APPENDIX A – TESTHOLE LOGS

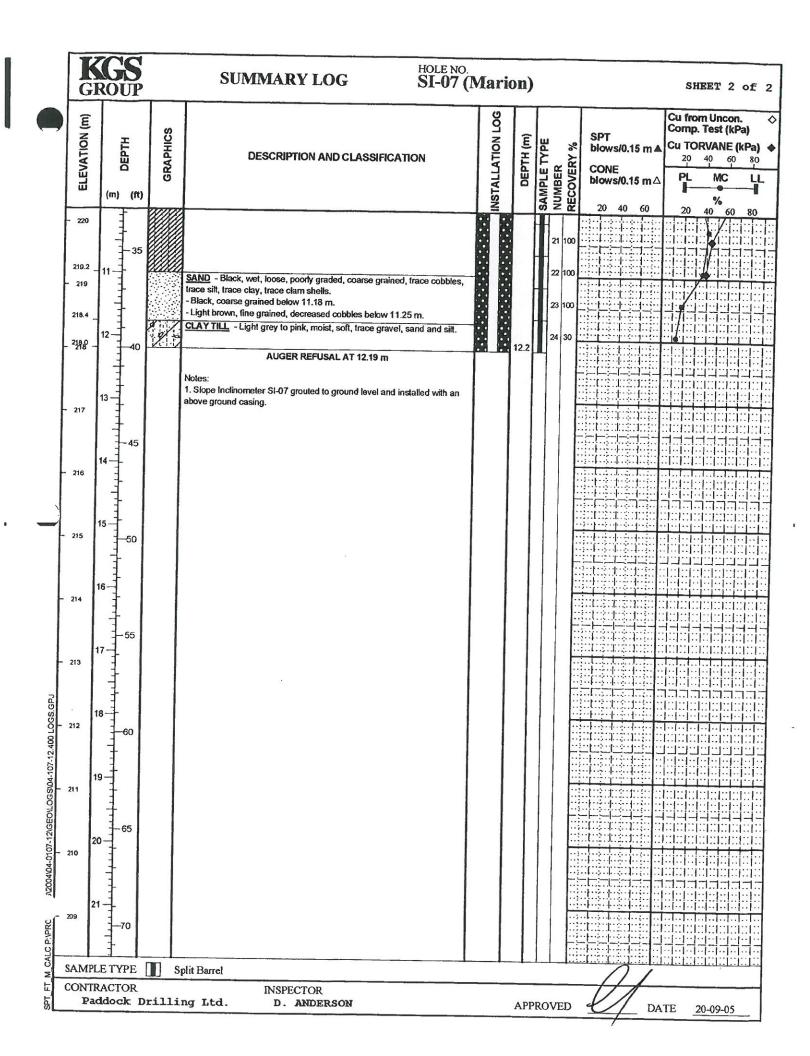
K GF	GS ROUP		REFERENCE NO.			DLE H1	no. 2-0 1	1	SHEET 1 of 1
SITI	JECT E	Chatav Chatawa	DF WINNIPEG - WATER AND WASTE DEPARTME vay Outfall Repairs & Rehabilitation ay Blvd Outfall t of outfall, 3 m south of sidewalk	NT				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	3/21/2012
	LLING HOD	200 mm	mm ø Hollow Stem Auger						N 5,526,083 E 628,520
ELEVATION (m)	(m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) \star Cu TORVANE (kPa) \bullet 20 40 60 80 PL MC LL \bullet \bullet \bullet 20 40 60 80
230.3	-		TOPSOIL - Black to dark brown, damp, firm.						
230.3 _ - 230 - 229.0 _			CLAYEY SILT - Brown, damp, friable, low to intermediate plasticity, trace tree rootlets.		1.2	2	S1		
- 229 - - 228			SILTY CLAY - Brown, damp to moist, firm, intermediate to high plasticity, trace to some silt inclusions, trace fine to medium grained sand, trace roots.		2.9		52		
- 227			- Increase in silt content below 3.0 m.				53		
- 0107-33.GPJ	4		- Grain size distribution: Gravel (0.0%), Sand (5.4%), Silt (56.2%) and Clay (38.0%) at 3.66 m. - Wet, trace roots below 4.4 m.				54		
- ²²²⁰ - 2220 -	5		SANDY SILTY CLAY - Grey, damp to moist, soft to firm, with fine to medium grained sand, some red coloured sandy layers throughout (oxidized), trace to some clay.				S5		
A YAWATAHO	6 		 Increase in sand content below 5.49 m. Grain size distribution: Gravel (0.0%), Sand (42.4%), Silt (36.9%) and Clay (20.7%) at 5.49 m. Wet, trace cobbles below 6.08 m 			2	56		
224.2 _ 224.2 _ 224 224 224 224 224 224 224 224 224 22			SILT TILL - Tan to light grey, wet, dense, with cobbles, with hard chunks of silt till, decrease in moisture content with depth.				57		
- 22239 _					7.6		S8		
222 - 222 -	9		AUGER REFUSAL at 7.62 m Notes: 1. Installed SI-1 at 7.62 m below ground surface. 2. Installed pneumatic piezometer PN-1 (SN 034749) at 3.0 m below ground surface. 3. Groundwater level at 6.4 m below grade at end of drilling. 4. Backfilled TH12-01 with grout from 7.62 m to 0.3 m and bentonite chips from 0.3 m to surface.						
L-SOI									
SAM SAM CON CON E	PLE TYP TRACTO Paddock	R	Bag Sample INSPECTOR Ling Ltd. J. CANNING			.PPR	OVE	D	DATE 10/25/12

K GR	GS ROUP		REFERENCE NO.			0LE 'H1	NO. 2-0	2	SH	EET 1	of 1
PRO SITE LOC DRII	PROJECT SITE		OF WINNIPEG - WATER AND WASTE DEPARTME way Outfall Repairs & Rehabilitation way Blvd Outfall est of outfall n ø Hollow Stem Auger	NT				JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED UTM (m)	23 V. FI 3/2 N	-0107-3 0.56 lush Mo 21/2012 5,526,03 628,513	ount 87
ELEVATION (m)	DEPTH DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		KET PEN 40 60 MC % 40 60	Pa) ◆ 80 LL
230.3 _ - 230			TOPSOIL - Black to dark brown, damp, firm. CLAYEY SILT - Brown, damp, friable, low to intermediate plasticity, trace tree rootlets.								:1::1::1::
- 229.0 - 229 - - 228	2 5 		SILTY CLAY - Brown, damp to moist, firm, intermediate to high plasticity, trace to some silt inclusions, trace fine to medium grained sand, trace roots.	-							
- 227			- Increase in silt content below 3.0 m.								
	4 		 - Grain size distribution: Gravel (0.0%), Sand (5.4%), Silt (56.2%) and Clay (38.0%) at 3.66 m. - Wet, trace roots below 4.4 m. SANDY SILTY CLAY - Grey, damp to moist, soft to firm, with fine to medium grained sand, some red coloured sandy layers throughout (oxidized), trace to some clay. 						1		
224.2 _	6 - 20		 Increase in sand content below 5.49 m. Grain size distribution: Gravel (0.0%), Sand (42.4%), Silt (36.9%) and Clay (20.7%) at 5.49 m. Wet, trace cobbles below 6.08 m 								
2 – 224 5 – 224 5 – 223	7		SILT TILL - Tan to light grey, wet, dense, with cobbles, with hard chunks of silt till, decrease in moisture content with depth.		7.6						
222.6			AUGER REFUSAL at 7.9 m	μH	7.9						
222	8)	AUGER REFUSAL at 7.9 m Notes: 1. Stratigraphy for TH12-02 has been projected from TH12-01 and is assumed representative. 2. Installed Casagrande standpipe at 7.9 m below ground surface. 3. Backfilled TH12-02 with silica sand from 7.9 m to 7.6 m and bentonite chips from 7.6 m to ground surface.								
									1		·
CON	PLE TYF TRACTC addoc l	R	INSPECTOR ling Ltd. J. CANNING		I	APPF	ROVE		DATE 10/25/12	2	
j <u> </u>			• • • • • • • • •								

CLIFTON OUTFALL DEPTH Soil DESCRIPTION ELEY. 0 31.4 Brown Silty Clay with sand, grovel & organic moterial scattered throughout the entire stratum - Appears to be backfill which is not fully consolidated. 18.0' 13.4 Madium stiff silty brown clay stratified with fine sond 22.0 W.T. 10.10 A.M. JULY 20# 1960 9.4 24.0' Medium stiff silty blue clay strotified with fine sand 29.5' 29.0' Silty gravel seam = Glacial till 38.5 Auger refusal - Bottom of boring

DETAIL OF BORE HOLE No. 2 (Vert. Scole 1"=10" (1960) City of Winniper Durum -0.0 = 727.57 (Geod.)

	GROUP	CITY	DF WINNIPEG				JOB	NO. 0	4-107-12.400
7	ROJECT		D PUMPING STATIONS - CONDITION ASSESSMEN	ITetu			GRO	DUND 2	30.20 m
	ITE		Plood Pumping Station	11310	UT		ELE	V	
			Bank, 4 m from Crest at Slope, 12 m West of Pumphous	e			ELE	V. TER ELEV.	
D	RILLING		ø Hollow Stem Auger, ACKER SS Drill Rig						5-Oct-04
	ETHOD	T		U U	r	T			Cu from Uncon.
	-	S		NLO	F	ш	_	SPT	Comp. Test (kPa)
ATIO	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ATIO	DEPTH (m)	TYP	RY %	blows/0.15 m	20 40 60 80
ELEVATION (m)		GR		NSTALLATION LOG	СШ СШ СШ	PLE		CONE blows/0.15 m	A PL MC LL
	(m) (ft			INST		SAN	RECOVERY %	20 40 60	% 20 40 60 80
- 230. - 230			TOPSOIL CLAY FILL - Brown, mottled black-brown, moist, very stiff, intermediate						
			plasticity, crumbly, trace gravel, sand, brick, and silt, trace organics and rootlets, trace oxidation.						
	1-		 Near plastic limit, trace wood below 0.51 m. Mottled brown-light brown below 1.02 m. 				2 60	ng den de se fer	
- 229	' ‡		- Notiled brown-light brown below 1.02 m.				65		
							1 75		
- 226	2-		- Gravel, wood and oxidation decrease below 2.03 m.					······	
227.3	1 1					5	5 75		
l			<u>SILTY CLAY (CI)</u> - Brown, mottled grey-brown, moist, very stiff, intermediate plasticity, trace silt, trace organics, trace oxidation.			e	100		
7 227	3-10		Trace clam shells from 2.54 to 3.05 m.						
						7	100		
	4					8	100		
- 226							100		
	-15		- Trace organics, trace oxidation below 4.57 m.						
	5-					10	100		
- 225	lŧ					11	100		
						H			
20 00 - 224	6						2 100	·····	
50 CO						13	100		
-12.40			- Stiff below 6.60 m. Grain Size Distribution: Gravel (0.0%), Sand (0.0%), Silt (50.6%) and Clay				100		
61-10-223			(49.4%) at 6.60 m.		-				
OGSI						15	100		······································
GEON	8					16	100		
2004/04-0107-12/GEO/LOGS/04-107-12-400 LOGS/GPJ			- Alluvial below 8.13 m.		ł	H			
4/04-0			- Fine grained sand layer from 8.46 to 8.51 m. - Trace fine grained sand below 8.64 m.				100		//
	9-1-0					18	100		
3			- Organic odour below 9.14 m.		Ī	19	100		
CALC P:/PROJ			- Grey, mottled black-grey, firm below 9.65 m		-	H			
	MPLE TYPE		Split Barrel			20	100	1	•••••••••••••••••••••••••••••••••••••••
2	NTRACTO		INSPECTOR		_				



	GS		SUMMARY LOG	HOLE NO. SI-08 (Marion	I)				s	HEET	1 c		
CLI	ENT	CITY OF WINNIPEG J					NO.	04-	04-107-12.400				
PRO	JECT	FLOO	D PUMPING STATIONS - CONDITION	N ASSESSMENT STUD	Y	GRO	DUND V	226	26.20 m				
SIT	ROUP ENT CITY OF WINNIPEG DJECT FLOOD PUMPING STATIONS E Marion Flood Pumping Station CATION Lower Bank, 3 m West of Path LLING 125 mm ø Solid Stem Auger, ACK Hod Status Image: Status DESCRIPTION / Image: Status Status Image: Status DESCRIPTION / Image: Status Status Image: Status Stat	Flood Pumping Station	ion T(OF PVC							
LOC	ATION	Lower	Bank, 3 m West of Path			ELE WAT	IV. TER ELEV						
		125 mr	n ø Solid Stem Auger, ACKER SS Drill R	lig		DAT	'E DRILLE	D 14-	Oct-04	ł.			
Ē				D C C						om Unce p. Test (l			
ELEVATION (m)	표	HICS		CATION CATION	DEPTH (m)	NUMBER RECOVERY %	SPT blows/(.15 m 🛦		ORVANE	1000		
EVAT	DEP	RAP	DESCRIPTION AND CLASSIFI			ER /	CONE blows/0	45 m A	20 PL		60 :		
E	(m) (ft	-		STA		UMB	DIOW5/0			%	-		
- 22359	E		SILTY CLAY - Dark brown, moist, soft, intermediate	and the second	- "	j z Z	20 4	0 60	20	40 6	60 ·		
225:9			RIPRAP								:: :1		
- 225													
224.7 _	5	THE	ALLUVIAL SILTY CLAY (CI) - Dark brown, moist, f	irm, intermediate	T.T.	1							
	2-		plasticity, lean clay, alluvial, trace oxidation, trace wo	od and organics.	Ł	41			Ī				
- 224													
			1	Silk (46 EV) and Clay						Ţ, Ţ			
223	3-1-10			Silt (40.5%) and Clay	1	2					H		
- 225				irm, intermediate od and organics. Silt (46.5%) and Clay m.									
			- Mottled grey-brown, clay content increasing at 3.66	m.									
- 222													
					I	3							
	5-		- Grey, mottled black-grey at 4.88 m.										
- 221													
										i di			
- 220	6		Grain Size Distribution: Gravel (0.0%), Sand (0.8%), (54.1%) at 5.79 m.	Silt (45.1%) and Clay	1	4			··[··[·	+++++++++++++++++++++++++++++++++++++++			
219.8			SILT TILL - Light grey to pink, moist, stiff, dense, tra	ce gravel, coarse									
	1		grained sand and clay.							X: : :	 		
- 219				Silt (45.1%) and Clay ice gravel, coarse									
					1	5					4		
	8												
- 218	1		a.										
217.7 _		LE.ELT.	AUGER REFUSAL AT 8.53 m	And and a second se	5								
- 217				nd installed with an				<u>24688</u> 34640					
217			 Slope inclinemeter SI-U8 grouted to ground level al above ground casing. Water infiltration at 2.44 m. 	no mistalieu with an						1212121			
- 219 - 219 - 219 - 218 217.7 - 217 - 217	1		2, Wale mininguon at 2.44 m.								- -		
SAM	PLE TYP	E RT	Auger Grab					20					

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