



APPENDIX D

Geotechnical Information



RECORD OF BOREHOLE SWD-01-17 digation DRILLING START: 2017 janvier 25 00:00 SHEET: 1 of 3 PROJECT: Stormwater Dike Geotechnical Investigation GS ELEV .: 148,43 2017 janvier 25 00:00 PROJECT NO .: 1666488 - 8000 DRILLING END: TOC ELEV.: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 369 E: 637 994 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE BLOWS / 300 mm BORING METHOD ^ Elev ICE BOND DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **NOTES** USCS per 150 mm Depth REC DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -OW (cm) 0,00 20 60 80 (NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible <u>60</u> 126 (ML), SILT, non plastic, dark gray, 유-(UNFROZEN TAILINGS); non-cohesive, 2 150 149 282 ML 145 150 8 4 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIFI201613 PROJ/1666488 AEM SWD MITIGATION MEASURE MEADOWBANK13 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\1666488_V2.GPJ Triple Tube HQ Core (96 mm) 150 150 ъ В 5.70 5.76 1 Presence of ICE LENS; well bonded 6 (NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible 150 150 RC 5 Rotative drilling, (ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet 8 150 150 MLS ° 150 150 9.50
9.60 Presence of ICE LENS
9.60 / Well bonded
9.80 / Presence of ICE LENS; well bonded RC 7 138,77/ 138,63/ 10 \138,53' \138,32 Presence of ICE LENS; well bonded (NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible 150 150 88 (ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, loose, wet MI <u>150</u> Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder CHECKED: É. Ingabire DRILLER: Associates DRILL RIG: SH-31 REVIEWED: F. L. Bolduc

RECORD OF BOREHOLE SWD-01-17 digation DRILLING START: 2017 janvier 25 00:00 SHEET: 2 of 3 Stormwater Dike Geotechnical Investigation GS ELEV .: 148,43 PROJECT: 2017 janvier 25 00:00 PROJECT NO .: 1666488 - 8000 DRILLING END: TOC ELEV.: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 369 E: 637 994 DATUM: Geodetic SAMPLES SOIL PROFILE ■ PENETRATION RESISTANCE BLOWS / 300 mm 136,433 BORING METHOD DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **NOTES** per 150 mm Depth REC DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -OW (cm) 12 12,00 20 60 150 (NBN), (FROZEN TAILINGS); well bonded with no excess ice, No ice is visible 28 150 150 (ML), SILT, non plastic, dark gray, (UNFROZEN TAILINGS); non-cohesive, ML 14 145 150 유 Presence of ICE LENS; well bonded 14,32 134,11 (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 150 150 8= 16 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIF/2016\3 PROJ\1666488 AEM SWD MITIGATION MEASURE MEADOWBANK\3 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\166648<u>8</u>_V2.GPJ MLCore (96 150 150 222 Triple Tube HQ 130,68 Becoming UNFROZEN 18 18,25 130,18 (GP), GRAVEL, poorly graded, with cobbles, (Possibly UNFROZEN TILL) 120 150 GP 32 13 Rotative drilling, 18,70 129,73 COBBLES 100 19,50 128,93 BOULDERS 19,90 128,53 20 <u>90</u> 150 20,10 (CL), SILTY CLAY, brown; cohesive, soft, CL S₄ 128.33 w > PL (GP), GRAVEL, poorly graded, with GP cobbles 20,75 127,68 (ML), CLAYEY SILT, some gravel, brown, small organic smell, with cobbles, (interpreted as possible LAKEBED SEDIMENTS); cohesive, firm, w > PL RC 21 ML22 126,18 (SM), SILTY SAND, medium plasticity fines, some gravel, brown, small organic smell, (interpreted as LAKEBED SEDIMENTS); non-cohesive, wet <u>50</u> 150 2일 SM <u>55</u> SM Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder CHECKED: É. Ingabire DRILLER:

REVIEWED: F. L. Bolduc

DRILL RIG:

SH-31

RECORD OF BOREHOLE SWD-01-17 digation DRILLING START: 2017 janvier 25 00:00 SHEET: 3 of 3 PROJECT: Stormwater Dike Geotechnical Investigation GS ELEV .: 148,43 2017 janvier 25 00:00 PROJECT NO.: 1666488 - 8000 DRILLING END: TOC ELEV .: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 369 E: 637 994 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE BLOWS / 300 mm BORING METHOD DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **USCS NOTES** per 150 mm Depth REC DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -oW W_p H (cm) 24 24,00 20 40 60 80 150 (SM), SILTY SAND, medium plasticity fines, some gravel, gray-brown, with subangular cobbles, with boulders, RC 7 (UNFROZEN TILL); non-cohesive, wet <u>55</u> 150 (continued) SM 26 <u>125</u> 150 28 Triple Tube HQ Core (96 mm) 26,75 121,68 BEDROCK: Felsic intrusive rock, felsic porphyry. Fresh, massive, pinkish-white, medium strong, porous RC-19: SCR = 100%; RQD = 86.67% (Good) 150 150 S 6 28 Rotative drilling, - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIFI201613 PROJ/1666488 AEM SWD MITIGATION MEASURE MEADOWBANK13 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\1666488_V2.GPJ RC-20: SCR = 100%; RQD = 86.67% (Good) 150 150 28 30 RC-21: SCR = 100%; RQD = 94,67% 150 150 RC 21 (Excellent) 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. 32 Bottom of borehole at 31,25 m. 34 36 DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder DRILLER: CHECKED: É. Ingabire Associates DRILL RIG: SH-31 REVIEWED: F. L. Bolduc

RECORD OF BOREHOLE SWD-02-17 description DRILLING START: 2017 janvier 18 00:00 SHEET: 1 of 3 PROJECT: Stormwater Dike Geotechnical Investigation GS ELEV .: 133,00 2017 janvier 18 00:00 PROJECT NO .: 1666488 - 8000 DRILLING END: TOC ELEV .: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 232 E: 638 074 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE BLOWS / 300 mm BORING METHOD ND Elev 133,00 DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **USCS NOTES** per 150 mm Depth **REC** DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -OW W_p F (cm) 0 0,00 20 60 (GP), GRAVEL, poorly graded, angular, gray-blue, with angular boulders, (ROCKFILL); non-cohesive, very dense, ĕ Destructive drilling; 2 GP 2_L <u>0</u> 150 4 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIFI201613 PROJ/1666488 AEM SWD MITIGATION MEASURE MEADOWBANK13 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\1666488_V2.GPJ <u>0</u> 150 28 (GP), GRAVEL, poorly graded, subangular to angular, gray-blue and pink, (Interpreted as a MIXTURE OF LAKEBED 6 E E SEDIMENTS and ROCKFILL, from some Tube HQ Core (96 soft spots in boulders matrix); <u>50</u> 150 GP 38 % non-cohesive, very dense, dry (NBN), (FROZEN TILL); well bonded with Triple. no excess ice, no ice visible, no ice lines visible Rotative drilling; 8 140 ъ Р 0 (GM), SANDY SILTY GRAVEL, subangular, and medium plasticity fines, brown, (UNFROZEN TILL), with cobbles 150 and boulders; non-cohesive, wet 150 150 2 2 0 w, IC, MH GM 10 <u>170</u> 150 ည္မ 0 w, IC, MH 121,40 (SM), GRAVELLY SILTY SAND, and SM _{12,00} Fines becoming gray and brown 121,00 Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré

CHECKED: É. Ingabire

REVIEWED: F. L. Bolduc

DRILLER:

DRILL RIG:

SH-31

Golder

RECORD OF BOREHOLE SWD-02-17 description DRILLING START: 2017 janvier 18 00:00 SHEET: 2 of 3 Stormwater Dike Geotechnical Investigation GS ELEV .: 133,00 PROJECT: PROJECT NO .: 1666488 - 8000 DRILLING END: 2017 janvier 18 00:00 TOC ELEV.: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 232 E: 638 074 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE 0000 97 121,000 BLOWS / 300 mm BORING METHOD DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **NOTES** per 150 mm Depth REC DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -OW (cm) 12 12,00 20 60 (NBN), (FROZEN TILL); well bonded with no excess ice, no ice visible, no ice lines visible 8∠ 135 150 0 w, IC, MH (SM), GRAVELLY SILTY SAND, and medium plasticity fines, subangular gravel, brown, (UNFROZEN TILL), with SM cobbles and boulders; non-cohesive, wet 14 <u>120</u> 150 & ℃ 0 w. IC Boulders are inferred between 14,8 m and 15,4 m 150 150 ည္မ 0 16 116,70 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIF/2016\3 PROJ\1666488 AEM SWD MITIGATION MEASURE MEADOWBANK\3 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\166648<u>8</u>_V2.GPJ (NBN), (FROZEN TILL); well bonded with no excess ice, no ice visible, no ice lines Core (96 mm) (GM), SANDY SILTY GRAVEL 150 150 subangular, and medium plasticity fines, 유우 0 w, IC, MH brown, (UNFROZEN TILL), with cobbles GM and boulders; non-cohesive, wet Triple Tube HQ 115,20 Gravel and cobbles becoming spotted 18 pink ,fines particules becoming gray 150 150 Rotative drilling; 8= Мн 113,70 (GP), GRAVEL, poorly graded, with cobbles, presence of quartzile fragments, (UNFROZEN TILL) 00 20 150 150 282 2001 GΡ 0 150 150 85€ 22 110,94 BEDROCK: Quartzite with some minor felsic porphyry lenses. Fresh, thickly foliated, bluish-gray, medium strong, QUARTZITE <u>150</u> 84 Longitudinal joint between 23,3 m and 23,70 _____23,7 m Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder CHECKED: É. Ingabire DRILLER:

REVIEWED: F. L. Bolduc

DRILL RIG:

SH-31

	JEC	T NO.: 1	Stormwater Dike Geotechnical Investi 1666488 - 8000 Meadowbank Mine	RECC gation	R	D O	DRIL	LING END:	OLE SV 2017 janvie 2017 janvie N: 7 215 23	r 18 0	0:00			SHEET: 3 of 3 GS ELEV.: 133,00 OC ELEV.: na DATUM: Geodetic	
			SOIL PROFILE						SAMPLES		■ PENETRAT	ION RESISTA S / 300 mm	NCE		۵۴
HLdad 24	BORING METHOD	24,00	DESCRIPTION	<u>∂</u> Ш 109,00	ICE BOND	nscs	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 150 mm Hammer, 0.3 m drop	REC ATT (cm)	20 40 WATER (60 80 CONTENT (%)	ı H W _i	NOTES	ADDITIONAL LAB TESTING
		fel: 24,50 foli JQL Be	EDROCK: Quartzite with some minor sic porphyry lenses. Fresh, thickly isted, bluish-gray, medium strong, JARTZITE (continued) coming pinkish white					RC 15		150 150					
01 - GOLDRR - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 N.ACTIFIZO1613 PROJ/1666488 AEM SWD MITIGATION MEASURE MEADOWBANK/3 TECHNIQUE/3 DONNÉES TERRAINA LOG PDF/1666488 V2.GPJ R		the (S) va pie de	strument installation in borehole: 1 ermistor string with 16 beads WD-T02-01 to SWD-T02-16) at depth rying from 6.0 m to 66.0 m. 1 ezometer (PZ-SWD-02-17) at 71.0 m pth. ittom of borehole at 75,17 m.												
1 - GOLDER - BORE	DR	IG CO.: RILLER: LL. RIG:					CHI		M. Paré É. Ingabire F. L. Boldu					Golde	er ates

RECORD OF BOREHOLE SWD-03-17 stigation DRILLING START: 2017 janvier 23 00:00 DRILLING END: 2017 janvier 23 00:00 SHEET: 1 of 3 PROJECT: Stormwater Dike Geotechnical Investigation GS ELEV .: 133,00 PROJECT NO.: 1666488 - 8000 TOC ELEV .: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 220 E: 638 018 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE BLOWS / 300 mm BORING METHOD ^ EE BOND 133,00 DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 Depth **USCS NOTES** per 150 mm **REC** DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -oW W_D (cm) 0,00 20 60 80 (GP), GRAVEL, poorly graded, angular, gray-blue, with boulders, (ROCKFILL); non-cohesive, very dense, dry 2 4 GP 01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 N:ACTIF\2016\3 PROJ1666488 AEM SWD MITIGATION MEASURE MEADOWBANK\3 TECHNIQUE\3 DONNÉES TERRAINA LOG PDF\1666488_V2.GPJ Destructive drilling; PW (144 mm) 8 124,88 MIXTURE OF LAKEBED SEDIMENTS <u>46</u> 150 and ROCK FILL, (interpreted from soft გspots boulders matrix) 28 85 28 10 ws 3 122,50 <u>5</u>4 <u>15</u> 15 (SM), SILTY SAND, medium plasticity fines, some subangular gravel, gray, with cobbles, (interpreted as LAKEBED SEDIMENTS); non-cohesive, loose, wet SM 5.5 <u>0</u> 15 11,70 150 150 Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder DRILLER: CHECKED: É. Ingabire

REVIEWED: F. L. Bolduc

DRILL RIG:

SH-31

RECORD OF BOREHOLE SWD-03-17 digation DRILLING START: 2017 janvier 23 00:00 SHEET: 2 of 3 PROJECT: Stormwater Dike Geotechnical Investigation GS ELEV .: 133,00 2017 janvier 23 00:00 PROJECT NO.: 1666488 - 8000 DRILLING END: TOC ELEV .: LOCATION: Meadowbank Mine COORDINATES: N: 7 215 220 E: 638 018 DATUM: Geodetic SOIL PROFILE SAMPLES ■ PENETRATION RESISTANCE BLOWS / 300 mm BORING METHOD ND Electronic BOND 121,00 DEPTH (m) SAMPLE TYPE & NUMBER **BLOWS** GRAPHIC LOG 40 60 **USCS NOTES** per 150 mm Depth REC DESCRIPTION WATER CONTENT (%) Hammer, 0.3 m drop -oW W_p (cm) 12 12,00 20 40 60 80 (SM), SILTY SAND, medium plasticity fines, some subangular gravel, 12,50 brown-gray, with cobbles and boulders, 120,50 200 IC, w <u>150</u> (TILL); non-cohesive, loose, wet 150 (continued) (NBN), Becoming FROZEN, (TILL); well bonded with no excess ice, no ice visible, no ice lines visible 14 130 150 RC 7 0 150 150 S ∞ 16 SM - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 17-6-21 10:16 ACTIFI201613 PROJ/1666488 AEM SWD MITIGATION MEASURE MEADOWBANK13 TECHNIQUE\3 DONNÉES TERRAIN\4 LOG PDF\1666488_V2.GPJ Tube HQ Core (96 mm) 150 150 28 18 Triple -<u>120</u> 150 유우 Rotative drilling; RC-11 : SCR = 75,7%; RQD = 22,8% (Very <u>80</u> 150 20 113,00 20,00 8= bad) BEDROCK: Felsic intrusive rock, felsic porphyry. Fresh, massive, pinkish-white, medium strong, moderately porous RC-12: SCR = 100%; RQD = 66.7% (Medium) 150 150 22 22 RC-13: SCR = 100%; RQD = 43.3% (Bad) <u>150</u> 2 2 2 2 150 <u>78</u> 78 Log continued on next page DRILLING CO.: Orbit Garant LOGGED: M. Paré Golder DRILLER: CHECKED: É. Ingabire Associates DRILL RIG: SH-31 REVIEWED: F. L. Bolduc

	PRO	JEC.	T NO.:	R Stormwater Dike Geotechnical Investiga 1666488 - 8000 Meadowbank Mine	ECC ition	R		DRIL	LING END:	OLE SV : 2017 janvie : 2017 janvie : N: 7 215 22	r 23 0	0:00	SHEET: 3 of 3 GS ELEV.: 133,00 OC ELEV.: na DATUM: Geodetic	
	<u> </u>	S G G		SOIL PROFILE				ر د		SAMPLES BLOWS		■ PENETRATION RESISTANCE BLOWS / 300 mm		ONAL
	표(표) 24	BORING METHOD		DESCRIPTION		ICE BOND	nscs	GRAPHIC LOG	SAMPLE TYPE & NUMBER	per 150 mm Hammer, 0.3 m drop	REC ATT	WATER CONTENT (%)	NOTES	ADDITIONAL LAB TESTING
			24,00		109,00				RC 41		78 78	20 40 60 80	RC-14 : SCR = 100%; RQD = 89.7% (Good)	
3 E-M/GDT - 17-6-21 10:16 N MEASURE MEADOWBANK(3 TECHNIQUE)3 DONNÉES TERRAINA LOG PDF\1666488_V2.GPJ	- 28 32		t (nstrument installation in borehole: 1 hermistor 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 ntervals. 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.										
BOREHULE I 3 PROJN16662	- 36_													
01 - GOLDEK - N:\ACTIF\2016\ 		DR	IG CO. RILLER LL RIG			. 1		CHI		M. Paré É. Ingabire F. L. Boldu		,	Golder	tes

Run No.	 exestication Pril 9/14 Exercise of common dril Print diamond dril Print dr	Frozen Core/Cutting	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	Ę	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
2 1	ice									
6 8 0 2 2	Dark Grey Silty sand	У	ice lense visible	100%	Easy to drill	Good 1001/.	N	#1 0.4m to 2.0m	У	
2								#2 2.0m to 3.5m		
3	Dark grey silty sand fine	Y	re lense visible at depth 3.35m	50%	Easy to drill	Good 92%	N	#3 3,5 m +120 m	Y	
4	Dark grey tailings and Till	Y	Tailings: Ice lense visible	50%	Slow to drill	Pool 20%	N .	#4 4,20m to 5,72m	y	contact unknow 50cm till was up till

LOG BY:	Melissa	Lapointe
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PROJECT: DRILLING D DRILL CONT DRILLER:	TS ATE: TRACTORY	F IY DRILL TYPE:	APRIL 9 Orbit 60 Gue / Chr	Ition 114 rant/Biamonddii ristian Levesque	HOLE#: LOCATION SURFACE CORE DIA	N: TSF, OYEA P ELEVATION: 146,9M HOLE DEPTH: 7, METER: HQ OR CUTTING	22m	a a a a a	Symbolic Log Cley - Fine material Sity Material Sand - Coarser Mater Visible ice inclusion Visible ice lense	ial		SHEE	т2о <u>г</u> 2
Depth Scale (m)	Run No.	Symbolic Log *		ption (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	ice description - not visible, visible crystal/inclusion,io lense, bonded, friable	% Ice Content	Penetration Rate (Fast, Sow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water - Y or N	Sample Record - Y / N, Interval, ID#	Photo - Y/N	Comments
6.4 6.6 6.8	5		Till + malt	bedrock	7	No ice	0%	hard to drill	Poor 25%	N	#5 5,72m to 7,22m	У	T:11 Tº 8.7°C
7.4 7.6 7.8 8.0 8.2 8.4 8.6 8.8				End of	h	ole							
9.4 9.6 9.8 10.0 10.2 10.4 10.6 10.8 11.0 11.2 11.4 11.6													

LOGBY: Mélissa Lapointe O.

DRILLING DA	ECT: TSF INVESTIGATION ING DATE: APRIL 10 14 CONTRACTOR/DRILL TYPE: ORBIT GARANT DIAMOND					200-1 TSF AREA 1	Symbolic Log Clay- Fine material Sity Material Sand - Coerser Material				SHEET OF		
DRILL CONTI	RACTOR/	DRILL TYPE:	ORBIT GARANT I	DIRMOND	SURFACE I	ELEVATION: 147, 1 M HOLE DEPTH: 11.		0 0 0 0	Sand - Coarser Mater Visible ice inclusion Visible ice lense	al			
Depth Scale (m)	Run No.	Symbolic Log *	Material Description (Col		Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ice lense, bonded, friable	% ice Content	Penstration 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			1CE						8.1			*000000000	No (I COVER)
0.6				NO RE	Cov	ERY		EASY TO DRILL	Pook 0%	2			NO RECOVERY OF MATL.
1.4	2		DARK GR FINE SAN	TAILINGS	Y	NOT VISIBLE, WELL BONDED FROZEN	, dh	EASY TO DRILL	G000 100%		#1 #2	Y	VISIBLE CONTACT POINT P 1.6M TEMP 1.0°C
2.0 2.2 2.4 2.6				10		iary			Poor				
3.2 3.4 3.6 3.8	3			REC	201	IGLY			Pool	2			
4.0 4.2 4.4 4.6			DARK G FINE SP	PREY TAIUNGS	4	NOT VISIBLE WELL BONDED FROZEN			Gass	2	¥ 3	Υ.	
5.0 5.2 5.4 5.6	4				Y	NOT VISIBLE SOFT ON OUTSIDE	531.		100%	•	#4	Y	OUTSIDE OF CORE VISIBLY SOFT TEMP 1.0°C
5.8	5		DARK GRI		Y	NOT FROZEN VISIBLE WELL BONDED	60%	V	G000 90%	N	#5	Υ	

LOG BY:	T. DAHM.

DRILLING D	TOF INVESTIGATION DATE: APRIL 10/14 WITH THE TOP OF THE SAPENT / DIAMOND DRIE ERIC LEVESOUS, CHRISTIAN LEVESOUS		SURFACE	200-1 N: TSF AREA ELEVATION: 147, 1 M HOLE DEPTH: 11 METER: HQ OR CUTTINGS		0,000		SHEE	T 2 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	% ke Content	Penetration Rate (Fast, Sow, Very Sow - 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 6.6 6.8 7.0	5		DARK GREY FINE TAIUNGS SAND	Y	NOT VISIBLE WELL BONDED FROZEN	50°{s	EASY TO DRILL	90%	7	#5	Y	
7.6 7.8 8.0 8.2 8.4 8.6	6							Pook 10%	7	#0		
9.0 9.2 9.4 9.6 9.8	7			V	8		V			#7	Y	TEMP 6.1°C
10.2			LIGHT BR SICTY SAND IS GRAVEL	2	NO ICE.	0%	HARD TO DRILL	MEDIUM 50°/s	2	#8	Y	
10.8 11.0 11.2	8		BEDROCK		NO ICE	0%	HARD TO DRILL	160R 25%	7	#9	4	
11.6 11.8 12.0	и денер дин на		END OF	tou	5							

LOG BY: T. DAHM

PROJECT: DRILLING DA DRILL CONT. DRILLER:	PROJECT: TSF Investigation PRILLING DATE: April 10/14 night PRILLING DATE: April 10/14 night PRILLER: Sylvain Levesque / Ranald drill E				300-1 H: TSF QCQ A ELEVATION: 146, 8 HOLE DEPTH: 14 METER: HQ ORCUTTINGS	0°0 0 0	SHEET LOF 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 0.2 0.4 0.6	1		No recove	284	Eosy to		Easy to drill	Poor 0%	70		N	NO (Etove
1.4 1.6 1.8 2.0 2.2 2.4 2.6	2		dark grey fine tailings sand	γ	NOT visible, well bonded frozen		Easy to	Good	.gyJ	#1 10 2.7m	γ	T= 015 e
3.6	3		Dark grey solid tailing	Y	ice lense visib at depth 2.7m	50%	Easy to drill	mediu 77%	2	#2 2,7m to 4,2,00	Section and the section and	
4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8	4		Dark grey softer	4	NOT visible Soft on outside and frozen inside. few ice lense visible inside.	50%	Easy to drill	Poor 324	N .	#3 #2m +0 5.7m	Statistical industrial in the state of the s	9

LOG BY:	Melissa	Lapointe
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DRILLING D DRILL CONT DRILLER:	TRACTOR/	DRILL TYPE:	April 10/14 nigh orbit garant / diamond exesque / Ronald	LOCATION SURFACE CORE DIA	N: TSF, QYEO, A ELEVATION: 146/8 HOLE DEPTH: 14 METER: HQ OR CUTTING	1.7m	00000	Symbolic Log Clay-Fine material Silty Material Sand - Coarser Material Visible ice inclusion Visible ice lense		SHEE	T <u>2</u> OF <u>3</u>	
Depth Scale (m)	Run Ne.	Symbolic Lag *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion, i lense, bended, friable	% lce	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, artting %)	Sample Record - Y /N, Interval, ID#	Photo - Y/N	Comments	
6,2 6,4 6,6 6,8	5		Dark grey Softer	У	ice lense visible at depth 5.7m	50%	Easy to drill	Good 100% N	#4 517m to 7.2m	Y	T= 1,0°C	
7.2 7.4 7.6 7.8 8.0 8.2	6		Dark grey fine tailings sand	Y	ICE lenge visible at depth 7.2m	5°%	Easy to	Medium 5.4 /	#5 + 8+1		TELOC	
9.0 9.2 9.4 9.6 9.8 10.0 10.2 10.4 10.6 11.0 11.2 11.4	7+		park grey tailings and cloudy ice		Tailthuse Mixt of Ice and tailings	T /8	hard to	Poor 4686	# 6 8.7m tio tii7m	Y	2	2
11.8												

LOGBY: Mélissa LaPointe D.

PROJECT: DRILLING D DRILL CONT DRILLER:	ATE: RACTOR/	DRILL TYPE:	orbit garant/ diagnopo	HOLE#: LOCATION SURFACE CORE DIA	ELEVATION: 146, B HOLE DEPTH: 4	.7m	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	Symbolic Log Clay - Fine material Sity Material Sand - Coarser Mater Visible Ice inclusion Visible ice lense	ial		SHEE	, <u>3</u> , <u>3</u>	
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,ic 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#	Phate - Y/N	Comments	
12.9	8		Park grey tailings Soft Light bedrock sand and gravel Gravel = 5mm to 10m	Y	Not visible soft on outside frozen	50%	hard to drill	Medium 72%	N	#7 11.7m to 13.2m	Y	11.7 to 13.1 m ils tailings 13.1 m to 13.2 m Bedrock T= 1,0°C	
13.6 13.6 13.8 14.0 14.2			Bedrock	7	No îce	0%	hard to deill	Cutting 54%	2	#8 13.2m to 14.7m	Y	Big rock block that's the reason we the sample it's not full or rock.	J
14,8 23 15,0 2.8 3.0 3.2 3.4 3.6	Cur	gaar Gishanililigan Ahrisi			End of hole				the pure of the second second				
4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6													

LOGBY: Melissa Lapointe D.

DRILLING DA	TE:	Ap	estigat ril 12 Orbit esque	ion 114 Garant	LOCATIO	ELEVATION: 147.33 HOLE DEPTH:	Symbolic Log Clay-Fine material Sitty Material Sand - Coarser Material a ° ° ° ° Visible ice inclusion Visible Ice lense				SHEET 1 OF 3		
Depth Scale (m)	Run No.	Symbolic Log *		scription (Color, sand/silt/day %)	ozen Cere/Cutting - Y,N	tce description - not visible, visible crystal/indusion,tee lense, bonded, friable	% ice Content	Penetration Rate (Fast, Sow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, artting %)	Water - Y or N	Sample Record - Y /N, interval, ID#	Photo - Y/N	Comments
0.0 0.2 0.4 0.6	1		Dark Sand	grey tailings	£	ice not visible well bonded frozen	50%	Easy to drill	84% Medium	N	#1 0.2m to 1.2m	Y	TEO,1°C Omto 0,2m it's ice on
1.4	2		NO 1	ecovery	N			Easy to	Poor 0%			N	
2.0 2.2 2.4 2.6 2.8	3		Dark Sand	grey tailings	Y	ice lense visible	50%	Easy to drill	Good 100%	7	#2 17m to 3.2m		T= 0.1°C
3.4 3.6 3.8 4.0 4.2 4.4 4.6 5.0 5.2	4		Dark Sand	grey tailings	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. (4.4mto5,4)
5.8					. San Assauran San Judgar ya					The second se			

LOG BY: Thomas Dahm

PROJECT: TSF Investigation
DRILLING DATE: April 12 114
DRILL CONTRACTOR/DRILL TYPE: Or bit Garant Symbolic Log
Clay - Fine material
Silty Material
Sand - Coarser Material
a ⁰ ⁰ ⁰ Visible ice inclusion
Visible ice lense SHEET 2013 LOCATION: TSF, Area A SURFACE ELEVATION: 147,33 MOLE DEPTH: 18.2 m Eric Levesque /Christian. L core DIAMETER: HQ DRILLER: Sample Record - Y /N, Interval, ID# Scale (m) Jone/Cut Y,N Recovery (Poor, Medium, Good -core %, autting %) Run No. Ice description - not visible, visible crystal/indusion,ice lense, bonded, friable Penetration Rate (Fast, Sow, Very Slow - m/min) Material Description (Color, sand/silt/day %) Comments Photo. Depth Easy to Poor 6.2 0% No recovery 6.4 6.6 6.8 7.0 7.2 Modium Dark grey tailings ice not visible #4 Easyto T=0,8°C 7.4 Sand well bonded 85% 7.2m drill N 50% 40 frozen. 8.7m 46 7.8 8.0 8.4 8.6 Poor Easy to N #7 0% No recovery drill 9.0 ice lense visible T=1,30 Good Dark grey tailings Easy To #5 5and 100% 8# 50% drill 9.2m 9.6 To 10,7m 9.8 10.2 10.4 10.6 Poor Easy To 10.8 N 49 0% drill 11.0 No recovery 11.2 11.4 11.6 11.8 12.0 12.2

HOLE#:# 100-3

OG BY: THOMAS DAHN	4
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PROJECT: TSF investigation DRILLING DATE: April 12 /14 DRILL CONTRACTOR/DRILL TYPE: Orbit Garant DRILLER: Evic levesque / Christian-L				HOLER: \$\frac{100-3}{\text{LOCATION: T6\$, A/eA}}\$ SURFACE ELEVATION: \(\frac{133}{\text{LOCATION: OR CUTTINGS}}\) CORE DIAMETER: \(\frac{1}{\text{LOCATION: OR CUTTINGS}}\)			Symbolic Log Cley - Fine material Silty Material Sand - Coarser Material a D a a Visible (ce inclusion Visible (ce lense				sнеет. Зов. З		
Depth Scale (m)	Run Ne.	Symbolic Log *	Material Description (Color, sand/silt/day %)	Frozen Core/Cutting - Y,N	Ice description - not visible, visible crystal/inclusion,ic lense, bonded, friable	% ice Content	Penetration Rate (Fast, Sow, 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 12.6 13.0 13.2 13.4			Dark grey tailings Sand		No ice	7	Easy to drill	Good 100%	У	#6 12.2m TO 13.7m	y	T= 7.7'c The cove its not frozen, really soft and wet.	
13.8	#11		No recovery			N	Easy to drill	Poor 0%					
15.4 92 15.6 15.8 16.0 96 16.2 90 16.4	#12		No recovery		- N		Easy to drill	Poor o%			2		
17.0 17.0 17.4 17.6 18.2 17.6 18.0 18.0	#13	•	Dark grey tailings Sand	Y	ice not visible well bonded		Easy to drill		The second secon			we don't keep the samp and we never approact to the till or bedrock.	
18.4					End of hole								

LOGBY: THOMAS dahm

PROJECT: TSF INVESTIGATION HOLES: 74100 - DRILLING DATE: APril 12 114 NIGHT LOCATION: TSF DRILL CONTRACTOR/DRILL TYPE: Orbit garant diamond drill surface ELEVATION: DRILLER: Sylvain Levesque / Ronald core Diameter: HQ					1100 - 2 II: TSF, Are A ELEVATION: 147, 3 M HOLE DEPTH: 11. METER: HQ OR CUTTINGS	mF	Symbolic Log Clay - Fine material Silty Material 1			SHEET_1 OF_2			
Depth Scale (m)	Run No.	Symbolic Log.*	Material Description (Color, sand/slit/day %)	Frozen Core/Cutting - Y,N	ice description - not visible, visible crystal/inclusion,ic lense, bonded, friable	tent	Penetration Rate (Fast, Slow, Very Slow - m/min)	Recovery (Poor, Medium, Good - core %, cutting %)	Water-Yor N	Sample Record - Y /N, Interval, ID#	Photo - Y/N	Comments	
0.0 0.2 0.4 0.6	1		No recovery				Edgy to	Poor 0%	7			No recovery	
1.2 1.4 1.6 1.8 2.0 2.2 2.4	2		Dark grey fine tailings sand	7	Many lense of ice visible at depth 1.2M Tailings solid Frozen	50%	Easy to	Good 100%	2		Ÿ	T°= 016°C	
2.8 3.0 3.2 3.4 3.6	3		No recovery				Easy to	P	2				
4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4	4		Dark grey Fine tailings sand	У	Many lense of ice and ice crystal visible	65%	Easy to drill	Med um 62°/		4.2 M to 5.7 m	Y .	T=0,2°C	
5.8		The state of the s			profession de la companya del companya del companya de la companya								

NOTES: Metissa lapointe D NOTES: I took many picture of the lense and crystal for each sample.