APPENDIX D

Geotechnical Information

RECORD OF BOREHOLE SWD-01-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine
DRILLING START: 2017 janvier 25 00:00
DRILLING END: 2017 janvier 25 00:00
COORDINATES: N: 7 215 369 E: 637 994
SHEET: 1 of 3
GS ELEV.: 148,43
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE: BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
0	Rotative drilling, Triple Tube HQ Core (96 mm)	0,00	(NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible	148,43				RC 1		60 / 126			
			(ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet			ML							
2								RC 2		150 / 149			
								RC 3		145 / 150			
4								RC 4		150 / 150			
		5,70		142,73									
		5,76	Presence of ICE LENS; well bonded	142,67									
6			(NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible					RC 5		150 / 150			
			(ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet										
8						ML		RC 6		150 / 150			
		9,50		138,93									
		9,60	Presence of ICE LENS	138,83									
		9,66	Well bonded	138,77									
		9,80		138,63									
10		9,90	Presence of ICE LENS; well bonded	138,53				RC 7		150 / 150			
		10,11	Presence of ICE LENS; well bonded	138,32									
			(NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible										
			(ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet			ML		RC 8		150 / 150			
12										150			

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
N:\ACTIF\2016\3 PROJ\1666488 AEM SWD MITIGATION MEASURE MEADOWBANK\3 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\1666488_V2.GPJ

RECORD OF BOREHOLE SWD-01-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine
DRILLING START: 2017 janvier 25 00:00
DRILLING END: 2017 janvier 25 00:00
COORDINATES: N: 7 215 369 E: 637 994
SHEET: 2 of 3
GS ELEV.: 148,43
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
12	Rotative drilling, Triple Tube HQ Core (96 mm)	12,00	(NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible	136,43				RC 9		150 150/150			
			(ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet			ML							
14		14,06		134,37				RC 10		145/150			
		14,32	Presence of ICE LENS; well bonded	134,11									
			(NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible										
			(ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet					RC 11		150/150			
16						ML							
								RC 12		150/150			
		17,75		130,68									
18			Becoming UNFROZEN										
		18,25		130,18									
			(GP), GRAVEL, poorly graded, with cobbles, (Possibly UNFROZEN TILL)			GP		RC 13		120/150			
		18,70		129,73									
			COBBLES										
		19,50		128,93									
			BOULDERS										
20		19,90		128,53									
		20,10	(CL), SILTY CLAY, brown; cohesive, soft, w > PL	128,33		CL		RC 14		90/150			
			(GP), GRAVEL, poorly graded, with cobbles			GP							
		20,75		127,68									
			(ML), CLAYEY SILT, some gravel, brown, small organic smell, with cobbles, (interpreted as possible LAKEBED SEDIMENTS); cohesive, firm, w > PL			ML		RC 15		90/150			
22		22,25		126,18									
			(SM), SILTY SAND, medium plasticity fines, some gravel, brown, small organic smell, (interpreted as LAKEBED SEDIMENTS); non-cohesive, wet			SM		RC 16		50/150			
		23,75		124,68									
24						SM				55			

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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RECORD OF BOREHOLE SWD-01-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine

DRILLING START: 2017 janvier 25 00:00
DRILLING END: 2017 janvier 25 00:00
COORDINATES: N: 7 215 369 E: 637 994

SHEET: 3 of 3
GS ELEV.: 148,43
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
24		24,00		124,43									
	Rotative drilling, Triple Tube HQ Core (96 mm)		(SM), SILTY SAND, medium plasticity fines, some gravel, gray-brown, with subangular cobbles, with boulders, (UNFROZEN TILL); non-cohesive, wet *(continued)*			SM		RC 17		150 55/150			
26								RC 18		125/150			
		26,75	BEDROCK: Felsic intrusive rock, felsic porphyry. Fresh, massive, pinkish-white, medium strong, porous	121,68				RC 19		150/150		RC-19: SCR = 100%; RQD = 86.67% (Good)	
28								RC 20		150/150		RC-20: SCR = 100%; RQD = 86.67% (Good)	
30								RC 21		150/150		RC-21: SCR = 100%; RQD = 94,67% (Excellent)	
		31,25	Instrument installation in borehole: 1 thermistor string with 16 beads (SWD-T01-01 to SWD-T01-16) at depths varying from 1.0 m to 31.0 m at 2.0 m intervals. Bottom of borehole at 31,25 m.	117,18									
32													
34													
36													

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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SWD-01-17
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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RECORD OF BOREHOLE SWD-02-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine

DRILLING START: 2017 janvier 18 00:00
DRILLING END: 2017 janvier 18 00:00
COORDINATES: N: 7 215 232 E: 638 074

SHEET: 1 of 3
GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
0		0,00		133,00									
	Destructive drilling; PW		(GP), GRAVEL, poorly graded, angular, gray-blue, with angular boulders, (ROCKFILL); non-cohesive, very dense, dry			GP		RC 1		0/150			
2													
4								RC 2		0/150			
		5,64		127,36									
6	Rotative drilling; Triple Tube HQ Core (96 mm)		(GP), GRAVEL, poorly graded, subangular to angular, gray-blue and pink, (Interpreted as a MIXTURE OF LAKEBED SEDIMENTS and ROCKFILL, from some soft spots in boulders matrix); non-cohesive, very dense, dry			GP		RC 3		50/150			
		7,24		125,76									
8			(NBN), (FROZEN TILL); well bonded with no excess ice, no ice visible, no ice lines visible					RC 4		140/150	O		w, IC, MH
			(GM), SANDY SILTY GRAVEL, subangular, and medium plasticity fines, brown, (UNFROZEN TILL), with cobbles and boulders; non-cohesive, wet					RC 5		150/150	O		w, IC, MH
10						GM							
								RC 6		170/150	O		w, IC, MH
		11,60		121,40									
12		12,00	(SM), GRAVELLY SILTY SAND, and Fines becoming gray and brown	121,00		SM							

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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SWD-02-17
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RECORD OF BOREHOLE SWD-02-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine
DRILLING START: 2017 janvier 18 00:00
DRILLING END: 2017 janvier 18 00:00
COORDINATES: N: 7 215 232 E: 638 074
SHEET: 2 of 3
GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
12	Rotative drilling; Triple Tube HQ Core (96 mm)	12,00	(NBN), (FROZEN TILL); well bonded with no excess ice, no ice visible, no ice lines visible	121,00				RC 7		135/150			w, IC, MH
			(SM), GRAVELLY SILTY SAND, and medium plasticity fines, subangular gravel, brown, (UNFROZEN TILL), with cobbles and boulders; non-cohesive, wet			SM							
14								RC 8		120/150			w, IC
			Boulders are inferred between 14,8 m and 15,4 m					RC 9		150/150			w, IC
16		16,30		116,70									
			(NBN), (FROZEN TILL); well bonded with no excess ice, no ice visible, no ice lines visible					RC 10		150/150			w, IC, MH
			(GM), SANDY SILTY GRAVEL, subangular, and medium plasticity fines, brown, (UNFROZEN TILL), with cobbles and boulders; non-cohesive, wet			GM							
18		17,80		115,20									
			Gravel and cobbles becoming spotted pink ,fines particules becoming gray					RC 11		150/150			MH
		19,30		113,70									
			(GP), GRAVEL, poorly graded, with cobbles, presence of quartzile fragments, (UNFROZEN TILL)					RC 12		150/150			
20						GP							
								RC 13		150/150			
22		22,06		110,94									
			BEDROCK: Quartzite with some minor felsic porphyry lenses. Fresh, thickly foliated, bluish-gray, medium strong, QUARTZITE					RC 14		150/150			
			Longitudinal joint between 23,3 m and 23,7 m										
		23,70		109,30									
24													

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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RECORD OF BOREHOLE SWD-02-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine
DRILLING START: 2017 janvier 18 00:00
DRILLING END: 2017 janvier 18 00:00
COORDINATES: N: 7 215 232 E: 638 074
SHEET: 3 of 3
GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
24		24,00		109,00									
		24,50	BEDROCK: Quartzite with some minor felsic porphyry lenses. Fresh, thickly foliated, bluish-gray, medium strong, QUARTZITE *(continued)* Becoming pinkish white	108,50				RC 15		150/150			
		25,30		107,70									
26			Instrument installation in borehole: 1 thermistor string with 16 beads (SWD-T02-01 to SWD-T02-16) at depths varying from 6.0 m to 66.0 m. 1 piezometer (PZ-SWD-02-17) at 71.0 m depth. Bottom of borehole at 75,17 m.										
28													
30													
32													
34													
36													

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31
LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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SWD-02-17
3 of 3

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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RECORD OF BOREHOLE SWD-03-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine

DRILLING START: 2017 janvier 23 00:00
DRILLING END: 2017 janvier 23 00:00
COORDINATES: N: 7 215 220 E: 638 018

SHEET: 1 of 3
GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
0	Destructive drilling; PW (144 mm)	0,00	(GP), GRAVEL, poorly graded, angular, gray-blue, with boulders, (ROCKFILL); non-cohesive, very dense, dry	133,00		GP							
8		8,12	MIXTURE OF LAKEBED SEDIMENTS and ROCK FILL, (interpreted from soft spots boulders matrix)	124,88				RC 1		46 / 150			
10								RC 2		28 / 85			
		10,50	(SM), SILTY SAND, medium plasticity fines, some subangular gravel, gray, with cobbles, (interpreted as LAKEBED SEDIMENTS); non-cohesive, loose, wet	122,50		SM		WS 3					
								TO 4		15 / 15			
								TO 5		0 / 15			
12		11,70		121,30		SM				150 / 150			

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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RECORD OF BOREHOLE SWD-03-17

SHEET: 2 of 3

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine

DRILLING START: 2017 janvier 23 00:00
DRILLING END: 2017 janvier 23 00:00
COORDINATES: N: 7 215 220 E: 638 018

GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
12	Rotative drilling; Triple Tube HQ Core (96 mm)	12,00	(SM), SILTY SAND, medium plasticity fines, some subangular gravel, brown-gray, with cobbles and boulders, (TILL); non-cohesive, loose, wet *(continued)*	121,00		SM		RC 6		150/150			IC, w
		12,50	(NBN), Becoming FROZEN, (TILL); well bonded with no excess ice, no ice visible, no ice lines visible	120,50									
14								RC 7		130/150			
								RC 8		150/150			
16													
								RC 9		150/150			
18													
								RC 10		120/150			
20		20,00	BEDROCK: Felsic intrusive rock, felsic porphyry. Fresh, massive, pinkish-white, medium strong, moderately porous	113,00				RC 11		80/150		RC-11 : SCR = 75,7%; RQD = 22,8% (Very bad)	
								RC 12		150/150		RC-12 : SCR = 100%; RQD = 66.7% (Medium)	
22													
								RC 13		150/150		RC-13 : SCR = 100%; RQD = 43.3% (Bad)	
24										78/78			

Log continued on next page

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31

LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

Golder Associates

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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RECORD OF BOREHOLE SWD-03-17

PROJECT: Stormwater Dike Geotechnical Investigation
PROJECT NO.: 1666488 - 8000
LOCATION: Meadowbank Mine
DRILLING START: 2017 janvier 23 00:00
DRILLING END: 2017 janvier 23 00:00
COORDINATES: N: 7 215 220 E: 638 018
SHEET: 3 of 3
GS ELEV.: 133,00
TOC ELEV.: na
DATUM: Geodetic

DEPTH (m)	BORING METHOD	SOIL PROFILE: Depth	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: Elev	ICE BOND	USCS	GRAPHIC LOG	SAMPLES: SAMPLE TYPE & NUMBER	SAMPLES: BLOWS per 150 mm (Hammer, 0.3 m drop)	SAMPLES: REC / ATT (cm)	PENETRATION RESISTANCE BLOWS / 300 mm; WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
24		24,00		109,00									
		24,48		108,52				RC 14		78/78		RC-14 : SCR = 100%; RQD = 89.7% (Good)	
26			Instrument installation in borehole: 1 thermistor string with 16 beads (SWD-T03-01 to SWD-T03-16) at depths varying from 8.0 m to 23.0 m at 1.0 m intervals. 2 piezometers at 11.0 m depth (PZ-SWD-03-17B) and 23.0 m depth (PZ-SWD-03-17A). Bottom of borehole at 24,48 m.										
28													
30													
32													
34													
36													

PENETRATION RESISTANCE BLOWS / 300 mm: 20 40 60 80
WATER CONTENT (%): W_p — W — W_l; 20 40 60 80

DRILLING CO.: Orbit Garant
DRILLER:
DRILL RIG: SH-31
LOGGED: M. Paré
CHECKED: É. Ingabire
REVIEWED: F. L. Bolduc

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SWD-03-17
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01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16
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PROJECT: TSF investigation
DRILLING DATE: April 9/14
DRILL CONTRACTOR/DRILL TYPE: orbit Garant / diamond drill
DRILLER: Eric Levesque / Christian Levesque
HOLE#: 100-1
LOCATION: TSF area A
SURFACE ELEVATION: 146.9m HOLE DEPTH: 7.22m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

SHEET 1 OF 2

Depth Scale (m)	Run No.	Symbolic Log*	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
0.0												
0.2	1		ICE									→
0.4												
0.6												
0.8					ice lense visible		Easy to drill	Good 100%	N		Y	
1.0										#1 0.4m to 2.0m		
1.2	2		Dark Grey silty sand	Y		100%						
1.4												
1.6												
1.8												
2.0												
2.2										#2 2.0m to 3.5m		
2.4												
2.6												
2.8												
3.0												
3.2												
3.4												
3.6												
3.8	3		Dark grey silty sand fine	y	ice lense visible at depth 3.35m	50%	Easy to drill	Good 92%	N	#3 3.5m to 4.20m	Y	
4.0												
4.2												
4.4	4		Dark grey tailings and Till	y	Tailings: Ice lense visible	50%	Slow to drill		N			contact unknow ≃ 50cm drop till washed up till
4.6										#4 4.20m to 5.72m	Y	
4.8								Poor 20%				
5.0												
5.2												
5.4												
5.6												
5.8												
6.0												

LOG BY: Melissa Lapointe

NOTES:

PROJECT: TSF investigation
DRILLING DATE: APRIL 9 / 14
DRILL CONTRACTOR/DRILL TYPE: Orbit Garant / Diamond dri
DRILLER: Eric Levesque / Christian Levesque

HOLE#: 100-1
LOCATION: TSF area A
SURFACE ELEVATION: 946.9m HOLE DEPTH: 7.22m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
6.2	5		Till + bedrock malt	N	No ice	0%	hard to drill	Poor 25%	N	#5 5.72m to 7.22m	Y	Till T° = 8.7°c
6.4												
6.6												
6.8												
7.0												
7.2			End of hole									
7.4												
7.6												
7.8												
8.0												
8.2												
8.4												
8.6												
8.8												
9.0												
9.2												
9.4												
9.6												
9.8												
10.0												
10.2												
10.4												
10.6												
10.8												
11.0												
11.2												
11.4												
11.6												
11.8												
12.0												
12.2												

LOG BY: Mélissa Lapointe D.

NOTES:

PROJECT: TSF INVESTIGATION | HOLE#: 200-1

DRILLING DATE: APRIL 10 | 14 | LOCATION: TSF AREA 1

DRILL CONTRACTOR/DRILL TYPE: ORBIT GARANT / DIAMOND | SURFACE ELEVATION: 147.1m HOLE DEPTH: 11.5m

DRILLER: ERIC LEVESQUE, CHRISTIAN LEVESQUE | CORE DIAMETER: HQ OR CUTTINGS X

Symbolic Log: Clay - Fine material; Silty Material; Sand - Coarser Material; Visible ice inclusion; Visible ice lense

SHEET 1 OF 2

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y, N	Ice description - not visible, visible crystal/inclusion, ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y /N, Interval, ID#	Photo - Y/N	Comments
0.0			ICE									
0.2												
0.4												
0.6												
0.8	1		NO RECOVERY				EASY TO DRILL	POOR 0%	N			NO RECOVERY OF MATL.
1.0												
1.2												
1.4			DARK GREY FINE TAILINGS SAND.	Y	NOT VISIBLE, WELL BONDED FROZEN		EASY TO DRILL	GOOD 100%		#1	Y	VISIBLE CONTACT POINT @ 1.6M. TEMP 1.0°C
1.6	2									#2		
1.8												
2.0												
2.2												
2.4												
2.6			NO RECOVERY									
2.8								POOR 0%				
3.0	3								N			
3.2												
3.4												
3.6												
3.8												
4.0												
4.2												
4.4			DARK GREY FINE TAILINGS SAND	Y	NOT VISIBLE WELL BONDED FROZEN			GOOD 100%	N	#3	Y	
4.6												
4.8	4					50%						
5.0				Y	NOT VISIBLE SOFT ON OUTSIDE FROZEN					#4	Y	OUTSIDE OF CORE VISIBLY SOFT TEMP 1.0°C
5.2												
5.4												
5.6												
5.8	5		DARK GREY FINE TAILINGS SAND.	Y	NOT VISIBLE FROZEN WELL BONDED	50%		GOOD 90%	N	#5	Y	
6.0												

LOG BY: T. DAHM.

NOTES:

PROJECT: TSF INVESTIGATION
DRILLING DATE: APRIL 10/14
DRILL CONTRACTOR/DRILL TYPE: ORBIT GARANT / DIAMOND DRILL
DRILLER: ERIC LEVESQUE, CHRISTIAN LEVESQUE

HOLE#: 200-1
LOCATION: TSF AREA 1
SURFACE ELEVATION: 147.1m HOLE DEPTH: 11.5m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y /N, Interval, ID#	Photo - Y/N	Comments
6.2												
6.4			DARK GREY FINE TAILINGS SAND		NOT VISIBLE		EASY TO DRILL	GOOD				
6.6												
6.8	5			Y	WELL BONDED	50%		90%	N	#5	Y	
7.0					FROZEN							
7.2												
7.4												
7.6												
7.8												
8.0												
8.2	6							POOR 10%	N	#6	Y	
8.4												
8.6												
8.8												
9.0												
9.2												TEMP 6.1°C
9.4												
9.6										#7	Y	
9.8	7											
10.0												
10.2			LIGHT BR SILTY SAND W GRAVEL	N	NO ICE.	0%	HARD TO DRILL	MEDIUM 50%	N	#8	Y	
10.4												
10.6												
10.8							HARD					
11.0	8		BEDROCK		NO ICE	0%	TO DRILL	POOR 25%	N	#9	Y	
11.2												
11.4												
11.6			END OF HOLE									
11.8												
12.0												
12.2												

LOG BY: T. DAHM

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 10/14 night
DRILL CONTRACTOR/DRILL TYPE: orbit garant / diamond
DRILLER: Sylvain Levesque / Ronald drill

HOLE#: 300-1
LOCATION: TSF, area A
SURFACE ELEVATION: 146.8 HOLE DEPTH: 14.7m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

SHEET 1 OF 3

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
0.0 – 1.2	1		No recovery				Easy to drill	Poor 0%			N	
1.4 – 2.6	2		dark grey fine tailings sand	y	NOT visible, well bonded frozen		Easy to	Good 0			y	
2.8 – 4.2	3		Dark grey solid tailing	y	ice lense visib at depth 2.7m	50%	Easy to drill	mediu 77%	N		y	
4.4 – 5.6	4		Dark grey softer	y	NOT visible soft on outside and frozen inside. Few ice lense visible inside.	50%	Easy to drill	Poor 32%			y	9
5.8 – 6.0												

LOG BY: Mélissa Lapointe

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 10/14 nigh
DRILL CONTRACTOR/DRILL TYPE: orbit garant / diamond
DRILLER: Sylvain Levesque / Ronald

HOLE#: 300-1
LOCATION: TSF, area A
SURFACE ELEVATION: 146.8 HOLE DEPTH: 14.7m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/clay %)	Frozen Core/Cutting - Y,N	Ice description - net visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
6.2	5		Dark grey softer	Y	ice lense visible at depth 5.7m	50%	Easy to drill	Good 100%	N	#4 5.7m to 7.2m	Y	T= 1.0°c
6.4												
6.6												
6.8												
7.0												
7.2												
7.4	6		Dark grey fine tailings sand					M				
7.6												
7.8												
8.0												
8.2												
8.4												
8.6												
8.8	7		dark grey tailings and cloudy ice		T gs u	7%				8.7m to 7m		2
9.0												
9.2												
9.4												
9.6												
9.8												
10.0												
10.2												
10.4												
10.6												
10.8												
11.0												
11.2												
11.4												
11.6												
11.8												
12.0												
12.2												

LOG BY: Mélissa LaPointe D.

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 11 / 14
DRILL CONTRACTOR/DRILL TYPE: orbit garant / diamond drill
DRILLER: Sylvain L. / Ronald

HOLE#: 300-1
LOCATION: TSF, Area A
SURFACE ELEVATION: 146.8 HOLE DEPTH: 14.7m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

SHEET 3 OF 3

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y /N, interval, ID#	Photo - Y/N	Comments
12.4 0.0 12.6 0.2 12.8 0.4 13.0 0.6 13.2 0.8	8		Dark grey tailings Soft Light bedrock sand and gravel Gravel ≃ 5mm to 10mm	Y	NOT visible soft on outside frozen	50%	hard to drill	Medium 72%	N	#7 11.7m to 13.2m	Y	11.7 to 13.1m it's tailings 13.1m to 13.2m Bedrock T= 1,0°C
13.4 1.0 13.6 1.2 13.8 1.4 14.0 1.6 14.2 1.8 14.4 2.0 14.6 2.2	9		Bedrock	N	No ice	0%	hard to drill	Cutting 54%	N	#8 13.2m to 14.7m	Y	Big rock block that's the reason why the sample it's not full of rock.
14.8 2.4 15.0 2.6					End of hole							
2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0												

LOG BY: Melissa Lapointe D.

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 12 / 14
DRILL CONTRACTOR/DRILL TYPE: Orbit Garant
DRILLER: Eric Levesque /

HOLE#: #100-3
LOCATION: TSF, area A
SURFACE ELEVATION: 147.39m HOLE DEPTH: 18.2m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

SHEET 1 OF 3

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/clay %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/indusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y /N, interval, ID#	Photo - Y/N	Comments
0.0 – 1.2	1		Dark grey tailings Sand	Y	Ice not visible well bonded frozen	50%	Easy to drill	84% Medium	N	#1 0.2m to 1.2m	Y	T=0,1°C 0m to 0,2m it's ice only.
1.4 – 1.6	2		NO recovery	N			Easy to drill	Poor 0%			N	
1.8 – 3.2	3		Dark grey tailings sand	Y	ice lense visible	50%	Easy to drill	Good 100%	N	#2 1,7m to 3,2m		T=0,1°c
3.4 – 5.6	4		Dark grey tailings sand	Y	Ice not visible well bonded frozen	60%	Easy to drill	Good 100%		#3 3,2m to 5,7m		T=1,2°c Big piece of ice at the middle of the core. (4,4m to 5,4m)
5.8 – 6.0												

LOG BY: Thomas Dahm

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 12 & 14
DRILL CONTRACTOR/DRILL TYPE: Orbit Garant
DRILLER: Eric Levesque / Christian. L

HOLE#: # 100-3
LOCATION: TSF, Area A
SURFACE ELEVATION: 147.33M HOLE DEPTH: 18.2m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/indusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y /N, interval, ID#	Photo - Y/N	Comments
6.2 – 6.4	#5		No recovery				Easy to drill	Poor 0%	N		N	
6.6 – 6.8 – 7.0 – 7.2												
7.4 – 7.6 – 7.8	#6		Dark grey tailings sand	Y	Ice not visible well bonded frozen.	50%	Easy to drill	Medium 85%		#4 7.2M to 8.7m	N	T=0,8°C
8.0 – 8.2 – 8.4 – 8.6												
8.8 – 9.0 – 9.2	#7		No recovery				Easy to drill	Poor 0%			N	
9.4 – 9.6	#8		Dark grey tailings sand	Y	ice lense visible	50%	Easy To drill	Good 100%	N	#5 9.2m to 10.7m		T=1.3°C
9.8 – 10.0 – 10.2 – 10.4 – 10.6												
10.8 – 11.0	#9		No recovery				Easy To drill	Poor 0%			N	
11.2 – 11.4 – 11.6 – 11.8 – 12.0 – 12.2												

LOG BY: THOMAS DAHM

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 12 /14
DRILL CONTRACTOR/DRILL TYPE: Orbit Garant
DRILLER: Eric levesque / Christian.L

HOLE#: #100-3
LOCATION: TSF, AreA A
SURFACE ELEVATION: 147.33m HOLE DEPTH: 18.2m
CORE DIAMETER: HQ OR CUTTINGS

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

SHEET 3 OF 3

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
12.4 (6.2)												
12.6 (6.4)	#10		Dark grey tailings Sand	N	NO ice	N	Easy to drill	Good 100%	Y	#6 12.2m TO 13.7m	Y	T= 7.7°c The core its not frozen, really soft and wet.
12.8 (6.6)												
13.0 (6.8)												
13.2 (7.0)												
13.4 (7.2)												
13.6 (7.4)												
13.8 (7.6)												
14.0 (7.8)	#11		No recovery			N	Easy to drill	POOR 0%				
14.2 (8.0)												
14.4 (8.2)												
14.6 (8.4)												
14.8 (8.6)												
15.0 (8.8)												
15.2 (9.0)												
15.4 (9.2)							Easy to drill	Poor 0%				
15.6 (9.4)											N	
15.8 (9.6)	#12		NO recovery									
16.0 (9.8)												
16.2 (10.0)												
16.4 (10.2)												
16.6 (10.4)												
16.8 (10.6)			Dark grey tailings Sand	y	ice not visible well bonded		Easy to drill					we don't keep the sample And we never approach to the till or bedrock.
17.0 (10.8)	#13											
17.2 (11.0)												
17.4 (11.2)												
17.6 (11.4)												
17.8 (11.6)												
18.0 (11.8)												
18.2 (12.0)												
18.4 (12.2)					End of hole							

LOG BY: Thomas dahm

NOTES:

PROJECT: TSF investigation
DRILLING DATE: April 12 / 14 NIGHT
DRILL CONTRACTOR/DRILL TYPE: Orbit garant / diamond drill
DRILLER: Sylvain Levesque / Ronald

HOLE#: #100 - 2
LOCATION: TSF, Area A
SURFACE ELEVATION: 147,3m HOLE DEPTH: 11.7m
CORE DIAMETER: HQ OR CUTTINGS Ø

Symbolic Log
- Clay - Fine material
- Silty Material
- Sand - Coarser Material
- Visible ice inclusion
- Visible ice lense

Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y/N, Interval, ID#	Photo - Y/N	Comments
0.0												
0.2												
0.4	1		No recovery				Easy to drill	Poor 0%	N			0 recovery
0.6												
0.8												
1.0												
1.2												
1.4	2		Dark grey fine tailings sand	Y	• Many lense of ice visible at depth 1.2M • Tailings solid frozen	50%	Easy to drill	Good 100%	N	#1 1.2M to 2.7m	Y	T = 0,5°C
1.6												
1.8												
2.0												
2.2												
2.4												
2.6												
2.8												
3.0	3		No recovery				Easy to drill	Poor 0%	N			
3.2												
3.4												
3.6												
3.8												
4.0												
4.2												
4.4	4		Dark grey fine tailings sand	Y	Many lense of ice and ice crystal visible	65%	Easy to drill	Medium 62%		#2 4.2M to 5.7m	Y	T = 0,2°C
4.6												
4.8												
5.0												
5.2												
5.4												
5.6												
5.8												
6.0												

LOG BY: Mélissa Lapointe D
NOTES: I took many picture of the lense and crystal for each sample.