Appendix B.	LSMEOC Reach 1 and 3 Soil Logs

APPENDIX D KGS GROUP BOREHOLE LOGS



KGS GROUP			LE NO. H -L1							S	HEET	r 1	of :	2						
CLIENT PROJECT SITE	ill hol	e on drill PAD 1				GF TO W/ D/	OB NC ROUN OP OF ATER ATE D	ID EL PVC ELE RILL	ELE V.	7. N		2011 1,688 41,84	5							
ELEVATION (m) (a) (b) (b) (c) (c) (d)	GRAPHICS	DESCRIPTION AND CLASSIFICATION		SAMPLE TYPE	NUMBER RECOVERY %	SF blo DY (N)	PT (N) ows/0 'NAMI) blow	.15 m IC CC /s/ft			40 I	MC %		*						
1 1 1		PEAT - Organics									40 1 11 1 11 1 11 1 11		80 1 1 1 1 1 1 1 1							
3 111 2	///	CLAYEY SILT TILL - Light grey, moist to wet, soft, some sand, some grav																		
5 5 6 7 8 9 9 1 1 1 1 1 1 1 1		SILT TILL - Light brown/tan, low plasticity, limestone, some sand, trace gragenerally sub-angular, some cohesion. - Drilled through boulder at 2.74 m.	ivel,		32															
10								- Drilled through boulder at 2.74 m.												
18 - 19 - 20 - 20 - 20 - 20		END OF HOLE 6.10 m												1 1						
21		Note: 1. Auger refusal at 2.74 m. Switched to Air Hammer. 2. No refusal.																		
SAMPLE TYPE CONTRACTOR	R	Auger Grab INSPECTOR	A	PPR	OVE	, D			1	DATE				_						

7/28/11

GROUP DEPTH DEPTH	SS		m °	SPT (N)	Cu POCKET PEN (k Cu TORVANE (kPa)
VATION	GRAPHICS	DESCRIPTION AND CLASSIFICATION	R RETYP	blows/0.15 m ADVNAMIC CONE	20 40 00
(m) (ff			SAMPLE TYPE NUMBER RECOVERY %	(N) blows/ft	
	+	3. In bedrock.	σ z <u>α</u>	20 40 60	20 40 60
23		4. Water at 0.30 m below surface.			
24 ————————————————————————————————————					
1 1					
1 7	5				
26					: : : : :
27					
28 =					
26					
30 -3)				
31 —					
30 = 3					
33					
34 —					
	.				
35 = 3					
36					
37					
					1
39 =					
40 = 4)				
41 =					
42					
42					
43 - 1					
44					
45 = 4	5				
=					
46 =					
47 =					
48 🗓	E 🔢	Auger Grab			

I G	KGS ROUP		SUMMARY LOG HOLE NO. BH-L2				SH	EET 1 c	of 2
CL PR SI'	IENT ROJECT TE	5m No	rth of creek, Drill hole on PAD 5			JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	EV. 7/2 N	21/2011 562,070 5,745,441	1
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	APLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu TOF	CKET PEN (I	
"	(m) (ft)			SAN	N	20 40 60	20	% 40 60	80
	2 - 3 - 3		PEAT - Organics SILTY CLAY - Black/grey to grey/brown, moist, soft to firm, low plasticity, some sand, trace fine gravel. SILT TILL - Light brown/ tan, damp to moist, firm, with sand fine grain to coarse grain,						
	- 1 2 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		trace to some gravel, some clay, limestone angular to sub-angular, low plasticity.	II F					
	7		- Grey/ tan, moist to wet, firm, low plasticity, with sand fine grain to coarse grain, some gravel, some clay, limestone angular to sub-angular below 2.74 m.		S3 S4				
GPJ	13			IL∕	S5				
KE ST MARTIN3	20 — 20			14 17 17 17	S6				
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DESIGNIGEO/LOGS/LAKE ST MARTIN3. GFJ	22		SILTY SAND - Limestone and granite.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	S7				
ROJE	31			<u> </u>					
SOIL LOG P:\P	32	- a. 4 - f. Q	END OF HOLE 9.75 m Notes: 1. Auger refusal at 6.71 m. Switched to Air Hammer with water injection. 2. In till.						
SA SA	<u>135 - 1 35</u> MPLE TYPE		Auger Grab				I I I		
CC	ONTRACTOR		INSPECTOR	APP	ROVI	ED	DATE 7/28/11		

GROUP ELEVATION (m) DEPTH DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu POCKET PEN (kPa) Cu TORVANE (kPa) 20 40 60 80 PL MC L % 20 40 60 80
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 60 61 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 60 61 61 61 61 61 61 61 61 61 61 61 61 61		Water at 0.30 m below surface.			
SAMPLE TYPE CONTRACTOR	Au;	ger Grab INSPECTOR			DATE

	K	GS OUP		SUMMARY LOG HOLE NO. BH-L3				SHE	ET 1	of 1
	SITE	JECT	Drill ho	le on PAD 4			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	7/2 N 5	2/2011 556,490 5,744,8	6
	ELEVATION (m)	(m) (ft)		DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu TOR) 80 LL
GEOTECHNICAL-SOIL LOG P:)PROJECTS\2011/11-0300-18\IDES\GN\GEO\LOGS\LAKE ST MARTIN3.GPJ		1	E	PEAT - Organics - Sand gravel seam at 0.61 m. GLAY - Black/ drak grey, moist to wet, soft to firm, with sand - Gravel and cobbles at 0.91 m. SILTY CLAY TILL - Light brown, moist, firm to stiff, intermediate to high plasticity, some sand, fine to coarse grained gravel, trace travel, boulder (approx. 0.15 to 0.20 m in diameter). TILL - Dense, mix of granite chips with clay peices, sand included. END OF HOLE 9.75 m Notes: 1. In till. 2. Water at 6.40 m below surface.		ROVE		DATE		
GEOT		1101010		E IOLECTOR P	1			7/28/11		

		GS OUP		SUMMARY LOG HOLE NO. BH-L3A	\			SH	ZET 1	of 1
	CLIE PRO SITE LOC	ENT JECT	Drill ho	le on PAD 4		JOB NO. GROUND TOP OF F WATER E DATE DR UTM (m)	PVC ELE ELEV.	ΞV.	22/2011	
	ELEVATION (m)	(#) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	SPT (N) blows/0.1 DYNAMIC (N) blows 20 40	CONE /ft △		40 60 MC 40 60 40 60) 80 LL
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGNIGEOILOGS/LAKE ST MARTIN3.GPJ		2		PEAT - Organics - Sand gravel seam at 0.61 m. CLAY - Black/ drak grey, moist to wet, with organics, some sand, some limestone gravel. SILTY CLAY - Brown, moist, soft, high plasticity, some sand, trace gravel. SILTY CLAY TILL - Light brown/ tan, wet, soft, low plasticity, some sand, trace to some gravel.		20 40				80
OIL LOG P:\PROJECT	-		/0/	AUGER REFUSAL AT 1.98 m. Notes: 1. In till.						
ICAL-SC	CAR			In till. Water at 6.40 m below surface.		;				
GEOTECHN		PLE TYP TRACTO		INSPECTOR	APPROV	VED		DATE 7/28/11		

KGS GROUP			HOLE NO. BH-L4					SE	ÆET	1 of 2
CLIENT PROJECT SITE LOCATION [DRILLING METHOD	Orill ho	le on PAD 3A				JOB NO. GROUND E TOP OF PV WATER EL DATE DRIL UTM (m)	C ELI EV.	EV.	23/20	11
ELEVATION (m) (a) (b) (c) (c) (d) (d)	GRAPHICS	DESCRIPTION AND CLASSIFICATION		SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 DYNAMIC (N) blows/fit	ONE	Cu TOI	40 M(60 80 C LL
1 2 3 4 5 5 6 6 10 10 11 12 10 11 11 12 13 14 14 15 16 17 18 19 20 21 14 11 15 16 17 18 19 20 21 14 15 25 26 27 14 14 15 15 25 26 27 28 29 30 31 14 14 15 15 25 26 27 28 29 30 31 31 35 35 SAMPLE TYPE	# 10 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0	SILTY CLAY - Black/ dark grey, wet, medium to high plasticity, soft, so gain to coarse gain, trace fine gravel. SILTY CLAY - Light grey, wet, soft, low plasticity, some to with sand, to subangular. S2 at 0.91 - 1.37 m. SILTY CLAY TILL - Light brown/ tan, moist, firm to stiff. - S3 at 1.37 m. END OF HOLE 9.75 m Notes: 1. Air Hammer with water injection. 2. In till.								
CONTRACTOR	}	INSPECTOR		APP	ROVI	ED		DATE 7/28/11		

GRO (m) RELEVATION (m)	ОЕРТН	GRAPHICS	DESCRIPTION AND CLASSIFICATION	TYPE	SPT (N) blows/0.15 m	20 40 00 8
ELEVA		GRA		SAMPLE TYPE NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft \triangle	%
44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74	Tandamahan bandamahan	3.	Water at 0.30 m below surface.			
SAMPLI						<u> </u>

	GS ROUP		SUMMARY LOG HOLE NO. BH-L4A				SH	EET 1 of	2
CLII PRO SITI LOO	ENT DJECT E	Orill ho	le on PAD 3A			JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	EV.	23/2011	
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu TOR	CKET PEN (kPa) 40 60 8 MC L % 40 60 80	0 L
-	2		PEAT - Organics SILTY CLAY - Black/ dark grey, wet, medium to high plasticity, soft, some sand, fine gain to coarse gain, trace fine gravel.						
TIN3.GPJ	3		SILTY CLAY - Light grey, wet, soft, low plasticity, some to with sand, trace gravel, subangular.						
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/LAKE ST MARTIN3.GPJ O Y V V	5 - 5		SILTY CLAY TILL - Light brown/ tan, moist, firm to stiff. END OF HOLE 2.29 m						
ICAL-SOIL LOG F	8 — 8 — 1		Notes: 1. Air Hammer with water injection. 2. In till.						
CON	IPLE TYPE		INSPECTOR	APPI	ROVE		DATE 7/28/11		

	OUP	S				0.0	Cu 1		(ET PEN 'ANE (kF	
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	۲۲ %	SPT (N) blows/0.15 m	. 1	20 4	40 60	80
EVA	DE	GRAI		PLE .	OVER	DYNAMIC CONE (N) blows/ft		PL	МС	_
	(m) (ft)			SAM	REC	20 40 60		20 4	% 40 . 60	80
	-		3. Water at 0.30 m below surface.						· · · · · ·	· · ·
	-						
(9 🚽 📗						1	1		
	-						: :: ::	. j j - j j	: : - -	.
]] 	 	
10	010							. -	. . 	
	-						: :	
	-						1::::			
1	1 -							. 	: :: :: : 	i
]							. .	: :: :: : : :: :: :	
	-							 .	 . .	
12	2 -							. .	: :: :: :	
							: :: ::	: -		
	-									
1,	3 -							. :. :. -
	`							
	-									
	, <u> </u>							. -	: :: :: : - -	
14	* 🗍 📗							.TT • •• ••	.TTT. - -	
	-							. - -	. . - · - · · · · ·	!!
	_						: :: ::	: :: :: : :: ::		
15	5 15							.TT -	. . . · · · · ·	.
								 -	. . - - .	
	-							
16	6 +						1:::::	
]						 -	 - -	. . - - -	- - - -
]							
17	7 -								
	1							. . - - - ·	
	1							. j j . j j	: :: :: : : :: :: :	: i i
14	LE TYPE						1	11	.111.	

		GS ROUP		SUMMARY LOG HOLE N BH-I				SH	EET 1	of 1
	SITE	JECT	Prill hol	le on PAD 3A			JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	EV. 7/2 N :	24/2011 553,446 5,741,00	2
	ELEVATION (m)	(a) DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	AAMDI E TVDE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu TOR	40 60 MC 40 60	
GEOTECHNICAL-SOIL LOG P.:PROJECTS/2011/11-0300-18/DESIGN/GEOILOGS/LAKE ST MARTIN3.GPJ		1 2 3 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 16 17 18 19 10 11 12 20 21 22 23 24 25 26 27 28 29 30 31 32 33 32 33 32 33 32 37 17 17 17 17 17 17 17 17 17 17 17 17 17		BOULDERS - Cobbles, mix limestone and granite TILL - Sitty clay till/ clayey silt till, grey, wet, soft, medium plasticity, some to with trace gravel. END OF HOLE 9.75 m Notes: 1. In till. 2. Water at 0.30 m below surface.		PROVE				
GEOTE	CON	TKACIOR		INSPECTOR	API	ROVE		7/28/11		

APPENDIX E

TESTPITTING AND TILL SAMPLING PROGRAM ALONG BUFFALO CREEK - INTERNAL MEMO





MEMORANDUM

TO: Colin Siepman

FROM: John Burns

cc: Tony Ng, Brian Bodnaruk, Bert Smith

DATE: October 7, 2011

PROJECT NO: 11-0300-18

RE: Testpitting and Till Sampling Program along Buffalo Creek,

Lake St. Martin Outlet Sediment Erosion Monitoring

1.0 INTRODUCTION

As part of the Sediment Erosion Monitoring Program for the Lake St Martin Flood Relief project, KGS Group completed 15 testpits and collected till samples along Buffalo Creek between station 13+500 and 27+500 m (Figure 1). All field work was completed between September 21, 2011 and September 26, 2011. The field work required helicopter support for site access each day. Five additional helipads (#15 to #19) were cut immediately prior to the start of the testpitting program.

The purpose of the testpitting program was to document the soil characteristics in the till embankments along Buffalo Creek as part of the Sediment Erosion Monitoring program. The testpit program involved the excavation of approximately 1.0 m³ of soil, then separating the coarse fraction (>50 mm ø) from the fine soil fraction. The coarse fraction is the material that is expected to remain in place to armour the new flood relief channel. The fine material is expected to erode away by stream flow. A soil sample of the fine grained material (smaller than 50 mm ø) from each testpit was collected for grain size analysis.

In addition to the testpit/till sampling program, a vegetation survey was completed during the same time frame and a detailed cross section survey is currently being completed. The results of the vegetation survey and detailed cross section survey will be presented as stand alone reports.

2.0 WORK PROGRAM

The testpitting program included the following components:

- Cutting of 5 additional helipads
- Excavation of 1.0 m³ testpits at 1 km spacings between Helipad #5 and the Dauphin River
- Separating the fine soil fraction from coarse soil fraction and calculating the volume of coarse material by water displacement method

- Collecting a representative sample of the fine soil fraction (smaller than 50 mm Ø) for laboratory grain size analysis.
- Photographing the testpit, recording the GPS coordinate of the testpit, and backfilling the testpit.

3.0 METHODOLOGY

A crew of four was mobilized to the closest helipad to the work area each day. Field equipment included 20 L pails with graduation marks, a 2 L measuring cup with graduations, digging tools, tarps, and a screen with a 50 mm mesh.

The crew took turns digging and placed excavated soils adjacent to the testpit. Depending on the soil texture, the coarse gravel, cobbles, and boulders were either separated by hand or by using the screen (50 mm mesh) as excavation continued. In general, two people sorted the soils as the other two dug the testpit.

Digging ceased when approximately 1 m³ of soil had been excavated. The testpit walls were squared-up and the testpit was measured so the in-situ volume could be calculated.

The coarse fragments were brushed clean, and then placed into a 20 L pail. The 20 L pail was then filled to either the 10 L mark or 20 L mark with water using the graduated 2 L measuring cup. The water displaced by the coarse fragments was then recorded and the percent (by volume) of coarse fragments was calculated for the testpit.

A representative sample of the fine fraction from the testpit was then collected. The field crew collected this sample from a portion of the testpit wall that looked most representative of the entire testpit. It was decided (in the field) not to collect the sample from the stockpile of excavated soil, because any changes in the soil texture with depth could skew the sampling results – if the soils near the base of the testpit were coarser grained or finer grained than the upper soils, these soils would end up on the top of the soil pile, and potentially skew the sampling results.

After a 5 kg soil sample was collected from the testpit wall (with fragments larger than 50 mm \emptyset removed) the sample was labelled with the testpit name and depth-interval (i.e. TP7, 0.25-0.40 m). After the first 5 testpits were completed, it was decided to use a hand auger to probe deeper from the base of the testpit. This enabled the field crew to determine if there were any significant changes in the soil characteristics below the testpits. The testpit stratigraphy and the stratigraphic information gathered with the hand auger testhole were recorded on field logs. The data on the field logs also includes the GPS coordinate of the testpit, the volume of material larger than 50 mm \emptyset , the dimensions of the testpit, and the percent by volume of coarser material (Appendix A).

Prior to backfilling the testpits, the coarse fragments and the excavation were photographed. The photographs of each testpit are attached to the field logs in Appendix A.

4.0 LABORATORY ANALYTICAL RESULTS

One soil sample from each of the 15 testpits was submitted to the MIT Materials Engineering Branch Central Laboratory for grain size analyses. The laboratory analytical report is included as Appendix B.

All soil samples except the sample from testpit TP5 contained a large proportion of fine material (clay and silt). The clay and silt contents ranged from a high of 98% at TP14 to 45% at TP13.

Excluding TP5, the average clay and silt content was 70.4%. The sand size fraction (0.075 mm to 4.75 mm) ranged from a high of 46% at TP8 down to 2% at TP14 (average=24%). The fine to medium grained gravel fraction (4.75 mm to 50 mm) ranged from a high of 22% at TP3 to 0% at TP10, TP11, TP12, TP14 and TP15 (average=6%).

The soils at testpit TP5 are discussed separately because of the vast difference in the soil texture at this location. At TP5, the silt and clay content was 5%, the sand size fraction was 40% and the fine to medium gravel fraction was 55%.

5.0 PERCENT BY VOLUME LARGER THAN 50 MM Ø

Testpit TP5 contained 11.3% (by volume) material larger than 50 mm in size. This location was anomalous compared to the remaining 14 testpit locations, and is not factored into the following discussion.

The remaining 14 testpits contained between 0% material larger than 50 mm (TP8, TP10, TP12 and TP13) and 3.2% material larger than 50 mm (TP2). Testpit 14 contained a very small amount of coarse material (less than 0.1%). Twelve (12) of the fourteen (14) testpits contained 1% or less coarse material. Excluding TP5, only TP2 and TP4 contained more than 1% coarse material.

6.0 CONCLUSIONS

The soils along Buffalo Creek can be classified as a silty clay till. The silt and clay content combined average approximately 70%. The sand size fraction averages approximately 24%, and the fine to medium gravel content is approximately 6%.

Factoring out the results from TP5, the percent by volume of material exceeding 50 mm in size is approximately 0.65%. With the results from TP5 factored in, the percent by volume of material exceeding 50 mm in size is 1.37%.

If you have any questions regarding the three work programs described above, contact Colin Siepman or John Burns.

Prepared By:

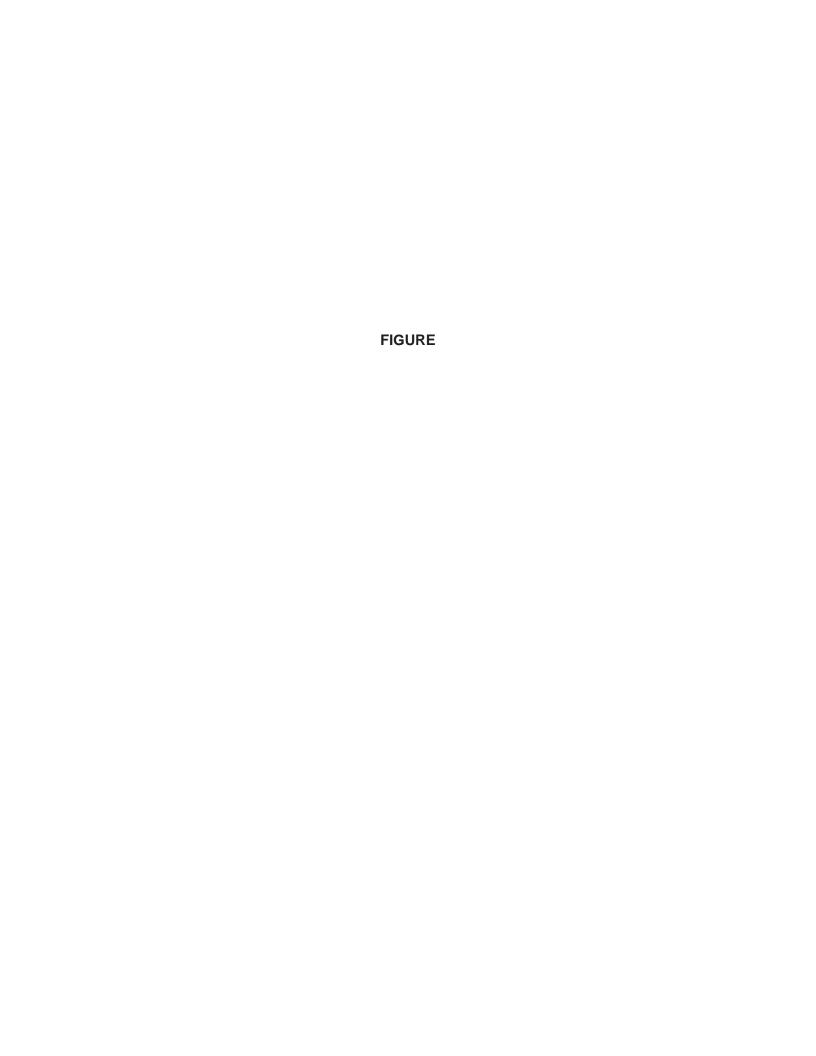
John Burns, P.Geo.

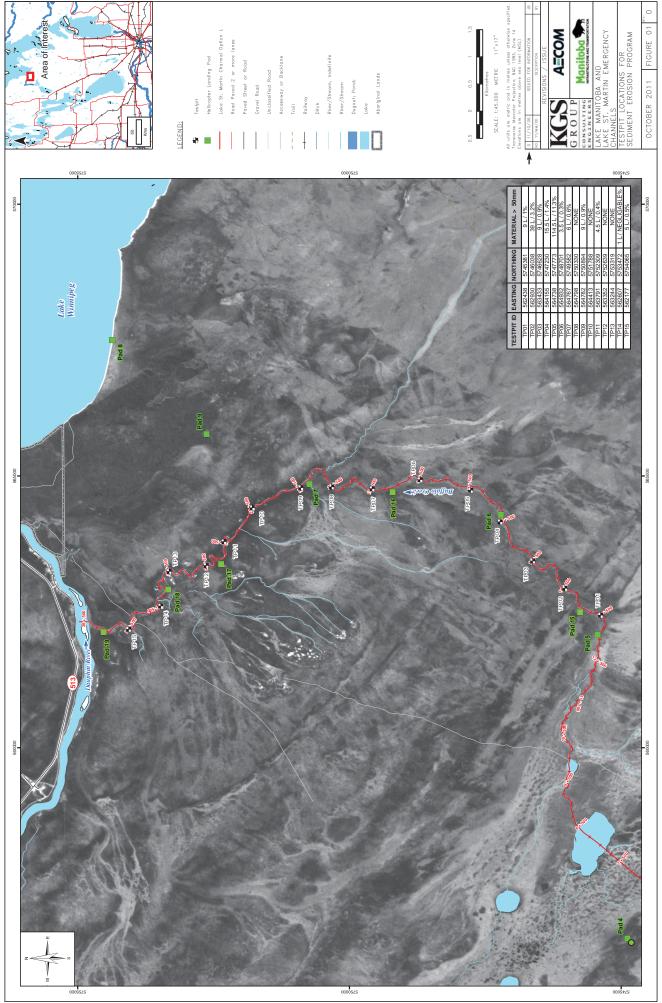
John Buns

Senior Environmental Geologist

JB/sl

Attachment





APPENDIX A TESTPIT LOGS



Photo 1 - Helipad 5 area, Inundated



Photo 2 - Helipad 5 area, Inundated



Photo 3 - Helipad 5 area

	K GR		P		SUMMARY LOG HOLE NO. TP01				SHI	EET 1 of 1		
	CLIE	NT JECT	M B	uffalo	OBA INFRASTRUCTURE AND TRANSPORTATION Creek Sediment Survey Creek			JOB NO. GROUND ELEV. TOP OF PVC ELI		0300-18		
					ank Sta. 13+500	WATER ELEV. DATE DRILLED						
DRILLING METHOD			Sł	novel				UTM (m)	Ε :	5,745,381 562,438		
ELEVATION (m) (m) (m) DEPTH		(tt) GRAPHICS		DESCRIPTION AND CLASSIFICATION		NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		KET PEN (kPa) ★ VANE (kPa) ◆ 40 60 80 MC LL			
Γ					ORGANICS - Black, moist, soft, non to low plastic, with rootlets.	П			111	11111		
EY.GPJ		1 - 1			SILTY CLAY (CH) - Grey, moist, soft, high plasticity, some fine to medium grained sand, some gravel, trace cobbles (up to 125 mm x 125 mm x 200 mm), occasional silt seams up to 25 mm thick. END OF TESTPIT AT 0.49 m. Notes: 1.) Recovered 9 L of material larger than 50 mm Ø (1% by volume).		61					
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ	SAM	2—	YPE		Shovel							
ECE ECE	CON	TRACT	ГOR		INSPECTOR A		OVE		DATE			
ğL	K	GS G	rou		C. ROBAK	RAF	T		9/28/11			



Photo 1 – Completed Testpit



Photo 2 – Coarse material >50 mm ø from testpit



Photo 3 - Material passing 50 mm ø screen



Photo 4 – Backfilled testpit

CLIENT PROJECT BUTTELO Creek Sediment Survey SITE BUTTELO Creek Sediment Survey SITE BUTTELO Creek Sediment Survey BUTTELO Creek Sediment Survey DRILLING DRILLING Shovel DESCRIPTION AND CLASSIFICATION BUTTELO CREEK DESCRIPTION AND CLASSIFICATION DESCRIPTION AND CLASSIFICATION		K GR	G	S JP		SUMMARY LOG HOLE NO. TP02				SH	EET 1	of 1		
Shove E 562,930	•	PRO	PROJECT Buffalo Creek Sediment Survey SITE Buffalo Creek LOCATION West Bank Sta. 14+500 DRILLING Shovel						GROUND ELEV. TOP OF PVC ELI WATER ELEV.	9/22/2011 N 5,746,038				
DESCRIPTION AND CLASSIFICATION DIVAMIC CONE (N) blows/0.15 m brown of the plant of the plan		DRIL MET							UTM (m)					
ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SILTY CLAY (CH) - Dark grey, moist, soft to firm, high plasticity, some gravel, trace sand. SANDY CLAY (CI) - Light grey, moist to wet, soft, low to intermediate plasticity, some fine grained gravel, trace to some medium to coarse grained grael, trace cobbles (subrounded to subangular and up to 225 mm Ø), increasing silt content and decreasing plasticity with depth. END OF TESTPIT AT 0.7 m. Notes: 1.) Recovered 39 L of material larger than 50 mm Ø (3.2% by volume). 2.) Water infiltration at base of testpit. 3.) GPS point didn't save, coordinates scaled off from drawing.		ELEVATION (m)			GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu TOF	40 60 MC %	80 LL		
CONTRACTOR INSPECTOR APPROVED DATE KGS Group C. ROBAK DRAFT 9/28/11		SAM	2—	-		SILTY CLAY (CH) - Dark grey, moist, soft to firm, high plasticity, some gravel, trace sand. SANDY CLAY (CI) - Light grey, moist to wet, soft, low to intermediate plasticity, some fine grained gravel, trace to some medium to coarse grained gravel, trace cobbles (subrounded to subangular and up to 225 mm Ø), increasing silt content and decreasing plasticity with depth. END OF TESTPIT AT 0.7 m. Notes: 1.) Recovered 39 L of material larger than 50 mm Ø (3.2% by volume). 2.) Water infiltration at base of testpit. 3.) GPS point didn't save, coordinates scaled off from drawing.	-							
	SEOTECH													



Photo 1 – Side view of testpit



Photo 2 – End view of testpit



Photo 3 – Gravel <50 mm ø from testpit



Photo 4 – Fine material from testpit



Photo 5 – Coarse material >50 mm ø from testpit



Photo 6 – Backfilling testpit



Photo 7 – View of work area



Photo 8 - Testpit backfilled

	K GR	GS OUP	•	SUMMARY LOG HOLE NO. TP03				SH	EET 1	of 1
•	SITE	JECT E	Buffalo Buffalo				JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV.	EV.	-0300-18	}
	DRIL	ATION LING HOD	West B Shovel	ank Sta. 15+500			DATE DRILLED UTM (m)	9/2 N . E .	8	
	ELEVATION (m)	(m) (f) (DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	AMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu TOR	CKET PEN (RVANE (KPa	80 LL
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ		1		CLAYEY SILT (CL-ML) - Brown, dry, firm to stiff, friable, low plasticity, some fine to coarse grained sand, trace subangular gravel (mostly 20 mm to 40 mm Ø). - Some tan, dry, hard silt pockets (up to 75 mm Ø) below 0.3 m. END OF TESTPIT AT 0.6 m. Notes: 1.) Recovered 9 L of material larger than 50 mm Ø (0.9% by volume). 2.) Water infiltration at base of testpit.					40 60	80
INICAL-SO	SAM	3 PLE TY	PE 🔀	Shovel						
GEOTEC		TRACTO		INSPECTOR C. ROBAK	APF DR2	PROVE Aft		DATE 9/28/11		

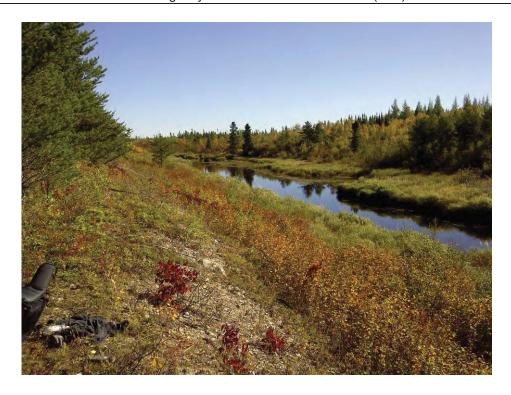


Photo 1 - Creek embankment/work area



Photo 2 - Coarse material >50 mm ø



Photo 3 – View of testpit



Photo 4 – Surficial boulder near testpit

	K	G	S JP		SUMMARY LOG HOLE NO. TP04							S	HEI	ET 1	of	: 1	
	PROJECT B				GROUND ELEV. TOP OF PVC ELEV.								11-0300-18				
	SITE		Buffalo Creek WATER ELEV. DN West Bank Sta. 16+500 DATE DRILLEI									(9/22	/ 201 1	1		
	DRILLING			Shovel	ain ota. 10-500				TM (r			٨	۱ 5, [′]	747,2	230		
-	MET	THOD SHOVE				1		_						64,15 ET PE		20/ *	
	ON (m)	2	Ξ	SOIL		'PE	%	SI	PT (N		m ▲	Cu T	ORV	ANE (k	(Pa)	•	
	ELEVATION (m)	D E O E	7	GRAPHICS	DESCRIPTION AND CLASSIFICATION	APLE T	NUMBER RECOVERY %	D'(N		ис с	ONE	PI		MC		30 LL - 1	
		(m)	(ft)		ORGANICS - Black, moist, soft, non to low plastic, with rootlets.	SAN	NE SE		20	40	60	20	0 4	% 10 6	0 8	30	
NIGEO'LOGSICMRIBUFFALO CREEK SEDIMENT SURVEY.GPJ		1—	5		rounded gravel (up to 50 mm Ø), trace coarse grained gravel, trace cobbles. - 50 mm thick sand seam at 0.25 m, medium to coarse grained sand, trace fine grained gravel. SAND AND CLAY (CL) - Grey/Brown, damp, stiff/dense, low plasticity, some medium grained gravel (up to 50 mm Ø), trace coarse grained gravel, trace cobbles, trace boulders (up to 250 mm Ø). SILTY CLAY (CI) - Grey, moist, firm, intermediate plasticity, some silt pockets (up to 20 mm Ø), trace cobbles. END OF TESTPIT AT 0.75 m. Notes: 1.) Recovered 15.5 L of material larger than 50 mm Ø (1.4% by volume).		S1										
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/CMR/BUFFALO CREEK S			-														
CHNIC	SAM				Shovel												
GEOTE	CONTRACTOR KGS Group																



Photo 1 – Side view of testpit



Photo 2 – End view of testpit



Photo 3 - Coarse material >50 mm ø from testpit



	K GR	G	SP		SUMMARY LOG	HOLE NO. TP05		SHEET 1 o	f 1
	CLIE	ENT JEC1	, E		OBA INFRASTRUCTURE AND TRANSPORTAT Creek Sediment Survey Creek	ON	JOB NO. GROUND ELEV. TOP OF PVC ELI	11-0300-18 EV.	
					ank Sta. 17+500		WATER ELEV. DATE DRILLED	9/23/2011	
		LLING		hovel			UTM (m)	N 5,747,773 E 564,738	
	(m)							Cu POCKET PEN (k Cu TORVANE (kPa)	
	ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m		80
	LEVA.		1	GRAF	DESCRIPTION AND GENORITOR TON	PLE 7 OVER	DYNAMIC CONE (N) blows/ft △		<u> </u>
	Ш	(m)	(ft)		ORGANICS - Black, moist, soft, non to low plastic, with rootlets.	SAM	20 40 60	% 20 40 60	80
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DESIGNI/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY GPJ			5		GRAVELLY SAND (SW) - Brown, damp, dense, well graded, trace st subrounded cobbles. END OF TESTPIT AT 0.85 m. Notes: 1.) Recovered 114.5 L of material larger than 50 mm Ø (11.3% by vo	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
HNICAL	SAM	PLE T	YPE		Shovel		1 · 1 · 1 · 1 ·		
GEOTEC		TRAC			INSPECTOR C. ROBAK	APPROVE DRAFT		DATE 9/28/11	



Photo 1 – View of testpit



Photo 2 – Sidewall of testpit

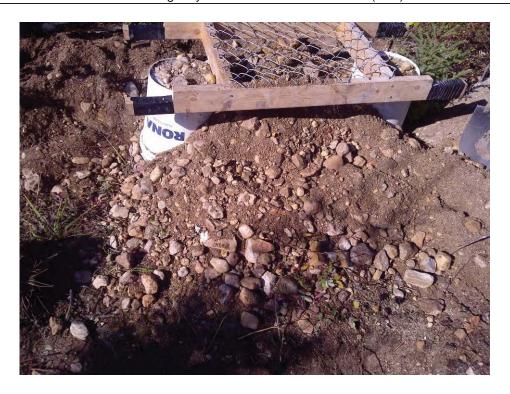


Photo 3 – Screening testpit material



Photo 4 – Coarse material >50 mm ø from testpit

G	KGS ROUP	•	SUMMARY LOG HOLE NO. TP06						SHE	CET 1	of 1
PR SI	IENT ROJECT TE CCATION	Buffalo Buffalo West B	OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey Creek ank Sta. 18+500 and Hand Auger				JOB NO. GROUND ELE TOP OF PVC E WATER ELEV. DATE DRILLEI UTM (m)	LEV	9/2 N 5	0300-1 3/2011 5,748,7	01
ELEVATION (m)	(m) (f)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CON (N) blows/ft	C	u POC	664,932 KET PEN VANE (KF 40 60 MC 40 60	N (kPa) ★ Pa) ◆ 80 LL
אוראב-סטור בסס דיורן -סטט - נייניניט ייניניט ייניניט ייניניט ייניניט ייניניט ייניניט ייניניט ייניניט ייניניט יי	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —	PE X	ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SILTY CLAY (CH) - Grey, dry to damp, stiff to very stiff, friable (high plasticity when wetted), occasional silt pockets (up to 50 mm thick), trace silt seams. - Switched to hand auger at 0.85 m. AUGER REFUSAL ON SUSPECTED COBBLE/BOULDER AT 1.68 m. Notes: 1) Recovered 3.5 L of material larger than 50 mm Ø (0.3% by volume). 2.) Found a 600 mm by 450 mm Ø boulder first encountered at 0.15 m depth, moved testpit beside boulder.		S1						
ŞI	NTRACTO	DR	INSPECTOR C. ROBAK	APP DRA		ΈI	D		ATE 28/11		



Photo 1 – End view of testpit



Photo 2 – Rock in testpit wall



Photo 3 – Recording GPS coordinate of testpit



Photo 4 – Coarse material >50 mm ø from testpit

	KGS ROUP		SUMMARY LOG HOLE NO. TP07				SHI	EET 1 of 1
PR SI	ROJECT	Buffalo Buffalo	OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey Creek onk Sta. 19+500			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED	€V. 9/2	0300-18
DR ME	RILLING (Shovel	and Hand Auger			UTM (m)		5,749,582 564,767
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		KET PEN (kPa) ★ VANE (kPa) ◆ 40 60 80 MC LL
			ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SILTY CLAY (CI) - Brown, dry, stiff to very stiff, friable (low to intermediate plasticity when wetted), some medium grained sand, trace gravel, trace cobbles (up to 150 mm Ø), some silt seams (up to 25 mm thick), roots to 0.3 m.		S1			
DIMENT SURVEY.GPJ	1 —		- Switched to hand auger below 0.9 m.					
ALO CREEK SEDIME	5		SANDY SILT (ML) - Tan, moist, soft, non-plastic, some medium to coarse grained sand. SAND (SW) - Brown, moist, compact, well graded medium to coarse grained sand.		S2			
//LOGS/CMR/BUFF	2—		END OF HOLE AT 1.97 m.	77	S3			
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SE OD V V V V V V V V V V V V V			Notes: 1.) Recovered 6 L of material larger than 50 mm Ø (0.6% by volume). 2.) Water entering hole from sand at end of drilling.					
SA CC	MPLE TYPI ONTRACTOI KGS Gro	 R	Shovel Auger Grab INSPECTOR C. ROBAK	APPR DRAI			DATE 9/28/11	



Photo 1 – Side wall of testpit



Photo 2 - End wall of testpit



Photo 3 – Base of testpit showing auger hole



Photo 4 – Coarse material >50 mm ø from testpit

	K	G	S JP		SUMMARY LOG TPO				SHE	ET 1	of 1
	CLIE	JEC.	r I	Buffalo	OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey			JOB NO. GROUND ELEV. TOP OF PVC ELI		0300-18	8
	SITE			Buffalo	Creek ank Sta. 20+500			WATER ELEV. DATE DRILLED	9/2/	4/2011	
	DRII		_		and Hand Auger			UTM (m)	N 5	,750,33	
ŀ	MET			I					Cu POCK	64,798	
	(m)			γχ				SPT (N)	Cu TORV		
	ATION	L FOOD	-	GRAPHICS	DESCRIPTION AND CLASSIFICATION			blows/0.15 m ▲	20 4	40 60	80
	ELEVATION (m)	<u></u>	5	GRA		G	NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft \triangle	PL ⊩	MC	LL —
		(m)	(ft)		ODCANICO District of and a least trick with and a	N S	N N	20 40 60	20	% 40 60	80
	_	_			ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SANDY CLAY (CL) - Grey/Black, dry, firm, low plsticity, some silt, trace grave	el (up to				. .	
		_			25 mm Ø), some roots.			
	_	-	_		SILTY CLAY (CH) - Grey, dry to damp, stiff, friable (high plasticity when wet),	trace			- 	· j · · j · · j · · j · i · j	. j j j
					gravel (up to 40 mm \varnothing), trace sand, some silt pockets (up to 25 mm \varnothing).	~				· ·· ·· ·	· ·· ·· ··
		_	_			<u> </u>	S1				
		_			- Switched to hand auger at 0.7 m.				. j . j . j .	.jjj.	.iii
		-			Ü				-		
		-	-						.	- -	.
F)		1-									
RVEY.G		_							i i i -	_iii . .	i i i .
NT SUF		-							 -	1	
SEDIMENT SURVEY.GPJ		-								· · · ·	
ZEEK S		-	- 5						$\frac{1}{1}$		
ALO CF	_	-			END OF HOLE AT 1.65 m.				jjj- 	rjerjerje I I I	·j··j··j·· I I I
NBUFF		_			Notes:					1.1.1.	
SCMF		-	_		 No material larger than 50 mm Ø was encountered. Water entering hole at 1.36 m, rising to base of testpit at end of digging. 					. .	.
∃O\LOC		2-								$\frac{1}{1}$	<u>i i i</u> I I I
SIGNG		-	_					
18\DES		-							-	1 1 1	.
1-0300-		_									
\2011\1		_	-						i i i - - - -	i i i - - - -	i i i
JECTS		-								- -	.
-:\PRO		-	-						.		
_ LOG		-									· · · · · · · ·
AL-SOI											
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGNIGEO/LOGS/CMR/BUFFALO CREEK S	SAM				Shovel	A FOT	DD (VIII)	D	DATE		
GEOTE	CON K	TRAC			INSPECTOR C. ROBAK	DRI	PROVE Aft		DATE 9/28/11		



Photo 1 – Side wall of testpit



Photo 2 - End wall of testpit



Photo 3 – Base of testpit



Photo 4 – Fine material excavated from testpit

	GS ROUF		CTIN FR F A DET T C C	LE NO. P09		SHEET 1 of 1
	LIENT	Buffalo	OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey		JOB NO. GROUND ELEV. TOP OF PVC ELE	11-0300-18
LC	TE OCATION RILLING ETHOD		Creek ank Sta. 21+500 and Hand Auger		WATER ELEV. DATE DRILLED UTM (m)	9/24/2011 N 5,750,894 E 564,782
ELEVATION (m)		GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL % 20 40 60 80
טור בסמ דיודים טבט ו זייניסטרי וסושבסומיוימבטיבעס מיינים של מרחים של מרחים של מרחים של מרחים של מרחים של מרחים	1		ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SANDY CLAY (CL) - Grey/Black, dry, firm, low plsticity, some silt, trace gra 25 mm Ø), some roots. SILTY CLAY (CH) - Grey, dry to damp, stiff, friable (high plasticity when we boulders (up to 280 mm Ø), trace cobbles, trace gravel (up to 40 mm Ø), trace silt pockets (up to 25 mm Ø). - Switched to hand auger below 0.85 m. END OF HOLE AT 1.8 m. Notes: 1.) Recovered 9 L of material larger than 50 mm Ø (0.9% by volume).	vel (up to		
└ ──	MPLE TY ONTRACTO	OR	Shovel INSPECTOR C. ROBAK	APPROVE DRAFT		DATE 9/28/11



Photo 1 – Base of testpit



Photo 2 – Coarse material >50 mm ø from testpit

Notes: 1.) No material larger than 50 mm Ø was encountered. 2.) Water entering hole at 1.26 m, rising to base of testpit at end of digging.		K	G	P			SUMMARY LOG HOLE NO. TP10								:	SHE	ET	1 c	of	1
DESCRIPTION AND CLASSIFICATION DESCRIPTION AND CLASSIFICATION		PRO SITE LOC DRII	JECT E ATIOI	B N W	Buff Buffa Vest	alo alo t Ba	Creek Sediment Survey Creek ank Sta. 22+500				GF TO WA DA	NOUI POF ATE	ND I F P\ R EL DRIL	/C EL .EV.	EV.	9/24 N 5,	1/20: ,751	11 ,788	3	
SRAMECS - Black, most, soft, non to low plastic, with noteles. SILTY CLAY (CH) - Grey, damp to most, stiff, finable (high plasticity when wet), trace line grained sand, some sitt pockets (up to 25 mm O). SILTY CLAY (CH) - Grey, moist, soft, low plasticity, with clay, trace line grained sand. - Switched to hand auger below 0.8 m. - Switched to hand auger below 0.8 m. AUGER REFUSAL ON SUSPECTED COBBLE AT 1.26 m. Notes: 1.) No created larger than 50 mm O was encounteed. 2.) Waler entering hole at 1.25 m, rising to base of testpit at end of digging. SAMPLE TYPE Shovel R Auger Grab CONTRACTOR INSPECTOR APPROVED DATE	٠		DEPTH	(ft)	SUHOVAS	SOUTHER		SAMPLE TYPE	NUMBER	RECOVERY %	DY (N)	NAN blov	0.15 IIC (ws/f	CONE t △	Cu F	ORV	(ET P	PEN (I (kPa)	80 LL	•
SAMPLE TYPE Shovel Auger Grab SAMPLE TYPE Shovel Auger Grab SAMPLE TYPE Shovel Novel: Auger Grab SAMPLE TYPE Shovel Novel: Auger Grab CONTRACTOR INSPECTOR APPROVED DATE			-				SILTY CLAY (CH) - Grey, damp to moist, stiff, friable (high plasticity when wet), trace fine grained sand, some silt pockets (up to 25 mm Ø).						 					 	 	
SAMPLE TYPE Shovel Some clay. AUGER REFUSAL ON SUSPECTED COBBLE AT 1.26 m. Notes: 1.) No material larger than 50 mm Ø was encountered. 2.) Water entering hole at 1.26 m, rising to base of testpit at end of digging. SAMPLE TYPE Shovel Auger Grab CONTRACTOR INSPECTOR APPROVED DATE	.GРЈ		1				- Switched to hand auger below 0.8 m.			,										
SAMPLE TYPE Shovel Auger Grab CONTRACTOR INSPECTOR APPROVED DATE	SEDIMENT	-	-	_		2	some clay. AUGER REFUSAL ON SUSPECTED COBBLE AT 1.26 m.	}	S2				 		 	, 			 	
CONTRACTOR INSPECTOR APPROVED DATE	AL-SOIL LOG P:\PROJECTS\2011\11-0300-18\DESIGN\GEO\LOGS\CMR\BUFFALO CREEK		2	- 5			1.) No material larger than 50 mm Ø was encountered. 2.) Water entering hole at 1.26 m, rising to base of testpit at end of digging. 1.1. No material larger than 50 mm Ø was encountered. 2.) Water entering hole at 1.26 m, rising to base of testpit at end of digging.													
:	OTECHNIC,	CON	TRAC	ГOR	_		INSPECTOR			ΈI)									



Photo 1 – Base and side wall of testpit



Photo 2 - End wall of testpit

	K GR	GS OUP		SUMMARY LOG TP11				SH	EET 1 o	of 1
•	CLIE			OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey			JOB NO. GROUND ELEV. TOP OF PVC ELE		-0300-18	
	SITE		Buffalo	Creek ank Sta. 23+500			WATER ELEV. DATE DRILLED	9/2	25/2011	
	DRIL			and Hand Auger			UTM (m)	N :	5,752,309 563,791)
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		**EXET PEN (kPa) **AVANE (kPa) **AU 60 **MC **MC **AU 60 **AU 60	
	_			ORGANICS - Black, moist, soft, non to low plastic, with rootlets.		T_				
GEOTECHNICAL-SOIL LOG P.PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ		1—		SILTY CLAY (CH) - Grey, damp to moist, stiff, friable (high plasticity when wet), trace cobbles. - Switched to hang auger at 0.7 m. END OF HOLE AT 1.62 m. Notes: 1.) Recovered 4.5 L of material larger than 50 mm Ø (0.4% by volume).		51				
HNICAL	SAM	L ₃ L PLE TYPE		Shovel			<u>, , , , , , , , , , , , , , , , , , , </u>			
SEOTECH		TRACTO	R		PPR RAE	OVE		DATE 9/28/11		



Photo 1 – Base and side wall of testpit



Photo 2 - End wall of testpit



Photo 3 – View of testpit



Photo 4 – Coarse material >50 mm ø from testpit

	K	GS OUP		SUMMARY LOG TP12				SHI	EET 1 of 1
	CLIE			OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey			JOB NO. GROUND ELEV. TOP OF PVC ELE		0300-18
		ATION \		ank Sta. 24+500			WATER ELEV. DATE DRILLED UTM (m)		5,752,639
	MET	HOD (Shovel	and Hand Auger			, ,	E s	563,352
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		**XANE (kPa) ** VANE (kPa) ** 40 60 80 **MC LL ** 40 60 80
t				ORGANICS - Black, moist, soft, non to low plastic, with rootlets.					1 1 1 1 1
GEOTECHNICAL-SOIL LOG P?PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ		1		SILTY CLAY (CH) - Grey, damp to moist, stiff, friable (high plasticity when wet). - Light grey, moist below 0.4 m. - Switched to hang auger at 0.7 m.		S1			
HNICAL	SAM	PLE TYPE		Shovel					
GEOTEC		TRACTOR			PPR RAI	ROVE F T		DATE 9/28/11	



Photo 1 – Side wall of testpit



Photo 2 - End wall of testpit

	K GR	GS OUP		SUMMARY LOG HOLE NO. TP13				SHI	EET 1 of 1
	CLIE PRO SITE	JECT		OBA INFRASTRUCTURE AND TRANSPORTATION Creek Sediment Survey Creek			JOB NO. GROUND ELEV. TOP OF PVC ELE		0300-18
				ank Sta. 25+500			WATER ELEV. DATE DRILLED	9/2	5/2011
	DRII MET	LING	Shovel	and Hand Auger			UTM (m)		5,753,319 563,244
	ELEVATION (m)	(m) (f	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		KET PEN (kPa) ★ VANE (kPa) ★ 40 60 80 MC LL 40 60 80
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ				ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SILTY CLAY (CH) - Grey, damp to moist, stiff, friable (high plasticity when wet), trace cobbles. - Moist to wet, decreased plasticity, increased silt content, some sand and gravel below (up to 25 mm Ø) below 0.45 m. - Switched to hang auger at 0.7 m. - Switched to hang auger at 0.7 m. Notes: 1.) No material larger than 25 mm Ø was encountered. 2.) Water entering testhole from 1.3 m, rising to base of testpit at end of digging.			20 40 60		40 60 80
HNICAL	SAM	PLE TY	PE 🔀	Shovel					
GEOTECI		TRACTO			APPR DRAF			DATE 9/28/11	



Photo 1 – End wall of testpit



Photo 2 – Close up of fine textured soils in testpit



Photo 3 – General view of testpit

	K	G	S JP		SUMMARY LOG HOLE NO TP14).			SHEET 1 of 1	Ĺ
	CLIE	JEC	T E	Buffalo	OBA INFRASTRUCTURE AND TRANSPORTATION O Creek Sediment Survey			JOB NO. GROUND ELEV. TOP OF PVC ELE	11-0300-18 V.	
	SITE			Buffalo Vest Ra	Creek ank Sta. 26+500			WATER ELEV. DATE DRILLED	9/25/2011	
	DRII	LLIN	G e		and Hand Auger			UTM (m)	N 5,753,472	
ŀ	MET	HOD)					1	E 562,607 Cu POCKET PEN (kPa)	*
	(m) N		_	၂			ш.,		Cu TORVANE (kPa)	•
	ATIOI	DEBTU		GRAPHICS	DESCRIPTION AND CLASSIFICATION	2		blows/0.15 m A	20 40 60 80	_
	ELEVATION (m)			GR/			NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft	PL MC LL	
		(m)	(ft)	<u> </u>	ORGANICS - Black, moist, soft, non to low plastic, with rootlets.	2	N N	20 40 60	% 20 40 60 80	_
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/GNI/GEO/LOGS/CMR/BUFFALO CREEK SEDIMENT SURVEY.GPJ		1—	5		SILTY CLAY (CH) - Brown/Grey, damp, stiff to very stiff, high plasticity, trace sand trace subangular gravel (up to 50 mm Ø), occasional silt seams (up to 25 mm thick trace rootlets. - Switched to hang auger at 0.83 m. END OF HOLE AT 1.85 m. Notes: 1.) Recovered less than 1 L of material larger than 50 mm Ø (negligable amount by volume).	×),	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z			
SOIL LOG P:\PROJECTS\		-	-							
HNICAL	SAM	BLE T	ГҮРЕ		Shovel					
GEOTEC	CON K	TRAC			INSPECTOR C. ROBAK		PROVE Aft		OATE /28/11	



Photo 1 – End wall of testpit



Photo 2 – Side wall of testpit



Photo 3 – Auger cuttings from below



Photo 4 – Auger hole at base of testpit

K	GS ROUP		SUMMARY LOG HOLE NO. TP15					SH	EET 1	of 1
	ENT DJECT		OBA INFRASTRUCTURE AND TRANSPORTATION Creek Sediment Survey Creek				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV.		-0300-1	8
			ank Sta. 27+500				DATE DRILLED UTM (m)		26/2011 5,754,00	65
	LLING THOD	Shovel	and Hand Auger	_			O TIWI (III)	E	562,177	,
ELEVATION (m)	(m) (ft	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 60 MC 40 60 40 60	80 LL
	1		ORGANICS - Black, moist, soft, non to low plastic, with rootlets. SILTY CLAY (CH) - Grey, moist, firm, high plasticity, trace sand, trace gravel (majority less than 50 mm Ø), trace cobbles (up to 75 mm x 75 mm x 100 mm in size) - Switched to hang auger at 0.75 m, increased medium to coarse grained gravel (up to 50 mm Ø) below. GRAVELLY SILT (ML) - Brown, wet, soft, non plastic, fine grained gravel, some sand, some clay. END OF HOLE AT 1.66 m. Notes: 1.) Recovered 5 L of material larger than 50 mm Ø (0.5% by volume). 2.) Water entering hole at 1.8 m, rising to 0.9 m at end of digging.		S1					
CAL-COL										
CON	IPLE TYP VTRACTO)R		APPI DRA				DATE 9/28/11		



Photo 1 – Side wall of testpit



Photo 2 - End wall of testpit



Photo 3 - Coarse material >50 mm ø from testpit



Photo 4 – Fine textured soil from testpit and auger cuttings

APPENDIX B

LABORATORY ANALYTICAL RESULTS GRAIN SIZE ANALYSES

Client:	Wat	er Contro	Water Control and Structures	nctures																	
Project:	Buff	alo Cree	Sedimer	Buffalo Creek Sediment Survey - LSM						Site/File No.							Ö	ite Requis	sitioned S	Date Requisitioned Sep 28, 2011	_
Location:	Buff	alo Cree	Station	Buffalo Creek Station 13+500 to 27+500	00					internal Order No.	er INO.						۵	Date Reported:	ed:	Oct 3 2011	f
Municipality:										Sampled By: Date Sampled:	j.		KGS Group	dno			ă.	Report To:		Alena James	S
-																	ď	Page:	-	of 1	
		SAMPLE	TE DATA		10 10-7		ATTEF	ATTERBERG LI	LIMITS		GRAI	GRAIN SIZE						STE	STRENGTH		1
oN deJ	Test Hole No. Sample No.	Station	<u>P</u> Sentedine	Depth(m)	Unified Classification	Moisture Content %	% jimid biupid	Plastic Limit %	Plasticity Index %	Gravel % (pass 75mm)	(mm27.4 seeq) % bns2	(mm270.0 seaq) % HiS	Clay % (pass 0.005 mm)	(mm 670.0 seeq) % \(\rangle \text{IsIOVIII}\)	Organic Content %	(N) T92	Field PP (kpa)	Unconfined qu (kpa)	Direct Shear Performed	Bulk Density (kg/cu.m.)	
WGT110568	TP1	-		0.45-0.60						9	180	16	9	3 7	T	+	+	+	1	+	4
WGT110569	TP2	2		0.45-0.60						1,			3	9		1		1			
WGT110570	TP3	8	-	0.45.0.60					1	13	8	36	19	55							
WGT110571	TOL		1	0.0-0-0-0						22	19	59	30	59							
M/CT440E72		<u>.</u>		0.30-0.60						9	44	20	30	20					T		
7/601	- F	2		0.45-0.60						55	40	ю	2				-				1
wG11105/3	TP6	9		0.45-0,60						9	7	17	02	18				-	-	+	
WGT110574	TP7	7		0.25-0.40						o o	16	16	59	1 1/2					İ	+	
WGT110575	TP8			0.45-0.60						-	46	23	30	43			-	-			
WGT110576	TP9	0		0.45-0.60						9	9	12	92			+	+	+		+	I
WGT110577	TP10	0		09.0-08.0							31	28	41	001	T		+	+	t	+	1
WGT110578	TP11	_		0.45-0.60							32	26	63	30		+	+	+	+	+	
WGT110579	TP12	0		0.45-0.60					-	 	22	24	54	7 0	+			+			
WG1110580	TP13	~		0.45-0.60		-				13	42	20	+		+	+	+	-		+	
WGT110581	TP14			0.30-0.45		7		-			2	00	+	200			+	+			
WGT110582	TP15			0.30-0.45					+		15	, 6		200	+				+	+	
								1	+	1	1	2		2		-					
		\perp			1		+	+	+				1	000	17 =	11	70	1/0h			
-					1	+	+	+	+	1				0							
-		_				+	+	+	+	1								-			
						+	+	+				1								-	
WETSON						-	-	_													

	K GR	GS OUP		SUMMARY LOG REFERENCE NO. 061	HOLE N			SH	EET 1	of 1				
	CLIE PRO SITE	JECT L	AKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Outlet			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV.		0300-1	8				
	DRILLING METHOD Top of Beach Head DATE DRILLE UTM (m) UTM (m)								N 5,753,343 E 570,280					
•	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	ECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft		VANE (kF	Pa) ◆				
GEOTECHNICAL-SOIL LOG P.:PROJECTS)2011/11-0300-18/DESIGN/GEOLLOGS;#REACH 3:HAND AUGER_TP_CORING.GPJ		1		- Sand Mixed with peat like material black to brown in color, small rocks below 1.52 m. PEAT - Brown to black, roots and small rocks, some wood chips. SILTY CLAY - Grey to blue, damp to moist, firm, high plasticity. END OF HOLE AT 3.96 m.	s	11				80				
EOTECHNI	CON	PLE TYPE TRACTOR		Grab from Bucket INSPECTOR cruction Ltd. J. ARROWSMTIH/C. ROBAK	APPRO DRAF			DATE 10/16/12	<u> </u>					
Ö					0. 21									

	K	GS OUP		SUMMARY LOG	REFERENCE NO. 062		LE N P22			SHI	EET 1	of 1			
	CLIENT MANITOBA INFRASTRUCTURE AND TRANSPORTATION PROJECT LAKE ST. MARTIN EMERGENCY CHANNEL EXTENSION SITE Reach 3 Outlet WATER ELEV. LOCATION Shoreline DATE DRILLED DRILLING METHOD Test Pit - John Deere Excavator (300 Series)									EV. 11/ N 5	11-0300-18 V. 11/24/2011 N 5,753,354 E 570,285				
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION			SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m A DYNAMIC CONE (N) blows/ft \(\triangle \) 20 40 60	Cu TOR	VANE (kPa 40 60 MC 40 60				
	-	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		SAND - Medium to coarse grained PEAT - Brown to black SILTY CLAY - Grey to blue, damp to me	oist, firm, high plasticity.		-								
		2-1													
_CORING.GPJ		3	5	END OF	HOLE AT 2.74 m.										
₽]		5 — 15													
GEO/LOGS/#REACH 3/P		620													
:011/11-0300-18/DESIGN		25 8 —													
SEOTECHNICAL-SOIL LOG P:\PROJECTS\\2011\t11-0300-18\\DES\\GN\GEO\\LOGS\\REACH 3\\AND AUGER\\		9-1-30													
SEOTECHNICAL-S	CON	PLE TYPE TRACTOR	₹	INSPECTOR truction Ltd. J. ARROW	JSMTIH/C. ROBAK		PPRO DRAI			DATE 10/16/12					

	K GR	GS ROUP		SUMMARY LOG	REFERENCE NO. 063	но: ТІ		NO. 3					SH	EET	1	of 1
	SITE LOC DRII	JECT L F ATION S	AKE S Reach 3 Shorelin	OBA INFRASTRUCTURE A ST. MARTIN EMERGENCY (3 Outlet ne - John Deere Excavator (300	CHANNEL EXTENSION				TOP WAT	UND I OF P\ ER EL E DRII			11/ N :	-030 /24/2 5,75, 570,	011 3,39	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION		SAMPLE TYPE	NUMBER RECOVERY %	SPT blow DYN/ (N) b	s/0.15 AMIC (lows/f	m ▲ CONE t △	Cu		40 M 40 40	60 C	(kPa) ★ a) ◆ 80 LL 80
GEOTECHNICAL-SOIL LOG P:PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1		SAND - Brown, medium to coarse grain SILTY CLAY - Grey, firm, high plastici - Grey to brown, damp to moist, stiff be	ty.											
GEOTECHNIC	CON	PLE TYPE TRACTOR Arnason	<u> </u>	INSPECTOR truction Ltd. J. ARRO	WSMTIH/C. ROBAK		PPR ORA	OVE FT	D			DA′ 10/1	TE 16/12	2		

K GF	GS ROUP		SUMMARY LOG	REFERENCE NO. 064	HOLE TP2			SHEET 1 of 1
CLIENT PROJECT SITE LOCATION DRILLING METHOD		LAKE S Reach 3 Top of B		HANNEL EXTENSION			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 EV. 11/24/2011 N 5,753,382 E 570,182
ELEVATION (m) (m) (m) (m) (m)		GRAPHICS	DESCRIPTION AND (CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %		Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL
	1 — 5 — 15 — 15 — 15 — 15 — 15 — 15 — 1		PEAT - Red to brown SILTY CLAY - Grey to blue, damp to me	oist, firm, high plasticity. HOLE AT 3.05 m.		S1		
CON	TRACTO	R	Grab from Bucket INSPECTOR cruction Ltd. J. ARROW	SMTIH/C. ROBAK		ROVE AFT		DATE 10/16/12

	K GR	GS OUP		SUMMARY LOG	REFERENCE NO. 066	P25						SH	EET	1	of	1
		JECT	LAKE S	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY C				JOB GRO TOP	UND E	ELEV. 'C ELI		11-	-030	D-18	}	
	SITE		Reach 3					WAT	ER EL E DRII			11.	/24/2	011		
		LING		- John Deere Excavator (300 S	eries)			UTM				Ν :	5,75, 570,	3,49		
	ON (m)	폰	SOIL			PE	%	SPT	(N) e/0 15	m 🔺	Cu	TOR	VANE	(kPa	a)	•
	ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND C	ELASSIFICATION	MPLE TY	NUMBER RECOVERY %	DYNA (N) bl	AMIC (CONE	⊢	20 PL	40 M	-	80 LI	
ŀ		(m) (ft)	www.	GRASS WITH ROCKS AND COARSE G	RAINED SAND	S.	N N	20	40	60		20	40	60	80	.1
	-	<u> </u>	,,,,,,,	PEAT - Brown to black.	10 u1125 37 u15						::¦:					
		7		SILTY CLAY - Grey to brown, damp to m	oist, high plasticity.					44					i::i: -	
		1									:::				: : : : : :	
		-5													::: : :	:1:: -
		2—									:: :					
		1														
															: : : :	7. : ::
		3 -10													· · · · · ·	
	-	1		CLAY TILL - Tan, with coarse grained g						4	:: :			1	1::1:	
GPJ		4 —		END OF H	IOLE AT 3.66 m.											
TP_CORING.GPJ		1									:: : :: :				:: : :: :	
· 1			5													
AUGER		5-								1						1
HAND /		+													i∷i: 11:	:j::
ACH 3/		6						:::::t:		4	:: :	: ::	:: :: 		:: : -	: ::
SS/#RE		20)						0 - 1 - 0 3 - 1 - 3 0 - 1 - 0						- :: : -	
0/L06		<u> </u>														
IGN/GE		7 =									j - -: j :			::1::	<u> </u>	
18/DES		- - - 25								1	:: :			1	11:	- -
-0300-		8	`								::::					
2011/11																
ECTSV		<u>+</u>													i i. I::I:	i.
:\PROJ		9 - 30								- - 	- -	-			- -	.
LOG P		4								444					:: : <u></u> :	::::: -
T-SOIL		1 1														
HNICA	SAM	PLE TYP	E													
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/#REACH 3/HAND AUGER		TRACTO		INSPECTOR truction Ltd. J. ARROW	SMTIH/C. ROBAK	APPR DRA	OVE FT	D			DA7 10/1	ΓΕ .6/12	2			

	K	GS ROUP		SUMMARY LOG	REFERENCE NO. 067	P2(SHI	EET	1 (of 1
	SITE LOC DRII	JECT L FATION T	AKE Steach Stop of I	OBA INFRASTRUCTURE AIST. MARTIN EMERGENCY (3 Outlet Beach Head - John Deere Excavator (300 S	CHANNEL EXTENSION			JOB N GROU TOP O WATE DATE UTM (I	ND E F PV(R ELE DRILI	C ELE EV.		11/ N :	.0300 /24/2 5,753 570,1	011 3,472	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N blows/ DYNAM (N) blo	/0.15 i /IIC C ws/ft	ONE	Cu		40 M 40 %	60 C	(kPa) ★ a) ◆ 80 LL 80
GEOTECHNICAL-SOIL LOG P:PROJECTS/2011/11-0800-18/DESIGN/GEOILOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1		SAND - Brown, medium to coarse grain - Oxidized (orange) sand layer between - Orange below 1.56 m. SILTY CLAY - Grey to blue, firm, high periods of the second seco	0.61 and 0.63 m.	-									
GEOTECHNIC,	CON	PLE TYPE TRACTOR Arnason		INSPECTOR truction Ltd. J. ARROW	wsmtih/c. robak	PPR ORA	OVE FT	D			DAT 10/1	ΓΕ 6/12	<u> </u>		

	K	GS ROUP		SUMMARY	Y LOG	REFERENCE NO. 068	DLE N P27	O.		SH	EET 1	of 1
	SITE	JECT L FATION S	AKE S Reach 3 Shorelir	ST. MARTIN EM	ERGENCY C	ID TRANSPORTA HANNEL EXTENS eries)			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11 N E	-0300-1 /24/201 5,753,5 570,066	1 662 6
	ELEVATION (m)	(m) (ft)	GRAPHICS			CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m A DYNAMIC CONE (N) blows/ft \(\triangle \) 20 40 60		40 60 MC 40 60 40 60) 80 LL
GEOTECHNICAL-SOIL LOG P:PROJECTS/2011/11-0300-18/DESIGN/GEOILOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1 — 5 — 5 — 10 — 15 — 5 — 15 — 5 — 15 — 5 — 15 — 1		SILTY CLAY - Grey t	END OF I	HOLE AT 3.20 m.						
GEOTEC		TRACTOR Arnason		ruction Ltd.	INSPECTOR J. ARROW	SMTIH/C. ROBAK	PPRC DRAF			DATE 10/16/12	2	

	K	GS OUP		SUMMARY	LOG	REFERENCE NO. 069		ноlе ГР2						SH	EET	. 1	of	1
•	SITE	JECT L	AKE S	ST. MARTIN EME 3 Outlet		ID TRANSPORTAT HANNEL EXTENS				GRO TOP WAT	OF P					00-1		
	DRIL		-	Beach Head - John Deere Exc	avator (300 S	eries)					[DKI	LLED		N :	5,75	2011 53,52 ,052	24	
•	ELEVATION (m)	DEРТН	GRAPHICS	DESCI	RIPTION AND (CLASSIFICATION		IPLE TYPE	NUMBER RECOVERY %	SPT blow DYN (N) b	vs/0.1	5 m ▲ CONE ft △	Cu		RVAN	PEN 60 VIC	Pa)	•
	ш	(m) (ft)						SAN	NUN REC	20) 40	60		20	40	% 60	80)
GEOTECHNICAL-SOIL LOG P:?PROJECTS\2011/11-0800-18\DESIGN\GEO\LOGS\#REACH 3\HAND AUGER_TP_CORING.GPJ		1 — 5 — 5 — 10 — 15 — 5 — 15 — 5 — 15 — 5 — 15 — 1		SAND - Brown, damp, PEAT - Brown to black SILTY CLAY - Grey to	roots.	oist, firm, high plasticity, sor	ne silt pockets.											
-SOIL L(
-INICAL-	SAM	PLE TYPE	<u> </u>													11.		
GEOTECI		TRACTOR rnason		truction Ltd.	INSPECTOR J. ARROW	SMTIH/C. ROBAK		APPF DRA		D			DA' 10/1	TE 16/12	2			

	K GR	GS ROUP		SUMMARY LOG	REFERENCE NO. 070	P29						SHI	EET	1	of 1	
	SITE LOC DRII	JECT L E F	AKE Seach Sop of B	OBA INFRASTRUCTURE AIST. MARTIN EMERGENCY (3 Outlet Beach Head - John Deere Excavator (300 S	CHANNEL EXTENSION			JOB N GROU TOP C WATE DATE UTM (IND E F PV R EL DRIL	C ELE		11/ N :	-0300 /24/2 5,753 569,9	011 3,59		
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT (I blows DYNA (N) blo	/0.15 MIC C	ONE	Cu		WANE 40 M 40 40 40	60 C	(kPa) * a) 80 LL 80	r ▶ —
GEOTECHNICAL-SOIL LOG P:PROJECTS/2011/11-0300-18/DESIGN/GEOLLOGS/#REACH 3!HAND AUGER_TP_CORING.GPJ		1		PEAT - Black, moist, some fine to medi SILTY CLAY - Grey to blue, wet, firm, END OF	um grained sand.											
GEOTECHNIC/	CON	PLE TYPE TRACTOF Arnason	{	INSPECTOR	WSMTIH/C. ROBAK	PPR ORA	OVE FT	D			DAT 10/1	ΓΕ .6/12	2			_

	K	GS OUP		SUMMARY LOG	REFERENCE NO. 071	DLE N P30						SH	EET	1	of	1
•	SITE	JECT L E F	_AKE \$	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY O 3 Outlet Beach Head				TOP WAT	OUND I OF P\ ER EL E DRII	/C EL .EV.		11/	-030 /24/2 5,75:	011		
		HOD	est Pit	- John Deere Excavator (300 S	Series)	1			. ()			Ε:	569,	906		
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT blow DYN (N) b	vs/0.15 AMIC (lows/f	CONE t △	Cu	20 PL	VANE 40 M	60 C	80 L	• L
GEOTECHNICAL-SOIL LOG P.PROJECTS/2011/11-03:00-18/DESIGN/GEO1LOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1 — 5 — 5 — 10 — 15 — 5 — 15 — 5 — 15 — 5 — 17 — 15 — 15		PEAT - Brown, wet, trace fine grained sa SILTY CLAY - Tan, moist, firm, high pla END OF											800 1 1 1 1 1 1 1 1 1	
NICAL-SOIL LOG P:\PROJECTS\20	SAM	9 — 30 - 30 - 30 - 30 - 30 - 30 - 30 - 30 -														
GEOTECHI	CON	TRACTOF	{	INSPECTOR truction Ltd. J. ARROW	SMTIH/C. ROBAK	PPRO		D			DA' 10/1	ΓΕ 16/12	2			

	K GR	GS OUP		SUMMARY LOG	REFERENCE NO. 073	DLE 1 P3 1						SHE	EET	1 (of 1
	SITE LOC DRII	JECT L F ATION E	AKE Steach 3 Sehind	OBA INFRASTRUCTURE AIST. MARTIN EMERGENCY (3 Outlet Beach Head - John Deere Excavator (300 S	CHANNEL EXTENSION			TOP O WATE	ND ELE F PVC R ELEV DRILLE	ELE	ĒV.	11/: N 5	0300 24/2 5,753 570,2	011 3,33	
	ELEVATION (m)	(B) (Bt)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N blows/ DYNAM (N) blo	0.15 m /IIC COI	NE △	Cu 1	TOR\	40 M0 %	(kPa	(kPa) ★ (a) ◆ 80 LL 80
GEOTECHNICAL-SOIL LOG P:PROJECTS/2011/11-03:00-18/DESIGN/GEO/LOGS/#REACH 3\HAND AUGER_TP_CORING.GPJ		1		SILTY CLAY - Grey to blue, damp, firm END OF											
GEOTECHNICAL.	CON	PLE TYPE TRACTOR		INSPECTOR truction Ltd. J. ARROW	WSMTIH/C. ROBAK	L LPPR DRA	OVE FT	D			DAT				

	K	GS ROUP		SUMMAR	Y LOG	REFERENCE NO 074	•	DLE N P32						SH	EET	1	of 1
	SITE	JECT E ATION	LAKE \$ Reach \$ Behind		ERGENCY (ND TRANSPORT				GRO TOP WA ⁻ DAT	OF F	ELEV. ELEV.		11, N :	-030 /24/2 5,75; 570,	011 3,37	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESC	RIPTION AND	CLASSIFICATION		SAMPLE TYPE	RECOVERY %	SPT blow DYN (N) k	vs/0.1		Cu		VANE 40 M 40 40	60 C	(kPa) * a) 4 80 LL 80
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-03:00-18/DESIGN/GEOILOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1		PEAT - Brown, wet, ro	o blue, wet, firm, I	HOLE AT 2.44 m.											
GEOTEC		TRACTOI Arnason		truction Ltd.	INSPECTOR J. ARROV	WSMTIH/C. ROBA		APPRO DRAF		D			DA 10/	TE 16/12	2		

	K	GS ROUP		SUMMAR	Y LOG	REFERENCE N	 OLE N						SH	EET	1 (of 1
	CLIE PRO SITE LOC	ENT DECT LESSES	AKE \$ Reach \$ Behind	OBA INFRASTR ST. MARTIN EM 3 Outlet Beach Head - John Deere Exc	ERGENCY (CHANNEL EXTI			GRO TOP WA ⁻ DAT	OF F	DELEV. ELEV. RILLED		11/ N :	-0300 /24/2 5,753 570,1	011 3,46	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESC	RIPTION AND	CLASSIFICATION	SAMPLE TYPE	NOMBER RECOVERY %	SPT blow DYN (N) k	vs/0.1		Cu		40 M 40 40	60 C	(kPa) ★ a) ◆ 80 LL 80
GEOTECHNICAL-SOIL LOG PAPROJECTS/2011/11-0300-18/DESIGN/GEOILOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		3 — 10 3 — 10 4 — 15 5 — 20 7 — 25 8 — 20 PLE TYPE		SILTY CLAY - Grey t	END OF	high plasticity. HOLE AT 2.44 m.										
GEOTEC		TRACTOF		truction Ltd.	INSPECTOR J. ARROV	WSMTIH/C. ROE	APPR(DRAI		D			DA 10/	TE 16/12	2		

	K	GS OUP		SUMMAR	Y LOG	REFERENCE N	DLE 1 P3 4						SHI	EET	1	of 1
	SITE LOC DRII	JECT L F ATION S	AKE Steach 3	OBA INFRASTR ST. MARTIN EM 3 Outlet ne - John Deere Exc	ERGENCY C	HANNEL EXT			TOP WAT	OUND I OF P\ TER EL E DRII	/C ELI .EV.		11/ N :	-030 /24/2 5,75, 570,	011 3,19	
	ELEVATION (m)	(3) DEPTH	GRAPHICS	DESC	RIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT blow DYN (N) b	AMIC (alows/f	CONE	Cu		40 M 40 40	60 C	(kPa) * a) • 80 LL 80
GEOTECHNICAL-SOIL LOG P.:PROJECTS/2011/11-03:00-18:DES/IGNI/GEOLLOGS/#REACH 3:HAND AUGER_TP_CORING.GPJ	SAM	1		SAND - Brown, damp, PEAT - Brown to black	k, wet, some roots.											
GEOTECHI	CON	TRACTOR		truction Ltd.	INSPECTOR J. ARROW	SMTIH/C. ROI	APPR DRA	OVE FT	D			DA7 10/1	ΓΕ 6/12	2		

	K	GS OUP		SUMMARY LOG	REFERENCE NO. 077	DLE NO P35).		:	SHE	ET	1 c	of 1
	SITE LOC DRII	JECT L F ATION E	AKE S Reach 3 Behind	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY O 3 Outlet Beach Head - John Deere Excavator (300 S	CHANNEL EXTENSION			JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	ΞV.	11/2 N 5	0300 24/20 5,753 70,7)11 ,184	ļ
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu T	ORV	40 MC %	(kPa)	80 LL 80
GEOTECHNICAL-SOIL LOG P:\PROJECTS\2011/11-0300-18\DESIGN\GEO\LOGS\#REACH 3\HAND AUGER_TP_CORING.GPJ		1 - 5 5		SILTY CLAY - Grey to blue, wet, firm, h - Hit water. Filled test pit hole at 2.44 m. END OF		S1 S1	R						80
L-SOIL LOG P:\PROJECTS		9											
GEOTECHNICAL	CON	PLE TYPE TRACTOR		Grab from Bucket INSPECTOR cruction Ltd. J. ARROW	JSMTIH/C. ROBAK	PPROV DRAFT			DAT 10/16				

	K	GS ROUP	•	SUMMARY LOG	REFERENCE NO. 078	HOLE NO TP36).	SHEET 1 of 1
	SITE	JECT	Reach :	OBA INFRASTRUCTURE A ST. MARTIN EMERGENCY (3 Outlet Beach Head t - John Deere Excavator (300	CHANNEL EXTENSION		JOB NO. GROUND ELE TOP OF PVC WATER ELEV DATE DRILLE UTM (m)	ELEV. 2. ED 11/24/2011 N 5,753,192 E 570,734
	ELEVATION (m)	(m) (f	GRAPHICS	DESCRIPTION AND		SAMPLE TYPE NUMBER	SPT (N) blows/0.15 m DYNAMIC COI (N) blows/ft 20 40 60	NE PL MC LL
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		1		SILTY CLAY - Grey to brown, wet, firm END OF	pots.			
GEOTECHNIC	CON	TRACTO	OR.	INSPECTOR truction Ltd. J. ARRO	WSMTIH/C. ROBAK	APPROV	/ED	DATE 10/16/12

K GF	GS ROUP		SUMMARY LOG	REFERENCE NO. 079	HOLE N			SHEET 1 of 1
SITI LOC DRII	DJECT E CATION	LAKE S Reach S Behind	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY C 3 Outlet Beach Head - John Deere Excavator (300 S	HANNEL EXTENSION			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 EV. 11/24/2011 N 5,753,155 E 570,919
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND (CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL
	1		PEAT - Brown to black, damp, some root SILTY CLAY - Grey to blue, dampt, firm END OF I					
CON	IPLE TYPE ITRACTOI Arnason	R	INSPECTOR truction Ltd. J. ARROW	SMTIH/C. ROBAK	APPRO DRAI			DATE 10/16/12

	K	GS OUP		SUMMARY L	OG	referenc 080	E NO.	LE N P38						SI	HEE	т 1	of	1
	CLIE PRO SITE LOC	ENT JECT E ATION	LAKE \$ Reach 3 Behind	OBA INFRASTRUCT ST. MARTIN EMERG Outlet Beach Head - John Deere Excavat	ENCY (CHANNEL EX				GRO TOP WA ^T DAT	OF I	D ELE\ PVC E ELEV. RILLED	LEV	1. N	1/24 5,7	300-1 3/201 3/53,1 0,91	1 42	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPT	ION AND	CLASSIFICATIO	DN	SAMPLE TYPE NUMBER	RECOVERY %	SPT blow DYN (N) t	vs/0.		△		40 40	MC %	Pa)) 8	\$\frac{30}{L}
		15		PEAT - Black, saturated, roo SILTY CLAY - Grey to blue,				-										
_TP_CORING.GPJ		310			END OF	HOLE AT 3.66 m.		-										
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ		5																
JECTS\2011\11-0300-18\DESIGN\G		7 -																
EOTECHNICAL-SOIL LOG P:\PRO.	CON	9 - 30 - 30 PLE TYP TRACTO	R		PECTOR	WSMTIH/C. F	ROBAK	PPR()		D			D/	12			· · · · · · · · · · · · · · ·

	K GR	GS OUP		SUMMARY LOG REFERENCE NO. 081	HOLE TP3			SH	EET 1 of 1
	SITE	JECT L FATION T	AKE Steach 3	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Outlet Beach Head - John Deere Excavator (300 Series)			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	EV. 11 N	-0300-18 /24/2011 5,753,170 570,917
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		**EKET PEN (kPa) ** **EVANE (kPa) ** 40 60 80 **MC LL ** 40 60 80
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DESIGNIGEO/LOGS/#REACH 3/HAND AUGER_TP_CORING.GPJ	SAM	1 — 5 — 5 — 10 — 15 — 5 — 15 — 5 — 15 — 1		PEAT - Brown to black, some roots, and wood pieces. SILTY CLAY - Grey to blue, firm, high plasticity. END OF HOLE AT 3.05 m.					
GEOTECHI	CON	TRACTOR		INSPECTOR truction Ltd. J. ARROWSMTIH/C. ROBAK	APP DR	ROVE AFT		DATE 10/16/12	2

	K	GS OUP			HOLE TH-			SHI	EET 1 of	2
	SITE	JECT L E F ATION A	AKE S Reach 3 Nignme	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3D/3E 2 Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	232 EV. 11/ N :	.0300-18 2.50 m (+/-) 230/2011 5,749,652 566,191	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		KET PEN (kPa) VANE (kPa) 40 60 80 MC LI % 40 60 80	• L
TP_CORING.GPJ 1	232 2310 — 230.1 — 229 228 227	1		SILTY CLAY - Light grey SILTY CLAY TILL - Larger stones (cobbles) in clay/silt matrix at 2.44 m. - 30.5 cm ø limestone boulder at 6.10 m. SILT TILL - Granite and limestone boulders in silty till (Approx. 60% limestone, 40% granite)						
ᆢ		9 - 30 PLE TYPE		INSPECTOR	Дррі	ROVE	D	DATE		
GEOTE				nterprises D. BARCHYN	DRA			DATE 10/16/12		

K	GS ROUP		SUMMARY LOG REFERENCE NO. TH-1	HOLE NO. TH-35		SHEET 2	2 of 2
ELEVATION (m)	E	SOIL		/PE	SPT (N) blows/0.15 m	Cu POCKET PE Cu TORVANE (kPa) ◆
EVATI	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft △	20 40 C	50 80 LL
	(m) (ft)			SAMI	20 40 60	% 20 40 6	50 80
- 222							
221.2			END OF HOLE AT 11.28 m.				1
– 221	12 — 40		Notes: 1. Did not encounter bedrock at end of test drilling. 2. Test hole dry at end of drilling.				
- 220	13 —						
- 219	14 —						
- 218	15 —						
- 217 GB SO	16 —						
AUGER_TP_CORING.GPJ							1 1 1 1 -
ZEACH 3/HAND 4 - 1515	18 —						
GN/GEO/LOGS/#							
11-0300-18\DESI							
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/IDES/GN/GEO/LOGS/#REACH 3/HAND AUGER	20 —						
AL-SOIL LOG P:/F	21 ————————————————————————————————————						
SAN	MPLE TYPE		INSPECTOR	APPROVEI		DATE	
E COI			nterprises D. BARCHYN	DRAFT		10/16/12	

K	GS ROUP			HOLE TH-			SHEET 1 of 1
PR SIT LO DR	IENT OJECT TE CATION SILLING	Reach 3	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3E Ø Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 234.10 m (+/-) EV. 12/1/2011 N 5,748,762 E 566,320
ELEVATION (m)	(m) (ft	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL % 20 40 60 80
- 234 - 233 232.6	1-1-5		PEAT SILTY CLAY - Light grey				
- 232 - 231 230.6	3-11		SILTY CLAY TILL				
AD AUGER TP CORING GP 1 229.5	5-1	5	- 1.07 m ø limestone boulder at 3.51 m. SILT TILL - Light brown, dense, with boulders, possibly weathered bedrock.				
201/GEO/LOGS/#REACH 3/HAN	6 - 21		LIMESTONE BEDROCK				
JECTS/2011/11-0300-18/DESIG	8 — 2	5	END OF HOLE AT 8.53 m.				
됐ㅡㅡ	9 - 30 - 30 - 30 - 30 - 30 - 30 - 30 - 30	PE	Note: 1. Artesian flow conditions present at end of hole, approximately 0.3 m above grade. INSPECTOR	APPR	OVE	D	DATE
GEOT			nterprises D. BARCHYN	DRA			10/16/12

K	GS ROUP		CTTS FS F L DTT T C C	HOLE TH-			SHEET 1	of 1
SITI	DJECT I	LAKE \$ Reach 3 Alignme	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3E 2 Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	12/4/2011 N 5,747,44	+/-)
MET	ГНОД		o Air Hammer			ODT (A))	E 566,072 Cu POCKET PEN Cu TORVANE (kP	
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	20 40 60 PL MC	80 LL
	(m) (ft)			SAM	REC	20 40 60	% 20 40 60	80
- 235 234.5 _	1-5		SILTY CLAY TILL - Dark grey, with trace coarse grained sand/gravel.					
- 234 - 233 232.7	2-1		- 30.5 cm ø limestone boulder at 2.74 m.					- - - - - - - - - -
- 232 - 232 - 232	4 — 15		SILT TILL - Light brown, granite, limestone, cobbles in silty matrix.					
- 11	5 — 5 — 6 — 20							
0-18/DESIGN/GEO/LOGS/#	7							
227.5 _ 227.5 _	8 - 1		END OF HOLE AT 8.23 m.	$\frac{1}{1}$				
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0330-18/DES/GN/GEO/LOGS/#REACH 3/HAND AUGER. GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0330-18/DES/GN/GEO/LOGS/#REACH 3/HAND AUGER.	9		Notes: 1. Did not encounter bedrock at end of test drilling. 2. Test hole dry at end of drilling.					
SAM	IPLE TYPE	Ξ						
E CON	NTRACTOR Maple Le		INSPECTOR nterprises D. BARCHYN	APPR DRA			DATE 10/16/12	

K	GS ROUP			HOLE TH-			SHI	EET 1 of 1
SITI	DJECT LE F	_AKE \$ Reach \$ Alignme	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3D/3E Ø Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	232 EV. 12/ N :	.0300-18 2.80 m (+/-) 26/2011 5,749,380 566,313
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		VANE (kPa) 40 60 80 MC LL 40 60 80
- 2 37 9 _	1 — 5	9/0/	PEAT SILTY CLAY TILL - Dark grey, trace coarse grained sand/gravel.					
- 231 - 230	310	6/0/ 6/0/	- Increased boulders (150 to 250 mm ø) below 1.8 m.					
UGER_TP_CORING.GPJ = 525 = 525	4		SILT TILL - Light brown, granite and limestone cobbles in silty matrix.					
227.3 _ 227.3 _ 227.3 _ 227.3 _ 226.4	620	0.0000	GRAVEL END OF HOLE ON SUSPECTED BEDROCK AT 6.40 m.					
711-0300-18/DESIGN/GEO	7		Note: 1. Artesian flow conditions persent at end of hole, approximately 0.3 m below grade.					
GEOTECHNICAL-SOIL LOG P.;PROJECTS/2011/11-0330-18/DES/GN/GEO/LOGS/#REACH 3/HAND AUGER, SECT = 752	9							
SAM CON CON NO.		₹	INSPECTOR nterprises D. BARCHYN	APPI DRA	ROVE		DATE 10/16/12	<u></u>

	K	GS OUP			HOLE TH-			SHI	EET 1 of 1
	SITE	JECT L FATION A	AKE S Reach 3 Nignme	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3E Ø Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	233 EV. 12/ N :	-0300-18 3.60 m (+/-) /7/2011 5,748,949 566,321
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		**XANE (kPa) ** **VANE (kPa) ** ** ** ** ** ** ** ** 40 60 80 ** ** ** 40 60 80
-	233 232.7 _	1 - 5		PEAT SILTY SAND - Trace gravel, trace cobbles.					40 00 80
CORING.GPJ	231.0 -	3 - 10		SILT TILL - Light brown, dense, with coarse grained gravel. - 25 to 50 mm ø stones in silty till at 4.27 m.					
- 11	2 28 .9 _	5		LIMESTONE BEDROCK					
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/HAND AUGER	226 225.7 _ 225	25 8		END OF HOLE AT 7.92 m. Note: 1. Artesian flow conditions persent at end of drilling, approximately 1.1 m above grade.					
GEOTECHNICAL-	CON	TPLE TYPE TRACTOR		INSPECTOR nterprises D. BARCHYN	APPI DRA	ROVE		DATE 10/16/12	2

K	KGS ROUP			OLE			SHI	EET 1 of 1
PR SIT LO	OJECT L	LAKE S Reach 3 Alignme	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ent 3E Ø Air Hammer			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	230 EV. 12/ N :	-0300-18 6.00 m (+/-) /8/2011 5,747,460 565,186
ELEVATION (m)	(tt) (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		**XET PEN (kPa) ★ VANE (kPa)
235.1 - 235	1-1	**	PEAT SILT TILL - Dense, with limestone cobbles (75 mm ø down)					
- 234	2-1		- Increasingly loose silt till with sand, limestone cobbles (19 to 25 mm ø) below 1.68 m.					
- 233 - 233	3							
AUGER TP CORING.GPJ	5— 5—							
OGS/#REACH 3/HAND	6 - 20							
03 00-18/DES/GN/GEO/ 229-228.8 28.822 - 229-228.8			GRAVEL					
GEOTECHNICAL-SOIL LOG P.PPROJECTS\2011\111-0330-18\DESIGN\GEO\LOGS\#REACH 3\HAND AUGER.	9		END OF HOLE AT 7.92 m. Note: 1. Artesian flow conditions encountered at end of drilling, approximately at grade.					
AS CO	MPLE TYPE ONTRACTOR Maple Le	₹	INSPECTOR aterprises D. BARCHYN	APPR DRA	ROVE		DATE	

K	GS ROUP			HOLE			SH	EET 1	of 1
CLI PRO SIT LOO	ENT ! DJECT ! E ! CATION !	_AKE \$	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION ike Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	233 EV. 11/ N	-0300-18 3.78 m /22/2011 5,750,26 566,432	-
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POC Cu TOR	EVANE (kP	80 LL
GEOTECHNICAL-SOIL LOG P., PROJECTS\Z011/11-0300-18\JDESIGN\GEOTLOGS\#REACH 3\JPEAT PROBE.GPJ \	1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—		REFUSAL ON HARD BOTTOM AT 1.22 m.					40 60	80
COJ COJ	NTRACTOR	{	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPR DRA			DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG REFERENCE NO. 002	HOLE NO. PP382		SHEET 1 of 1
CLIE PRO SITE	ENT DJECT E ATION	MANITE SAME SAME SAME SAME SAME SAME SAME SAM	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C		JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 236.83 m EV. 11/22/2011 N 5,750,323
MET	HOD	Peat Pro	obe		· ,	E 566,338
ELEVATION (m)	рертн	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80
LEVA	DE	GRAI		IPLE '	DYNAMIC CONE (N) blows/ft △	PL MC LL
Ш	(m) (f	t)	PEAT	SAN	20 40 60	% 20 40 60 80
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/GR/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ - 532.8			CLAY-LIKE MATERIAL - Firm to hard REFUSAL ON CLAY-LIKE BOTTOM AT 1.52 m.			
ICAL-S(<mark> </mark>	DE				
CON	TRACTO	OR	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPROVE DRAFT		DATE 10/16/12

K	GS ROUP			HOLE			SH	EET 1	of 1
CLI PRO SIT	ENT DJECT E CATION	LAKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23: EV.	-0300-13 5.92 m /22/2011 5,750,38	1
DRI ME	LLING THOD	Peat Pro	obe			• • • • • • • • • • • • • • • • • • • •	Ε:	566,261	
ELEVATION (m)	DЕРТН	GRAPHICS	DESCRIPTION AND CLASSIFICATION	TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m		VANE (kP	
LEVA		GRA		MPLE	MBER 30VEF	DYNAMIC CONE (N) blows/ft △	PL ⊩	MC	LL I
	(m) (ft)	<u> </u>		SAN	N N	20 40 60	20	% 40 60	80
- ²³ 58 -	- - - - - - - - 1		CLAY-LIKE MATERIAL - Firm.						
234.4	- - - - - - - - 5		REFUSAL ON CLAY-LIKE BOTTOM AT 1.52 m.						
DROBE: GP _ 234	2								
IDESIGNIGEOILOGS/#REACH 3/PEAT									
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/1/1-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ SEZ - SIZE - SI	3 — 10								
SAN	I + 1PLE TYP.	 E.						<u> </u>	<u>i i i</u>
CON 1	NTRACTO	R	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPR DRA			DATE 10/16/12	2	

K GR	GS OUP		SUMMARY LOG REFERENCE NO. 004	HOLE N			SH	EET 1	of 1
CLIE PRO SITE LOC	INT I	_AKE \$	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23 EV. 11 N	-0300-13 5.31 m /22/2011 5,750,44 566,177	1 10
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 60 MC 40 60	
- 235			PEAT						
234.4 _ - 234 233.8 _	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —		CLAY-LIKE MATERIAL - Firm. REFUSAL ON CLAY-LIKE BOTTOM AT 1.52 m.						
OLLOGS/#REACH 3/PEAT PROBE.GPJ	2 —								
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEOLLOGS/#REACH 3/PEAT PROBE.GFJ COV. K COV. K	3								
SAMI SAMI CON K	PLE TYPE TRACTOF	{	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPRC DRAF			DATE	2	·[··[··]··

K	G ROU	S P			HOLE PP3			SH	EET 1	of 1
CL PR SIT	IENT OJECT	N L	AKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED	22 9	-0300-1 9.51 m	
DR ME	ILLING	P	eat Pro	obe			UTM (m)	Ε:	5,750,47 566,131	-
ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	YPE	% \	SPT (N) blows/0.15 m		CKET PEN RVANE (KP	Pa) ◆
ELEVAT			GRAF	DESCRIPTION AND CLASSIFICATION	MPLET	NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft △	PL	MC %	4
	(m)	(11)		PEAT	8	<u> </u>	20 40 60	20	40 60	80
- 229	+							·· ·· ·· ·· ·· ··		· · · · · · · · · · · · · · _ _ _ _ _
228.6									·· ·· ·· · . ·· ·· ·	.111
228.3	1-			CLAY-LIKE MATERIAL - Firm to stiff.						
- 228	-	-5		REFUSAL ON CLAY-LIKE AT 1.22 m.					·· ·· ·· · ··	· ·· ·· ·· · ·· ·· ··
ЭРЈ	-							 		.
PEAT PROBE.	2 —									1 1 1
GS/#REACH 3) - 227									·· ·· ·· · · 	-
DESIGNIGEONIC	-							 		
11/11-0300-18\D	3 —	-10								+ + + + + + + + + + + + + + + + + + +
GEOTECHNICAL-SOIL LOG P.:/PROJECTS/2011/11-03:00-18:DESIGNIGEO/L.OGS/#REACH 3:/PEAT PROBE.GPJ O PS										
L-SOIL LOG P:\								 	. . -	
SA	MPLE T			INSPECTOR	АРРІ	ROVE	D I	DATE		
EOT SEOT	KGS G			J. ARROWSMITH/S. BEAUDRY	DRA			10/16/12	2	

K	GS ROUP	1	SUMMARY LOG REFERENCE NO. 006	HOLE NO. PP386		SHEET 1 of 1
SITI	DJECT E CATION	North D	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION bike Investigation (Reach 3) f Alignment 3C		JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 230.73 m EV. 11/22/2011 N 5,750,497
MET	HOD	Peat Pro	obe			E 566,043 Cu POCKET PEN (kPa) ★
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	rype ry %	SPT (N) blows/0.15 m	Cu TORVANE (kPa) ◆ 20 40 60 80
ELEVA'			BESSIAN FISH AND SEASON ISANISM	SAMPLE TYPE NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft △	PL MC LL
	(m) (ft) ===================================	<u>PEAT</u>	S N B	20 40 60	20 40 60 80
	- - -					
- 230 229.8	-	5446 5446 5446 5446 5446				
229.6	1 —		SILTY CLAY TILL - Firm			
229.2	- - - 5		REFUSAL ON SILTY CLAY TILL AT 1.52 m.			
- 229 - 229 - 25 - 23 - 23 - 23 - 23 - 23 - 23 - 23 - 23	- - - 2					
EACH 3/PEAT PRO	-					
GN/GEO/LOGS/#RE - 228	-					
011/11-0300-18/DESI	3	0				
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEOLLOGS/#REACH 3/PEAT PROBE.GPJ W PS LOS A CONTROLLED BY SPEAT PROBE.GPJ W PS LOS A CONTROLLED BY SPEAT PROBE.GPJ W PS LOS A CONTROLLED BY SPEAT PROBE.GPJ						
AL-SOIL LC						
SAM	IPLE TYP		INSPECTOR	APPROVE	D	DATE
E CON	TRACTO		J. ARROWSMITH/S. BEAUDRY	DRAFT		10/16/12

K	GS ROUP			PP38			SH	EET 1	of 1
CLII PRO SITI LOC	ENT DJECT E CATION	LAKE S North D North of	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION ike Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23 EV.	-0300-13 1.95 m /22/2011 5,750,56	I
MET	LLING F	Peat Pro	obe				Е	565,977	
ELEVATION (m)	DЕРТН	GRAPHICS	DESCRIPTION AND CLASSIFICATION	rype	% X .	SPT (N) blows/0.15 m		VANE (kP	
LEVA	DE	GRAI	DESCRIPTION AND SERVICE TO ATTOM	APLE 7	NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft △	PL	MC	4
	(m) (ft)	3.8.5	PEAT	SAN	N G	20 40 60	20	% 40 60	80
CON B	1—	1882 1882 1882 1882 1882 1882 1882 1882	REFUSAL ON HARD BOTTOM AT 1.22 m.						
OS - 228		7							1
CON	IPLE TYPE ITRACTOE KGS Gro	2	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPR DRA			DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG REFERENCE NO. 008	HOLE NO. PP388		SHEET 1 of 1
CLI PRO SIT LOO	ENT DECT LESSES	AKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION bike Investigation (Reach 3) f Alignment 3C		JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 229.82 m EV. 11/22/2011 N 5,750,598 E 565,863
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL %
GEOTECHNICAL-SOll. LOG P./PROJECTS/2011/11-0300-18/DESIGNIGEOILOGS/#REACH 3/PEAT PROBE.GPJ	1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—		REFUSAL ON CLAY-LIKE BOTTOM AT 1.52 m.			
CON	NTRACTOF	{	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPROVE DRAFT		DATE 10/16/12

K	G S	1	SUMMARY	Y LOG	REFERENCE NO 009		OLE N			SH	EET 1	of 1
CLI PRO SIT LOO	ENT DJECT	MAN LAK North	ITOBA INFRASTR E ST. MARTIN EMB Dike Investigation (of Alignment 3C Probe	ERGENCY C		_			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	233 EV.	-0300-1 3.78 m /22/201 5,750,6 565,753	1 86
ELEVATION (m)	(m) (DEPTH	(t)	DESC	RIPTION AND	CLASSIFICATION		SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 60 MC 40 60 40 60	Pa) ◆
GEOTECHNICAL-SOIL LOG P., PROJECTS\(\text{2011} (11-0300-18\) DESIGN\(\text{GEO\LOGS} \) #REACH 3\(\text{PEAT} \) PROBE. GPJ \(\text{GPJ} \) = 2337 \(\text{237} \) = 2357 \(\text{237} \) = 2377 \(\text{237} \) = 237	2	10 PE	GRANULAR CRUST -		ANULAR CRUST AT 1.52	ł m.						80
COI	NTRACT KGS G1			INSPECTOR J. ARROW	SMITH/S. BEAU		APPRO DRAI			DATE 10/16/12	2	

GRO	S OUP			HOLE PP39			SH	EET 1	of 1
CLIEN' PROJE SITE	T NECT L	AKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C Obe			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23: 11/ N :	-0300-1: 1.34 m /22/201: 5,750,78	1 87
ELEVATION (m)	E) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 60 MC	(Pa) ◆
- 231 230.3 1 - 230 229.8 _			GRANULAR CRUST REFUSAL ON FIRM TO STIFF CLAY AT 1.52 m.						
CONTR KGS									
SAMPL CONTRA		INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPR DRA			DATE			

I G	G	S		SUMMARY LOG	REFERENCE NO. 011	HOLI PP3			SHI	CET 1	of 1
CI PF SI LC	IENT ROJEC TE	T L N ON N	AKE S	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (like Investigation (Reach 3) obe				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	233 EV. 11/ N 5	.0300-1 3.17 m 222/201 5,750,9 565,692	1 16
ELEVATION (m)	(m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P., PROJECTS/2011/01-03:00-18/DES/IGN/GEO/LOGS/#REACH 3/PEAT PROBE, GPJ	3-2-		244 244 244 244 244 244 244 244 244 244	GRANULAR CRUST REFUSAL ON	STIFF CLAY AT 1.83 m.						
SA CC	MPLE ONTRA KGS	СТОБ	2	INSPECTOR J. ARROV	WSMITH/S. BEAUDRY		PROVE AFT		DATE 10/16/12		

K	GS ROUP			OLE PP3			SH	EET 1	of 1
PRO SITI LOC DRI	DJECT L E N	_AKE \$	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	230 EV. 11/ N	-0300-1 0.73 m /22/201 5,751,0: 565,591	1 53
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu TOR	40 60 MC 40 60	Pa) ◆
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEOLOGS/#REACH 3/PEAT PROBE.GPJ - 578 -	(m) (tt)	344 344 344 344 344 344 344 344 344 344	REFUSAL ON HARD BOTTOM AT 1.88 m.	75	N. N			40 60	80
SAN SAN			INSPECTOR	APPR	OVE	: : : : : : :	DATE		<u>i i i</u>
	KGS Gro		J. ARROWSMITH/S. BEAUDRY	DRA			DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG REFERENCE NO. 013	HOLE NO. PP393		SHEET 1 of 1
CLII PRO SITI	ENT DJECT E CATION	LAKE S North D	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11-0300-18 231.65 m EV. 11/22/2011 N 5,751,219
DRI MET	LLING	Peat Pro	obe		O 1 W (III)	E 565,273
ELEVATION (m)	DEРТН	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m 🔺	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80
LEVA	DE	GRA		MPLE MBER	DYNAMIC CONE (N) blows/ft △	PL MC LL
	(m) (ft)	 	DEAT	SAN	20 40 60	% 20 40 60 80
- 231	- - - - - - - - 1		PEAT			
230.3	1 1	<u> </u>	REFUSAL ON HARD BOTTOM AT 1.37 m.			-
PEAT PROBE.GPJ 1	2					
8IDESIGNIGEO/LOGS/#REACH 3/F						
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/IDES/IGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ A O S T O S						
SAM	IL ₄ F IPLE TYPI	E				
CON	TRACTO		INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPROVE DRAFT		DATE 10/16/12

KGS GROU	S P	SUMMARY LOG	REFERENCE NO. 014	HOLE NO. PP394		SHEET 1 of 1
CLIENT PROJECT SITE LOCATION DRILLING METHOD	North of	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY C ike Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
ELEVATION (m)	ច	DESCRIPTION AND (CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) Cu TORVANE (kPa) 20 40 60 80 PL MC LL % 20 40 60 80
224.8	-10	PEAT REFUSAL ON HA	ARD BOTTOM AT 1.37 m.			
SAMPLE TO CONTRAC KGS G	TOR	INSPECTOR J. ARROW	SMITH/S. BEAUDRY	APPROVE DRAFT		DATE 10/16/12

	K	G	S		SUMMARY LOG	REFERENCE NO. 015	но РІ				SH	EET 1	of 1
	CLIE PRO SITE	ENT JEC	T L N ON N	AKE S	OBA INFRASTRUCTURE AIST. MARTIN EMERGENCY (ike Investigation (Reach 3) f Alignment 3C					JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	230 EV. 11/ N	-0300- 0.73 m /22/20 5,751,4 565,13	11 401
	ELEVATION (m)	(m)		GRAPHICS	DESCRIPTION AND	CLASSIFICATION		SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		RVANE (I	0 80 LL
GEOTECHNICAL-SOIL LOG P:/PROJECTS\2011/11-0300-18\DESIGN\GEO\LOGS\#REACH 3\PEAT PROBE.GPJ	230 229.5 _ 229 228				REFUSAL ON H	ARD BOTTOM AT 1.22 m.							
GEOTECH	CON'	TRAC			INSPECTOR J. ARRO	WSMITH/S. BEAUDRY		PPR PRA	OVE FT		DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG	REFERENCE NO. 016	DLE NO P396			SH	EET 1	of 1
PRO SIT LOC DRI	DJECT E CATION	LAKE S	OBA INFRASTRUCTURE ADDITIONAL ADD				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	22 EV. 11 N	-0300- 21.28 m 2/22/202 5,751,4 565,10	11 193
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 6 MC 40 6	0 80 LL
GEOTECHNICAL-SOIL LOG PI, PROJECTS (2011/11-0300-18) DE ST PROBE. GPJ PROJECT PROBE. GPJ PROJECT PROJE	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —		CLAY - Firm. REFUSAL	ON CLAY AT 1.52 m.		<u> </u>				
CON CON	NTRACTO	R	INSPECTOR J. ARRO	WSMITH/S. BEAUDRY	APPRO' DRAFT			DATE 10/16/1	2	

I G	KGS ROUP)	SUMMARY LOG REFERENCE NO. 017	HOLE NO. PP397		SHEET 1 of 1
PF SI	LIENT ROJECT TE	LAKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C		JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED	11-0300-18 227.69 m EV.
DF	RILLING ETHOD	Peat Pro			UTM (m)	N 5,751,567 E 565,033
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	YPE	SPT (N) blows/0.15 m 🔺	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80
ELEVAT	(m) (fi	_	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	DYNAMIC CONE (N) blows/ft △ 20 40 60	PL MC LL
GEOTECHNICAL-SOIL LOG P.:PROJECTS\20011111-0300-18\DESIGN\GEO\LOGS\#REACH 3\PEAT PROBE.GPJ - 2522	1 — 5 — 5 — 7 — 7 — 7 — 7 — 7 — 7 — 7 — 7		CLAY - Firm. REFUSAL AT 1.68 m.			
SA CC	MPLE TYI		INSPECTOR	APPROVE	D	DATE
GEOT	KGS Gr		J. ARROWSMITH/S. BEAUDRY	DRAFT		10/16/12

K	GS ROUP			HOLE 1			SH	EET 1	of 1
CLI PR SIT LO	IENT OJECT TE CATION	LAKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION like Investigation (Reach 3) f Alignment 3C			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	220 EV. 11/ N :	-0300-18 6.77 m /22/2011 5,751,65 564,968	
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 60 MC	
GEOTECHNICAL-SOIL LOG P., PROJECTS\\2011011-0300-18\\DESIGN\\GEOTICO\\2013\\PROSE.\GPJ\\2013\2013	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —	342 342 342 342 342 342 342 342 342 342	REFUSAL ON HARD BOTTOM AT 1.22 m.						80
CO.	NTRACTOI	2	INSPECTOR J. ARROWSMITH/S. BEAUDRY	APPR DRA			DATE 10/16/12	2	

	K	GS OUP		SUMMARY LOG REFERENCE NO. 021	HOLE NO. PP399		SHEET 1 of	1
	PRO SITE	ENT JECT E ATION LING	LAKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ne Outlet obe		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11/23/2011 N 5,753,213 E 570,448	
	ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu POCKET PEN (kPa) Cu TORVANE (kPa) 20 40 60 80 PL MC LL	•
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	(m) (ft)		CLAYEY SILT REFUSAL ON CLAYEY SILT AT 1.52 m.	S N N N N N N N N N N N N N N N N N N N			
GEOTEC		TRACTO		INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12	

	K	GS OUP		SUMMARY LOG REFERENCE NO. 022	HOLE NO. PP400		SHEET 1 of 1
	CLIE PRO SITE LOC	ENT JECT E ATION LING	LAKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ne Outlet obe		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11/23/2011 N 5,753,244 E 570,416
	ELEVATION (m) DEPTH GRAPHICS		GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/IGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ		(m) (ft)		CLAYEY SILT REFUSAL ON CLAYEY SILT AT 1.52 m.	SAN NUI	20 40 60	9% 20 40 60 80
GEOTECHI	CON	TRACTO	R	INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

K	KGS ROUP		SUMMARY LOG REFERENCE NO. 023	HOLE NO. PP401		SHEET 1 of 1
CL PR SIT LO	IENT OJECT TE	LAKE S Reach 3			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL % 20 40 60 80
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —		SILTY CLAY REFUSAL ON FIRM SILTY CLAY AT 1.37 m.			
CO	NTRACTOI	2	INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

	K	GS OUP		SUMMARY LOG REFERENCE NO. 024	HOLE NO. PP402		SHEET 1 of 1
;	CLIE PROS SITE LOCA	NT JECT : ATION :	LAKE S Reach 3	OBA INFRASTRUCTURE AND TRANSPORTAT ST. MARTIN EMERGENCY CHANNEL EXTENSI S Alignment ne Outlet Obe		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11/23/2011 N 5,753,264 E 570,332
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL % 20 40 60 80
GEOTECHNICAL-SOIL LOG P.:PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE, GPJ	SAM	1—		CLAYEY SILT REFUSAL ON FIRM CLAYEY SILT AT 1.52 m.			
GEOTECH		TRACTO		INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

	KGS GROUP		SUMMARY LOG REFERENCE NO. 026	HOLE NO. PP403		SHEET 1 of 1
C P S L	LIENT ROJECT ITE OCATION	LAKE S			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11/23/2011 N 5,753,151 E 570,420
EI EVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL %
GEOTECHNICAL-SOIL LOG PAPROJECTS12011/11-0300-18IDESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	1 —		CLAYEY SILT REFUSAL ON HARD CLAYEY SILT AT 1.22 m.			
С	ONTRACTO	R	INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

K	KGS ROUP		SUMMARY LOG	REFERENCE NO. 027		DLE N P40			SH	EET 1	of 1
CL PR SIT LO	IENT OJECT CE F	AKE S						JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11/ N : E :	-0300-1 /23/201 5,753,1 570,499	1 14
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND C	ASSIFICATION		SAMPLE TYPE	ECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		40 60 MC 40 60 40 60	Pa) ◆
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-03:00-18/DESIGN/GEOLOGS/#REACH 3/PEAT PROBE.GPJ O Y	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —	SEECE	SILTY CLAY REFUSAL ON HIGH PLAS	FICITY SILTY CLAY AT 1.68	m.						
CO	NTRACTOF	2	INSPECTOR J.ARROWSM	ITH		APPRO DRAF			DATE 10/16/12	2	

	K	G	S IP		SUMMARY LOG	REFERENCE NO. 030	HOLE NO. PP405		SHEET 1 of 1
	SITE	JEC1	r L F ON S	AKE S	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY O 3 Alignment ne Outlet obe			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(a) DFPTH		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	PL MC LL
HNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	1— 3— 3— 4 PLE T	- - - - - - - - - - -	3446 3446 3446 3446 3446 3446 3446 3446	END OF Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.			
GEOTEC		TRAC			INSPECTOR J. ARROWS	SMITH	APPROVE DRAFT		DATE 10/16/12

	K	G	S		SUMMARY LOG	REFERENCE NO. 032	HOLE NO. PP406		SHEET 1 of 1
	SITE	JEC1	F N S	AKE S	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY O 3 Alignment ne Outlet			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(a) DFPTH	i i (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	PL MC LL
HNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	1— 3— 3— 4 PLE T		SEE	END OF Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.			
GEOTEC		TRAC			INSPECTOR J. ARROWS	SMITH	APPROVE DRAFT		DATE 10/16/12

	K	G	S			REFERENCE NO.	HOLI PP	E NO. 407		SHI	EET 1	of 1
,	CLIE PRO SITE LOC	ENT JEC	N F F ON S	AKE S	OBA INFRASTRUCTURE AND ST. MARTIN EMERGENCY CHAS Alignment ne Outlet				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23/201 5,753,2 570,331	1 01	
	ELEVATION (m)	(m)		GRAPHICS	DESCRIPTION AND CLA	SSIFICATION	SAMPI E TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P.PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	1—			CLAY REFUSAL ON STIF	F CLAY AT 1.52 m.						
GEOTECH		TRAC			INSPECTOR J.ARROWSMI	гн		PROVE PAFT		DATE 10/16/12	,	

Γ	K	GS OUP		SUMMARY LOG REFERENCE NO. 036	HOLE NO. PP408		SHEET 1 of 1
	CLIE PRO SITE	INT JECT I ATION (LAKE S Reach 3	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ne Outlet obe		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL
GEOTECHNICAL-SOIL LOG P;PROJECTS\2011/11-0300-18\DESIGN\GEO\LOGS\#REACH 3\PEAT PROBE.GPJ	SAM	1—		SILTY CLAY REFUSAL ON SILTY CLAY AT 1.22 m.			
GEOTECH	CON	TRACTOR	2	INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

I G	KGS ROUP		SUMMARY LOG REFERENCE NO. 039	HOLE NO. PP409		SHEET 1 of 1
CI PF SI LC	IENT ROJECT TE DCATION S	AKE S			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL %
GEOTECHNICAL-SOIL LOG P.;PROJECTS\2011/11-0300-18\DESIGN\GEO!LOGS\#REACH 3\PEAT PROBE.GPJ	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —		SILTY CLAY - Stiff. REFUSAL ON SILTY CLAY AT 1.37 m.			
CC CC	ONTRACTOR	{	INSPECTOR J.ARROWSMITH	APPROVI DRAFT		DATE 10/16/12

	K	G	S		SUMMARY LOG	REFERENCE NO. 041	HOL PP				SH	EET	1 0	f 1
•	CLIE PRO SITE LOC	ENT JECT	N S	AKE Steach 3	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY OF BAlignment the Outlet				JOB NO. 11- GROUND ELEV. TOP OF PVC ELEV. WATER ELEV. DATE DRILLED 11/ UTM (m) N 5)11 ,317	,
	ELEVATION (m)	a) DEPTH		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	T CALL	SAMPLE IYPE	RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POC Cu TOR	40 MC	(kPa)	
GEOTECHNICAL-SOIL LOG P\PROJECTS\2011/11-0300-18\DESIGN\GEO\LGGS\#REACH 3\PEAT PROBE.GPJ		1— 1— 2— 1— 1— 1— 1— 1— 1— 1— 1— 1— 1— 1— 1— 1—				ARD BOTTOM AT 1.68 m.								
GEOTEC		TRAC			INSPECTOR J.ARROWS	SMITH		PR RA	OVE FT		DATE 10/16/1	2		

	K	GS OUP			HOLE 1			SH	EET 1 of	 f 1
;	CLIEI PROJ SITE LOCA	NT NT LECT LATION S	AKE S	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION B Alignment ne Outlet obe			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	≣V. 11/ N :	-0300-18 /23/2011 5,753,278 570,390	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60		MC %	Pa) ★ 80 LL 80
GEOTECHNICAL-SOIL LOG P.:PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ		1 — 5 — 5 — — 10 — — — — — — — — — — — — — — — —		REFUSAL ON SAND MATERIAL AT 0.91 m.						
GEOTECH	CONT	RACTOR	2	INSPECTOR J.ARROWSMITH	APPR DRA			DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG REFERENCE NO. 044	HOLE NO. PP413		SHEET 1 of 1	
CLI PR SIT LO	IENT OJECT IE CATION (LAKE S		GROUND ELEV. TOP OF PVC ELEV. WATER ELEV. DATE DRILLED 11 UTM (m) N E			
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL % 20 40 60 80	
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —	Select S	SANDY MATERIAL REFUSAL ON HARD SANDY MATERIAL AT 1.68 m.				
СО	NTRACTOI	₹	INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12	

	K	G	S		SUMMARY LOG	REFERENCE NO. 046	HOLE NO PP414			SH	EET 1	of 1
	CLIE PRO SITE LOC	ENT	N F ON S	AKE S	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (3 Alignment ne Outlet			JOB NO. 11-03 GROUND ELEV. TOP OF PVC ELEV. WATER ELEV. DATE DRILLED 11/2; UTM (m) N 5,' E 57				1 67
	ELEVATION (m)	(m)		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEOIL/OGS/#REACH 3/PEAT PROBE.GPJ	SAM				Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.						
GEOTECH		TRAC			INSPECTOR J.ARROWS	SMITH	APPRO DRAF			DATE 10/16/12		

	K	G	S		SUMMARY LOG	REFERENCE NO. 047	HOLE N			SHI	EET 1	of 1
	CLIE PRO SITE LOC	ENT	N F ON S	AKE S	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (3 Alignment ne Outlet			GROUND ELEV. TOP OF PVC ELEV. WATER ELEV. DATE DRILLED 11/2; UTM (m) N 5,'			.0300-1 /23/201 5,753,2 570,564	1 29
	ELEVATION (m)	(m)		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P\PROJECTS\2011/11-0300-18\DESIGN\GEO\LOGS\#REACH 3\PEAT PROBE.GPJ	SAM				Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.						
GEOTECI		TRAC			INSPECTOR J.ARROWS	SMITH	APPRO DRAI			DATE 10/16/12		

	K	G	5		SUMMARY LOG	REFERENCE NO. 048	но Р 1		NO. 16		SH	EET :	l of 1
	CLIE PRO SITE LOC	INT JECT	N S	AKE S	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (3 Alignment ne Outlet					JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	EV. 11 N E	-0300- /23/20 5,753, 570,50	11 232 55
	ELEVATION (m)	(a) DEPTH		GRAPHICS	DESCRIPTION AND	CLASSIFICATION		SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		40 0 MC	50 80
GEOTECHNICAL-SOIL LOG P./PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	1—	-5		REFUSAL ON SA	NDY MATERIAL AT 1.52 m.							
GEOTECH		TRAC			INSPECTOR J.ARROWS	SMITH		PPF OR A	OVE FT		DATE 10/16/1	2	

K	GS ROUP		SUMMARY LOG REFERENCE NO. 049	HOLE NO. PP417		SHEET 1 of 1
CLI PRO SIT LOO	IENT OJECT TE CATION S	_AKE \$			JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	11/23/2011 N 5,753,206 E 570,681
ELEVATION (m)	(tt) (m) (DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆ 20 40 60 80 PL MC LL %
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ O Y Y O Y Y	1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 — 1 —		REFUSAL ON SANDY MATERIAL AT 1.52 m.			
COJ	NTRACTOF	₹	INSPECTOR J.ARROWSMITH	APPROVE Draft		DATE 10/16/12

	K	G	S		SUMMARY LOG	REFERENCE NO. 050	HOLE I			SHI	CET 1	of 1
,	CLIE PRO SITE LOC	ENT DJECT	N F N S	AKE Steach 3	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (3 Alignment ne Outlet				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11/ N : E :	0300-1 23/201 5,753,2 570,677	1 00
	ELEVATION (m)	(m)		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P\"PROJECTS\"2011/11-0300-18\"DESIGN\GEO\"LOGS\#REACH 3\"PEAT PROBE.GPJ		1—			Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.						
GEOTECI		TRAC			INSPECTOR J.ARROWS	SMITH	APPR DRA			DATE 10/16/12		

	K GR	GS ROUP		SUMMARY LOG REFERENCE NO. 053	HOLE NO. PP420		SHEET 1 of 1
	SITE LOC DRII	JECT E ATION	LAKE :	OBA INFRASTRUCTURE AND TRANSPORTATION ST. MARTIN EMERGENCY CHANNEL EXTENSION 3 Alignment ne Outlet		JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	PL MC LL
HNICAL-SOIL LOG P:/PROJECTS/2011/11-03:00-18 DES/GN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	SAM	1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—	Sec. S	END OF HOLE AT 1.83 m. Note: 1. Probe used was 1.83 m long.			
SEOTECH		TRACTO		INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

	K	G	S		SUMMARY LOG	REFERENCE NO. 054	HOLE NO. PP421		SHEET 1 of 1
	SITE	JEC1	F N S	AKE S	OBA INFRASTRUCTURE AND ST. MARTIN EMERGENCY OF A Alignment one Outlet			JOB NO. GROUND ELEV. TOP OF PVC EL WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(a) DFPTH	i i (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft \triangle	PL MC LL
HNICAL-SOIL LOG P:\PROJECTS\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SAM	1— 1— 3— 4 PLE T		SEE	END OF Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.			
GEOTEC		TRAC			INSPECTOR J. ARROWS	SMITH	APPROVI DRAFT		DATE 10/16/12

	K	GS ROUP		SUMMARY LOG REFERENCE NO 055	O. HOLE NO. PP422		SHEET 1 of 1
	SITE LOC DRII	JECT	LAKE Reach	OBA INFRASTRUCTURE AND TRANSPORT ST. MARTIN EMERGENCY CHANNEL EXTE 3 Alignment ne Outlet		JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	
	ELEVATION (m)	(m) (ff	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu POCKET PEN (kPa) * Cu TORVANE (kPa) 20 40 60 80 PL MC LL % 20 40 60 80
;HNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DES/GN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ			0 0	END OF HOLE AT 1.83 m. Note: 1. Probe used was 1.83 m long.			
SEOTEC!		TRACTO		INSPECTOR J.ARROWSMITH	APPROVE DRAFT		DATE 10/16/12

K	GS ROUP		SUMMARY LOG	REFERENCE NO. 056	LE NO. P423		SH	EET 1 c	of 1
CLII PRO SITI LOO	ENT POPER TO SECOND SEC	AKE S				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	EV. 11/ N : E :	-0300-18 /23/2011 5,753,154 570,867	ı
ELEVATION (m)	ОЕРТН	GRAPHICS	DESCRIPTION AND C	CLASSIFICATION	SAMPLE TYPE NUMBER RECOVERY %	SPT (N) blows/0.15 m A DYNAMIC CONE (N) blows/ft △		KET PEN (I VANE (kPa) 40 60 MC %	
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGNIGEO/LOGS/#REACH 3/PEAT PROBE.GPJ NO TO THE STATE OF	(m) (ft)	NEW NEW	REFUSAL ON HA	RD BOTTOM AT 1.83 m.	7S			40 60	80
CON	NTRACTOF	{	INSPECTOR J. Arrows i	мітн	PPROVI DRAFT		DATE 10/16/12	2	

K	GS ROUP		SUMMARY LOG	REFERENCE NO. 057	DLE NO P42 4			SH	EET 1	of 1
CLI PRO SIT LOO	ENT DECT LESSES	AKE S					JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	EV. 11 N E	-0300-1 /23/201 5,753,1 570,96	1 48 7
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE NUMBER	ECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu TOF	40 60 MC	80 LL
GEOTECHNICAL-SOIL LOG P.:PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ	1—	344 344 344 344 344 344 344 344 344 344	REFUSAL ON HA	ARD BOTTOM AT 1.83 m.				20		80
CON	NTRACTOF	{	INSPECTOR J. ARROWS	SMITH	APPRO DRAF			DATE 10/16/12	2	

	K	G	S		SUMMARY LOG	REFERENCE NO. 058	HOLE PP4			sнı	CET 1	of 1
	CLIE PRO SITE LOC	ENT DJECT	N F N S	AKE S	OBA INFRASTRUCTURE AI ST. MARTIN EMERGENCY (3 Alignment ne Outlet				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	EV. 11/ N 5	0300-1 23/201 5,753,1 570,960	1 02
	ELEVATION (m)	(m) DFPTH		GRAPHICS	DESCRIPTION AND	CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		WC	80 LL
GEOTECHNICAL-SOIL LOG P\"PROJECTS\"2011/11-0300-18\"DESIGN\GEO\"LOGS\#REACH 3\"PEAT PROBE.GPJ		1—			Note: 1. Probe used was 1.83 m long.	HOLE AT 1.83 m.						
GEOTECI		TRAC			INSPECTOR J.ARROWS	SMITH	APPF DR <i>A</i>	ROVEI AFT		DATE 10/16/12		

K	GS OUP		SUMMARY LOG	REFERENCE NO. 059	DLE N P42			SHE	EET 1	of 1
CLIE PRO SITE LOC	ENT JECT E ATION (L AKE \$	OBA INFRASTRUCTURE AN ST. MARTIN EMERGENCY C 3 Alignment ne Outlet obe				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	11/ N 5	0300-18 23/2011 5,753,08 571,061	l 8 1
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND O	CLASSIFICATION	SAMPLE TYPE	RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft 20 40 60	Cu TOR\	40 60 MC % 40 60	
SAM	1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—1—	346 346 346 346 346 346 346 346 346 346	REFUSAL ON SUSPECTE	ED SANDY MATERIAL AT1.83 m						
CON	PLE TYPE TRACTOR GS Gro	R	INSPECTOR J.ARROWS	MITH	.PPR(DATE 10/16/12		

I G	KGS ROUP			HOLE PP4			SH	EET 1	of 1
CL PF SI' LC	IENT ROJECT TE PCATION S	AKE S				JOB NO. GROUND ELEV. TOP OF PVC ELI WATER ELEV. DATE DRILLED UTM (m)	EV. 11/ N : E :	-0300-18 /23/2011 5,753,12 571,059	7
ELEVATION (m)	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m DYNAMIC CONE (N) blows/ft		KET PEN (KPa	
	(m) (ft)	3.8.2	PEAT	SAM	REC	20 40 60	20	% 40 60	80
GEOTECHNICAL-SOIL LOG P:/PROJECTS/2011/11-0300-18/DESIGN/GEO/LOGS/#REACH 3/PEAT PROBE.GPJ		24	REFUSAL ON HARD BOTTOM AT 1.83 m.						
SA	MPLE TYPE		INSPECTOR	ΔDDT	ROVE	D	DATE		
	KGS Gro		INSPECTOR J.ARROWSMITH	DRA			DATE 10/16/12	2	

APPENDIX D-04 LABORATORY TEST RESULTS



			(dn																				
			Alena James/Tony NG (KGS Group)			Visual Classification													185				
			ny NG (I		\vdash			4															\dashv
	2011	2011	mes/To	-		* IOH with HCI *																	\exists
	Nov 17,	Nov 21, 2011	Alena Ja	Jo	E	Bulk Density (kg/cu.m.)				٦													
	Date Requisitioned Nov 17, 2011			-	STRENGTH	Direct Shear Performed																	
	Date Re	Date Reported:	Report To:	Page:		Unconfined qu (kpa)																	
						Field PP (kpa)																	
						(N) TAS																	
AB						Organic Content %																	
ransportation H - CENTRAL LAB SUMMARY SHEET	9	360	dno	110		SilVClay % (pass 0.075 mm)												9					
Spor	2011-11G	710012360	KGS Group	Nov 7, 2011		Clay % (pass 0.005 mm)	22	19	32	28	19	74	39	49	61	71	27						
					GRAIN SIZE	(mm270.0 assq) % this	39	38	47	37	29	16	24	19	22	13	26						
ure and IG BRA		er No. :		:De	GRAII	(mm37.4 sssq) % bns2	31	59	16	21	35	8	21	20	6	6	41	45					
Manitoba Infrastructure and Transportation MATERIALS ENGINEERING BRANCH - CENTRAL LAB GEOTECHNICAL SOIL PROPERTY SUMMARY SHEI	Site/File No. :	Internal Order No. :	Sampled By:	Date Sampled:		Gravel % (pass 75mm)	80	14	5	14	17	2	16	12	8	7	9	49					
ba Inf S ENC ICAL					IMITS	Plasticity Index %	4	е	9	9	3	25	15	21	27	56	9					5	
Manitoba MATERIALS EOTECHNIC					ATTERBERG LIMITS	Plastic Limit %	13	41	14	14	13	24	16	21	21	24	13						
M MATI EOTE					ATTER	% fimid biupid	17	17	20	20	16	49	31	42	48	49	19						
o o						Moisture Content %	14	14	13	12	6	38	16	33	27	36	14	13					
						Unified Classification	CL-ML	ML	CL-ML	CL-ML	ML	CI	ច	ਹ	ច	Ö	CL-ML	GP-GC					
	Water Control and Structures	nel				Depth(m)	1.83	1.37	2.44	2.84	2.59	1.83	3.25	3.33	2.44-2.74	1.22	3.20	1.30					
	and Si	n Char			DATA	Senterline																	
	ontro	Marti	_		SAMPLE	noitst2																	
	Water C	Lake St. Martin Channel	Reach 3		SAN	Sample No.	TP01	TP03	TP07	TP10	TP11	TP11A	TP12	TP13	TP15	TP16	TP20	TP19					
						.oM eloH tseT																	
	Client:	Project:	Location:	Municipality:		.oN dsJ	WGT110740	WGT110741	WGT110742	WGT110743	WGT110744	WGT110745	WGT110746	WGT110747	WGT110748	WGT110749	WGT110750	WGT110751					

*1 - Non effervescent 2 - Very slightly effervescent 3 - Slightly effervescent 4 - Strongly effervescent 5 - Violently effervescent WGT-201

	er Conti	rol and	Water Control and Structures	ires					0,	Site/File No.	. :		2011-11G	(J				Date Red	Date Requisitioned Jan 26, 2012	Jan 26,	2012		
St. N	10	Lake St. Martin Channel	nannel						_	Internal Order No.	der No. :		710012360	09				Date Reported:	orted:	Jan 30, 2012	2012		
ch 3 -	>	/icinity	of Propo	Reach 3 - Vicinity of Proposed Shoreline Outlet Areas	reline C	utlet Ar	eas		3,	Sampled By:	y:		KGS Group	dno				Report To:		Alena Ja	ames/T	ony Ng	Alena James/Tony Ng (KGS Group)
										Date Sampled:	led:		Jan 24, 2012	2012				Page:	-	of	-		
[§	SAMPLE	E DATA	Y_				ATTERE	ATTERBERG LIMITS	MITS		GRAI	GRAIN SIZE						S	STRENGTH	ı			
Sample No.		noitst2	ənihətnəO	Depth(m)	Unified Classification	% finestro SerutsioM	% 1imid biupid	Plastic Limit %	Plasticity Index %	Gravel % (pass 75mm)	(mm37.4 sssq) % bns2	(mm270.0 sssq) % #il2	Clay % (pass 0.005 mm)	(mm 370.0 sssq) % (pass 0.075	% IneJrio Confent %	(N) TG2	(kqa) 99 blei7	Onconfined qu (kpa)	Direct Shear Performed	Bulk Density (kg/cu.m.)	Reactive with HCI *		Visual Classification
	TP12-02			8	ML	6	17	14	က	28	29	27	16										
	TP12-03			2.1	귕	12	22	41	ω	1	18	35	36										
	TP12-06			3.5	GP	80	16	13	က	69	7	16	ω										
l																							
l																							
l .																							
	_	-	-			ļ	l		ŀ			İ		Ī			1	1			Ī	1	

MANITOBA INFRASTRUCTURE and TRANSPORTATION MATERIALS ENGINEERING BRANCH CENTRAL LAB

PARTICLE SIZE ANALYSIS of SOILS A.S.T.M. D-422

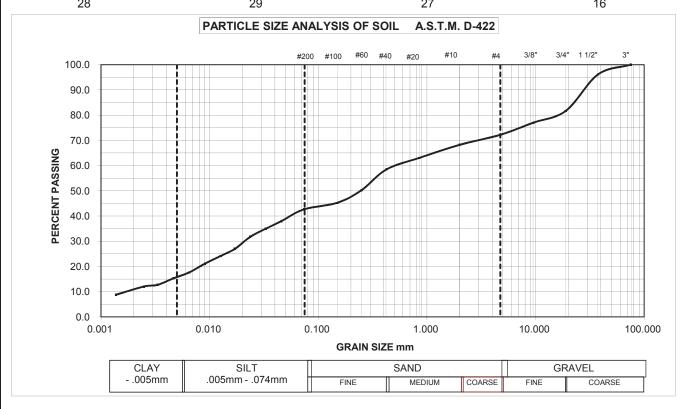
PROJECT: Lake St. Martin Channel TESTED BY: J.H.,P.M. LOCATION: Reach 3 - Vicinity of Proposed Shoreline Outlet Areas CHECKED: G.J.

LAB.NO. WGT110919 FIELD NO. TP12-02 HOLE NO. TP01 DEPTH (m) 3

S	SIEVE ANALYSI	S		HYDI	ROMETER ANA	LYSIS	
SIEVE	DIAMETER	%	TIME	HYDROMET	ER READING	DIAMETER	%
U.S. STANDARD	(mm)	PASSING	MINUTES	R _o	R _C	(mm)	PASSING
3.00 in	75.00	100.0	1	20.7	17.6	0.0457	38.0
1.50 in	37.50	96.1	2	19.3	16.2	0.0328	35.0
0.75 in	19.00	81.7	4	17.8	14.7	0.0236	31.7
0.375 in	9.50	77.0	8	15.6	12.5	0.0171	27.0
NO.4	4.75	72.2	15	14.3	11.2	0.0126	24.2
10	2.00	68.2	30	12.9	9.8	0.0090	21.1
20	850um	63.1	60	11.3	8.2	0.0065	17.7
40	425um	58.5	120	10.2	7.1	0.0046	15.3
60	250um	50.3	240	9.0	5.9	0.0033	12.7
100	150um	45.3	432	8.7	5.6	0.0025	12.1
200	75um	42.7	1455	7.0	4.1	0.0014	8.8

 % GRAVEL
 % SAND
 % SILT
 % CLAY

 28
 29
 27
 16



MANITOBA INFRASTRUCTURE and TRANSPORTATION

MATERIALS ENGINEERING BRANCH CENTRAL LABORATORY

PARTICLE SIZE ANALYSIS of SOILS A.S.T.M. D-422

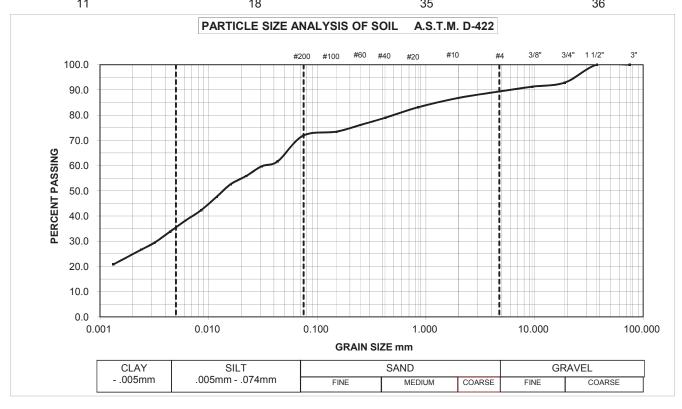
PROJECT: Lake St. Martin Channel TESTED BY: J.H.,P.M. LOCATION: Reach 3 - Vicinity of Proposed Shoreline Outlet Areas CHECKED: G.J.

LAB.NO. WGT110920 FIELD NO. TP12-03 HOLE NO. TP01 DEPTH (m) 2.1

S	SIEVE ANALYSI	S		HYDF	ROMETER ANA	LYSIS	
SIEVE	DIAMETER	%	TIME	HYDROMETI	ER READING	DIAMETER	%
U.S. STANDARD	(mm)	PASSING	MINUTES	R_0	R_{C}	(mm)	PASSING
3.00 in	75.00	100.0	1	25.5	22.4	0.0432	61.7
1.50 in	37.50	100.0	2	24.8	21.7	0.0308	59.8
0.75 in	19.00	92.9	4	23.4	20.3	0.0222	55.9
0.375 in	9.50	91.3	8	22.2	19.1	0.0159	52.6
NO.4	4.75	89.4	15	20.4	17.3	0.0119	47.6
10	2.00	86.8	30	18.5	15.4	0.0086	42.4
20	850um	83.1	60	17.0	13.9	0.0061	38.3
40	425um	79.0	120	15.4	12.3	0.0044	33.8
60	250um	76.1	240	13.8	10.7	0.0032	29.4
100	150um	73.4	428	12.8	9.7	0.0024	26.7
200	75um	71.8	1451	10.5	7.6	0.0013	20.8

 % GRAVEL
 % SAND
 % SILT
 % CLAY

 11
 18
 35
 36



MANITOBA INFRASTRUCTURE and TRANSPORTATION

MATERIALS ENGINEERING BRANCH CENTRAL LABORATORY

PARTICLE SIZE ANALYSIS of SOILS A.S.T.M. D-422

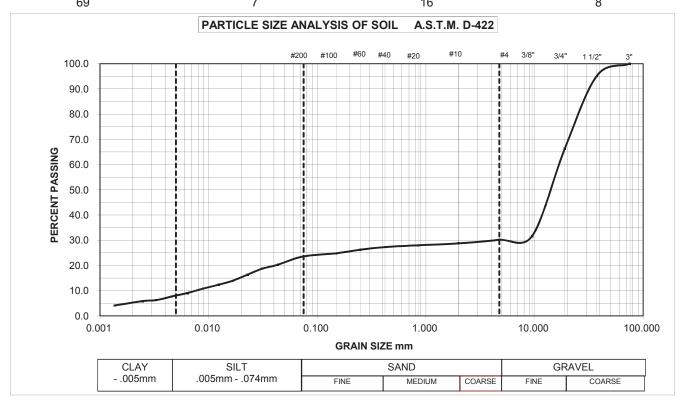
PROJECT: Lake St. Martin Channel TESTED BY: J.H.,P.M. LOCATION: Reach 3 - Vicinity of Proposed Shoreline Outlet Areas CHECKED: G.J.

LAB.NO. WGT110921 FIELD NO. TP12-06 HOLE NO. TP01 DEPTH (m) 3.5

S	SIEVE ANALYSIS	S		HYDF	ROMETER ANA	LYSIS	
SIEVE	DIAMETER	%	TIME	HYDROMETI	ER READING	DIAMETER	%
U.S. STANDARD	(mm)	PASSING	MINUTES	R_0	R _C	(mm)	PASSING
3.00 in	75.00	100.0	1	25.4	22.3	0.0433	20.3
1.50 in	37.50	95.2	2	23.7	20.6	0.0313	18.8
0.75 in	19.00	66.3	4	21.1	18.0	0.0228	16.4
0.375 in	9.50	31.7	8	18.4	15.3	0.0166	13.9
NO.4	4.75	30.2	15	16.7	13.6	0.0123	12.4
10	2.00	28.8	30	15.0	11.9	0.0089	10.8
20	850um	28.0	60	13.1	10.0	0.0064	9.1
40	425um	27.3	120	11.6	8.5	0.0046	7.7
60	250um	26.3	240	10.0	6.9	0.0033	6.3
100	150um	24.8	424	9.6	6.5	0.0025	5.9
200	75um	23.6	1447	7.5	4.6	0.0014	4.2

 % GRAVEL
 % SAND
 % SILT
 % CLAY

 69
 7
 16
 8



MANITOBA INFRASTRUCTURE AND TRANSPORTATION MATERIALS ENGINEERING BRANCH WINNIPEG CENTRAL LAB 1. Aggregate (WPg)



Water Control and Structures	ures								රි	Contract No.:							Product:		Limestone Rock	Bock Bock				
St. M	Lake St. Martin Channel - Reach 3	- Reach 3							<u>In</u>	Internal Order No. :	r No. :	710012360	360				Product Sequence:	nence:	-					
Ø	Downstream from Sta 21+00	00+							W	Work Order No. :	 						Pit Location:		n/a					
									S	Contractor:		Hugh M	Hugh Munro Construction	truction			Report To:		Alena Jar	nes, Tony N	Alena James, Tony Ng (KGS Group)	(dno		
Field Sample Number	Date Sampled	Sampled By	Date Testing Completed	4" 100mm % pass	4" 3" 2" 100mm 75mm 50mm % pass % pass	2" 50mm 3 % pass	11/2" 1" 3/4" 5/8" 37.5mm 25mm 19mm 16mm % pass % pass % pass	1" 25mm 1: 6 pass %	3/4" 5/8" 19mm 16mm % pass % pass	//8" 1// hmm 12.5 pass % p	1/2" 3/8" 12.5mm 9.5mm % pass	No. 4 m 4.75mm ss % pass	No. 10 n 2mm s % pass	No. 10 No. 20 2mm 850um % pass % pass	No. 40 425um % pass	No. 80 180um % pass	No. 200 75um % pass	Crush		S.G. Ab	Absorption A De (%) kg	Agg Sc Density A kg/m3	Soundness Ave. Loss	L.A. % Loss
RS1	1/25/2012	KGS	2/14/2012																	2.551	3.36			56.4
RS2	1/25/2012	KGS	2/14/2012																	2.594	2.96		43.0	
RS3	1/25/2012	KGS	2/14/2012																	2.559	3.17		46.1	
								H	\vdash															
			Specifications																					
			Average								_	_					_		2	2.568258 3.162232	62232			56.38

Remarks: