



**FOUNDATION INVESTIGATION REPORT
SWAMP AND HIGH FILL CROSSINGS**

for

**HIGHWAY 17 FOUR-LANING
FROM THE MANITOBA / ONTARIO BORDER EASTERLY 15 KM
TO RUSH BAY ROAD
TOWNSHIPS OF EWART AND FORGIE
G.W.P. 6020-09-00
DISTRICT OF KENORA, ONTARIO**

VOLUME 2

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May 27, 2011



APPENDIX B

Explanation of Terms Used in Report

Record of Borehole Sheets: Swamps 3 to Fire Road 46

Record of Penetration Test Sheets: Swamps 3 to Fire Road 46

EXPLANATION OF TERMS USED IN REPORT

N VALUE: THE STANDARD PENETRATION TEST (SPT) N VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D. SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N VALUE IS DENOTED THUS \bar{N} .

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475 J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

c_u (kPa)	0 - 12	12 - 25	25 - 50	50 - 100	100 - 200	> 200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

DENSENESS: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 - 5	5 - 10	10 - 30	30 - 50	> 50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND / OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (R Q D), FOR MODIFIED RECOVERY, IS:

RQD (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINTING AND BEDDING:

SPACING	50mm	50 - 300mm	0.3m - 1m	1m - 3m	> 3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

S S	SPLIT SPOON	T P	THINWALL PISTON
W S	WASH SAMPLE	O S	OSTERBERG SAMPLE
S T	SLOTTED TUBE SAMPLE	R C	ROCK CORE
B S	BLOCK SAMPLE	P H	T W ADVANCED HYDRAULICALLY
C S	CHUNK SAMPLE	P M	T W ADVANCED MANUALLY
T W	THINWALL OPEN	F S	FOIL SAMPLE
F V	FIELD VANE		

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ϵ	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
C_c	1	COMPRESSION INDEX
C_s	1	SWELLING INDEX
C_α	1	RATE OF SECONDARY CONSOLIDATION
c_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{vo}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_f	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
ϕ'	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
ϕ_u	-°	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = $\frac{c_u}{\tau_r}$

PHYSICAL PROPERTIES OF SOIL

ρ_s	kg/m^3	DENSITY OF SOLID PARTICLES	n	1, %	POROSITY	e_{max}	1, %	VOID RATIO IN LOOSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	w	1, %	WATER CONTENT	e_{min}	1, %	VOID RATIO IN DENSEST STATE
ρ_w	kg/m^3	DENSITY OF WATER	S_r	%	DEGREE OF SATURATION	I_D	1	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
γ_w	kN/m^3	UNIT WEIGHT OF WATER	w_L	%	LIQUID LIMIT	D	mm	GRAIN DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_p	%	PLASTIC LIMIT	D_n	mm	n PERCENT - DIAMETER
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_s	%	SHRINKAGE LIMIT	C_u	1	UNIFORMITY COEFFICIENT
ρ_d	kg/m^3	DENSITY OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	h	m	HYDRAULIC HEAD OR POTENTIAL
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	q	m^3/s	RATE OF DISCHARGE
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	v	m/s	DISCHARGE VELOCITY
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	DTPL		DRIER THAN PLASTIC LIMIT	i	1	HYDRAULIC GRADIENT
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	APL		ABOUT PLASTIC LIMIT	k	m/s	HYDRAULIC CONDUCTIVITY
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL	WTPL		WETTER THAN PLASTIC LIMIT	j	kN/m^3	SEEPAGE FORCE
e	1, %	VOID RATIO						

SWAMP 3 (WBL)

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 3-2

1 of 1

METRIC


G.W.P. 6020-09-00 LOCATION Coords: 5 511 745.4 N; 366 369.6 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×						LAB VANE		
371.3	Ground Surface						20	40	60	80	100									
0.0 371.0 0.3	Peat, fine fibrous cobbles																			
	Dark brown																			
	Sand, with silt some gravel, trace clay		1	SS	10															
	Compact Brown Wet to dense																			
			2	SS	44/23cm															
369.4 1.9	End of borehole																			
	Refusal on probable bedrock																			
	Sample 2: Sampler bouncing																			

RECORD OF PENETRATION TEST No 3-3

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 761.7 N; 366 383.4 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE			WATER CONTENT (%)							
371.2 0.0	Ground Surface Augered to 0.9m through cobble						371									
	----- Probable sand Compact						370									
369.4 1.8	End of dynamic cone penetration test Refusal on probable bedrock															
			</													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 3-5

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 747.2 N; 366 397.1 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE							
371.1	Ground Surface						20	40	60	80	100						
0.0	Peat, amorphous																
370.5	Dark brown																
0.6	Sand some silt, some gravel		1	SS	7												
	Loose to Brown Wet compact																
			2	SS	19												
	cobbles and boulders																
367.7			3	SS	16/15cm												
3.4	End of borehole																
	Refusal on probable bedrock																
	Sample 3: Sampler bouncing																

1 of 1 **METRIC**

MOT_DCPT R2004 09TF009E-SWAMP 3.GPJ ON_MOT.GDT 4/19/2010 4:32:16 PM

RECORD OF BOREHOLE No 3-7

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 729.3 N; 366 411.1 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
371.2	Ground Surface						20	40	60	80	100	20	40	60		GR SA SI CL	
0.0	Peat, amorphous					▽*											
	Dark brown					▽*											
370.1			1	SS	8										184		
1.1	Sand, some silt																
	Loose Brown Wet		2	SS	7												
367.8																	
3.4	Silty clay partings of silt		3	SS	6												
	Firm Dark Wet grey																
366.9																	
4.3	End of borehole																
	Refusal on probable bedrock																

* 2010 03 02

▽ Water level observed
during drilling

▼ Water level measured
after drilling

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC


20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 3-11

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 750.5 N; 366 447.0 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
371.7 0.0	Ground Surface							20	40	60	80	100		20	40	60		
371.6 0.1	Topsoil																	
371.2 0.5	Silty sand, some gravel																	
	Compact Brown Moist																	
	End of borehole																	
	Refusal on probable bedrock																	
	* Borehole dry																	

METRIC



SWAMP 3

Testholes From GWP 6053-03-00

10+605.0 45.0 Lt C/L 371.01 HA 3-P1
(5511755.232 N, 366410.713 E)
0 - 500 Dk Br Fib Org M Wet
500 - 1.3 Dk Br Amor Org M W Sa Wet
1.3 - 1.5 Gry Sa Some Si Wet
1.5 NFP TH Sloughing
Fr Wat @ 0

0 - 120 Tps
120 NFP Frag BR

HA0550

0 - 100 Tps
100 NFP Frag BR

HA0553

0 - 140 Tps
140 - 600 Br F-Med Sa with Si (Moist)
600 NFP BR

HA0556 (Swamp 3 WBL)

0 - 120 Tps
120 NFP Frag BR

HA0555 (Swamp 3 WBL)

0 - 500 Blk Org (Co Fib) (Wet)
500 - 1.0 Gry F-Co Sa Tr Si (Wet)
1.0 - 1.2 Gry Si(y) Cl (Wet)
1.2 NFP Bld

HA0554 (Swamp 3 WBL)

0 - 320 Blk Org (Co Fib) (Wet)
320 - 900 Gry Si(y) Cl (Wet)
900 NFP Frag BR

HA0557 (Swamp 3 WBL)

0 - 500 Blk Org (Co Fib) (Wet)
500 - 800 Gry F-Med Sa Tr Si (Wet)
800 NFP Sloughing

HA0559

0 - 70 Tps
70 - 100 Br F-Med Sa (Moist)
100 NFP Bld

HA0560

0 - 50 Tps
50 - 80 Br F-Med Sa Tr Si (Moist)
80 NFP BR

HA0558

0 - 110 Tps
110 NFP Frag BR

HA0561

0 - 50 Tps

50 NFP Frag BR

HA0564

0 - 130 Tps
130 - 180 Br F-Med Sa (Moist)
180 NFP Bld

HA0563

0 - 50 Tps
50 - 90 Br F-Med Sa with Si (Moist)
90 NFP Frag BR

HA0562

0 - 100 Tps
100 - 180 Br Gr(ly) Sa (Moist)
180 NFP Frag BR

HA0565

0 - 100 Tps
100 NFP BR

HA0568

0 - 150 Tps
150 NFP Bld

HA0567

0 - 100 Tps
100 - 150 Br F-Med Sa Tr Si (Moist)
150 - 750 Gry F-Co Sa with Si (Moist)
750 NFP BR

Sample No. 09-MC-017 (150 – 450)HA0567

% Passing 4.75 mm 95.8 %
% Passing 75 um 36.0 %
FMC @ 450 15.0 %
Group Symbol SM

HA0566

0 - 70 Tps
70 NFP Frag BR

HA0569

0 - 90 Tps
90 - 140 Br F-Med Sa Tr Si (Moist)
140 NFP Frag BR

HA0571

SWAMP 5W (WBL)

RECORD OF BOREHOLE No 5W-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 798.1 N; 367 448.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×						LAB VANE		
360.3	Ground Surface																			
0.0	Peat, fine fibrous																			
359.9	Dark brown		1	AS	-															
0.4	Organic clay																			
359.7	Dark brown																			
0.6	Silty clay, trace sand																			
358.8	Soft Grey Moist																			
1.5	Silty sand trace clay, trace gravel		2	SS	18															
358.0	Compact Grey Wet																			
2.3	End of borehole																			
	Refusal on probable bedrock																			

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 5W-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 797.4 N; 367 473.9 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
DATUM Geodetic DATE March 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
360.1	Ground Surface						● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)							
0.0	Peat, fine fibrous						20	40	60	80	100	20	40	60			
359.7	Dark brown		1	AS	-	▽*											
0.4	Organic clay																
359.3	Dark brown																
0.8	Silty sand, trace gravel																
	Very loose Grey Wet		2	SS	WH**												
357.8																	
2.3	Silty clay, trace sand																
	Firm Grey Moist																
356.7																	
3.4			3	SS	6												
356.5	Gravelly sand, trace silt																
3.6	Loose Grey Wet																
	End of borehole																
	Refusal on probable bedrock																
	* 2010 03 16																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	WH** denotes penetration due to weight of rods and hammer																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

0 - 100 Tps
 100 - 400 Br F-Co Sa Tr Gr
 400 NFP Cob

TP0234 (Swamp 5 WBL)

0 - 700 Blk Org (Co Fib) (Moist)
 (Wat Seep @ 700)
 700 - 1.3 Gry Si(y) Cl (Moist & Firm)
 1.3 NFP BR

PA0031

0 - 60 Asph
 60 - 300 Cr Gr (Moist)
 300 - 500 Gry Gr(ly) F-Co Sa (Moist)
 500 - 1.4 Br Gr(ly) F-Co Sa Tr Si (Moist)
 1.4 NFP Sh Rk

PA0024

0 - 50 Asph
 50 - 180 Cr Gr (Moist)
 180 - 700 Br Gr(ly) F-Co Sa (Moist)
 700 - 1.5 Br F-Co Sa Tr Gr (Moist)
 1.5 NFP Sh Rk

HA0054(Swamp 5 WBL)

0 - 400 Blk Org (Co Fib) (Moist)
 400 NFP Bld

HA0055(Swamp 5 WBL)

0 - 450 Blk Org (Co Fib) (Moist)
 450 - 550 Gry Cl (Moist)
 550 - 800 Gry F-Co Sa Tr Si (Moist)
 800 - 1.3 Gry F-Med Sa with Si (Wet)
 1.3 NFP Bld

Sample No. 09-LF-026 (650 – 800)**HA0055**

% Passing 4.75 mm 96.8 %
 % Passing 75 um 12.6 %
 FMC @ 800 15.7 %
 Group Symbol SM

Sample No. 09-LF-027 (900 – 1.2)**HA0055**

% Passing 4.75 mm 99.3 %
 % Passing 75 um 22.9 %
 FMC @ 1.2 17.9 %
 Group Symbol SM

PA0032

0 - 50 Asph
 50 - 150 Cr Gr (Moist)
 150 - 300 Br Gr(ly) F-Co Sa (Moist)
 300 - 1.1 Br F-Co Sa Tr Gr (Moist)
 1.1 NFP Sh Rk

PA0023

0 - 50 Asph
 50 - 200 Cr Gr (Moist)
 200 - 700 Br Si(y) F-Co Sa Tr Gr (Moist)
 700 NFP Sh Rk

Sample No. 09-LF-070 (50 – 200)**PA0023**

% Passing 4.75 mm 42.3 %
 % Passing 75 um 3.6 %
 % Crushed 92.5 %
 BLGM Gran 'A' – Due to oversized particles

Sample No. 09-LF-071 (200 – 700)**PA0023**

% Passing 4.75 mm 94.0 %
 % Passing 75 um 31.9 %
 FMC @ 700 14.1 %
 Group Symbol SM
 NAGM Gran 'B' Type III – Due to fineness of gradation

TP0041

0 - 300 Blk Org (Co Fib)
 300 - 900 Hi Weath/Frag BR with Sa Mixed (Moist)
 900 NFP BR

Sample No. 10-MC-008 (300 – 500) (Soil Only)**TP0041**

% Passing 4.75 mm 89.7 %
 % Passing 75 um 44.9 %
 FMC @ 500 21.0 %
 Group Symbol SM
 OMC 22.2 %
 MDD 1831 kg/m³

TP0042

0 - 700 Blk Org (Co Fib) with

SWAMP 5E (EBL, WEST SECTION)
SWAMP 5E (EBL, MIDDLE SECTION)
SWAMP 5E (EBL, EAST SECTION)

RECORD OF BOREHOLE No 5E-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 760.3 N; 367 358.3 E ORIGINATED BY W.L.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
DATUM Geodetic DATE March 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								20	40	60	80	100	W _p	W	W _L		
								○ UNCONFINED	+ FIELD VANE								
								● QUICK TRIAXIAL	× LAB VANE								
									20	40	60	80	100				
361.5	Ground Surface																
0.0	Peat, amorphous																
360.9	Dark brown																
0.6	Organic clayey silt						361										
	Black Wet		1	AS	-												
359.9																	
1.6	Clayey silt, organics						360										
359.6	sand layers		2	SS	50/23cm												
1.9	Firm Grey Wet																
	End of borehole																
	Refusal on probable bedrock																
	Sample 2: Sampler bouncing																

RECORD OF BOREHOLE No 5E-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 733.4 N; 367 369.2 E ORIGINATED BY W.L.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
360.2 0.0	Top of water					▽*		20	40	60	80	100					
360.0 0.2	Water																
359.6 0.6	Peat, amorphous						360										
	Dark brown																
358.9 1.3	Silty sand layers of silt		1	SS	9		359						o				
	Loose Grey/ Wet																
	Clayey silt, layered		2	SS	5								o				
	Firm to Grey Wet																
	very stiff						358										
	sand layers		3	SS	28								o				
357.4 2.8	End of borehole																
	Refusal on probable bedrock																
	Sample 3: Sampler bouncing																
	* 2010 03 18																
	▽ Water level observed during																
	▽ Water level measured after drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 5E-4

1 of 1

METRIC







G.W.P. 6020-09-00 LOCATION Coords: 5 511 764.6 N; 367 395.9 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
361.2	Ground Surface						20	40	60	80	100						
0.0	Peat, amorphous rock pieces																
360.5	Dark brown (FILL)																
0.7	Clayey silt, trace sand		1	SS	1												
	Very soft Grey/ Wet brown																
359.4			2	SS	50/13cm												
1.8	End of borehole																
	Refusal on probable bedrock																
	Sample 2: Sampler bouncing																

RECORD OF PENETRATION TEST No 5E-5

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 736.5 N; 367 393.7 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
360.8 0.0	Ground Surface Probable peat														Top 0.6m frozen
	Probable silty sand														
	Loose														
	Probable clayey silt														
	Stiff														
357.8 3.0	End of dynamic cone penetration test Refusal on probable bedrock														

RECORD OF BOREHOLE No 5E-6



1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 730.1 N; 367 420.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
360.4	Ground Surface							20	40	60	80	100					
0.0 360.1	Peat, fine fibrous Dark brown		1	AS	-		360										
0.3 359.6	Clayey silt some sand, trace gravel																
0.8	Grey Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry																

METRIC

SOIL PROFILE				SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
360.6	Ground Surface						SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	20 40 60 WATER CONTENT (%)		GR SA SI CL	

[illegible]

1 of 1 **METRIC**





MOT_DCPT R2004 09TF009F-SWAMP 5.GPJ ON_MOT.GDT 4/8/2010 7:27:38 PM

RECORD OF BOREHOLE No 5E-10

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 752.9 N; 367 457.6 E ORIGINATED BY W.L.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
360.2 0.0	Ground Surface Peat, amorphous Dark brown					▽*	360												
			1	SS	WH**		359								155				
358.6 1.6	Organic clayey silt layers of peat and organic sand Very soft Bluish Wet grey		2	SS	WH		358												
			3	SS	1		357												
357.1 3.1	Clay layers of sandy silt Firm to Grey Wet stiff trace sand, trace gravel		4	SS	4		356												
			5	SS	6		355												
			6	SS	5		354												
				FV			353												
			7	SS	4		352												
				FV			351												
			8	SS	3														
351.7 8.5	Sandy silt trace clay, trace gravel Loose Grey Wet																		
			9	SS	7														
350.2 10.0	End of borehole Refusal on probable bedrock																		

*

2010 03 18

▽

Water level observed during drilling

▼

Water level measured after drilling

WH**

denotes penetration due to weight of rods and hammer

RECORD OF PENETRATION TEST No 5E-11

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 770.4 N; 367 471.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 16, 2010 CHECKED BY C.N.

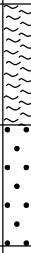


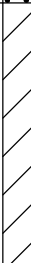
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
360.7 0.0	Ground Surface Probable peat							20	40	60	80	100	20	40	60		GR SA SI CL
	Probable sand Loose																
	Probable silty clay Soft to stiff																
	Probable silty sand Compact to dense																
354.8 5.9	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 5E-12

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 730.6 N; 367 468.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa				w _p	w	w _L					
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE								
360.1 0.0	Ground Surface Peat, fine fibrous Dark brown		1	AS	-	 *	360												
358.9 1.2	Sand trace silt, trace gravel Loose Grey Wet		2	SS	5		 *	359											
357.7 2.4	Clay, trace sand layers of silt Firm to Grey Moist stiff		3	SS	8		358												
355.1 5.0							357												
354.9 5.2	Silty sand, trace gravel Compact Grey Moist End of borehole Refusal on probable bedrock						356												
			4	SS	13		355												

* 2010 03 17

▽ Water level observed
during drilling

▽* Water level measured
after drilling

■ Penetrometer test

C.F.H.S.A. denotes
Continuous Flight hollow
Stem Augers

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

+⁷, X⁵: Numbers refer to Sensitivity


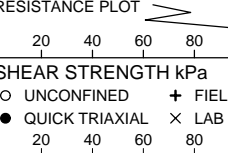

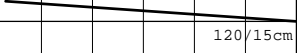
20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 5E-15

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 724.0 N; 367 492.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE								WATER CONTENT (%)			
360.2 0.0	Ground Surface Probable peat						360												
359.7 0.5	End of dynamic cone penetration test Refusal on probable bedrock																		

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 5E-17

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 766.3 N; 367 521.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
361.2 0.0	Ground Surface Probable peat						361										
	----- Probable sand Compact						360										
							359										
358.7 2.5	End of dynamic cone penetration test Refusal on probable bedrock																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

G.W.P.	6020-09-00	LOCATION	Coords: 5 511 721.0 N; 367 530.2 E	ORIGINATED BY	E.S.
DIST	Kenora HWY 17	BOREHOLE TYPE	Portable Washboring	COMPILED BY	N.R.
DATUM	Geodetic	DATE	March 18, 2010	CHECKED BY	C.N.


[illegible]

RECORD OF BOREHOLE No 5E-20

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 764.3 N; 367 546.3 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
361.2	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
360.9	End of borehole																
0.3	Refusal on probable bedrock																
	* Borehole dry																

1 of 1 **METRIC**

MOT_DCPT R2004 09TF009F-SWAMP 5.GPJ ON_MOT.GDT 4/27/2010 4:43:59 PM

+7, X⁵: Numbers refer to Sensitivity

20
15—○—5 (% STRAIN AT FAILURE)
10

RECORD OF BOREHOLE No 5E-22

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 744.6 N; 367 557.4 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.R.
 DATUM Geodetic DATE March 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			*GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
359.9 0.0	Top of Ice Ice and water					▽*		20	40	60	80	100						
358.9 1.0							359											
358.7 1.2	Peat																	
	Sandy silt, trace gravel organic inclusions		1	SS	16									○				
357.8 2.1	Compact Grey Wet		2	SS	10		358								○			
	Organic clayey silt																	
	Stiff Dark Wet grey		3	SS	37		357								○			
356.9 3.0	Sand and gravel trace silt		4	SS	93/20cm													
356.5 3.4	Dense Grey Wet																	
	End of borehole																	
	Refusal on probable bedrock																	



SWAMP 5E

Testholes From GWP 6053-03-00

11+635.0 40.0 Rt C/L 360.37 HA 5E-P1
(5511737.147 N, 367443.204 E)
0 - 500 Fr Wat
500 - 1.0 Dk Br Amor Org M Wet
1.0 - 1.7 Gry/Bl Si(y) Cl Soft Moist-Wet
1.7 NFP Poss Bld/Poss BR
Fr Wat @ 0

SWAMP 7 (EBL)

RECORD OF PENETRATION TEST No 7-1

1 of 1 **METRIC**

G.W.P. 6020-09-00	LOCATION	Coords: 5 511 762.0 N; 367 911.2 E	ORIGINATED BY	F.P.
DIST Kenora HWY 17	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	N.S.B.
DATUM Geodetic	DATE	January 28, 2010	CHECKED BY	C.N

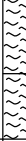

[illegible]

RECORD OF BOREHOLE No 7-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 733.0 N; 367 916.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE January 28, 2010 CHECKED BY C.N

SOIL PROFILE			SAMPLES			*GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p W W _L								
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)								
359.0	Ground Surface							20	40	60	80	100						GR	SA	SI	CL
0.0	Peat, coarse fibrous Dark brown fine fibrous		1	AS	-	▽*	358														
357.6																					
1.4	Sand, trace gravel Compact Grey Wet cobbles and boulders		2	SS	11			357							o						
356.3																					
2.7	End of borehole Refusal on probable bedrock																				
<div>* 2010 01 28</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div>																					

RECORD OF BOREHOLE No 7-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 750.0 N; 367 915.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE January 28, 2010 CHECKED BY C.N

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
358.9	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous Dark brown		1	AS	-												
357.7							358										
1.2	Organic silty clay Dark brown																
357.2			2	SS	18/20cm												
1.7	Silt trace sand, trace clay						357										
356.9	Compact Mottled grey/brown																
2.0	End of borehole Refusal on probable bedrock Sample 2: Sampler bouncing * 2010 01 28 ▽ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 7-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 733.0 N; 367 927.3 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE January 28, 2010 CHECKED BY C.N

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
358.9	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous Dark brown		1	SS	WH**															
	fine fibrous						358													
			2	SS	WH		357													
	amorphous																			
356.2	Organic silt						356													
355.7	Grey Wet																			
3.2	Silty clay, trace sand Firm Grey Wet		3	SS	2		355													
354.9	Gravelly sand some silt, trace clay																			
4.0	Compact Grey Wet to loose		4	SS	13		354									32 54 13 1				
							353													
352.3			5	SS	4															
6.6	End of borehole Refusal on probable bedrock																			
	Sample 5: Sampler bouncing																			
	* 2010 01 28																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			
	WH** denotes penetration due weight of hammer and rods																			

RECORD OF BOREHOLE No 7-5

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 763.0 N; 367 937.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE January 28, 2010 CHECKED BY C.N

SOIL PROFILE			SAMPLES			*GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT								PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)						
358.9	Ground Surface																			
0.0	Peat, coarse fibrous		1	AS	-															
	Dark brown																			
	Fine fibrous						358													
	Amorphous		2	SS	WH**		357									403				
356.9	Organic silt																			
2.0	Grey Wet																			
356.3	End of borehole																			
2.6	Refusal on probable bedrock																			

RECORD OF PENETRATION TEST No 7-6


1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 738.0 N; 367 938.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE January 27, 2010 CHECKED BY C.N

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa											
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METRIC

METRIC

SOIL PROFILE				SAMPLES		DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT w _p NATURAL MOISTURE CONTENT w LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES				
358.9	Ground Surface								

[illegible]

RECORD OF BOREHOLE No 7-7A

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 767.0 N; 367 947.2 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE January 29, 2010 CHECKED BY C.N

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
358.9	Ground Surface						20	40	60	80	100						GR SA SI CL			
0.0	Peat, coarse fibrous Dark brown Fine fibrous		1	AS	-												Top 0.2m frozen			
			2	SS	WH**															
356.3	Silty sand, trace gravel cobbles Compact Grey Wet cobbles and boulders		3	SS	17															
2.6																				
			4	SS	50/15cm															
353.7	End of borehole																			
5.2	Refusal on probable bedrock Sample 4: sampler bouncing * 2010 01 29 Water level observed during drilling Water level measured after drilling WH** denotes penetration due to weight of rods and hammer																			

1 of 1 **METRIC**

MOT_DCPT R2004 09TF009D-SWAMP 7.GPJ ON_MOT.GDT 4/8/2010 6:36:04 PM

+7, X⁵: Numbers refer to Sensitivity

20
15—○—5 (% STRAIN AT FAILURE)
10

700 Hi Weath/Frag BR Mixed
NFP BR

TP0043

0 - 200 Blk Org (Co Fib)
200 - 1.4 Hi Weath/Frag BR with Sa & Gr
Mixed
1.4 NFP BR

TP0044

0 - 250 Blk Org (Co Fib)
250 NFP BR

HA1798

0 - 400 Blk Org (Co Fib) with Frag Rk
Mixed
400 NFP BR

HA1797

0 - 250 Blk Org (Co Fib)
250 - 600 Br Si(y) F Sa (Moist)
600 NFP BR

HA1796

0 - 200 Blk Org (Co Fib)
200 - 1.2 Gry Si(y) F Sa Occ Bld (Moist)
1.2 NFP BR

HA1795

0 - 1.0 Blk Org (Co Fib) (Moist)
1.0 - 1.6 Gry Si(y) F Sa (Moist)
1.6 - 5.1 Gry Si(y) Cl (Moist & Soft)
(Wat Seep @ 1.7)
5.1 EOH

TP0045

0 - 250 Blk Org (Co Fib)
250 - 900 Br F-Med Sa Tr Si Occ Bld
900 NFP BR

Sample No. 10-MC-009A (250 – 450)TP0045

% Passing 4.75 mm 93.5 %
% Passing 75 um 20.3 %
FMC @ 450 4.7 %
Group Symbol SM

TP0046

0 - 250 Blk Org (Co Fib)
250 - 400 Br F-Co Sa
400 NFP BR

HA1794

0 - 450 Blk Org (Co Fib)
450 - 1.1 Gry F-Co Sa with Gr & Blds
1.1 NFP BR

HA1793

0 - 300 Blk Org (Co Fib)
300 - 900 Br Si(y) F-Med Sa Tr Gr Occ Bld
900 NFP BR

HA1792

0 - 200 Blk Org (Co Fib)
200 NFP BR

HA1786 (Swamp 7 EBL)

0 - 350 Blk Org (Co Fib)
350 - 400 Gry Si Tr F Sa
400 NFP BR

HA1787(Swamp 7 EBL)

0 - 400 Wat
400 - 1.6 Blk Org (Co Fib) (Wet)
1.6 NFP Bld Poss BR

HA1788(Swamp 7 EBL)

0 - 600 Wat
600 - 2.0 Blk Org (Co Fib) (Wet)
2.0 NFP BR

HA1791 (Swamp 7 EBL)

0 - 350 Wat
350 - 2.0 Blk Org (Co Fib) (Wet)
2.0 - 2.5 Gry Si(y) Cl Tr Gr
2.5 NFP Sloughing

Sample No. 10-MC-031 (2.0 – 2.1)HA1791

% Passing 4.75 mm 94.6 %
% Passing 75 um 31.3 %
FMC @ 2.1 20.9 %
W_L 29 %
W_p 16 %
I_p 13
Group Symbol SC

HA1789(Swamp 7 EBL)

0 - 550 Wat
550 - 2.0 Blk Org (Co Fib) (Wet)
2.0 - 2.1 Gry Si(y) F-Co Sa with Gr (Wet)
2.1 NFP Sloughing

HA1790(Swamp 7 EBL)

0 - 200 Wat
 200 - 600 Blk Org (Co Fib) (Wet)
 600 NFP BR

HA0120

0 - 400 Br Org (Co Fib) (Wet)
 400 NFP Cob

HA0119

0 - 300 Br Org (Co Fib) (Wet)
 300 NFP Cob

TP0047

0 - 300 Blk Org (Co Fib) Occ Bld
 300 NFP BR

HA0118

0 - 200 Br Org (Co Fib) (Wet)
 200 - 400 Br F-Co Sa Tr Si Tr Gr
 400 NFP Cob

HA0057

0 - 160 Tps
 160 NFP Bld

HA0058

0 - 180 Tps
 180 - 350 Br Si(y) F-Co Sa Occ Cob
 350 NFP Cob

HA0056

0 - 140 Tps
 140 - 500 Br F-Co Sa with Si (Moist)
 500 NFP Cob

Sample No. 09-LF-028 (200 – 500)HA0056

% Passing 4.75 mm 93.6 %
 % Passing 75 um 23.1 %
 FMC @ 500 11.8 %
 Group Symbol SM

HA0117

0 - 80 Tps
 80 - 600 Br F-Co Sa Tr Gr (Wet)
 600 NFP Cob

TP0048

0 - 500 Blk Org (Co Fib)
 500 NFP BR

HA0059

0 - 150 Tps
 150 NFP Bld

HA0076

0 - 70 Tps
 70 NFP Frag BR

HA0075

0 - 70 Tps
 70 NFP BR

HA0074

0 - 60 Tps
 60 NFP BR

HA0116

0 - 150 Wat
 150 - 190 Tps (Wet)
 190 NFP BR

HA0077

0 - 30 Tps
 30 NFP BR

TP0049

0 - 300 Blk Org (Co Fib)
 300 NFP BR

HA0080

0 - 140 Tps
 140 NFP BR

HA0079

0 - 80 Tps
 80 NFP Frag BR

HA0078

0 - 35 Tps
 35 NFP BR

HA0115

0 - 150 Wat
 150 - 250 Br Org (Wet)

SWAMP 9 (EBL)

RECORD OF BOREHOLE No 9-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 026.5 N; 368 740.0 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 08, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
359.7	Ground Surface							20	40	60	80	100									
0.0	Peat, fine to coarse fibrous																				
359.2	Dark brown																				
0.5	Silty clay, trace sand																				
358.5	Soft to firm		1	SS	5																
1.2	Dark grey																				
	Moist																				
	Sand																				
	some silt, some gravel																				
	Compact		2	SS	18																
	Brown																				
	Wet																				
357.6	End of borehole																				
2.1	Refusal on probable bedrock																				
* 2010 03 08																					
Water level measured after drilling																					

RECORD OF BOREHOLE No 9-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 048.2 N; 368 746.1 E ORIGINATED BY E.S.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×						LAB VANE		
360.0	Ground Surface						20	40	60	80	100									
0.0	Peat																			
359.7																				
0.3	Silty sand, trace gravel cobbles																			
	Dense to Brown Moist very dense to wet		1	SS	36															
			2	SS	87															
357.4	End of borehole																			
2.6	Refusal on probable bedrock																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 9-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 012.9 N; 368 782.7 E ORIGINATED BY E.S.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 9-6

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 062.5 N; 368 794.0 E ORIGINATED BY E.S.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		× LAB VANE
359.7	Ground Surface							20	40	60	80	100								
0.0 359.4 0.3	Peat Black		1	AS	-															
358.9 0.8 358.6 1.1	Silty clay trace sand, trace gravel					▼*	▽*													
	Soft Mottled Moist brown/grey		2	SS	4/15cm															
	Silty sand, trace clay trace to some gravel																			
	Loose Brown Wet																			
	End of borehole																			
	Refusal on probable bedrock																			
	Sample 2: Sampler bouncing																			
	* 2010 03 15																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			



METRIC

+⁷, X⁵: Numbers refer to Sensitivity


20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

METRIC

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES							
359.5	Ground Surface											

[illegible]

 Water level measured
after drilling

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 9-12


1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 066.0 N; 368 882.9 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 07, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
359.5	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous					* ▼											
	Dark brown																
358.8																	
0.7	Sand, with silt trace clay, trace gravel cobbles		1	SS	7												
	Loose Dark Wet Brown		2	SS	8												
			3	SS	7												
356.2			4	SS	29/10cm												
3.3	End of borehole Refusal on probable bedrock Sample 4: Sampler bouncing																
* 2010 03 07																	
▼ Water level measured after drilling																	

METRIC

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT w_p w w_L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES							
359.4	Ground Surface											

[illegible]

HA1801

0 - 700 Wat including Ice Layer
 700 - 2.4 Earth (Use of depth sounding rods)
 2.4 NFP Firm Bottom

HA1802

0 - 600 Ice
 600 - 1.0 Blk Org (Co Fib) (Wet from 800)
 1.0 - 1.8 Br Si(y) F-Co Sa (Wet)
 1.8 NFP Sloughing

Sample No. 10-MC-032 (1.2 – 1.4)HA1802

% Passing 4.75 mm 99.3 %
 % Passing 75 um 26.0 %
 FMC @ 1.4 19.5 %
 Group Symbol SM

HA1804

0 - 400 Blk Org (Co Fib) (Frozen)
 400 - 2.5 Br Si(y) F-Co Sa with Gr Occ Cob
 (Moist)
 2.5 NFP BR

Sample No. 10-MC-033 (600 – 800)HA1804

% Passing 4.75 mm 79.1 %
 % Passing 75 um 27.3 %
 FMC @ 800 10.4 %
 Group Symbol SM

HA1803

0 - 600 Ice
 600 - 900 Blk Org (Co Fib) (Frozen)
 900 - 1.1 Br Si(y) F-Co Sa (Moist)
 1.1 NFP Bld Poss BR

HA1805

0 - 300 Ice
 300 - 700 Blk Org (Co Fib) (Frozen)
 700 - 1.4 Br Si(y) F-Co Sa Occ Bld (Moist)
 1.4 NFP Bld Poss BR

HA1806(Swamp 9EBL)

1.5 Ø Bld on Surf
 0 - 100 Ice
 100 - 900 Blk Org (Co Fib)
 900 - 1.2 Gry Si(y) Cl Occ Bld (Stiff)
 1.2 NFP Bld

Sample No. 10-MC-034 (900 – 1.2)HA1806(Swamp 9EBL)

% Passing 4.75 mm 98.5 %
 % Passing 75 um 56.2 %
 FMC @ 1.2 21.7 %
 W_L 30 %
 W_p 15 %
 I_p 15
 Group Symbol ML

HA0145(Swamp 9EBL)

0 - 500 Blk Org (Amor) (Wet)
 500 - 850 Gry Si(y) Cl (Wet & Firm)
 850 - 1.7 Gry Si(y) Sa Tr Cl (Wet)
 1.7 NFP Sloughing

Sample No. 09-LF-095 (500 – 800)HA0145

% Passing 4.75 mm 100.0 %
 % Passing 75 um 66.6 %
 FMC @ 800 37.4 %
 W_L 39 %
 W_p 19 %
 I_p 20
 Group Symbol CI

Sample No. 09-LF-096 (850 – 1.1)HA0145

% Passing 4.75 mm 99.0 %
 % Passing 75 um 27.8 %
 FMC @ 1.1 21.8 %
 Group Symbol SM

HA1842(Swamp 9EBL)

0 - 800 Blk Org (Co Fib) (Moist)
 800 - 1.2 Gry Si(y) Cl (Moist & Firm)
 1.2 EOH

HA1841(Swamp 9EBL)

0 - 800 Blk Org (Co Fib) (Wet)
 800 - 1.1 Br Si(y) Cl (Moist & Firm)
 1.1 EOH

TP0233(Swamp 9EBL)

0 - 1.1 Blk Org (Co Fib) (Wet)
 (Wat Seep @ 1.0)
 1.1 - 2.1 Br Si(y) F-Co Sa (Moist)
 2.1 - 3.4 Gry Si(y) Cl (Moist & Firm)

3.4 NFP BR

HA1840(Swamp 9EBL)

- 0 - 1.1 Blk Org (Co Fib) (Wet)
(Wat Seep @ 300)
- 1.1 - 1.3 Br Si(y) F-Co Sa (Moist)
- 1.3 NFP Sloughing

HA0147(Swamp 9EBL)

- 0 - 750 Blk Org (Amor) (Wet)
- 750 - 1.2 Gry Si(y) Cl (Wet & Firm)
- 1.2 NFP Sloughing

HA0146(Swamp 9EBL)

- 0 - 750 Blk Org (Amor) (Wet)
- 750 - 1.1 Gry Si(y) Cl (Wet & Firm)
- 1.1 - 1.6 Gry Si(y) F-Co Sa (Wet)
- 1.6 NFP Sloughing

TP0232(Swamp 9EBL)

- 0 - 900 Blk Org (Co Fib) (Moist)
- 900 - 2.0 Br Si(y) F-Co Sa (Moist)
- 2.0 - 3.4 Gry Si(y) Cl (Moist & Firm)
- 3.4 NFP Bld

HA1839(Swamp 9EBL)

- 0 - 1.0 Blk Org (Co Fib) (Moist)
- 1.0 - 1.2 Br Si(y) F-Co Sa (Moist)
- 1.2 - 1.6 Gry Si(y) Cl (Moist & Firm)
- 1.6 EOH

TP0231(Swamp 9EBL)

- 0 - 900 Blk Org (Co Fib) (Moist)
- 900 - 1.2 Br Si(y) F-Co Sa (Moist)
- 1.2 - 3.4 Gry Si(y) Cl (Moist & Firm)
- 3.4 NFP BR

HA1838(Swamp 9EBL)

- 0 - 1.2 Blk Org (Co Fib) (Moist)
(Wat Seep @ 500)
- 1.2 - 1.4 Gry Si(y) Cl with F-Med Sa
(Moist & Firm)
- 1.4 - 1.5 Br Si(y) F-Co Sa (Wet)
- 1.5 EOH

TP0229(Swamp 9EBL)

- 0 - 1.1 Blk Org (Co Fib) (Moist)
(Blds @ 500) (Wat Seep @ 1.1)
- 1.1 - 1.6 Br Si(y) F-Co Sa (Moist)
- 1.6 - 3.4 Gry Si(y) Cl (Moist & Firm)
(Blds & Cob @ 3.3)

3.4 NFP Bld

HA0148(Swamp 9EBL)

- 0 - 450 Blk Org (Amor) (Wet)
- 450 NFP Bld

TP0228(Swamp 9EBL)

- 0 - 1.0 Blk Org (Co Fib) (Moist)
(Wat Seep @ 1.0)
- 1.0 - 4.6 Gry Si(y) Cl (Moist & Firm)
- 4.6 NFP Limit of Reach

Sample No. 10-MC-047 (1.2 – 1.5)TP0228

% Passing 4.75 mm %

% Passing 75 um %

FMC @ 1.5 %

Group Symbol

HA1837(Swamp 9EBL)

- 0 - 1.1 Blk Org (Co Fib) (Moist)
- 1.1 - 1.3 Gry Si(y) Cl (Moist & Firm)
- 1.3 - 1.5 Br Si(y) F-Co Sa (Wet)
- 1.5 EOH

HA1836(Swamp 9EBL)

- 0 - 900 Blk Org (Co Fib) (Moist)
- 900 NFP BR

TP0227 (Swamp 9EBL)

- 0 - 1.2 Blk Org (Co Fib) (Moist)
- 1.2 - 4.3 Gry Si(y) Cl (Moist & Firm)
- 4.3 NFP Bld Poss BR

TP0226(Swamp 9EBL)

- 0 - 750 Blk Org (Co Fib) (Moist)
- 750 - 2.0 Br Si(y) F-Co Sa with Cob Occ
Bld (Moist) (Wat Seep @ 1.0)
- 2.0 NFP BR

Sample No. 10-MC-046 (800 – 1.0)TP0226

% Passing 4.75 mm %

% Passing 75 um %

FMC @ 1.0 %

Group Symbol

HA0149

- 0 - 250 Blk Org (Co Fib) (Moist)
- 250 - 300 Br F-Med Sa Tr Si

300 NFP Cob

2.8 NFP BR

HA1835(Swamp 9EBL)

0 - 550 Blk Org (Co Fib) (Moist)
 550 - 1.0 Br Si(y) Cl with F-Med Sa (Moist)
 1.0 EOH

TP0230(Swamp 9EBL)

0 - 1.0 Blk Org (Co Fib) (Moist)
 1.0 - 1.8 Br Si(y) F-Co Sa (Moist)
 1.8 - 2.9 Gry Si(y) Cl with Cob
 (Moist & Firm)
 2.9 NFP Bld Poss BR

TP0070

1.2 Ø Bld on Surf
 0 - 500 Blk Org (Co Fib)
 500 - 1.2 Br F-Co Sa with Gr & Bld Tr Si
 1.2 - 2.0 Gry Si(y) Cl (Moist)
 (Wat Seep @ 2.0)
 2.0 NFP BR

Sample No. 10-MC-012 (500 – 700)TP0070

% Passing 4.75 mm 96.6 %
 % Passing 75 um 26.2 %
 FMC @ 700 10.5 %
 Group Symbol SM

Sample No. 10-MC-013 (1.2 – 1.6)TP0070

% Passing 4.75 mm 99.9 %
 % Passing 75 um 92.7 %
 FMC @ 1.6 31.2 %
 W_L 61 %
 W_p 31 %
 I_p 30
 Group Symbol CH

HA0150A

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP Bld

TP0071

Blds on Surf
 0 - 200 Blk Org (Co Fib)
 200 - 1.4 Br Si(y) F-Co Sa Tr Gr Occ Bld
 1.4 - 2.8 Gry Si(y) F-Med Sa Occ Bld
 (Moist)

Sample No. 10-MC-014 (1.4 – 1.6)TP0071

% Passing 4.75 mm 94.4 %
 % Passing 75 um 41.9 %
 FMC @ 1.6 11.4 %
 Group Symbol SM

HA0151

0 - 100 Tps
 100 - 400 Br F-Med Sa
 400 NFP BR

HA0152

0 - 100 Tps
 100 - 200 Br F-Med Sa Tr Si
 200 NFP Bld

HA0150B

0 - 100 Blk Org (Co Fib) (Moist)
 100 NFP BR

TP0072

Blds on Surf
 0 - 140 Tps
 140 NFP BR

HA0153

0 - 110 Tps
 110 - 180 Br F-Med Sa Tr Si
 180 NFP Frag BR

HA0155

0 - 100 Tps
 100 - 290 Br F-Med Sa Tr Si
 290 NFP Cob

HA0156

0 - 150 Blk Org (Co Fib) (Moist)
 150 - 200 Br F-Med Sa Tr Si
 200 NFP Cob

HA0154

0 - 100 Tps
 100 - 180 Br F-Med Sa Tr Si
 180 NFP Frag BR

SWAMP 10 (EBL)

RECORD OF PENETRATION TEST No 10-1

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 512 075.4 N; 369 046.1 E ORIGINATED BY E.S.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
357.9 0.0	Ground Surface Augered to 1.5m Probable peat																
	Probable clay Firm																
	Probable sand Compact																
353.3 4.6	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 10-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 114.9 N; 369 050.8 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
358.5	Ground Surface						20	40	60	80	100						
0.0	Gravelly sand pockets of clayey silt cobbles and boulders (rockfill)		1	SS	52												Top 0.5m frozen
357.7	Dense (FILL)																
0.8	Peat, fine fibrous		2	SS	4												
357.1	Dark brown																
1.4	Organic sand		3	SS	10												
356.8	Dark brown																
1.7	Silty sand, trace gravel																
356.5	Compact Grey Moist																
2.0	End of borehole																
	Refusal on probable bedrock																
	Sample 3: Sampler bouncing																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 10-6

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 119.2 N; 369 088.2 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
358.9	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous to amorphous pockets of silty sand and gravelly sand to 1.8m		1	SS	19												
	Dark brown (FILL)		2	SS	3												
357.1			3	SS	14												
1.8	Peat, fine fibrous to amorphous																
	Dark brown		4	SS	WH**												
354.9																	
4.0	Clayey silt, trace sand organics layers of sandy silt																
354.0	Very soft Grey Wet		5	SS	4												
4.9	Clay, trace sand																
	Firm to Grey Wet soft			FV													
			6	SS	WH												
				FV													
351.6																	
7.3	Silty clay, trace sand		7	SS	WH												
	Firm to Grey Wet stiff																
350.4				FV													
8.5	Sand, with silt trace clay, trace gravel																
	Compact Grey Wet		8	SS	18												
			9	SS	17												
347.3																	
11.6	End of borehole																
	Refusal on probable bedrock																
												</					

RECORD OF PENETRATION TEST No 10-7

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 512 080.9 N; 369 092.2 E ORIGINATED BY E.S.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
357.8 0.0	Ground Surface Augered to 1.5m																
	Probable peat																
	Probable clay Very soft to firm																
349.9 7.9	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 10-8

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 101.8 N; 369 102.4 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 10, 2010 CHECKED BY C.N.


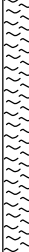
















SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES		SHEAR STRENGTH kPa									
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
357.8	Ground Surface						20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown					▽										
			1	SS	WH**										448	
			2	SS	WH											
354.6	Organic clayey silt		3	SS	WH										360	
354.1	Very soft Green/ Wet brown															
354.1	Clay clayey silt layers		4	SS	3											
	Firm Grey Wet		5	SS	5											
				FV												
			6	SS	WH											
				FV												
350.6	Clayey silt															
7.2	Firm Grey Wet		7	SS	WH											
349.3	End of borehole															
8.5	Refusal on probable bedrock															

RECORD OF BOREHOLE No 10-9

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 121.7 N; 369 113.1 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L					
359.0	Ground Surface							20	40	60	80	100								
0.0	Gravelly sand pockets of silty sand cobbles and boulders (rockfill) pockets of peat (FILL)																			
356.9			1	SS	23		358													
2.1	Peat, fine fibrous Dark brown						357													
			2	SS	2															
			3	SS	1		356													
							355													
354.3						▼*														
4.7	Silty sand, organics		4	SS	WH**	▽*	354													
354.0	Very loose Grey Wet			FV																
5.0	Silty clay thin layers of silt																			
353.2	Firm Grey Wet						353													
5.8	Clay																			
	Soft to Grey Wet		5	SS	WH		352													
	firm			FV																
	_____						351													
	trace sand, trace gravel		6	SS	WH															
				FV																
350.2							350													
8.8	Clayey silt trace sand, trace gravel																			
349.5	Firm Grey Wet		7	SS	11															
9.5	Sandy silt trace clay, trace gravel						349													
	Compact Grey Wet																			
348.2			8	SS	25/15cm															
10.8	End of borehole Refusal on probable bedrock Sample 8: Sampler bouncing * 2010 03 14 ▽ Water level observed during drilling ▼ Water level measured after drilling WH** denotes penetration due to weight of rods and hammer																			

RECORD OF BOREHOLE No 10-10

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 081.2 N; 369 116.7 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 12 & 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa									
357.8	Ground Surface						20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown Amorphous		1	AS	-	▽*										
						▽*										
			2	SS	WH**											
354.4			3	SS	WH											
3.4																
354.3	Silty sand, organics			SS												
3.5	Very loose Grey Wet			FV												
	Clay, trace sand organics to 4.3m															
	Very soft Grey Moist to firm		4	SS	1											
				FV												
	thin layers of silty clay															
			5	SS	WH											
				FV												
350.5																
7.3	Clayey silt, some sand															
	Firm to Grey Wet stiff		6	SS	WH											
				FV												
348.7	Sand															
9.1	trace silt, trace gravel		7	SS	2											
348.3																
9.5	Very loose Grey Wet															
348.0	Silty sand, trace gravel															
9.8	Very loose Grey Wet															
	End of borehole															
	Refusal on probable bedrock															

* 2010 03 12 & 13

▽* Water level observed
during drilling

▽ Water level measured
after drilling

■ Penetrometer test

WH** denotes penetration due
to weight of rods and
hammer

RECORD OF BOREHOLE No 10-11

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 103.9 N; 369 126.8 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
357.9	Ground Surface																		
0.0	Peat, fine to coarse fibrous Dark brown					▽*													
			1	SS	WH**										518				
			2	SS	WH										611				
354.6	Organic clayey silt		3	SS	WH										479				
3.3	Very soft Brown Wet																		
354.2	Silty clay silt and sand layers		4	SS	3														
3.7	Soft Grey Wet		5	TW	PH														
				FV															
			6	TW	PH														
				FV															
350.6	Clayey silt, trace sand																		
7.3	Firm Grey Wet		7	SS	WH														
348.6	Silt trace clay, trace sand		8	SS	16														
9.3	Compact Grey Wet																		
348.1	End of borehole																		
9.8	Dynamic Cone Penetration Test started																		
	Probable silt																		
	Compact																		
345.7	End of dynamic cone penetration test																		
12.2	Refusal on probable bedrock																		
	* 2010 03 09																		
	▽ Water level observed during drilling																		
	■ Penetrometer test																		
	WH** denotes penetration due to weight of rods and hammer																		
																C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers			

RECORD OF BOREHOLE No 10-12

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 123.6 N; 369 138.0 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
358.3	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine to coarse fibrous pockets of sand and gravel cobbles and boulders to 1.8m (Rockfill) (FILL)																			
			1	SS	10															
356.5	Peat, fine fibrous Dark brown																			
1.8			2	SS	WH**															
			3	SS	WH															
353.7	Organic clayey silt																			
4.6			4	SS	4															
353.2	Firm Grey Wet																			
5.1	Clay			FV																
	Stiff to Grey Wet soft																			
	silt and sand layers		5	SS	WH															
				FV																
			6	SS	WH															
				FV																
349.6	Silt, trace sand layers of silty sand																			
8.7	Compact Grey Wet		7	SS	19															
			8	SS	16															
347.0	End of borehole																			
11.3	Dynamic Cone Penetration Test started																			
	Probable silt																			
	Compact																			
345.5	End of dynamic cone penetration test																			
12.8	Refusal on probable bedrock																			

RECORD OF PENETRATION TEST No 10-13

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 512 088.7 N; 369 140.6 E ORIGINATED BY E.S.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa										
						○ UNCONFINED			+ FIELD VANE							
357.8 0.0	Ground Surface Augered to 1.5m						● QUICK TRIAXIAL	× LAB VANE								
	Probable peat															
	Probable silty clay Soft to firm															
	Probable sand Compact															
348.3 9.5	End of dynamic cone penetration test Refusal on probable bedrock															

METRIC

RECORD OF BOREHOLE No 10-15

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 125.3 N; 369 163.0 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE
358.8	Ground Surface						20	40	60	80	100							
0.0	Gravelly sand pockets of sand and silty sand cobbles and boulders (rockfill)					▽*												
	Brown Moist (FILL)		1	SS	6													
356.7																		
2.1	Peat, fine fibrous																	
	Dark brown		2	SS	4													
			3	SS	1													
354.5																		
4.3	Silty sand, organics																	
353.9	Very loose Grey Wet		4	SS	2													
4.9	Silty clay thin layers of silt			FV														
	Stiff to Grey Moist soft to wet																	
			5	SS	2													
				FV														
351.5																		
7.3	Silty sand, trace gravel																	
350.9	Compact Grey Wet		6	SS	14/15cm													
7.9	End of borehole																	
	Refusal on probable bedrock																	
	Sample 6: Sampler bouncing																	

RECORD OF BOREHOLE No 10-16

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 090.4 N; 369 165.1 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

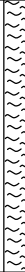






SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
357.7	Ground Surface																
0.0	Peat, fine fibrous Dark brown																
354.5			1	SS	WH**												
354.2	Silty sand, organics		2	SS	1												
354.2	Very loose Grey wet																
	Silty clay trace to some sand																
	Firm Grey Wet		3	SS	3												
				FV													
			4	TW	PH												
				FV													
350.4	Clayey silt, with sand layers of silt		5	SS	7												
7.3	Firm Grey Moist																
349.2				FV													
8.5	Sand, with silt trace clay, trace gravel		6	SS	5												
	Loose Grey Wet																
347.3																	
10.4	End of borehole Refusal on probable bedrock																

RECORD OF BOREHOLE No 10-17

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 107.3 N; 369 176.4 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE								
357.3	Ground Surface						20	40	60	80	100	20	40	60		GR SA SI CL			
0.0	Peat, fine fibrous Dark brown															Top 0.6m frozen			
			1	SS	WH**										603				
			2	SS	WH														
			3	SS	1														
354.6	Sand, trace silt thin layers of silty clay Loose Grey Wet																		
2.7			4	SS	5														
			5	SS	7														
353.3	Silty clay Firm to Dark Moist stiff grey																		
4.0			6	SS	5														
				FV															
351.8	Sand with gravel, some silt Compact Grey Wet to dense																		
5.5			7	SS	38														
350.6	End of borehole																		
6.7																			
<div>* 2010 03 09</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div> Penetrometer test</div> <div>WH** denotes penetration due to weight of rods and hammer</div>																			

* 2010 03 09

▽ Water level observed
during drilling

▽ Water level measured
after drilling

■ Penetrometer test

WH** denotes penetration due
to weight of rods and
hammer

RECORD OF BOREHOLE No 10-18

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 126.6 N; 369 187.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
358.2	Ground Surface						20	40	60	80	100	20	40	60		GR SA SI CL				
0.0	Silty sand, trace gravel cobbles and boulders (rockfill)					▽*										0 96 (4)				
	(FILL)		1	SS	5															
356.4	Peat, fine fibrous Dark brown																			
355.1	Sand, trace silt Loose Grey Wet		3	SS	5								o							
353.9	Gravelly sand Loose Grey Wet		4	SS	4															
352.4	End of borehole Refusal on probable bedrock																			
5.8																				
<div>* 2010 03 14</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div>																				

1 of 1 **METRIC**

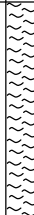



MOT_DCPT R2004 09TF009F-SWAMP 10.GPJ ON_MOT.GDT 6/11/2010 8:48:19 AM

RECORD OF BOREHOLE No 10-20

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 108.4 N; 369 201.1 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.S.B.
 DATUM Geodetic DATE March 07, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
357.5	Ground Surface							20	40	60	80	100								
0.0	Peat, amorphous Dark brown		1	AS	-		357													
			2	SS	1		356													
			3	SS	2		355													
355.3	Sand, some silt		4	SS	16		354													
2.2	Compact Grey Wet		5	SS	12		353													
352.9	End of borehole																			
4.6																				
	<div>* 2010 03 07</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div>Note: Borehole caved-in at 4.0m</div>																			

METRIC

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 10-23

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 512 128.2 N; 369 235.4 E ORIGINATED BY E.S.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
359.2	Ground Surface							20	40	60	80	100								
0.0	Gravelly sand, boulders (rockfill)						359													
	Brown Moist (FILL)																			
357.7							358													
1.5	Gravelly sand, trace silt		1	SS	11															
357.2	Compact Dark Wet brown																			
2.0	End of borehole Refusal on probable bedrock Sample 1: Sampler bouncing																			
	* 2010 03 15																			
	Water level observed during drilling																			
	Water level measured after drilling																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10



SWAMP 10

Testholes From GWP 6053-03-00

13+425.0 50.0 Rt C/L 357.38 HA 10-P1
(5512097.563 N, 369184.176 E)
0 - 2.7 Dk Br F Fib Org M Wet
2.7 - 3.5 Gry Sa(y) Si Wet
3.5 NFP TH Sloughing
Fr Wat @ 0

HA0157

0 - 50 Tps
50 NFP BR

(Wat Seep @ 1.8)
3.3 - 4.1 Gr Si(y) F Sa (Moist)
4.1 NFP Limit of Reach

TP0073

0 - 300 Blk Org (Co Fib)
300 - 400 Hi Weath/Frag BR with Sa & Gr
Mixed
400 NFP BR

HA1831(Swamp 10 EBL)

0 - 1.6 Blk Org (Co Fib-Amor) (Wet)
1.6 NFP Sloughing

HA0285(Swamp 10 EBL)

0 - 120 Tps
120 NFP Frag BR

HA0160

0 - 100 Tps
100 NFP Frag BR

HA0284(Swamp 10 EBL)

0 - 3.8 Blk Org (Co Fib) (Wet)
3.8 - 3.9 Gry Si(y) Cl (Moist)
3.9 NFP Sloughing

HA0159

0 - 250 Blk Org (Wet)
250 - 300 Br F Sa with Si (Wet)
300 NFP Bld

TP0222(Swamp 10 EBL)

0 - 3.7 Blk Org (Co Fib) (Moist)
3.7 - 4.6 Gry Si(y) Cl (Moist & Soft)
4.6 NFP Limit of Reach

HA0158

0 - 170 Tps
170 - 500 Br F-Med Sa Tr Si
500 NFP BR

Sample No. 10-MC-045 (3.8 – 4.1)TP0222

% Passing 4.75 mm %
% Passing 75 um %
FMC @ 4.1 %
Group Symbol

TP0075

0 - 300 Blk Org (Co Fib)
300 - 800 Br Si(y) F-Co Sa Tr Gr
800 NFP BR

HA1832(Swamp 10 EBL)

0 - 3.1 Blk Org (Co Fib-Amor) (Wet)
3.1 NFP Sloughing

HA0286(Swamp 10 EBL)

0 - 3.7 Blk Org (Co Fib) (Wet)
3.7 - 3.8 Gry Si(y) Cl (Moist)
3.8 NFP Sloughing

TP0074

0 - 100 Tps
100 NFP BR

HA0283(Swamp 10 EBL)

0 - 1.5 Blk Org (Co Fib) (Moist)
1.5 NFP BR

TP0223(Swamp 10 EBL)

0 - 3.5 Blk Org (Co Fib) (Moist)
3.5 - 4.6 Gry Si(y) Cl (Moist & Firm)
4.6 NFP Limit of Reach

TP0220(Swamp 10 EBL)

0 - 2.2 Blk Org (Co Fib) (Moist)
(Wat Seep @ 400)
2.2 - 4.0 Gry Si(y) F Sa (Moist)
4.0 NFP Limit of Reach

TP0224(Swamp 10 EBL)

0 - 2.3 Blk Org (Co Fib) (Moist)
2.3 - 3.2 Gry Si(y) F Sa (Moist)
3.2 NFP Limit of Reach

HA1830 (Swamp 10 EBL)

0 - 1.6 Blk Org (Co Fib) (Wet)
1.6 NFP Sloughing

TP0221(Swamp 10 EBL)

0 - 3.3 Blk Org (Co Fib) (Moist)

HA1833(Swamp 10 EBL)

0 - 1.5 Blk Org (Co Fib-Amor) (Wet)

Twp. Ewart
Page 23 of 73

SWAMP 17 (EBL)

METRIC

ON_MOT VER3 09TF009F-SWAMP 17 N 17A.GPJ ON_MOT.GDT 4/8/2010 6:23:34 PM

METRIC

ON_MOT VER3 09TF009F-SWAMP 17 N 17A.GPJ ON_MOT.GDT 4/28/2010 4:40:01 PM

+7, X⁵: Numbers refer to Sensitivity

20
15—○—5 (% STRAIN AT FAILURE)
10

RECORD OF PENETRATION TEST No 17-5

1 of 1 **METRIC**

G.W.P. 6020-09-00	LOCATION	Coords: 5 511 313.7 N; 371 447.5 E	ORIGINATED BY	M.R.
DIST Kenora HWY 17	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	N.S.B.
DATUM Geodetic	DATE	March 19, 2010	CHECKED BY	C.N.

[illegible]

METRIC

ON_MOT VER3 09TF009F-SWAMP 17 N 17A.GPJ ON_MOT.GDT 4/8/2010 6:23:36 PM

+7, X⁵: Numbers refer to Sensitivity

20
15—○—5 (% STRAIN AT FAILURE)
10

RECORD OF BOREHOLE No 17-7

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 291.3 N; 371 450.1 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		W _p	w	W _L		
364.0	Top of Ice							20 40 60 80 100						
0.0	Ice							20 40 60 80 100						
363.4	Water													
0.6	Silty sand													
363.1	Loose Grey Wet		1	SS	4									
0.9	Silty clay													
	Firm Dark Wet		2	SS	2									
362.2	Clayey silt, some sand layers of silty clay													
1.8	Firm Dark Wet		3	SS	2									0 12 58 30
			4	SS	WH**									
			5	SS	1									
359.9	Sandy silt, trace clay													
4.1	Loose to Grey Wet compact		6	SS	WH									0 30 66 4
			7	SS	WH									
			8	SS	7									
			9	SS	5									
355.7	End of borehole													
8.3	Refusal on probable bedrock								120/8cm					

RECORD OF BOREHOLE No 17-8

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 302.3 N; 371 469.8 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
363.9 0.0	Top of Ice Ice					363	20	40	60	80	100						
363.3 0.6	Water																
	Peat, amorphous Dark brown		1	SS	1												
362.5 1.4	Clayey silt, trace sand																
362.2 1.7	Soft Dark grey Wet		2	SS	22/15cm										96		
	End of borehole Refusal on probable bedrock Sample 2: Sampler bouncing * 2010 03 18 ▽ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF PENETRATION TEST No 17-9

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 511 268.0 N; 371 452.3 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			WATER CONTENT (%)									
						○ UNCONFINED			+ FIELD VANE	● QUICK TRIAXIAL	x LAB VANE							
363.9 0.0	Top of Ice																	
	Ice																	
	Water																	
	Probable peat																	
	Probable sand																	
	Loose																	
	Probable clay/clayey silt																	
	Firm to stiff																	
	Probable silt, with sand																	
	Compact																	
355.4 8.5	End of borehole																	
	Refusal on probable bedrock																	
</																		

METRIC

ON_MOT VER3 09TF009F-SWAMP 17 N 17A.GPJ ON_MOT.GDT 4/8/2010 6:23:32 PM

+ , X⁵ : Numbers refer to Sensitivity

20
15—○—5 (% STRAIN AT FAILURE)
10



SWAMP 17

Testholes From GWP 6053-03-00

15+850.0 50.0 Rt C/L 364.08 HD 17-P1
(5511297.058 N, 371431.326 E)

0	-	1.4	Dk Br Amor Org M Wet
1.4	-	3.6	Gry Cl(y) Si W Sa Soft Wet
3.6	-	5.5	Gry F Sa(y) Si Very L Wet
5.5	-	6.1	Gry F Sa(y) Si Occ Cob Occ
			Bld D Wet
6.1			NFP BR
			Fr Wat @ 0
			N @ 300 = 4
			N @ 1.05 = 11
			N @ 1.85 = 3
			N @ 2.60 = 4
			N @ 3.35 = 3
			N @ 4.10 = 1
			N @ 4.90 = 2
			N @ 6.05 = 50 blows/25
			(bouncing)

HA1560

0 - 200 Blk Org (Co Fib) (Moist)
 200 - 900 Br Si Tr F Sa (with Gr from 800)
 900 NFP Frag BR

HA1558

0 - 80 Tps
 80 NFP Frag BR

HA1557

0 - 450 Blk Org (Co Fib) (Moist)
 450 - 500 Br F-Med Sa with Si
 500 NFP BR

HA1556

0 - 280 Blk Org (Co Fib) (Moist)
 280 NFP BR

HA1555

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP BR

HA1554

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP Frag BR

HA1553

0 - 60 Tps
 60 NFP BR

HA1551

0 - 120 Tps
 120 NFP BR

HA1552

0 - 160 Blk Org (Co Fib) (Moist)
 160 NFP BR

HA1550

0 - 200 Blk Org (Co Fib) (Moist)
 200 - 600 Br Si Tr F Sa
 600 NFP BR

HA1549

0 - 350 Br Org (Co Fib) (Moist)
 350 NFP BR

HA1547

0 - 120 Tps
 120 NFP Frag BR

HA1548

0 - 180 Blk Org (Co Fib) (Moist)
 180 NFP Frag BR

HA1546

0 - 60 Tps
 60 NFP BR

HA1545

0 - 100 Tps
 100 NFP Frag BR

TP0094

0 - 500 Blk Org (Co Fib) with Hi
 Weath/Frag BR Mixed
 500 NFP BR

HA1544(Swamp 17 EBL)

0 - 500 Blk Org (Co Fib) (Moist)
 500 - 850 Gry Si(y) Cl (Moist & Firm)
 (Wet from 700)
 850 - 1.0 Gry F-Med Sa Tr Si (Wet)
 1.0 - 1.7 Gry Si(y) Cl (Moist & Firm)
 1.7 EOH

HA1543(Swamp 17 EBL)

0 - 850 Blk Org (Co Fib) (Moist)
 (Wet from 300)
 850 - 1.1 Gry Si(y) Cl (Moist & Stiff)
 1.1 NFP BR

TP0095(Swamp 17 EBL)

0 - 400 Blk Org (Co Fib)
 400 - 700 Br F-Co Sa Tr Si (Moist)
 700 - 1.0 Gry Si(y) F-Sa (Moist)
 1.0 - 1.3 Gry Si(y) Cl (Moist & Stiff)
 (Wat Seep @ 1.3)
 1.3 NFP BR

Sample No. 10-MC-021 (400 – 600)TP0095

% Passing 4.75 mm 99.4 %
 % Passing 75 um 17.4 %
 FMC @ 600 16.5 %
 Group Symbol SM

Sample No. 10-MC-022 (700 – 900)TP0095

% Passing 4.75 mm 99.9 %
 % Passing 75 um 64.8 %
 FMC @ 900 21.3 %
 Group Symbol ML

Sample No. 10-MC-023 (1.0 – 1.3)TP0095

% Passing 4.75 mm 99.9 %
 % Passing 75 um 90.8 %
 FMC @ 1.3 39.3 %
 W_L 68 %
 W_p 27 %
 I_p 41
 Group Symbol CH

TP0213(Swamp 17 EBL)

0 - 750 Blk Org (Co Fib)
 (Wat Seep @ 750)
 750 - 1.2 Gry Si(y) F-Med Sa (Moist)
 1.2 - 1.8 Gry Si(y) Cl (Moist & Firm)
 1.8 NFP BR

TP0212(Swamp 17 EBL)

0 - 1.0 Blk Org (Co Fib)
 (Wat Seep @ 1.0)
 1.0 - 1.5 Gry Si(y) F-Med Sa (Moist)
 1.5 - 3.9 Gry Si(y) Cl (Moist & Firm)
 3.9 NFP BR

TP0211(Swamp 17 EBL)

0 - 900 Blk Org (Co Fib) (Moist)
 900 - 1.5 Gry Si(y) F-Med Sa (Moist)
 (Wat Seep @ 1.5)
 1.5 - 4.5 Gry Si(y) Cl (Moist & Firm)
 4.5 NFP Limit of Reach

HA1542B(Swamp 17 EBL)

0 - 200 Wat
 200 - 450 Blk Org (Co Fib) (Wet)
 450 - 800 Gry F-Med Sa (Moist)
 800 - 1.0 Gry Si Tr F Sa (Moist)
 1.0 - 1.6 Gry Si(y) Cl (Moist & Firm)
 1.6 NFP Sloughing

HA1829(Swamp 17 EBL)

0 - 350 Ice

350 - 1.0 Blk Org (Co Fib) (Moist)
 1.0 - 1.5 Gry Si(y) F-Med Sa (Moist)
 1.5 EOH

HA1828(Swamp 17 EBL)

0 - 700 Ice
 700 - 900 Blk Org (Co Fib) (Moist)
 900 - 1.1 Gry Si(y) F-Med Sa (Moist)
 1.1 - 1.2 Gry Si(y) Cl (Moist & Firm)
 1.2 EOH

TP0210(Swamp 17 EBL)

0 - 200 Blk Org (Co Fib)
 200 - 300 Hi Weath/Frag BR
 300 NFP BR

TP0209

0 - 150 Blk Org (Co Fib)
 150 - 700 Hi Weath/Frag BR with Sa & Gr
 Mixed
 700 NFP BR

HA1542A

0 - 90 Tps
 90 NFP BR

HA1541

0 - 80 Tps
 80 NFP BR

TP0208

0 - 800 Blk Org (Co Fib) (Moist)
 800 - 2.0 Gry Si(y) Cl (Moist & Firm)
 2.0 NFP BR

TP0207

0 - 200 Blk Org (Co Fib) with Hi
 Weath/Frag BR Mixed
 200 NFP BR

HA1540(Swamp 17A EBL)

0 - 700 Tps
 700 - 1.2 Br F-Med Sa Tr Gr
 (Moist from 1.0)
 1.2 - 1.7 Gry Si(y) Cl (Moist & Firm) (HP)
 (Tr F-Med Sa @ 1.6)
 1.7 NFP Sloughing

Sample No. 09-LA-158 (1.2 – 1.5)HA1540

SWAMP 17A (EBL)

RECORD OF BOREHOLE No 17A-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 255.1 N; 371 556.5 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE										
362.5	Ground Surface						20	40	60	80	100										
0.0	Organic clayey silt and sandy silt Very soft Black Wet					▼*															
	_____		1	SS	3								○								
	layers of sand																				
360.7			2	SS	4									○							
1.8	Organic silty clay, trace sand thin sand layers								■												
360.1																					
2.4	Soft to Dark Moist firm grey		3	SS	2		■							○							
359.6	Organic clayey silt																				
2.9	Soft Grey Wet Silty clay, trace sand		4	SS	2									○							
358.7	Soft Grey Moist																				
3.8	End of borehole <																				

* 2010 03 17

▼ Water level measured
after drilling

■ Penetrometer test

METRIC

RECORD OF BOREHOLE No 17A-5

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 217.9 N; 371 584.2 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 18, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED	+	FIELD VANE								
							● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)								
362.8	Ground Surface						20	40	60	80	100							
0.0	Peat, amorphous																	
362.2	Dark brown		1	SS	27												Top 0.6m frozen	
0.6	Sand, some silt																	
	Loose Light brown Wet		2	SS	7													
361.1	Clay trace sand, trace gravel		3	SS	8							163					1 5 39 55	
1.7	Stiff to Dark Moist very stiff grey thin partings of silt																	
			4	SS	7													
359.6	Silt trace clay, trace sand																	
3.2	Compact Dark Wet grey		5	SS	11													
359.1	End of borehole																	
3.7	Refusal on probable bedrock																	
																</		

* 2010 03 18

Water level measured
after drilling

Penetrometer test



SWAMP 17A

Testholes From GWP 6053-03-00

15+970.0	30.0		Rt C/L 362.57 HD 17A-P1
<u>(5511270.430 N, 371545.584 E)</u>			
0	-	1.2	Dk Br/Blk F-Co Fib Org M Wet
1.2	-	1.7	Gry/Br Sa Some Si L Wet-Sat
1.7			NFP BR
			Fr Wat @ 1.0
			N @ 300 = 1
			N @ 1.05 = 7
			N @ 1.60 = 50 blows/100

Sample No. 10-MC-022 (700 – 900)TP0095

% Passing 4.75 mm 99.9 %
 % Passing 75 um 64.8 %
 FMC @ 900 21.3 %
 Group Symbol ML

Sample No. 10-MC-023 (1.0 – 1.3)TP0095

% Passing 4.75 mm 99.9 %
 % Passing 75 um 90.8 %
 FMC @ 1.3 39.3 %
 W_L 68 %
 W_p 27 %
 I_p 41
 Group Symbol CH

TP0213(Swamp 17 EBL)

0 - 750 Blk Org (Co Fib)
 (Wat Seep @ 750)
 750 - 1.2 Gry Si(y) F-Med Sa (Moist)
 1.2 - 1.8 Gry Si(y) Cl (Moist & Firm)
 1.8 NFP BR

TP0212(Swamp 17 EBL)

0 - 1.0 Blk Org (Co Fib)
 (Wat Seep @ 1.0)
 1.0 - 1.5 Gry Si(y) F-Med Sa (Moist)
 1.5 - 3.9 Gry Si(y) Cl (Moist & Firm)
 3.9 NFP BR

TP0211(Swamp 17 EBL)

0 - 900 Blk Org (Co Fib) (Moist)
 900 - 1.5 Gry Si(y) F-Med Sa (Moist)
 (Wat Seep @ 1.5)
 1.5 - 4.5 Gry Si(y) Cl (Moist & Firm)
 4.5 NFP Limit of Reach

HA1542B(Swamp 17 EBL)

0 - 200 Wat
 200 - 450 Blk Org (Co Fib) (Wet)
 450 - 800 Gry F-Med Sa (Moist)
 800 - 1.0 Gry Si Tr F Sa (Moist)
 1.0 - 1.6 Gry Si(y) Cl (Moist & Firm)
 1.6 NFP Sloughing

HA1829(Swamp 17 EBL)

0 - 350 Ice

350 - 1.0 Blk Org (Co Fib) (Moist)
 1.0 - 1.5 Gry Si(y) F-Med Sa (Moist)
 1.5 EOH

HA1828(Swamp 17 EBL)

0 - 700 Ice
 700 - 900 Blk Org (Co Fib) (Moist)
 900 - 1.1 Gry Si(y) F-Med Sa (Moist)
 1.1 - 1.2 Gry Si(y) Cl (Moist & Firm)
 1.2 EOH

TP0210(Swamp 17 EBL)

0 - 200 Blk Org (Co Fib)
 200 - 300 Hi Weath/Frag BR
 300 NFP BR

TP0209

0 - 150 Blk Org (Co Fib)
 150 - 700 Hi Weath/Frag BR with Sa & Gr
 Mixed
 700 NFP BR

HA1542A

0 - 90 Tps
 90 NFP BR

HA1541

0 - 80 Tps
 80 NFP BR

TP0208

0 - 800 Blk Org (Co Fib) (Moist)
 800 - 2.0 Gry Si(y) Cl (Moist & Firm)
 2.0 NFP BR

TP0207

0 - 200 Blk Org (Co Fib) with Hi
 Weath/Frag BR Mixed
 200 NFP BR

HA1540(Swamp 17A EBL)

0 - 700 Tps
 700 - 1.2 Br F-Med Sa Tr Gr
 (Moist from 1.0)
 1.2 - 1.7 Gry Si(y) Cl (Moist & Firm) (HP)
 (Tr F-Med Sa @ 1.6)
 1.7 NFP Sloughing

Sample No. 09-LA-158 (1.2 – 1.5)HA1540

% Passing 4.75 mm 100.0 %
 % Passing 75 um 88.2 %
 FMC @ 1.5 33.3 %
 W_L 57 %
 W_p 27 %
 I_p 30
 Group Symbol CH

TP0206(Swamp 17A EBL)

0 - 250 Blk Org (Co Fib) (Moist)
 (Wat Seep @ 250)
 250 - 3.6 Gry Si(y) Cl (Moist & Firm)
 3.6 NFP BR

TP0205(Swamp 17A EBL)

0 - 1.1 Blk Org (Co Fib) (Moist)
 (Wat Seep @ 1.1)
 1.1 - 4.3 Gry Si(y) Cl (Moist & Firm)
 (Wat Seep @ 1.1)
 4.3 NFP Limit of Reach

TP0204(Swamp 17A EBL)

0 - 700 Blk Org (Co Fib) (Moist)
 700 - 1.8 Br Si(y) F-Med Sa (Moist)
 (Wat Seep @ 800)
 1.8 - 2.4 Gry Si(y) Cl (Moist & Firm)
 2.4 - 4.5 Br F-Co Sa with Gr Tr Si Occ Cob
 & Bld (Wet)
 4.5 NFP Limit of Reach

TP0203(Swamp 17A EBL)

0 - 700 Blk Org (Co Fib) (Moist)
 700 - 2.0 Br Si(y) F-Med Sa (Moist)
 2.0 - 4.1 Gry Si(y) Cl (Moist & Firm)
 (Wat Seep @ 2.3)
 4.1 NFP Limit of Reach

HA1539

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP BR

HA1538

0 - 300 Blk Org (Co Fib) (Moist)
 300 - 550 Gry Si Tr F-Co Sa (Moist)
 550 NFP BR

HA1537

0 - 140 Tps

140 - 1.6 Br F-Med Sa Tr Gr
 (Moist from 1.0) (Wet from 1.5)
 1.6 NFP Sloughing

Sample No. 09-LA-157 (750 – 900)**HA1537**

% Passing 4.75 mm 88.5 %
 % Passing 75 um 18.9 %
 FMC @ 900 10.8 %
 Group Symbol SM

TP0096

1.5 Ø Bld on Surf
 0 - 400 Blk Org (Co Fib)
 400 - 800 Br Si(y) F-Co Sa Occ Bld (Moist)
 800 - 1.0 Gry Si(y) F Sa (Moist & Comp)
 1.0 NFP BR

Sample No. 10-MC-024 (400 – 600)**TP0096**

% Passing 4.75 mm 97.0 %
 % Passing 75 um 34.1 %
 FMC @ 600 9.6 %
 Group Symbol SM

Sample No. 10-MC-025 (800 – 1.0)**TP0096**

% Passing 4.75 mm 99.9 %
 % Passing 75 um 87.0 %
 FMC @ 1.0 23.9 %
 Group Symbol ML

HA1536

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP BR

HA1535

0 - 60 Tps
 60 NFP BR

HA1534

0 - 180 Blk Org (Co Fib) (Moist)
 180 NFP BR

HA1533

0 - 80 Tps
 80 NFP BR

SWAMP 19

RECORD OF BOREHOLE No 19-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 758.0 N; 372 301.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
353.5	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous Dark brown Moist fine fibrous Wet					▽* ▽*	353										
351.7							352										
1.8	End of borehole Refusal on probable bedrock																
	<div>* 2010 02 14</div> <div>▽ Water level observed during drilling</div> <div>▽ Water level measured after drilling</div>																

1 of 1 **METRIC**

MOT_DCPT R2004 09TF009D-SWAMP 19.GPJ ON_MOT.GDT 4/9/2010 1:11:09 PM

RECORD OF BOREHOLE No 19-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 688.0 N; 372 246.4 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE										
353.9	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous		1	AS	-	▼* ▽*														
	Dark brown																			
	Moist																			
	Wet																			
			2	SS	WH**															
	cobbles and boulders																			
350.7			3	SS	20/15cm															
3.2	End of borehole																			
	Refusal on probable bedrock																			
	Sample 3: Sampler bouncing																			
	* 2010 02 14																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			
	WH** denotes pepetration due to weight of rods and hammer																			

RECORD OF BOREHOLE No 19-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 726.0 N; 372 301.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
353.5	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous Dark brown		1	AS	-	▽* ▽*	353																
							352																
			2	SS	3		351																
350.4							350																
3.1	Clayey silt some sand, trace gravel cobbles and boulders Grey Wet		3	AS	-																		
349.2																							
4.3	End of borehole Refusal on probable bedrock																						
<div>* 2010 02 13</div> <div>▽ Water level observed during drilling</div> <div>▽ Water level measured after drilling</div>																							

* 2010 02 13
 ▼ Water level observed during drilling
 ▼ Water level measured after drilling

RECORD OF BOREHOLE No 19-5

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 696.0 N; 372 278.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
353.9	Ground Surface					▽*		20	40	60	80	100		20	40	60		GR SA SI CL		
0.0	Peat, coarse fibrous Dark brown Wet		1	AS	-	▽*														
							353													
			2	SS	1		352													
							351													
			3	SS	1		350									554				
	fine fibrous																			
349.6	Silty clay, trace sand organic inclusions silty sand layers		4	SS	WH**		349											0 42 30 28		
4.3	Soft to Grey Wet firm			FV																
							348													
			5	TW	PM															
				FV			347													
	sand layers cobbles and boulders																			
346.1	Sand, trace gravel cobbles		6	SS	27		346													
7.8																				
345.7	Compact Grey Wet																			
8.2	End of borehole Refusal on probable bedrock																			
	 * 2010 02 13 ▽ Water level observed during drilling ▽ Water level measured after drilling WH** denotes penetration due to weight of rods and hammer																			

RECORD OF PENETRATION TEST No 19-6

1 of 2 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 723.0 N; 372 330.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 13, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40					
353.5 0.0	Ground Surface Probable peat													
	Probable silty clay Soft													
	Probable clayey silt Firm													
	Cont'd													

2 of 2 **METRIC**

[illegible]

RECORD OF BOREHOLE No 19-7

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 688.0 N; 372 319.2 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE January 30, 2010 CHECKED BY C.N.


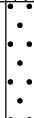



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa										WATER CONTENT (%)		
							○ UNCONFINED		+ FIELD VANE								○		
						● QUICK TRIAXIAL	x LAB VANE												
353.5	Ground Surface						20	40	60	80	100	20	40	60					
0.0	Peat, coarse fibrous		1	SS	2														
	Dark brown Moist																		
	fine fibrous																		
	Wet		2	SS	1														
			3	SS	WH**														
349.2	Organic clayey silt																		
4.3	Dark brown		4	SS	WH														
347.5	Silty clay, trace sand																		
6.0	Very soft Grey Wet		5	SS	WH														
	to soft			FV															
			6	SS	WH														
				FV															
			7	SS	WH														
				FV															
	sand layers																		
			8	SS	1														
				FV															
			9	SS	WH														
				FV															
			10	SS	WH														
				FV															
338.5																			

RECORD OF BOREHOLE No 19-7

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 688.0 N; 372 319.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE January 30, 2010 CHECKED BY C.N.

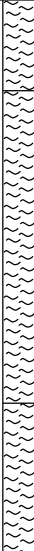




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
338.5 15.0	Silty clay, trace sand Firm Grey Wet (Cont'd)		11	SS	WH		338													
				FV			337													
336.4 17.1	Sand with gravel, trace silt cobbles and boulders Compact Grey Wet		12	SS	12		336													
335.2 18.3	End of borehole Refusal on probable bedrock																			
	<div>* 2010 01 30</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div>WH** denotes penetration due to weight of rods and hammer</div>																			

RECORD OF BOREHOLE No 19-8A

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 709.4 N; 372 351.6 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 16 & 17, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa												
							○ UNCONFINED + FIELD VANE												
							● QUICK TRIAXIAL × LAB VANE												
					WATER CONTENT (%)														
353.7	Ground Surface						20	40	60	80	100	20	40	60					
0.0	Peat, coarse fibrous		1	AS	-														
	Dark brown Moist																		
	fine fibrous																		
	Wet			2	SS		WH**												
			3	SS	WH														
	amorphous																		
			4	SS	WH														
348.2																			
5.5	Clay, trace sand																		
	Very soft Grey Wet																		
				5	SS	WH													
					FV														
				6	SS	WR***													
					FV														
			7	SS	WH														
				FV															
343.3																			
10.4	Silt trace clay, trace sand																		
	Loose Grey Moist			8	SS	9													
342.4																			
11.3	Clay, trace sand			FV															
	Soft to firm Grey Wet																		
				9	SS	WH													
					FV														
			10	SS	WH														
				FV															
338.7																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19-7A

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 680.6 N; 372 297.8 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 14, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
353.9	Ground Surface							20	40	60	80	100					GR SA SI CL		
0.0	Peat, coarse fibrous		1	AS	-														
	Dark brown Moist																		
	Wet																		
			2	SS	2														
	fine fibrous																		
			3	SS	1														
	amorphous		4	SS	WH**										591				
348.4																			
5.5	Clay, trace sand organics to 7.3m																		
	Very soft Grey Wet		5	SS	WH										182				
	to soft			FV															
	silty sand layers		6	SS	WH														
	clayey silt layers			FV															
			7	SS	WH										81				
				FV															
			8	TW	PM														
				FV															
			9	SS	WH														
				FV															
			10	SS	WH														
				FV															
338.9																			

RECORD OF BOREHOLE No 19-7A

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 680.6 N; 372 297.8 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 14, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION			STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa											
									○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
338.9 15.0	Clayey silt silty sand layers Firm Grey Wet								338									0 36 55 9			
					11	SS	WR***														
						FV															
337.4 16.5	Sand and silt with gravel, trace clay Compact Grey Wet 																				

METRIC

RECORD OF BOREHOLE No 19-9

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 695.0 N; 372 340.6 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 12, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
338.6 15.0	Clayey silt, trace sand Firm Grey Wet						20	40	60	80	100	20	40	60						
			11	SS	WH															
				FV																
	sandy silt layers																			
			12	SS	WH															
				FV																
			13	SS	WH															
				FV																
			14	SS	WH															
333.2 20.4	End of borehole																			
332.4 21.2	Dynamic cone penetration test started																			
	Probable silty sand Compact Grey Wet to dense																			
330.7 22.9	End of dynamic cone penetration test																			
	Refusal on probable bedrock																			
									</											

RECORD OF BOREHOLE No 19-10

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 665.0 N; 372 317.6 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE January 31, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
353.8	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	AS	-	▽*											
	Dark brown Moist																
	fine fibrous																
	Wet		2	SS	1	▼*											
			3	SS	WH**												
	amorphous		4	SS	WH										515.		
347.4	Silty clay		5	SS	WH												
6.4	trace to some sand			FV													
	organic inclusions																
	Very soft Grey Wet																
	to firm																
	clayey silt layers		6	SS	WH											0 12 68 20	
				FV													
			7	SS	WH												
				FV													
343.4	Clay, trace sand																
10.4	Soft to Grey Wet		8	SS	WH												
	firm			FV													
			9	SS	WH											0 5 43 52	
				FV													
	silty clay layers		10	SS	WH											0 7 57 36	
				FV													
338.8		Cont'd															

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19-11

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 700.0 N; 372 376.1 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 11, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa									
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
353.6	Ground Surface						20	40	60	80	100					
0.0	Peat, coarse fibrous Dark brown Wet fine fibrous		1	AS	-	▽* ▽*										
			2	SS	WH**											
			3	SS	WH											
			4	SS	WH									525	○	
347.7																
5.9	Clay, trace sand organic clayey silt layers Very soft Grey Wet		5	SS	WR***									162	○	
				FV			+	4								
			6	SS	WR									118	○	0 6 36 58
				FV			+	9								
			7	SS	WR										○	
				FV			+	10								
343.1																
10.5	Silty clay, trace sand Soft Grey Wet		8	SS	1											0 10 50 40
				FV			+	5								
			9	SS	1										○	
				FV			+	7								
			10	SS	WH										○	
				FV			+	6								
338.6																

METRIC
























20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19-11A

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 679.7 N; 372 360.3 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE									LAB VANE
353.6	Ground Surface							20	40	60	80	100									
0.0	Peat, coarse fibrous Dark brown Wet fine fibrous		1	AS	-	 * 	353														
																					
			2	SS	1		352														
																					
							351														
			3	SS	1		350														
																					
	amorphous		4	SS	WH**		349														
348.1							348														
5.5	Clay, trace sand																				
	Very soft Grey Wet to soft		5	SS	WR***		347														
				FV																	
							346														
			6	SS	WH																
				FV			345														
	thin sandy silt layers																				
			7	SS	WH		344														
				FV																	
343.1																					
10.5	End of borehole Refusal on probable bedrock																				
	<div>* 2010 02 15</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div>WH** denotes penetration due to weight of rods and hammer</div> <div>WR*** denotes penetration due to weight of rods only</div>																				

* 2010 02 15

▼ Water level observed
during drilling

▼ Water level measured
after drilling

WH** denotes penetration due
to weight of rods and
hammer

WR*** denotes penetration due
to weight of rods only

RECORD OF PENETRATION TEST No 19-12

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 665.0 N; 372 348.8 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 01, 2010 CHECKED BY C.N.







SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
353.8 0.0	Ground Surface Probable peat													
	Probable clay Soft													
	Probable sand Loose to compact													
343.1 10.7	End of dynamic cone penetration test Refusal on probable bedrock								120/3cm					

RECORD OF BOREHOLE No 19-13

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 630.0 N; 372 321.6 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 01, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
354.0	Ground Surface							20	40	60	80	100	20	40	60	kN/m ³	GR SA SI CL			
0.0	Peat, coarse fibrous		1	AS	WH**	 														
	Dark brown Moist																			
	Wet			2	SS		WH													
	fine fibrous																			
			3	SS	WH											399	Org. 80.1%			
350.0	Clay, trace sand organics																			
4.0	Very soft Grey Wet to soft			4	SS	WH														
					FV															
				5	SS	WH											132			
					FV															
	silty sand layers clayey silt layers			6	SS	1												0 42 36 22		
				FV																
			7	SS	WH															
				FV																
343.6	End of borehole																			
10.4	Refusal on probable bedrock																			
	<div>* 2010 02 01</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div>WH** denotes penetration due to weight of rods and hammer</div>																			

* 2010 02 01

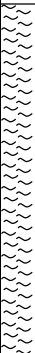

▽ Water level observed during drilling

▼ Water level measured after drilling

WH** denotes penetration due to weight of rods and hammer

RECORD OF PENETRATION TEST No 19-13A 1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 678.5 N; 372 391.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								\circ UNCONFINED	\bullet QUICK TRIAXIAL	$+$ FIELD VANE						\times LAB VANE		
353.8 0.0	Ground Surface Probable peat																	
	Probable silty clay Soft																	
345.2 8.6	End of dynamic cone penetration test Refusal on probable bedrock																	

RECORD OF BOREHOLE No 19-14

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 665.0 N; 372 380.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 11, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
354.0	Ground Surface							20	40	60	80	100						
0.0	Peat, coarse fibrous Dark brown Moist Wet fine fibrous		1	AS	-	* *												
352.5							353											
1.5	Silt cobbles and boulders		2	SS	5		352											
351.6	Loose Grey Wet																	
2.4	End of borehole Refusal on probable bedrock																	
<div>* 2010 02 11</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																		


METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 19-16

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 662.0 N; 372 410.0 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 10, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa										
						○ UNCONFINED			● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE					
353.7 0.0	Ground Surface Probable peat						20	40	60	80	100	20	40	60		
	Probable silty clay Soft						353									
							352									
							351									
							350									
							349									
							348									
							347									
							346									
							345									
							344.4 9.3	End of dynamic cone penetration test Refusal on probable bedrock								
						120/15cm										

1 of 1 **METRIC**

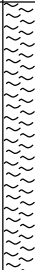

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RECORD OF BOREHOLE No 19-17

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 634.0 N; 372 388.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 11, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)						
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE											
354.0	Ground Surface							20	40	60	80	100							
0.0	Peat, coarse fibrous		1	AS	-														
	Dark Wet																		
	brown																		
			2	SS	1														
351.3	End of borehole																		
2.7	Refusal on probable bedrock																		

METRIC[illegible]

METRIC

RECORD OF BOREHOLE No 19-21

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 633.0 N; 372 450.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 09 & 10, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
354.0	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous Dark brown Moist fine fibrous Wet		1	AS	-	▼*											
			2	SS	1												
			3	SS	WH**												
			4	SS	WH									519			
348.5	Clay, trace sand organic inclusions Very soft Grey Wet to soft		5	SS	WH									150		0 1 15 84	
5.5				FV			+	5						97			
			6	TW	PM									130	13.5	0 3 50 47	
				FV			+	8									
			7	SS	WH												
			8	SS	WH												
				FV			+	10									
342.1	Sand, trace silt																
11.9																	
341.8	Grey Wet		9	AS	-												
12.2	End of borehole Dynamic cone penetration test started Probable sand Loose																
339.0																	

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 19-22

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 604.0 N; 372 427.9 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 02, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
354.0 0.0	Ground Surface Probable peat													
	Probable clay Soft													
	Probable silty sand Loose to compact													
339.7 14.3	End of dynamic cone penetration test Refusal on probable bedrock													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19-24

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 603.0 N; 372 459.3 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40					
354.0	Ground Surface													
0.0	Peat. coarse fibrous Dark brown Moist fine fibrous Wet		1	AS	-	▽*								
						▼*								
			2	SS	WH**									
			3	SS	WH									
350.0	Silty clay, organics													
4.0	Soft Grey Wet													
349.1	Sand, trace silt		4	SS	9									
4.9	Loose Grey Wet													
			5	SS	5									
			6	SS	1									
			7	SS	1									
344.2	End of borehole													
9.8	Dynamic cone penetration test started													
	Probable sand													
	Loose to compact													
339.0														

METRIC

RECORD OF BOREHOLE No 19-25

1 of 2



METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 574.0 N; 372 436.3 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
DATUM Geodetic DATE February 02 & 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _P	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
354.0	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous Dark brown		1	AS	-															
	fine fibrous																			
	Wet		2	SS	2															
			3	SS	2															
349.7	Organic clay																			
4.3	Grey Wet		4	SS	WH**															
349.1	Clay, trace sand organic inclusions			FV																
4.9	Very soft Grey Wet to soft																			
			5	SS	WH															
				FV																
	silty sand layers clayey silt layers		6	SS	WH															
			7	SS	2															
			8	SS	WH															
				FV																
342.1	Sand some silt, some clay																			
11.9	Loose Grey Wet		9	SS	8															
340.4	End of borehole																			
13.6	Refusal on probable bedrock																			
	Cont'd																			

Cont'd

METRIC

SOIL PROFILE				SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
339.0							SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	20 40 60	GR SA SI CL		

[illegible]

RECORD OF PENETRATION TEST No 19-26

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 602.0 N; 372 489.6 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
353.8 0.0	Ground Surface Probable peat													
	Probable sand Loose to compact													
342.8 11.0	End of dynamic cone penetration test Refusal on probable bedrock								120/8cm					

RECORD OF BOREHOLE No 19-27

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 573.0 N; 372 467.6 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60	W _p W W _L				
354.1	Ground Surface													
0.0	Peat, coarse fibrous		1	AS	-									
	Dark brown Moist													
	Wet		2	SS	2									
	fine fibrous		3	SS	1									
350.3	Sand, trace silt													
3.8	Loose Grey Wet		4	SS	5									
			5	SS	5									
			6	SS	5									
			7	SS	4									
			8	SS	4									
341.6	End of borehole													
12.5	Dynamic cone penetration test started													
	Probable sand													
	Loose to dense													

Cont'd

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 19-27A

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 558.2 N; 372 456.1 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
DATUM Geodetic DATE February 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60	W _p w W _L				
354.1 0.0	Ground Surface Probable peat						354							
							353							
							352							
							351							
							350							
	Probable sand Loose to compact						349							
							348							
							347							
							346							
							345							
							344							
							343							
							342							
							341							
339.9 14.2	End of dynamic cone penetration test Refusal on probable bedrock						340							

RECORD OF PENETRATION TEST No 19-28

1 of 2 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 545.0 N; 372 445.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
354.2 0.0	Ground Surface Probable peat						354							
	Probable sand						353							
	Loose to compact						352							
							351							
							350							
							349							
							348							
							347							
							346							
							345							
							344							
							343							
							342							
							341							
							340							

RECORD OF PENETRATION TEST No 19-28

2 of 2 **METRIC**

G.W.P. 6020-09-00	LOCATION	Coords: 5 510 545.0 N; 372 445.5 E	ORIGINATED BY	F.P.
DIST Kenora HWY 17	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	G.D.
DATUM Geodetic	DATE	February 03, 2010	CHECKED BY	C.N.

[illegible]

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 19-30

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 543.0 N; 372 475.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 08, 2010 CHECKED BY C.N.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		WATER CONTENT (%)	GR	SA	SI	CL
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×	LAB VANE								
339.2	Refusal on probable bedrock																				
	<div>* 2010 02 08</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> <div>WH** denotes penetration due to weight of rods and hammer</div>																				

RECORD OF BOREHOLE No 19-31

1 of 1

METRIC

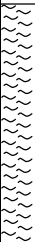
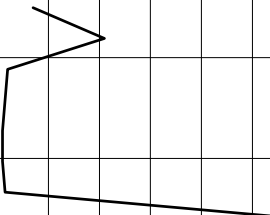
G.W.P. 6020-09-00 LOCATION Coords: 5 510 572.0 N; 372 529.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				GR	SA	SI	CL
354.6	Ground Surface					*														
0.0	Topsoil		1	AS	-															
354.3	End of borehole																			
0.3	Refusal on probable bedrock																			
	Sample 1: Sampler bouncing																			

RECORD OF PENETRATION TEST No 19-32

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 543.0 N; 372 507.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 08, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
353.8 0.0	Ground Surface Probable peat														
351.4 2.4	End of dynamic cone penetration test Refusal on probable bedrock														

METRIC






20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19-34

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 542.0 N; 372 538.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
355.2	Ground Surface																			
0.0	Topsoil		1	AS	-	 *  *	355													
354.9	Sand, trace silt						354													
0.3	Loose Brown Moist to wet																			
353.4			2	SS	20/15cm															
1.8	End of borehole																			
	Refusal on probable bedrock																			
	Sample 2: Sampler bouncing																			
	<div>* 2010 02 09</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																			

RECORD OF BOREHOLE No 19-35

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 513.0 N; 372 515.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 08, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p W W _L				WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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355.2	Ground Surface					*		20	40	60	80	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

RECORD OF BOREHOLE No 19-36

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 540.0 N; 372 568.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Test Pit COMPILED BY G.D.
 DATUM Geodetic DATE January 31, 2010 CHECKED BY C.N.



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
355.2	Ground Surface					*											
0.0	Silty sand, trace gravel cobbles						355										
354.7	Brown Moist																
0.5	End of borehole Refusal on probable bedrock																
	* Borehole dry																

RECORD OF BOREHOLE No 19-37

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 512.0 N; 372 546.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Test Pit COMPILED BY G.D.
 DATUM Geodetic DATE January 31, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
357.2	Ground Surface						357										
0.0	Silty sand, trace gravel							○ UNCONFINED + FIELD VANE									
356.9								● QUICK TRIAXIAL × LAB VANE									
0.3	Brown Moist							20	40	60	80	100		20	40	60	
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry																

RECORD OF PENETRATION TEST No 19-38

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 485.0 N; 372 525.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 09, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
354.1 0.0	Ground Surface						354										
	Probable silty sand																
353.6 0.5	End of dynamic cone penetration test																
	Refusal on probable bedrock																








1 of 1

DATUM Geodetic DATE February 14, 2010 CHECKED BY C.N.

ON_AP VER 3 09TF009D-SWAMP 19.GPJ ON_MOT.GDT 4/9/2010 12:40:47 PM

RECORD OF AUGER PROBE No 19-AP2 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 710.8 N; 372 289.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 16, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✚ FIELD VANE	✕ LAB VANE									
353.7	Ground Surface																			
0.0	Peat, coarse fibrous																			
	Dark brown Moist																			
	fine fibrous																			
	Wet																			
350.2	Silty clay, trace sand																			
3.5	Grey Wet																			
348.1	End of Auger Probe																			
5.6	Refusal on probable bedrock																			
	* 2010 02 16																			
	 Water level observed during drilling																			
	 Water level measured after drilling																			

1 of 2

— CHECKED BY C.N.

ON_AP VER 3 09TF009D-SWAMP 19.GPJ ON_MOT.GDT 4/9/2010 12:40:48 PM

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF AUGER PROBE No 19-AP3 2 of 2 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 710.4 N; 372 320.8 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE February 15, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
338.7 15.0	Clay, trace sand						338	20	40	60	80	100						
337.5 16.2	(Cont'd)																	
336.8 16.9	Silty sand, trace gravel cobbles						337											
	End of auger probe Refusal on probable bedrock																	
	<div>* 2010 02 15</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																	

1 of 2

DATUM Geodetic DATE February 16, 2010 CHECKED BY C.N.

ON_AP VER 3 09TF009D-SWAMP 19.GPJ ON_MOT.GDT 4/9/2010 12:40:49 PM

σ , $\times 5$: Numbers refer to Sensitivity

(%) STRAIN AT FAILURE

2 of 2

— CHECKED BY C.N.

(%) STRAIN AT FAILURE

1 of 1

 CHECKED BY C.N.

ON AP VER 3 09TF009D-SWAMP 19.GPJ ON MOT.GDT 4/9/2010 12:40:50 PM

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 1

— CHECKED BY C.N.

DATE February 01, 2010

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF AUGER PROBE No 19-AP7 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 589.0 N; 372 416.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.S.S.A. and Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE February 11, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60	W _p W W _L				
354.1	Ground Surface													
0.0	Peat, coarse fibrous Dark brown Moist Wet fine fibrous amorphous													
348.9	Clay, trace silt organics Grey Wet silty sand layers													
344.4	End of auger probe and dynamic cone penetration test Refusal on probable bedrock													
9.7														



SWAMP 19

Testholes From GWP 6053-03-00

16+850.0 220.0 Rt C/L 353.57 HA 19-P1
(5510731.509 N, 372312.866 E)

0 - 5.2 Dk Br F-Co Fib Org M Wet
5.2 - 5.3 Gry Sa And Gr Sat
5.3 NFP Cob
Fr Wat @ 300

16+910.0 260.0 Rt C/L 353.62 HA 19-P2
(5510676.451 N, 372387.033 E)

0 - 5.1 Dk Br F-Co Fib Org M Wet
5.1 NFP Si(y) Sa/Cob
Fr Wat @ 100

16+980.0 290.0 Rt C/L 353.68 HA 19-P3
(5510633.744 N, 372463.012 E)

0 - 7.3 Dk Br F-Co Fib Org M Num Wd
Pieces Wet
7.3 NFP TH Terminated
Fr Wat @ 200

TP0132

0 - 350 Blk Org (Co Fib) Occ Bld
350 NFP BR

HA0644(Swamp 19)

0 - 7.2 Blk Org (Amor) (Wet)
7.2 - 7.5 Gry Si(y) Cl (Wet & Soft)
7.5 NFP Sloughing

HA0643(Swamp 19)

0 - 7.0 Blk Org (Amor) (Wet)
7.0 - 7.5 Gry Si(y) Cl (Wet & Soft)
7.5 NFP Sloughing

HA0645(Swamp 19)

0 - 100 Tps
100 - 200 Br F-Med Sa Tr Si
200 NFP BR

HA0646(Swamp 19)

0 - 7.0 Blk Org (Amor) (Wet)
7.0 - 7.5 Gry Si(y) Cl (Wet & Soft)
7.5 NFP Sloughing

HA0647(Swamp 19)

0 - 7.4 Blk Org (Amor) (Wet)
7.4 - 7.5 Gry Si(y) Cl (Wet & Soft)
7.5 NFP Sloughing

HA0649(Swamp 19)

0 - 3.6 Blk Org (Amor) (Wet)
3.6 - 3.9 Gry Si(y) Sa (Wet)
3.9 NFP Sloughing

HA0648(Swamp 19)

0 - 3.3 Blk Org (Amor) (Wet)
3.3 - 3.4 Gry Si(y) Sa (Wet)
3.4 NFP Sloughing

HA0377

0 - 160 Blk Org (Co Fib) (Moist)
160 NFP Frag BR

HA0379

0 - 120 Tps
120 NFP BR

HA0380

0 - 140 Tps
140 NFP BR

HA0650(Swamp 19)

0 - 120 Tps
120 - 220 Br Si(y) Sa (Moist)
220 NFP BR

HA0378

0 - 40 Tps
40 NFP BR

HA0381

0 - 140 Tps
140 NFP BR

HA0383

0 - 180 Blk Org (Co Fib) (Moist)
180 NFP Frag BR

HA0384

0 - 80 Tps
80 NFP BR

HA0382

0 - 140 Tps
140 NFP Frag BR

HA0385

0 - 140 Tps
140 - 300 Br F-Med Sa Tr Si (Moist)
300 NFP Frag BR

HA0388

0 - 190 Blk Org (Co Fib) (Moist)
190 NFP Frag BR

HA0387

0 - 160 Blk Org (Co Fib) (Moist)
160 NFP BR

HA0386

0 - 40 Tps
40 NFP BR

TP0149

0 - 300 Blk Org (Co Fib)
300 - 400 Hi Weath/Frag BR with Sa & Gr

SWAMP 19A

METRIC

SOIL PROFILE				SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT w_p w w_L 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
359.4	Ground Surface										

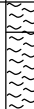
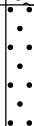

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
359.4 0.0	Ground Surface Peat, fine fibrous Dark brown Wet		1	SS	WH**	*	359									0 2 35 63			
								*	358										
			2	SS	1					*	357								
356.7 2.7	Clay, trace sand Firm to Grey Moist soft											*	356						
		3	SS	5	*	355													
			FV				*	354											
		4	SS	WH					*	353									
			FV								*	120/0cm							
353.5 5.9	Sand trace silt, trace gravel Loose Grey Wet				*	352													
352.1 7.3	End of borehole Refusal on probable bedrock							*					120/0cm						
					*	120/0cm													
							*	120/0cm											
					*	120/0cm													
							*	120/0cm											
					*	120/0cm													
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							*	120/0cm											

RECORD OF BOREHOLE No 19A-1A

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 431.5 N; 372 715.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 27, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.5	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous amorphous Dark brown Wet		1	AS	-	▽*											
358.4																	
1.1	Sand trace silt, trace gravel Loose Grey Wet		2	SS	6	▽*											
357.1																	
2.4	Clay, trace sand Stiff Grey Moist		3	SS	8												
				FV													
354.9																	
4.6	End of borehole Refusal on probable bedrock																
<div>* 2010 02 27</div> <div>▽ Water level observed during drilling</div> <div>▽ Water level measured after drilling</div> <div>■ Penetrometer test</div>																	

METRIC

METRIC

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19A-1E

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 416.0 N; 372 701.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
359.4	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown		1	AS	-	▼*	▽*	359									
358.9	Silty sand, trace clay Grey Wet																
0.5																	
358.2	Clay, trace sand Stiff Grey Moist																
1.2			2	SS	1												
				FV													
356.3	End of borehole Refusal on probable bedrock																
3.1																	
<div>* 2010 03 01</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> <div>■ Penetrometer test</div> <div>Note: Exposed rock at Sta. 17+383, 19.0m Lt.</div>																	

* 2010 03 01

▽ Water level observed
during drilling

▼ Water level measured
after drilling

■ Penetrometer test

Note: Exposed rock at
Sta. 17+383, 19.0m Lt.

RECORD OF BOREHOLE No 19A-1F

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 405.8 N; 372 689.6 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
361.2	Ground Surface					*												
0.0	Silty sand, trace gravel		1	AS	-		361											
360.7	Brown Moist																	
0.5	End of borehole Refusal on probable bedrock																	
	* Borehole dry																	

RECORD OF BOREHOLE No 19A-1G

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 430.4 N; 372 699.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.4 0.0	Ground Surface						20	40	60	80	100	20	40	60			
359.2 0.2	Peat, coarse fibrous Dark brown		1	AS	-												
	Silty sand Loose Brown Wet																
	sandy silt layers Grey		2	SS	9												
357.0 2.4	Silty clay, trace sand sandy silt layers Firm Grey Moist																
			3	SS	5												
354.8 4.6	End of borehole Refusal on probable bedrock																
<div>* 2010 03 02</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																	

RECORD OF PENETRATION TEST No 19A-2


1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 391.5 N; 372 709.5 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						
359.3 0.0	Ground Surface Probable peat							20 40 60 80 100						
	Probable silty clay Soft to firm						359							
							358							
							357							
							356							
354.8 4.5	Probable silty sand Compact						355							
	End of dynamic cone penetration test Refusal on probable bedrock							120/20cm						

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity



(%) STRAIN AT FAILURE

METRIC








20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19A-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 401.4 N; 372 729.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 23, 2010 CHECKED BY G.D.










SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE						
359.5	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous Dark brown fine fibrous Wet		1	SS	4	 	359									Frozen	
			2	SS	1												
356.8							357										
2.7	Clay, trace sand Firm Grey Moist Soft Wet		3	SS	5		356										
							355										
			4	SS	WH**		354										
				FV													
353.4	Clayey silt trace sand, trace gravel		5	SS	15		353										
6.1	Firm to Grey Wet stiff																
352.8	End of borehole Refusal on probable bedrock																
6.7																	
	* 2010 02 23																
	 Water level observed during drilling																
	 Water level measured after drilling																
	WH** Penetration due to weight of rods and hammer																

RECORD OF BOREHOLE No 19A-4A

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 370.6 N; 372 708.5 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

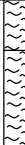




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								20 40 60 80 100									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
								WATER CONTENT (%)									
								20 40 60									
359.3	Ground Surface																
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-		359										
358.1	Clay, trace sand organic inclusions						358										
1.2	Firm Grey Moist to wet		2	SS	WH**										81	0 6 28 66	
				FV			357										
						 *											
356.4	Silty sand, trace gravel					 *											
2.9	Compact Grey Wet		3	SS	23		356										
355.8	End of borehole																
3.5	Refusal on probable bedrock																
* 2010 02 26																	
 Water level observed during drilling																	
 Water level measured after drilling																	
WH** Penetration due to weight of rods and hammer																	

RECORD OF BOREHOLE No 19A-4B

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 386.3 N; 372 718.7 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
DATUM Geodetic DATE February 27, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	WATER CONTENT (%)								
359.3	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-															
357.8																				
1.5	Clay, trace sand Soft to Grey Wet firm		2	SS	WH**															
				FV																
	silty clay layers																			
			3	SS	2															
				FV																
			4	SS	WH															
				FV																
353.2																				
6.1	Sand trace silt, trace gravel		5	SS	20															
352.7	Compact Grey Wet																			
6.6	End of borehole Refusal on probable bedrock																			

* 2010 02 27

▽ Water level observed
during drilling

▼ Water level measured
after drilling

WH** Penetration due to
weight of rods and
hammer

RECORD OF BOREHOLE No 19A-5

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 378.2 N; 372 733.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES		SHEAR STRENGTH kPa									
							○ UNCONFINED							+ FIELD VANE		
						● QUICK TRIAXIAL	× LAB VANE			WATER CONTENT (%)						
359.4	Ground Surface						20	40	60	80	100	20	40	60		
0.0	Peat, coarse fibrous Dark brown fine fibrous amorphous		1	AS	-											
357.4	Clay, trace sand Soft Grey Moist		2	SS	WH**											
2.0				FV												
			3	SS	2									0 2 39 59		
				FV												
	thin layers of silty clay		4	SS	WH											
				FV												
353.6	Silty clay, trace sand Soft Grey Moist		5	SS	WH											
5.8																
352.7	Silty sand, trace gravel Loose Grey Wet															
6.7																
352.0	End of borehole Refusal on probable bedrock															
7.4																
			</													

RECORD OF PENETRATION TEST No 19A-6

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 346.9 N; 372 711.3 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE				WATER CONTENT (%)							
359.1 0.0	Ground Surface Probable peat						359	20	40	60	80	100					
357.1 2.0	Probable silt Compact						358	20	40	60	80	100					
	End of dynamic cone penetration test																
	Refusal on probable bedrock																

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 19A-8

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 357.1 N; 372 730.0 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE						
359.2	Ground Surface																
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-	▼*											
357.4			2	SS	WH**												
1.8	Clay, trace sand Very soft Grey Moist to firm			FV													
			3	SS	2												
				FV													
354.2						▽*											
5.0	Sandy silt		4	SS	1												
353.9																	
5.3	Loose Grey Wet End of borehole Refusal on probable bedrock																

* 2010 02 26

▽ Water level observed
during drilling

▼ Water level measured
after drilling

■ Penetrometer test

WH** Penetration due to
weight of rods and
hammer

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 19A-10

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 368.2 N; 372 751.7 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
DATUM Geodetic DATE February 24, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L				
359.3 0.0	Ground Surface Probable peat						359							
	Probable clay Soft to firm						358							
							357							
							356							
							355							
							354							
							353							
	Probable silty sand Compact						352							
351.7 7.6	End of dynamic cone penetration test Refusal on probable bedrock													

METRIC[illegible]

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19A-13

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 343.8 N; 372 751.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE										
								20	40	60	80	100								
359.3	Ground Surface																			
0.0	Peat, coarse fibrous Dark brown fine fibrous		1	AS	-		359													
							358													
357.5	Clay, trace sand		2	SS	WH**															
1.8	Soft Grey Moist to wet			FV			357	+												
			3	SS	2		356									82				
				FV																
							355	+												
354.1			4	SS	1															
5.2	Silty sand, trace gravel						354													
353.9	Compact Grey Wet																			
5.4	End of borehole Refusal on probable bedrock																			
<div>* 2010 02 26</div> <div><div>▽</div>Water level observed during drilling</div> <div><div>▼</div>Water level measured after drilling</div> <div>WH** Penetration due to weight of rods and hammer</div>																				

* 2010 02 26


▽ Water level observed
during drilling

▼ Water level measured
after drilling

WH** Penetration due to
weight of rods and
hammer

RECORD OF PENETRATION TEST No 19A-13A 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 380.7 N; 372 787.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		w _p	w	w _L		
359.6 0.0	Ground Surface Probable peat							20 40 60 80 100						GR SA SI CL
	Probable silty clay Firm													
352.6 7.0	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 19A-14

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 351.2 N; 372 773.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 24, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	WATER CONTENT (%)								
359.5	Ground Surface						20	40	60	80	100	20	40	60		GR	SA	SI	CL	
0.0	Peat, coarse fibrous Dark brown		1	AS	-		359													
	amorphous						358													
357.7			2	SS	WH**															
1.8	Clay, trace sand			FV			357													
	Soft to Grey Moist very soft																			
			3	SS	3		356										0	2	31	67
					FV															
			4	SS	1		355													
					FV		354													
353.7																				
5.8	Silty clay, trace sand thin layers of clay						353													
	Very soft Grey Moist			5	SS	WH														
				FV			352													
352.3																				
7.2	Sandy silt, trace clay																			
	Loose to Grey Wet compact			6	SS	15/23cm														
351.4																				
8.1	End of borehole																			
	Refusal on probable bedrock																			
	Sample 6: Sampler bouncing																			
	* 2010 02 24																			
	Water level observed during drilling																			
	Water level measured after drilling																			
	WH** Penetration due to weight of rods and hammer																			

RECORD OF PENETRATION TEST No 19A-15 1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 320.7 N; 372 752.3 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE February 26, 2010 CHECKED BY G.D.
















SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L	WATER CONTENT (%)			
359.1 0.0	Ground Surface Probable peat						359							
	Probable clay Soft to firm						358							
							357							
							356							
355.6 3.5	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 19A-16

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 363.0 N; 372 792.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
359.5	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-	▽*	359										
358.0							358										
1.5	Clay, trace sand organics to 2.0m Soft to Grey Moist firm to wet		2	SS	WH**		357	+	3							135	
				FV			356	■	17								0 4 40 56
			3	SS	3		355	+	6								
				FV		▼*	354										
			4	SS	WH		353										
				FV			352										
353.7	Clayey silt, trace sand thin layers of silt																
5.8	Soft Grey Wet		5	SS	1												
352.9	Sand and silt, with gravel thin layers of clayey silt																
6.6	Loose to Grey Wet compact																
			6	SS	30												28 31 35 6
351.3																	
8.2	End of borehole Refusal on probable bedrock																
	<div>* 2010 03 01</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> <div>■ Penetrometer test</div> <div>WH** Penetration due to weight of rods and hammer</div>																

RECORD OF BOREHOLE No 19A-17

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 330.7 N; 372 772.8 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
DATUM Geodetic DATE February 25, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)									
359.3	Ground Surface							20	40	60	80	100									
0.0	Peat, coarse fibrous		1	AS	-		359														
	Dark brown																				
	fine fibrous																				
	amorphous						358														
357.5			2	SS	1																
1.8	Clay, trace sand			FV			357	+ ⁶													
	Soft to firm																				
	Grey																				
	Moist to wet																				
			3	SS	WH**		356	■									0	2	35	63	
				FV				+ ⁶													
	thin layers of sandy silt						355														
			4	TW	PM		354	○									16.4	0	4	48	48
				FV																	
		5	SS	WH		353															
			FV					+ ³													
352.0							352														
7.3	Sandy silt, trace clay																				
351.2	Compact Grey Wet		6	SS	16																
8.1	End of borehole																				
	Refusal on probable bedrock																				
	* 2010 02 25																				
	▽ Water level observed during drilling																				
	▼ Water level measured after drilling																				
	■ Penetrometer test																				
	WH** Penetration due to weight of rods and hammer																				

RECORD OF BOREHOLE No 19A-17A 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 313.0 N; 372 764.1 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×						LAB VANE		
359.4	Ground Surface																			
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-															
357.6			2	SS	WH**															
1.8	Clay, trace sand Soft Grey Moist to wet			FV																
			3	SS	1															
				FV																
			4	SS	WH															
354.2																				
5.2	Silty sand, trace gravel																			
353.9																				
5.5	Loose Grey Wet End of borehole Refusal on probable bedrock																			

* 2010 03 02

▽ Water level observed
during drilling

▼ Water level measured
after drilling

WH** Penetration due to
weight of rods and
hammer

RECORD OF BOREHOLE No 19A-18

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 374.0 N; 372 812.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
359.4	Ground Surface							20	40	60	80	100								
0.0	Peat, coarse fibrous Dark brown		1	AS	-	▼* ▽*	359													
	fine fibrous																			
	amorphous																			
358.0							358													
1.4	End of borehole Refusal on probable bedrock																			
	 * 2010 03 01																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF PENETRATION TEST No 19A-19

1 of 1 **METRIC**

G.W.P. 6020-09-00	LOCATION	Coords: 5 510 340.5 N; 372 793.4 E	ORIGINATED BY	F.P.
DIST Kenora HWY 17	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	T.X.
DATUM Geodetic	DATE	February 24, 2010	CHECKED BY	G.D.

[illegible]

RECORD OF BOREHOLE No 19A-20



1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 307.5 N; 372 774.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 28, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.7	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-												
357.9			2	SS	WH**												
1.8	Clay, trace sand Soft to firm Grey Moist to wet			FV													
			3	SS	2												
				FV													
			4	SS	WH												
				FV													
353.6	Silty clay, trace sand Soft Grey Wet		5	SS	WH												
6.1				FV													
352.5	End of borehole Refusal on probable bedrock																
7.2																	
																</	

METRIC

SOIL PROFILE				SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
359.3	Ground Surface										

[illegible]

RECORD OF BOREHOLE No 19A-22

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 318.0 N; 372 794.8 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
DATUM Geodetic DATE February 25, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE	20	40	60						80	100	20
359.4	Ground Surface																			
0.0	Peat, coarse fibrous Dark brown amorphous		1	AS	-															
			2	SS	WH**															
357.3	Silty clay trace sand, trace gravel organic inclusions			FV																
2.1	Very soft Grey Moist to firm to wet																			
			3	SS	4															
				FV																
			4	SS	WH															
				FV																
			5	SS	WH															
				FV																
352.1	Sandy silt, trace clay																			
7.3	Loose Grey Wet		6	SS	6															
350.7	End of borehole																			
8.7	Refusal on probable bedrock																			



METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

METRIC

SOIL PROFILE				SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
359.5	Ground Surface										

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa										w _p	w	w _L
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)								
359.5 0.0	Ground Surface Peat, fine fibrous Dark brown amorphous Wet		1	AS	-		359													
357.7 1.8	Clay, trace sand Soft to firm Grey Moist to wet		2	SS	WH**		FV	358												
353.7 5.8	Silty clay, trace sand Soft to firm Grey Wet						357													
		3	SS	3	FV		356													
							355													
		4	SS	WH	FV		354													
352.2 7.3	Silty sand, trace gravel		5	SS	WH															
351.9 7.6	End of borehole Refusal on probable bedrock																			
<div>* 2010 02 28</div> <div> Water level observed during drilling</div> <div> Penetrometer test</div> <div>WH** Denotes penetration due to weight of rods and hammer</div>																				

RECORD OF PENETRATION TEST No 19A-24 1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 293.8 N; 372 795.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE February 27, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE					
359.2 0.0	Ground Surface Probable peat						20	40	60	80	100	20	40	60	
	Probable silty clay Soft to firm						359								
							358								
							357								
							356								
							355								
							354								
353.6 5.6	End of dynamic cone penetration test Refusal on probable bedrock														

METRIC

G.W.P.	6020-09-00	LOCATION	Coords: 5 510 338.4 N; 372 835.0 E	ORIGINATED BY	F.P.
DIST	Kenora	HWY	17	BOREHOLE TYPE	Continuous Flight Hollow Stem Augers
DATUM	Geodetic	DATE	February 28, 2010	COMPILED BY	T.X.
				CHECKED BY	G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100					
359.4 0.0	Ground Surface												
358.6 0.8	Peat, fine fibrous Dark brown amorphous		1	AS	-	☒ [*] ☒ [*]	359						
357.4 2.0	Sandy silt, trace clay Very loose Brown/ Wet grey		2	SS	3		358						
356.3 3.1	Clay, trace sand Firm Grey Moist			FV			357	☒ ¹¹					
End of borehole Refusal on probable bedrock													
* 2010 02 28													
☒ Water level observed during drilling													
☒ Water level measured after drilling													

RECORD OF PENETRATION TEST No 19A-25A 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 322.1 N; 372 825.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100		
359.2 0.0	Ground Surface Probable peat						359							
	Probable silty clay						358							
	Firm						357							
355.9 3.3	End of dynamic cone penetration test Refusal on probable bedrock						356							

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 19A-27

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 350.5 N; 372 855.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L				WATER CONTENT (%)	GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE								
359.7	Ground Surface		1	AS	-		359														
0.0 359.4 0.3	Peat, coarse fibrous Dark brown																				
	Sand trace silt, trace gravel Brown Wet																				
358.2 1.5	End of borehole Refusal on probable bedrock																				
	* 2010 03 01																				
	Water level observed during drilling																				
	Water level measured after drilling																				

RECORD OF PENETRATION TEST No 19A-28 1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 316.1 N; 372 836.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.

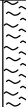













SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.6 0.0	Ground Surface Probable peat						359										
358.7 0.9	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 19A-29

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 281.6 N; 372 818.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
359.2	Ground Surface						20	40	60	80	100									
0.0	Peat, amorphous Dark brown		1	AS	-	 *	359													
358.1							358													
1.1	Clay, trace sand																			
357.4	Soft to Grey Moist firm to wet		2	SS	4	 *	357								○					
1.8	Silt, trace sand, trace clay																			
356.8	Loose Grey Wet																			
2.4	Clay, trace sand																			
	Stiff Grey Moist																			
355.5			3	SS	24		356													
3.7	End of borehole Refusal on probable bedrock																			
	<div>* 2010 03 02</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div> Penetrometer test</div>																			

RECORD OF BOREHOLE No 19A-30

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 326.9 N; 372 856.8 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 01, 2010 CHECKED BY G.D.







SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
359.5	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	SS	16												
358.9	Dark brown																
0.6	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry																

RECORD OF BOREHOLE No 19A-31

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 293.4 N; 372 839.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE February 25, 2010 CHECKED BY G.D.


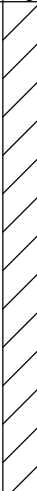

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.2	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous <u> Dark brown </u> /		1	AS	-		359										
358.4	fine fibrous																
0.8	Sand, trace silt																
357.8	Brown Moist						358										
1.4	Clay, trace sand																
	Firm to Grey Moist stiff		2	SS	5												
							357										
356.6	End of borehole																
2.6	Refusal on probable bedrock																

1 of 1 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF AUGER PROBE No 19A-AP1 1 of 1 METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 308.6 N; 372 811.3 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY T.X.
 DATUM Geodetic DATE March 02, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×									LAB VANE		
359.3 0.0	Ground Surface Peat, fine fibrous Dark brown amorphous						359																
358.4 0.9	Clay Grey Moist						358																
							357																
							356																
							355																
							354																
353.5 5.8	End of borehole Refusal on probable bedrock																						
	<div>* 2010 03 02</div> <div> Water level observed during drilling</div>																						

HA0405

0 - 140 Tps
140 NFP Bld

HA0408

0 - 100 Tps
100 - 280 Br F-Med Sa Tr Si (Moist)
280 NFP BR

HA0407

0 - 100 Tps
100 - 400 Br F-Med Sa Tr Si (Moist)
400 NFP Frag BR

HA0406

0 - 40 Tps
40 NFP Frag BR

TP0151

0 - 160 Blk Org (Co Fib)
160 NFP BR

TP0152

0 - 100 Tps
100 NFP BR

HA0410(Swamp 19A)

0 - 1.5 Blk Org (Co Fib) (Wet)
1.5 - 2.4 Gry Si(y) Cl (Moist)
2.4 NFP Sloughing

HA0409(Swamp 19A)

0 - 1.7 Blk Org (Co Fib) (Wet)
1.7 - 2.6 Gry Si(y) Cl (Moist)
2.6 NFP Sloughing

Sample No. 09-MC-012 (1.7 – 2.2)HA0409

% Passing 4.75 mm 100.0 %
% Passing 75 um 64.5 %
FMC @ 2.2 35.9 %
W_L 32 %
W_p 17 %
I_p 15
Group Symbol CL

HA0411(Swamp 19A)

0 - 2.0 Blk Org (Co Fib) (Wet)

2.0 - 2.5 Gry Si(y) Cl (Moist)
2.5 NFP Sloughing

HA0412(Swamp 19A)

0 - 1.9 Blk Org (Co Fib) (Wet)
1.9 - 2.6 Gry Si(y) Cl (Moist)
2.6 NFP Sloughing

HA0413(Swamp 19A)

0 - 2.1 Blk Org (Co Fib) (Wet)
2.1 - 2.7 Gry Si(y) Cl (Moist)
2.7 NFP Sloughing

HA0415(Swamp 19A)

0 - 100 Tps
100 - 230 Br F-Med Sa Tr Si (Moist)
230 NFP Frag BR

HA0414(Swamp 19A)

0 - 150 Blk Org (Co Fib) (Moist)
150 - 400 Br F-Med Sa Tr Si (Moist)
400 NFP Frag BR

HA0416

0 - 160 Blk Org (Co Fib) (Moist)
160 NFP BR

HA0418

0 - 100 Tps
100 - 300 Br F-Med Sa with Si (Moist)
300 NFP BR

HA0419

0 - 100 Tps
100 NFP Frag BR

HA0417

0 - 140 Tps
140 NFP Frag BR

HA0420

0 - 120 Tps
120 NFP BR

HA0423

0 - 120 Tps
120 NFP BR

SWAMP 20

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 20-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 077.8 N; 373 514.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 08, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
356.7	Ground Surface							20	40	60	80	100									
0.0 356.4 0.3	Peat, fine fibrous Dark brown Silty sand Grey Wet		1	AS	-	▽* ▽*															
355.3 1.4	Sand, trace silt Loose Grey Wet						356														
354.6 2.1	Silty clay, trace sand Firm Grey Moist		2	SS	4		355						o								
353.6 3.1	End of borehole Refusal on probable bedrock						354														
<div>* 2010 03 08</div> <div>▽ Water level observed during drilling</div> <div>▽ Water level measured after drilling</div>																					

* 2010 03 08

▽ Water level observed
during drilling








▽* Water level measured
after drilling

RECORD OF BOREHOLE No 20-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 096.1 N; 373 525.8 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
356.5	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown Wet		1	AS	-	 *  *	356													
355.4																				
1.1	Clayey silt trace sand, trace gravel organic inclusions Stiff Grey						355													
354.1			2	SS	5															
2.4	End of borehole Refusal on probable bedrock																			
<div><div>*</div><div>2010 03 08</div></div> <div><div></div><div>Water level observed during drilling</div></div> <div><div></div><div>Water level measured after drilling</div></div> <div><div></div><div>Penetrometer test</div></div>																				

* 2010 03 08

▼ Water level observed
during drilling

▼ Water level measured
after drilling

■ Penetrometer test

RECORD OF BOREHOLE No 20-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 133.0 N; 373 540.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE								
357.3	Ground Surface							20	40	60	80	100								
0.0	Topsoil	~					357													
357.0	End of borehole																			
0.3	Refusal on probable bedrock																			
	* Borehole dry																			

RECORD OF PENETRATION TEST No 20-5

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 076.2 N; 373 537.0 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 08, 2010 CHECKED BY G.D.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa										
									○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL					
356.6 0.0	Ground Surface Probable peat							20 40 60 80 100				20 40 60				
	Probable clayey silt Firm															
	Probable sandy silt Loose to compact															
349.6 7.0	End of dynamic cone penetration test Refusal on probable bedrock															

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 20-8

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 150.8 N; 373 566.3 E ORIGINATED BY F.P.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 09, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
								20	40	60	80	100								
356.2	Ground Surface																			
0.0	Peat, fine fibrous Dark brown amorphous		1	AS	-	▼*	356													
							355													
			2	SS	WH**		354													
353.8	Silt with sand, trace clay silty sand layers						353													
2.4	Loose to Grey Wet compact		3	SS	14															
352.4	End of borehole																			
3.8	Refusal on probable bedrock																			

RECORD OF PENETRATION TEST No 20-9

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 112.6 N; 373 564.6 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)						
						20 40 60 80 100 20 40 60 80 100					20 40 60						
356.4 0.0	Ground Surface																
	Probable peat																

	Probable silty clay																
	Firm																

	Probable silty sand																
353.7 2.7	Loose to compact																
	End of dynamic cone penetration test																
	Refusal on probable bedrock																
	Note: Exposed rock some 8.0m to the east																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10



SWAMP 20

Testholes From GWP 6053-03-00

18+130.0 560.0 Rt C/L 356.27 HA 20-P1
(5510139.800 N, 373568.843 E)
0 - 1.8 Dk Br F-Co Fib Org M Wet
1.8 NFP Si(y) Sa/Cob
Fr Wat @ 0

HA0697

0 - 60 Tps
60 NFP BR

HA0698

0 - 30 Tps
30 NFP BR

HA0696

0 - 40 Tps
40 NFP BR

HA0699

0 - 100 Tps
100 NFP BR

HA0702

0 - 200 Blk Org (Co Fib) (Moist)
200 NFP BR

HA0701

0 - 120 Tps
120 - 600 Br Si(y) Sa (Moist)
600 - 700 Br F-Co Sa Tr Si (Wet)
700 NFP BR

Sample No. 09-MC-022 (200 – 500)HA0701

% Passing 4.75 mm 95.7 %
% Passing 75 um 41.7 %
FMC @ 500 18.3 %
Group Symbol SM

HA0700

0 - 200 Blk Org (Co Fib) (Moist)
200 NFP BR

HA0703

0 - 100 Tps
100 - 210 Br F-Med Sa Tr Si (Moist)
210 NFP BR

HA0705 (Swamp 20)

0 - 50 Tps
50 NFP BR

HA0704(Swamp 20)

0 - 200 Blk Org (Co Fib) (Moist)
200 NFP BR

HA0706(Swamp 20)

0 - 650 Blk Org (Amor) (Wet)
650 NFP BR

HA0707

0 - 150 Blk Org (Co Fib) (Moist)
150 NFP BR

HA0708

0 - 160 Blk Org (Co Fib) (Moist)
160 - 600 Br F-Med Sa Tr Si (Moist)
600 - 1.3 Br Si(y) Sa (Wet)
1.3 NFP Bld

HA0710

0 - 400 Blk Org (Co Fib) (Wet)
400 - 1.1 Br F-Co Sa with Si (Wet)
1.1 NFP Sloughing

Sample No. 09-MC-024 (450 – 700)HA0710

% Passing 4.75 mm 97.9 %
% Passing 75 um 7.0 %
FMC @ 700 22.8 %
Group Symbol SP-SM

HA0709

0 - 140 Tps
140 - 750 Br F-Med Sa Tr Si (Moist)
750 NFP Bld

Sample No. 09-MC-023 (200 – 550)HA0709

% Passing 4.75 mm 94.7 %
% Passing 75 um 13.4 %
FMC @ 550 16.6 %
Group Symbol SM

HA0711

0 - 170 Blk Org (Co Fib) (Moist)
170 - 420 Br F-Med Sa Tr Si (Moist)
420 NFP Frag BR

HA0712

0 - 160 Blk Org (Co Fib) (Wet)






SWAMP 23

RECORD OF BOREHOLE No 23-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 408.7 N; 374 576.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 11, 2010 CHECKED BY G.D.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
355.3	Ground Surface							20	40	60	80	100								
0.0	Organic sand trace silt, trace gravel		1	AS	-	 *  *	355													
	2		SS	31	354															
352.9							353													
2.4	End of borehole Refusal on probable bedrock																			
	<div>* 2010 03 11</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																			

RECORD OF BOREHOLE No 23-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 397.9 N; 374 595.4 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 11, 2010 CHECKED BY G.D.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										WATER CONTENT (%)			
355.9 0.0	Ground Surface							20	40	60	80	100		20	40	60					
355.4 0.5	Topsoil																				
	End of borehole Refusal on probable bedrock																				
	* Borehole dry																				

RECORD OF BOREHOLE No 23-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 382.3 N; 374 605.2 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 11, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
355.9	Ground Surface					▽*														
0.0	Sand																			
355.6	cobbles and boulders		1	AS	-															
0.3	Brown (FILL)																			
	Silty sand						▽*													
	cobbles and boulders																			
	Grey Wet																			
352.8																				
3.1	End of borehole																			
	Refusal on probable bedrock																			

* 2010 03 11

▽ Water level observed during drilling

▼ Water level measured after drilling

METRIC


METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 23-6

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 377.1 N; 374 637.7 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 10, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE								WATER CONTENT (%)	
356.5 0.0	Ground Surface							20	40	60	80	100					
	Probable topsoil																
	Probable silty sand						356										
355.7 0.8	End of dynamic cone penetration test																
	Refusal on probable bedrock																
									</								

RECORD OF BOREHOLE No 23-7

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 383.5 N; 374 647.9 E ORIGINATED BY F.P.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 11, 2010 CHECKED BY G.D.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
356.1	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous		1	AS	-	* * 356											
355.9	Dark brown																
0.2	Organic silty sand cobbles and boulders																
	Brown Wet																
354.0																	
2.1	End of borehole Refusal on probable bedrock																

* 2010 03 11

▽ Water level observed
during drilling

▼ Water level measured
after drilling

RECORD OF BOREHOLE No E33-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 473.0 N; 377 924.3 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE									
358.9	Ground Surface																			
0.0	Peat, fine fibrous Dark brown																			
357.8			1	SS	2											117				
1.1	Silt, trace clay																			
357.5																				
1.4	Very loose Grey Wet Clayey silt		2	SS	WH**															
356.8	Very soft Grey Wet																			
2.1	Sand some silt, some gravel Compact Grey Wet		3	SS	15															
			4	SS	22															
354.4	End of borehole																			
4.5	Refusal on probable bedrock																			

* 2010 03 05

▽ Water level observed
during drilling

WH** denotes penetration due
to weight of rods and
hammer

RECORD OF BOREHOLE No E33-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 459.3 N; 377 922.7 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

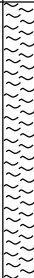

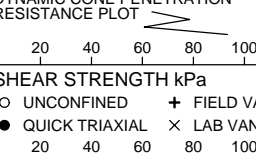
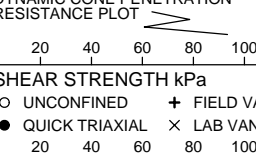
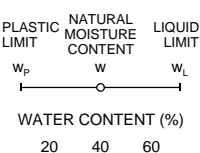


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE									
							20	40	60	80	100								
359.1	Ground Surface																		
0.0	Peat, amorphous Dark brown																		
357.9			1	SS	WH**														
1.2	Silty clay trace sand, trace gravel Soft Grey Wet																		
			2	SS	WH										90				
					FV														
356.4																			
2.7	Sand with gravel, trace silt																		
356.1	Loose to Grey Wet compact (Note 1)																		
3.0			3	SS	14														
355.3	End of borehole																		
3.8	Gravelly sand trace silt, trace clay Compact Grey Moist Dynamic cone penetration test started End of dynamic cone penetration test Refusal on probable bedrock * 2010 03 05 ▽ Water level observed during drilling WH** denotes penetration due to weight of rods and hammer C.F.H.S.A. denotes continuous flight hollow stem augers Note 1 Sloping bedrock was contacted at 2.7m																		

RECORD OF BOREHOLE No E33-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 418.5 N; 377 913.0 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.S.B.
 DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
359.0 0.0	Ground Surface Peat, amorphous wood pieces inclusions Dark brown		1	SS	39								1019		Top 0.6m frozen					
			2	SS	WH**															
			3	SS	WH															
			4	SS	WH															
356.1 2.9	Sand and gravel, some silt Compact to Grey Wet very dense		5	SS	38															
			6	SS	29															
			7	SS	56															
353.9 5.1	End of borehole Refusal on probable boulder <																			

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No W33-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 498.6 N; 377 935.9 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa						w _p	w	w _L					
								○ UNCONFINED + FIELD VANE		● QUICK TRIAXIAL × LAB VANE		WATER CONTENT (%)									
359.6	Ground Surface							20	40	60	80	100									
0.0	Augered 0.8m through fill (Note 1)						359														
358.8	Sand and cobbles Compact (FILL)		1	SS	16		358														
357.5	Peat, coarse fibrous Dark brown		2	SS	8		357											194			
356.8	Clayey silt, trace sand Stiff Grey Moist		3	SS	10		356														
356.0	Sand, some silt cobbles and boulders Grey																				
355.8	End of borehole Refusal on probable bedrock																				
3.8																					
	* Borehole dry																				
	Note 1 Drilled through platform build for drilling rig																				

800 - 1.1 Gry Si(y) Cl (Wet & Stiff)
 1.1 - 1.5 Br F-Co Sa Tr Si (Wet)
 1.5 NFP Sloughing

HA1751

0 - 800 Blk Org (Co Fib) (Moist)
 (Wet from 200) (Amor from 300)
 800 - 1.1 Gry Si(y) Cl (Wet & Stiff)
 1.1 - 1.6 Br F-Co Sa Tr Si (Wet)
 1.6 - 1.8 Gry F-Med Sa Tr Si (Wet)
 1.8 - 2.2 Gry Si (Wet)
 2.2 - 2.6 Gry Si(y) Cl (Wet & Firm)
 2.6 NFP BR

Sample No. 09-LA-162 (850 – 1.0)HA1751

% Passing 4.75 mm 100.0 %
 % Passing 75 um 84.9 %
 FMC @ 1.0 44.9 %
 W_L 50 %
 W_p 29 %
 I_p 21
 Group Symbol CH

HA1750B

0 - 100 Tps
 100 NFP BR

HA1750A

0 - 100 Tps
 100 - 450 Br F-Med Sa
 450 NFP BR

HA1749

0 - 100 Tps
 100 NFP BR

HA1748

0 - 210 Blk Org (Co Fib) (Moist)
 210 NFP BR

HA1747

0 - 200 Blk Org (Co Fib) (Moist)
 200 NFP BR

HA1746

0 - 300 Blk Org (Co Fib) (Moist)
 300 - 500 Br F-Med Sa Tr Gr

500 NFP BR

HA1745

0 - 180 Blk Org (Co Fib) (Moist)
 180 NFP BR

HA1744

0 - 100 Tps
 100 NFP BR

HA1743

0 - 50 Tps
 50 NFP BR

HA1742

0 - 170 Blk Org (Co Fib) (Moist)
 170 NFP BR

HA1741

0 - 140 Tps
 140 NFP BR

HA1631

0 - 120 Tps
 120 NFP Frag BR

HA1630

0 - 50 Br F-Med Sa
 50 NFP BR

HA1740(Swamp 23)

0 - 250 Blk Org (Co Fib) (Wet)
 250 - 500 Gry Si Tr F Sa
 500 NFP Bld

Sample No. 09-LA-161 (400 – 500)HA1740

% Passing 4.75 mm 98.4 %
 % Passing 75 um 11.5 %
 FMC @ 500 31.0 %
 Group Symbol SW-SM

HA1739(Swamp 23)

0 - 40 Tps
 40 NFP Frozen ground

HA1738(Swamp 23)

0 - 20 Tps

20 NFP Frozen ground

1.6 NFP BR

HA1737(Swamp 23)

0 - 50 Br F-Med Sa
50 NFP Frozen ground

HA0770 0 - 120 Tps
120 NFP Sh Rk

HA1735(Swamp 23)

0 - 100 Tps
100 - 250 Gry Si Tr F Sa (Wet)
250 NFP Cob

TP0146(Swamp 23)

0 - 1.0 Blk Org (Co Fib) (Moist)
(Wat Seep @ 700)
1.0 - 3.0 Gry Si(y) F-Co Sa with Gr & Blds
(Moist)
3.0 NFP BR

HA1736(Swamp 23)

0 - 110 Tps
110 - 600 Gry Si Tr F Sa (Wet)
600 NFP Bld

Sample No. 10-MC-030 (2.0 – 2.3)TP0146

% Passing 4.75 mm 90.1 %
% Passing 75 um 24.4 %
FMC @ 2.3 14.1 %
Group Symbol SM

HA1734(Swamp 23)

0 - 100 Tps
100 - 1.0 Gry F-Co Sa (Wet)
1.0 NFP Sloughing

HA1629

0 - 190 Blk Org (Co Fib) (Moist)
190 - 300 Br F-Med Sa Tr Si
300 NFP BR

PA1001

0 - 85 Asph
85 - 300 Cr Gr
300 - 1.1 Br F-Co Sa with Gr
1.1 - 1.7 Br Si(y) F-Med Sa with Gr
1.7 NFP Blds

TP0145(Swamp 23)

0 - 450 Blk Org (Co Fib) (Moist)
450 - 1.0 Br F-Co Sa with Gr Tr Si (Moist)
1.0 - 2.5 Gry Si(y) Sa (Moist)
(Wat Seep @ 1.4)
2.5 NFP BR

TP0144(Swamp 23)

0 - 300 Blk Org (Co Fib) with Hi
Weath/Frag BR Mixed
300 NFP BR

Sample No. 10-MC-029 (500 – 700)TP0145

% Passing 4.75 mm 92.6 %
% Passing 75 um 3.2 %
FMC @ 700 15.1 %
Group Symbol SP

HA0771 0 - 50 Tps
50 NFP Sh Rk

HA1733(Swamp 23)

0 - 160 Blk Org (Co Fib) (Moist)
160 - 1.0 Br F-Med Sa (F Sa @ 300) (Tr Gr
@ 500)
1.0 NFP BR

HA1731

0 - 230 Blk Org (Co Fib) (Moist)
230 NFP BR

HA1732(Swamp 23)

0 - 100 Tps
100 - 950 Br F-Med Sa Tr Gr (Occ Cob from
200 – 400) (Tr Si @ 500)
(Wet from 900)
950 - 1.6 Gry Si Tr F Sa (Wet)

HA0769 0 - 60 Tps
60 NFP Blds

HA0768 0 - 10 Tps
10 - 120 Br F-Co Sa (Moist)
120 NFP Sh Rk

SWAMP 24A AND 25 (WBL)

RECORD OF BOREHOLE No 24A-1										1 of 1		METRIC							
G.W.P. 6020-09-00		LOCATION		Coords: 5 510 765.2 N; 375 118.4 E				ORIGINATED BY M.R.											
DIST Kenora HWY 17		BOREHOLE TYPE		Continuous Flight Hollow Stem Augers				COMPILED BY N.R.											
DATUM Geodetic		DATE		March 04, 2010				CHECKED BY C.N.											
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		ELEVATION SCALE	SHEAR STRENGTH kPa											
355.3 0.0	Ground Surface						20 40 60 80 100	○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%) 20 40 60						
354.8 0.5	Peat, amorphous																		
	Black																		
	Silty clay, trace sand																		
	Firm Brown/ Moist grey		1	SS	7														
353.9 1.4	Clayey silt and sand																		
	Very stiff Mottled Moist brown/grey		2	SS	6														
353.2 2.1	Sand, with silt																		
	Loose Grey Wet		3	SS	9														
352.4 2.9	End of borehole																		
	Refusal on probable bedrock																		
	Sample 3: Sampler bouncing																		
	* 2010 03 04																		
	▼ Water level measured after drilling																		
	■ Penetrometer test																		

METRIC

RECORD OF PENETRATION TEST No 25-3

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 784.8 N; 375 152.5 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
							20	40	60	80	100						
354.7 0.0	Ground Surface																
	Probable peat																

	Probable clay																
	Soft to firm																

	Probable sand																
352.0 2.7	Loose to compact																
	End of dynamic cone penetration test																
	Refusal on probable bedrock																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC















20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 25-6

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 780.8 N; 375 191.7 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
355.4 0.0	Ground Surface					 *	20	40	60	80	100	20	40	60			
355.2 0.2	Peat, coarse fibrous Dark brown																
	Sand with gravel, some silt Very dense Brown Wet		1	SS	18/20cm												
																	
																	
																	
																	
																	
																	
																	
																	
353.6 1.8	End of borehole																
	Refusal on probable bedrock																
	Samples 1 & 2: Sampler bouncing																
	* 2010 03 03																
	 Water level measured after drilling																

<u>HA1730</u>	0 - 230	Blk Org (Co Fib) (Moist)
	230	NFP BR
<u>HA1729</u>	0 - 200	Blk Org (Co Fib) (Moist)
	200 - 320	Br Si Tr F Sa
	320	NFP BR
<u>HA1728</u>	0 - 230	Blk Org (Co Fib) (Moist)
	230	NFP BR
<u>HA1628</u>	Asph on Surf (Existing Hwy)	
<u>HA1627(Swamp 24A)</u>	0 - 80	Tps
	80	NFP Sh Rk
<u>HA1727</u>	0 - 150	Blk Org (Co Fib) (Moist)
	150	NFP BR
<u>HA1726</u>	0 - 200	Blk Org (Co Fib) (Moist)
	200	NFP Frag BR
<u>HA1725</u>	0 - 100	Tps
	100	NFP Frag BR
<u>HA1724</u>	0 - 200	Blk Org (Co Fib) (Moist)
	200 - 300	Br Si
	300	NFP BR
<u>HA1723</u>	0 - 120	Tps
	120 - 550	Br Si Tr F Sa
	550	NFP BR
<u>HA1722</u>	0 - 140	Tps
	140	NFP Frag BR
<u>HA1721</u>		

	0 - 100	Tps
	100	NFP BR
<u>HA1720</u>	0 - 150	Blk Org (Co Fib) (Moist)
	150 - 310	Br Si Tr F Sa
	310	NFP BR
<u>HA1719</u>	0 - 150	Blk Org (Co Fib) (Moist)
	150	NFP BR
<u>HA1626(Swamp 25)</u>	0 - 300	Wat
	300 - 400	Blk Org (Co Fib) (Wet)
	400 - 700	Gry F-Co Sa (Wet)
	700 - 1.5	Gry Si(y) Cl (Moist & Firm)
	1.5	NFP Sloughing
<u>HA1718</u>	0 - 300	Blk Org (Co Fib) (Moist)
	300	NFP BR
<u>HA1717</u>	0 - 50	Tps
	50	NFP BR
<u>HA1716</u>	0 - 150	Blk Org (Co Fib) (Moist)
	150 - 300	Br Si Tr F Sa
	300	NFP BR
<u>HA1715</u>	0 - 200	Blk Org (Co Fib) (Moist)
	200	NFP BR
<u>HA1714B</u>	0 - 100	Tps
	100	NFP BR
<u>HA1714A</u>	0 - 200	Blk Org (Co Fib) (Moist)
	200	NFP Frag BR
<u>HA1713</u>	0 - 100	Tps
	100	NFP Frag BR

SWAMP 29

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 29-2

1 of 1 **METRIC**

G.W.P. 6020-09-00 LOCATION Coords: 5 510 519.0 N; 377 841.9 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY N.R.
 DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
359.9 0.0	Top of Ice Ice Water Pushed rods to 1.5m, then DCPT started Probable peat Probable clayey silt Soft to firm																
356.3 3.6	End of dynamic cone penetration test Refusal on probable bedrock																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 29-4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 516.0 N; 377 866.2 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.R.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L							
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)							
359.8 0.0	Top of Ice					359														
359.4 0.4	Ice																			
	Peat, amorphous		1	SS	WH**	358														
	Dark brown		2	SS	WH															
357.6 2.2	Clayey silt, trace sand		3	SS	WH	357														
	Very soft Grey Wet to soft			FV																
				FV																
			4	SS	WH															
355.1 4.7						356														
			5	SS	50/5cm															
355.0 4.8	Sand, some silt					355														
	Compact Grey Wet																			
	End of borehole																			
	Refusal on probable bedrock																			
	Sample 5: Sampler bouncing																			
													</							

* 2010 03 05

Water level measured
after drilling

WH** denotes penetration due
to weight of rods and
hammer

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC


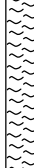

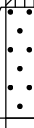
20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 29-7

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 503.0 N; 377 901.8 E ORIGINATED BY M.R.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
359.8 0.0	Ground Surface Augered through fill (Note 1)					▽*														
359.2 0.6	Peat, fine fibrous cobbles Dark brown						359													
			1	SS	8		358													
357.4 2.4	Clayey silt, trace sand																			
357.0 2.8	Firm Grey Wet Sand some silt, some gravel Very dense Grey		2	SS	6		357													
			3	SS	36/23cm															
355.9 3.9	End of borehole Refusal on probable bedrock Sample 3 Sampler bouncing * 2010 03 06 ▽ Water level observed during drilling Note : Drilled through platform build for drilling rig					356														

METRIC

\pm^7 , \times^5 : Numbers refer to Sensitivity

1 of 1 **METRIC**

MOT_DCPT R2004 09TF009D-SWAMP 29.GPJ ON_MOT.GDT 4/9/2010 10:46:09 AM

RECORD OF BOREHOLE No 29-10A

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 509.5 N; 377 945.7 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.R.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED	+	FIELD VANE								
359.7 0.0	Top of Ice Ice						● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)								
359.0 0.7	Peat, amorphous Dark brown		1	SS	WH**													
358.3 1.4	Silty sand, organic layers Loose Brown/ Wet grey		2	SS	8													
357.5 2.2	Clayey silt, some sand Very stiff Grey Wet		3	SS	16													
356.8 2.9	Silty clay, some sand silt layers Firm to Grey Wet Very stiff		4	SS	7													
355.5 4.2	Sand, some silt Compact Grey Wet		5	SS	18													
			6	SS	18													
353.9 5.8	End of borehole Refusal on probable bedrock Sample 7: Sampler bouncing * 2010 03 03 ▽ Water level observed during drilling ▼ Water level measured after drilling WH** denotes penetration due to weight of rods and hammer		7	SS	50/5cm													

* 2010 03 03

▽ Water level observed
during drilling

▼ Water level measured
after drilling

WH** denotes penetration due
to weight of rods and
hammer

RECORD OF BOREHOLE No 29-11

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 509.0 N; 377 951.7 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 03, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						W _p W W _L				WATER CONTENT (%)			
359.7 0.0	Top of Ice Ice/water					▽*		20	40	60	80	100									
359.0 0.7																					
358.9 0.8	Peat, amorphous Dark brown End of borehole Refusal on probable boulder						359														
<div>* 2010 03 03</div> <div>▽ Water level observed during drilling</div> <div>▽* Water level measured after drilling</div>																					

RECORD OF BOREHOLE No 29-12

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 492.0 N; 377 950.3 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
360.0	Top of Ice																
0.0	Ice																
359.8	Void																
0.2	Peat, fine fibrous																
359.7	Dark brown																
0.3	Sand, some silt		1	SS	13		359										
	Compact Grey Wet																
			2	SS	21												
357.9	End of borehole						358										
2.1	Refusal on probable bedrock																
												</					

RECORD OF BOREHOLE No 29-13

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 472.0 N; 377 961.4 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						WATER CONTENT (%) W _p W W _L							GR	SA	SI	CL
362.1 0.0	Ground Surface Silty sand, with rockfill (FILL)					*	362															
361.2 0.9	End of borehole Refusal on probable bedrock <																					

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 29-15

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 472.0 N; 377 936.4 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.R.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								\circ UNCONFINED	\bullet QUICK TRIAXIAL	$+$ FIELD VANE	\times LAB VANE												
359.5	Ground Surface							20	40	60	80	100											
0.0	Peat, amorphous boulders						∇ *	359															
358.7	Dark brown																						
0.8	Sand, some silt																						
358.1	Grey																						
1.4	End of borehole Refusal on probable bedrock																						
	<div>* 2010 03 05</div> <div>∇ Water level observed during drilling</div>																						

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No E33-1

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 473.0 N; 377 924.3 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE					WATER CONTENT (%)							
						● QUICK TRIAXIAL × LAB VANE	20	40	60	80	100	20	40	60						
358.9	Ground Surface					▽*	358													
0.0	Peat, fine fibrous Dark brown																			
357.8			1	SS	2													117		
1.1	Silt, trace clay																			
357.5																				
1.4	Very loose Grey Wet Clayey silt		2	SS	WH**															
356.8	Very soft Grey Wet																			
2.1	Sand some silt, some gravel Compact Grey Wet		3	SS	15															
			4	SS	22															
</																				

* 2010 03 05

▽ Water level observed
during drilling

WH** denotes penetration due
to weight of rods and
hammer

RECORD OF BOREHOLE No E33-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 459.3 N; 377 922.7 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 05, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
359.1	Ground Surface						20	40	60	80	100						GR SA SI CL
0.0	Peat, amorphous Dark brown																
357.9			1	SS	WH**												
1.2	Silty clay trace sand, trace gravel Soft Grey Wet																1 6 40 53
			2	SS	WH											90	
				FV													
356.4																	32 56 (12)
2.7	Sand with gravel, trace silt																
356.1	Loose to Grey Wet compact (Note 1)																
3.0			3	SS	14												
355.3	End of borehole																
3.8	Gravelly sand trace silt, trace clay Compact Grey Moist Dynamic cone penetration test started End of dynamic cone penetration test Refusal on probable bedrock * 2010 03 05 ▽ Water level observed during drilling WH** denotes penetration due to weight of rods and hammer C.F.H.S.A. denotes continuous flight hollow stem augers Note 1 Sloping bedrock was contacted at 2.7m																

RECORD OF BOREHOLE No E33-3

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 418.5 N; 377 913.0 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Portable Washboring COMPILED BY N.S.B.
 DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT LIMIT CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L				GR	SA	SI	CL
								<div>○ UNCONFINED + FIELD VANE</div> <div>● QUICK TRIAXIAL x LAB VANE</div>	20	40	60	80	100	WATER CONTENT (%)						
359.0 0.0	Ground Surface Peat, amorphous wood pieces inclusions Dark brown		1	SS	39	<div>▽</div>	358									1019	Top 0.6m frozen			
			2	SS	WH**															
			3	SS	WH													526		
			4	SS	WH													515		
356.1 2.9	Sand and gravel, some silt Compact to Grey Wet very dense		5	SS	38										○					
			6	SS	29										○					
			7	SS	56										○					
353.9 5.1	End of borehole Refusal on probable boulder 																			

METRIC

[illegible][illegible]

RECORD OF BOREHOLE No W33-2

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 510 498.6 N; 377 935.9 E ORIGINATED BY M.R.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 06, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L							
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)							
359.6	Ground Surface							20	40	60	80	100								
0.0	Augered 0.8m through fill (Note 1)						359													
358.8	Sand and cobbles Compact						358													
	(FILL)		1	SS	16															
357.5	Peat, coarse fibrous Dark brown						357											194		
2.1			2	SS	8															
356.8	Clayey silt, trace sand Stiff Grey Moist																			
2.8																				
356.0			3	SS	10		356													
3.6																				
355.8	Sand, some silt cobbles and boulders																			
3.8	Grey																			
	End of borehole																			
	Refusal on probable bedrock																			
				</																



SWAMP 29

Testholes From GWP 6053-03-00

12+700.0 65.0 Lt C/L 359.89 HA 29-P1
(5510504.737 N, 377873.155 E)

0 - 1.0 Fr Wat
1.0 - 2.7 Dk Br F Fib Org M Wet
2.7 - 4.0 Gry Si(y) Cl Very Soft Wet
4.0 NFP Si(y) Sa/Cob
Fr Wat @ 0

12+800.0 30.0 Lt C/L 359.03 HA 29-P2
(5510466.254 N, 377933.197 E)

0 - 600 Dk Br F Fib Org M Wet
600 - 2.0 Gry Cl(y) Si W Sa Num Sa(y)
Si Layers Soft Moist-Wet
2.0 NFP Si(y) Sa/Cob
Fr Wat @ 200

& Bld
600 NFP BR

1.9 NFP BR

HA1240

BR on Surf

HA1234

0 - 40 Tps
40 NFP BR

HA1239

0 - 70 Tps
70 NFP BR

HA1233

0 - 250 Blk Org (Co Fib) (Moist)
250 NFP BR

TP0159

0 - 100 Tps
100 - 500 Br F-Co Sa with Gr
500 NFP BR

HA1232

0 - 270 Blk Org (Co Fib) (Moist)
270 - 370 Gry Si Tr F Sa (Moist)
370 - 800 Gry Cl (Stiff & Moist)
800 - 1.2 Gry Si(y) Cl (Moist & Firm)
(Pockets of Br Si)
1.2 NFP Cob

HA1238

0 - 30 Tps
30 NFP BR

Sample No. 09-LA-149 (700 – 800)HA1232

% Passing 4.75 mm 100.0%
% Passing 75 um 96.0 %
FMC @ 800 31.4 %
W_L 57 %
W_p 23 %
I_p 34
Group Symbol CH

TP0158(Swamp 29)

0 - 400 Blk Org (Co Fib)
400 - 1.4 Hi Weath/Frag BR with Sa & Gr
Mixed Occ Blds (Wat Seep @ 1.0)
1.4 NFP BR

HA1231

0 - 90 Tps
90 NFP BR

Sample No. 10-MC-037 (400 – 600)TP0158

% Passing 4.75 mm 33.1 %
% Passing 75 um 5.0 %
FMC @ 600 22.6 %
Group Symbol SP-SM

HA1230

0 - 90 Tps
90 NFP BR

HA1237

0 - 250 Blk Org (Co Fib) (Moist)
250 - 500 Br F-Med Sa Tr Si (Moist)
500 NFP BR

HA1229

0 - 320 Blk Org (Co Fib) (Moist)
320 - 430 Br F-Med Sa with Si (Moist)
430 - 1.1 Br Si(y) Cl (Moist) (HP)
1.1 - 1.3 Gry Si Tr Br F Sa (Moist)
1.3 - 1.4 Br F-Co Sa Tr Si (Wet)
1.4 NFP BR

HA1236

0 - 50 Tps
50 NFP BR

HA1235

0 - 300 Blk Org (Co Fib) (Moist)
300 NFP BR

Sample No. 09-LA-148 (500 – 730)HA1229

% Passing 4.75 mm 100.0 %
% Passing 75 um 90.9 %

TP0163

0 - 450 Blk Org (Co Fib)
450 - 1.9 Br F-Co Sa with Gr, Blds & Cob

FMC @ 730 31.4 %
 W_L 47 %
 W_p 21 %
 I_p 26
 Group Symbol CI

TP0157(Swamp 29)

0 - 100 Ice
 100 - 1.0 Blk Org (Co Fib) (Moist)
 (Wat Seep @ 500)
 1.0 - 2.7 Gry Si(y) Cl (Moist & Firm)
 2.7 - 3.1 Gry Si(y) F-Co Sa with Gr & Cob
 Occ Bld (Wet)
 3.1 NFP Prob BR Poss Bld

HA1226

0 - 150 Tps
 150 NFP Bld

HA1227

0 - 170 Blk Org (Co Fib) (Wet)
 170 NFP Cob

HA1228

0 - 170 Blk Org (Co Fib) (Wet)
 170 - 1.5 Br Si(y) Cl Tr F Sa (Moist & Firm)
 (SP) (Gry from 1.0)
 1.5 NFP Sloughing

HA1225

0 - 270 Blk Org (Co Fib) (Wet)
 270 - 860 Gry Cl Tr F Sa (Wet & Firm)
 (Pockets of Br Si(y) F Sa)
 860 NFP Sloughing

Sample No. 09-LA-147 (450 – 600)HA1225

% Passing 4.75 mm 100.0 %
 % Passing 75 um 54.1 %
 FMC @ 600 31.6 %
 W_L 41 %
 W_p 18 %
 I_p 23
 Group Symbol CI

TP0155(Swamp 29)

0 - 450 Blk Org (Co Fib) with Hi
 Weath/Frag BR Mixed (Moist)

450 - 1.3 Blk Org (Co Fib) (Moist)
 (Wat Seep @ 500)
 1.3 - 2.8 Gry Si(y) Cl Occ Cob
 (Moist & Firm)
 2.8 - 3.2 Gry Si(y) F-Co Sa with Gr & Cob
 Occ Bld (Wet)
 3.2 NFP BR Poss Bld

HA1224

0 - 180 Blk Org (Co Fib) (Moist)
 180 - 880 Br Si(y) Cl (Moist & Stiff)
 (Wet from 650)
 880 NFP Sloughing

TP0154 (Swamp 29)

0 - 800 Blk Org (Co Fib)
 (1.5 Ø Bld @ 100)
 800 - 2.6 Gry Si(y) Cl Occ Cob
 (Moist & Firm) (Wat Seep @ 2.6)
 2.6 NFP BR

Sample No. 10-MC-035 (900 – 1.2)TP0154

% Passing 4.75 mm 100.0 %
 % Passing 75 um 84.0 %
 FMC @ 1.2 36.0 %
 W_L 35 %
 W_p 19 %
 I_p 16
 Group Symbol CI

TP0156(Swamp 29)

0 - 200 Blk Org (Co Fib)
 200 - 2.6 Br F-Co Sa with Gr & Cob Occ Bld
 & Sh Rk
 2.6 - 3.2 Blk Org (Co Fib) (Moist)
 3.2 - 3.9 Gry Si(y) Cl (Moist)
 3.9 - 4.3 Gry Si(y) F-Co Sa with Cob Occ
 Bld
 4.3 NFP Limit of Reach

Sample No. 10-MC-036 (4.0 – 4.3)TP0156

% Passing 4.75 mm 74.9 %
 % Passing 75 um 19.1 %
 FMC @ 4.3 10.4 %
 Group Symbol SM

HA1207

0 - 190 Blk Org (Co Fib) (Moist)
190 NFP Bld

HA1208

0 - 150 Blk Org (Co Fib) (Moist)
150 NFP Bld

HA1206

0 - 160 Blk Org (Co Fib) (Moist)
160 - 330 Br F Sa
330 NFP BR

TP0164(Swamp 29)

0 - 550 Blk Org (Co Fib)
550 - 1.6 Br F-Co Sa with Cob Tr Gr
(Wat Seep @ 600)
1.6 - 3.2 Gry Si(y) F-Co Sa Occ Bld
3.2 NFP BR

HA1205

BR on Surf

HA1204

0 - 290 Blk Org (Co Fib) (Moist)
290 - 390 Br F Sa Tr Si
390 NFP Bld

HA1203

0 - 290 Blk Org (Co Fib) (Moist)
290 NFP BR

HA1202

0 - 160 Blk Org (Co Fib) (Moist)
160 - 250 Br Si Tr F Sa
250 NFP Frag BR

HA1201

0 - 140 Tps
140 - 290 Br F-Co Sa
290 NFP Bld

HA1200

0 - 190 Blk Org (Co Fib) (Moist)
190 - 210 Br Si Tr Co Sa
210 NFP Frag BR

HA1199

0 - 100 Tps
100 NFP Bld

HA1198

0 - 80 Tps
80 NFP Bld

HA1197

0 - 180 Blk Org (Co Fib) (Moist)
180 NFP Bld

HA1196

0 - 20 Tps
20 - 1.0 Br F-Co Sa
1.0 NFP Asph

HA1195

0 - 90 Tps
90 - 640 Br Si (Tr F Sa from 550)
640 NFP Frag BR

HA1194

0 - 170 Blk Org (Co Fib) (Moist)
170 NFP Frag BR

HA1193

0 - 60 Wat
60 - 160 Blk Org (Co Fib) (Wet)
160 - 300 Br Si(y) F-Med Sa Tr Gr (Moist)
300 - 900 Br Si Tr F Sa (Moist)
(Tr Gr @ 500) (Stiff)
900 NFP BR

HA1192

Asph on Surf

HA1191

0 - 300 Blk Org (Co Fib) (Moist)
300 - 360 Br F-Med Sa (Moist)
360 NFP Bld

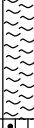


HA1190

0 - 70 Tps
70 - 300 Gry Si(y) F Sa
300 NFP Bld

HA1189

0 - 100 Tps (Moist)

FIRE ROAD 46 REALIGNMENT

<div style="display: flex; justify-content: space-between;"> RECORD OF BOREHOLE No N1 1 of 1 METRIC </div>																	
G.W.P. 6020-09-00		LOCATION Coords: 5 511 087.3 N; 372 013.9 E				ORIGINATED BY W.L.											
DIST Kenora HWY 17		BOREHOLE TYPE Continuous Flight Solid Stem Augers				COMPILED BY N.S.B.											
DATUM Geodetic		DATE March 20, 2010				CHECKED BY C.N.											
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
353.3	Ground Surface							20	40	60	80	100					
0.0	Peat, amorphous Dark brown						353										
352.1	Silty sand						352										
1.2	Compact Grey Wet		1	SS	16												
351.3	End of borehole																
2.0	Refusal on probable bedrock																
	Sample 1: Sampler bouncing																
	* 2010 03 20																
	 Water level observed during drilling																

METRIC

(%) STRAIN AT FAILURE

METRIC

ON_MOT VER3 09TF009F-NORTH SWAMP.GPJ ON_MOT.GDT 4/8/2010 5:37:08 PM

RECORD OF BOREHOLE No N4

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 137.7 N; 372 050.8 E ORIGINATED BY W.L.
DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY N.S.B.
DATUM Geodetic DATE March 21, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa				w _p	w	w _L			
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE						
353.4	Top of Ice							20	40	60	80	100					
0.0	Ice							20	40	60	80	100					
353.1																	
0.3	Peat, amorphous Dark brown																
			1	SS	WH**												
350.7																	
2.7	Silty sand Very loose Grey Wet to compact		2	SS	3												
	layers of peat and sand to 5.5m depth		3	SS	12												
			4	SS	4												
			5	SS	7												
344.9																	
8.5	Clayey silt, trace sand Stiff Grey Wet		6	SS	3												
343.6																	
9.8	End of borehole																
<div><div>*</div><div>2010 03 21</div></div> <div><div>▽</div><div>Water level observed during drilling</div></div> <div><div>▼</div><div>Water level measured after drilling</div></div> <div><div>■</div><div>Penetrometer test</div></div> <div><div>WH**</div><div>denotes penetration due to weight of rods and hammer</div></div> <div><div>Note:</div><div>Cave-in at 6.1m</div></div>																	

METRIC

ON_MOT VER3 09TF009F-NORTH SWAMP.GPJ ON_MOT.GDT 5/4/2010 12:42:16 PM

RECORD OF BOREHOLE No N5

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 151.9 N; 372 051.3 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 20, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa													
									○ UNCONFINED	+	FIELD VANE						WATER CONTENT (%)		
338.3 15.0	Probable silt Compact to dense <i>(Cont'd)</i>						338												
							337												
							336												
							335												
333.9 19.4							334												
End of dynamic cone penetration test																			
* 2010 03 20																			
Water level observed during drilling																			
Water level measured after drilling																			
WH** denotes penetration due to weight of rods and hammer																			
C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers																			

METRIC

ON_MOT VER3 09TF009F-NORTH SWAMP.GPJ ON_MOT.GDT 5/4/2010 12:44:04 PM

RECORD OF BOREHOLE No N6

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 157.1 N; 372 064.7 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 21, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa												
									○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
338.3 15.0	Probable silt Loose to compact <i>(Cont'd)</i>	<div><div></div><div></div><div></div><div></div></div>					338	20	40	60	80	100						
							337											
335.9 17.4	End of dynamic cone penetration test						336											
	<div><div>* 2010 03 21</div><div>▽ Water level observed during drilling</div><div>▼ Water level measured after drilling</div><div>WH** denotes penetration due to weight of rods and hammer</div><div>C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers</div></div>																	

RECORD OF BOREHOLE No N7

1 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 172.2 N; 372 066.9 E ORIGINATED BY W.L.
DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)
353.2 0.0	Top of Ice Ice							20	40	60	80	100					
352.6 0.6	Peat, amorphous wood pieces Dark brown		1	SS	WH**										363		Top 0.6m frozen
			2	SS	WH												
			3	SS	WH										452		
			4	SS	WH										652		
	Olive green		5	SS	WH										435		
			6	SS	WH										526		
			7	SS	WH										446		
347.1 6.1	Organic silt		8	SS	WR***										173		
346.6 6.6	Very loose Blueish Wet grey																
	Sandy silt																
	Very loose Grey Wet																
345.3 7.9	Clay, trace sand		9	SS	1												
	Very soft Grey Wet																
			10	SS	WR												
				FV													
342.9 10.3	Clayey silt, trace sand layers of sandy silt																
	Very soft Grey Wet		11	SS	WH												
341.3 11.9	Silt, trace sand																
	Very loose Grey Wet		12	SS	WH												
340.4 12.8	End of borehole																
	Dynamic Cone Penetration Test started																
	Probable silt																
	Loose to compact																
338.2	Cont'd																

RECORD OF BOREHOLE No N7

2 of 2

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 172.2 N; 372 066.9 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE C.F.H.S.A. and Dynamic Cone Penetration Test COMPILED BY N.S.B.
 DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)									
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE							
338.2 15.0	Probable silt Loose to compact (Cont'd)						338													
							337													
							336													
335.5 17.7	End of dynamic cone penetration test																			
	<div>* 2010 03 19</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> <div>WH** denotes penetration due to weight of rods and hammer</div> <div>WR*** denotes penetration due to weight of rods only</div> <div>C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers</div>																			

METRIC

ON_MOT VER3 09TF009F-NORTH SWAMP.GPJ ON_MOT.GDT 5/4/2010 12:45:30 PM

METRIC

ON_MOT VER3 09TF009F-NORTH SWAMP.GPJ ON_MOT.GDT 5/4/2010 12:45:30 PM

RECORD OF BOREHOLE No N9

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 189.3 N; 372 084.2 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
353.9 0.0	Ground Surface					*		20	40	60	80	100					
353.8 0.1	Topsoil																
353.4 0.5	Gravelly sand, trace silt cobbles and boulders																
	Brown Moist (FILL)																
	End of borehole																
	Refusal on probable rockfill																
	* Borehole dry																

RECORD OF BOREHOLE No N10

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 203.8 N; 372 104.5 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
354.3	Ground Surface					*											
0.0	Asphalt over																
353.9	gravelly sand, some silt																
0.4	Brown Wet (PAVEMENT FILL)																
	End of borehole																
	Refusal on probable rockfill																
	* Borehole dry																

RECORD OF BOREHOLE No N11

1 of 1

METRIC

G.W.P. 6020-09-00 LOCATION Coords: 5 511 214.3 N; 372 127.2 E ORIGINATED BY W.L.
 DIST Kenora HWY 17 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY N.S.B.
 DATUM Geodetic DATE March 19, 2010 CHECKED BY C.N.

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE									20	40
354.4	Ground Surface																						
0.0	Asphalt over gravelly sand, some silt						354																
353.6	Brown Moist (PAVEMENT FILL)																						
0.8	Silty sand, some gravel																						
353.4	cobbles and boulders																						
1.0	Brown (FILL)																						
	End of borehole																						
	Refusal on probable rockfill																						
	* Borehole dry																						

Highway 17, from the Ontario / Manitoba Border
Easterly 15 km to Rush Bay Road
G.W.P. 6020-09-00, Index No.: 200FIR
PML Ref.: 09TF009D/E/F, May 27, 2011



APPENDIX C

Drawings 3-1 to FR-2 – Borehole Locations and Soil Strata

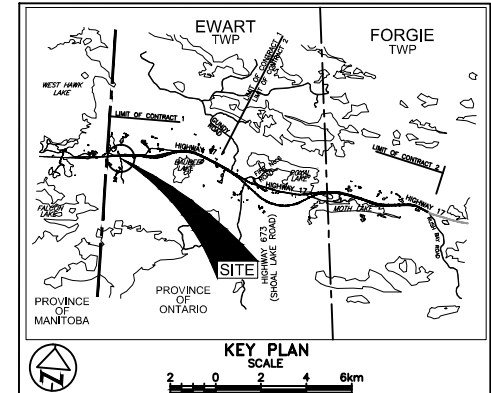
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES



CONT No
GWP No 6020-09-00

HIGHWAY 17 - FOUR LANEING
SWAMP 3
STA. 10+550 TO 10+620 WBL EWART TWP
BOREHOLE LOCATIONS AND SOIL STRATA

SHEET



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
	Preliminary Test Hole by PML		
	Hand Auger Hole by TBTE (see note 3)		
N	Blows/0.3m (Std. Pen Test, 475 J/blow)		
CONE	Blows/0.3m (60° Cone, 475 J/blow)		
	W L at time of investigation March 2010		
	3-P1 June 2009		
	Head		
	ARTESIAN WATER		
	Encountered		
	PIEZOMETER		

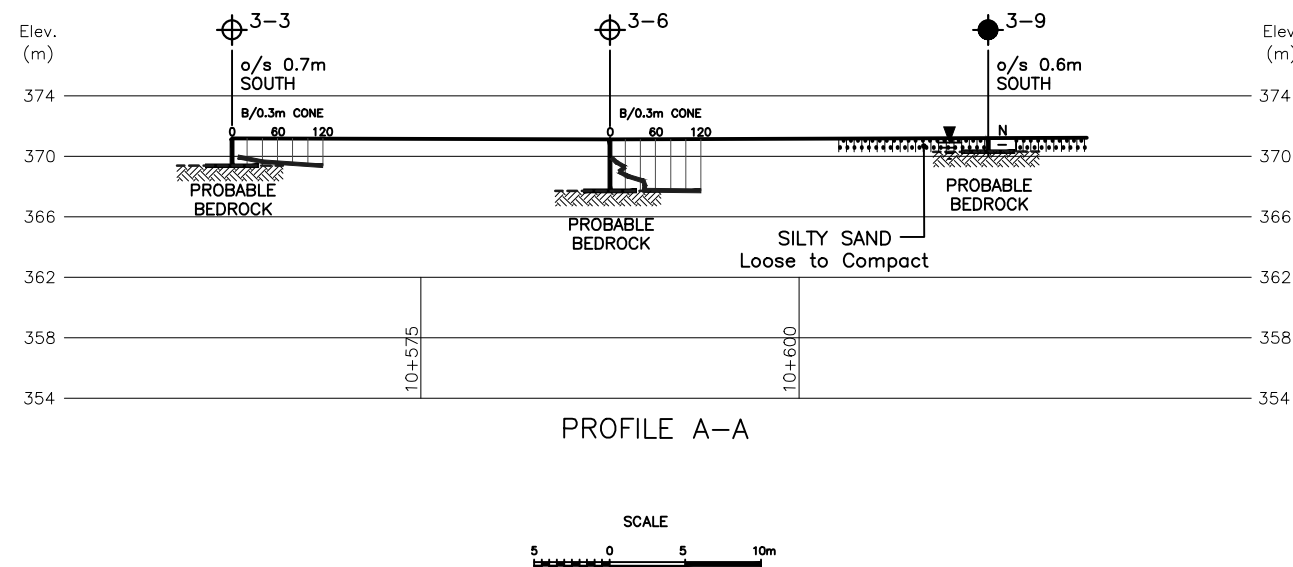
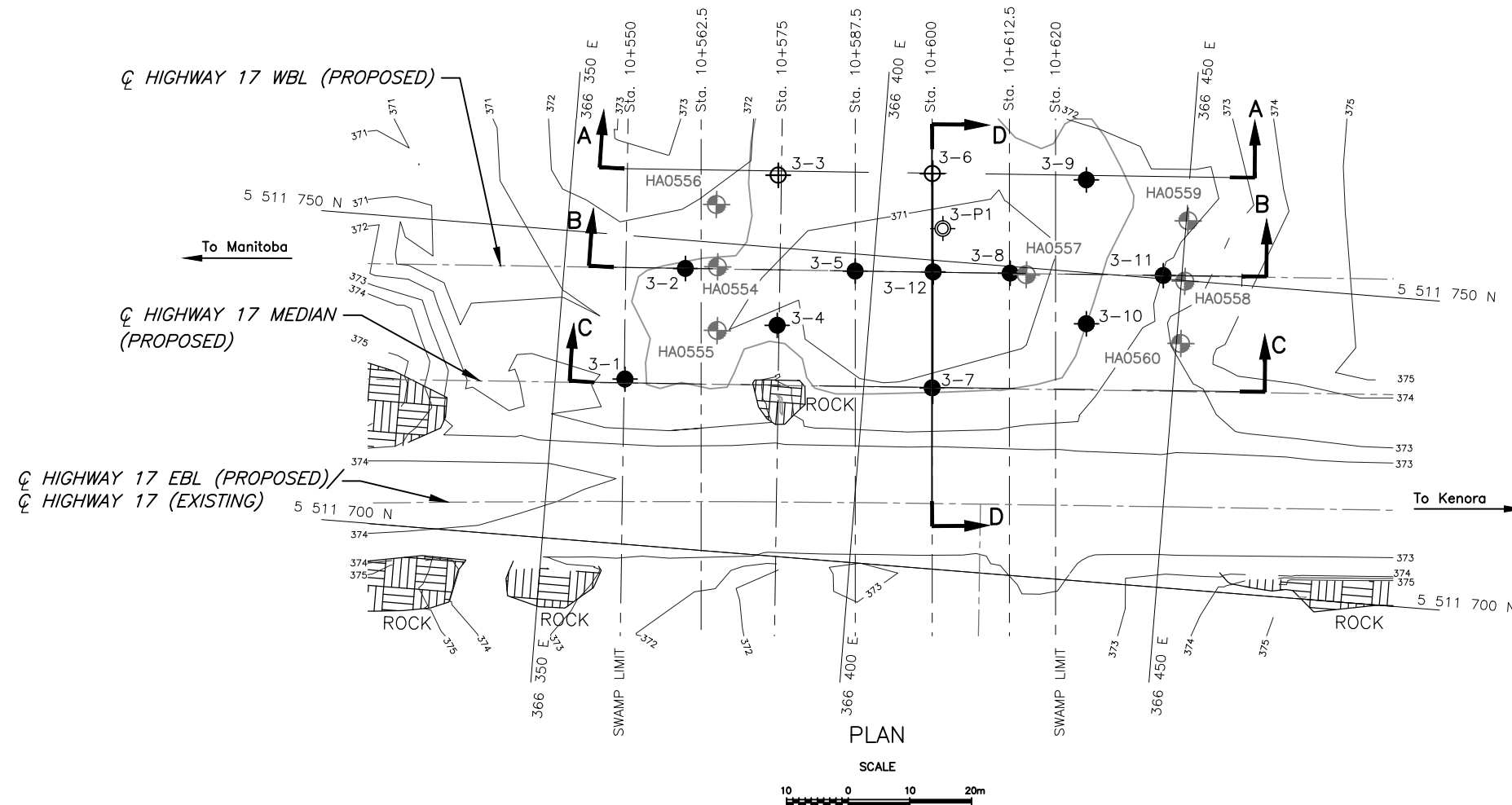
BH No	ELEVATION	NORTHINGS	EASTINGS
3-1	371.5	5 511 726.1	366 361.3
3-2	371.3	5 511 745.4	366 369.6
3-3	371.2	5 511 761.7	366 383.4
3-4	371.2	5 511 737.4	366 385.2
3-5	371.1	5 511 747.2	366 397.1
3-6	371.1	5 511 764.0	366 408.3
3-7	371.2	5 511 729.3	366 411.1
3-8	371.2	5 511 748.9	366 422.2
3-9	371.2	5 511 765.0	366 433.3
3-10	371.4	5 511 741.7	366 435.2
3-11	371.7	5 511 750.5	366 447.0
3-12	371.2	5 511 748.1	366 409.7
3-P1	371.0	5 511 755.2	366410.7

NOTE
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

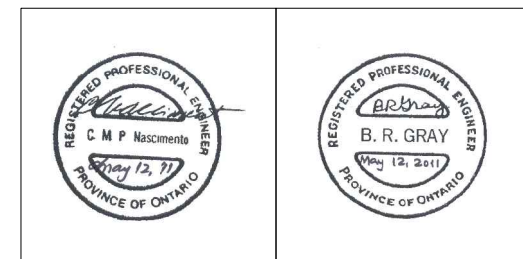
Geocres No. 52E-52

HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB
DATE May 12, 2011	SITE --
DRAWN NA	CHECKED CN
APPROVED BRG	DWG 3-1



NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 3-2 FOR PROFILES B-B, C-C AND SECTION D-D.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



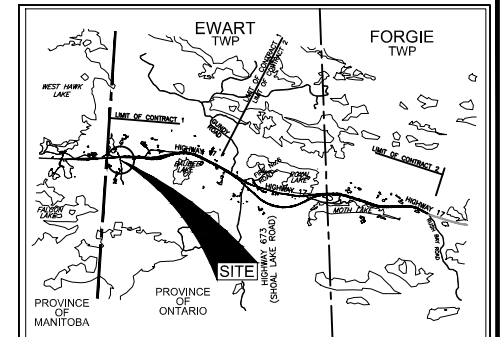
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

HIGHWAY 17 - FOUR LANE
SWAMP 3
STA. 10+550 TO 10+620 WBL EWART TWP
SOIL STRATA

SHEET



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Hand Auger Hole by TBTE (see note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	NORTHINGS	EASTINGS
SEE DRAWING 3-1 FOR DETAILS			

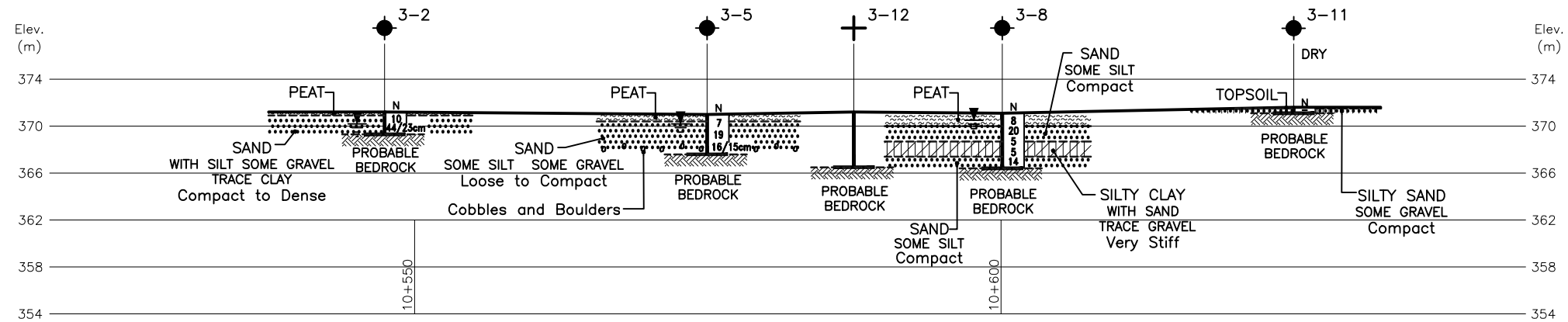
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

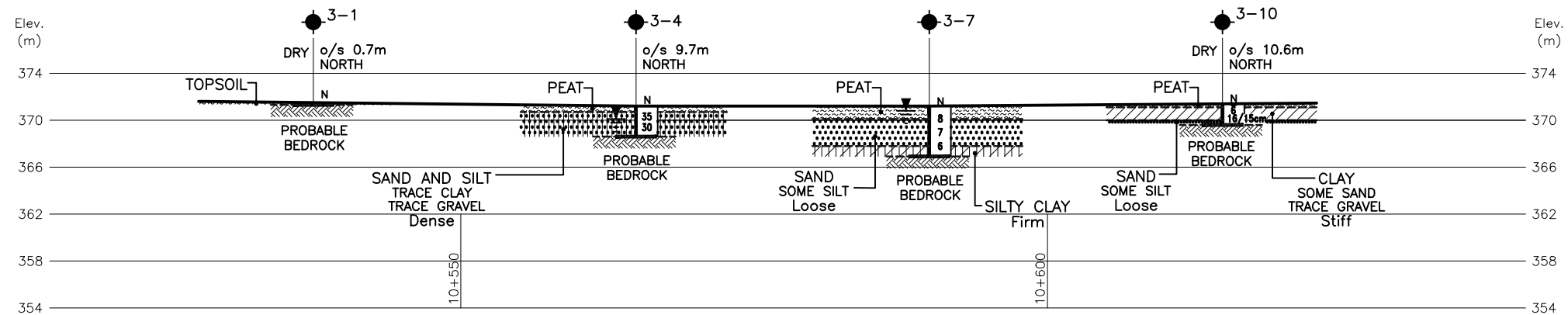
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

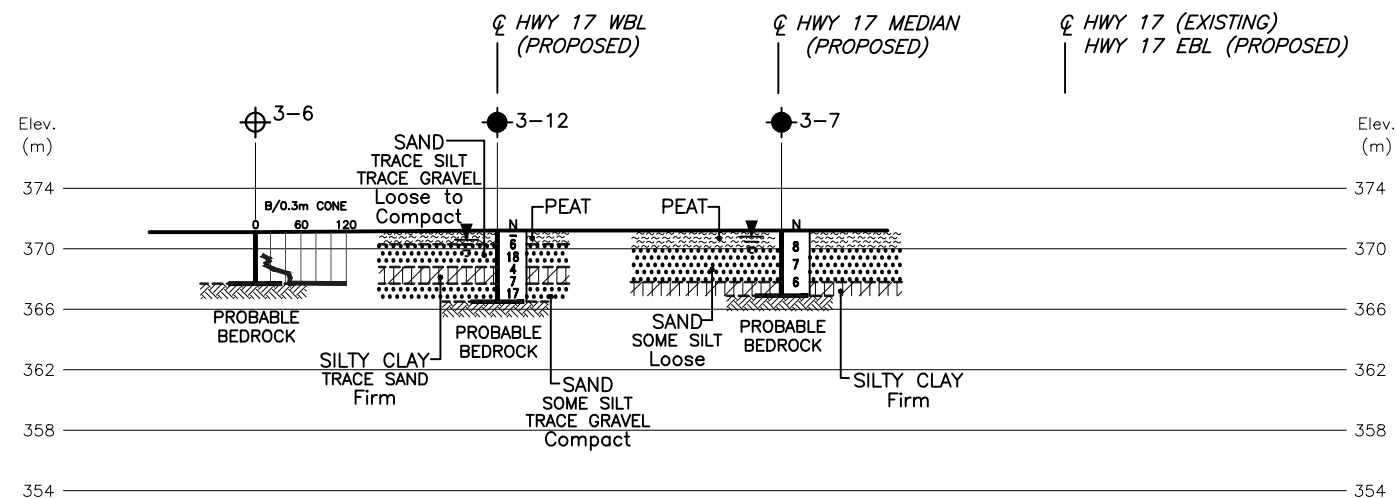
HWY No 17	SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE	Kenora
DRAWN NA	CHECKED CN	APPROVED BRG	DWG	3-2	



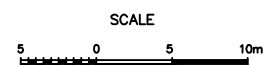
PROFILE B-B



PROFILE C-C

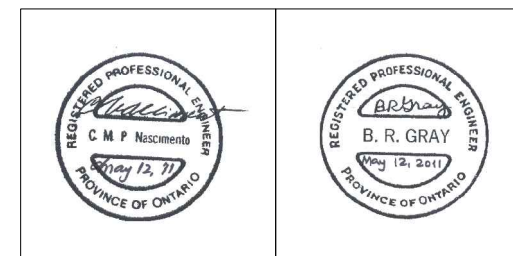


SECTION D-D



NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 3-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

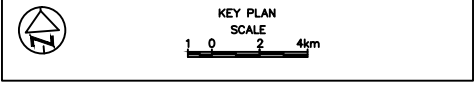
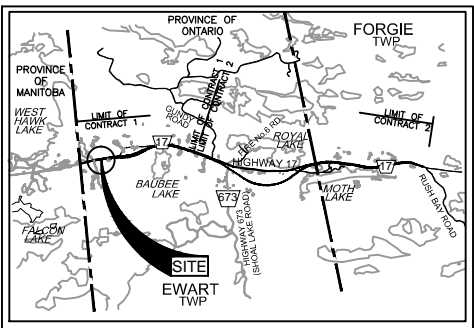
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00



HIGHWAY 17 FOUR LANE
SWAMP 5
SWAMP 5E (WEST SECTION)
STA. 11+530 TO 11+590 EBL
SWAMP 5E (MIDDLE SECTION)
STA. 11+615 TO 11+680 EBL
SWAMP 5E (EAST SECTION)
STA. 11+680 TO 11+755 EBL
SWAMP 5W
STA. 111+630 TO 111+680 WBL
EWART TWP
BOREHOLE LOCATIONS

SHEET



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Preliminary Test Hole by PML
- Test Hole by TBTE (See Note 3)
- Test Pit by TBTE (See Note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation Mar. 2010
- 5E-P1 June 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
5E-1	361.5	5 511 760.3	367 358.3
5E-2	360.2	5 511 733.4	367 369.2
5E-3	361.2	5 511 758.8	367 383.0
5E-4	361.2	5 511 764.6	367 395.9
5E-5	360.8	5 511 736.5	367 393.7
5E-6	360.4	5 511 730.1	367 420.7
5E-7	360.2	5 511 755.0	367 432.7
5E-8	360.6	5 511 764.1	367 445.9

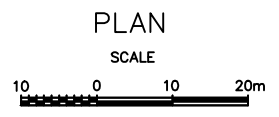
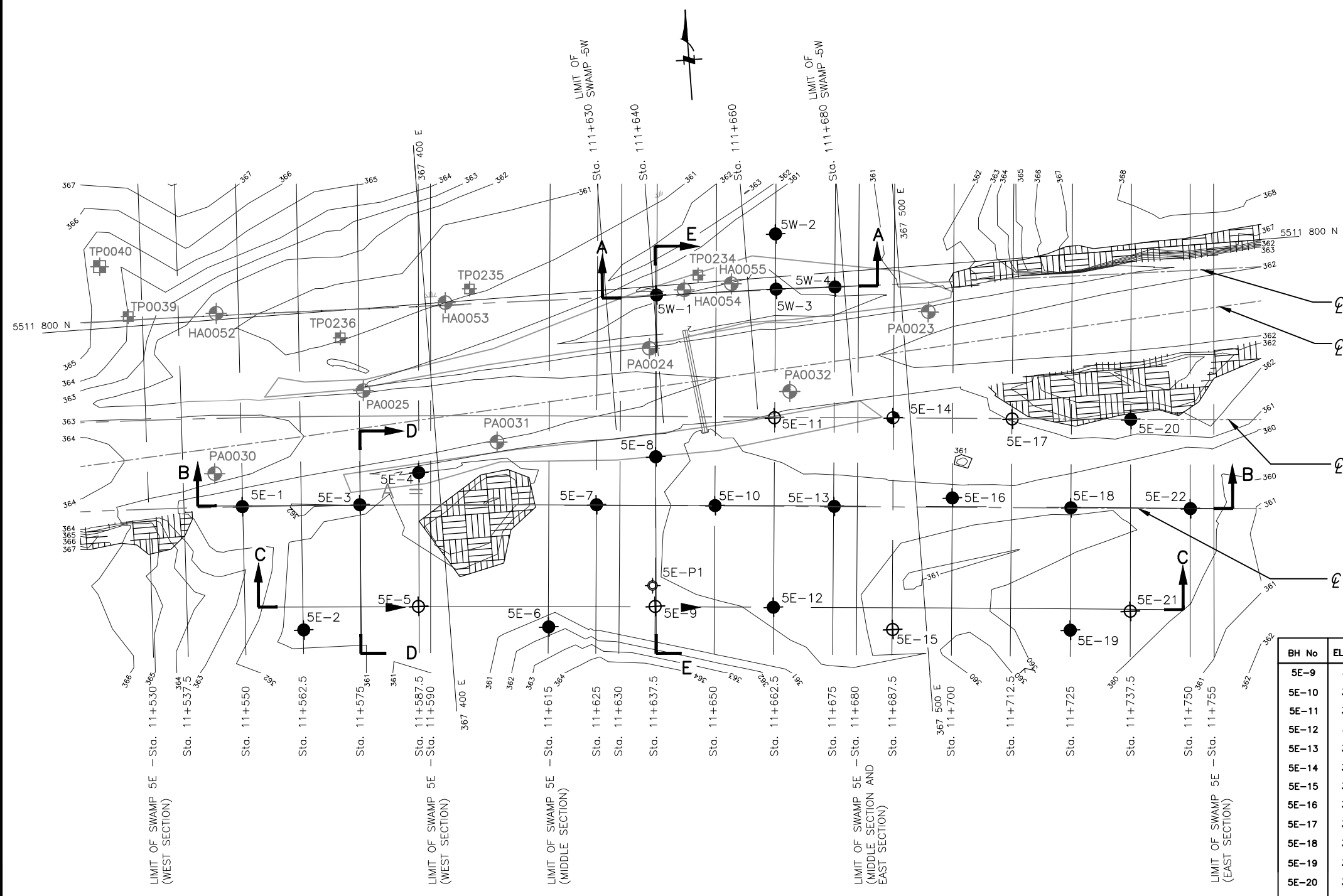
(Legend Continues)

- NOTE -
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB
DRAWN NA	CHECKED CN
DATE May 12, 2011	APPROVED BRG
SITE ---	DWG 5-1



- NOTES:
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
 - REFER TO DRAWINGS 5-2 AND 5-3 FOR PROFILES A-A, B-B, C-C, SECTIONS D-D AND E-E.
 - TBTE DENOTES THUNDER BAY TESTING AND ENGINEERING.
 - THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

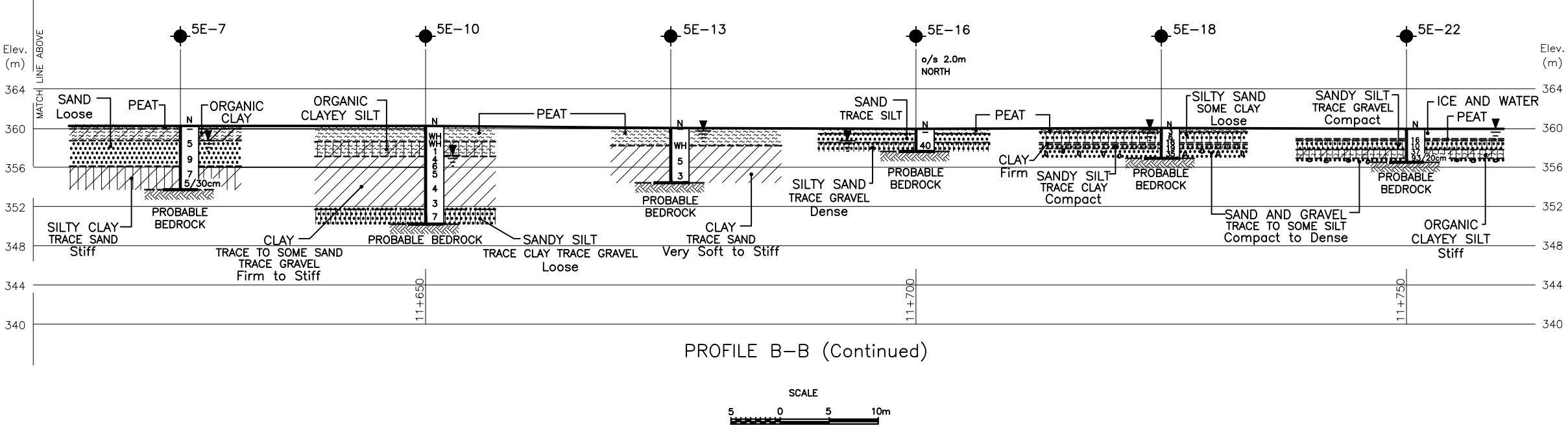
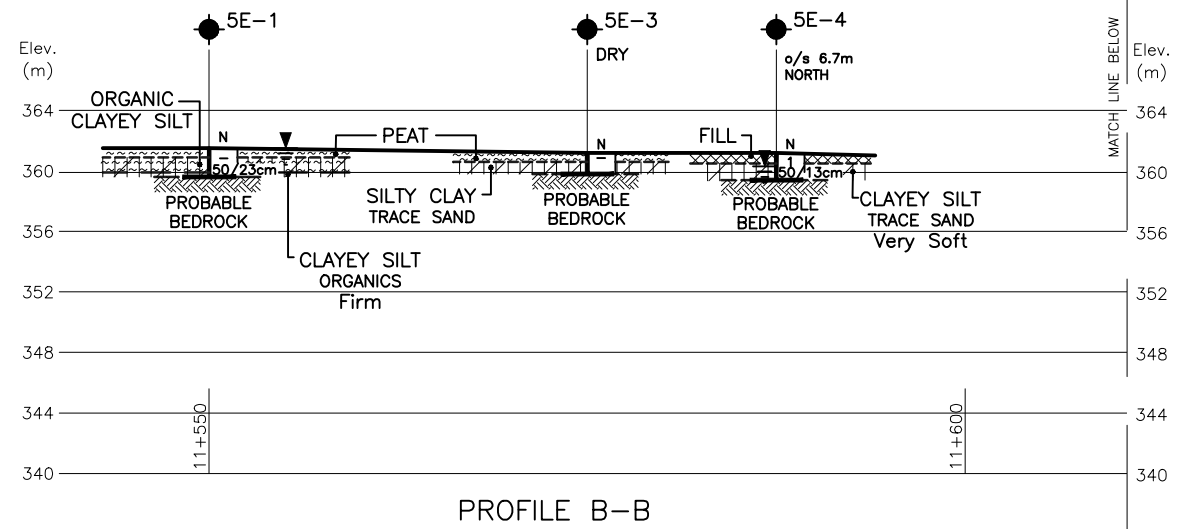
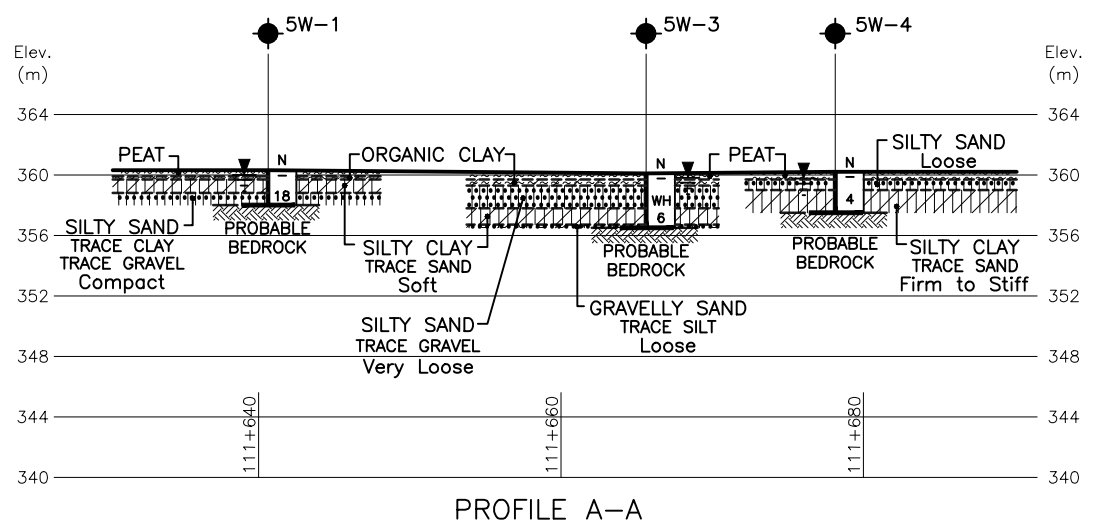
CONT No
GWP No 6020-09-00

HIGHWAY 17 FOUR LANE
SWAMP 5
SWAMP 5E (WEST SECTION)
STA. 11+530 TO 11+590 EBL
SWAMP 5E (MIDDLE SECTION)
STA. 11+615 TO 11+680 EBL
SWAMP 5E (EAST SECTION)
STA. 11+680 TO 11+755 EBL
SWAMP 5W
STA. 111+630 TO 111+680 WBL
EWART TWP
SOIL STRATA

SHEET

Peto MacCallum Ltd.
CONSULTING ENGINEERS

KEY PLAN
SCALE
1 0 2 4km



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- W L at time of investigation Mar. 2010
- 5E-P1 June 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 5-1 FOR DETAILS			

- NOTES:
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
 - REFER TO DRAWING 5-1 FOR BOREHOLE LOCATIONS PLAN AND DRAWING 5-3 FOR PROFILE C-C AND SECTIONS D-D & E-E.
 - THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS

DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED NSB	DATE May 12, 2011
DRAWN	NA	CHECKED CN	APPROVED BRG

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

HIGHWAY 17 FOUR LANEING
SWAMP 5
SWAMP 5E (WEST SECTION)
STA. 11+530 TO 11+590 EBL
SWAMP 5E (MIDDLE SECTION)
STA. 11+615 TO 11+680 EBL
SWAMP 5E (EAST SECTION)
STA. 11+680 TO 11+755 EBL
SWAMP 5W
STA. 111+630 TO 111+680 WBL
EWART TWP
SOIL STRATA

SHEET

Peto MacCallum Ltd.
CONSULTING ENGINEERS

KEY PLAN
SCALE
1 0 2 4km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- W L at time of investigation Mar. 2010
- 5E-P1 June 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 5-1 FOR DETAILS			

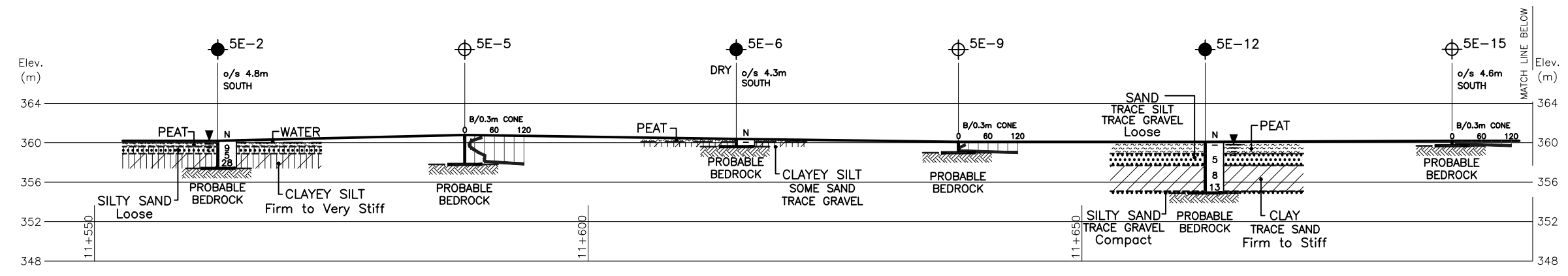
- NOTE -
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS

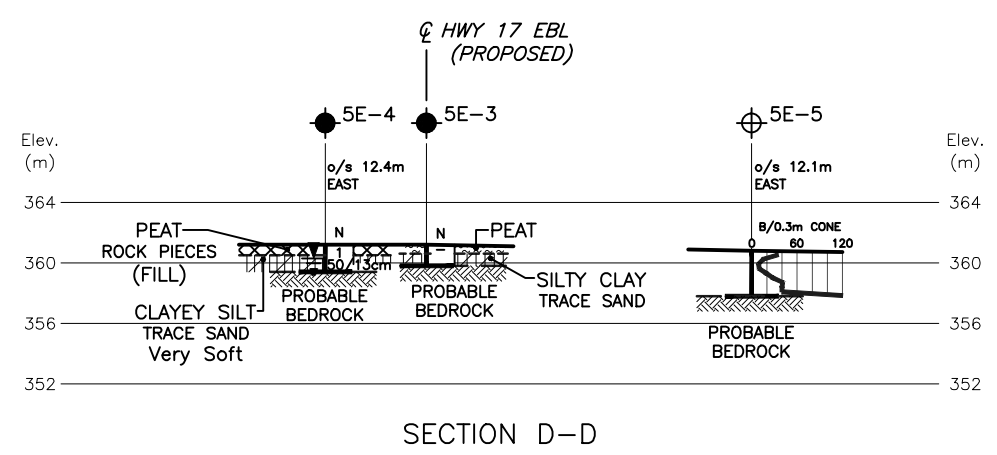
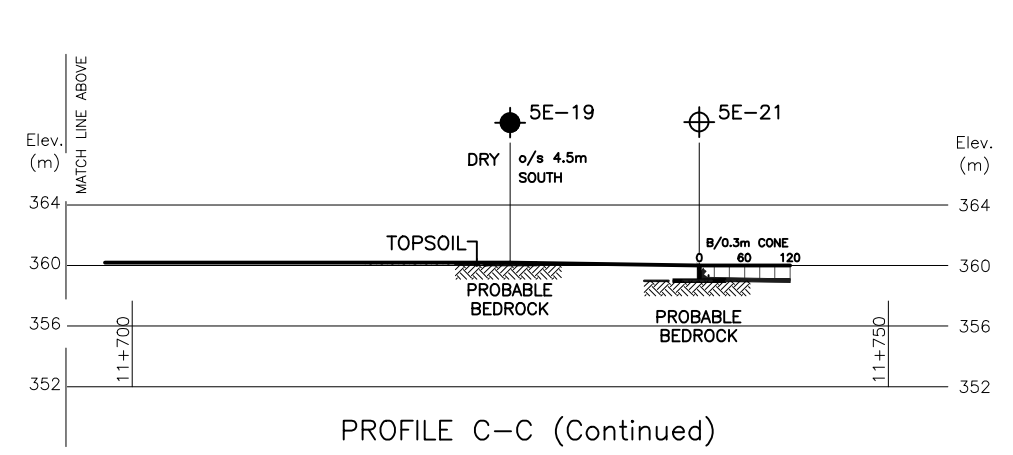
DATE	BY	DESCRIPTION

Geocres No. 52E-52

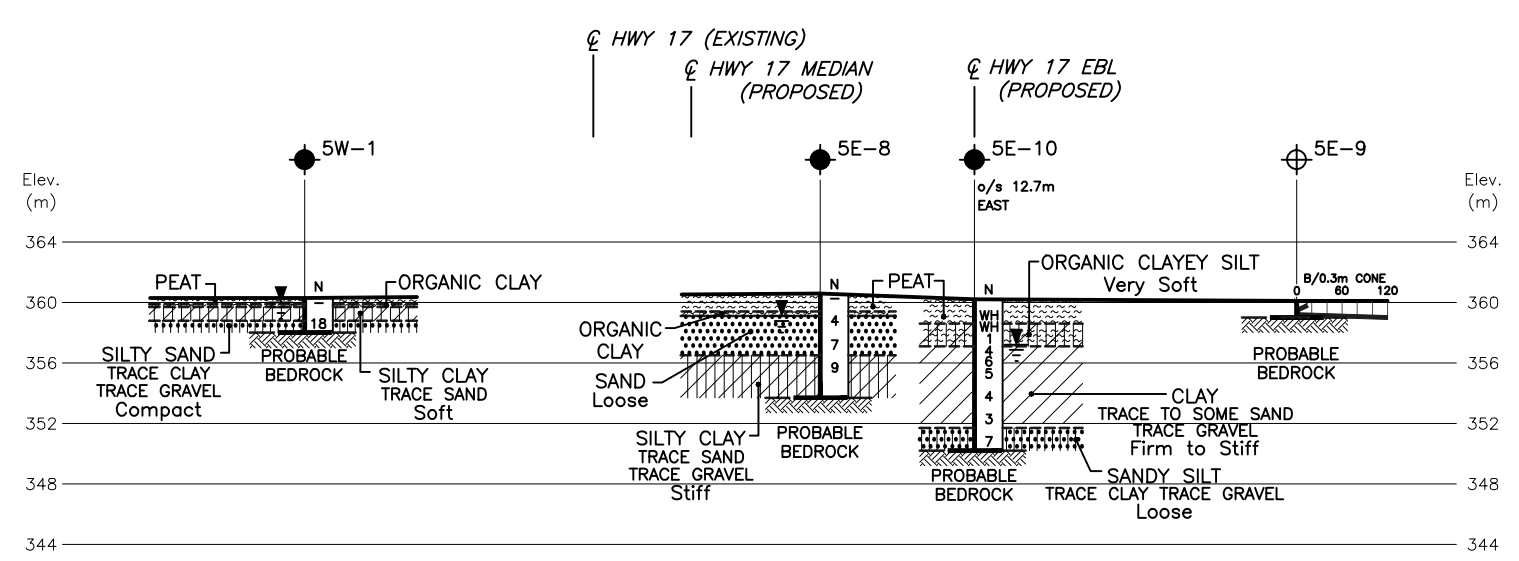
HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED NSB	DATE May 12, 2011
DRAWN	NA	CHECKED CN	APPROVED BRG



PROFILE C-C



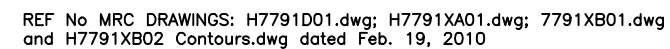
SECTION D-D



SECTION E-E
SCALE
5 0 5 10m

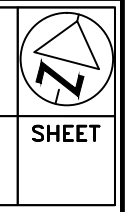
- NOTES:
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
 - REFER TO DRAWING 5-1 FOR BOREHOLE LOCATIONS PLAN AND DRAWING 5-2 FOR PROFILES A-A AND B-B.
 - THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

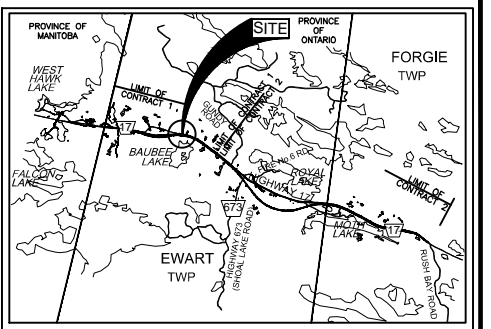


METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00
SWAMP 9
HIGHWAY 17 FOUR-LANING
STA. 12+960 TO 13+160 EBL EWTW TWP
BOREHOLE LOCATIONS AND SOIL STRATA



PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
0 2 4 km

LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole and Cone
	Hand Auger Hole by TBTE (see note 3)
	Test Pit by TBTE (see note 3)
N	Blows/0.3m (Std. Pen Test, 475 J/blow)
CONE	Blows/0.3m (60° Cone, 475 J/blow)
WH	Penetration due to weight of rods and hammer
W L	at time of investigation March 2010
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

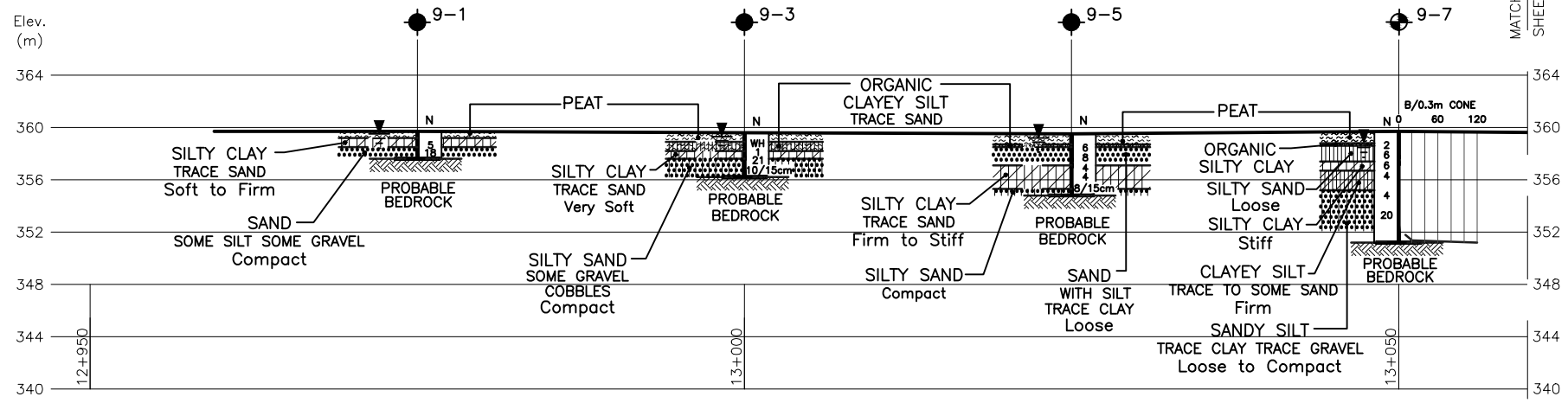
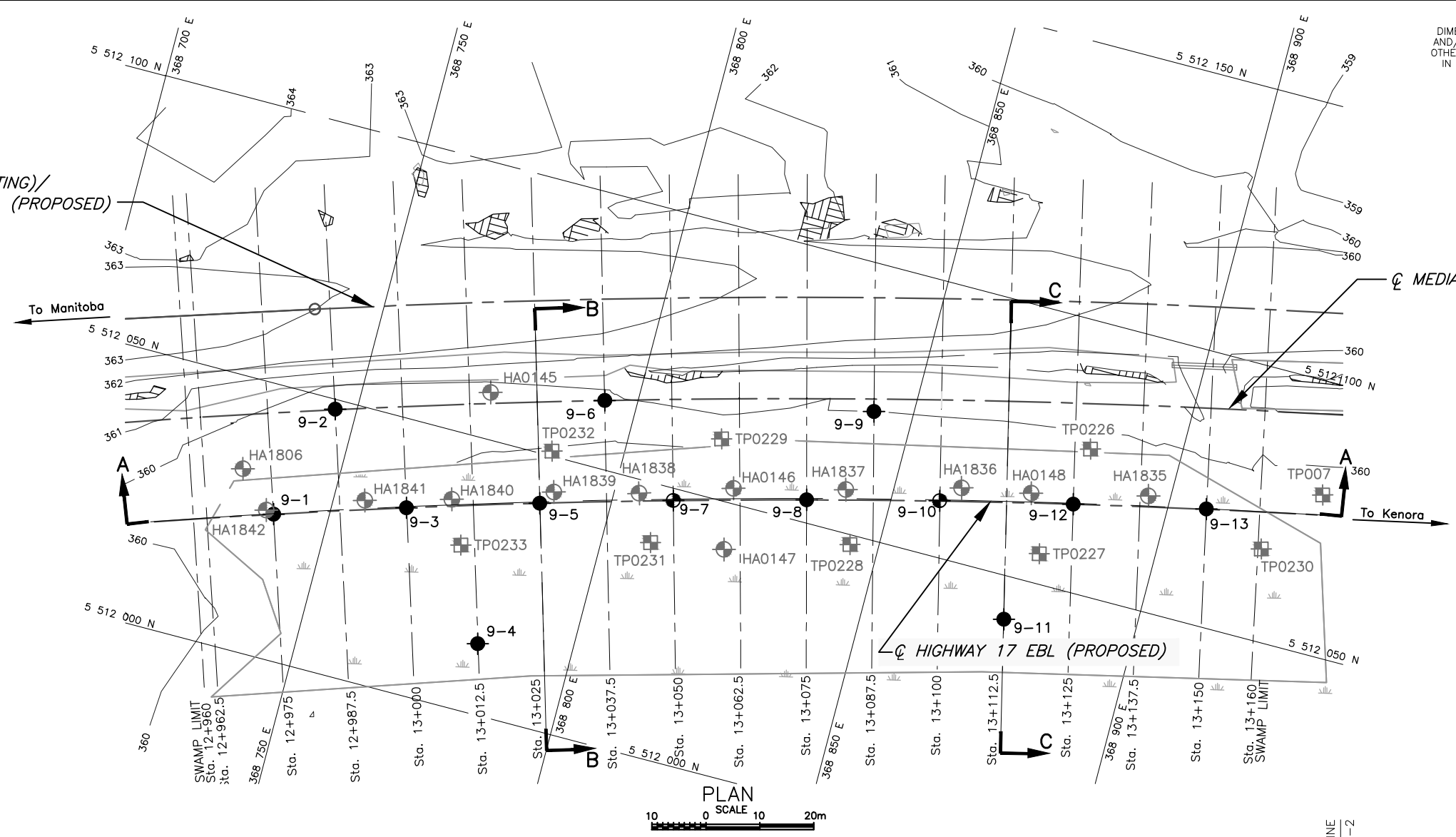
BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
9-1	359.7	5 512 026.5	368 740.0
9-2	360.0	5 512 048.2	368 746.1
9-3	359.6	5 512 033.9	368 763.5
9-4	359.6	5 512 012.9	368 782.7
9-5	359.5	5 512 041.0	368 787.2
9-6	359.7	5 512 062.5	368 794.0
9-7	359.7	5 512 047.8	368 811.0
9-8	359.5	5 512 054.2	368 834.9
9-9	359.8	5 512 073.2	368 842.8
9-10	359.4	5 512 060.3	368 858.8
9-11	359.6	5 512 042.1	368 875.9
9-12	359.5	5 512 066.0	368 882.9
9-13	359.4	5 512 071.4	368 907.0

NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

Geocres No.	52E-52
HWY No.	17
SUBM'D NSB	CHECKED NSB
DATE	May 12, 2011
SITE	---
DRAWN NA	CHECKED CN
APPROVED BRG	---
DWG	9-1

☐ HIGHWAY 17 (EXISTING)/
☐ HIGHWAY 17 (WBL) (PROPOSED)

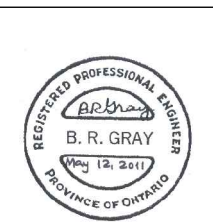
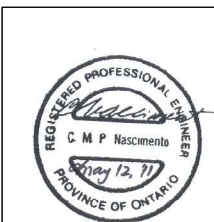


PROFILE A-A

SCALE
0 5 10m

NOTES:

1. REFER TO DRAWING 9-2 FOR PROFILE A-A (Continued), SECTIONS B-B AND C-C.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
3. TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
4. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



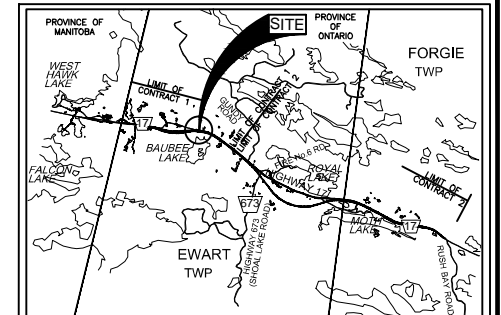
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00
SWAMP 9
HIGHWAY 17 FOUR-LANING
STA. 12+960 TO 13+160 EBL EWART TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
1 0 2 4km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Hand Auger Hole by TBTE (see note 3)
- Test Pit by TBTE (see note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

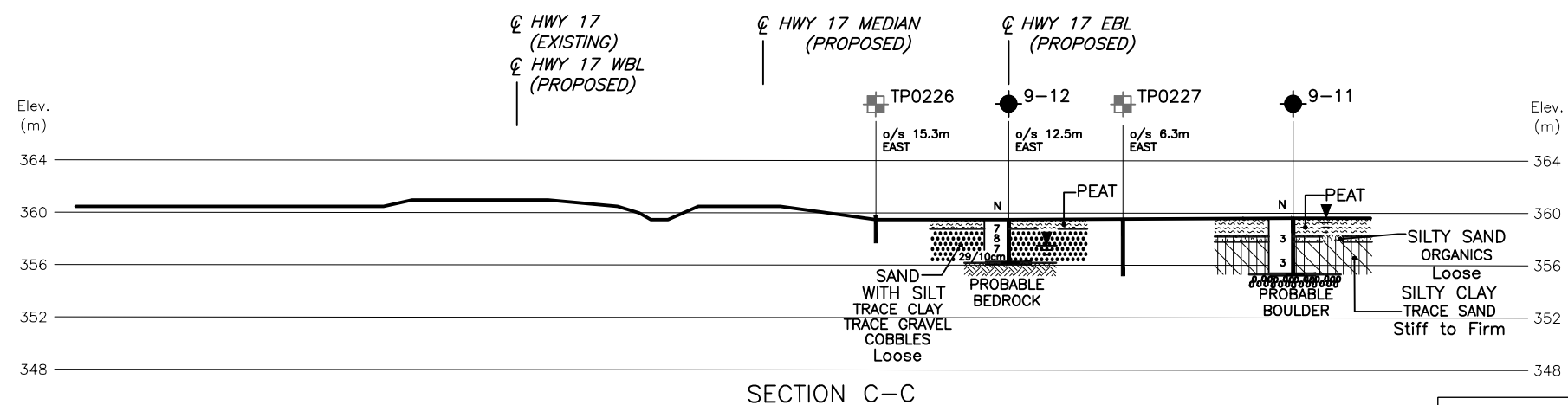
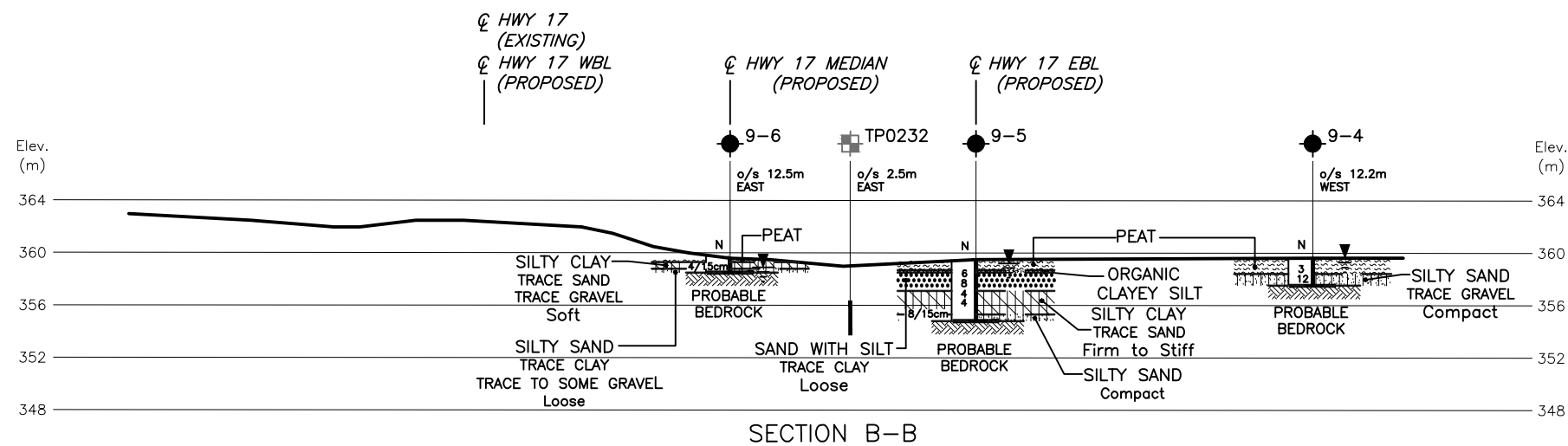
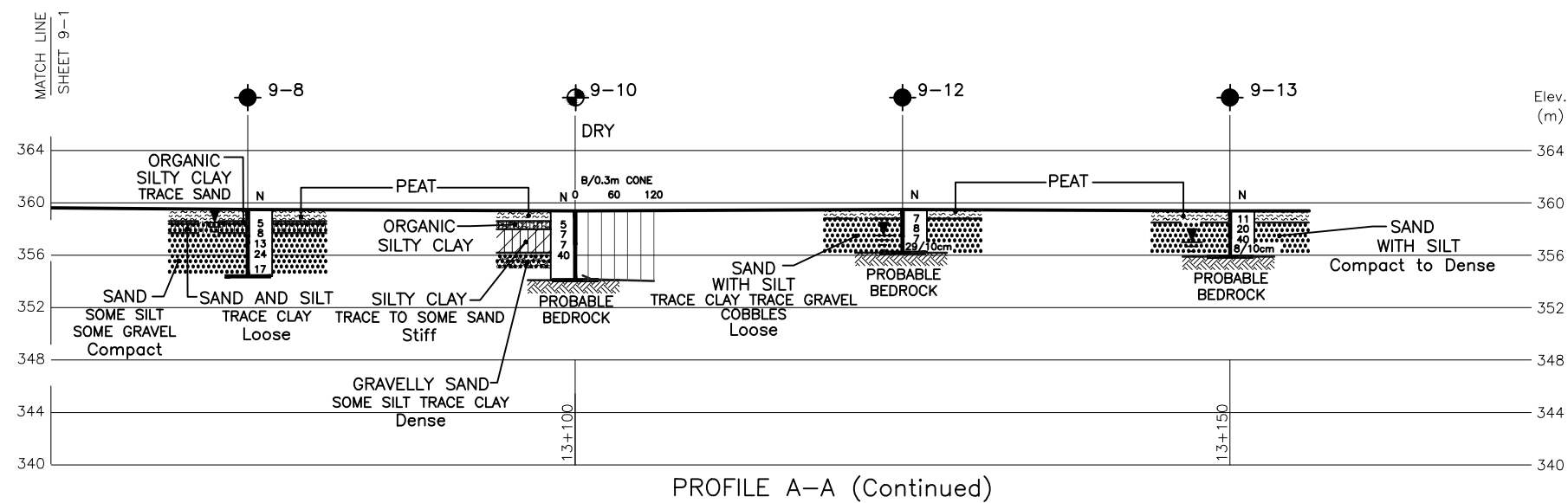
BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 9-1 FOR DETAILS			

- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

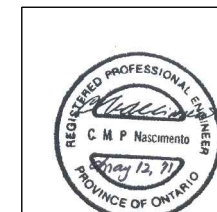
Geocres No. 52E-52		HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE ---
DRAWN NA	CHECKED CN	APPROVED BRG	DWG 9-2



NOTES:

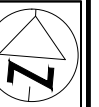
- REFER TO DRAWING 9-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

SCALE
5 0 5 10m

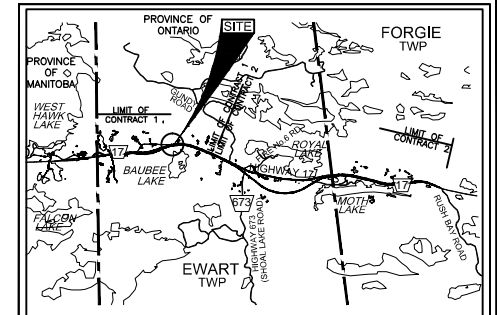


REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRESCONT No
GWP No 6020-09-00SWAMP 10
HIGHWAY 17 FOUR-LANING
STA. 13+290 TO 13+485 EBL EWARD TWP
BOREHOLE LOCATIONS AND SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERSKEY PLAN
SCALE
0 2 4 km

LEGEND

- Borehole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊙ Borehole and Cone
- ⊙ Preliminary Test Hole by PML
- ⊙ Test Hole by TBTE (See Note 3)
- ⊙ Test Pit by TBTE (See Note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- W L at time of investigation March 2010
10-P1 June 2009
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
10-1	357.9	5 512 075.4	369 046.1
10-2	358.5	5 512 114.9	369 050.8
10-3	358.9	5 512 116.4	369 063.3
10-4	357.8	5 512 076.2	369 068.1
10-5	358.0	5 512 099.2	369 077.8
10-6	358.9	5 512 119.2	369 088.2
10-7	357.8	5 512 080.9	369 092.2
10-8	357.8	5 512 101.8	369 102.4
10-9	359.0	5 512 121.7	369 113.1
10-10	357.8	5 512 081.2	369 116.7
10-11	357.9	5 512 103.9	369 126.8
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10-13	357.8	5 512 088.7	369 140.6

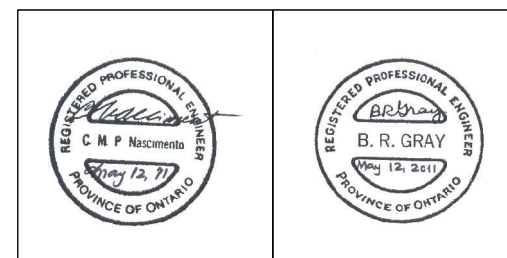
(Legend Continues)

- NOTE -

The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

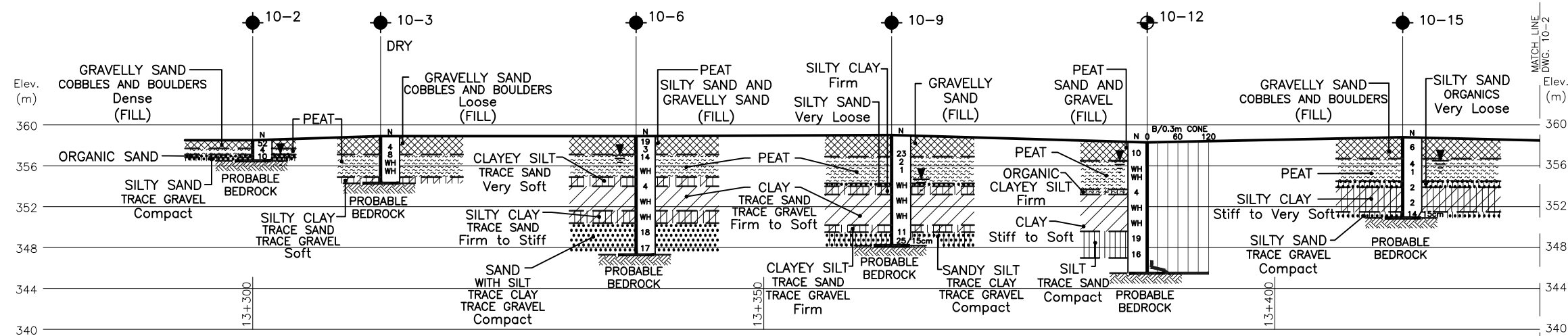
Geocres No. 52E-52

HWY No 17
SUBM'D NSB [CHECKED NSB] DATE May 12, 2011 SITE ---
DRAWN NA [CHECKED CN] APPROVED BRG DWG 10-1REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg;
H7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

To Manitoba

To Kenora

PLAN

SCALE
10 0 10 20m

PROFILE A-A

SCALE
5 0 5 10m

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWINGS 10-2 FOR PROFILE A-A (CONTINUED), PROFILE B-B AND SECTION C-C AND DRAWING 10-3 FOR SECTIONS D-D AND E-E.
- TBTE DENOTES THUNDER BAY TESTING AND ENGINEERING.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

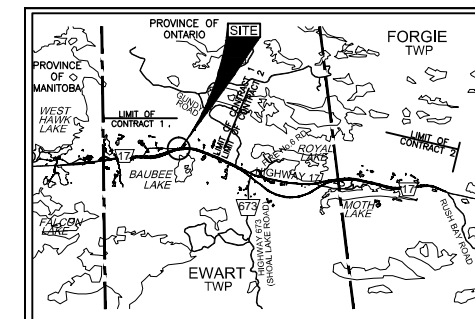
(Legend Continued)

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
10-14	357.7	5 512 105.8	369 151.7
10-15	358.8	5 512 125.3	369 163.0
10-16	357.7	5 512 090.4	369 165.1
10-17	357.3	5 512 107.3	369 176.4
10-18	358.2	5 512 126.6	369 187.9
10-19	357.5	5 512 091.7	369 189.5
10-20	357.5	5 512 108.4	369 201.1
10-21	357.4	5 512 092.6	369 214.0
10-22	357.5	5 512 109.2	369 225.9
10-23	359.2	5 512 128.2	369 235.4
10-24	357.9	5 512 093.2	369 236.0
10-P1	357.4	5 512 097.6	369 184.2

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRESCONT No
GWP No 6020-09-00SWAMP 10
HIGHWAY 17 FOUR-LANING
STA. 13+290 TO 13+485 EBL EWART TWP
SOIL STRATA

SHEET

PMI Peto MacCallum Ltd.
CONSULTING ENGINEERSKEY PLAN
SCALE
1 0 2 4km

LEGEND

- Borehole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Borehole and Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- PH Shelby tube pushed hydraulically
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
REFER TO DWG 10-1 FOR DETAILS			

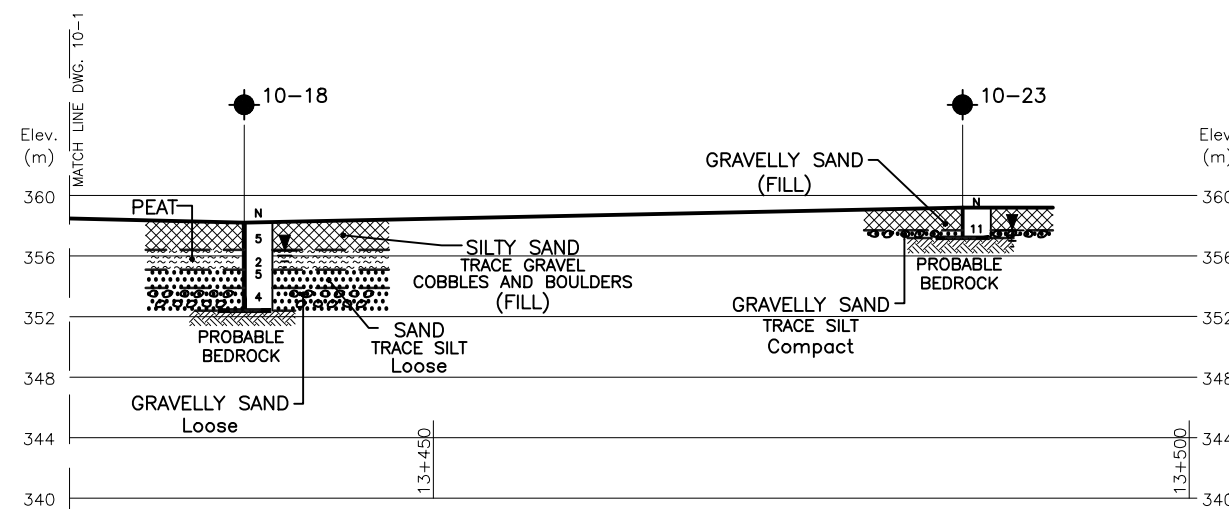
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

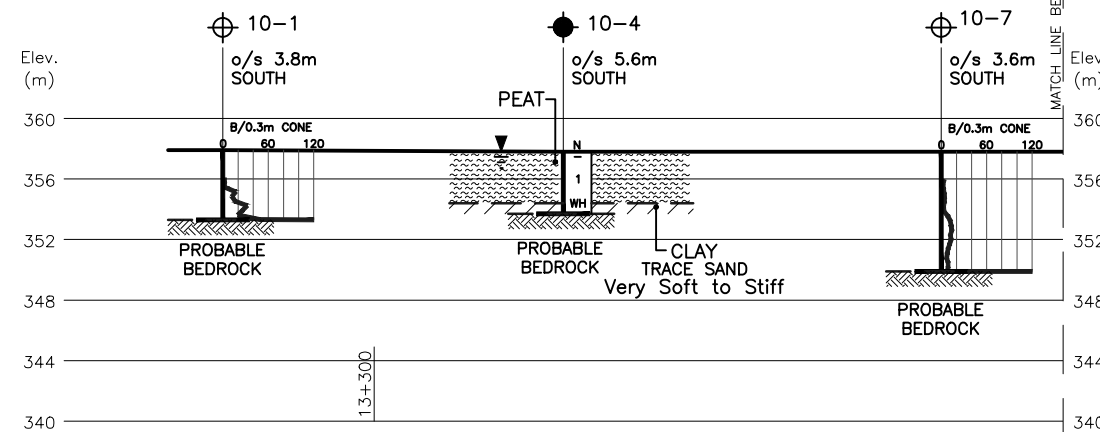
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

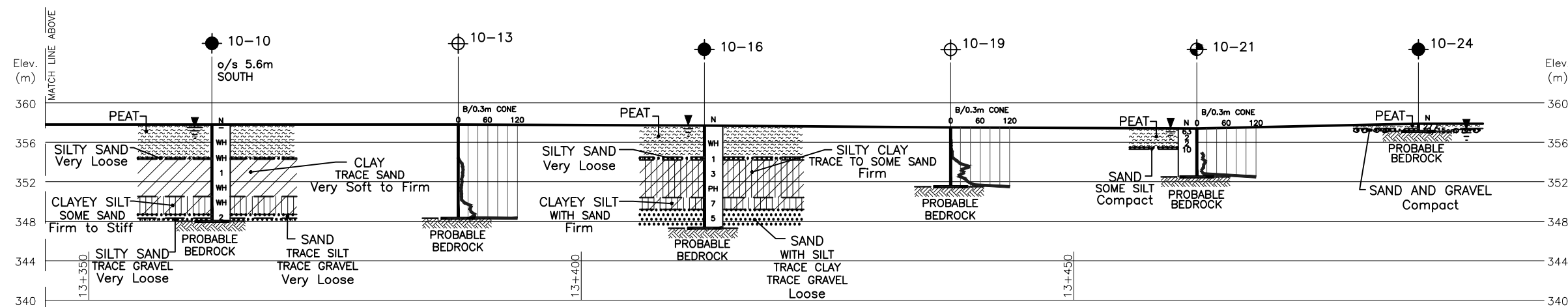
HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB
DRAWN NA	CHECKED CN
DATE May 12, 2011	APPROVED BRG
SITE ---	DWG 10-2

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

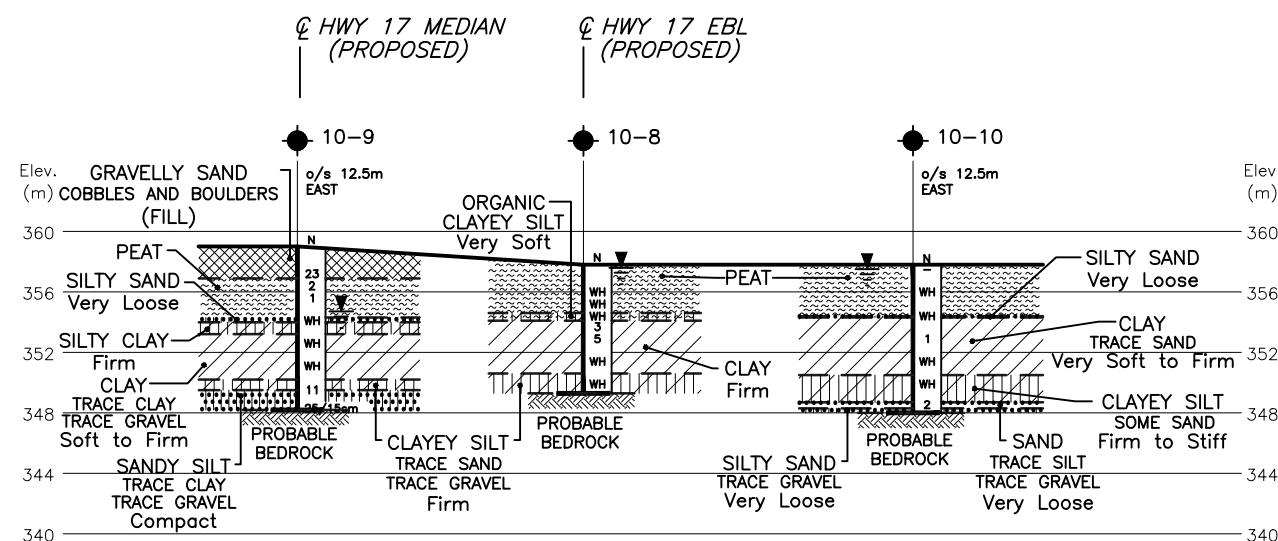
PROFILE A-A (Continued)



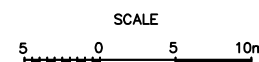
PROFILE B-B



PROFILE B-B (Continued)



SECTION C-C



NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 10-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A AND DRAWING 10-3 FOR SECTIONS D-D AND E-E.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

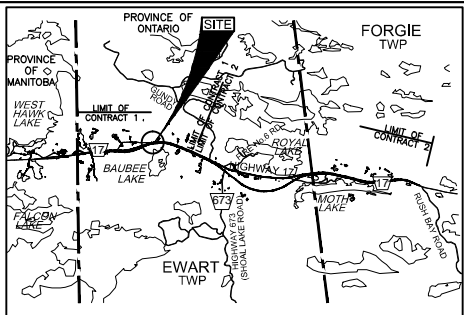
METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 10
HIGHWAY 17 FOUR-LANING
STA. 13+290 TO 13+485 EBL EWART TWP
SOIL STRATA

SHEET



KEY PLAN
SCALE
1 0 2 4km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- PH Shelby tube pushed hydraulically
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
REFER TO DWG 10-1 FOR DETAILS			

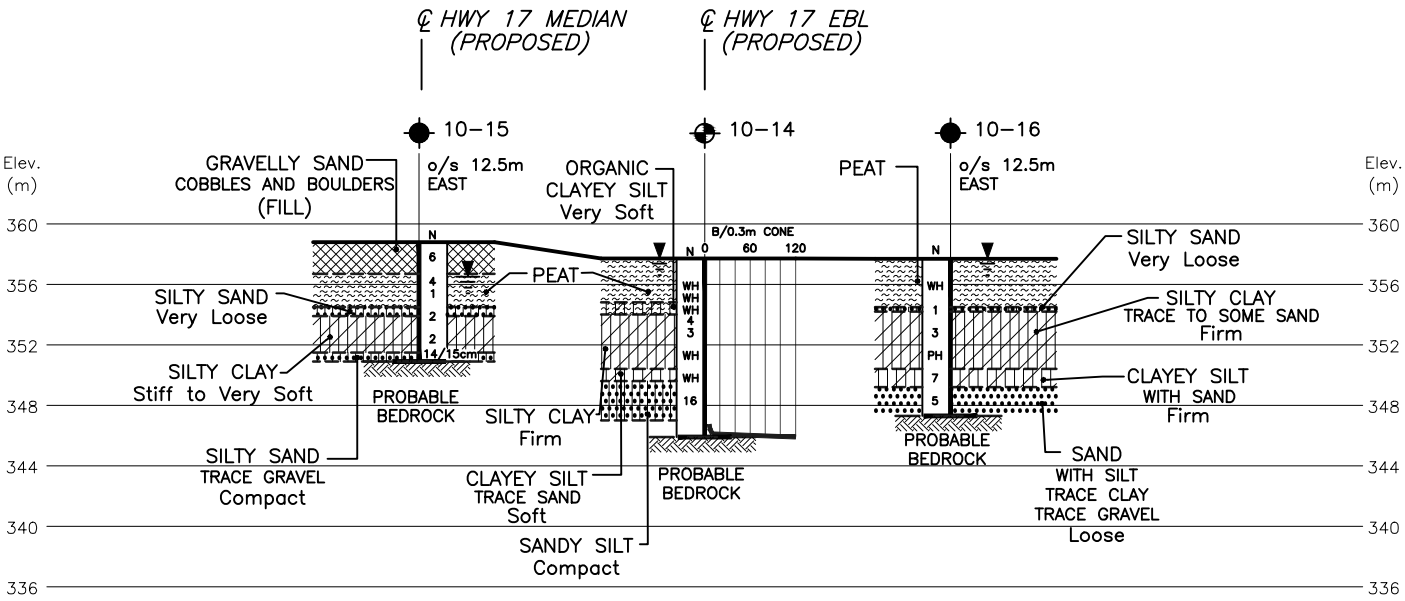
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

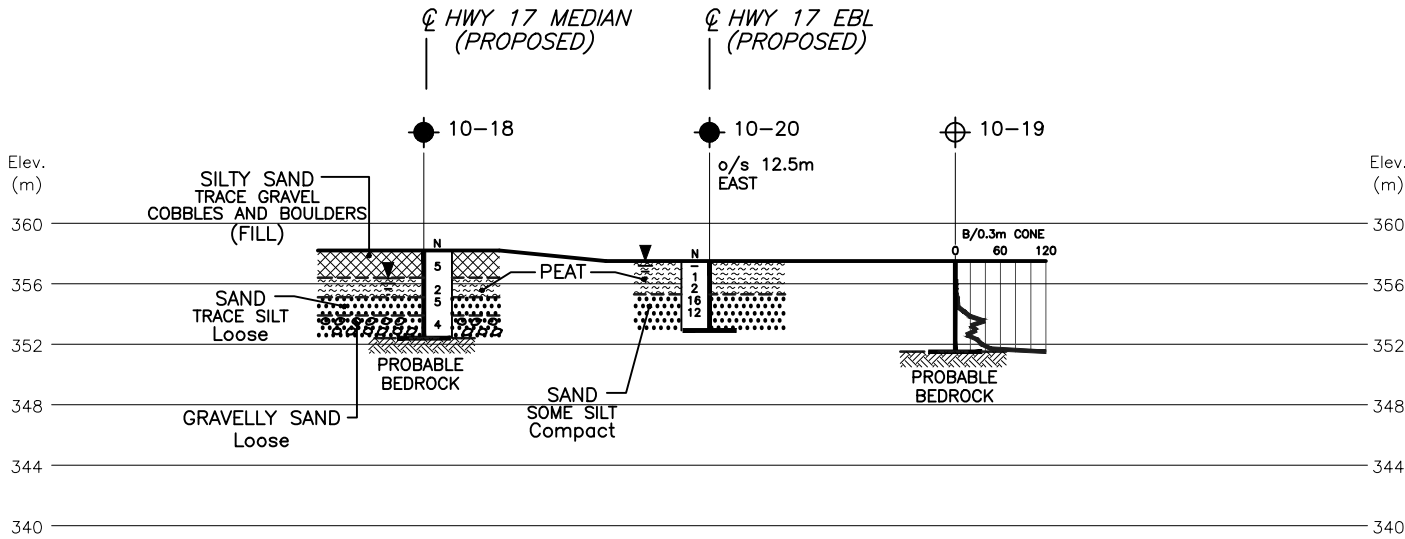
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

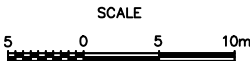
HWY No 17	SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE ---	DIST Kenora
DRAWN NA	CHECKED CN	APPROVED BRG		DWG 10-3	



SECTION D-D



SECTION E-E



NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 10-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A AND DRAWING 10-2 FOR PROFILE A-A (CONTINUED), PROFILE B-B AND SECTION C-C.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.














REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES



SWAMP 17
HIGHWAY 17 FOUR-LANING
STA. 15+800 TO 15+900 EBL EWART TWP
BOREHOLE LOCATIONS

[illegible]

LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole and Cone
	Test Pit
	Preliminary Test Hole by PML
	Test Hole by TBTE (See Note 3)
	Test Pit by TBTE (See Note 3)
N	Blows/0.3m (Std. Pen Test, 475 J/blow)
CONE	Blows/0.3m (60° Cone, 475 J/blow)
	W L at time of investigation March 2010 17-P1 JUNE 2009
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	CO—ORDS	
		NORTHING	EASTING
17-1	365.6	5 511 296.4	371 396.7
17-2	364.3	5 511 325.1	371 425.3
17-3	364.7	5 511 290.8	371 407.8
17-4	364.3	5 511 304.9	371 423.4
17-5	364.1	5 511 313.7	371 447.5
17-6	364.1	5 511 279.0	371 430.0
17-7	364.0	5 511 291.3	371 450.1
17-8	363.9	5 511 302.3	371 469.8
17-9	363.9	5 511 268.0	371 452.3
17-10	363.9	5 511 279.9	371 472.4
17-P1	364.1	5 511 297.1	371 431.3

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS			
	DATE	BY	DESCRIPTION

HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED	NSB
DATE	May 12, 2011	SITE	--
DRAWN	NA	CHECKED	CN
APPROVED	BRG	DWG	17-1

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg;
7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING 17-2 FOR PROFILE A-A, PROFILE B-B AND SECTION C-C.
3. TBTE DENOTES THUNDER BAY TESTING AND ENGINEERING.
4. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

METRIC

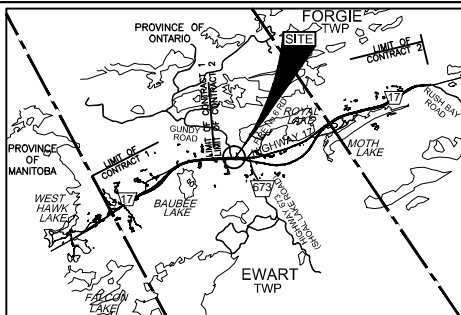
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 17
HIGHWAY 17 FOUR-LANING
STA. 15+800 TO 15+900 EBL EWART TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
0 2 4 6 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Test Pit
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 17-1 FOR DETAILS			

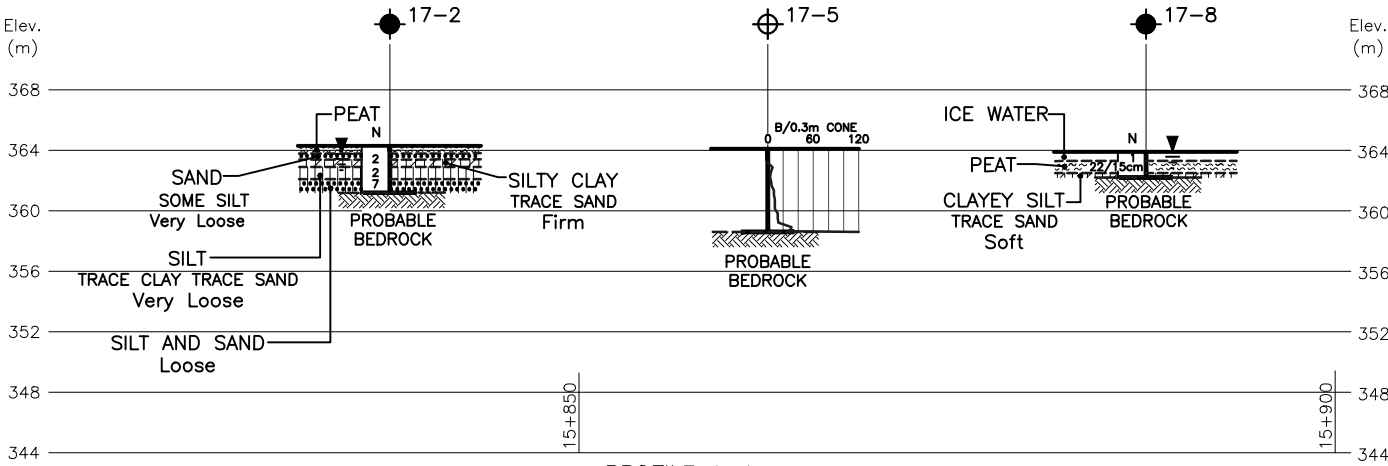
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

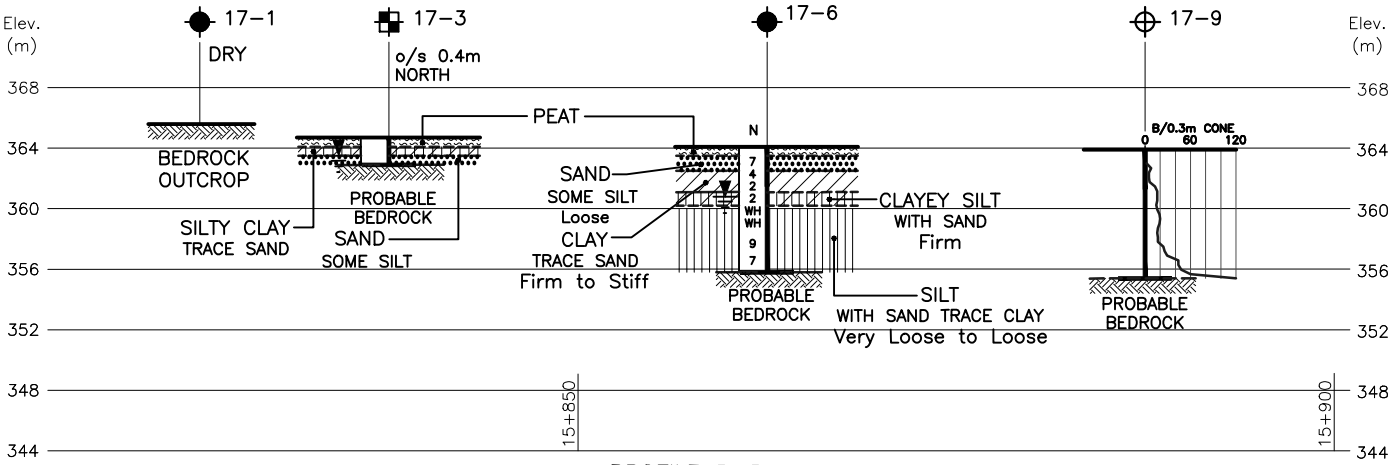
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

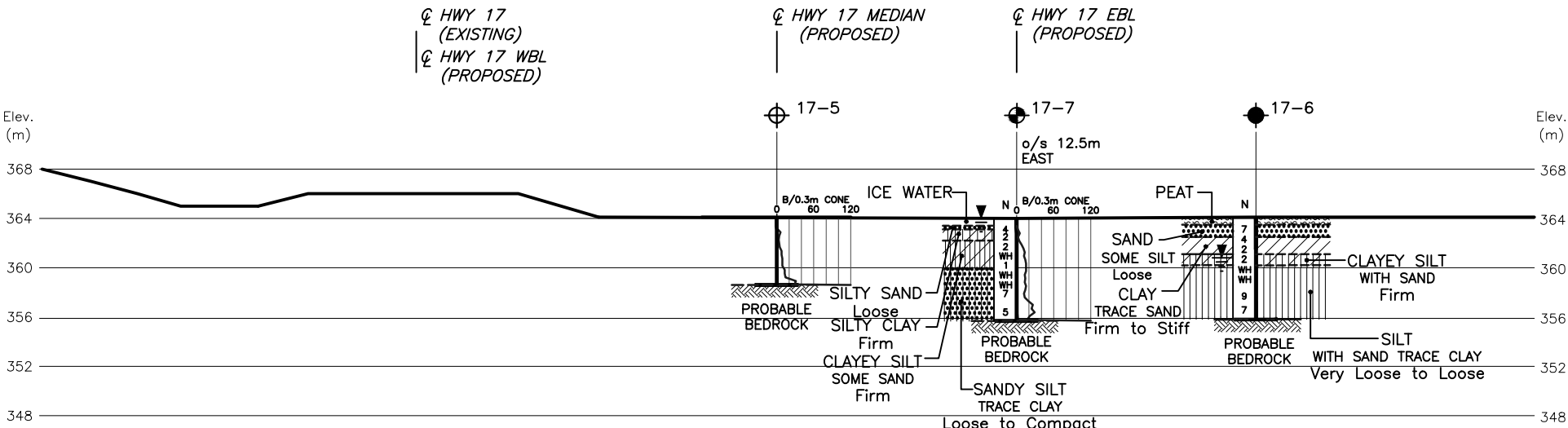
HWY No 17	SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE ---	DIST Kenora
DRAWN NA	CHECKED CN	APPROVED BRG		DWG 17-2	



PROFILE A-A



PROFILE B-B



SECTION C-C

SCALE
0 5 10m

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 17-1 FOR BOREHOLE LOCATIONS PLAN.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg;
H7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

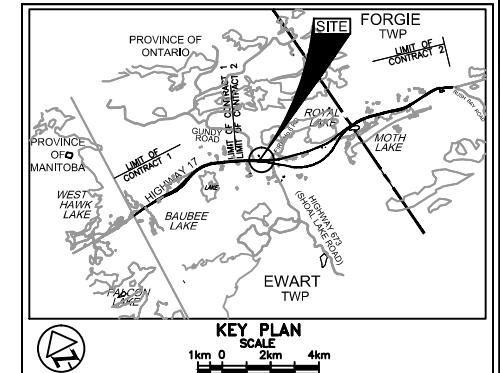
CONT No
GWP No 6020-09-00

SWAMP 17A
HIGHWAY 17 FOUR-LANING
STA. 15+970 TO 16+030 EBL EWART TWP
BOREHOLE LOCATIONS AND SOIL STRATA



SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Preliminary Test Hole by PML
- Test Hole by TBTE (See Note 3)
- Test Pit by TBTE (See Note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation March 2010
17A-P1 June 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
17A-1	362.5	5 511 255.1	371 556.5
17A-2	362.3	5 511 232.6	371 559.3
17A-3	362.1	5 511 242.5	371 579.5
17A-4	362.6	5 511 207.6	371 558.9
17A-5	362.8	5 511 217.9	371 584.2
17A-P1	362.6	5 511 270.4	371 545.6

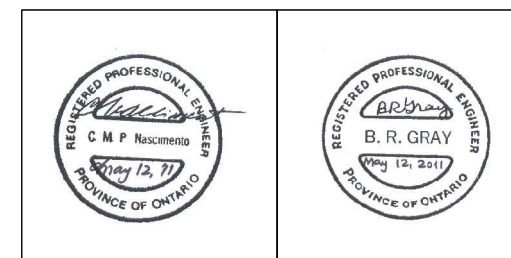
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

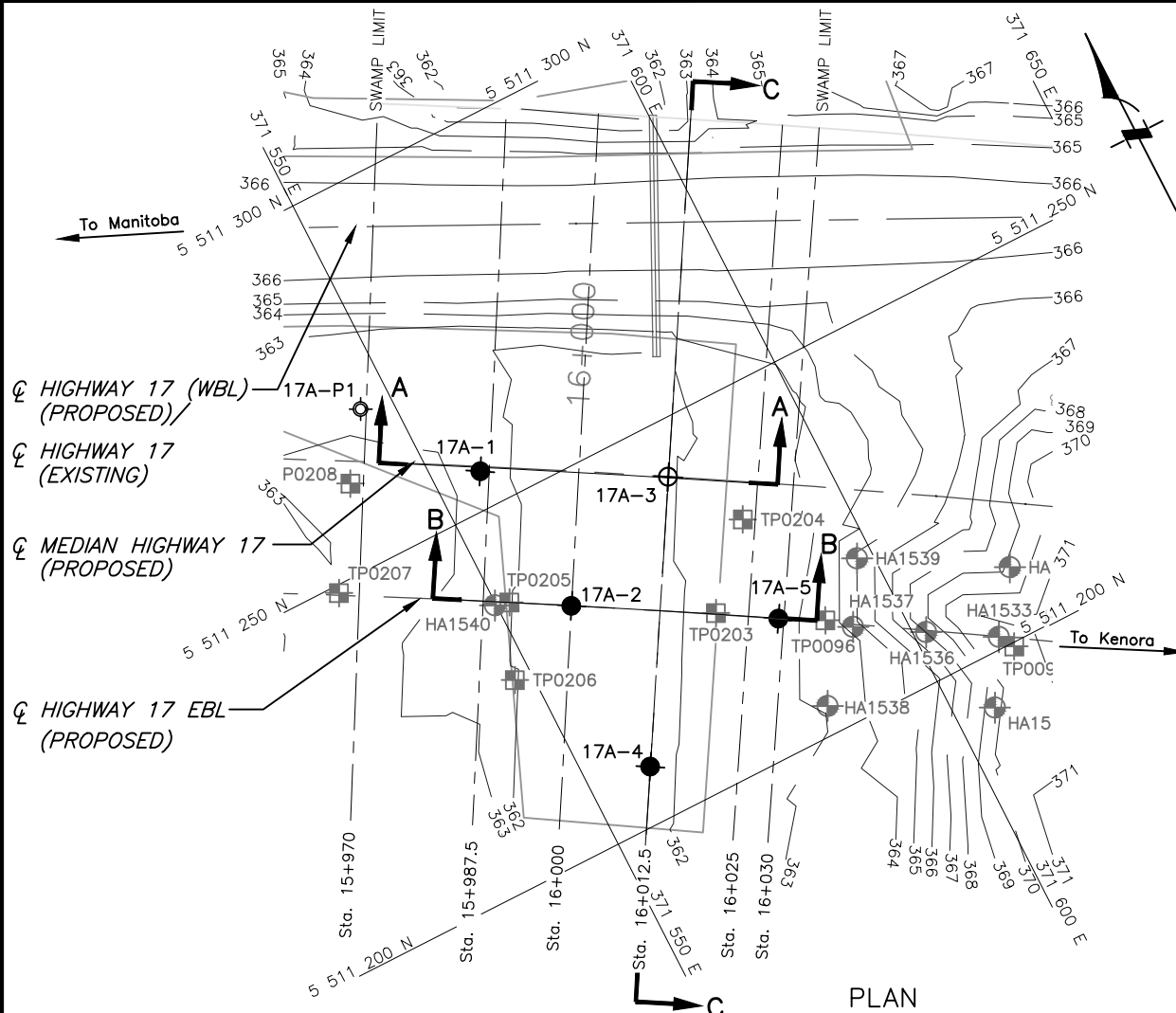
DATE	BY	DESCRIPTION

Geocres No. 52E-52

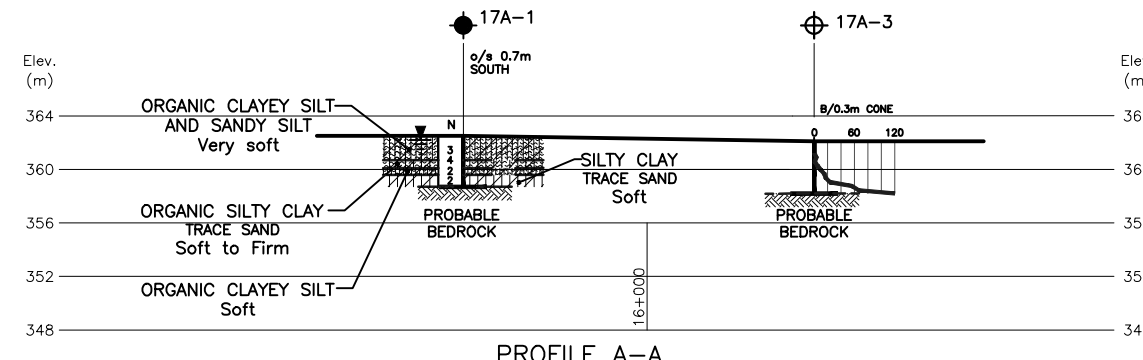
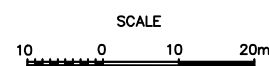
HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB
DATE May 12, 2011	SITE
DRAWN NA	CHECKED CN
APPROVED BRG	DWG 17A-1



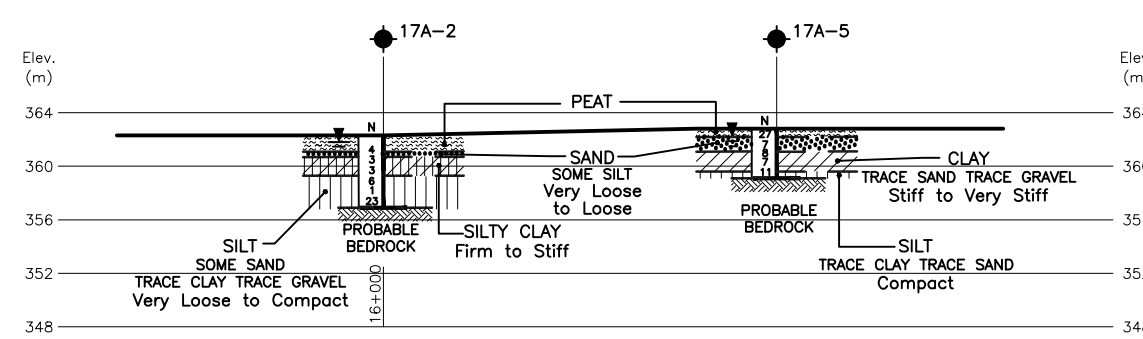
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg;
H7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010



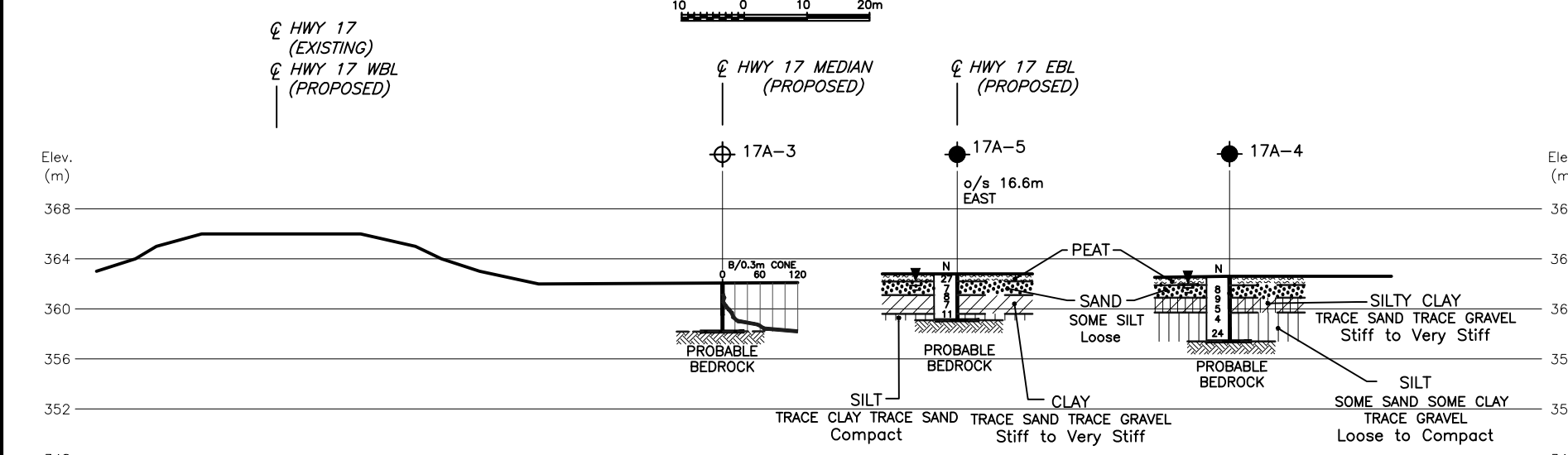
PLAN



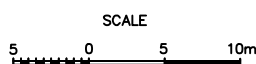
PROFILE A-A



PROFILE B-B



SECTION C-C



NOTES:

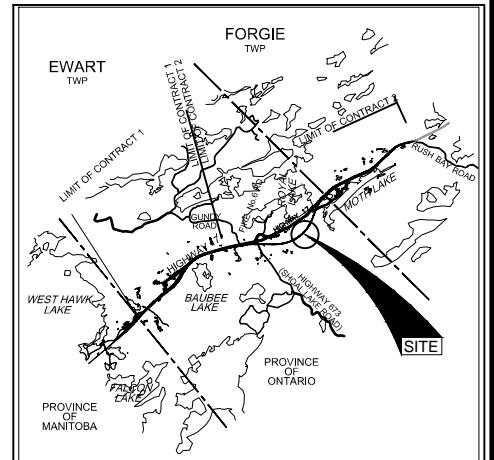
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 19
HIGHWAY 17 FOUR-LANING
STA. 16+880 TO 17+230 Ewart TWP
SOIL STRATA

SHEET



KEY PLAN
SCALE
0 2 4 6 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Test Pit
- Auger Probe
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of hammer and rods
- WR Penetration due to weight of rods only
- W L at time of investigation Jan-Feb 2010
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	CO—ORDS	
		NORTHING	EASTING
SEE DRAWING 19-1 FOR DETAILS			

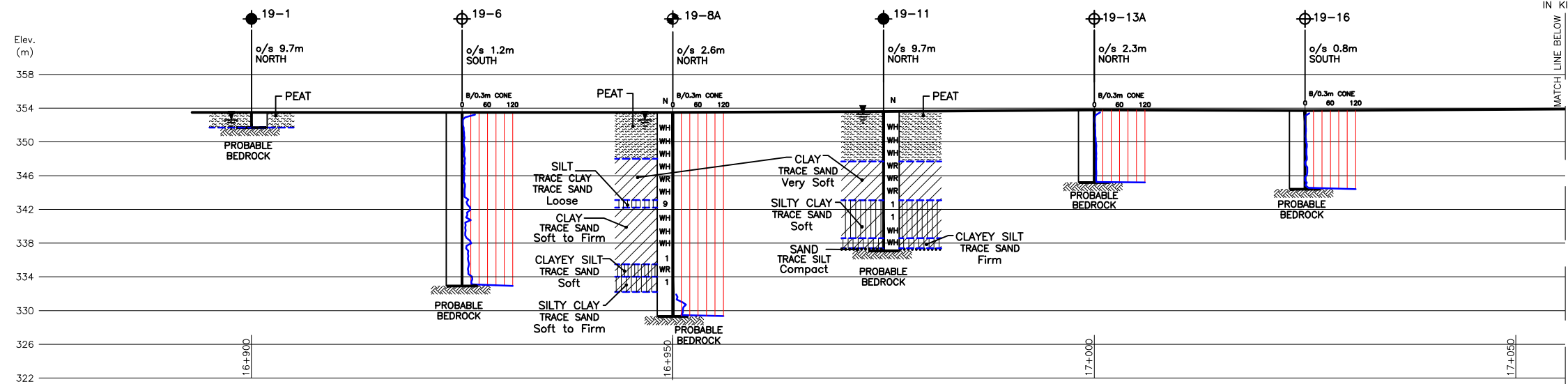
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

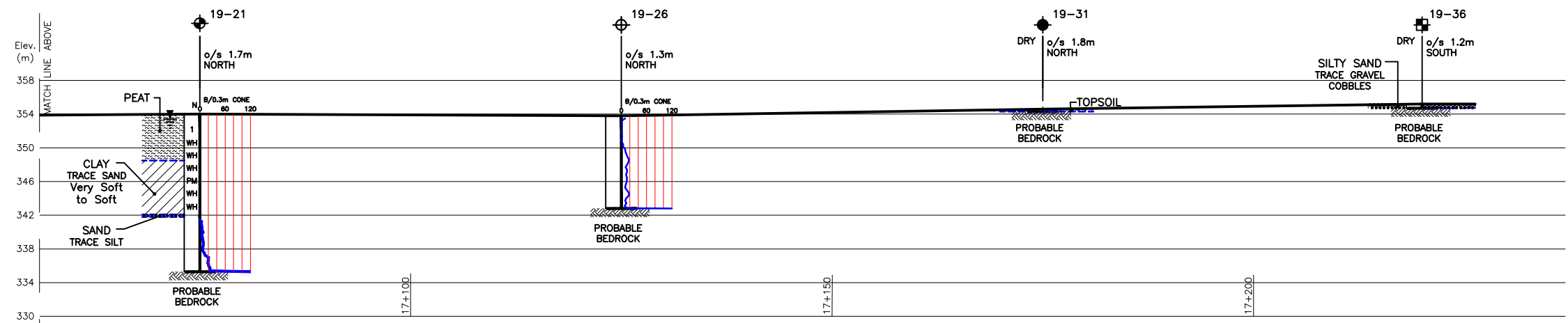
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

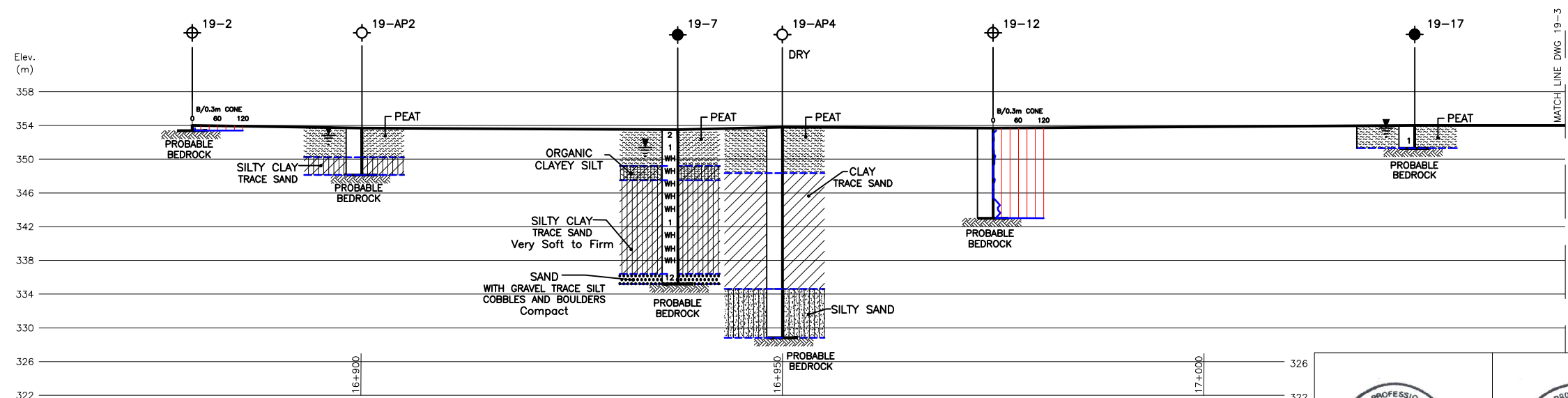
HWY No 17	DIST Kenora
SUBMIT NSB	CHECKED NSB
DRAWN NA	CHECKED CN
DATE May 12, 2011	APPROVED BRG
SITE	DWG 19-2



PROFILE A-A



PROFILE A-A (Continued)



PROFILE B-B

NOTES:

- REFER TO DRAWING 19-1 FOR BOREHOLE LOCATIONS PLAN, DRAWING 19-3 FOR PROFILE B-B (CONTINUED) AND PROFILE C-C AND DRAWING 19-4 FOR SECTIONS D-D AND E-E..
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

SCALE
0 5 10m



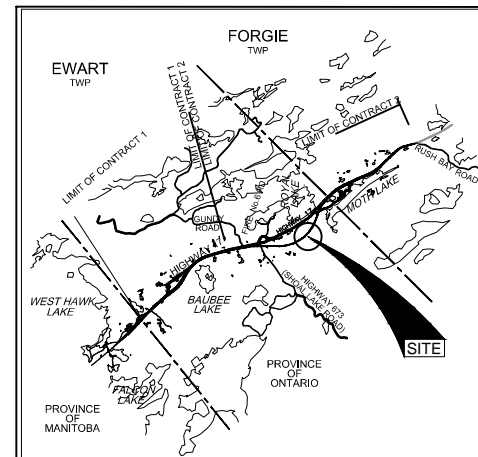
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 19
HIGHWAY 17 FOUR-LANING
STA. 16+880 TO 17+230 Ewart TWP
SOIL STRATA

SHEET



KEY PLAN
SCALE
0 2 4 6 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Test Pit
- Auger Probe
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of hammer and rods
- WR Penetration due to weight of rods only
- W L at time of investigation Jan-Feb 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

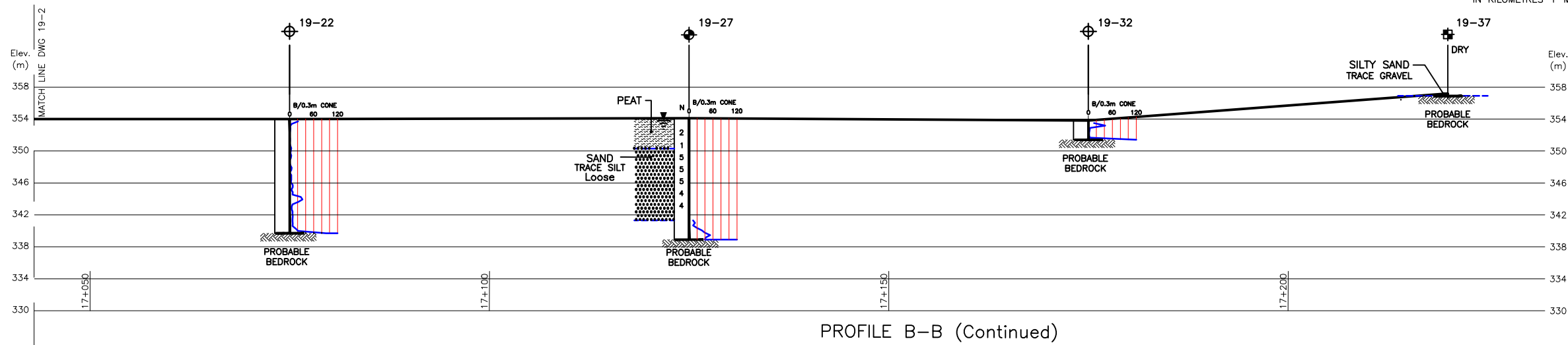
BH No	ELEVATION	CO—ORDS	
		NORTHING	EASTING
SEE DRAWING 19—1 FOR DETAILS			

NOTE

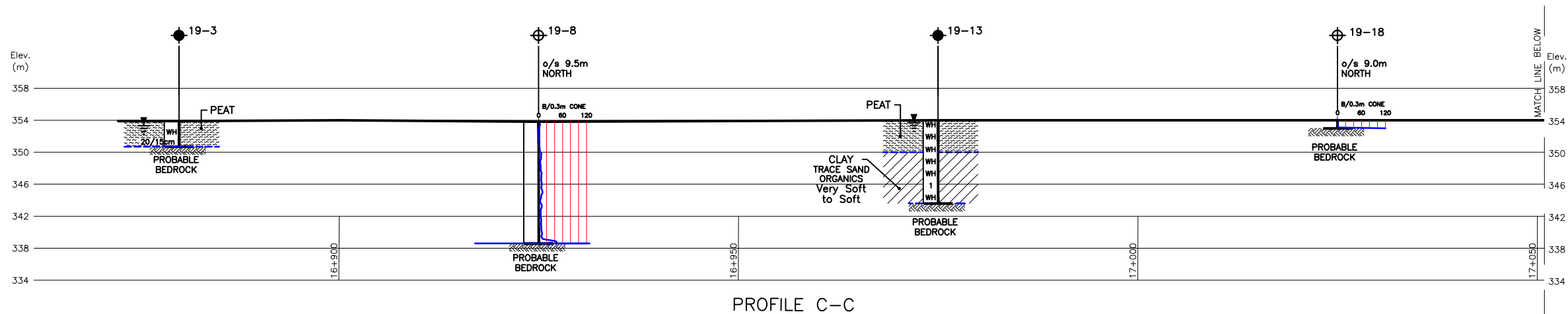
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

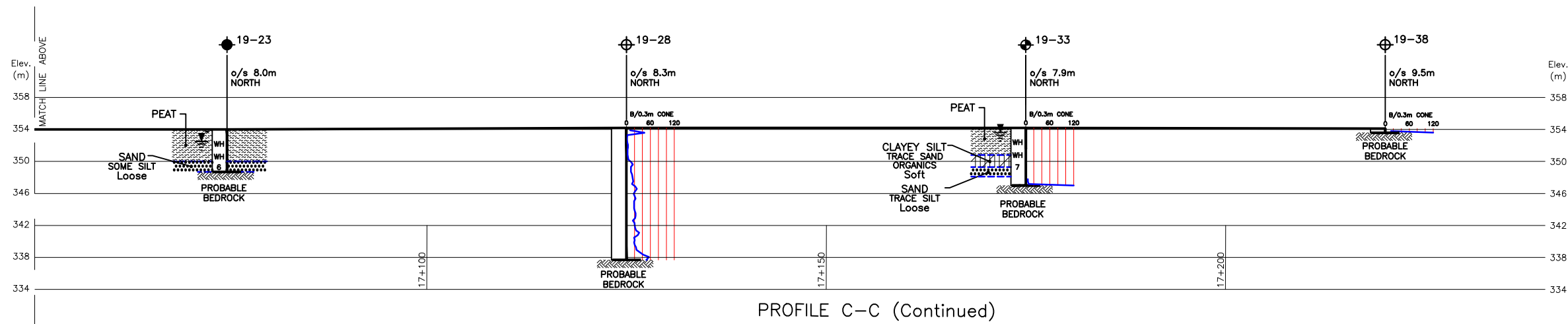
Geocres No. 52E-52			
HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED NSB	DATE May 12, 2011
DRAWN	NA	CHECKED CN	APPROVED BRG
SITE	---	DWG	19-3



PROFILE B-B (Continued)



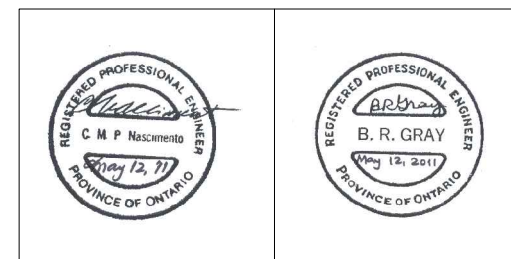
PROFILE C-C



PROFILE C-C (Continued)

NOTES:

- REFER TO DRAWING 19-1 FOR BOREHOLE LOCATIONS PLAN, DRAWING 19-2 FOR PROFILES A-A AND PROFILE B-B (CONTINUED) AND DRAWING 19-4 FOR SECTIONS D-D AND E-E.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



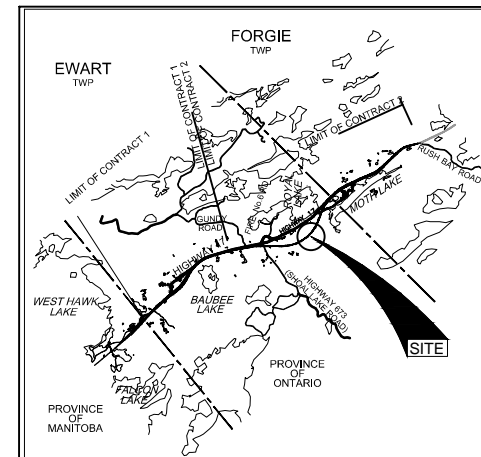
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 19
HIGHWAY 17 FOUR-LANING
STA. 16+880 TO 17+230 EWART TWP
SOIL STRATA

SHEET



KEY PLAN
SCALE
0 2 4 6 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Test Pit
- Auger Probe
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of hammer and rods
- WR Penetration due to weight of rods only
- PM Shelby tube pushed manually
- PH Shelby tube pushed hydraulically
- W L at time of investigation Jan-Feb 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

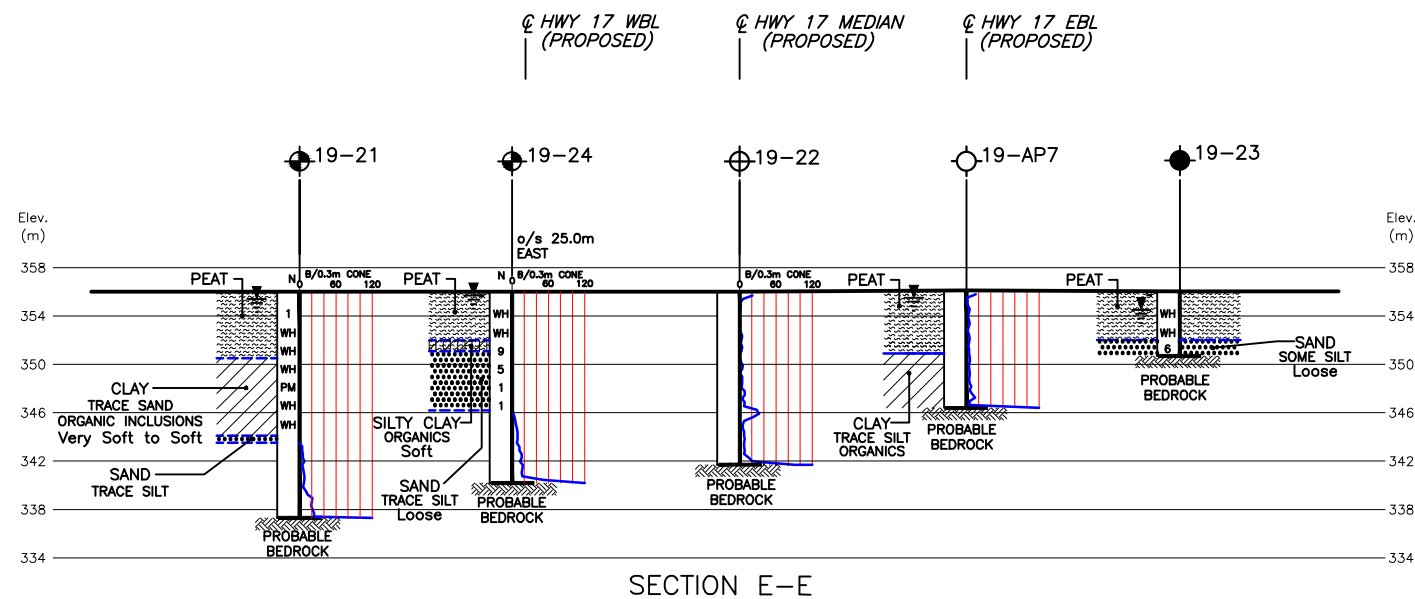
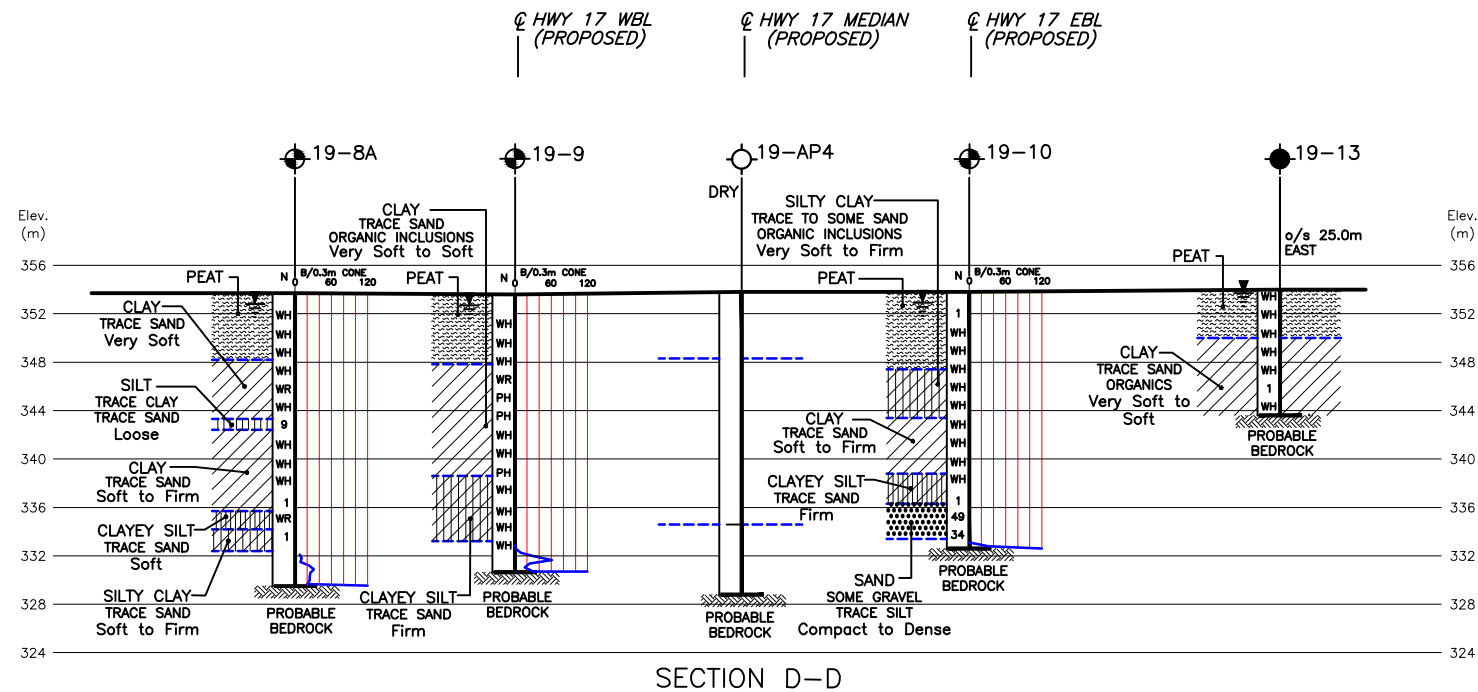
BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 19-1 FOR DETAILS			

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

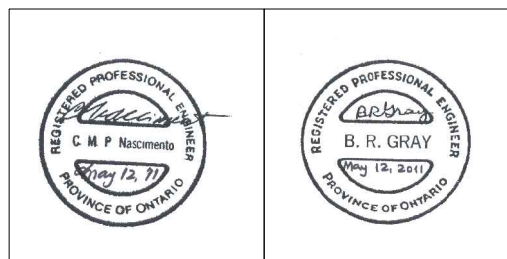
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52	HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB	DATE May 12, 2011
DRAWN NA	CHECKED CN	APPROVED BRG
SITE	DWG	19-4

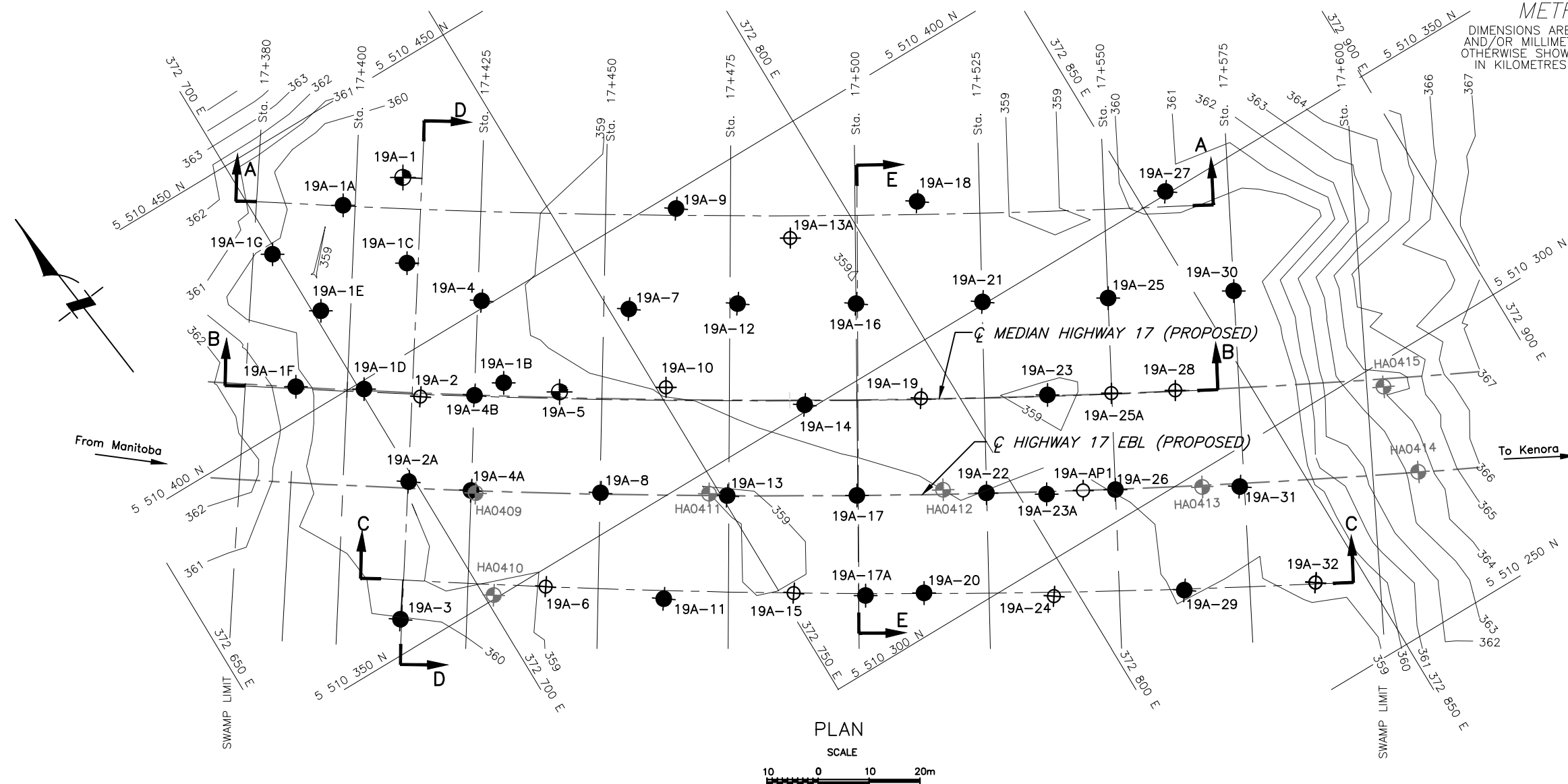


NOTES:

- REFER TO DRAWING 19-1 FOR BOREHOLE LOCATIONS PLAN, DRAWINGS 19-2 AND 19-3 FOR PROFILES A-A, B-B AND C-C.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

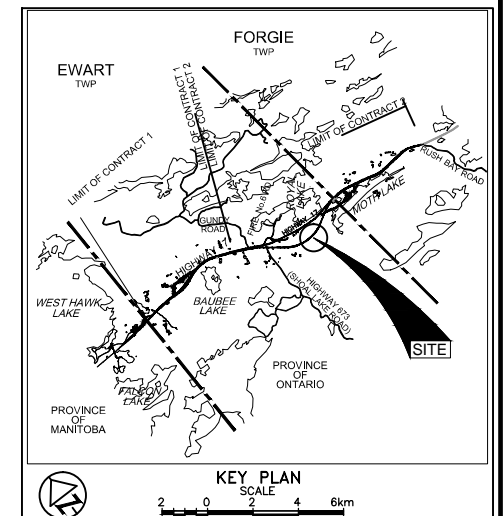













REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010



METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole and Cone
	Auger Probe
	Test Hole by TBTE (See Note 3)
	Test Pit by TBTE (See Note 3)
N	Blows/0.3m (60 Cone, 475 J/blow)
	W L at time of investigation Feb-Mar 2010
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
19A-1	359.4	5 510 430.1	372 728.8
19A-1A	359.5	5 510 431.5	372 715.9
19A-1B	359.4	5 510 385.4	372 724.9
19A-1C	359.4	5 510 415.3	372 720.8
19A-1D	359.3	5 510 398.5	372 700.8
19A-1E	359.4	5 510 416.0	372 701.5
19A-1F	361.2	5 510 405.8	372 689.6
19A-1G	359.4	5 510 430.4	372 699.1
19A-2	359.3	5 510 391.5	372 709.5

(Legend Continues)

- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS			
DATE	BY	DESCRIPTION	

Geocres No. 52E-52

HWY No	17			DIST	Kenora
SUBM'D	GD	CHECKED	GD	DATE	52E-52
DRAWN	NA	CHECKED	CN	APPROVED	BRG
				DWG	19A-1

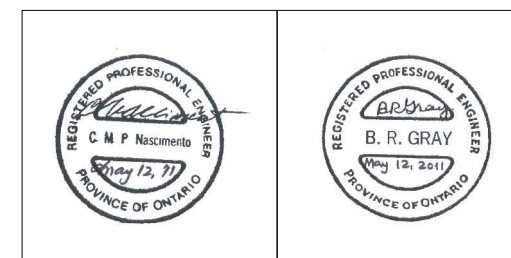
NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING 19A-2 FOR PROFILES A-A, B-B AND TO DRAWING 19A-3 FOR PROFILE C-C, SECTIONS D-D, E-E.
3. TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING:."
4. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
5. CENTRELINE OF WBL NOT AVAILABLE AT THE TIME OF THE INVESTIGATION.

(Legend Continued)			
BH No	ELEVATION	NORTHINGS	EASTINGS
19A-17A	359.4	5 510 313.0	372 764.1
19A-18	359.4	5 510 374.0	372 812.7
19A-19	359.4	5 510 340.5	372 793.4
19A-20	359.7	5 510 307.5	372 774.2
19A-21	359.3	5 510 350.5	372 813.5
19A-22	359.4	5 510 318.0	372 794.8
19A-23	359.4	5 510 328.3	372 815.0
19A-23A	359.5	5 510 311.7	372 804.8
19A-24	359.2	5 510 293.8	372 795.7
19A-25	359.4	5 510 338.4	372 835.0
19A-25A	359.2	5 510 322.1	372 825.9
19A-26	359.2	5 510 305.5	372 816.8
19A-27	359.7	5 510 350.5	372 855.4
19A-28	359.6	5 510 316.1	372 836.9
19A-29	359.2	5 510 281.6	372 818.2
19A-30	359.5	5 510 326.9	372 856.8
19A-31	359.2	5 510 293.4	372 839.0
19A-32	359.4	5 510 269.6	372 841.0
19A-AP1	359.3	5 510 308.6	372 811.3

(Legend Continued)			
BH No	ELEVATION	NORTHINGS	EASTINGS
19A-2A	359.3	5 510 378.4	372 698.9
19A-3	360.6	5 510 356.1	372 683.6
19A-4	359.5	5 510 401.4	372 729.5
19A-4A	359.3	5 510 370.6	372 708.5
19A-4B	359.3	5 510 386.3	372 718.7
19A-5	359.4	5 510 378.2	372 733.4
19A-6	359.1	5 510 346.9	372 711.3
19A-7	359.5	5 510 385.1	372 753.4
19A-8	359.2	5 510 357.1	372 730.0
19A-9	359.6	5 510 397.2	372 771.5
19A-10	359.3	5 510 368.2	372 751.7
19A-11	359.2	5 510 332.9	372 729.9
19A-12	359.5	5 510 375.0	372 772.2
19A-13	359.3	5 510 343.8	372 751.0
19A-13A	359.6	5 510 380.7	372 787.7
19A-14	359.5	5 510 351.2	372 773.2
19A-15	359.1	5 510 320.7	372 752.3
19A-16	359.5	5 510 363.0	372 792.1
19A-17	359.3	5 510 330.7	372 772.8

(Legend Continues)



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

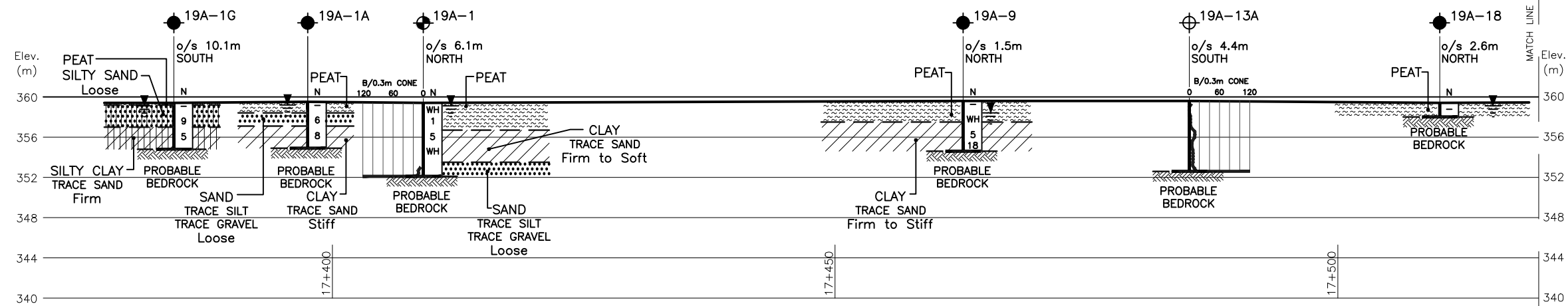
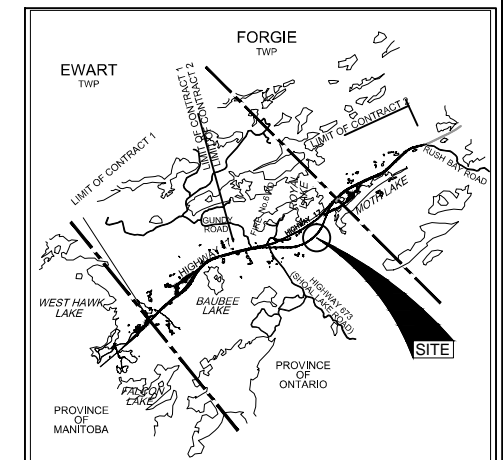
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

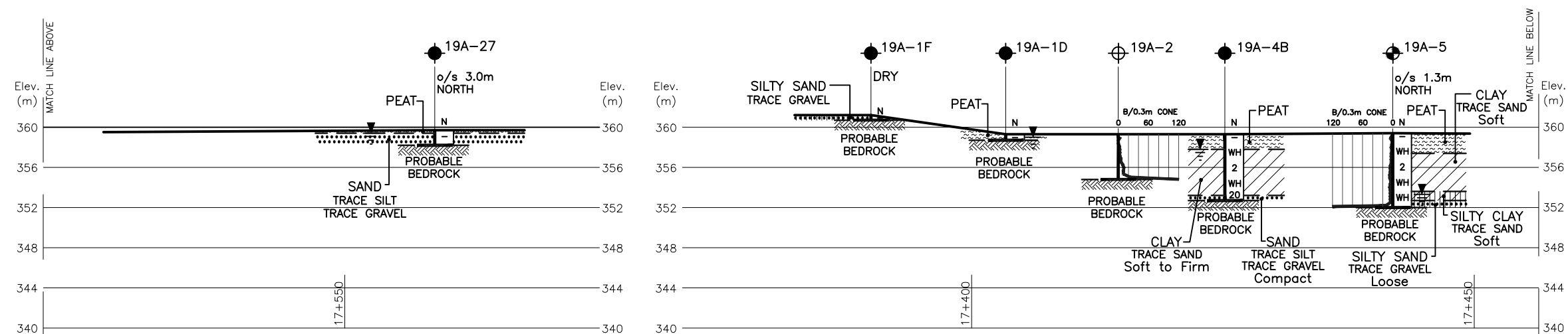
SWAMP 19A
HIGHWAY 17 FOUR-LANING
STA. 17+380 TO 17+600 EWARD TWP
SOIL STRATA

SHEET

PMI Peto MacCallum Ltd.
CONSULTING ENGINEERS

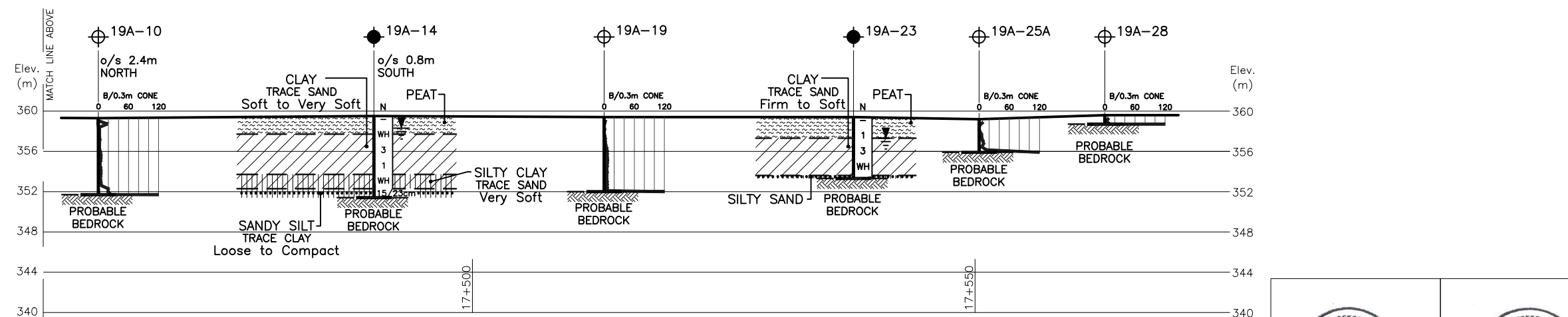


PROFILE A-A



PROFILE A-A (Continued)

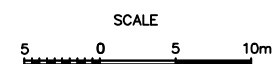
PROFILE B-B



PROFILE B-B (Continued)

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 19A-1 FOR BOREHOLE LOCATIONS PLAN AND DRAWING 19A-3 FOR PROFILE C-C, SECTIONS D-D AND E-E.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



LEGEND			
	Borehole		Dynamic Cone Penetration Test (Cone)
	Borehole and Cone		Auger Probe
	N		Blows/0.3m (60° Cone, 475 J/blow)
	WH		Penetration due to weight of rods and hammer
	PM		Shelby tube pushed manually
	W L at time of investigation Feb-Mar 2010		Head
	ARTESIAN WATER		Encountered
	PIEZOMETER		

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 19A-1 FOR DETAILS			

NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.	52E-52	HWY No.	17	DIST	Kenora
SUBM'D	GD	CHECKED	GD	DATE	52E-52
DRAWN	NA	CHECKED	CN	APPROVED	BRG
				SITE	---
				DWG	19A-2

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

CONT No
GWP No 6020-09-00










SWAMP 19A
HIGHWAY 17 FOUR-LANING
STA. 17+380 TO 17+600 EWART TWP

SOIL STRATA

KEY PLAN

SCALE 0 2 4 6km

The key plan map shows the location of the Site in the Province of Ontario, near the border with the Province of Manitoba. The map includes labels for Ewart Twp, Forge Twp, and various lakes (West Hawk Lake, Baubee Lake, Rush Bay Lake, Wolf Lake). It also shows Highway 1, Highway 504, and Highway 630. A scale bar indicates distances up to 6 km.

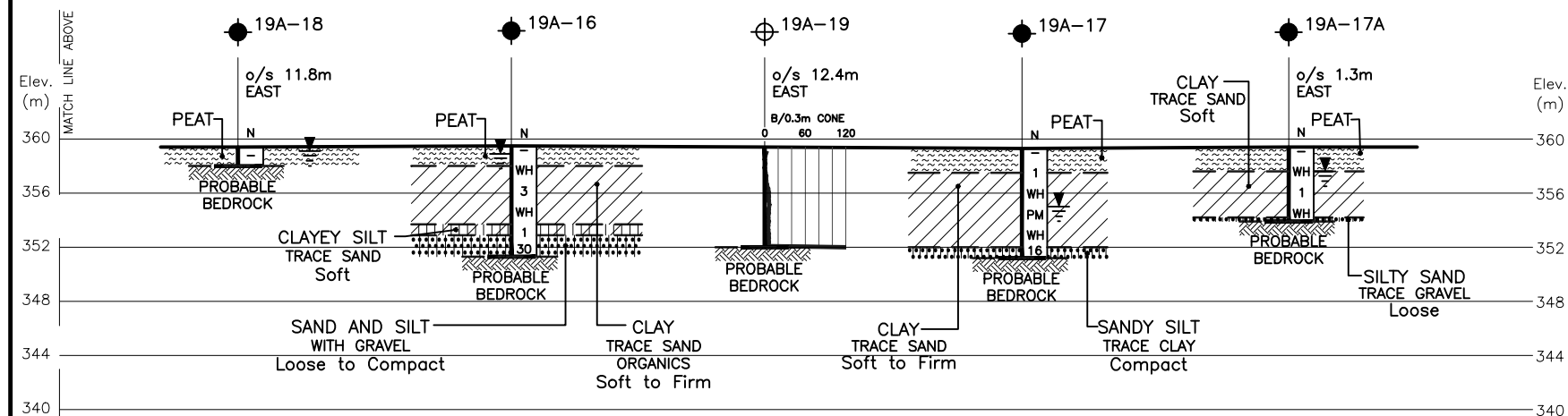
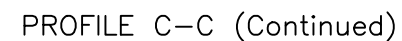
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole and Cone
	Auger Probe
N	Blows/0.3m (60 Cone, 475 J/blow)
WH	Penetration due to weight of rods and hammer
PM	Shelby tube pushed manually
	W L at time of investigation Feb-Mar 2010
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

[illegible]

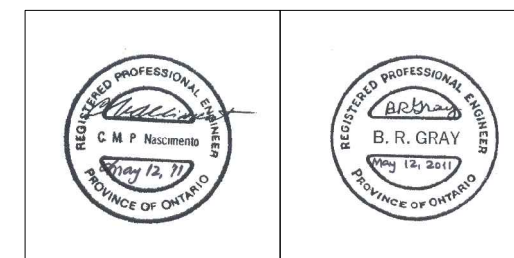
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

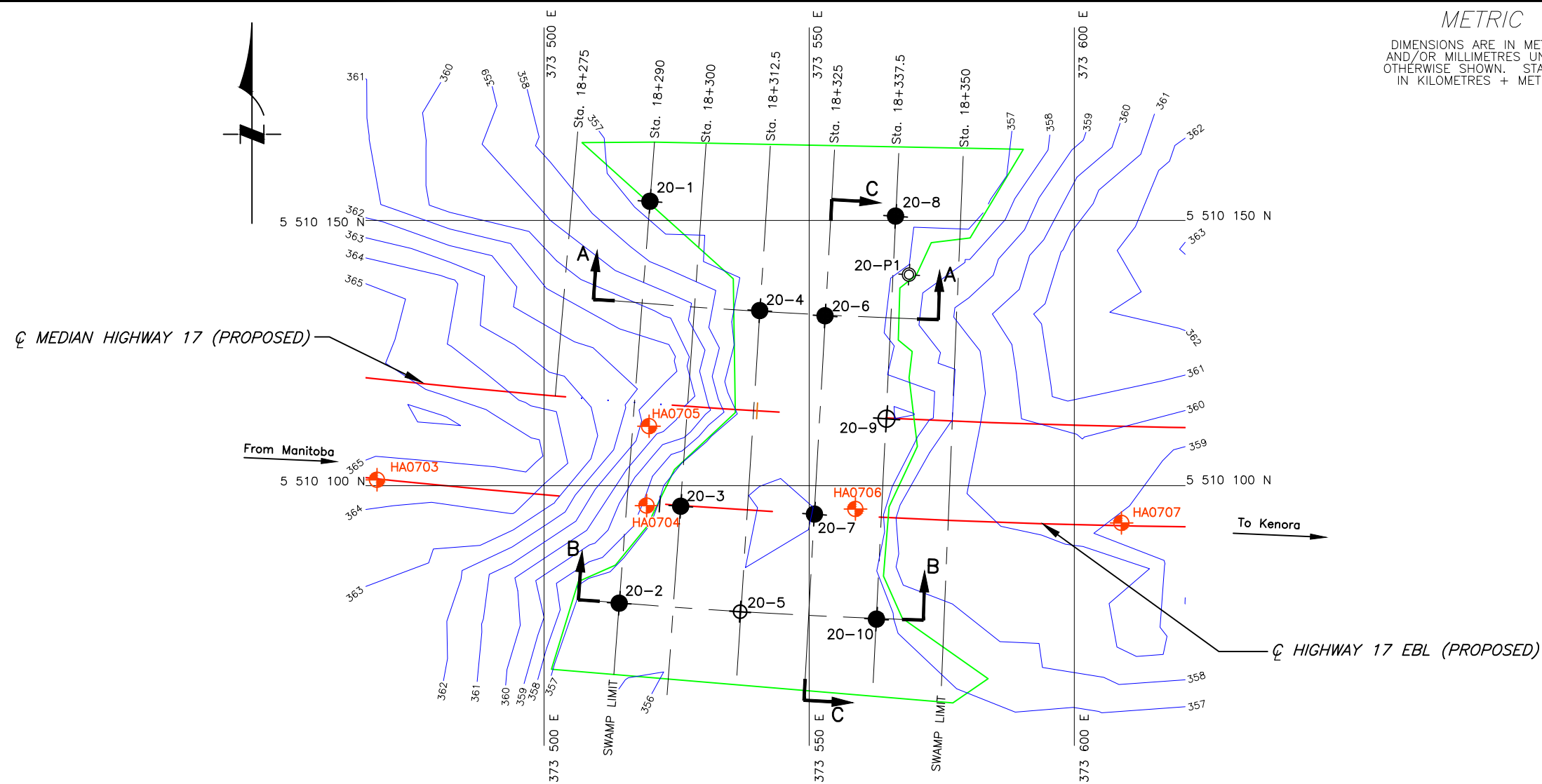
REVISIONS				
DATE	BY	DESCRIPTION		
Geocres No. 52E-52				
HWY No	17			DIST Kenora
SUBM'D	GD	CHECKED	GD	DATE 52E-52
DRAWN	NA	CHECKED	CN	APPROVED BRG
				DWG 19A-3



1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING 19A-1 FOR BOREHOLE LOCATIONS PLAN AND DRAWING 19A-2 FOR PROFILES A-A AND B-B.
3. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

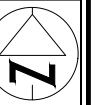


METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

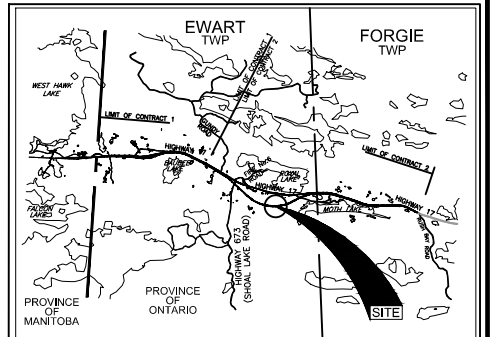
CONT No
GWP No 6020-09-00

SWAMP 20
HIGHWAY 17 FOUR-LANING
STA. 18+290 TO 18+350 EWART TWP
BOREHOLE LOCATIONS AND SOIL STRATA



SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Test Hole by TBTE (See Note 3)
- preliminary Test Hole by PML
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of hammer and rods
- W L at time of investigation March 2010
20-P1 June 2009
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

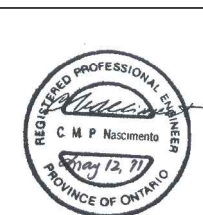
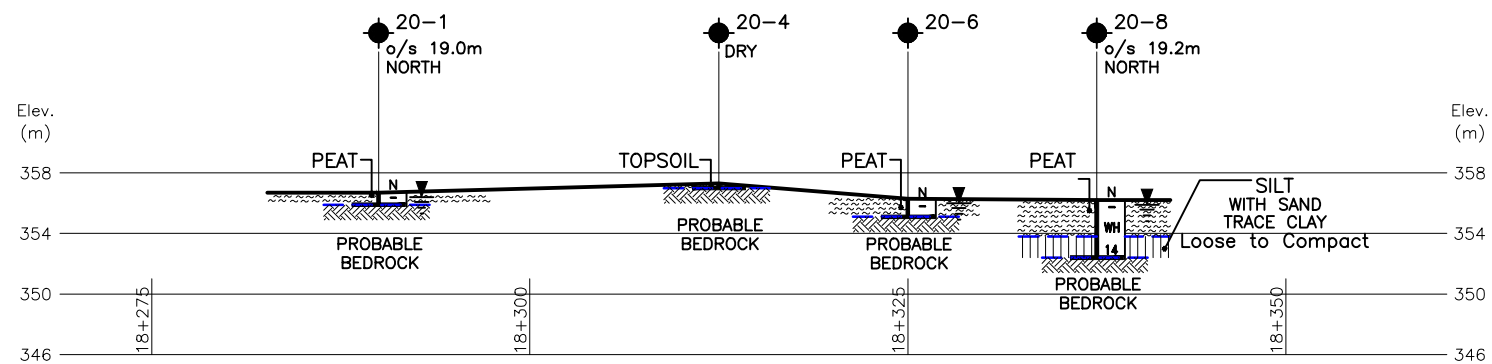
BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
20-1	356.7	5 510 153.6	373 520.0
20-2	356.7	5 510 077.8	373 514.2
20-3	356.5	5 510 096.1	373 525.8
20-4	357.3	5 510 133.0	373 540.7
20-5	356.6	5 510 076.2	373 537.0
20-6	356.3	5 510 132.0	373 553.0
20-7	356.6	5 510 094.6	373 551.0
20-8	356.2	5 510 150.8	373 566.3
20-9	356.4	5 510 112.6	373 564.6
20-10	356.7	5 510 074.8	373 562.7
20-P1	356.3	5 510 139.8	373 568.8

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 20-2 FOR PROFILE B-B AND SECTION C-C.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- CENTERLINE OF WBL NOT AVAILABLE AT THE TIME OF THE INVESTIGATION.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

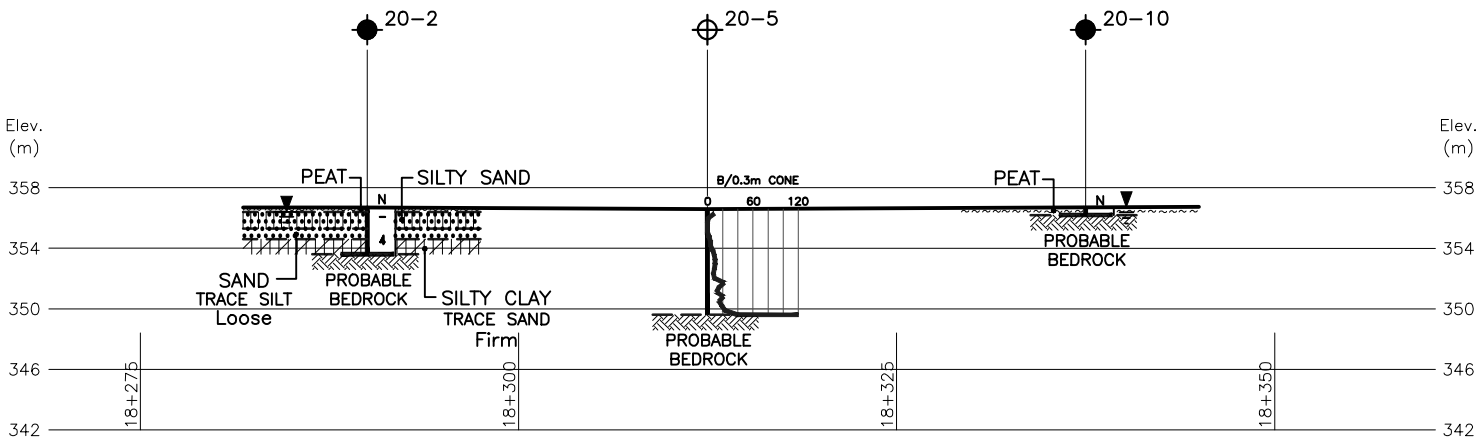
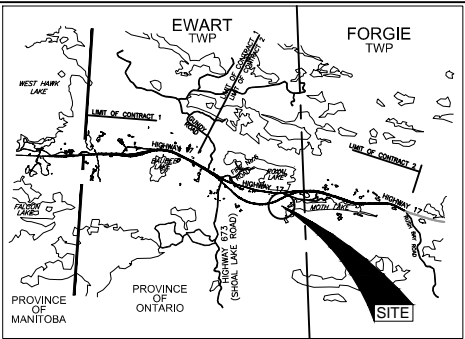
HWY No 17	SUBM'D NSB	CHECKED GD	DATE May 12, 2011	SITE	Kenora
DRAWN NA	CHECKED CN	APPROVED BRG		DWG	20-1

METRIC

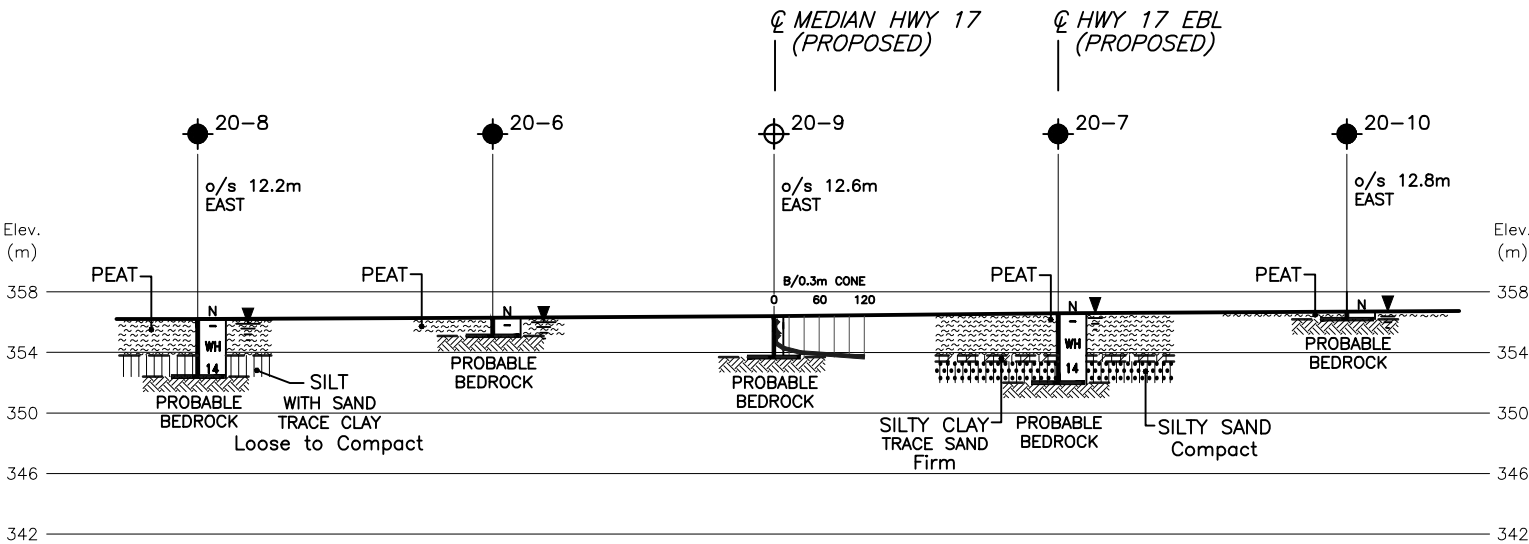
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00
SWAMP 20
HIGHWAY 17 FOUR-LANING
STA. 18+290 TO 18+350 EWART TWP
SOIL STRATA

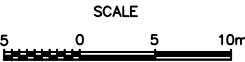
SHEET



PROFILE B-B



SECTION C-C



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Preliminary Test Hole
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- WH Penetration due to weight of hammer and rods
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 20-1 FOR DETAILS			

- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

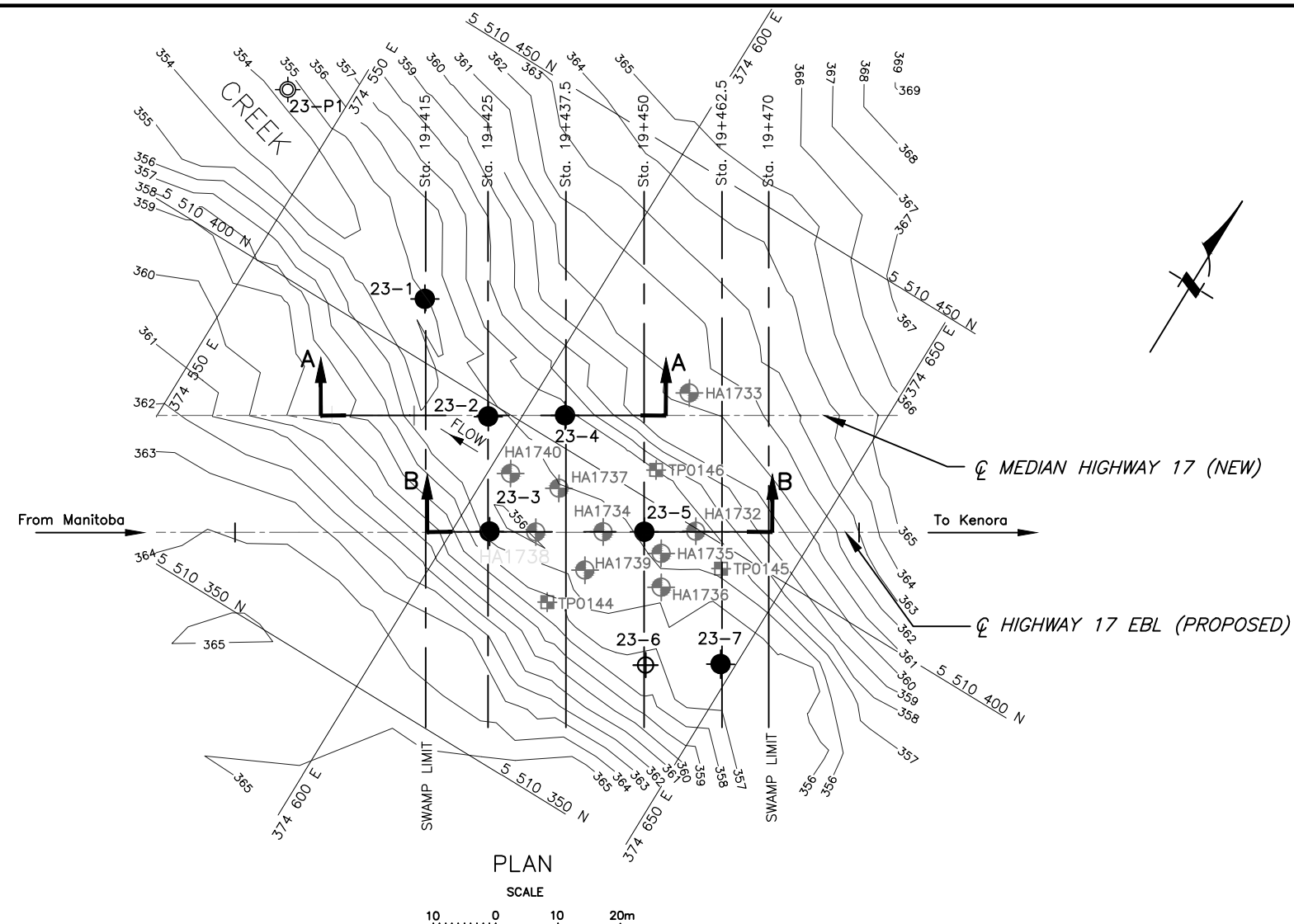
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 20-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.	52E-52
HWY No	17
SUBM'D	NSB
CHECKED	GD
DATE	May 12, 2011
DIST	Kenora
DRAWN	NA
CHECKED	CN
APPROVED	BRG
SITE	---
DWG	20-2

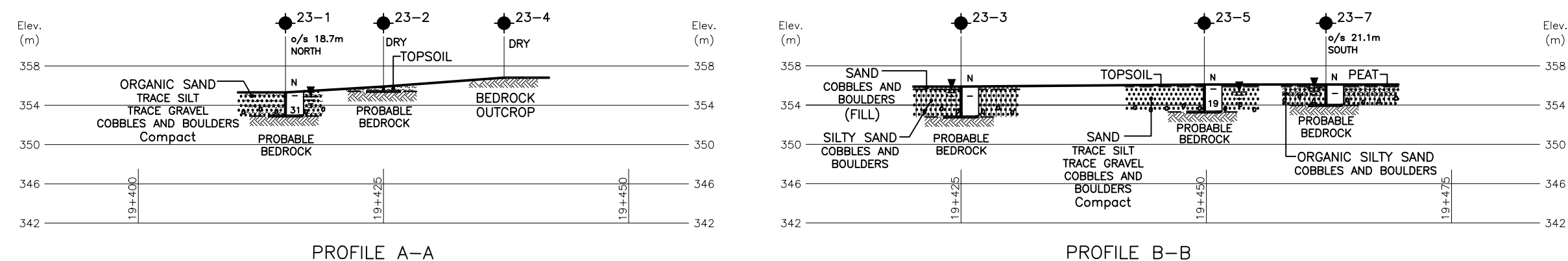
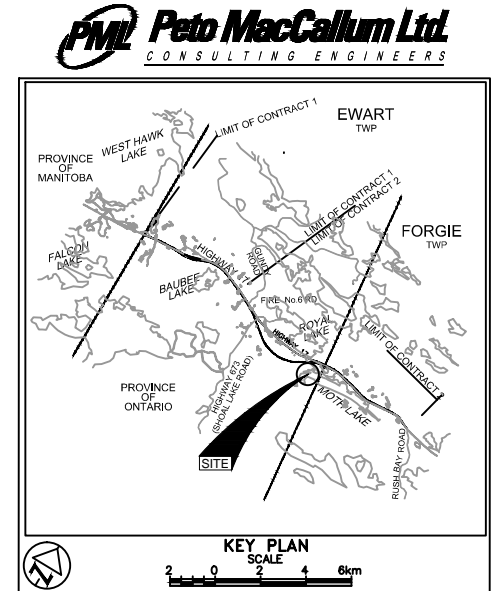


METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

SWAMP 23
HIGHWAY 17 FOUR-LANING
STA. 19+415 TO 19+470 EWART TWP
BOREHOLE LOCATIONS AND SOIL STRATA

SHEET



LEGEND

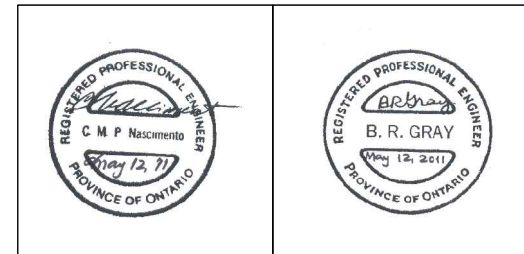
Borehole
 Dynamic Cone Penetration Test (Cone)
 Borehole and Cone
 Test Hole by TBTE (See Note 3)
 Test Pit by TBTE (See Note 3)
 Preliminary Test Hole by PML
N Blows/0.3m (Std. Pen Test, 475 J/blow)
CONE Blows/0.3m (60° Cone, 475 J/blow)
WH Penetration due to weight of rods and hammer
W L at time of investigation March 2010
23-P1 June 2009
Head
ARTESIAN WATER
Encountered
PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
23-1	355.3	5 510 408.7	374 576.9
23-2	355.9	5 510 397.9	374 595.4
23-3	355.9	5 510 382.3	374 605.2
23-4	356.8	5 510 404.5	374 605.8

- NOTES:
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
 - THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
 - TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
 - CENTERLINE OF WBL NOT AVAILABLE AT THE TIME OF THE INVESTIGATION.

(Legend Continued)

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
23-5	356.1	5 510 395.2	374 626.4
23-6	356.5	5 510 377.1	374 637.7
23-7	356.1	5 510 383.5	374 647.9
23-P1	354.0	5 510 425.8	374 540.6



- NOTE -
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No 17	SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE	---
DRAWN NA	CHECKED CN	APPROVED BRG		DWG	23-1

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

HIGHWAY 17 - FOUR LANE

SWAMP 24A
STA. 219+640 TO 219+660 WBL EWART TWP

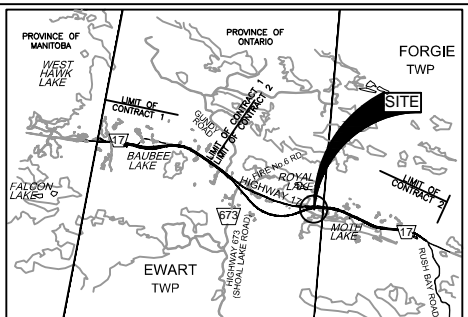
SWAMP 25
STA. 219+660 TO 219+730 WBL EWART TWP

BOREHOLE LOCATIONS



SHEET

PMI Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
1 0 2 4km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole and Cone
- Hand Auger Hole by TBTE (see note 3)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
24A-1	355.3	5 510 765.2	375 118.4
25-1	354.5	5 510 779.2	375 125.6
25-2	354.7	5 510 770.5	375 142.8
25-3	354.7	5 510 784.8	375 152.5
25-4	354.9	5 510 775.6	375 167.2
25-5	355.0	5 510 789.9	375 177.0
25-6	355.4	5 510 780.8	375 191.7

- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No 17	DIST Kenora
SUBM'D NSB	CHECKED NSB
DATE May 12, 2011	SITE ---
DRAWN NA	CHECKED CN
APPROVED BRG	DWG 24/25-1



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 24/25-2 FOR PROFILES A-A AND B-B.
- TBTE DENOTES 'THUNDER BAY TESTING AND ENGINEERING'.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

HIGHWAY 17 - FOUR LANING
SWAMP 24A
STA. 219+640 TO 219+660 WBL EWART TWP
SWAMP 25
STA. 219+660 TO 219+730 WBL EWART TWP
SOIL STRATA

PROVINCE OF MANITOBA

WEST HAWK LAKE

PROVINCE OF ONTARIO

FORGIE TWP

SITE

LIMIT OF CONTRACT

LAUREL LAKE

FAULCON LAKE

NEW W. RD.

ROYAL HIGHWAY

MOULT LAKE

RESERVOIR

673

17

EWART TWP

SHORE LAKE (SHORE LAKE TWP)

KEY PLAN SCALE

0 2 4 km



REVISIONS			
DATE	BY	DESCRIPTION	

HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED NR	DATE May 12, 2011
DRAWN	NA	CHECKED CN	APPROVED BRG
			DWG 24/25-2

REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg
and H7791XB02 Contours.dwg dated Feb. 19, 2010

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING 24/25-1 FOR BOREHOLE LOCATIONS PLAN.
3. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

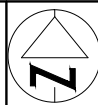
CONT No
GWP No 6020-09-00

HIGHWAY 17 - FOUR LANE

SWAMP 29

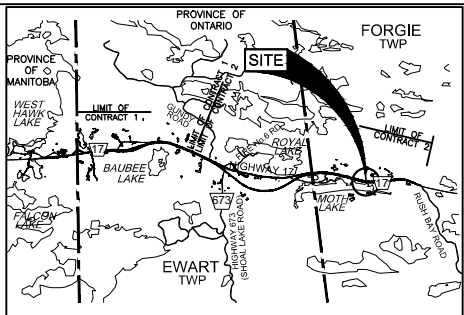
STA. 12+240 TO 12+390 FORGIE TWP

BOREHOLE LOCATIONS AND SOIL STRATA



SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Test Pit
- Preliminary Test Hole by PML
- Test Pit by TBTE (See Note 3)
- Blows/0.3m (Std. Pen Test, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation Mar. 2010
- 29-P Series June 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
29-1	360.8	5 510 521.9	377 813.9
29-2	359.9	5 510 519.0	377 841.9
29-3	360.0	5 510 507.0	377 852.6
29-4	359.8	5 510 516.0	377 866.2
29-5	359.8	5 510 513.0	377 890.5
29-6	359.6	5 510 479.0	377 886.7
29-7	359.8	5 510 503.0	377 901.8
29-8	359.7	5 510 512.0	377 915.0
29-9	359.4	5 510 476.0	377 911.6
29-10	359.7	5 510 513.0	377 939.7
29-10A	359.7	5 510 509.5	377 945.7
29-11	359.7	5 510 509.0	377 951.7
29-12	360.0	5 510 492.0	377 950.3
29-13	362.1	5 510 472.0	377 961.4
29-14	359.3	5 510 460.1	377 900.0

(Legend Continues)

- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

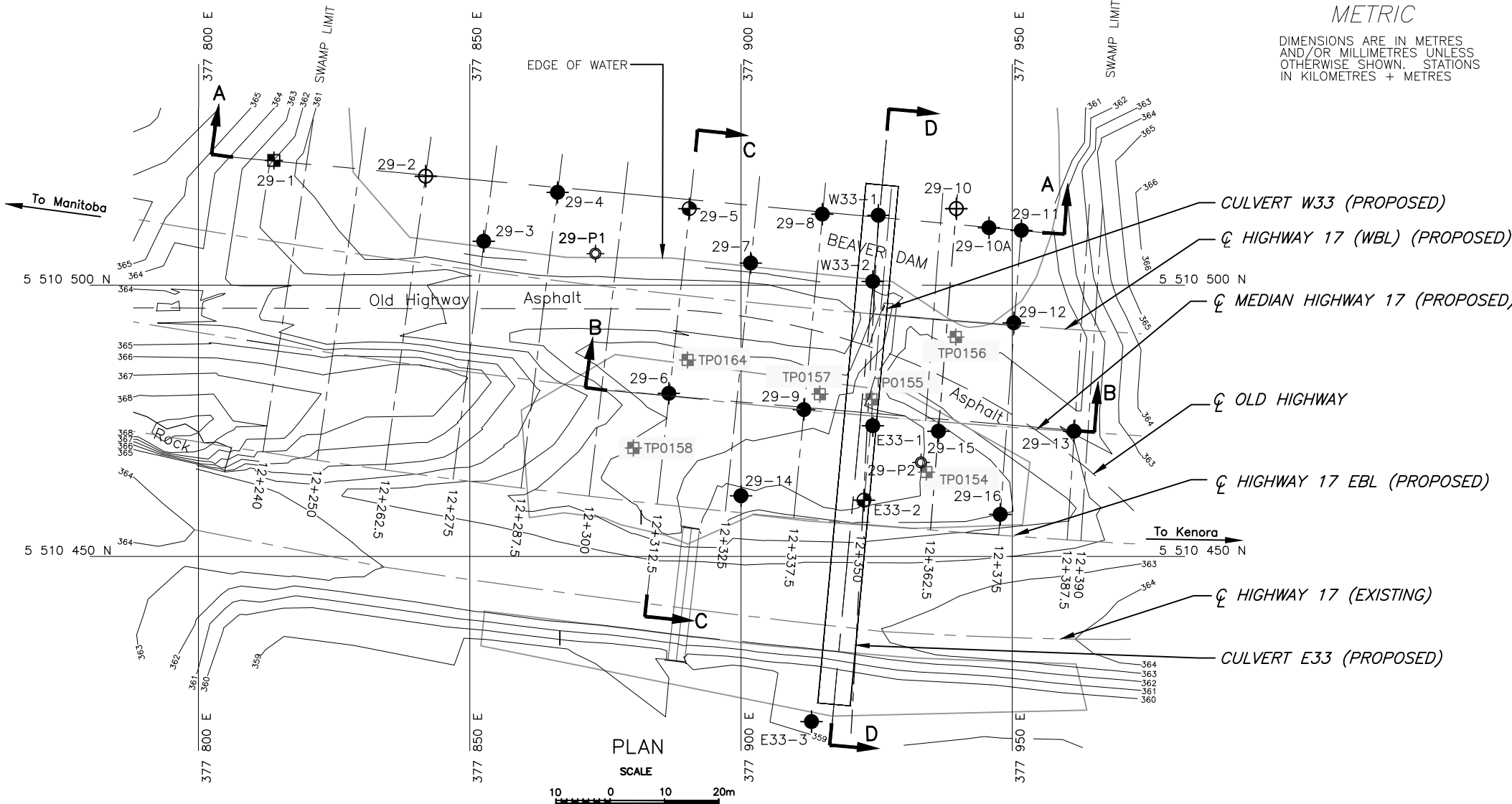
REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No 17	SUBM'D NSB	CHECKED NSB	DATE May 12, 2011	SITE	DIST Kenora
DRAWN NA	CHECKED CN	APPROVED BRG	DWG	29-1	

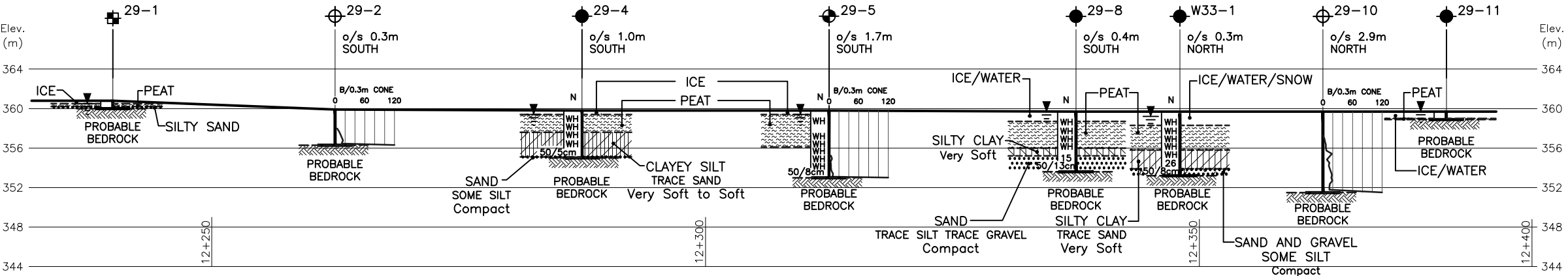
METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES



PLAN

SCALE



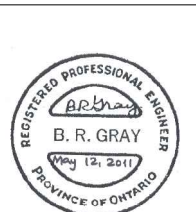
PROFILE A-A

SCALE



(Legend Continued)

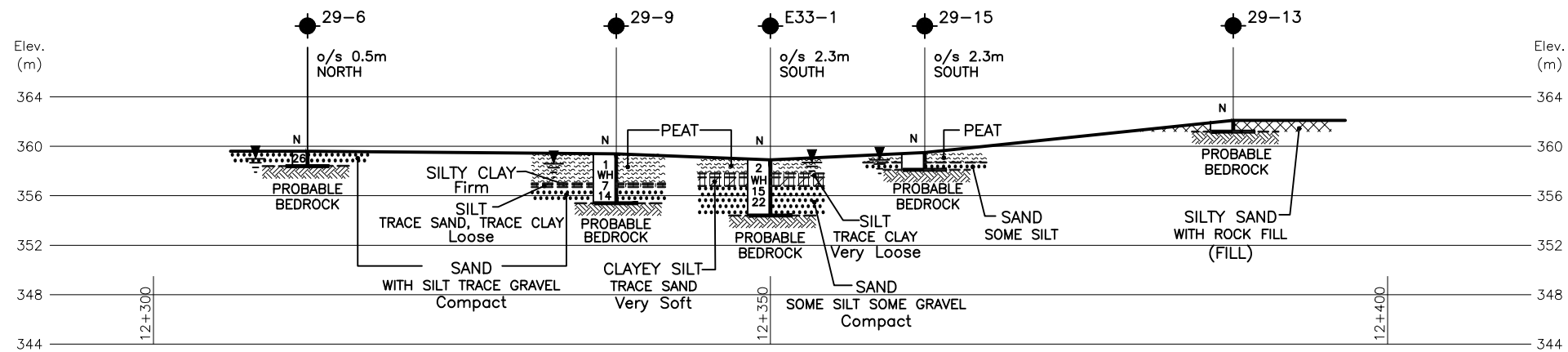
BH No	ELEVATION	NORTHINGS	EASTINGS
29-15	359.5	5 510 472.0	377 936.4
29-16	359.7	5 510 456.7	377 947.8
29-P1	359.9	5 510 504.7	377 873.2
29-P2	359.0	5 510 466.3	377 933.2
E33-1	358.9	5 510 473.0	377 924.3
E33-2	359.1	5 510 459.3	377 922.7
E33-3	359.0	5 510 418.5	377 913.0
W33-1	359.5	5 510 511.8	377 925.3
W33-2	359.6	5 510 499.6	377 924.3



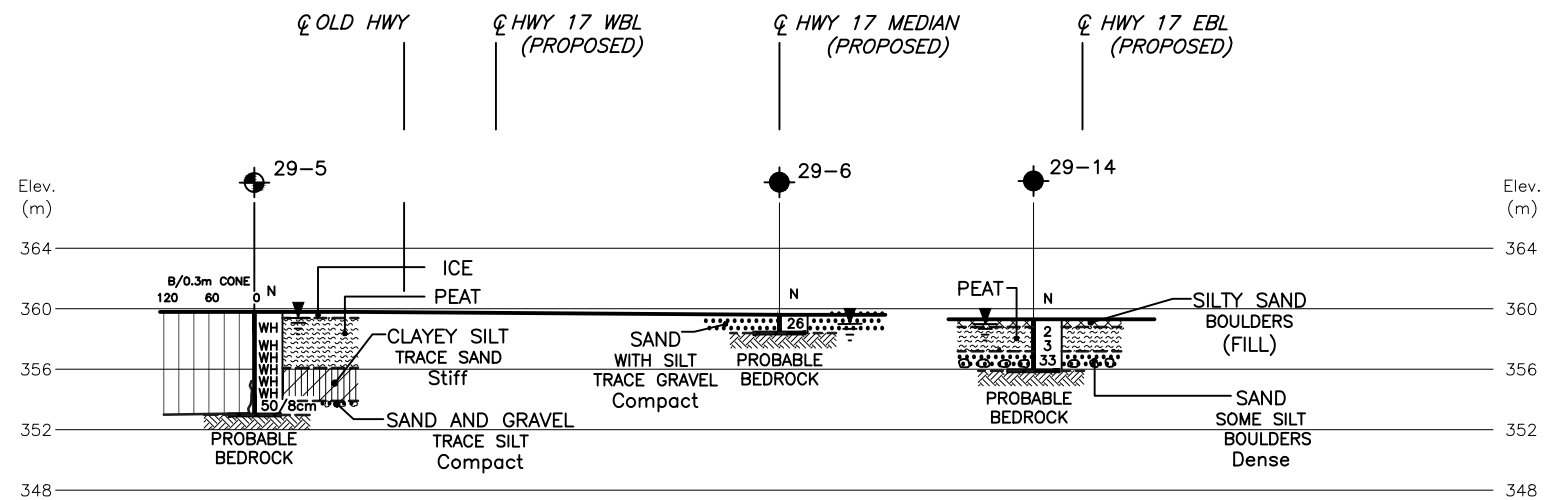
NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING 29-2 FOR PROFILE B-B, SECTIONS C-C AND D-D.
- TBTE DENOTES "THUNDER BAY TESTING AND ENGINEERING".
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

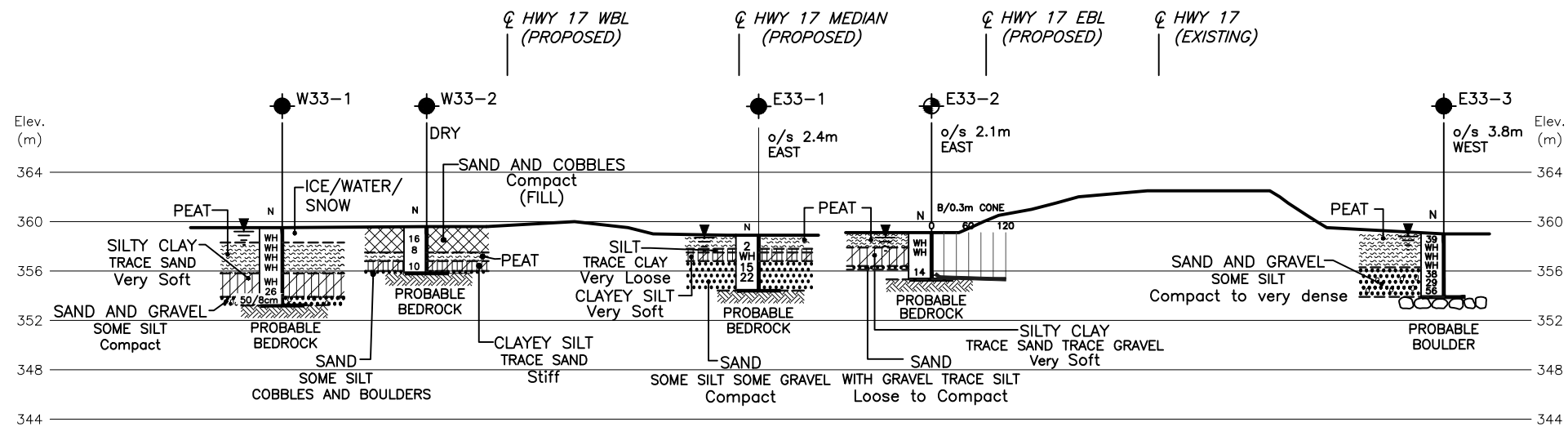
REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010



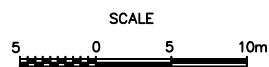
PROFILE B-B



SECTION C-C



SECTION D-D



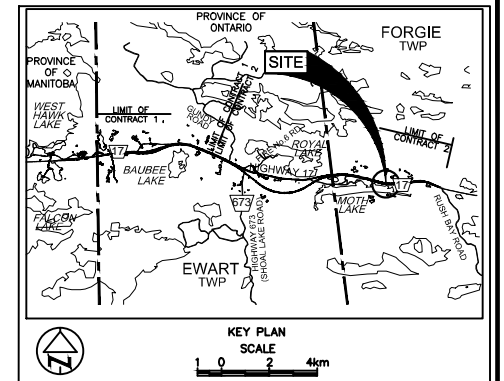
NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING 29-1 FOR BOREHOLE LOCATIONS PLAN AND PROFILE A-A.
3. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No	
GWP No 6020-09-00	
HIGHWAY 17 - FOUR LANING	SHEET
SWAMP 29	
STA. 12+240 TO 12+390 FORGE TWP	
SOIL STRATA	



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Test Pit
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- WH Penetration due to weight of rods and hammer
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation MAR. 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHING	EASTING
SEE DRAWING 29-1 FOR DETAILS			

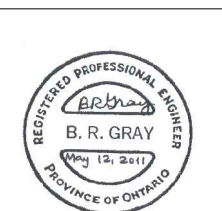
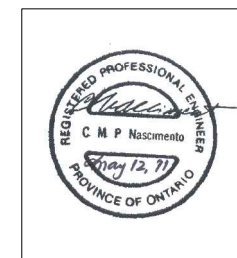
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52

HWY No	17	DIST	Kenora
SUBM'D	NSB	CHECKED	NSB
DATE	May 12, 2011	DATE	May 12, 2011
DRAWN	NA	CHECKED	CN
APPROVED	BRG	DWG	29-2



REF No MRC DRAWINGS: H7791D01.dwg; H7791XA01.dwg; 7791XB01.dwg and H7791XB02 Contours.dwg dated Feb. 19, 2010

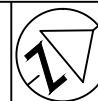
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00

FIRE ROAD 46

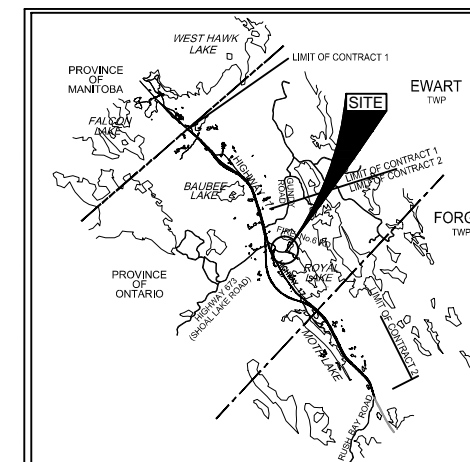
STA. 10+150 TO 10+325 EWART TWP

BOREHOLE LOCATIONS



SHEET

PMI Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
0 2 4 6 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W L at time of investigation March 2010
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDS	
		NORTHINGS	EASTINGS
N1	353.3	5 511 087.3	372 013.9
N2	353.2	5 511 109.2	372 025.9
N3	353.2	5 511 133.0	372 034.3
N4	353.4	5 511 137.7	372 050.8
N5	353.3	5 511 151.9	372 051.3
N6	353.3	5 511 157.1	372 064.7
N7	353.2	5 511 172.2	372 066.9
N8	353.3	5 511 172.3	372 083.0
N9	353.9	5 511 189.3	372 084.2
N10	354.3	5 511 203.8	372 104.5
N11	354.4	5 511 214.3	372 127.2

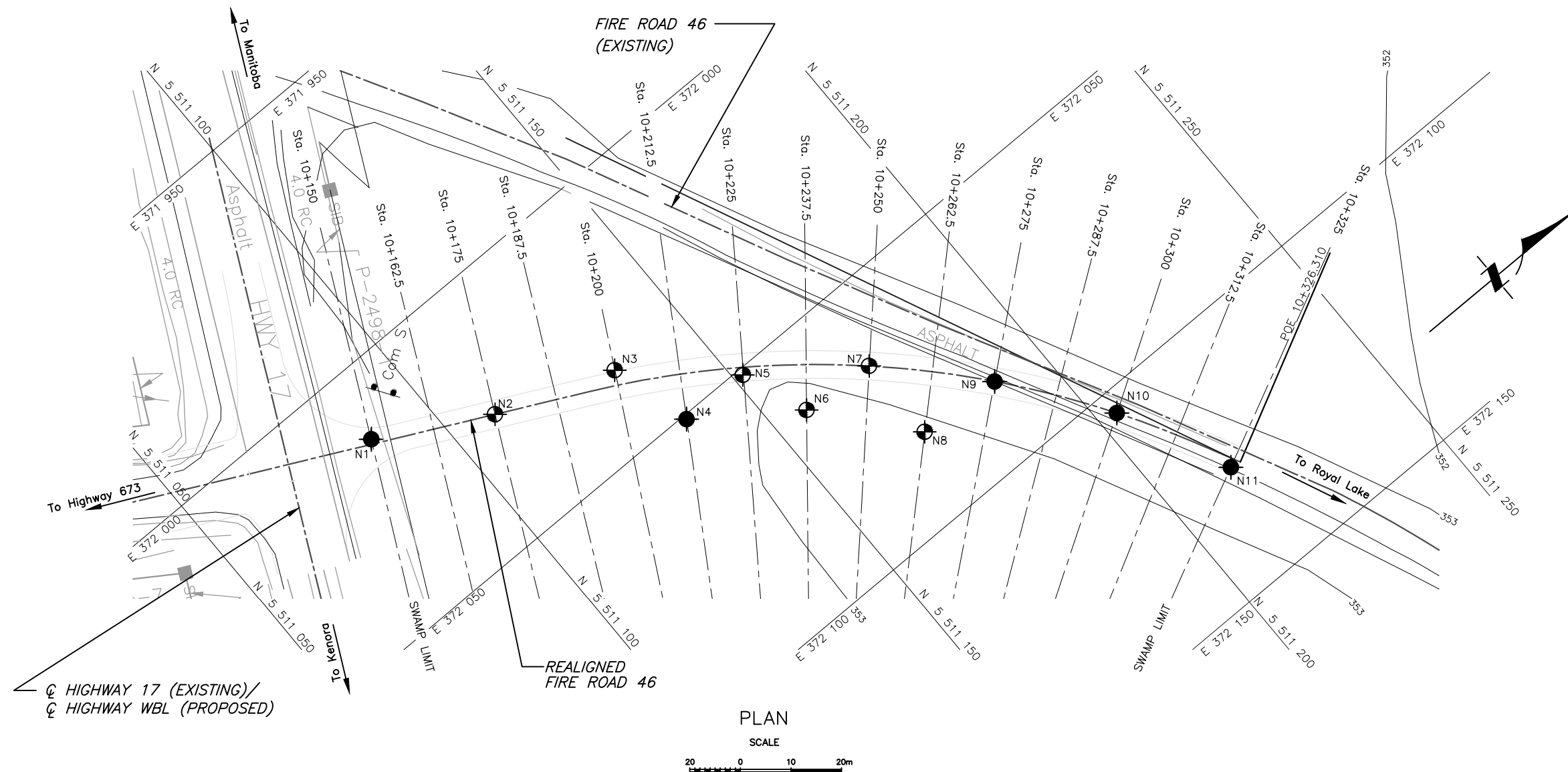
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

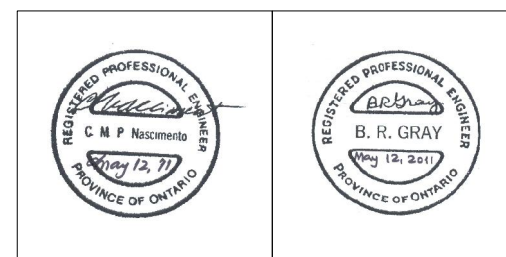
Geocres No. 52E-52

HWY No	17	Fire Road 46	DIST	Kenora
SUBM'D	NSB	CHECKED NSB	DATE	May 12, 2011
DRAWN	NA	CHECKED CN	APPROVED	BRG
SITE	---	DWG	FR-1	---



NOTES:

- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING FR-2 FOR PROFILE ALONG CENTRE LINE OF FIRE ROAD 46.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.

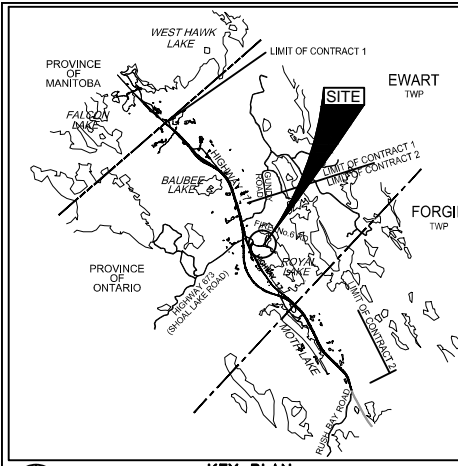


REF No MRC DRAWING: 6020 Realigned Pvt Rd & Hwy 673
alignments, profile-March 04, 2010 and H7791XB01.dwg

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 6020-09-00
FIRE ROAD 46
STA. 10+150 TO 10+325 EWART TWP
SOIL STRATA

PMI Peto MacCallum Ltd
CONSULTING ENGINEERS



KEY PLAN
SCALE
2 0 2 4 6km

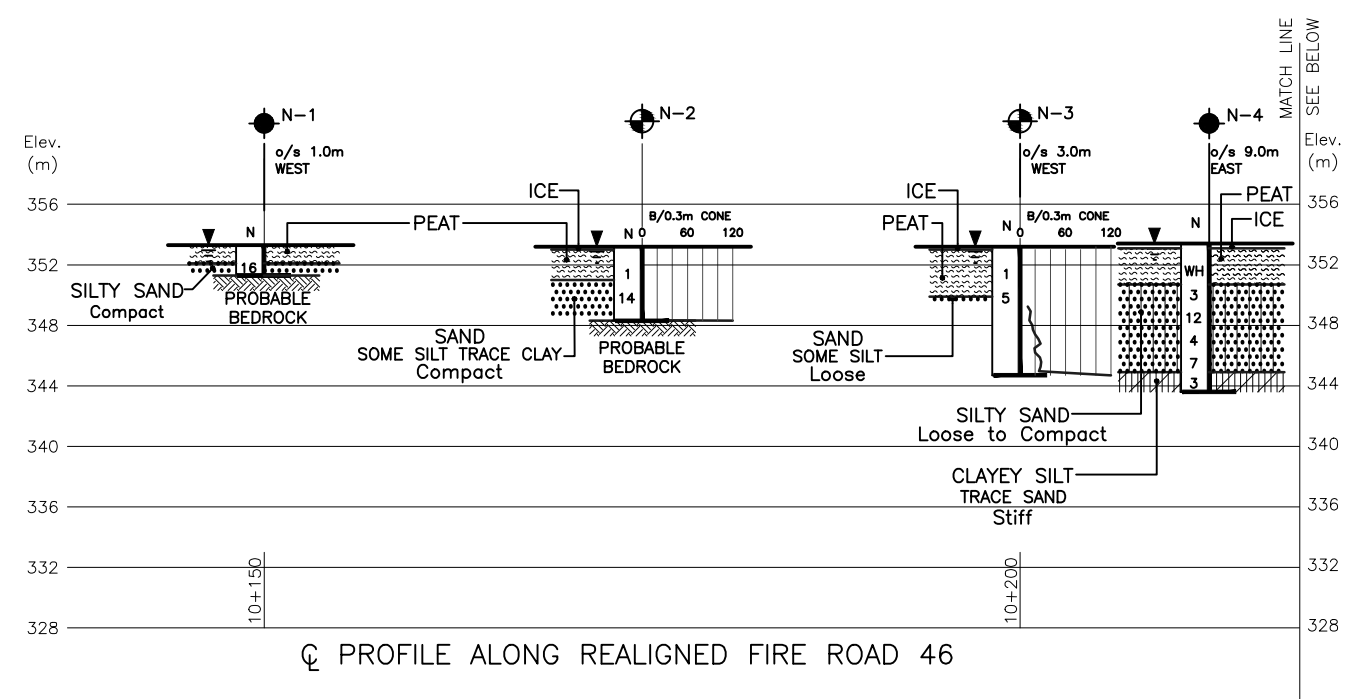
LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J/blow)		
CONE	Blows/0.3m (60° Cone, 475 J/blow)		
WH	Penetration due to weight of rods and hammer		
WR	Penetration due to weight of rods only		
	W L at time of investigation March 2010		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	CO-ORDS	
		NORTHINGS	EASTINGS
SEE DRAWING FR-1 FOR DETAILS			

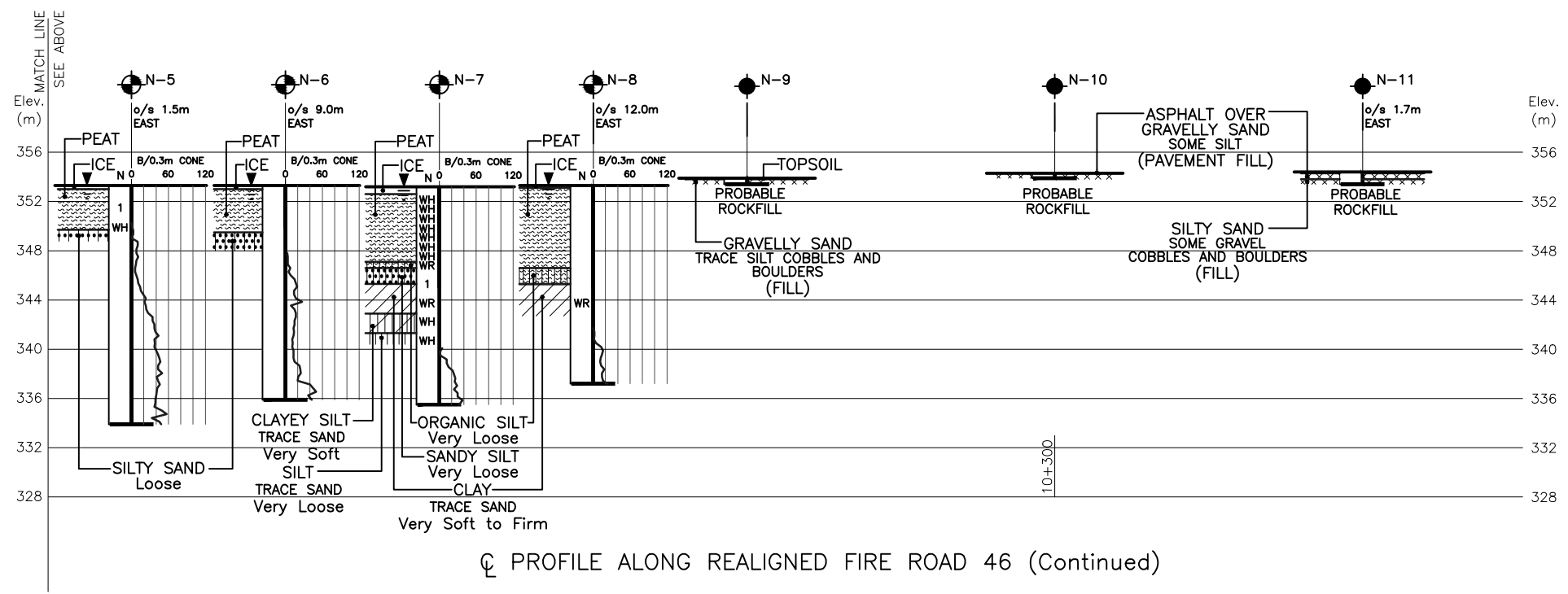
NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No. 52E-52	HWY No 17 / Fire Road 46	DIST Kenora
SUBM'D NSB	CHECKED NSB DATE May 12, 2011	SITE --
DRAWN NA	CHECKED CN	APPROVED BRG
		DWG FR-2



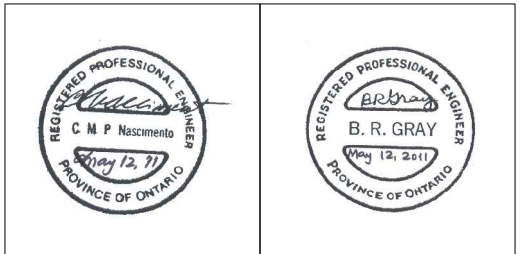
PROFILE ALONG REALIGNED FIRE ROAD 46



PROFILE ALONG REALIGNED FIRE ROAD 46 (Continued)



- NOTES:
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
 - REFER TO DRAWING FR-1 FOR BOREHOLE LOCATIONS PLAN.
 - THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.



REF No MRC DRAWING: 6020 Realigned Pvt Rd & Hwy 673 alignments, profile-March 04, 2010 and H7791XB01.dwg