values A	Values B
Methane (CH4)	%LEL	Ø	Ø
Oxygen (O2)	%	9.0	15.0
Carbon Dioxide (C02)	PPM	10,000 OVER RANGE →	10,000

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

FROZEN

General Notes and Observations:

* A NEEDS 1" CAP. WE RAN OUT OF PLASTIC CAPS. PLASTIC BAG TIED BACK ON A.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-03	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	~~1" STEEL~~ 3/4" INSIDE 1" STEEL	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0388958 N: 6881744	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ 12°C LIGHT SNOW
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 286 - 288.	**Purge Method**			
Duplicate Collected	☐ Yes Name: /	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: /				

Initial Depth to Water (m)	COULD NOT GET TAPE PASS THE FROZEN PERI TUBING. TUBING FROZEN IN PLACE.	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)		**Depth to water (m)**									
Well Stick-up Height (m)	0.54	**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		**Cond. (µs/cm) 3%**									
		Specific Cond. (µs/cm) 3%									
		Redox (mV) 10%									
		DO (mg/L) 10%									
		DO (%) 10%									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MP09-03

Sample Date (Con't): Feb 3, 2016

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	Ø
Oxygen (O2)	%	~~20~~ 21.0
Carbon Dioxide (C02)	PPM	25

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-04	**Project Number**	1343-005.14	**Date**	FEB 2, 2016
Piezometer Diameter	1.5"	**Client**	GY - AAM	**Samplers**	AN DC
UTM Location	Z: 08 E: 0389577 N: 6880610	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	OVERCAST -19°C
Waypoint	GPS: HEM Name: MP09-04			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 49-51	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra** X	**Peristaltic**	**Disp. Bailer** X	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	1.814	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit					
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**											
Well Stick-up Height (m)	1.225	**Temperature (°C) 3%**											
Estimated Water Volume (L)	N/A	**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr²)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**				FROZEN							
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**				NOT SAMPLED							
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra** X	**Peristaltic** X	**Disp. Bailer** X	**Other** X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MP09-04

Sample Date (Con't): FEB 2, 2016

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 (C02)	PPM	700

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

WELL HAS LOTS OF TUBING HAD TO USE SMALL DIA. TAP

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-05	**Project Number**	1343-005.14	**Date**	Feb. 2 / 2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389549 N: 6880589	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -19°C
Waypoint	GPS: HEM Name: MP09-05			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 61-63	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to ~~Water~~ ICE (m)	1.343	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit					
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**											
Well Stick-up Height (m)	1.050	**Temperature (°C) 3%**											
Estimated Water Volume (L)	N/A	**pH (pH Units) ±0.1**											
(DTB – DTW) x ($\pi r^{2)}$*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

FROZEN ONLY

MONITOR

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MP09-05

Sample Date (Con't): Feb. 2/2016

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)	%	18.5
Carbon Dioxide (C02)	PPM	260

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- FROZEN TUBING IN WELL SMALL DIA REQUIRED
- 20cm SNOW COVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09 - 08	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	WATERRA (5/8") INSIDE 1" STEEL	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389160 N: 6881719	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -12°C OVERCAST.
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 292 - 294				
Duplicate Collected	☐ Yes Name: /				
Field Blank Collected	☐ Yes Name:				

Purge Method			
Waterra	**Peristaltic**	**Disp. Bailer**	**Other**

Initial Depth to Water (m)	* DEPTH TO ICE 0.36 m	**Purge Start Time:**		**Purge End Time:**	
Depth to Bottom (m)					
Submerged Tubing Depth (m)					
Well Stick-up Height (m)	0.82				
Estimated Water Volume (L)					

Pen or YSI: ☐ YSI Pro Plus ☐ Pen Unit

(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:

* MEASURED USING FREE TUBE HITTING ICE.

Purge Interval Time (____) min / Vol. (____) L										
Depth to water (m)										
Temperature (°C) 3%										
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)**										
Only for final readings **Turbidity (NTU)**										
Interval Purge Volume (L)										
Cumulative Purge Volume (L):										

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MP09-08

Sample Date (Con't): FEB 3 2016

Well Head Seal: ☐ J-Plug ☐ PVC Cap ☒ Not Sealed ☐ Other NO CAP

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☐ Other PERI TUBING STUCK IN WELL

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 (C02)	PPM	0

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-09	**Project Number**	1343-005.14	**Date**	FEB 4 2016
Piezometer Diameter	1.5"	**Client**	GY - AAM	**Samplers**	AN DC
UTM Location	Z: 08 E: 0389241 N: 6880682	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	P CLOUDY -12°C
Waypoint	GPS: MEM Name: MP09-09			**Recovery**	☒ Good ☐ Bad
Photos	Cam: MEM Nos: 94-96				
Duplicate Collected	☐ Yes Name:				
Field Blank Collected	☐ Yes Name:				

Purge Method

Waterra	Peristaltic	Disp. Bailer	Other
		X	

Initial Depth to Water (m)	3.890	**Purge Start Time:**		**Purge End Time:**	**Pen or YSI:** ☐ YSI Pro Plus ☐ Pen Unit
Depth to Bottom (m)	5.560				
Submerged Tubing Depth (m)	N/A				
Well Stick-up Height (m)	2.46				
Estimated Water Volume (L)	1.75				

(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:

4/4
5.560
3.890
1.670

Purge Interval Time (____) min / Vol. (____) L									
Depth to water (m)									
Temperature (°C) 3%									
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)									
Only for final readings Turbidity (NTU)								100 SILTY	
Interval Purge Volume (L)									
Cumulative Purge Volume (L):									

Direct Sample

YSI ID	
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	10:00

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
	X		

HEMMERA

Sample Site (Con't): MD09-09

Sample Date (Con't): FEB 4, 2016

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	4
Oxygen (O2)	%	18.0
Carbon Dioxide (C02)	PPM	260

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☑ Field Filtered	☑ HNO_3 (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☑ Field Filtered	☑ HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☑ NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☑ H_2SO_4 (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☑ HNO_3 (Nitric)	120	
6	120 ml (plastic)	Sulphide	60 ml	-	☑ Zinc Acetate, then NaOH	120	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

10 cm of snow cover

Consumables Used:

1" bailer

1 inline filter

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-10	**Project Number**	1343-005.14	**Date**	FEB 4, 2018
Piezometer Diameter	1.5"	**Client**	GY - AAM	**Samplers**	AM DC
UTM Location	Z:08 E: 6389241 N: 6880681	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	P CLOUDY -12°C
Waypoint	GPS: HEM Name: MP09-10X			**Recovery**	☐ Good ☒ Bad
Photos	Cam: HEM Nos: 91-93	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:			X	

Initial Depth to Water (m)	3.655	**Purge Start Time:**	X	**Purge End Time:**	X					**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit		
Depth to Bottom (m)	4.390	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**											
Well Stick-up Height (m)	2.20	**Temperature (°C) 3%**											
Estimated Water Volume (L)	1	**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations: 4.390 − 3.655 = 0.735		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

Direct sample

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	1030			X	

HEMMERA

Sample Site (Con't): MP09-10

Sample Date (Con't): FEB 4, 2016

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)	%	18.1
Carbon Dioxide (C02)	PPM	380

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☑ Field Filtered	☑ HNO_3 (Nitric)	100	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☑ Field Filtered	☑ HCL (Hydrochloric)	30	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	200	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	Ø	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)	Ø	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)	Ø	Not enough sample
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH	Ø	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	Ø	

General Notes and Observations:

10cm of snow cover

Consumables Used:

1" bailer

1 inline filter

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-11	**Project Number**	1343-005.14	**Date**	FEB 4, 2016
Piezometer Diameter	1.5"	**Client**	GY - AAM	**Samplers**	AN DC
UTM Location	Z: 08 E: 0389219 N: 6880614	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	PARTLY CLOUDY -12°C
Waypoint	GPS: MEM Name: MP09-11			**Recovery**	☐ Good ☐ Bad
Photos	Cam: MEM Nos: 85-87	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to ICE Water (m)	7.900	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**									
Well Stick-up Height (m)	1.89	**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		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

MONITOR ONLY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MP09-11

Sample Date (Con't): FEB 4 2016

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)	%	17.7
Carbon Dioxide (C02)	PPM	460

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

10 cm of snow cover

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-12	**Project Number**	1343-005.14	**Date**	FEB 4, 2016
Piezometer Diameter	1.5"	**Client**	GY - AAM	**Samplers**	AN DC
UTM Location	Z: 08 E: 0389219 N: 6880613	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	P CLOUDY -12°C
Waypoint	GPS: MEM Name: MP09-12 X			**Recovery**	☐ Good ☒ Bad
Photos	Cam: MEM Nos: 89-90	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X				

Initial Depth to Water (m)	2.000
Depth to Bottom (m)	N/A
Submerged Tubing Depth (m)	N/A
Well Stick-up Height (m)	1.84
Estimated Water Volume (L)	N/A

(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:

Purge Start Time:		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Purge Interval Time (____) min / Vol. (____) L										
Depth to water (m)										
Temperature (^{0}C) 3%										
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):										

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ONLY
MONITOR

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MP09-12

Sample Date (Con't): FEB 4, 2016

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)	%	18.0
Carbon Dioxide (C02)	PPM	340

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

10cm of snow cover

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MP09-14	**Project Number**	1343-005.14	**Date**	FEB 4, 2016
Piezometer Diameter	5/8" WATERRA INSIDE 1" STEEL	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	ZONE E:038 9141 N: 6880720	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -11°C OVERCAST
Waypoint	GPS: ELR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 329-331	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	0.864 TO ICE/ BLOCKAGE	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)		**Depth to water (m)**									
Well Stick-up Height (m)	0.92	**Temperature (°C) 3%**									
Estimated Water Volume (L)		**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MP09 - 14

Sample Date (Con't): FEB 4, 2016

Well Head Seal: ☐ J-Plug ☐ PVC Cap ☐ Not Sealed ☒ Other GLOVE + PLASTIC BAG.

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☐ Other ABOVE METHOD IS PROBABLY THE BEST.

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

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	Ø
Oxygen (O2)	%	21.0
Carbon Dioxide (C02)	PPM	Ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

FROZEN

General Notes and Observations:

Consumables Used:

Peri. DS.

0.74cm MW09-2 Photo: 70-72

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-01	**Project Number**	1343-005.14	**Date**	FEB 3, 2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	DC AN
UTM Location	Z: 08 E: 0389393 N: 6880559	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	-19 BROKEN CLOUD
Waypoint	GPS: HEM Name: MW09-01			**Recovery**	☐ Good ☒ Bad
Photos	Cam: HEM Nos: 67-69	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	X PUMP & DAY			

Initial Depth to Water (m)	7.170
Depth to Bottom (m)	9.180
Submerged Tubing Depth (m)	N/A
Well Stick-up Height (m)	0.73
Estimated Water Volume (L)	4.00

(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:

9.18
7.17
2.01

Purge Start Time:		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Purge Interval Time (____) min / Vol. (____) L									
Depth to water (m)									
Temperature (°C) 3%									
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):									

DIRECT SAMPLE

YSI ID	
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	NOT 14:45 SEE NOTES

Sample Method:			
Waterra	**Peristaltic**	**Disp. Bailer**	**Other**

HEMMERA

Sample Site (Con't): MW09-01

Sample Date (Con't): FEB 3, 2016

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 (C02)	PPM	1700

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	120	DECANT OFF FEB2 @ 1700
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	90	DECANT OFF FEB2
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	120	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	120	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

Feb 2 PURGE INTO 1 LITRE BOTTLE

50cm SNOW COVER. Purge dry.

Due to the amount of sediment in the sample, we collected the Feb 2 purge water from the last portion of purging, and allowed the sediment to settle, we then used this water to filter for our D. Metals + D. Mercury Samples.

Consumables Used:

1" bailer

1' silicon

60 ft. ¼" tubing. peri.

Feb 3

The remaining sample bottles were filled with recharged well water, although they are extremely turbid/silty.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-02	Project Number	1343-005.14	Date	FEB 2, 2016
Piezometer Diameter	2"	Client	GY - AAM	Samplers	AN DC
UTM Location	Z: 08 E: 0389395 N: 6880558	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	HIGH CLOUD −19°C
Waypoint	GPS: HBM Name: MW09-02			Recovery	☒ Good ☐ Bad
Photos	Cam: HBM Nos:				
Duplicate Collected	☐ Yes Name:				
Field Blank Collected	☐ Yes Name:				

Purge Method

Waterra	Peristaltic	Disp. Bailer	Other
	X		

Initial Depth to Water (m)	3.612
Depth to Bottom (m)	4.720
Submerged Tubing Depth (m)	~ 4.5
Well Stick-up Height (m)	0.74
Estimated Water Volume (L)	~ 2.2

(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:

Purge Start Time: 16:52 | Purge End Time: 16:55 | Pen or YSI: ☒ YSI Pro Plus ☐ Pen Unit

Purge Interval Time (3) min / Vol. (____) L	16:55							
Depth to water (m)	4.12							
Temperature (°C) 3%	0.1							
pH (pH Units) ±0.1	7.28							
Cond. (µs/cm) 3%	1463							
Specific Cond. (µs/cm) 3%	2790							
Redox (mV) 10%	-69.3							
DO (mg/L) 10%	2.68							
DO (%) 10%	18.6							
Appearance & Odour (Clear, Silty, HC odours, etc.)	clear-Yellow brown tinge							
Only for final readings: Sulphide (mg/L)	0.04							
Only for final readings: Turbidity (NTU)	18.8							
Interval Purge Volume (L)	1.0							
Cumulative Purge Volume (L):	1.0							

Direct Sample.

YSI ID	MW09-02
Logged Field Parameters	☒ Yes ☐ No
Time logged on YSI (24hr)	16:57
Sample Time (24hr)	17:00

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
	X		

HEMMERA

Sample Site (Con't): MW09-02

Sample Date (Con't): FEB 2, 2016

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 (C02)	PPM	520

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	✓	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	✓	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	✓	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	✓	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	✓	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	✓	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	✓	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	✓	

General Notes and Observations:

Previous notes indicated proper purge. DTW dropped after purge start, therefore switched to "direct sample".
DTW seemed to stabilize, recommend proper purge next winter.

Consumables Used:

~5 m peri. tubing.
6" silicon.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-03	Project Number	1343-005.14	Date	FEB 3, 2016
Piezometer Diameter	2"	Client	GY - AAM	Samplers	AN DC
UTM Location	Z:08 E: 0389420 N: 6880557	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	HIGH CLOUD -19°C
Waypoint	GPS: HEM Name: MW09-03			Recovery	☒ Good ☐ Bad
Photos	Cam: HEM Nos: 76-78	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:		X		

Initial Depth to Water (m)	6.754
Depth to Bottom (m)	9.953
Submerged Tubing Depth (m)	9.2
Well Stick-up Height (m)	0.23
Estimated Water Volume (L)	6.4

(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:

9.953
6.754
3.200

Purge Start Time:	1217	Purge End Time:	12:54	Pen or YSI:	☒ YSI Pro Plus ☐ Pen Unit				
Purge Interval Time (____) min / Vol. (__1__) L		1224	1230	1238	1246	1254			
Depth to water (m)		6.95	6.99	6.98	6.98	6.99			
Temperature (°C) 3%		0.5	0.3	0.4	0.4	0.4			
pH (pH Units) ±0.1		8.37	8.04	7.62	7.52	7.45			
Cond. (µs/cm) 3%		1447	1436	1428	1431	1431			
Specific Cond. (µs/cm) 3%		2719	2718	2702	2702	2703			
Redox (mV) 10%		133.7	120.2	115.1	116.1	112.0			
DO (mg/L) 10%		2.85	3.04	3.23	3.46	3.36			
DO (%) 10%		20.2	20.9	22.8	24.0	23.4			
Appearance & Odour (Clear, Silty, HC odours, etc.)		Clear	Clear	Clear	Clear	Clear			
Only for final readings	Sulphide (mg/L)	—	—	—	—	—			
	Turbidity (NTU)	—	—	—	—	0.59			
Interval Purge Volume (L)		1.0	1.0	1.0	1.0	1.0			
Cumulative Purge Volume (L):		1.0	2.0	3.0	4.0	5.0			

YSI ID		Sample Method:			
Logged Field Parameters	☐ Yes ☒ No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)					
Sample Time (24hr)	13:00		X		

HEMMERA

Sample Site (Con't): MW09-03

Sample Date (Con't): FEB 3, 2016

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)	%	18.0
Carbon Dioxide (C02)	PPM	380

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)	120	
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH	120	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- BURIED UNDER SNOW COVER (0.80m)

Consumables Used:

1" SILICONE

25' 1½" HDPE

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-04	Project Number	1343-005.14	Date	FEB 3, 2016
Piezometer Diameter	2"	Client	GY - AAM	Samplers	AN DC
UTM Location	Z: 08 E: 0389420 N: 6880558	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	HIGH CLOUD -19°C
Waypoint	GPS HEM Name: MW09-04			Recovery	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 73-75	Purge Method			
Duplicate Collected	☒ Yes Name: MW16-200	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:		X		

Initial Depth to Water (m)	4.738.
Depth to Bottom (m)	7.680
Submerged Tubing Depth (m)	7.0
Well Stick-up Height (m)	.04
Estimated Water Volume (L)	5.8

(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:

7.680
4.738
2.942

Purge Start Time:	10:00	Purge End Time:	10:40	Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit				
Purge Interval Time (min) / Vol. (L) L	10:04	10:15	10:25	10:39					
Depth to water (m)	5.03	5.38	5.45	5.47					
Temperature (°C) 3%	0.5	0.5	0.4	0.3					
pH (pH Units) ±0.1	8.26	8.28	8.29	8.37					
Cond. (µs/cm) 3%	1460	1454	1464	1467					
Specific Cond. (µs/cm) 3%	2737	2732	2766	2766					
Redox (mV) 10%	143.1	137.0	138.3	141.5					
DO (mg/L) 10%	3.16	3.34	9.04	3.78					
DO (%) 10%	22.9	23.8	28.1	26.2					
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear	Clear	Clear	Clear					
Only for final readings: Sulphide (mg/L)	—	—	—	0.03					
Only for final readings: Turbidity (NTU)	—	—	—	3.40*					
Interval Purge Volume (L)	1.0	1.0	1.0	1.0					
Cumulative Purge Volume (L):	1.0	2.0	3.0	4.0					

YSI ID	ELR
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	10:30

Sample Method:			
Waterra	Peristaltic	Disp. Bailer	Other
	X		

* some ice/slush floating in sample. Results for turbidity may not be accurate.

HEMMERA

Sample Site (Con't): MW09-04

Sample Date (Con't): FEB 3, 2016

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)	%	18.0
Carbon Dioxide (C02)	PPM	440

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)	40	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)	120	
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH	120	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120	

General Notes and Observations:

- TRANSDUCER IN WELL
- BURIED UNDER SNOW (80 cm)

Consumables Used:

1' SILICONE

25' 1/4 HDPE

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-05	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E:0389412 N:6880656	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	-12 WIND LIGHT SNOW
Waypoint	GPS: GR Name: /			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos:	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	~~DRY~~ 7.480 DRY	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)		**Depth to water (m)**									
Well Stick-up Height (m)	1.11	**Temperature (^{0}C) 3%**									
Estimated Water Volume (L)		**pH (pH Units) ±0.1**									
(DTB – DTW) x ($\pi r^{2)}$*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

DRY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MW09-05

Sample Date (Con't): FEB 3 2016

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	Ø
Oxygen (O2)	%	20.9
Carbon Dioxide (C02)	PPM	375

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

2545

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-06	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389412 N: 6880656	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	-12 LIMOY LIGHT SNOW
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☒ Bad
Photos	Cam: ELR Nos: 313 - 316	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X			✓	

Initial Depth to Water (m)	4.454
Depth to Bottom (m)	5.950
Submerged Tubing Depth (m)	—
Well Stick-up Height (m)	2.07
Estimated Water Volume (L)	~ 3

(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:

1.450 X 2

~ 3 L

Purge Start Time:	16:33	**Purge End Time:**		1649		**Pen or YSI:**	☒ YSI Pro Plus ☐ Pen Unit			
Purge Interval Time (____) min / Vol. (1) L	~~1L~~	~~2L~~	~~3L~~	~~4L~~ 16 L/S	1649					
Depth to water (m)		5.200	5.520	5.760						
Temperature (°C) 3%	1.3	2.0	2.2	2.3	1.6					
pH (pH Units) ±0.1	6.06	6.41	6.86	7.2	7.29					
Cond. (µs/cm) 3%	970	1066	1110	772	678					
Specific Cond. (µs/cm) 3%	1774	1890	1975	1360	1209					
Redox (mV) 10%	210.4	189.8	174.9	162.3	159.9					
DO (mg/L) 10%	2.53	2.79	3.01	1.78	2.53					
DO (%) 10%	18.7	~~18.8~~ 20.6	21.5	13.2	17.9					
Appearance & Odour (Clear, Silty, HC odours, etc.)	SLIGHTLY TURBID.	↓	TURBID	↓	↓					
Only for final readings — **Sulphide (mg/L)**	—	—	—	—		0.05 (FEB 4)				
Only for final readings — **Turbidity (NTU)**	—	—	—	—		16.6 (FEB 4)				
Interval Purge Volume (L)	1	1	1	0.5	0.4					
Cumulative Purge Volume (L):	1	2	3	3.5	3.9					

YSI ID	Pine	**Sample Method:**			
Logged Field Parameters	☐ Yes ☒ No				
Time logged on YSI (24hr)	—	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	09-15 (Feb 4)			X	

HEMMERA

Sample Site (Con't): MW09-06

Sample Date (Con't): FEB 3 2016 / Feb 4 ← Sampled

↑ Purge

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	Ø
Oxygen (O2)	%	14.1
Carbon Dioxide (C02)	PPM	3350

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	FULL	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- Purged 3.9L on Feb 2, purged well dry + allow overnight recharge.
- Feb 4, Sampled right away to minimize sediment in samples.
- DTW prior to sampling is: DIPPED ON FEB 4.. 4.450 m

Consumables Used:

1x2" bailer

7m of twine.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-07	**Project Number**	1343-005.14	**Date**	Feb 4, 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	JH + GR
UTM Location	Z:08V E: 0389324 N: 6880699	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Clear -13°C
Waypoint	GPS: ELR Name: -			**Recovery**	☐ Good ☐ Bad
Photos	Cam: ELR Nos: 317-319	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X				

Initial Depth to Water (m)	3.316 TO ICE/ BLOCKAGE	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit						
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)		**Depth to water (m)**											
Well Stick-up Height (m)	1.37	**Temperature (°C) 3%**											
Estimated Water Volume (L)		**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

FROZEN / DRY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MW09-07

Sample Date (Con't): FEB 4 2016

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	Ø
Oxygen (O2)	%	20.9
Carbon Dioxide (C02)	PPM	Ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

FROZEN/DRY

General Notes and Observations:

DURING OPENING OF WELL. TOP OF CASING CRACKED. TAPED UP WITH ELECTRICAL TAPE TO ~~GAIN~~ KEEP SEAL.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-08	**Project Number**	1343-005.14	**Date**	Feb. 2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389818 N: 6880576	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -19°C
Waypoint	GPS: MEM Name: MW09-08			**Recovery**	☐ Good ☐ Bad
Photos	Cam: MEM Nos: 55-57	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	X	X	X	X

Initial Depth to ICE Water (m)	1.240	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**									
Well Stick-up Height (m)	1.112	**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		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings — **Sulphide (mg/L)**									
		Only for final readings — **Turbidity (NTU)**									
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

MONITORED

ONLY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MW09-08

Sample Date (Con't): Feb. 2 / 2016

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)	%	18.8
Carbon Dioxide (C02)	PPM	340

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

TUBING FROZEN IN WELL

20 cm SNOW COVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09 -11	**Project Number**	1343-005.14	**Date**	FEB 4 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389040 N: 6880711	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -11°C PATCHY
Waypoint	GPS: ~~LUMIX~~ EOS Name:			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 323-325	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	4.845 FROZEN/ DRY	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	-	**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**									
(DTB – DTW) x ($\pi r^{2)}$*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN / DRY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MW09-11

Sample Date (Con't): FEB 4 2016

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	Ø
Oxygen (O2)	%	20.9
Carbon Dioxide (C02)	PPM	1125

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-	FROZEN / DRY	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09 - 14 & MW09-13	Project Number	1343-005.14	Date	FEB 3 2016
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	GR + JH
UTM Location	Z:08V E:0389006 N:6881669	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	~12°C CLOUDY
Waypoint	GPS: ELR Name: —			Recovery	☐ Good ☒ Bad ?
Photos	Cam: LUMIX Nos: 277 – 280.	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:				

	(13)	(14)
Initial Depth to Water (m)	8.920 FROZEN/BLOCKED	5.114
Depth to Bottom (m)	—	7.618
Submerged Tubing Depth (m)	—	—
Well Stick-up Height (m)	0.73	0.74
Estimated Water Volume (L)	~~5.00~~	5.0

(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

Calculations:

~ 5L

Purge Start Time:		Purge End Time:		Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit

Parameter							
Purge Interval Time (___) min / Vol. (___) L							
Depth to water (m)							
Temperature (°C) 3%							
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)							
Only for final readings: Turbidity (NTU)							
Interval Purge Volume (L)							
Cumulative Purge Volume (L):							

MW09-14 DIRECT SAMPLED WITH BAILER.

* MW09-13 was not sampled

YSI ID	
Logged Field Parameters	☐ Yes ☐ No
Time logged on YSI (24hr)	
Sample Time (24hr)	10:15

Sample Method:

Waterra	Peristaltic	Disp. Bailer	Other
		(14) BAILER.	

HEMMERA

Sample Site (Con't): MW09-13 & MW09-14

Sample Date (Con't): FEB 3 2016

Well Head Seal: ☐ J-Plug ☒ PVC Cap ☐ Not Sealed ☐ Other ON BOTH

Seal Replaced: ☐ J-Plug ☒ PVC Cap ☒ Not required ☐ Other FOR BOTH

Well properly sealed for gas monitoring: ☒ Yes ☐ No Details: FOR BOTH.

SAMPLED 14 ONLY.

Head Space Gas Measurements

	Units	Values 13	14
Methane (CH4)	%LEL	Ø	Ø
Oxygen (O2)	%	20.9	20.9
Carbon Dioxide (C02)	PPM	1200	~~475~~ 525

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	20	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	~ 200	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	50	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	50	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50	

General Notes and Observations:

ONLY SAMPLED (14) LIKELY MELTWATER ABOVE AN ICE PLUG. TRIED PERISTALTIC PUMP BUT ~~HDI~~ TUBING ICE UP. USE 1" BAILER TO COLLECT WATER. BALL FREEZING IN BAILER - GOT MIN VOLUMES.

Consumables Used:

1" bailer

5m ¼" tubing

6" silicone

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-15	**Project Number**	1343-005.14	**Date**	FEB 3 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z:08V E:0388921 N: 6881723	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	-12°C LIGHT SNOW.
Waypoint	GPS: ECR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: LUMIX Nos: 310 – 312	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	13.989	**Purge Start Time:**		**Purge End Time:**		**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	14.025	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)		**Depth to water (m)**									
Well Stick-up Height (m)	0.89	**Temperature (°C) 3%**									
Estimated Water Volume (L)		**pH (pH Units) ±0.1**									
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations: 0.072 L (72mL)		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

INSUFFICIENT VOLUME

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)					
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): MW09-15

Sample Date (Con't): FEB 3, 2016

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)	%	20.7
Carbon Dioxide (C02)	PPM	650.

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

INSTRUMENTATION IN WELL. TRANSDUCER?

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-16	Project Number	1343-005.14	Date	Feb 1, 2016
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JH + DC
UTM Location	Z: 08 E: 0387990 N: 6881096	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	Broken clouds, -11°C
Waypoint	GPS: Hem Name: MW09-16 X			Recovery	☐ Good ☐ Bad
Photos	Cam: Hem Nos: 27-29				
Duplicate Collected	☐ Yes Name: X				
Field Blank Collected	☐ Yes Name: X				

Purge Method			
Waterra	Peristaltic	Disp. Bailer	Other
X	X	X	X

Initial Depth to Water (m)	1.855	Purge Start Time: X	Purge End Time: X	Pen or YSI:	☐ YSI Pro Plus ☐ Pen Unit
Depth to Bottom (m)	N/A				
Submerged Tubing Depth (m)	N/A				
Well Stick-up Height (m)	1.29				
Estimated Water Volume (L)	N/A				

(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:

Purge Interval Time (____) min / Vol. (____) L									
Depth to water (m)									
Temperature (°C) 3%									
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)									
Only for final readings: Turbidity (NTU)									
Interval Purge Volume (L)									
Cumulative Purge Volume (L):									

NOT SAMPLED FROZEN

YSI ID	
Logged Field Parameters	☐ Yes ☐ No X
Time logged on YSI (24hr)	
Sample Time (24hr)	NOT SAMPLED

Sample Method:			
Waterra	Peristaltic	Disp. Bailer	Other
X	X	X	X

HEMMERA

Sample Site (Con't): MW09-16

Sample Date (Con't): FEB 1 2016

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 (C02)	PPM	525

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

27cm of Snow

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-17	Project Number	1343-005.14	Date	Feb 1, 2016
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JH + DC
UTM Location	Z:08 E:0388078 N6880972	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	Broken cloud, -16°C
Waypoint	GPS: Hem Name: MW09-17*			Recovery	☐ Good ☐ Bad
Photos	Cam: Hem Nos: 015-017	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:		X		

Initial Depth to ~~Water~~ Ice (m)	5.609	Purge Start Time:	X	Purge End Time:	X	Pen or YSI:	☐ YSI Pro Plus ☑ Pen Unit						
Depth to Bottom (m)	—	Purge Interval Time (____) min / Vol. (____) L											
Submerged Tubing Depth (m)	—	Depth to water (m)	Well										
Well Stick-up Height (m)	0.97	Temperature (°C) 3%											
Estimated Water Volume (L)	—	pH (pH Units) ±0.1											
		Cond. (µs/cm) 3%											
		Specific Cond. (µs/cm) 3%	frozen										
		Redox (mV) 10%											
		DO (mg/L) 10%											
		DO (%) 10%	or										
		Appearance & Odour (Clear, Silty, HC odours, etc.)	dry										
		Only for final readings: Sulphide (mg/L)											
		Only for final readings: Turbidity (NTU)											
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

(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:

N/A

YSI ID		Sample Method:			
Logged Field Parameters	☐ Yes ☐ No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	X				
Sample Time (24hr)	Not sampled				

HEMMERA

Sample Site (Con't): MW09-17

Sample Date (Con't): Feb 1, 2016

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)	%	9.3
Carbon Dioxide (C02)	PPM	10000 + (overrange)

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- well frozen or dry. silt observed on water level probe
- Not surged
- ~30 cm of snow on ground

Consumables Used:

None

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-18	**Project Number**	1343-005.14	**Date**	Feb 1, 2016
Piezometer Diameter	2" PVC	**Client**	GY - AAM	**Samplers**	JH · DC
UTM Location	Z:08 E:0388055 N:6880984	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Broken Cloud, -16°C
Waypoint	GPS: Hem Name: MW09-18			**Recovery**	☒ Good ☐ Bad
Photos	Cam: Hem Nos: 012 - 014	**Purge Method**			
Duplicate Collected	☒ Yes Name: MW16-100	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☒ Yes Name: FB16-100			X	

Initial Depth to Water (m)	5.104
Depth to Bottom (m)	7.696
Submerged Tubing Depth (m)	7.45
Well Stick-up Height (m)	0.86
Estimated Water Volume (L)	5.2 L

(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:

7.696
- 5.104
2.592 x 2 = 5.184 L

Purge Start Time: 13:00 **Purge End Time:** 13:07 **Pen or YSI:** ☒ YSI Pro Plus ☐ Pen Unit

Purge Interval Time (____) min / Vol. (1) L	13:00	13:03	13:05	13:06	13:07				
Depth to water (m)	5.105	5.105	5.105	5.105	5.105				
Temperature (°C) 3%	-0.1	-0.1	-0.1	-0.1	-0.1				
pH (pH Units) ±0.1	6.55	6.71	6.74	6.75	6.76				
Cond. (µs/cm) 3%	1285	1303	1329	1330	1356				
Specific Cond. (µs/cm) 3%	2465	2505	2556	2559	2608				
Redox (mV) 10%	160.8	139.0	133.8	130.5	127.5				
DO (mg/L) 10%	4.06	2.56	2.59	2.28	2.16				
DO (%) 10%	28.4	17.7	17.9	15.6	14.4				
Appearance & Odour (Clear, Silty, HC odours, etc.)	clear	clear	clear	clear	clear				
Only for final readings Sulphide (mg/L)	–	–	–	–	0.0 (Feb 4)				
Only for final readings Turbidity (NTU)	–	–	–	–	34.1				
Interval Purge Volume (L)	1.0	1.0	1.0	1.0	1.0				
Cumulative Purge Volume (L):	1.0	2.0	3.0	4.0	5.0				

YSI ID	Pink
Logged Field Parameters	☐ Yes ☒ No
Time logged on YSI (24hr)	–
Sample Time (24hr)	13:10

Sample Method:

Waterra	**Peristaltic**	**Disp. Bailer**	**Other**
		X	

HEMMERA

Sample Site (Con't): MW09-18

Sample Date (Con't): Feb 1, 2016

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 (C02)	PPM	125

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100mL	each
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	15mL	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100mL	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100mL	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60mL	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	50 mL	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	60mL	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50mL	↓

General Notes and Observations:

~30cm of snow on ground

- Returned Feb 4 @ 11:00 to collect in-field sulphides

Consumables Used:

1 bailer

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-19	Project Number	1343-005.14	Date	Feb 1, 2016
Piezometer Diameter	2" PVC	Client	GY - AAM	Samplers	JH. DC
UTM Location	Z:08 E:0388051 N:6881014	Project Name	Mount Nansen 2016 GW Sampling Program	Weather/Temperature	Broken Cloud -
Waypoint	GPS: Hem Name: MW09-19*			Recovery	☒ Good ☐ Bad
Photos	Cam: Hem Nos: 018-020	Purge Method			
Duplicate Collected	☐ Yes Name:	Waterra	Peristaltic	Disp. Bailer	Other
Field Blank Collected	☐ Yes Name:		X		

Initial Depth to Water (m)	3.040	Purge Start Time:	11:51	Purge End Time:	12:08	Pen or YSI:	☒ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	5.797	Purge Interval Time (3) min / Vol. (____) L	11:53	11:56	11:59	12:02	12:08				
Submerged Tubing Depth (m)	5.6	Depth to water (m)	3.30	3.387	3.452	3.463	3.280				
Well Stick-up Height (m)	0.99	Temperature (°C) 3%	0.1	0.0	0.0	0.0	-0.3				
Estimated Water Volume (L)	5.5 L	pH (pH Units) ±0.1	6.08	6.42	6.53	6.61	6.68				
		Cond. (µs/cm) 3%	1148	1133	1127	1123	1116				
		Specific Cond. (µs/cm) 3%	2193	2164	2154	2151	2157				
		Redox (mV) 10%	-34.9	-62.4	-70.8	-77.7	-77.8				
		DO (mg/L) 10%	2.96	2.22	1.23	0.80	0.52				
		DO (%) 10%	20.4	15.7	8.7	5.5	3.5				
		Appearance & Odour (Clear, Silty, HC odours, etc.)	sulfur odour clear	clear slight sulfur	clear sulfur odour	clear sulfur odour	clear silty odour				
		Only for final readings: Sulphide (mg/L)	–	–	–	–	0.12				
		Only for final readings: Turbidity (NTU)	–	–	–	–	2.87				
		Interval Purge Volume (L)	.350	.450	.350	.300	.150				
		Cumulative Purge Volume (L):	.350	.800	1.150	1.450	1.600				

(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:

5.797
-3.040
2.757 x 2 = 5.514 L

YSI ID	Pine	Sample Method:			
Logged Field Parameters	☐ Yes ☒ No	Waterra	Peristaltic	Disp. Bailer	Other
Time logged on YSI (24hr)	—				
Sample Time (24hr)	12:10			X	

20.4 15.7
2.96 2.22

HEMMERA

Sample Site (Con't): MW09-19

Sample Date (Con't): Feb 1, 2016

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 (C02)	PPM	50

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100mL	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	15mL	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100mL	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100mL	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60mL	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	50mL	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	60mL	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50mL	

General Notes and Observations:

-25cm of snow on ground
- Water freezing in tube replaced tubing froze up a second time, switched to bailer for sampling

Consumables Used:

40' 1/4 HDPE
1' SILICONE
1x BAILER
20' TWINE

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-20	**Project Number**	1343-005.14	**Date**	Feb. 2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389592 N: 6880587	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -19°C
Waypoint	GPS: HEM Name: MW09-20			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 52-54	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:	X	X	X	X

Initial Depth to ~~Water~~ Ice (m)	3.700	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit						
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**											
Well Stick-up Height (m)	0.92	**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		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**			FROZEN								
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**			NOT SAMPLED								
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MW09-20

Sample Date (Con't): Feb. 2/2016.

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)	%	18.7
Carbon Dioxide (C02)	PPM	1500

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

10 cm snow cover

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-21	**Project Number**	1343-005.14	**Date**	Feb. 2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389536 N: 6880576	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -19°C.
Waypoint	GPS: HEM Name: MW09-21			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 58 - 60	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	X	X	X	X

Initial Depth to Water (m)	1.030	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit				
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**									
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**									
Well Stick-up Height (m)	0.40	**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		**Cond. (µs/cm) 3%**									
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**									
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**									
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**									
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**									
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**									
		Only for final readings	**Sulphide (mg/L)**								
			Turbidity (NTU)								
		Interval Purge Volume (L)									
		Cumulative Purge Volume (L):									

FROZEN

MONITOR ONLY

YSI ID	X	**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): MW09-21

Sample Date (Con't): Feb. 2/2016

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)	%	18.6
Carbon Dioxide (C02)	PPM	260

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

- TUBING FROZEN IN WELL
- WELL HAS ICE SEEP AT COVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-22	**Project Number**	1343-005.14	**Date**	Feb. 3/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389497 N: 6880551	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Snowing ~ -18°C.
Waypoint	GPS: HEM Name: MW09-22*			**Recovery**	☐ Good ☒ Bad
Photos	Cam: HEM Nos: 82-84	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:			X	

Initial Depth to Water (m)	4.587
Depth to Bottom (m)	5.298
Submerged Tubing Depth (m)	—
Well Stick-up Height (m)	0.83
Estimated Water Volume (L)	~1.8

(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:

Purge Start Time:		**Purge End Time:**				**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit		
Purge Interval Time (____) min / Vol. (____) L									
Depth to water (m)									
Temperature (°C) 3%									
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):									

Direct Sample. min Vol.

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☒ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)	16:40			X	

HEMMERA

Sample Site (Con't): MW09-22

Sample Date (Con't): Feb. 3/2016.

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)	%	17.3
Carbon Dioxide (C02)	PPM	5000*

* PPM OVER.

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	100	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	15	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	100	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	100	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	60	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	50	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	60	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	50	

General Notes and Observations:

30cm SNOW COVER.

Consumables Used:

1" bailer + twine.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-23	**Project Number**	1343-005.14	**Date**	Feb. 3/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC
UTM Location	Z: 8 E: 0389458 N: 6880555	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -15°C Very Windy.
Waypoint	GPS: HEM. Name: MW09-23			**Recovery**	☒ Good ☐ Bad
Photos	Cam: HEM. Nos: 79-81	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	manual X			

Initial Depth to Water (m)	12.600	**Purge Start Time:**	15:20	**Purge End Time:**	15:32	**Pen or YSI:**	☒ YSI Pro Plus ☐ Pen Unit					
Depth to Bottom (m)	15.850	**Purge Interval** Time (____) min / Vol. (____) L	15:23	15:27	15:31							
Submerged Tubing Depth (m)	~13.8	**Depth to water (m)**	12.80	12.8	12.8							
Well Stick-up Height (m)	0.11	**Temperature (°C) 3%**	⊘	⊘	0.0							
Estimated Water Volume (L)	~6.5	**pH (pH Units) ±0.1**	7.24	7.19	7.21							
(DTB – DTW) x (πr^{2})*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**	668	705	716							
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**	1277	1351	1372							
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**	-68.8	-83.0	-79.7							
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**	2.66	3.34	3.30							
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**	18.0	22.9	21.4							
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**	Grey turbid	Same	Same							
		Only for final readings — **Sulphide (mg/L)**	-	-	0.29*							
		Only for final readings — **Turbidity (NTU)**	-	-	49.1*							
		Interval Purge Volume (L)	9	9	7							
		Cumulative Purge Volume (L):	9	18	25							

YSI ID	ELK	**Sample Method:**			
Logged Field Parameters	☒ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	15:35				
Sample Time (24hr)	15:40	X			

* sample freezing. Ice/slush may affect sulphide + turbidity results. reagents also freezing.

HEMMERA

Sample Site (Con't): MW09-23

Sample Date (Con't): feb. 3/2016

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)	%	18.0
Carbon Dioxide (C02)	PPM	320

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	120	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	46	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	500	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	145	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	120	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	120	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	120	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	120.	

General Notes and Observations:

Consumables Used:

~18 m waterra tubing.
+ footvalve.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	MW09-24	**Project Number**	1343-005.14	**Date**	Feb. 2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389561 N: 6880622	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~-19°C
Waypoint	GPS: HEM Name: MW09-24			**Recovery**	☒ Good ☐ Bad
Photos	Cam: HEM Nos: 64-66	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:	X		X	

Initial Depth to Water (m)	9.440	**Purge Start Time:**		**Purge End Time:**			**Pen or YSI:**	☒ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	11.240	**Purge Interval Time (____) min / Vol. (____) L**	13:39	13:42	Stopped purge to locate bailer.	14:39	14:44	14:50			
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**	9.45								
Well Stick-up Height (m)	0.67	**Temperature (°C) 3%**	0.1	0.0		0.0	0.2	0.2			
Estimated Water Volume (L)	3.6 L	**pH (pH Units) ±0.1**	7.42	7.44		7.32	7.33	723			
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**	501	398.9		377.3	431.7	445.8			
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**	954	763.2		722.1	818.9	846.8			
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**	220.7	226.9		203.6	~~430.7~~	224.2			
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**	10.52	9.69		10.00	8.96	8.06			
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**	72.3	65.8		68.0	61.3	55.2			
Calculations: 11.240 − 9.440 = 1.800		**Appearance & Odour (Clear, Silty, HC odours, etc.)**	Brown turbid	Same.		Clear.	Clear.	Clear.			
		Only for final readings **Sulphide (mg/L)**	—	—		—	—	0.17			
		Only for final readings **Turbidity (NTU)**	—	—		—	—	37.6			
		Interval Purge Volume (L)	1	1		4	4	2			
		Cumulative Purge Volume (L):	1	2		6	12	14			

YSI ID	MW09-24	**Sample Method:**			
Logged Field Parameters	☒ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	14:51				
Sample Time (24hr)	13:30*			X	

* labeled sample bottles prior to purge. Account for time discrepancy.

HEMMERA

Sample Site (Con't): MW09-24

Sample Date (Con't): Feb. 2/2016

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)	%	24.3
Carbon Dioxide (C02)	PPM	4500

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☒ Field Filtered	☒ HNO_3 (Nitric)	1	
1b	40 ml (glass)	Dissolved Mercury	15 mL	☒ Field Filtered	☒ HCL (Hydrochloric)	1	
2	500 ml (plastic)	General Chemistry	100 ml	-	-	1	
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☒ NaOH (Sodium Hydroxide)	1	
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☒ H_2SO_4 (Sulfuric)	1	
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☒ HNO_3 (Nitric)	1	
6	120 ml (plastic)	Sulphide	60 ml	-	☒ Zinc Acetate, then NaOH	1	
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-	1	

General Notes and Observations:

Did not have bailer in truck. Had to stop mid purge to find bailer. Bailer used due to turbidity/sand at bottom of well. Clogged foot valve and could not manual purge. Tu waterra.

Consumables Used:

1 bailer + twine.
1 inline filter.

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W141030838H01	**Project Number**	1343-005.14	**Date**	Feb.2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389523 N: 6880669	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~ -19°C
Waypoint	GPS: HEM Name: BH01			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 46-48	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:	X	X	X	X

Initial Depth to Water (m) FROZEN	6.450	**Purge Start Time:**	X	**Purge End Time:**	X	**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit							
Depth to Bottom (m)	N/A	**Purge Interval Time (____) min / Vol. (____) L**												
Submerged Tubing Depth (m)	N/A	**Depth to water (m)**												
Well Stick-up Height (m)	0.62	**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		**Cond. (µs/cm) 3%**				FROZEN								
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**												
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**												
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**												
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**				NOT MONITORED								
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**												
		Only for final readings **Sulphide (mg/L)**												
		Only for final readings **Turbidity (NTU)**												
		Interval Purge Volume (L)												
		Cumulative Purge Volume (L):												

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): W141030B3BH01

Sample Date (Con't): FEB 2, 2016

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: OPEN

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	18.3
Carbon Dioxide (C02)	PPM	320

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

20 cm OF SNOW COVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W14103083BH02	**Project Number**	1343-005.14	**Date**	Feb. 2/2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AM, DC.
UTM Location	Z: 08 E: 0389558 N: 6880665	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~-19°C
Waypoint	GPS: HEM Name: BH02X			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 40-42	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name: X	X	X	X	X

Initial Depth to Water (m)	6.690	**Purge Start Time:**		**Purge End Time:**				**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)	N/A	**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**										
(DTB – DTW) x (πr²)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**										
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**			FROZEN							
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**										
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**										
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**										
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**			NOT SAMPLED							
		Only for final readings	**Sulphide (mg/L)**									
			Turbidity (NTU)									
		Interval Purge Volume (L)										
		Cumulative Purge Volume (L):										

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)	X	X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): W14103083BH02

Sample Date (Con't): FEB 2, 2018

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 (C02)	PPM	300

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

20 cm OF SNOW COVER

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W14 03083 BH03	**Project Number**	1343-005.14	**Date**	FEB 4 2016
Piezometer Diameter	2" PVC.	**Client**	GY - AAM	**Samplers**	GR + JH
UTM Location	Z: 08V E: 0389134 N: 6880732	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	~ -10°C
Waypoint	GPS: ELR Name: —			**Recovery**	☐ Good ☐ Bad
Photos	Cam: WMX Nos: 326 - 328	**Purge Method**			
Duplicate Collected	☐ Yes Name:	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:				

Initial Depth to Water (m)	1.425 TO ICE?	**Purge Start Time:**		**Purge End Time:**				**Pen or YSI:**		☐ YSI Pro Plus ☐ Pen Unit			
Depth to Bottom (m)		**Purge Interval Time (____) min / Vol. (____) L**											
Submerged Tubing Depth (m)		**Depth to water (m)**											
Well Stick-up Height (m)	0.74	**Temperature (°C) 3%**											
Estimated Water Volume (L)		**pH (pH Units) ±0.1**											
(DTB – DTW) x (πr²)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**											
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**											
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**											
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**											
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**											
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**											
		Only for final readings	**Sulphide (mg/L)**										
			Turbidity (NTU)										
		Interval Purge Volume (L)											
		Cumulative Purge Volume (L):											

FROZEN / DRY

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No				
Time logged on YSI (24hr)		**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Sample Time (24hr)					

HEMMERA

Sample Site (Con't): W1410 3083 BH03

Sample Date (Con't): FEB 4 2016

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

Seal Replaced: ☐ J-Plug ☐ PVC Cap ☐ Not required ☐ Other NO CAPS

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

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	Ø
Oxygen (O2)	%	21.0
Carbon Dioxide (C02)	PPM	Ø

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

NEEDS 2" SCREW CAP. THINNER THAN SCHED 40.

Consumables Used:

HEMMERA

GROUNDWATER SAMPLE COLLECTION SHEET

Sample Site	W1410308 3BH04	**Project Number**	1343-005.14	**Date**	Feb. 2 / 2016
Piezometer Diameter	2"	**Client**	GY - AAM	**Samplers**	AN, DC.
UTM Location	Z: 08 E: 0389543 N: 6880668	**Project Name**	Mount Nansen 2016 GW Sampling Program	**Weather/Temperature**	Overcast ~-19°C
Waypoint	GPS: HEM Name: BH04			**Recovery**	☐ Good ☐ Bad
Photos	Cam: HEM Nos: 43-45	**Purge Method**			
Duplicate Collected	☐ Yes Name: X	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Field Blank Collected	☐ Yes Name:	X	X	X	X

Initial Depth to Water (m) FROZEN	6.500	**Purge Start Time:**	X	**Purge End Time:**	X				**Pen or YSI:**	☐ YSI Pro Plus ☐ Pen Unit		
Depth to Bottom (m)	N/A	**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**										
(DTB – DTW) x (πr^2)*1000 (for well diameter) = 1 well volume		**Cond. (µs/cm) 3%**		NOT					MONITORED			
(DTB – DTW) x 8.1 (for 4" well diameter) = 1 well volume		**Specific Cond. (µs/cm) 3%**										
(DTB – DTW) x 2 (for 2" well diameter) = 1 well volume		**Redox (mV) 10%**										
(DTB-DTW) x 1.1 (for 1.5" diameter) = 1 well volume		**DO (mg/L) 10%**										
(DTB-DTW) x 0.5 (for 1" diameter) = 1 well volume		**DO (%) 10%**										
Calculations:		**Appearance & Odour (Clear, Silty, HC odours, etc.)**				FROZEN						
		Only for final readings **Sulphide (mg/L)**										
		Only for final readings **Turbidity (NTU)**										
		Interval Purge Volume (L)										
		Cumulative Purge Volume (L):										

YSI ID		**Sample Method:**			
Logged Field Parameters	☐ Yes ☐ No	**Waterra**	**Peristaltic**	**Disp. Bailer**	**Other**
Time logged on YSI (24hr)		X	X	X	X
Sample Time (24hr)	NOT SAMPLED				

HEMMERA

Sample Site (Con't): W14103083B1104

Sample Date (Con't): FEB 2, 2016

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: OPEN

Head Space Gas Measurements

	Units	Values
Methane (CH4)	%LEL	0
Oxygen (O2)	%	18.3
Carbon Dioxide (C02)	PPM	320

Priority	Bottle Type	Parameters Analyzed	Min. Volume	Treatment ☒	Preservative Added ☒	Vol. Collected (ml)	Comments
1a	120 ml (plastic)	Dissolved Metals	100 ml	☐ Field Filtered	☐ HNO_3 (Nitric)		
1b	40 ml (glass)	Dissolved Mercury	15 mL	☐ Field Filtered	☐ HCL (Hydrochloric)		
2	500 ml (plastic)	General Chemistry	100 ml	-	-		
3	145 ml (plastic)	Cyanide (total, free, weak acid dissociable)	100 ml	-	☐ NaOH (Sodium Hydroxide)		
4	120 ml (glass)	Ammonia (NH3)	60 ml	-	☐ H_2SO_4 (Sulfuric)		
5	120 ml (plastic)	Thiocyanate (SCN)	50 ml	-	☐ HNO_3 (Nitric)		
6	120 ml (plastic)	Sulphide	60 ml	-	☐ Zinc Acetate, then NaOH		
7	120 ml (glass amber)	Total Inorganic Carbon (TIC)	50 ml	-	-		

General Notes and Observations:

20 cm OF SNOW COVER

Consumables Used: