


CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT OUTFALL REPLACEMENT
SITE Radcliffe Outfall
LOCATION
DRILLING METHOD Hollow Stem Auger, S61 Nodwell

JOB NO. 09-107-13
GROUND ELEV. 226.99 m
TOP OF PVC ELEV. 228.00 m
WATER ELEV. 225.56 m
DATE DRILLED 31-Aug-09
UTM (m) N 5,517,500
 E 634,382

ELEVATION (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆		
										PL	MC	LL
			SILTY CLAY - Brown, moist, firm, high plasticity, trace rootlets. - Fine grained sand seam (1 mm thick) at 0.13 m.				S1	67				
226	1		- Trace fine grained sand below 1.01 m.				S2	60				
	5		- Trace black organics below 1.52 m.				S3	37				
225	2		- Trace 1mm diameter shells below 2.03 m.				S4	75				
			- No shells, no sand below 2.54 m.				S5	65				
224	3		- Stiff below 3.15 m. - Increased organics at 3.30 m.				S6	100				
			- Trace fine grained sand, mottled brown, black colour, trace oxidation below 3.56 m.				S7	100				
223	4		- Increased oxidation below 4.57 m. - Grain Size: Gravel (0%), Sand (4.9%), Silt and Clay (95.1%) at 4.6 m.				S8	100				
	15		- Wet below 5.08 m.				S9	100				
222	5		- Grey below 5.41 m. - Trace black organic layers below 5.59 m.				S10	100				
			- Rootlet (3mm diameter) at 6.04m. - No organic layers and soft below 6.10 m.				S11	100				
221	6		- Trace black organic modules (1mm diameter) trace silt modules (1mm diameter) below 6.61 m.				S12	85				
			- Mottled grey and black, no black organic or silt modules, trace fine grained sand below 7.11 m.				S13	100				
220	7		- Grain Size: Gravel (0%), Sand (1.2%), Silt and Clay (98.8%) at 7.6 m. - Trace organic modules (1mm diameter) below 7.62 m.				S14	100				
	25		- Layer of shells at 7.64 m. - Layer of shells, trace fine grained gravel, medium to coarse grained sand at 7.95 m.				S15	100				
219	8		- Trace silt modules (< 1mm diameter), trace organic modules (3mm diameter) below 8.13 m.				S16	100				
			- Sand layer at 8.28 m.				S17	100				
218.4			SAND - Grey, moist, loose, well graded, medium grained, some clay.				S18	85				
218.2			CLAY TILL - Grey, moist to wet, loose, fine grained gravel, some coarse grained sand, trace medium grained sand.				S19	100				
218	9		SILTY CLAY - Grey, moist, firm, high plasticity, trace modules (1-5 mm)				S20A					
217.3							S20B					
217												

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SAMPLE TYPE  Split Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED _____ DATE 11/24/09

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆
	(m)	(ft)								
216.4	35			diameter), trace medium grained sand. - Silt modules (1-2 mm diameter), no medium grained sand, trace fine grained sand below 10.16 m. - Grain Size: Gravel (0%), Sand (0.9%), Silt and Clay (99.1%) at 10.2 m.		11.9	S21A S21B S21C	50		
216	11			CLAYEY SILT TILL - Tan, moist, soft, trace fine to coarse grained sand, trace fine to coarse grained gravel. - Moist to wet, no coarse grained gravel below 10.67 m. - Moist below 11.18 m.			S22	70		
215.0 215	12			- Cobble (60 mm), with trace fine to coarse grained sand, trace clay, trace silt below 11.68 m.			S23	10		
	40			AUGER REFUSAL AT 11.94 m.			S24	20		
	13			Notes: 1. Installed slope inclinometer to depth of 12.88 m, with a stick-up of 1.0 m. Backfilled with grout to surface.						
	45									
	14									
	55									
	17									
	60									
	19									
	65									
	20									
	70									

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SAMPLE TYPE Split Barrel

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED _____ DATE 11/24/09

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT
PROJECT OUTFALL REPLACEMENT
SITE Radcliffe Outfall
LOCATION
DRILLING METHOD Solid Stem 125 mm ø Continues Flight Auger, Acker SS Drill Rig

JOB NO. 09-107-13
 GROUND ELEV. 227.07 m
 TOP OF PVC ELEV.
 WATER ELEV.
 DATE DRILLED 1-Sep-09
 UTM (m) N 5,517,501
 E 634,380

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆									
	(m)	(ft)								PL	MC	LL							
227				SILTY CLAY - Brown, moist, firm, high plasticity, trace rootlets. - Fine grained sand seam (1 mm thick) at 0.13 m.															
226	1			- Trace fine grained sand below 1.01 m.															
	5			- Trace black organics below 1.52 m.															
225	2			- Trace 1mm diameter shells below 2.03 m.															
				- No shells, no sand below 2.54 m.															
224	3	10		- Stiff below 3.15 m. - Increased organics at 3.30 m. - Trace fine grained sand, mottled brown, black colour, trace oxidation below 3.56 m.															
223	4			- Increased oxidation below 4.57 m.		4.3													
	15			- Wet below 5.08 m.															
222	5			- Grey below 5.41 m. - Trace black organic layers below 5.59 m.															
221	6	20		- Rootlet (3mm diameter) at 6.04m. - No organic layers and soft below 6.10 m.															
				- Trace black organic modules (1mm diameter) trace silt modules (1mm diameter) below 6.61 m.															
220	7			- Mottled grey and black, no black organic or silt modules, trace fine grained sand below 7.11 m.		7.3													
	25			- Trace organic modules (1mm diameter) below 7.62 m. - Layer of shells at 7.64 m.															
219	8			- Layer of shells, trace fine grained gravel, medium to coarse grained sand at 7.95 m.															
218.4				- Trace silt modules (< 1mm diameter), trace organic modules (3mm diameter) below 8.13 m.															
218.3				- Sand layer at 8.28 m.															
218	9	30		SAND - Grey, moist, loose, well graded, medium grained, some clay.															
				CLAY TILL - Grey, moist to wet, loose, fine grained gravel, some coarse grained sand, trace medium grained sand.															
217.4				SILTY CLAY - Grey, moist, firm, high plasticity, trace modules (1-5 mm)															

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SAMPLE TYPE

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Paddock Drilling Ltd.

INSPECTOR
C. FRIESEN

APPROVED _____ DATE 11/24/09

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆		
	(m)	(ft)								PL	MC	LL
217				diameter), trace medium grained sand. - Silt modules (1-2 mm diameter), no medium grained sand, trace fine grained sand below 10.16 m.								
216.5												
216.4		35		SILT TILL		10.7						
216		11		END OF HOLE AT 10.67 m.								
				Notes: 1. Water elevation recorded on September 16, 2009 was 224.908 m. 2. Installed two pneumatics (serial numbers 60685 (to a depth of 7.32 m) and 60687 (to a depth of 4.27 m). Piezometers backfilled with bentonite-cement abd grout to surface. 3. Pneumatic readings taken on September 16, 2009. Pneumatic 60685: Reading 1 (7.5 psi), Reading 2 (7.5 psi), Reading 3 (7.6 psi) Pneumatic 60687: Reading (3.0 psi), Reading (3.0 psi), Reading 3 (3.0 psi). 4. TH09-02 lithology taken from TH09-01 summary log.								
215		12										
		40										
214		13										
		45										
213		14										
		50										
212		15										
		55										
211		16										
		60										
210		17										
		65										
209		18										
		70										
208		19										
		75										
207		20										
		80										
206		21										

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PROJECT OUTFALL REPLACEMENT
SITE Radcliffe Outfall
LOCATION
DRILLING METHOD Solid Stem 125 mm ø Continues Flight Auger, Acker SS Drill Rig

JOB NO. 09-107-13
GROUND ELEV. 227.56 m
TOP OF PVC ELEV. 228.50 m
WATER ELEV. 224.74 m
DATE DRILLED 1-Sep-09
UTM (m) N 5,517,499
 E 634,374

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆		
	(m)	(ft)								PL	MC	LL
227				SILTY CLAY - Brown, moist, firm, high plasticity, trace rootlets. - Fine grained sand seam (1 mm thick) at 0.13 m.								
	1			- Trace fine grained sand below 1.01 m.								
226	5			- Trace black organics below 1.52 m.								
	2			- Trace 1mm diameter shells below 2.03 m.								
225				- No shells, no sand below 2.54 m.								
	3	10		- Stiff below 3.15 m. - Increased organics at 3.30 m.								
224	4			- Trace fine grained sand, mottled brown, black colour, trace oxidation below 3.56 m.								
	5	15		- Increased oxidation below 4.57 m.								
223				- Wet below 5.08 m.								
	6	20		- Grey below 5.41 m. - Trace black organic layers below 5.59 m.								
222				- Rootlet (3mm diameter) at 6.04m. - No organic layers and soft below 6.10 m.								
	7			- Trace black organic modules (1mm diameter) trace silt modules (1mm diameter) below 6.61 m.								
221				- Mottled grey and black, no black organic or silt modules, trace fine grained sand below 7.11 m.								
	8	25		- Trace organic modules (1mm diameter) below 7.62 m. - Layer of shells at 7.64 m. - Layer of shells, trace fine grained gravel, medium to coarse grained sand at 7.95 m.								
220				- Trace silt modules (< 1mm diameter), trace organic modules (3mm diameter) below 8.13 m.								
219.9				- Sand layer at 8.28 m.								
218.7	9	30		SAND - Grey, moist, loose, well graded, medium grained, some clay. CLAY TILL - Grey, moist to wet, loose, fine grained gravel, some coarse grained sand, trace medium grained sand.								
218				SILTY CLAY - Grey, moist, firm, high plasticity, trace modules (1-5 mm)								
217.3												

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ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	R.Q.D. %	Cu TORVANE (kPa) ◆					
	(m)	(ft)									PL	MC	LL			
217		35		diameter), trace medium grained sand.												
216.3	11					11.3										
216				SILT TILL												
215.4	12	40				12.2										
				END OF HOLE AT 12.19 m.												
215				Note: 1. TH09-02 lithology taken from TH09-01 summary log.												
214	13															
		45														
213	14															
		50														
212	15															
		55														
211	16															
		60														
210	17															
		65														
209	18															
		70														
208	19															
		75														
207	20															
		80														
206	21															

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