Independent Expert Engineering Investigation and Review Panel

Report on Mount Polley Tailings Storage Facility Breach

Appendix D: ATTACHMENT D6

Attachment D6: Panel Boreholes and Sampling

- Panel Borehole Logs
- Field Photos of Tube Samples

Appendix D
Attachment 6
Panel Boreholes and Sampling

Panel Borehole Logs

595 000 E

595 250 E

N

MR14-111

MR14-112

MR14-113

MR14-110

MR14-107

MR14-109

MR14-108

MR14-106

MR14-105

MR14-104

MR/SC14-103

MR14-102

MR14-101

MR14-115

MR14-116

RH14-118

MR14-114

RH14-117

930

940

950

960

970

4+300

4+200

4+100

4+000

4+400

4+500

5 820 000 N

15 0 30 60m

LEGEND:

- BORE HOLE / SAMPLING HOLE
  MR - MUD ROTARY DRILLING METHOD
  RH - ODEX DRILLING METHOD
  SC - SOIL CORING DRILLING METHOD

PANEL BOREHOLE AND SAMPLING LOCATIONS

MOUNT POLLEY INDEPENDENT EXPERT ENGINEERING INVESTIGATION AND REVIEW PANEL

DESIGNED	DRAWN
PJW	NAK
APPROVED	
D. VAN ZYL	
DATE	FIGURE No.
JANUARY 06, 2015	**D.A6-1**

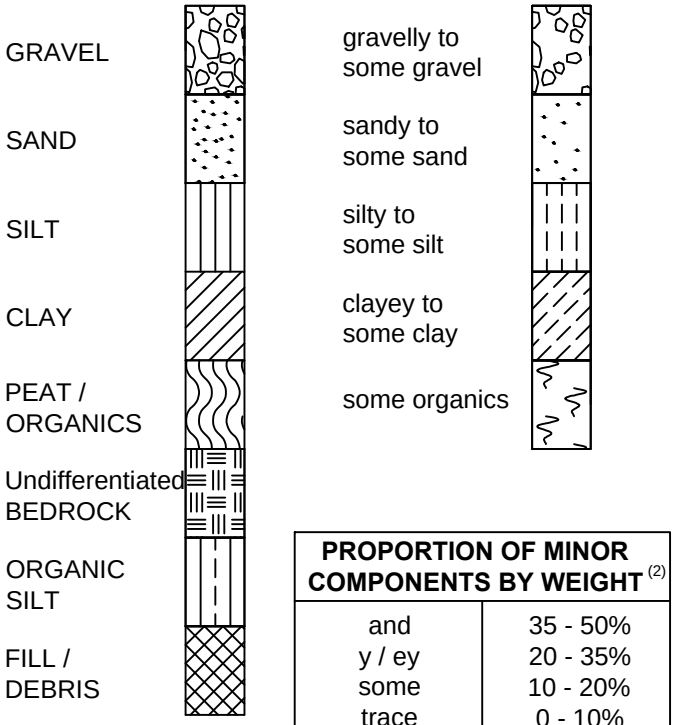
Hole Location Summary

Hole Number	Northing (m)	Easting (m)	Elevation (m)
MR14-101	5819826	595340	933.0
MR14-102	5819832	595330	932.5
MR14-103	5819865	595296	930.7
SC14-103	5819967	595292	930.8
SC14-103A	5819868	595290	930.9
MR14-104	5819891	595255	931.7
MR14-105	5819914	595228	931.7
MR14-105A	5819916	595226	931.7
MR14-106	5819997	595148	929.4
MR14-106A	5819997	595146	928.7
MR14-106B	5820001	595139	928.5
MR14-106C	5820002	595139	928.5
MR14-106D	5819993	595137	928.7
MR14-106E	5819990	595134	929.0
MR14-106F	5819994	595134	928.7
MR14-106G	5819997	595135	928.7
MR14-106H	5819998	595135	928.6
MR14-106I	5820001	595135	928.6
MR14-107	5820013	595131	928.7
MR14-107A	5820013	595132	928.3
MR14-107B	5820013	595129	928.4
MR14-108	5820013	595105	928.6
MR14-108A	5820014	595106	928.6
MR14-109	5820022	595087	929.0
MR14-110	5820037	595092	928.7
MR14-111	5820044	595115	928.6
MR14-111A	5820046	595119	928.1
MR14-112	5820028	595149	928.9
MR14-112A	5820026	595151	928.7
MR14-113	5820013	595152	929.4
MR14-114	5819981	595064	930.6
MR14-115	5820007	595076	929.0
MR14-116	5819969	595113	930.6
MR14-116A	5819969	595112	930.6
RH14-117*	5819939	595125	932.4
RH14-117A*	5819936	595132	932.6
RH14-118*	5819922	595176	937.7

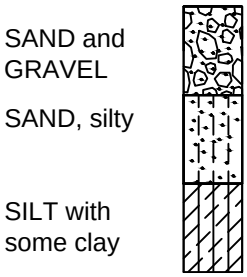
* locations not surveyed

SYMBOLS AND TERMS
FOR SOIL DESCRIPTION SHOWN ON LOGS

BASIC SOIL SYMBOLS



SYMBOL VARIATIONS - EXAMPLES[1]



PROPORTION OF MINOR COMPONENTS BY WEIGHT[2]	
and	35 - 50%
y / ey	20 - 35%
some	10 - 20%
trace	0 - 10%

DENSITY OF GRANULAR SOILS	
Description	SPT N[4]
Very Loose	0 - 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very Dense	> 50

CONSISTENCY OF COHESIVE SOILS	
Description	Undrained Shear Strength (kPa)[4]
Very Soft	< 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	> 200

PENETRATION TESTS	
Dynamic Cone Penetration	
Standard Penetration	
Becker Closed Casing	
Becker Open Casing	
Bounce Chamber Pressure	

CLASSIFICATION BY PARTICLE SIZE				
		Size Range[4]		
		(mm)[3]	U.S. Standard Sieve Size	
Name			Retained	Passing
Boulders		> 200	8 inch	-
Cobbles		75 - 200	3 inch	8 inch
Gravel:	coarse	19 - 75	0.75 inch	3 inch
	fine	5 - 19	No. 4	0.75 inch
Sand:	coarse	2 - 5	No. 10	No. 4
	medium	0.4 - 2	No. 40	No. 10
	fine	0.075 - 0.4	No. 200	No. 40
Fines:	silt	0.002 - 0.075	-	No. 200
	clay	< 0.002	-	-

1. Only selected examples of the possible variations or combinations of the basic symbols are illustrated.
2. USCS refers to group symbols as defined by the Unified Soil Classification System. Soil descriptions related to fines and secondary materials are based on particle size where lab testing was completed by Thurber and visual and tactile field behaviour of samples where lab testing was not compled by Thurber.
3. Approximate metric conversion.
4. Reference Canadian Foundation Engineering Manual 4th Edition, 2006.

THURBER

Sheet 1 of 4

HOLE NO. **MR14-101**

LOCATION: See Fig. 209
E 595340, N 5819826

TOP OF HOLE ELEV: 933.0 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 17, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Drill with odex to 4.1 m through gravel and rock fill. Cvane is torvane. Cpen is pocket penetrometer.		GRAVEL with some sand, a trace to some cobbles and a trace of silt. (Fill)	
1					932
2					931
				Very stiff to hard, sandy SILT to silty SAND with some gravel and cobbles and a trace of clay, inferred from CPT data. (Possible ablation/moraine till)	
3					930
4		Switch to mud rotary using tricone bit with side injection ports at 4.1 m.			929
5	● — ▲ △		SC Sa		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

HOLE NO. **MR14-101**

LOCATION: See Fig. 209
E 595340, N 5819826

TOP OF HOLE ELEV: 933.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 17, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit Liquid Limit | SAMPLES USCS Grab Sample USCS Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

Depth (m)	Elevation (m)	Comments	Samples	Soil Description
5		>> Cpen > 225 kPa	SC 1	Very stiff to hard, sandy SILT to silty SAND with some gravel and cobbles and a trace of clay, inferred from CPT data. (Possible ablation/moraine till)
			GC Sa 2	
6	927			
			SC Sa 3	
		>> Cpen > 225 kPa		
7	926		Sa 4	
				No recovery and no samples between 7.5 and 14.7 m.
8	925			
9	924			
10				

HOLE NO.
MR14-101

LOCATION: See Fig. 209
E 595340, N 5819826

TOP OF HOLE ELEV: 933.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 17, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

10

No recovery and no samples between 7.5 and 14.7 m.

11 — 922

12 — 921

13 — 920

14 — 919

- cobble or boulder between 14.0 and 14.3 m

Sa 5

Very stiff to hard, gravelly SAND and SILT with some cobbles and a trace of clay. (Basal till)

15

Cvane >245 kPa

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 4 of 4

HOLE NO.
MR14-101

LOCATION: See Fig. 209
E 595340, N 5819826

TOP OF HOLE ELEV: 933.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 17, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
15	●⊢ ▲ △	>> ◈ Cpen > 225 kPa	SC Sa 6	Very stiff to hard, gravelly SAND and SILT with some cobbles and a trace of clay. (Basal till)	
16	●⊢ ▲ △		GC-GM Sa 7		917
			Sa 8	Very stiff to hard, clayey SILT with a trace of sand. (Glaciolacustrine)	
17				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	916
18					915
19					914
20					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-102**

LOCATION: See Fig. 209
E 595330, N 5819832

TOP OF HOLE ELEV: 932.5 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 16, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Drill with odex to 2.8 m through gravel and rock fill. Cvane is torvane. Cpen is pocket penetrometer.	GRAVEL with some sand and a trace of silt. (Fill)	932
1			931
2		Stiff, gravelly, silty SAND with some clay and traces of wood fragments and organics. (Possible weathered ablation/moraine till)	930
3	Switch to mud rotary, set HW casing and use tricone bit with side injection ports at 2.8 m. SC Sa 1		929
4	Cvane = 98 kPa SC Sa 2 Cvane = 147 kPa Cpen = 145 kPa	Very stiff to hard, gravelly, silty SAND with some clay. (Possible ablation/moraine till)	928
5			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-102**

LOCATION: See Fig. 209
E 595330, N 5819832

TOP OF HOLE ELEV: 932.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 16, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5				Very stiff to hard, gravelly, silty SAND with some clay. (Possible ablation/moraine till)	
					927
6					
					926
	● ▲ △		SC Sa 3		
7					
					925
8					
			Sa 4		924
9				Firm to stiff, sandy SILT with some clay and a trace of gravel. (Possible ablation/moraine till)	
	● ▲ △		CL Sa 5		923
		>> ◇ Cvane = 98 kPa Cpen = 170 kPa		- stiff to very stiff with some gravel	
10	●		SC/GC		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-102**

LOCATION: See Fig. 209
E 595330, N 5819832

TOP OF HOLE ELEV: 932.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 16, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10	○		Sa 6	Stiff to very stiff, sandy SILT with some gravel and clay. (Possible ablation/moraine till)	
			Sa 7	Very stiff to hard, sandy SILT with some gravel and a trace of clay. (Basal till)	922
11				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	921
12					920
13					919
14					918
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO. **MR14-103**

LOCATION: See Fig. 209
E 595296, N 5819865

TOP OF HOLE ELEV: 930.7 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 18, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Drill with odex to 2.7 m through gravel and rock fill.	GRAVEL with some sand, a trace to some cobbles and a trace of silt. (Fill)	
		Cvane is torvane. Cpen is pocket penetrometer.		930
1			- boulder between 1.2 and 1.8 m	
				929
2			Stiff to hard, silty SAND with some gravel to gravelly and some clay. (Possible ablation/moraine till)	
		Switch to mud rotary using wing bit with side injection ports at 2.7 m.		928
3				
	● ▲ △	>> ◈ Cpen = 168 kPa	SC Sa 1	927
4				
	● ▲ △		SC Sa 2	926
5				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO. **MR14-103**

LOCATION: See Fig. 209
E 595296, N 5819865

TOP OF HOLE ELEV: 930.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 18, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5	>> Cpen = 120 to 170 kPa	SC / Sa 2	Stiff to hard, silty SAND with some gravel to gravelly and some clay. (Possible ablation/moraine till)	
		Sa 3		925
6				
		Sa 4		924
7	>>> Cvane = 147 kPa Cpen = 170 to 220 kPa			
			Firm to stiff, sandy SILT with some clay and a trace of gravel. (Possible ablation/moraine till)	923
		GC / CL / CL / CL / CL / CL / CL / Sa 5	Firm to stiff, brown, laminated clayey sandy SILT with a trace of gravel and some massive gravelly zones (Glaciolacustrine with ablation till inclusions).	
8	Cvane = 27.5 kPa			
			Firm to stiff, sandy SILT with some clay and a trace of gravel. (Basal till)	
		SC/GC / Sa 6		922
9	Cvane = 44 kPa Cpen = 70 kPa			
			End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
				921
10				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO. **SC14-103**

LOCATION: See Fig. 209
E 595292, N 5819967

TOP OF HOLE ELEV: 930.8 m

METHOD: PQ Air Coring / HQ Water Coring

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 25, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Drill with ODEX to 2.6 m through gravel and rock fill.	Rockfill.	
1				930
2				929
3	○	Switched to PQ air flush soil coring method with face injection carbide bit at 2.6 m.	Stiff to hard, brown, sandy, gravelly SILT with a trace of clay. (Possible ablation/moraine till)	928
			- very poor recovery, core barrel blocked by gravel between 2.6 and 3.6 m	
4	○		- poor recovery and heavily disturbed, loose in barrel liner between 3.6 and 5.1 m	927
5				926

Sa 1

Sa 2

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **SC14-103**

LOCATION: See Fig. 209
E 595292, N 5819967

TOP OF HOLE ELEV: 930.8 m

METHOD: PQ Air Coring / HQ Water Coring

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 25, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5	○	Switched to HQ water flush soil coring method with diamond face injection bit and very low downfeed drill pressure at 5.2 m.	Sa 3	Stiff to hard, brown, sandy, gravelly SILT with a trace of clay. (Possible ablation/moraine till)	
				- poor recovery and sample washed of fines between 5.2 and 6.7 m	925
6					
					924
7	○		Sa 4	- poor recovery and sample disturbed between 6.7 and 8.2 m	
					923
8		Increased downfeed drill pressure in attempt to improve recovery at 8.2 m.		- poor recovery and sample disturbed between 8.2 and 9.8 m	
	○			- likely basal till below 8.6 m	
			Sa 5		922
9					
					921
10				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **SC14-103A**

LOCATION: See Fig. 209
E 595290, N 5819868

TOP OF HOLE ELEV: 930.9 m

METHOD: PQ Water Soil Coring

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 27, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Drill with ODEX to 2.7 m through gravel and rock fill. Cvane is torvane. Cpen is pocket penetrometer.		Rockfill.	
1					930
2					929
3		Switched to HQ water flush soil coring method using SandDrill and Matex drill fluid additives at 2.7 m. >> Cpen = 125 kPa	Sa 1 Sa 2	Stiff to hard, brown, sandy, gravelly SILT with a trace of clay. (Possible ablation/moraine till)	928
4			Sa 3		927
5			Sa 4	- core barrel blocked by cobble	926

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
SC14-103A

LOCATION: See Fig. 209
E 595290, N 5819868

TOP OF HOLE ELEV: 930.9 m
METHOD: PQ Water Soil Coring
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 27, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5			Sa 5	Stiff to hard, brown, sandy, gravelly SILT with a trace of clay. (Possible ablation/moraine till) - core barrel blocked by cobble	
6			Sa 6		925
7			Sa 7		924
8					923
9			Sa 8	- likely basal till below 8.5 m	922
10				End of hole at required depth. Test hole grouted upon completion.	921

HOLE NO. **SC14-103A**

LOCATION: See Fig. 209
E 595290, N 5819868

TOP OF HOLE ELEV: 930.9 m
METHOD: PQ Water Soil Coring
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 27, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10			Top of hole backfilled with bentonite chips.	
11				920
12				919
13				918
14				917
15				916

Sheet 1 of 3

HOLE NO. **MR14-104**

LOCATION: See Fig. 209
E 595255, N 5819891

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW/CJC

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 18, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.	Drilled out. Fill of uncertain thickness.	931
1			930
2			929
3		Very stiff, brown, silty SAND with some gravel and clay. (Possible ablation/moraine till)	928
4	>> Cvane = 100 kPa Cpen > 225 kPa	SC Sa 1	927
5	>> Cpen > 225 kPa	SC/GC Sa 2	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-104**

LOCATION: See Fig. 209
E 595255, N 5819891

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW/CJC

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 18, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit Liquid Limit | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5	○		Sa 3	Very stiff, brown, silty SAND with some gravel and clay. (Possible ablation/moraine till)	
				Brown, sandy GRAVEL with some silt.	
				Stiff to very stiff, brown, gravelly, silty SAND with some clay. (Possible ablation/moraine till)	926
6	●—, ▲, △		SC Sa 4		
					925
7					
					924
8			Sa 5	- grey below 7.8 m	
	◈	Cvane = 88 kPa Cpen = 90 kPa			
				Stiff, brown, sandy SILT with some gravel and a trace to some clay. (Possible ablation/moraine till)	923
9	○		Sa 6		
					922
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-104**

LOCATION: See Fig. 209
E 595255, N 5819891

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: WRW/CJC

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 18, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10			Stiff, brown, sandy SILT with some gravel and a trace to some clay. (Possible ablation/moraine till)	
		Sa 7	(Glaciolacustrine) Inferred from CT scanning, sample not extruded.	921
11	Cpen = 40 kPa		Firm to stiff, brown, sandy, silty CLAY with some gravel. (Possible ablation/moraine till)	
		CL Sa 8		920
12	Cvane = 60 kPa Cpen = 40 to 50 kPa			
		Sa 9		919
	Cvane = 60 kPa Cpen = 25 to 35 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
13				918
14				
15				917

Sheet 1 of 3

HOLE NO. **MR14-105**

LOCATION: See Fig. 209
E 595228, N 5819914

TOP OF HOLE ELEV: 931.7 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 20, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.	Sa 1	Stiff to very stiff, silty, fine SAND with some clay, a trace to some gravel and traces of clay and wood fragments. (Possible fill)	931
1				
2		OL Sa 2		930
	Cvane = 170 kPa Cpen > 225 kPa			929
3		SC Sa 3		
	Cvane = 50 kPa Cpen = 63 kPa			928
		CL		
4		SC Sa 4		
	Cvane = 83 kPa Cpen = 88 kPa	CL		
			Stiff to hard, brown, silty, fine SAND with some clay and gravel. (Possible ablation/moraine till)	927
5		SC		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 3

HOLE NO. **MR14-105**

LOCATION: See Fig. 209
E 595228, N 5819914

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 20, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS			SOIL DESCRIPTION	ELEVATION (m)
5			SC	Sa 5	Stiff to hard, brown, silty, fine SAND with some clay and gravel. (Possible ablation/moraine till)	
						926
6				Sa 6	- grey below 5.9 m	
						925
7		Cvane = 45 kPa Cpen = 41 kPa	SC	Sa 7		
					Firm to stiff, brown, fine sandy SILT with some clay and gravel. (Possible ablation/moraine till)	924
8			SC	Sa 8		
		Cvane = 70 kPa Cpen = 55 kPa				923
9			CL GC CL CL CH	Sa 9	Firm to stiff, brown, laminated silty CLAY with traces of sand and gravel. (Glaciolacustrine)	
			CL		Firm to stiff, brown, fine sandy SILT with some clay and gravel. (Possible ablation/moraine till)	922
10		Cpen = 78 kPa				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 3 of 3

HOLE NO. **MR14-105**

LOCATION: See Fig. 209
E 595228, N 5819914

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 20, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10				Firm to stiff, brown, fine sandy SILT with some clay and gravel. (Possible ablation/moraine till)	
			Sa 10		921
11	● ●—I ◆◈ ▲ △	Cvane = 25 kPa Cpen = 28 kPa	CL		
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
12					
					919
13					
					918
14					
					917
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 1

HOLE NO.
MR14-105A

LOCATION: See Fig. 209
E 595226, N 5819916

TOP OF HOLE ELEV: 931.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 1, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Test hole drilled to complete vane shear testing.	Drilled out to 1.7 m.	
		Cevane is an in-situ electric vane shear test. Remolded values were taken after 10 rotations.		931
1				
				930
2	◆ ◇ >>◆	Cevane: Peak = 118 kPa Residual = 52 kPa Remolded = 5 kPa	Very stiff, fine sandy SILT with a trace to some wood fragments and a trace of clay. (Possible fill)	
	◆ ◇ >>◆	Cevane: Peak = 142 to 155 kPa Residual = 62 kPa Remolded = 11 kPa		
	◆ ◆ ◇ >>◆	Cevane: Peak = 165 kPa Residual = 43 kPa Remolded = 15 to 23 kPa	End of hole at required depth. Test hole backfilled with drill cuttings and bentonite chips upon completion.	929
3				
				928
4				
				927
5				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-106**

LOCATION: See Fig. 209
E 595148, N 5819997

TOP OF HOLE ELEV: 929.4 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 20/21, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit Liquid Limit | SAMPLES USCS Grab Sample USCS Tube Sample No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100 COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.	Brown, silty, fine SAND. (Tailings)	929
1		Stiff to hard, brown, silty, fine SAND with some clay and gravel. (Possible ablation/moraine till)	928
2			927
3	>> Cpen = 169 kPa	SC Sa 1	926
4		CL Sa 2	925
5	Cvane = 95 kPa Cpen = 69 kPa	CL	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 3

HOLE NO. **MR14-106**

LOCATION: See Fig. 209
E 595148, N 5819997

TOP OF HOLE ELEV: 929.4 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 20/21, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5			SC Sa 3	Stiff to hard, brown, silty, fine SAND with some clay and gravel. (Possible ablation/moraine till)	924
		Cpen = 88 kPa			
				- silty SAND and GRAVEL between 5.7 and 6.6 m	
6			GC Sa 4		
		Cpen = 50 kPa		- firm to stiff below 6.3 m	923
			SC Sa 5		
7		Cvane = 55 kPa Cpen = 50 kPa			922
			Sa 6		
8			CH CL	Firm to stiff, brown CLAY with some silt and a trace of fine sand. (Glaciolacustrine)	
		Cvane = 50 kPa Cpen = 42 kPa			921
			SC Sa 7		
9			CL SC CL	Stiff to very stiff, brown, fine sandy SILT with some clay and gravel. (Basal till)	
		Cvane = 110 kPa Cpen = 119 kPa			920
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-106**

LOCATION: See Fig. 209
E 595148, N 5819997

TOP OF HOLE ELEV: 929.4 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 20/21, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10		Stiff to very stiff, brown, fine sandy SILT with some clay and gravel. (Basal till)	
	Cvane = 103 kPa Cpen = 213 kPa	CL Sa 8	919
		Hard, brown, clayey SILT with a trace of sand. (Glaciolacustrine)	
11		No recovery and no samples below 10.7 m.	918
12		Sa 9	
		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	917
13			916
14			915
15			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106A

LOCATION: See Fig. 209
E 595146, N 5819997

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 31, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Test hole drilled to complete vane shear testing. Cvane is torvane. Cpen is pocket penetrometer. Cevane was completed in-situ, using an electric vane. Remolded values were taken after 10 rotations.	Drilled out.	928
1			927
2			926
3			925
4			924
5			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO. **MR14-106A**

LOCATION: See Fig. 209
E 595146, N 5819997

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 31, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit Liquid Limit | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
5	>> Cevane: Peak > 192 kPa	Hard, brown, fine sandy SILT with a trace to some gravel and a trace of clay. (Possible ablation/moraine till)	
			923
6	>> Cevane: Peak = 350 kPa		
			922
7	>> Cevane: Peak = 130 kPa	- a trace of gravel below 7.2 m	
	>>	CL / CH Sa 1 — Hard, brown, SILT and CLAY with a trace of fine sand. (Glaciolacustrine)	921
8	Cevane: Peak = 138 kPa Remolded = 29 to 34 kPa		
	>> Cevane: Peak = 156 kPa Remolded = 43 kPa	Very stiff, grey, clayey SILT with a trace to some gravel, and a trace of fine sand. (Basal till)	
		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9			
			919
10			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106B

LOCATION: See Fig. 209
E 595139, N 5820001

TOP OF HOLE ELEV: 928.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out, no sampling.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-106B

LOCATION: See Fig. 209
E 595139, N 5820001

TOP OF HOLE ELEV: 928.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	SAMPLES	SOIL DESCRIPTION	ELEVATION (m)
5		Drilled out, no sampling.	
			923
6			
			922
7			
	Sa 1	No recovery.	921
8	Sa 2		
		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9			
			919
10			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106C

LOCATION: See Fig. 209
E 595139, N 5820002

TOP OF HOLE ELEV: 928.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.2 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO.
MR14-106C

LOCATION: See Fig. 209
E 595139, N 5820002

TOP OF HOLE ELEV: 928.5 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 7.2 m.	
					923
6					
					922
7					
			CH CH CH CL CL ML	Firm to stiff, grey to brown SILT and CLAY with a trace to some sand. (Glaciolacustrine)	921
8		Cvane = 56 kPa Cpen = 24 to 34 kPa Cvane = 19 kPa Cpen = 4 to 9 kPa	Sa 1		
			Sa 2	No recovery.	
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9					
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106D

LOCATION: See Fig. 209
E 595137, N 5819993

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.6 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO.
MR14-106D

LOCATION: See Fig. 209
E 595137, N 5819993

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
5	Cvane is torvane. Cpen is pocket penetrometer.	Drilled out to 7.6 m.	
6			923
7			922
8	Cvane = 20 kPa Cpen = 5 kPa	Sa 1 Sa 2 CH Firm, grey, moist, silty CLAY with a trace of sand. (Glaciolacustrine)	921
9		No recovery.	920
10		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	919

10 20 30 40 50 60 70 80 90 100

Plastic Limit — Liquid Limit

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106E

LOCATION: See Fig. 209
E 595134, N 5819990

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 5 and 6, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.1 m.
1	928	
2	927	
3	926	
4	925	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO. **MR14-106E**

LOCATION: See Fig. 209
E 595134, N 5819990

TOP OF HOLE ELEV: 929.0 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 5 and 6, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 7.1 m.	
6					923
7					922
8		Cvane = 62 kPa Cpen = 68 to 98 kPa	Sa 1 Sa 2 Sa 3 Sa 4 CL CL CH CL CH CH	Stiff, grey, moist, silty CLAY with a trace of sand. (Glaciolacustrine)	921
9		Cvane = 63 kPa Cpen = 63 to 68 kPa	CH CH CH CL	- very stiff at 9.2 m	920
10		Cvane = 171 kPa Cpen > 225 kPa	CL	No recovery. End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106F

LOCATION: See Fig. 209
E 595134, N 5819994

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 6, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out 7.0 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO.
MR14-106F

LOCATION: See Fig. 209
E 595134, N 5819994

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 6, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out 7.0 m.	
					923
6					
					922
7			Sa 1	Firm, grey, moist, SILT and CLAY with some rounded gravel. (Glaciolacustrine)	
	◆⊕	Cvane = 31 kPa Cpen = 29 to 36 kPa			921
8	● ● ● ● ▲		CH Sa 2	Firm, grey, moist, silty CLAY with a trace of sand. (Glaciolacustrine)	
	● ◆ ⊕ ● ▲ △	Cvane = 35 kPa Cpen = 24 to 44 kPa	CL CH Sa 3		
	● ▲ △ ◆ ⊕	Cvane = 93 kPa Cpen = 122 to 147 kPa	CL	- some sand below 8.6 m - stiff to very stiff at 8.7 m	920
9				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106G

LOCATION: See Fig. 209
E 595135, N 5819997

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 6 and 7, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.0 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-106G

LOCATION: See Fig. 209
E 595135, N 5819997

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 6 and 7, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 7.0 m.	
6					923
7		Cvane = 29 kPa Cpen = 14 kPa	Sa 1	Firm to stiff, grey, moist, SILT and CLAY with a trace of sand. (Glaciolacustrine)	922
8			Sa 2 CL		921
		Cvane = 53 kPa Cpen = 24 to 58 kPa	Sa 3 CH	- some sand partings below 8.2 m	
9		>> Cvane = 278 kPa Cpen = 29 to 39 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106H

LOCATION: See Fig. 209
E 595135, N 5819998

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 7, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.3 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO.
MR14-106H

LOCATION: See Fig. 209
E 595135, N 5819998

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 7, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 7.3 m.	
					923
6					
					922
7					
	● ● ● ▲ ◆ ⊕	Cvane = 51 kPa Cpen = 34 to 58 kPa	CH CH CH Sa 1	Firm to stiff, grey, moist, thinly laminated SILT and CLAY with a trace of fine sand in partings. (Glaciolacustrine)	
					921
			Sa 1	No recovery.	
8			Sa 2	Stiff, grey, moist, SILT and CLAY with a trace of fine gravel. (Glaciolacustrine)	
	⊕ >> ◆	Cvane = 196 kPa Cpen = 39 to 44 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9					
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-106I

LOCATION: See Fig. 209
E 595135, N 5820001

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 7, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 7.3 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO. **MR14-106I**

LOCATION: See Fig. 209
E 595135, N 5820001

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 7, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 7.3 m.	
					923
6					
					922
7					
			CL Sa 1	Firm to stiff, grey, moist, SILT and CLAY with traces of sand and fine gravel. (Glaciolacustrine)	921
8		Cvane = 78 kPa Cpen = 29 to 39 kPa	Sa 2	Stiff to very stiff, grey, moist, gravelly, sandy SILT with some clay. (Basal till)	
		>> Cpen = 107 to 117 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9					
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO.
MR14-107

LOCATION: See Fig. 209
E 595131, N 5820013

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 21, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty fine SAND. (Tailings)	
				Stiff to hard, brown SAND, SILT and GRAVEL with some clay. (Possible ablation/moraine till)	928
1					
					927
2					
					926
3		Cvane = 98 kPa Cpen = 146 kPa	SC Sa 1		
			Sa 2		925
4			Sa 3		
			SC Sa 4		924
5					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-107**

LOCATION: See Fig. 209
E 595131, N 5820013

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 21, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5	Cvane = 88 kPa Cpen = 59 kPa	SC Sa 4	Stiff to hard, brown SAND, SILT and GRAVEL with some clay. (Possible ablation/moraine till) - stiff below 5.2 m	923
6		SC Sa 5		
	Cpen = 63 kPa			922
7		CL Sa 6 CL CL CL/CH CL/CH	Stiff, brown, SILT and CLAY with a trace of sand. (Glaciolacustrine)	
	Cvane = 90 kPa Cpen = 60 kPa		Stiff, brown, gravelly, silty SAND with some clay. (Basal till)	921
8		Sa 7		
	Cvane = 100 kPa Cpen = 75 kPa		No recovery and no samples below 8.5 m.	920
9				
				919
10				

HOLE NO.
MR14-107

LOCATION: See Fig. 209
E 595131, N 5820013

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 21, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	SOIL DESCRIPTION	ELEVATION (m)
10	No recovery and no samples below 8.5 m.	
	End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
11		918
12		917
13		916
14		915
15		914

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO.
MR14-107A

LOCATION: See Fig. 209
E 595132, N 5820013

TOP OF HOLE ELEV: 928.3 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 30, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Test hole drilled to complete vane shear testing.	Drilled out to 5.5 m.	928
1				927
2				926
3				925
4				924
5				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-107A

LOCATION: See Fig. 209
E 595132, N 5820013

TOP OF HOLE ELEV: 928.3 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 30, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5	Cvane is torvane. Cpen is pocket penetrometer. Cevane is an in-situ electric vane shear test.		Drilled out to 5.5 m.	923
6	Cevane: Peak = 90 kPa		Stiff, brown, fine sandy SILT with a trace to some gravel and a trace of silt. (Possible ablation/moraine till)	922
7	Cevane: Peak = 93 kPa Remolded = 20 kPa	CH CL CL	Stiff, grey, SILT and CLAY with a trace of fine sand. (Glaciolacustrine) - sandy below 7.4 m	921
8	Cvane = 63 kPa Cpen = 63 kPa; >> Cevane: Peak > 150 kPa	CL	Stiff to very stiff, brown, fine sandy SILT with some gravel and clay. (Basal till)	920
9	Cvane = 80 kPa Cpen = 38 kPa	Sa 1, Sa 2, Sa 3		919
10	>> Cvane = 95 kPa Cpen = 113 kPa			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 3 of 3

HOLE NO.
MR14-107A

LOCATION: See Fig. 209
E 595132, N 5820013

TOP OF HOLE ELEV: 928.3 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 30, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10			Sa 4	Stiff to very stiff, brown SILT with traces of clay and fine sand. (Glaciolacustrine)	918
		>> Cvane = 80 kPa Cpen = 200 kPa			
				Very stiff, brown, fine sandy SILT with traces of clay and gravel. (Basal till)	
11			Sa 5		917
		Cvane = 138 kPa Cpen >225 kPa			
			CL Sa 6 CL	Stiff, dark grey, laminated clayey SILT with traces of fine sand, gravel and organic odour. (Glaciolacustrine)	
		>> Cvane = 88 kPa Cpen >225 kPa		- trace to no gravel below 11.7 m	
12			Sa 7		916
		>> Cpen > 225 kPa	Sa 8		
				Dense (inferred), dark grey, fine to medium SAND with a trace to some silt. (Possible glaciofluvial)	
13				End of hole at required depth. Test hole grouted to surface upon completion.	915
14					914
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 15/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO.
MR14-107B

LOCATION: See Fig. 209
E 595129, N 5820013

TOP OF HOLE ELEV: 928.4 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 1, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Test hole drilled to complete vane shear testing.	Drilled out to 6.6 m.	
			928
1			
			927
2			
			926
3			
			925
4			
			924
5			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-107B

LOCATION: See Fig. 209
E 595129, N 5820013

TOP OF HOLE ELEV: 928.4 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 1, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS			SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer. Cevane is an in-situ electric vane shear test. Remolded values were taken after 10 rotations.			Drilled out to 6.6 m.	
6						923
						922
7		Cvane = 30 kPa Cpen = 50 kPa Cevane: Peak = 98 kPa Residual = 42 kPa Remolded = 17 kPa	CL CH	Sa 1	Firm to stiff, grey, SILT and CLAY with a trace of fine sand. (Glaciolacustrine)	
					Pushed vane.	921
8					End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	920
9						919
10						

Sheet 1 of 3

HOLE NO.
MR14-108

LOCATION: See Fig. 209
E 595105, N 5820013

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty, fine SAND. (Tailings)	928
1				Very stiff to hard, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)	
	● ▲ △		CL Sa 1		927
2		Cvane = 125 kPa Cpen = 213 kPa		- gravelly between 2.3 and 3.2 m	
					926
				- boulder at 2.7 m	
3	● ▲ △		SC Sa 2		
		Cvane = 128 kPa Cpen = 125 kPa			
			SM Sa 3		925
	● ▲ △				
		Cvane = 125 kPa Cpen > 225 kPa			
4					
			Sa 7		924
5					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-108**

LOCATION: See Fig. 209
E 595105, N 5820013

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m) | 10 20 30 40 50 60 70 80 90 100 | **COMMENTS** | SOIL DESCRIPTION | ELEVATION (m)

5
6
7
8
9
10

Cvane = 50 kPa
Cpen = 42 kPa

Cvane = 48 kPa
Cpen = 63 kPa

Cvane = 73 kPa
Cpen = 100 kPa

Sa 7
Sa 4
Sa 5
Sa 6

SC

Firm to stiff, gravelly, fine sandy SILT with some clay. (Possible ablation/moraine till)

Firm to stiff, brown, silty CLAY. (Possible glaciolacustrine)

Stiff to very stiff, fine sandy, gravelly SILT with a trace of clay. (Possible ablation/moraine till)

No recovery and no samples below 8.1 m.

923
922
921
920
919

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-108

LOCATION: See Fig. 209
E 595105, N 5820013

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10			No recovery and no samples below 8.1 m.	
				918
11				
				917
12			End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
				916
13				
				915
14				
				914
15				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO.
MR14-108A

LOCATION: See Fig. 209
E 595106, N 5820014

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 29, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
0		Drilled out to 8.5 m.
	928	
1		
	927	
2		
	926	
3		
	925	
4		
	924	
5		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-108A

LOCATION: See Fig. 209
E 595106, N 5820014

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 29, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5		Cvane is torvane. Cpen is pocket penetrometer.		Drilled out to 8.5 m.	
					923
6					
					922
7					
					921
8					
					920
	>> ◈	Cvane = 100 kPa Cpen > 225 kPa	Sa 1	Very hard, grey to brown SILT with a trace to some gravel and a trace of fine sand. (Basal till)	
9		Pitcher Sampler Used.	Sa 2		
		Pitcher Sampler Used.	Sa 3		
				No recovery between 9.5 and 11.4 m.	919
		Pitcher Sampler Used.	Sa 4		
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-108A

LOCATION: See Fig. 209
E 595106, N 5820014

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 29, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10		Sa 4	No recovery between 9.5 and 11.4 m.	
	Pitcher Sampler Used.	Sa 5		918
11				
		Sa 6	CL Very stiff, grey, moist, clayey SILT with a trace of fine sand. (Glaciolacustrine)	917
	Cvane = 105 kPa Cpen > 225 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
12				916
13				915
14				914
15				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-109**

LOCATION: See Fig. 209
E 595087, N 5820022

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty, fine SAND. (Tailings)	
1			Stiff to hard, brown, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)	928
		CL Sa 1		
	>> Cvane = 75 kPa Cpen = 175 kPa			
2				927
		SC Sa 2		
	Cpen = 50 kPa		- gravelly at 2.8 m	
3			- grey below 3.0 m	926
		CL-ML Sa 3		
	Cvane = 95 kPa Cpen = 180 kPa			
4				925
		CL-ML Sa 4		
5	Cvane = 95 kPa Cpen > 225 kPa			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-109**

LOCATION: See Fig. 209
E 595087, N 5820022

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5				Stiff to hard, brown, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)	
				Stiff to hard, grey GRAVEL, SAND and SILT with a trace of clay. (Basal till)	
6					923
	● ⊢⊣ ▲ △		GC-GM Sa 5		
		>> ◈ Cpen = 175 kPa		No recovery and no samples between 6.7 and 12.2 m.	
7					922
8					921
9					920
10					

HOLE NO.
MR14-109

LOCATION: See Fig. 209
E 595087, N 5820022

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 24, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◈ Remolded, ◇ Residual, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10				No recovery and no samples between 6.7 and 12.2 m.	
11					918
12					917
			ML CL/ML CL	Sa 6 Stiff to hard, grey, fine sandy SILT with some gravel and clay. (Basal till)	
	>>	Cvane = 75 kPa Cpen > 225 kPa			
				No recovery and no samples below 12.6 m.	
13					916
14					915
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-110**

LOCATION: See Fig. 209
E 595092, N 5820037

TOP OF HOLE ELEV: 928.7 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 23, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty, fine SAND. (Tailings)	
					928
1				Stiff to hard, brown, fine SAND and SILT with some gravel and clay. (Possible ablation/moraine till)	
					927
2	● ▲ △		SC Sa 1	- gravelly between 2.3 and 3.5 m	
		>> Cpen = 150 kPa			
					926
3	● ▲ △		SC Sa 2		
		>> Cpen = 138 kPa			
					925
4	▲ △		Sa 3		
					924
5	● ▲ △ ◆	Cvane = 80 kPa Cpen = 150 kPa	CL Sa 4		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-110**

LOCATION: See Fig. 209
E 595092, N 5820037

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 23, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5			Sa 4	Stiff to hard, grey, fine sandy SILT with a trace to some gravel and a trace of clay. (Possible ablation/moraine till)	
			CL-ML Sa 5		923
	>>	Cvane = 75 kPa Cpen = 113 kPa		No recovery and no samples between 5.9 and 12.2 m.	
6					
					922
7					
					921
8					
					920
9					
					919
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 3 of 3

HOLE NO. **MR14-110**

LOCATION: See Fig. 209
E 595092, N 5820037

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 23, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10				No recovery and no samples between 5.9 and 12.2 m.	
					918
11					
					917
12	● ● ● ▲ ◆	Cvane = 138 kPa Cpen > 225 kPa	ML CL CL/ML CL Sa 6	Very stiff to hard, brown, clayey SILT with a trace of fine sand. (Glaciolacustrine)	
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	916
13					
					915
14					
					914
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-111**

LOCATION: See Fig. 209
E 595115, N 5820044

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 23, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty, fine SAND. (Tailings)	928
1					
				Stiff to hard, brown, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)	927
2		Cpen = 100 kPa	GC Sa 1		
			Sa 2		926
3					
			SC Sa 3		925
4		Cvane = 50 kPa Cpen = 100 kPa	CL CL	Stiff, brown, SAND, SILT and CLAY with some gravel with bedded zones of clay. (Glaciolacustrine with ablation till inclusions)	
			Sa 7	Stiff to hard, brown, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)	924
5					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-111**

LOCATION: See Fig. 209
E 595115, N 5820044

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 23, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit Liquid Limit | SAMPLES USCS Grab Sample USCS Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m) | 10 20 30 40 50 60 70 80 90 100 | COMMENTS | SOIL DESCRIPTION | ELEVATION (m)

5
6
7
8
9
10

Sa 4
Sa 5
Sa 6

CL
CL-ML

Cvane = 110 kPa
Cpen = 190 kPa

Cpen > 225 kPa

Stiff to hard, brown, fine sandy SILT with some gravel and clay. (Possible ablation/moraine till)

- likely basal till below 6.8 m

923
922
921
920
919

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
MR14-111

LOCATION: See Fig. 209
E 595115, N 5820044

TOP OF HOLE ELEV: 928.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 23, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

10 — 11 — 12 — 13 — 14 — 15

No recovery and no samples below 10.0 m.

End of hole at required depth.
Test hole grouted upon completion.
Top of hole backfilled with bentonite chips.

ELEVATION (m): 918, 917, 916, 915, 914

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 1

HOLE NO. **MR14-111A**

LOCATION: See Fig. 209
E 595119, N 5820046

TOP OF HOLE ELEV: 928.1 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB/CHS

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 23, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Test hole drilled to complete vane shear testing. Cevane is an in-situ electric vane shear test.	Drilled out to 4.2 m.	928
1				927
2				926
3				925
4	○ >>◆	Cevane: Peak > 190 kPa	GC Sa 1 Hard, grey, silty, sandy GRAVEL with a trace of clay. (Possible ablation/moraine till)	924
5			End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-112**

LOCATION: See Fig. 209
E 595149, N 5820028

TOP OF HOLE ELEV: 928.9 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 22, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty fine SAND. (Tailings)	
1				928
			Hard to stiff, brown, silty SAND and GRAVEL with some clay. (Possible ablation/moraine till)	
		SC Sa 1		
2	>> Cpen = 156 kPa			927
		Sa 2		
3				926
		Sa 3		
4				925
		GC Sa 4		
		CH	Brown, laminated silty CLAY with traces of gravel, fine sand and organics. (Glaciolacustrine)	
		CL	Hard to stiff, brown, silty SAND and GRAVEL with some clay. (Possible ablation/moraine till)	
5	>> Cvane = 90 kPa Cpen = 158 kPa			924

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

HOLE NO. **MR14-112**

LOCATION: See Fig. 209
E 595149, N 5820028

TOP OF HOLE ELEV: 928.9 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 22, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
5			Hard to stiff, brown, silty SAND and GRAVEL with some clay. (Possible ablation/moraine till)	
	○	>> Cpen = 106 kPa	Sa 5	923
6				
	○		Sa 6	922
7			No recovery and no samples below 7.0 m.	
				921
8				
				920
9				
				919
10				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

HOLE NO.
MR14-112

LOCATION: See Fig. 209
E 595149, N 5820028

TOP OF HOLE ELEV: 928.9 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 22, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	SOIL DESCRIPTION	ELEVATION (m)
10	End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
11		918
12		917
13		916
14		915
15		914

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 1 of 1

HOLE NO.
MR14-112A

LOCATION: See Fig. 209
E 595151, N 5820026

TOP OF HOLE ELEV: 928.7 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 31, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0		Test hole drilled to complete vane shear testing. Cevane is an in-situ electric vane shear test.	Drilled out to 2.4 m.	928
1				
2				927
3			Hard, brown, sandy SILT with a trace to some gravel and a trace of clay. (Possible ablation/moraine till)	926
4		>>◆ Cevane: Peak > 194 kPa		925
5		>>◆ Cevane: Peak > 190 kPa	End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	924

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO. **MR14-113**

LOCATION: See Fig. 209
E 595152, N 5820013

TOP OF HOLE ELEV: 929.4 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 22, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100 COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0	Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty fine SAND. (Tailings)	929
1	132	CL CL CL CL Sa 1	Hard to stiff, brown SAND and SILT to sandy SILT with some clay and traces of gravel and organics. (Possible ablation/moraine till)	928
2	Cvane = 75 kPa Cpen = 92 kPa			927
3				926
4	>> Cpen = 175 kPa	SC Sa 2	- gravelly between 3.6 and 5.5 m	925
5		SC		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO.
MR14-113

LOCATION: See Fig. 209
E 595152, N 5820013

TOP OF HOLE ELEV: 929.4 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 22, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5			SC	Hard to stiff, brown SAND and SILT to sandy SILT with some clay and traces of gravel and organics. (Possible ablation/moraine till)	
		>> Cpen = 125 kPa	Sa 3		924
6			CL-ML		
			CL-ML		923
			ML		
		Cvane = 95 kPa Cpen = 158 kPa	Sa 4		
7					
			CL-ML		922
		Cvane = 95 kPa Cpen = 125 kPa	Sa 5		
8					
					921
9					
			CL		920
		Cvane = 150 kPa Cpen = 169 kPa	Sa 6	End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 1 of 2

HOLE NO. **MR14-114**

LOCATION: See Fig. 209
E 595064, N 5819981

TOP OF HOLE ELEV: 930.6 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 28, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Rockfill.	
					930
1					
					929
2				Stiff to hard, brown, gravelly SILT and SAND with some clay. (Possible ablation/moraine till)	
			Sa 1		928
3	◆	>> Cvane = 70 kPa Cpen = 110 kPa			
					927
	●		GC Sa 2		
4	◆	>> Cvane = 80 kPa Cpen > 225 kPa			
					926
	● — △ ▲		SC Sa 3		
5	◆	>> Cvane = 80 kPa Cpen = 112 kPa			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 2 of 2

HOLE NO. **MR14-114**

LOCATION: See Fig. 209
E 595064, N 5819981

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 28, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
5			Sa 3	Stiff to hard, brown, gravelly SILT and SAND with some clay. (Possible ablation/moraine till)	
			Sa 4		925
6					
	● ▲ △ ◆ ⊕	Cvane = 80 kPa Cpen = 88 kPa	SC Sa 5		924
7					
			Sa 6		923
8				- likely basal till below 8.4 m	
					922
9	○		Sa 7		
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	921
10					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 20/1/15- THURBER BC.GLB

Sheet 1 of 3

HOLE NO. **MR14-115**

LOCATION: See Fig. 209
E 595076, N 5820007

TOP OF HOLE ELEV: 929.0 m

METHOD: Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: October 28, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0		Cvane is torvane. Cpen is pocket penetrometer.		Brown to grey, silty, fine SAND. (Tailings)	929
1					928
			Sa 1	Stiff to hard, brown, gravelly SAND and SILT with some clay. (Possible ablation/moraine till)	
2		Cvane = 95 kPa Cpen = 110 kPa	Sa 2		927
3					926
4		Cvane = 68 kPa Cpen = 63 kPa	SC Sa 3	- stiff below 4.1 m	925
			SC Sa 4		
5		Cvane = 89 kPa Cpen > 225 kPa		No recovery and no samples below 4.9 m.	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-115**

LOCATION: See Fig. 209
E 595076, N 5820007

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 28, 2014
FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	SOIL DESCRIPTION	ELEVATION (m)
5	No recovery and no samples below 4.9 m.	924
6		923
7		922
8		921
9		920
10		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 3 of 3

HOLE NO.
MR14-115

LOCATION: See Fig. 209
E 595076, N 5820007

TOP OF HOLE ELEV: 929.0 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: TB

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: October 28, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10			No recovery and no samples below 4.9 m.	919
11				918
12			End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	917
13				916
14				915
15				

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-116**

LOCATION: See Fig. 209
E 595113, N 5819969

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 3, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

Plastic Limit — Liquid Limit

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS			SOIL DESCRIPTION	ELEVATION (m)
0		Penetration recorded are uncorrected field values from large penetration test (LPT) with 7.6 cm outer diameter and 6.1 cm inner diameter, driven with SPT hammer.	CL	Sa 1	Stiff to very stiff, grey to brown, moist, sandy, rounded gravelly SILT with some clay. (Possible ablation/moraine till)	
						930
1			CL	Sa 2		
						929
2			CL	Sa 3		
			CL	Sa 4	- 2 to 3 mm thick layer of fine to medium sand at 2.5 m	928
3			GC	Sa 5		
						927
4			GC	Sa 6		
			GC	Sa 7	- minimum 100 mm diameter cobble at 4.4 m	926
5			CL/SC			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **MR14-116**

LOCATION: See Fig. 209
E 595113, N 5819969

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 3, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	COMMENTS			SOIL DESCRIPTION	ELEVATION (m)
5		CL/SC	Sa 8	Stiff to very stiff, grey to brown, moist, sandy, rounded gravelly SILT with some clay. (Possible ablation/moraine till)	
		CL	Sa 9	Firm, grey, moist, thinly laminated, silty CLAY with some sand on horizontal laminations. (Glaciolacustrine) - laminations 2 to 3 mm thick	925
		CL	Sa 10	- 100 mm thick layer of clay at 5.8 m	
6		SC/GC	Sa 11	Very stiff, grey, moist, silty, sandy GRAVEL with some clay. (Possible ablation/moraine till)	924
7		GC	Sa 12		
	- blow counts not recorded	GC	Sa 13		923
8		GC	Sa 14	Very stiff to hard, grey, moist, sandy, gravelly CLAY. (Possible ablation/moraine till)	922
	- possible pushing a cobble ahead of sampler (possible glaciolacustrine)	GC	Sa 15	No recovery between 8.7 and 10.5 m	
9					921
10					

HOLE NO. **MR14-116**

LOCATION: See Fig. 209
E 595113, N 5819969

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 3, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit | Liquid Limit | SAMPLES USCS Grab Sample, USCS Tube Sample, No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10		- blow counts may be affected by cobble below		No recovery between 8.7 and 10.5 m - possible cobble at 10.4 m	
			CL-ML Sa 16	Firm to stiff, grey, moist SILT with some clay and a trace of fine to medium sand. (Glaciolacustrine)	920
11			CH Sa 17	Firm to stiff, grey, moist, thinly laminated, silty CLAY with some 50 mm clay layers and fine sand in laminations. (Glaciolacustrine) - generally laminations 2 to 3 mm thick - a trace of rounded gravel to 40 mm diameter at 11.0 m	
			CH Sa 18		
			CL Sa 19	Very stiff, grey, moist SILT with some clay and fine sand and a trace of gravel. (Basal till)	919
12			CL Sa 20	Hard, grey, moist SILT with some rounded gravel to 40 mm diameter, fine sand and clay. (Glaciolacustrine)	
			CL Sa 21		918
13			CL-ML Sa 22	Hard, grey, moist SILT with some sand, rounded gravel and clay. (Glaciolacustrine)	
			CL-ML Sa 23		917
14			ML Sa 24	Hard, grey, moist, sandy SILT and CLAY with some rounded gravel to 40 mm diameter. (Glaciolacustrine)	
			CL-ML Sa 25		916
			SC/GC Sa 26		
15			CL Sa 27	Hard, grey, moist, clayey SILT with some fine sand laminations 3 to 5 mm thick. (Glaciolacustrine)	

Sheet 4 of 4

HOLE NO.
MR14-116

LOCATION: See Fig. 209
E 595113, N 5819969

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 3, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
15			CL	Hard, grey, moist, clayey SILT with some fine sand laminations 3 to 5 mm thick. (Glaciolacustrine)	
			Sa 27		
				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
					915
16					
					914
17					
					913
18					
					912
19					
					911
20					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 1

HOLE NO.
MR14-116A

LOCATION: See Fig. 209
E 595112, N 5819969

TOP OF HOLE ELEV: 930.6 m
METHOD: Mud Rotary
DRILLING CO.: Geotech Drilling Ltd.
INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel
PROJECT: Mount Polley Tailings Dam Breach
DATE: November 3, 2014
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
0	○	Penetration recorded are uncorrected field values from large penetration test (LPT).	CL Sa 1	Stiff to very stiff, brown, moist, sandy, silty GRAVEL to 50 mm diameter with some clay. (Possible ablation/moraine till)	930
1	○		GC Sa 2		
			Sa 3		929
2	○		GC Sa 4		
			GC Sa 5		928
3	○			End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	927
4					
					926
5					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **RH14-117**

LOCATION: See Fig. 209
E 595126, N 5819944 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.4 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit – Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

Drilled with odex.

SOIL DESCRIPTION

Drilled out 11.9 m.

DEPTH (m)	ELEVATION (m)
0	
	932
1	
	931
2	
	930
3	
	929
4	
	928
5	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
RH14-117

LOCATION: See Fig. 209
E 595126, N 5819944 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.4 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	SOIL DESCRIPTION	ELEVATION (m)
5	Drilled out 11.9 m.	
		927
6		
		926
7		
		925
8		
		924
9		
		923
10		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **RH14-117**

LOCATION: See Fig. 209
E 595126, N 5819944 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.4 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
10		Switched to mud rotary at 10.0 m. Cvane is torvane. Cpen is pocket penetrometer.		Drilled out 11.9 m.	
					922
11					
					921
12			Sa 1	Firm, grey, moist, 2 mm thick laminations sub-horizontal to sub-vertical, silty CLAY. (Glaciolacustrine)	
	◆ ⊕	Cvane = 30 kPa Cpen = 14 to 53 kPa			920
13			Sa 2	Firm to stiff, grey, moist, silty CLAY with some sand and a trace of gravel. (Glaciolacustrine)	
	◈	Cvane = 56 kPa Cpen = 55 kPa		- cobble at 13.0 m	
					919
			Sa 3	Stiff to very stiff, grey, moist, silty CLAY with some sand and rounded gravel to 25 mm diameter. (Basal till)	
14	>> ◇	Cvane = 62 kPa Cpen = 117 to 166 kPa		End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
					918
15					

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
RH14-117A

LOCATION: See Fig. 209
E 595125, N 5819939 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.6 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Drilled with odex.	Drilled out to 11.9 m.	
			932
1			
			931
2			
			930
3			
			929
4			
			928
5			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
RH14-117A

LOCATION: See Fig. 209
E 595125, N 5819939 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.6 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
5		Drilled out to 11.9 m.
	927	
6		
	926	
7		
	925	
8		
	924	
9		
	923	
10		

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
RH14-117A

LOCATION: See Fig. 209
E 595125, N 5819939 (est.)
Near KCB SH14-03

TOP OF HOLE ELEV: 932.6 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 12, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%) ○ Disturbed ● Undisturbed | WATER LEVEL Plastic Limit — Liquid Limit | SAMPLES USCS ◧ Grab Sample USCS ■ Tube Sample ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa) ◆ Peak ◇ Residual ◈ Remolded ⊕ Pocket Pen | GRAIN SIZE (%) ▲ Passing #200 sieve △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10	Switched to mud rotary at 10.0 m. Cvane is torvane. Cpen is pocket penetrometer.	Drilled out to 11.9 m.	
			922
11			
			921
12	Cvane = 46 kPa Cpen = 4 to 14 kPa	Sa 1 Sa 2 Firm, grey, moist, silty CLAY with traces of sand and rounded gravel to 30 mm diameter. (Glaciolacustrine)	920
13	Cvane = 52 kPa Cpen = 73 to 98 kPa	End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
			919
14			
			918
15			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

Sheet 1 of 4

HOLE NO.
RH14-118

LOCATION: See Fig. 209
E 595176, N 5819922 (est.)
Near KCB SH14-06

TOP OF HOLE ELEV: 937.7 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 11, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
0	Drilled with odex.	Drilled out to 11.6 m.	
			937
1			
			936
2			
			935
3			
			934
4			
			933
5			

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **RH14-118**

LOCATION: See Fig. 209
E 595176, N 5819922 (est.)
Near KCB SH14-06

TOP OF HOLE ELEV: 937.7 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 11, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

COMMENTS

SOIL DESCRIPTION

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION
5		Drilled out to 11.6 m.
6	932	
7	931	
8	930	
9	929	
10	928	

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO. **RH14-118**

LOCATION: See Fig. 209
E 595176, N 5819922 (est.)
Near KCB SH14-06

TOP OF HOLE ELEV: 937.7 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 11, 2014

FILE NO.: 15-3-280

DEPTH (m) | PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | ELEVATION (m)

10 20 30 40 50 60 70 80 90 100

DEPTH (m)	COMMENTS	SOIL DESCRIPTION	ELEVATION (m)
10	Cpen is pocket penetrometer.	Drilled out to 11.6 m.	
			927
11			
	Switched to mud rotary at 11.6 m.	Firm to stiff, grey, silty, sandy GRAVEL with some clay. (Possible ablation/moraine till)	
12			926
			925
13			
			924
14			
	>> Cpen = 113 to 152 kPa		923
15			

Sa 1

GC

Sa 2

LOG OF TEST HOLE - MT POLLEY 15-3-280 THURBER.GPJ THURBER BC.GDT 14/1/15- THURBER BC.GLB

HOLE NO.
RH14-118

LOCATION: See Fig. 209
E 595176, N 5819922 (est.)
Near KCB SH14-06

TOP OF HOLE ELEV: 937.7 m (est.)

METHOD: Odex / Mud Rotary

DRILLING CO.: Geotech Drilling Ltd.

INSPECTOR: BSP

THURBER

CLIENT: Mount Polley Independent Expert Engineering Investigation and Review Panel

PROJECT: Mount Polley Tailings Dam Breach

DATE: November 11, 2014

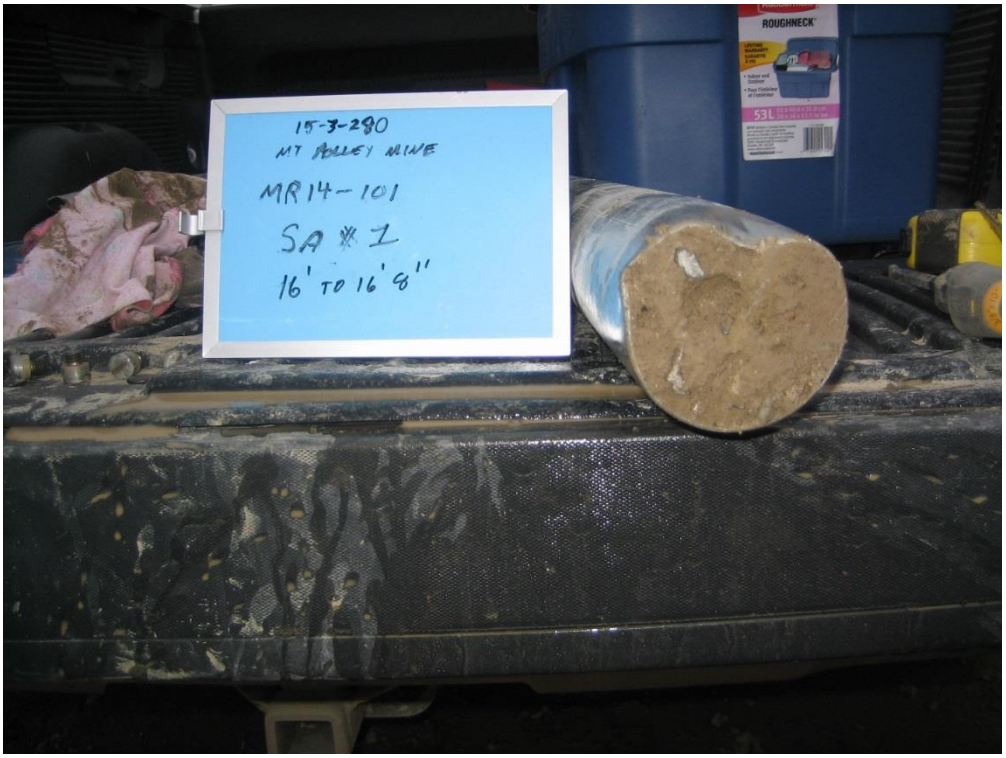
FILE NO.: 15-3-280

PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: USCS ◧ Grab Sample, USCS ■ Tube Sample, ⊠ No Recovery | UNDRAINED SHEAR STRENGTH (kPa): ◆ Peak, ◇ Residual, ◈ Remolded, ⊕ Pocket Pen | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve

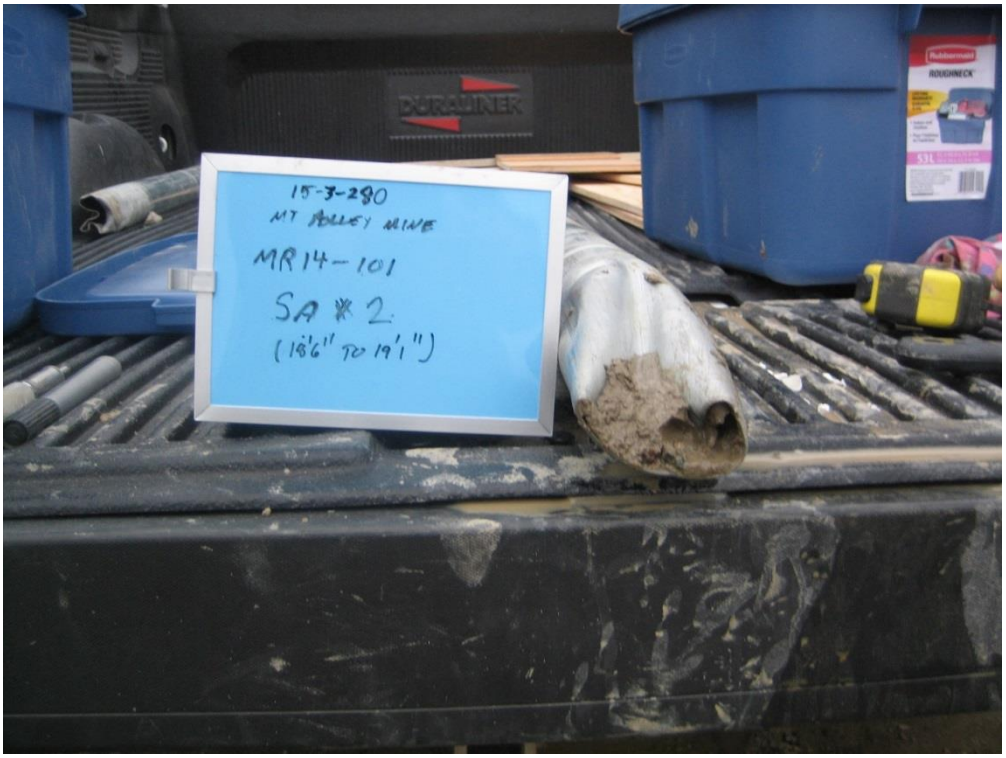
DEPTH (m)	10 20 30 40 50 60 70 80 90 100	COMMENTS		SOIL DESCRIPTION	ELEVATION (m)
15			GC Sa 2	Firm to stiff, grey, silty, sandy GRAVEL with some clay. (Possible ablation/moraine till)	
			GC		
			Sa 3	No recovery from 15.5 to 16.8 m (Possible glaciolacustrine)	922
16			Sa 4		
					921
			Sa 5	Very stiff, grey, moist, sandy, gravelly SILT with some clay. (Basal till)	
17		>> ◇ Cpen > 225 kPa			
			Sa 6	No recovery	920
18				End of hole at required depth. Test hole grouted upon completion. Top of hole backfilled with bentonite chips.	
					919
19					
					918
20					

Field Photos of Tube Samples

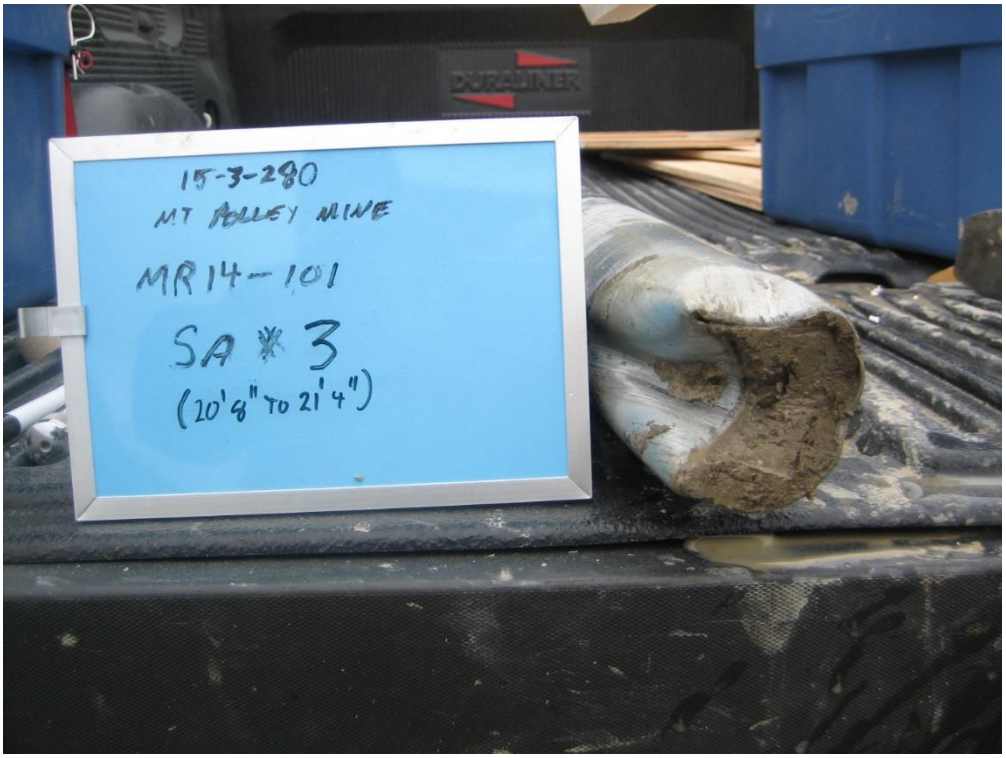
MR14-101 PHOTO SUMMARY



MR14-101 SAMPLE #1

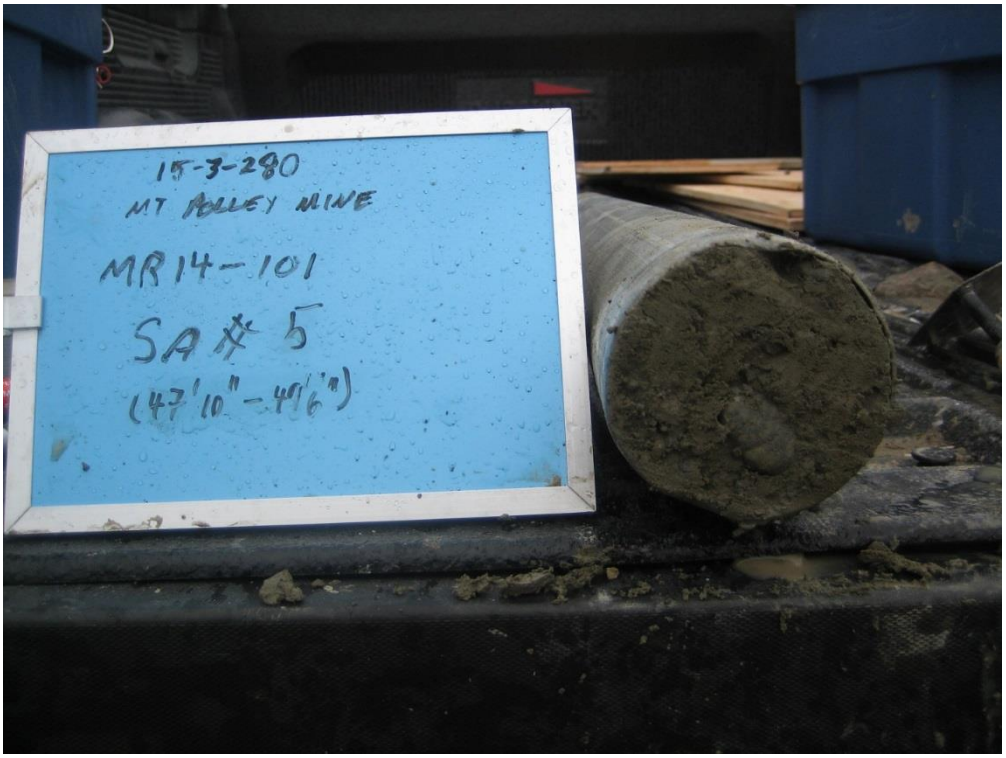


MR14-101 SAMPLE #2



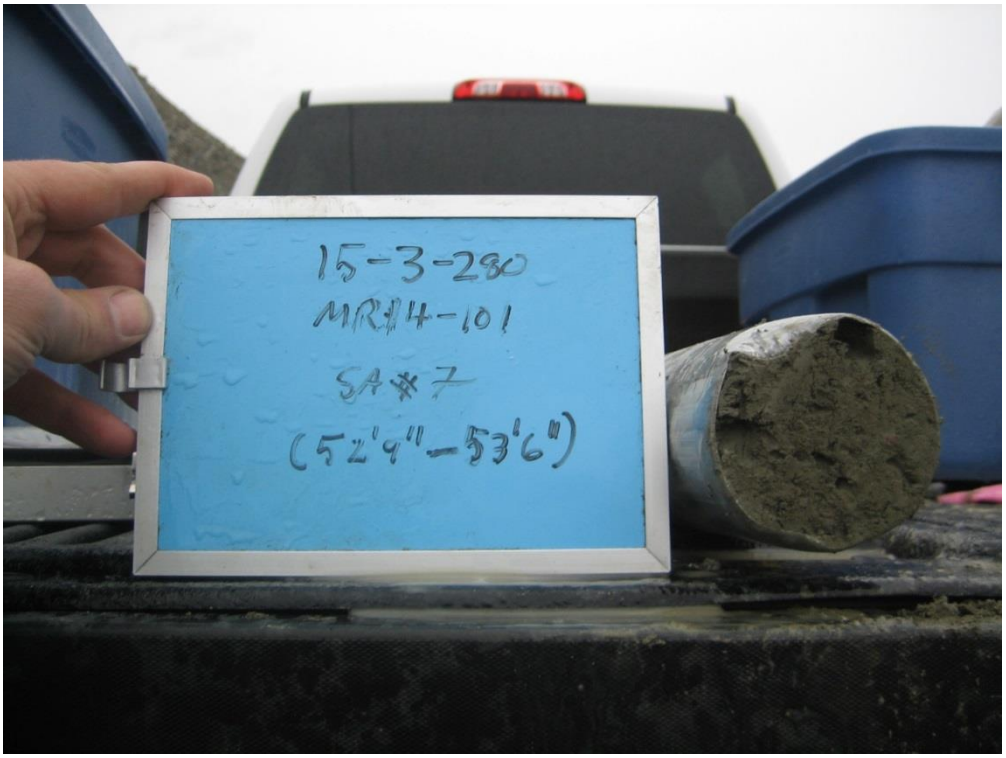
MR14-101 SAMPLE #3

MR14-101 SAMPLE #4

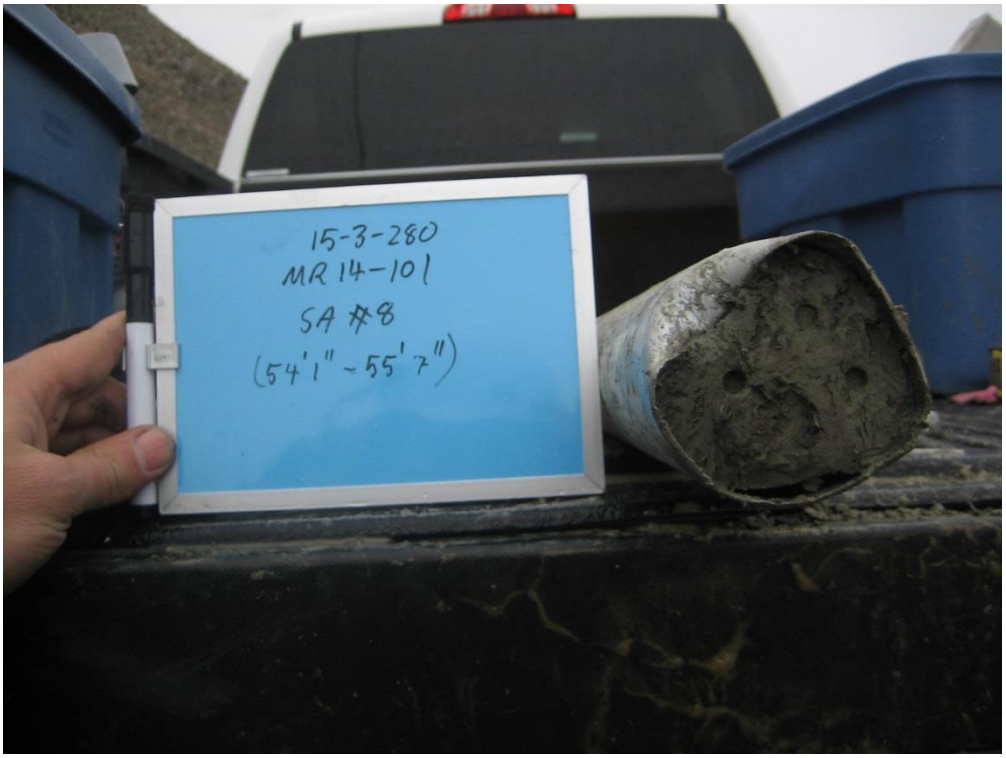


MR14-101 SAMPLE #5

MR14-101 SAMPLE #6



MR14-101 SAMPLE #7



MR14-101 SAMPLE #8

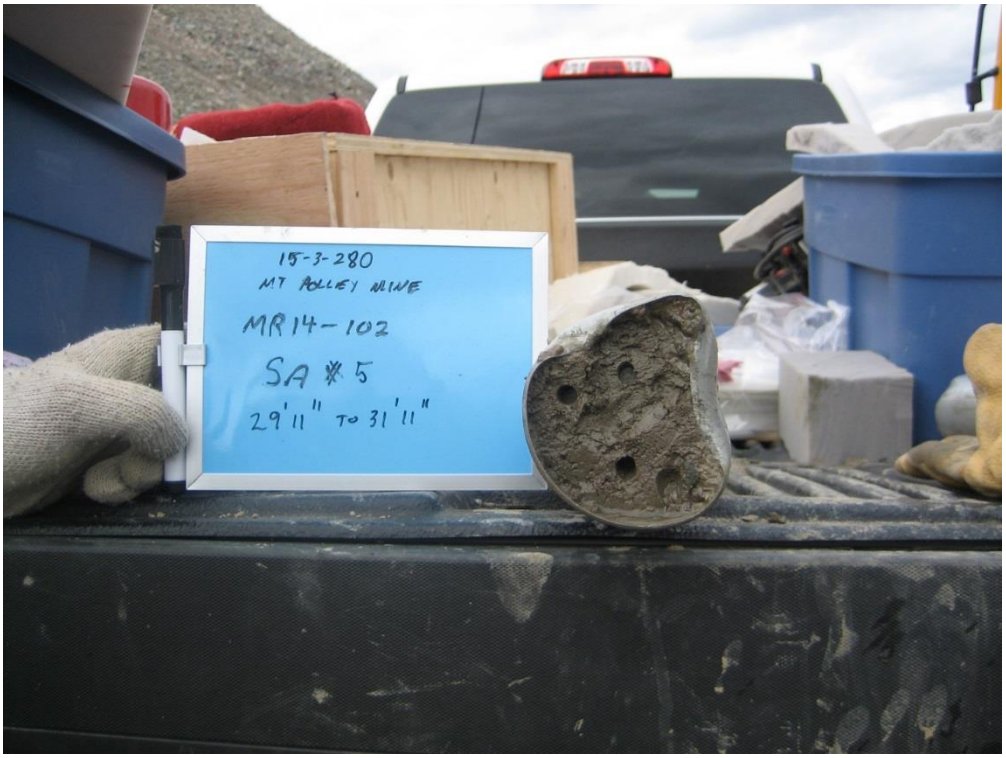
MR14-102 PHOTO SUMMARY

MR14-102 SAMPLE #1

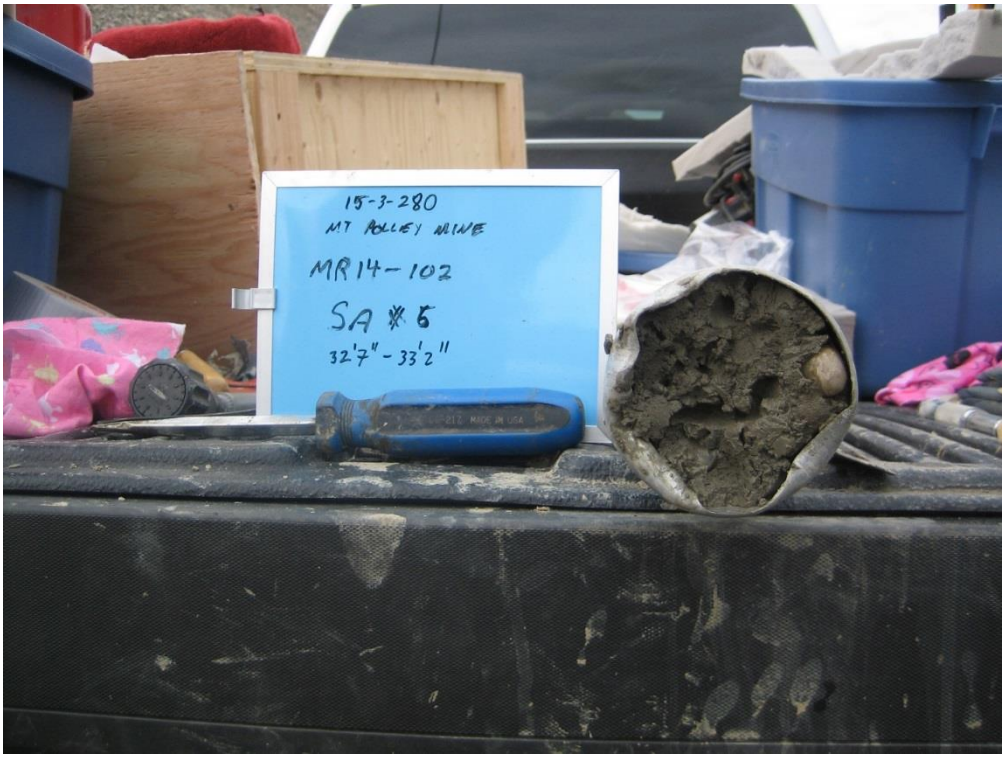
MR14-102 SAMPLE #2

MR14-102 SAMPLE #3

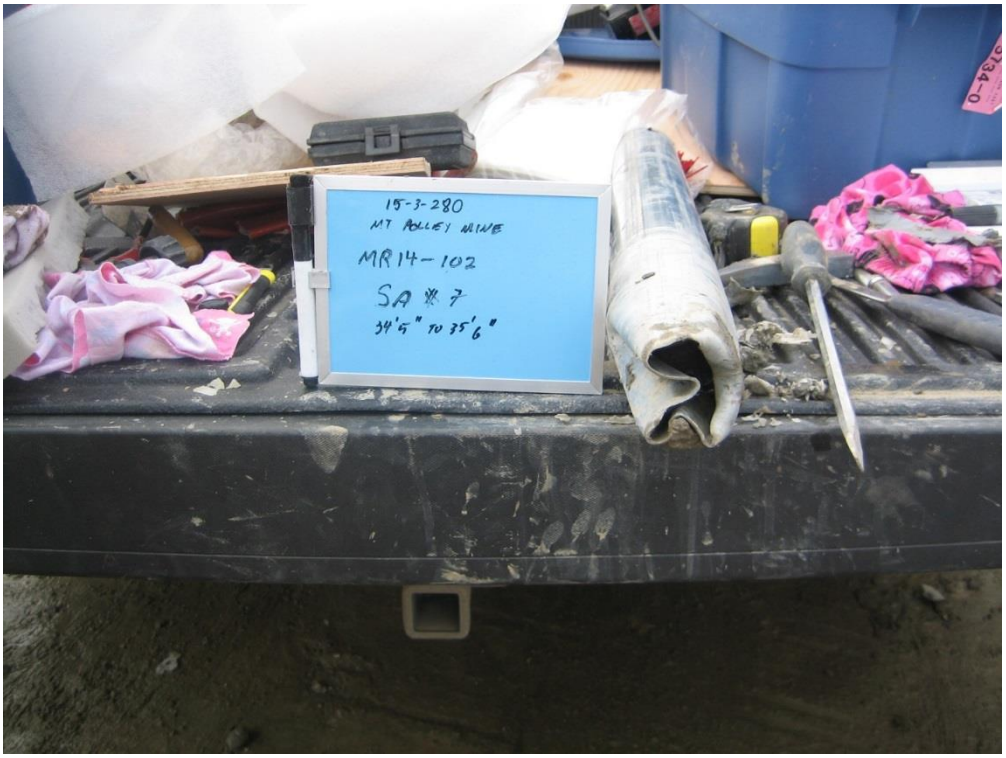
MR14-102 SAMPLE #4



MR14-102 SAMPLE #5



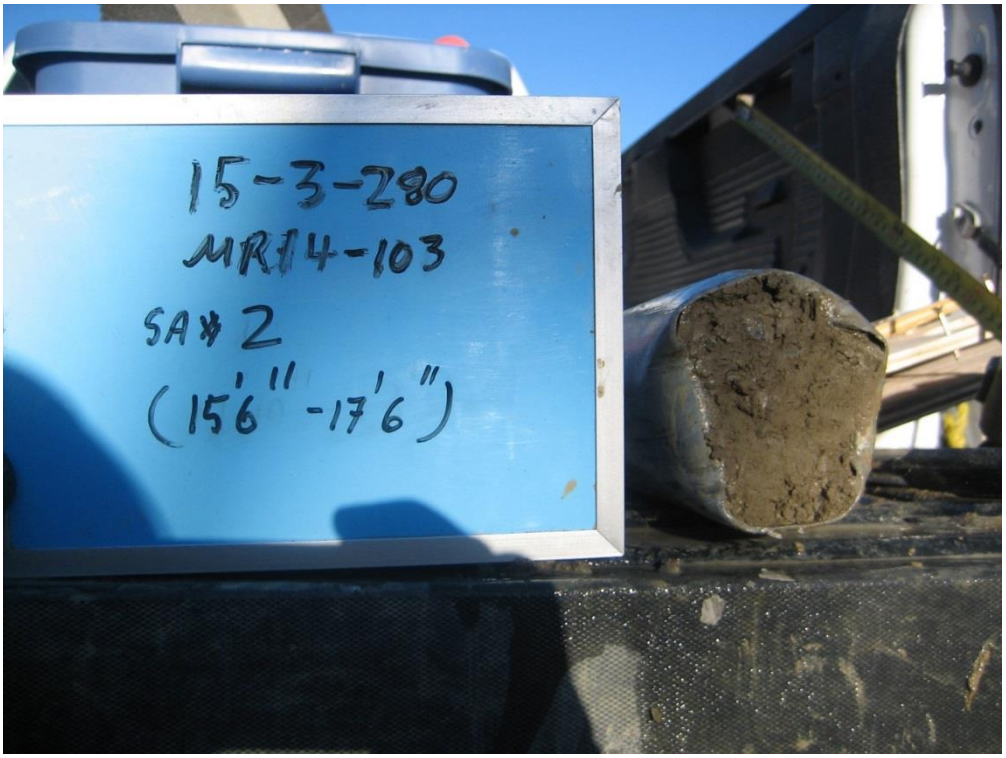
MR14-102 SAMPLE #6



MR14-102 SAMPLE #7

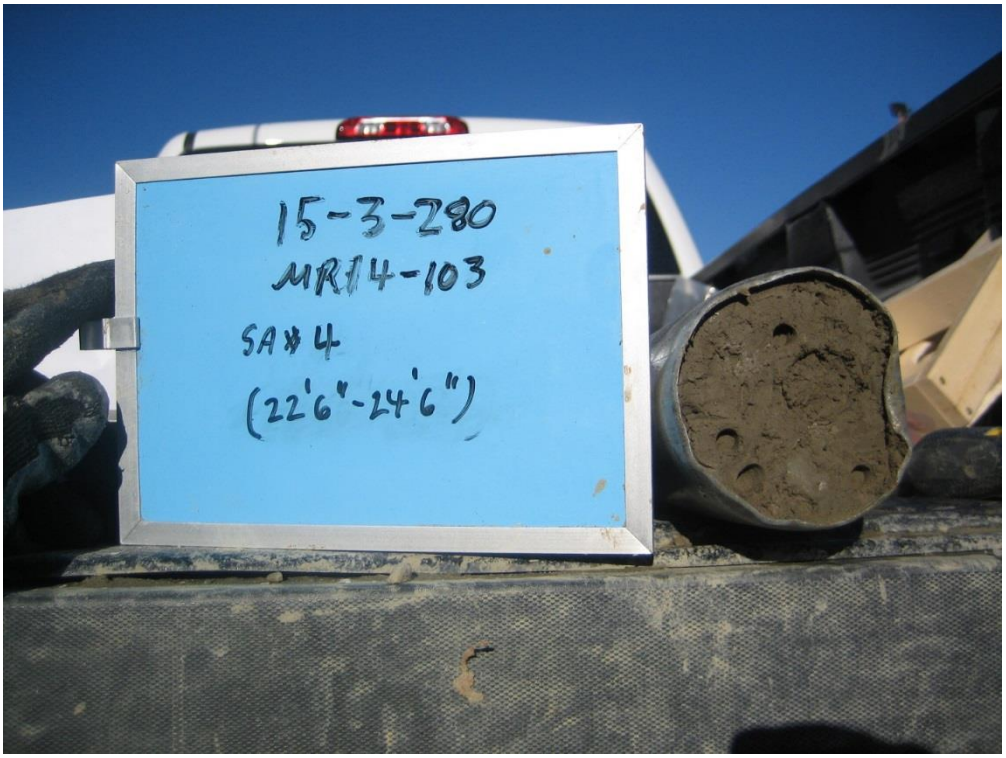
MR14-103 PHOTO SUMMARY

MR14-103 SAMPLE #1

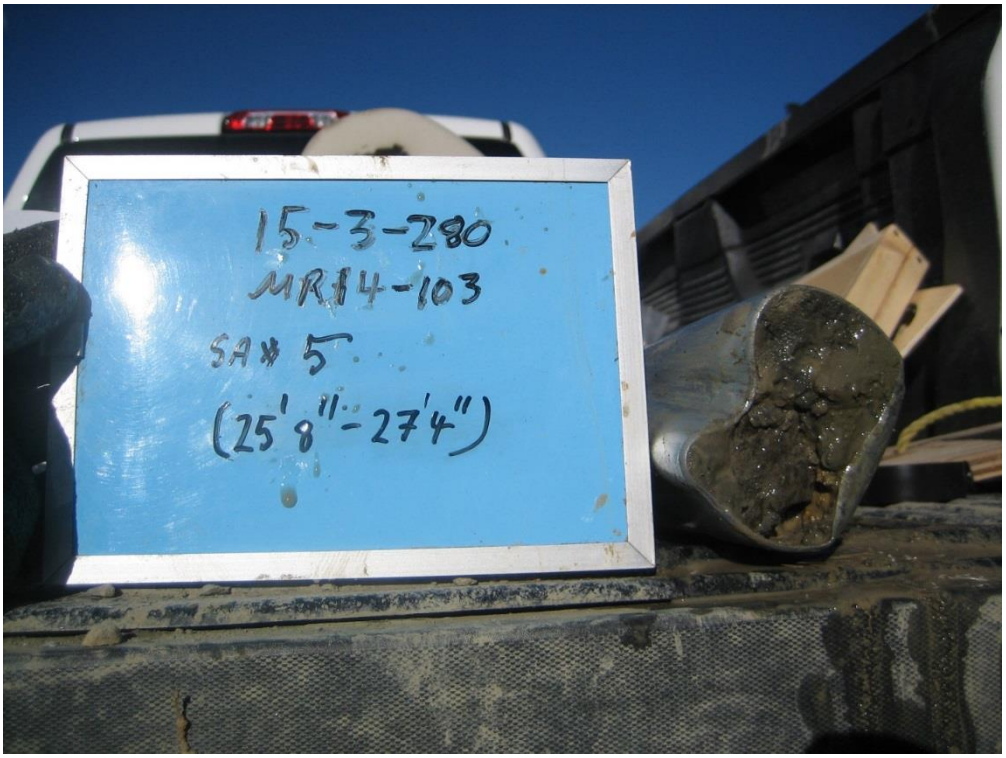


MR14-103 SAMPLE #2

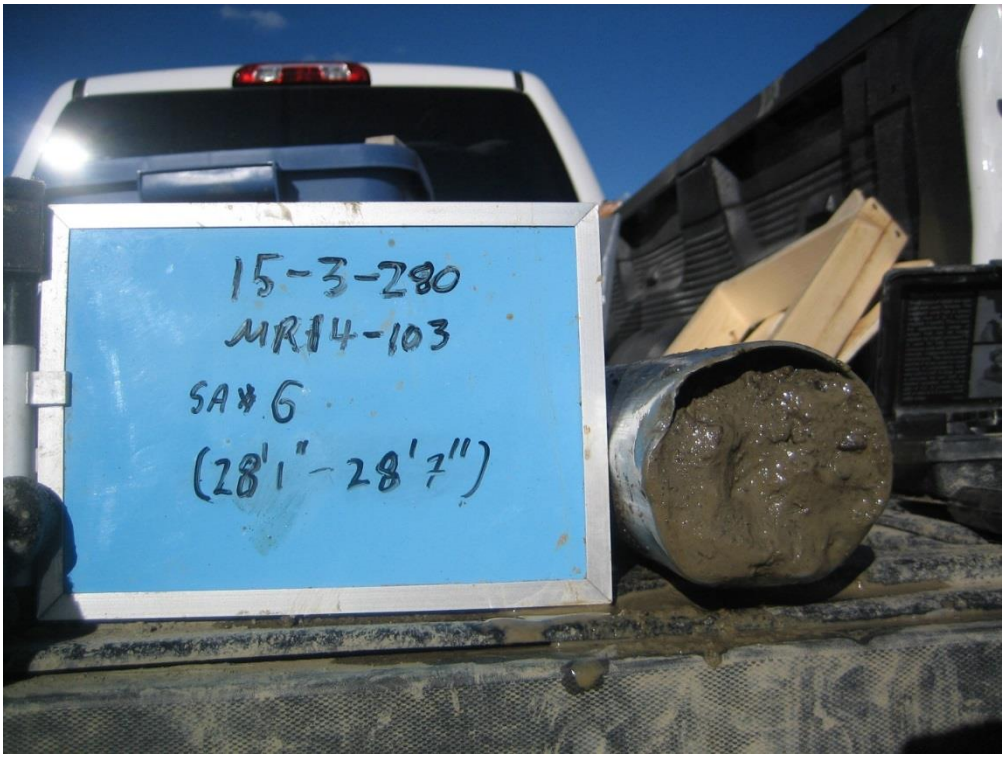
MR14-103 SAMPLE #3



MR14-103 SAMPLE #4



MR14-103 SAMPLE #5



MR14-103 SAMPLE #6

MR14-104 PHOTO SUMMARY

MR14-104 SAMPLE #1

MR14-104 SAMPLE #2

SEVERE DAMAGE – SAMPLE BAG REQUIRED

MR14-104 SAMPLE #3

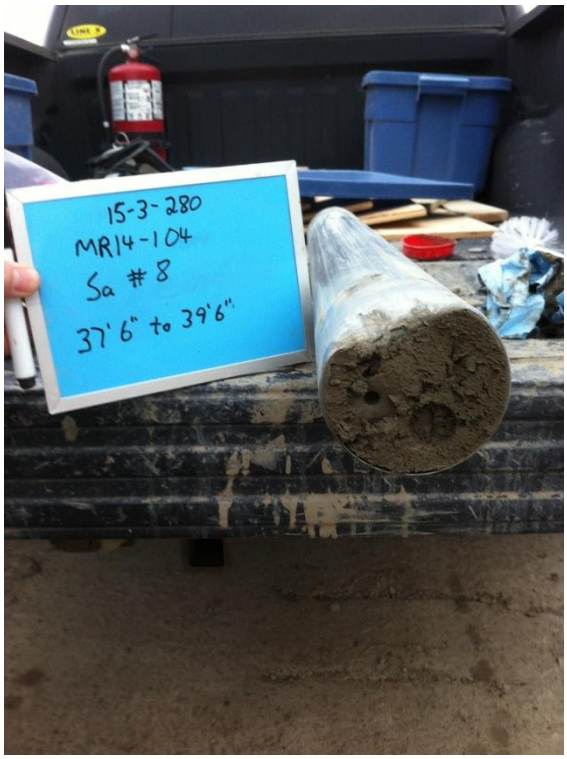
MR14-104 SAMPLE #4

MR14-104 SAMPLE #5

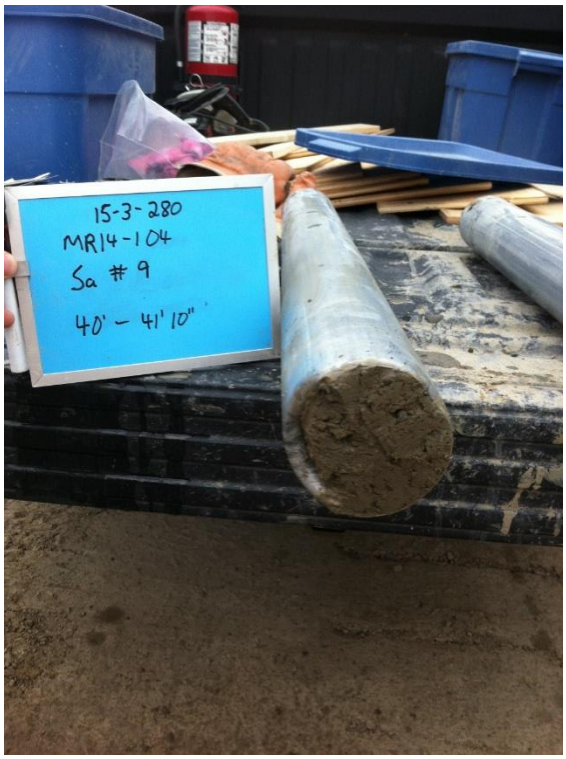
SEVERE DAMAGE – SAMPLE BAG REQUIRED

MR14-104 SAMPLE #6

MR14-104 SAMPLE #7



MR14-104 SAMPLE #8



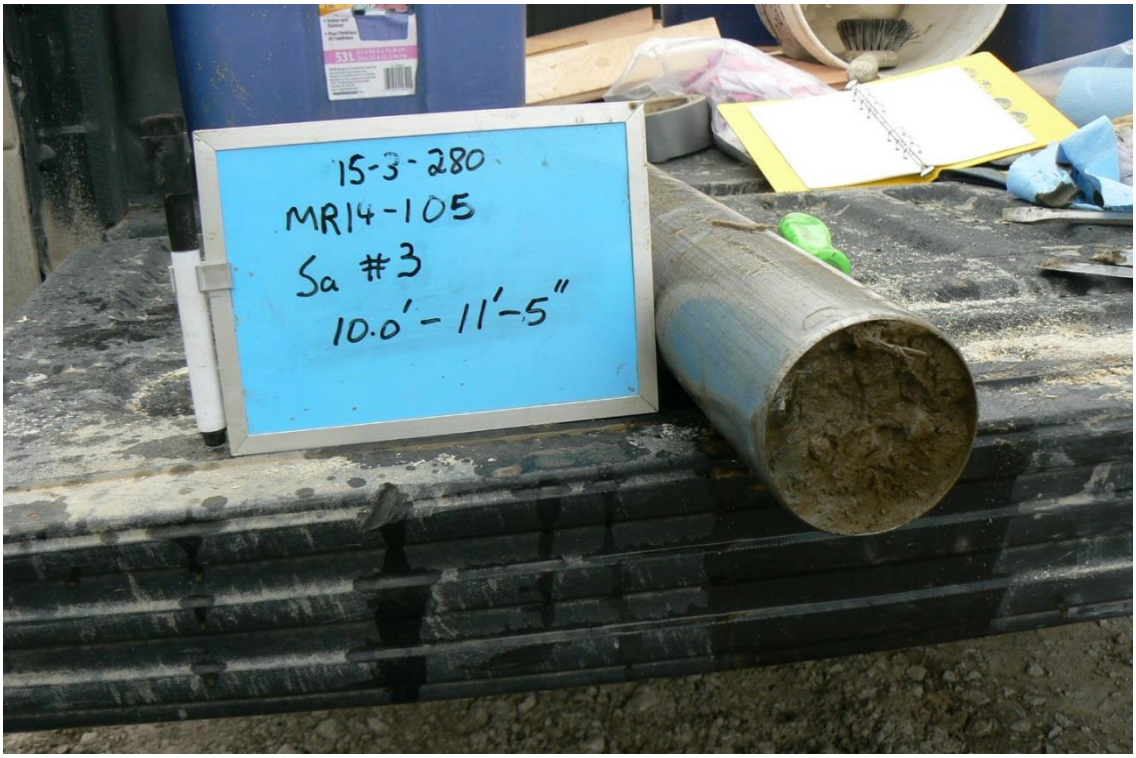
MR14-104 SAMPLE #9

MR14-105 PHOTO SUMMARY

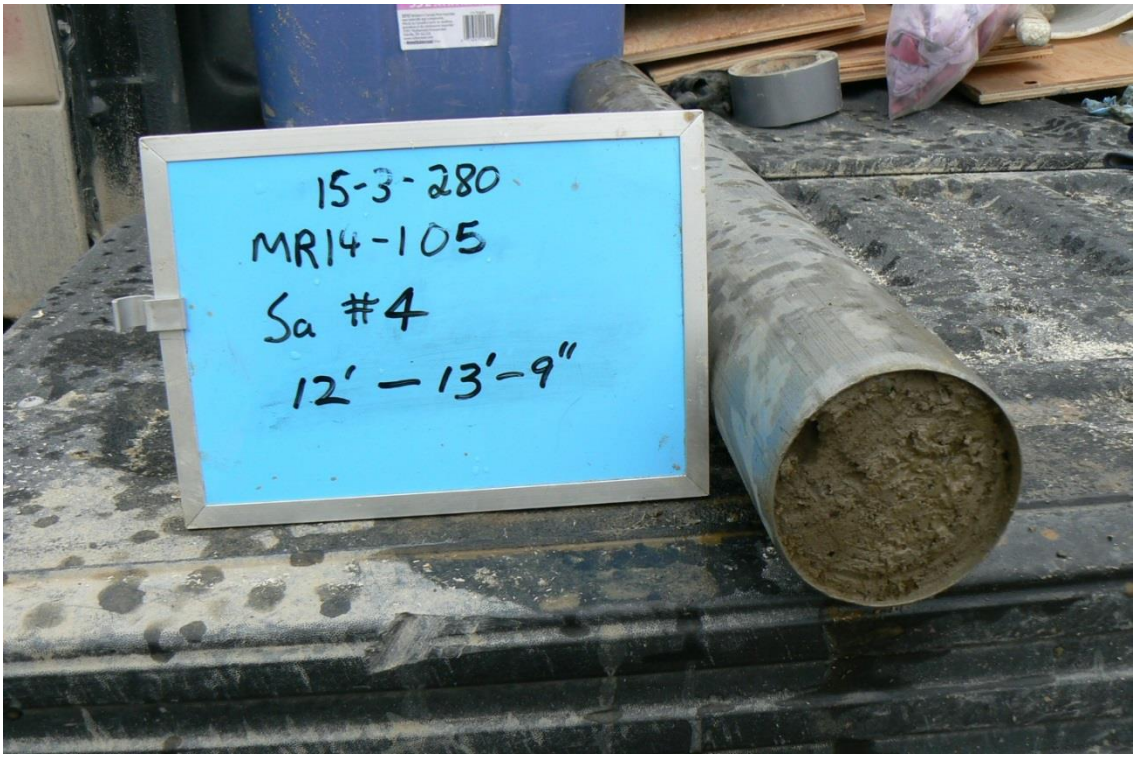
NO RECOVERY

MR14-105 SAMPLE #1

MR14-105 SAMPLE #2



MR14-105 SAMPLE #3

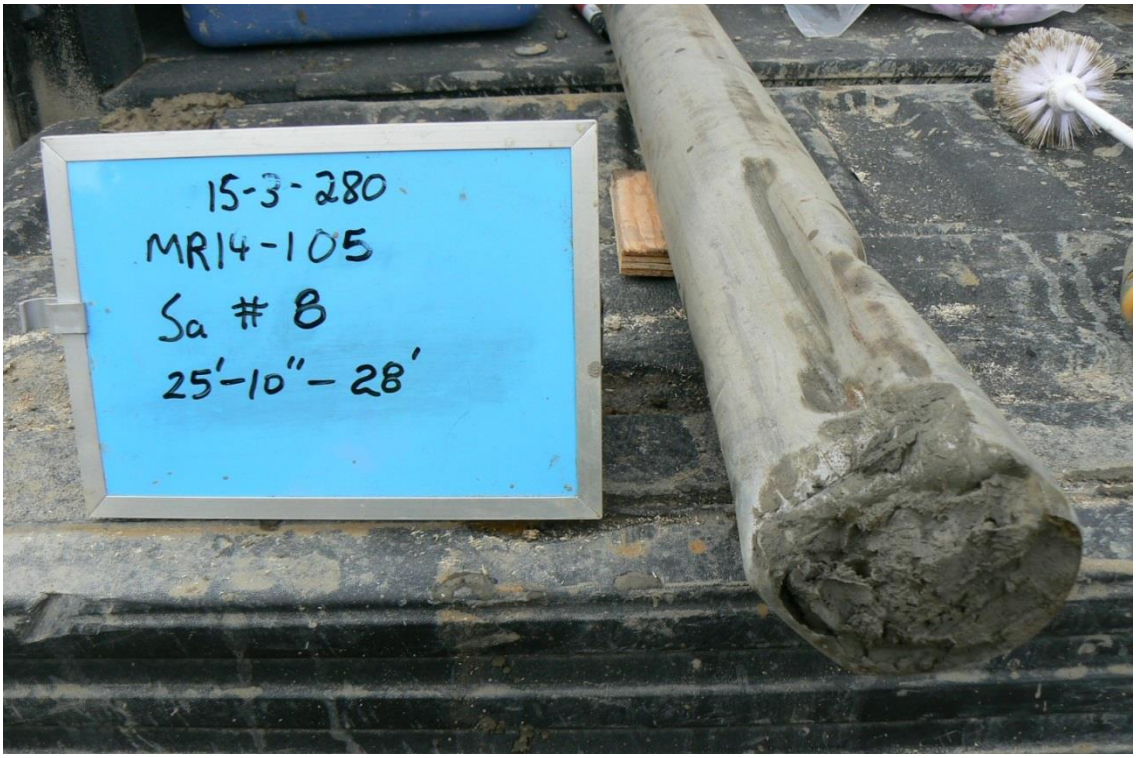


MR14-105 SAMPLE #4

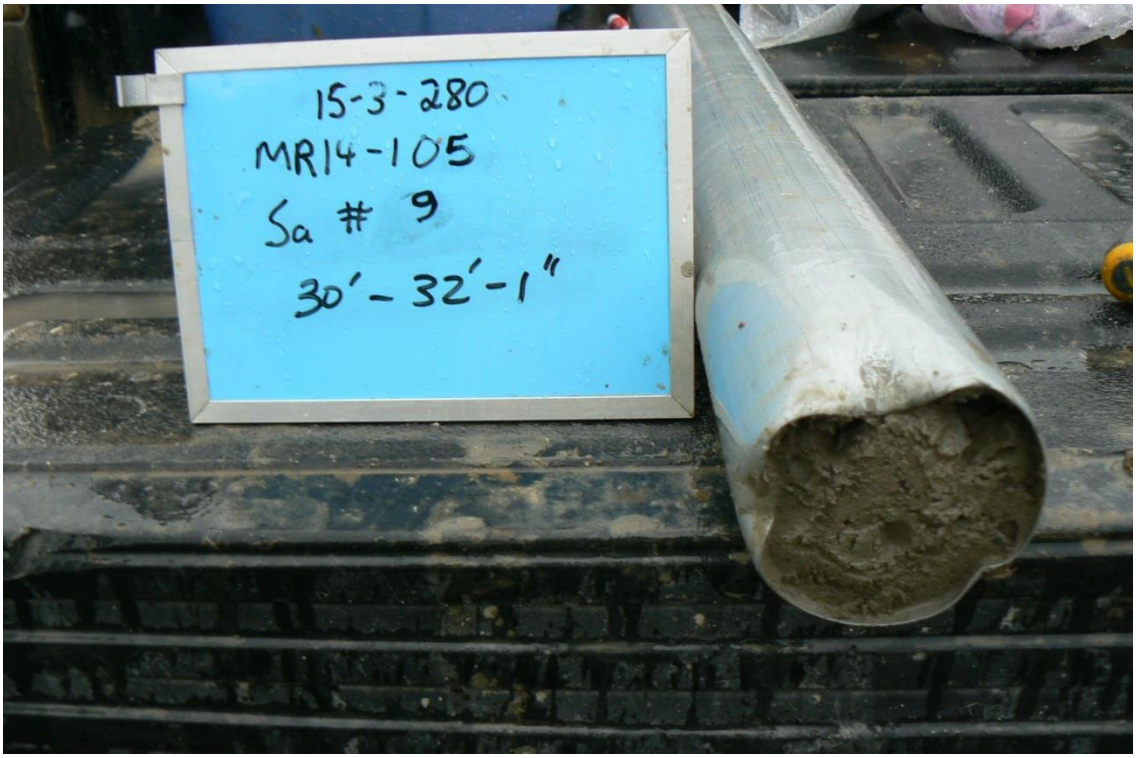
MR14-105 SAMPLE #5

MR14-105 SAMPLE #6

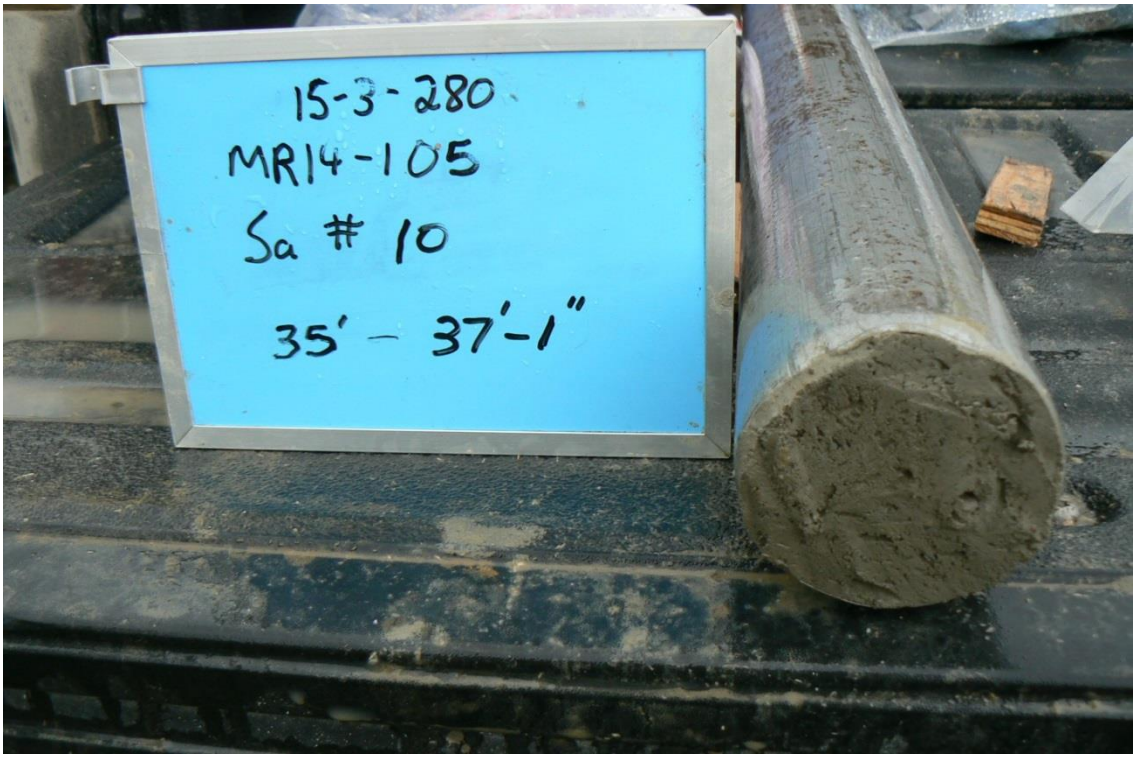
MR14-105 SAMPLE #7



MR14-105 SAMPLE #8



MR14-105 SAMPLE #9



MR14-105 SAMPLE #10

MR14-106 PHOTO SUMMARY

MR14-106 SAMPLE #1

MR14-106 SAMPLE #2

MR14-106 SAMPLE #3

MR14-106 SAMPLE #4

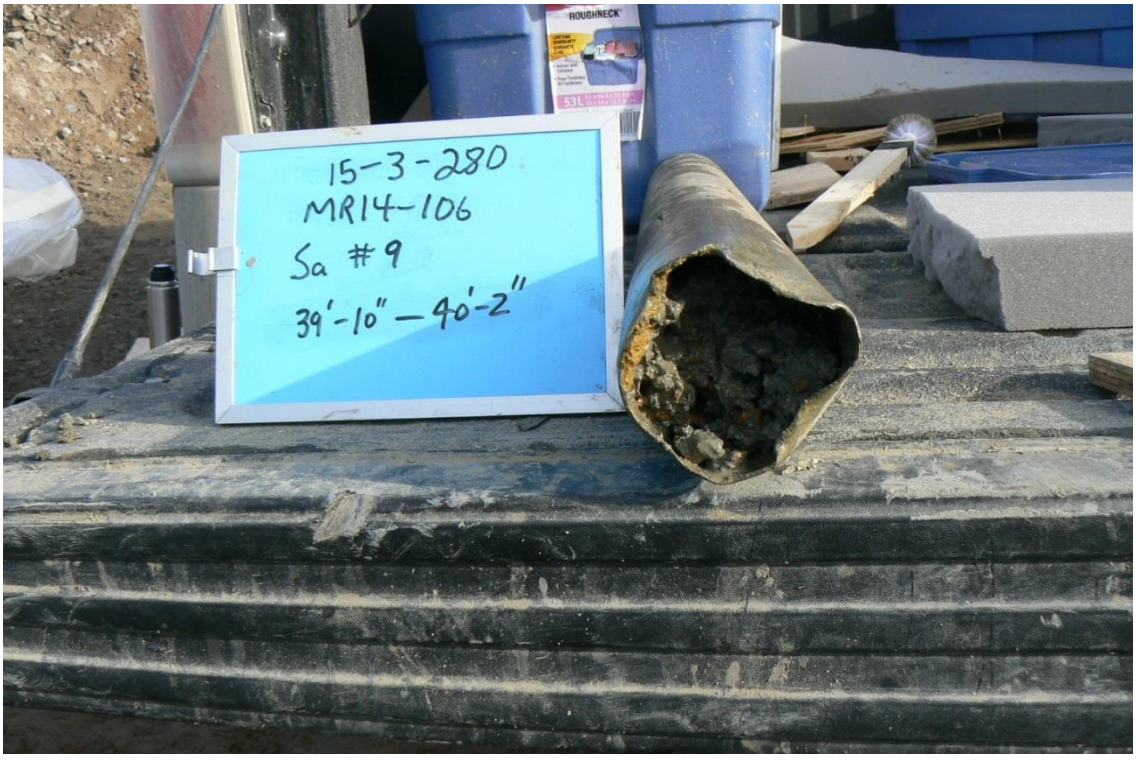
MR14-106 SAMPLE #5

MR14-106 SAMPLE #6 – SAMPLE TUBE WAS SPLIT IN THE FIELD

MR14-106 SAMPLE #6 – SPLIT SAMPLE

MR14-106 SAMPLE #7

MR14-106 SAMPLE #8



MR14-106 SAMPLE #9

MR14-106A PHOTO SUMMARY

MR14-106A SAMPLE #1

MR14-106B PHOTO SUMMARY

NO RECOVERY

MR14-106B SAMPLE #1

NO RECOVERY

MR14-106B SAMPLE #2

MR14-106C PHOTO SUMMARY

MR14-106C SAMPLE #1

MR14-106C SAMPLE #2

MR14-106D PHOTO SUMMARY

MR14-106D SAMPLE #1

MR14-106D SAMPLE #2

MR14-106E PHOTO SUMMARY

MR14-106E SAMPLE #1

MR14-106E SAMPLE #2

MR14-106E SAMPLE #3

MR14-106E SAMPLE #4

MR14-106F PHOTO SUMMARY

MR14-106F SAMPLE #1

MR14-106F SAMPLE #2

MR14-106F SAMPLE #3

MR14-106G PHOTO SUMMARY

MR14-106G SAMPLE #1

MR14-106G SAMPLE #2

MR14-106G SAMPLE #3

MR14-106H PHOTO SUMMARY

MR14-106H SAMPLE #1

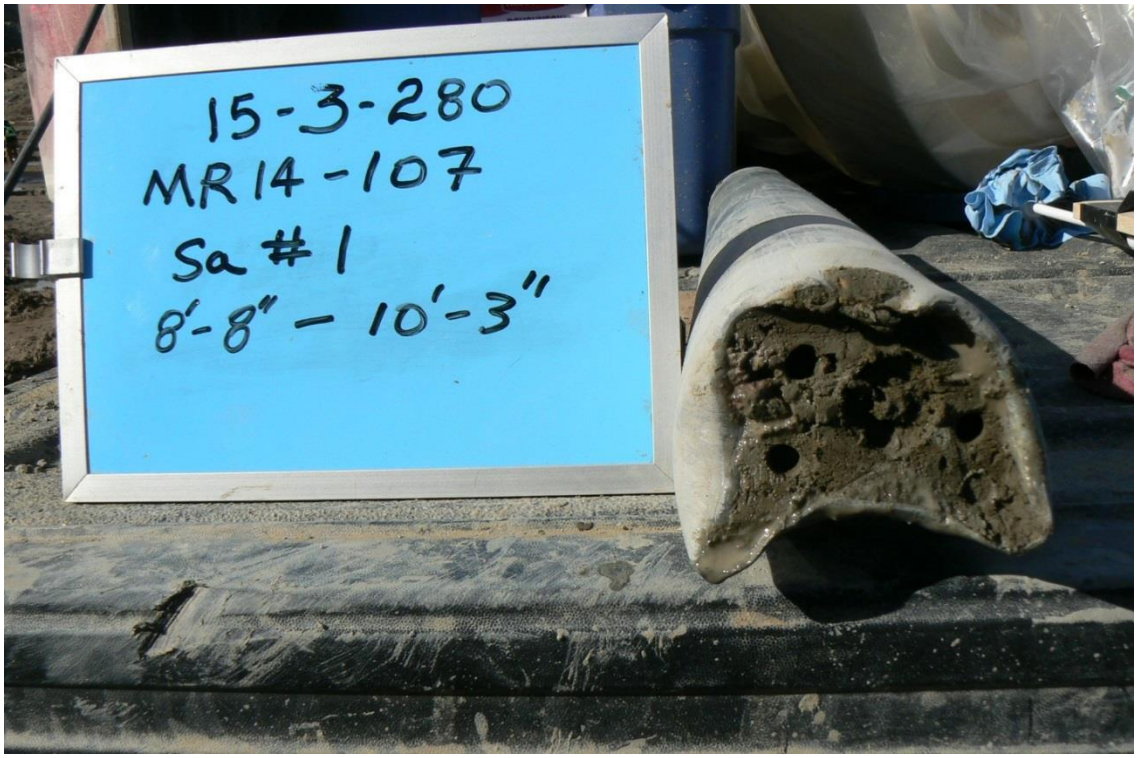
MR14-106H SAMPLE #2

MR14-106I PHOTO SUMMARY

MR14-106I SAMPLE #1

MR14-106I SAMPLE #2

MR14-107 PHOTO SUMMARY



MR14-107 SAMPLE #1

NO RECOVERY

MR14-107 SAMPLE #2

MR14-107 SAMPLE #3

MR14-107 SAMPLE #4

MR14-107 SAMPLE #5

MR14-107 SAMPLE #6

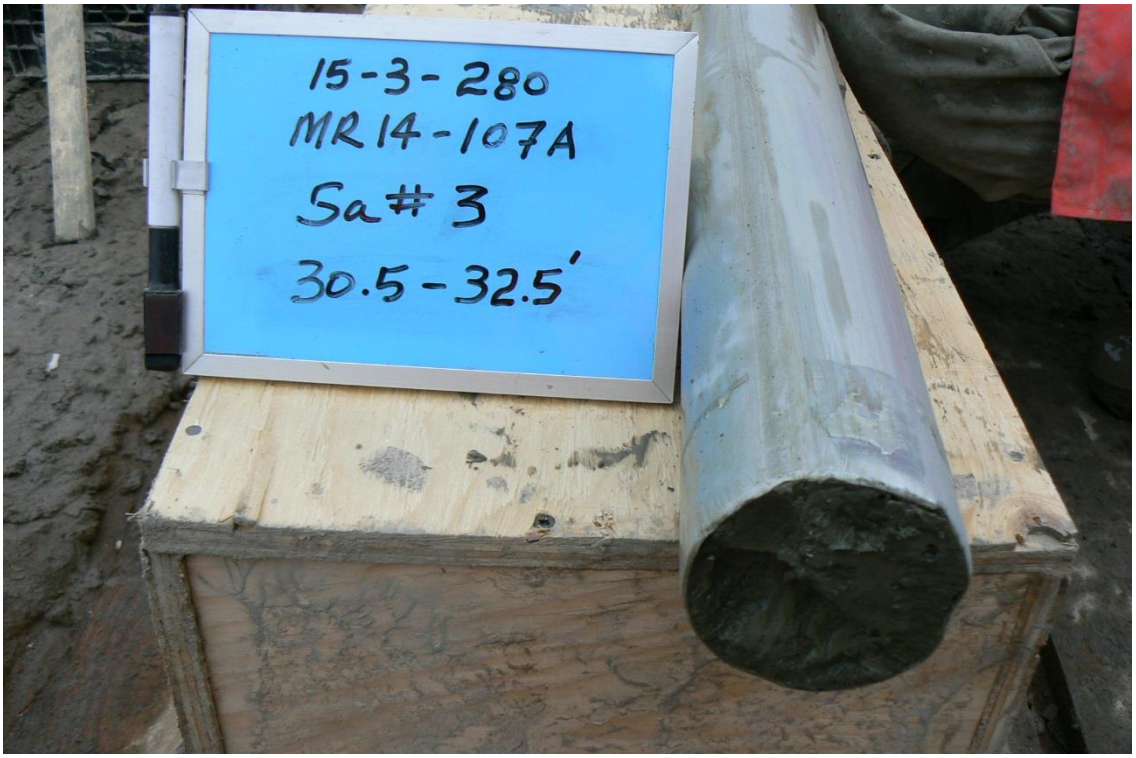
MR14-107 SAMPLE #7

MR14-107A PHOTO SUMMARY

MR14-107A SAMPLE #1

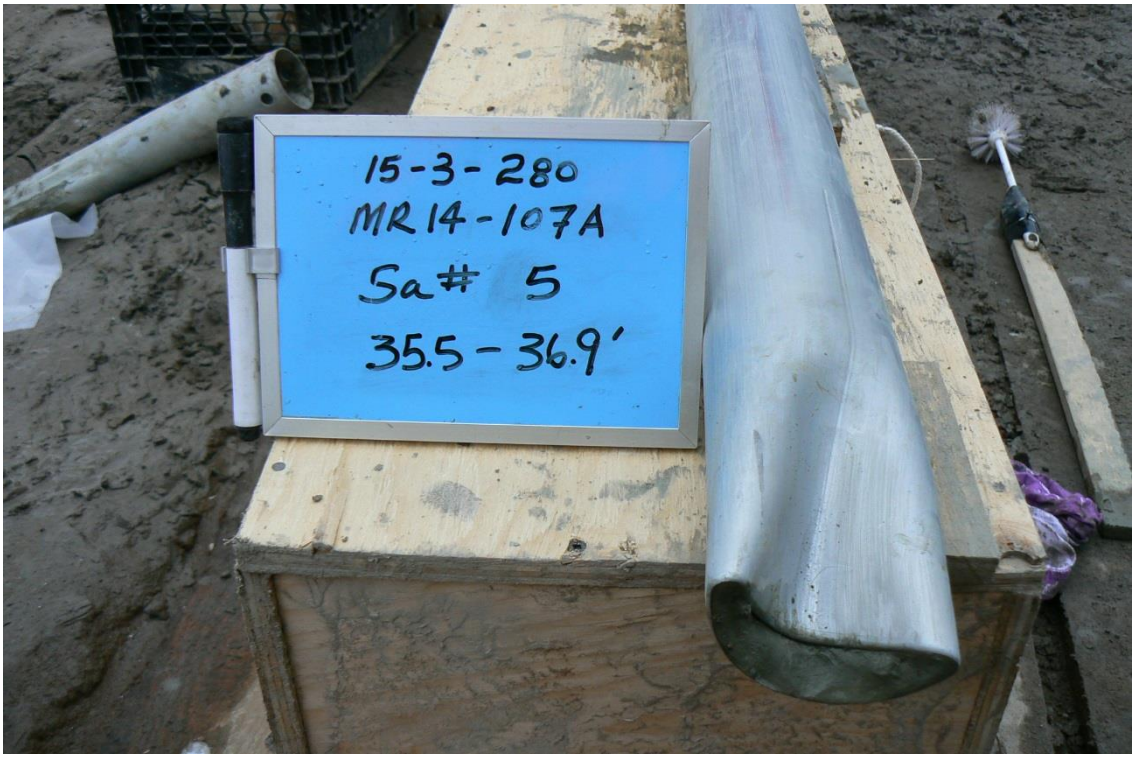
MR14-107A SAMPLE #2

MR14-107A SAMPLE #2



MR14-107A SAMPLE #3

MR14-107A SAMPLE #4



MR14-107A SAMPLE #5

MR14-107A SAMPLE #6

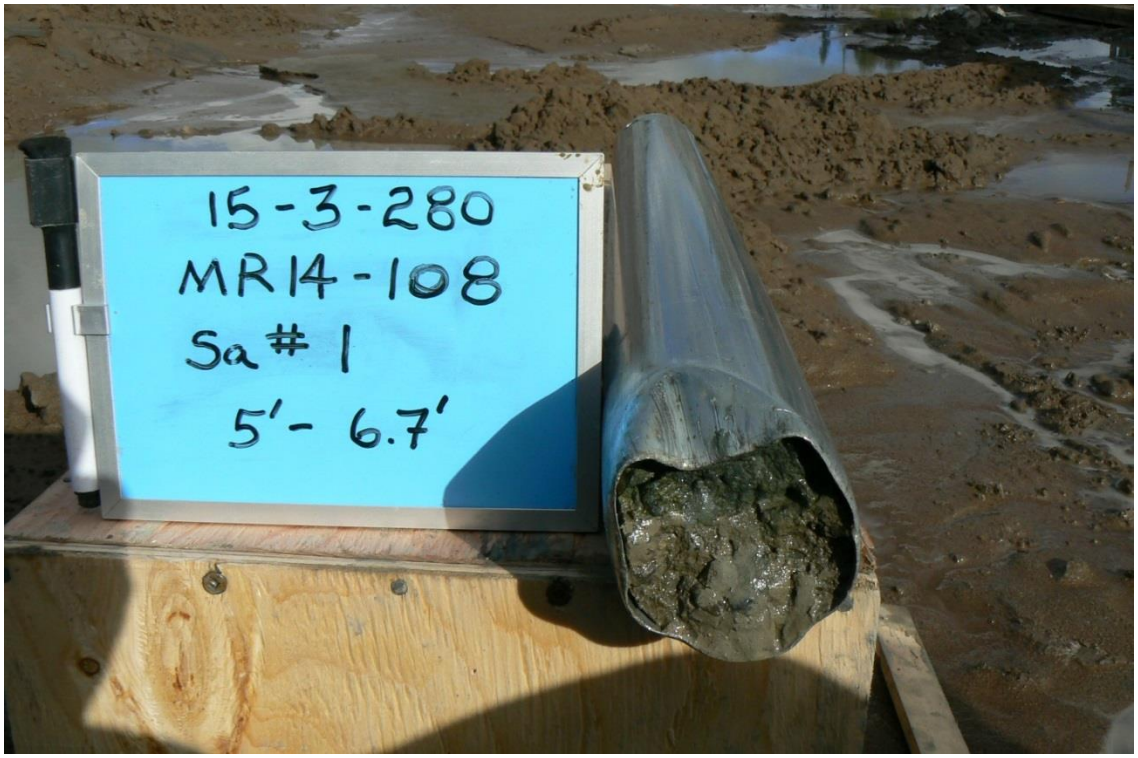
MR14-107A SAMPLE #7

MR14-107A SAMPLE #8

MR14-107B PHOTO SUMMARY

MR14-107B SAMPLE #1

MR14-108 PHOTO SUMMARY



MR14-108 SAMPLE #1

MR14-108 SAMPLE #2

MR14-108 SAMPLE #3

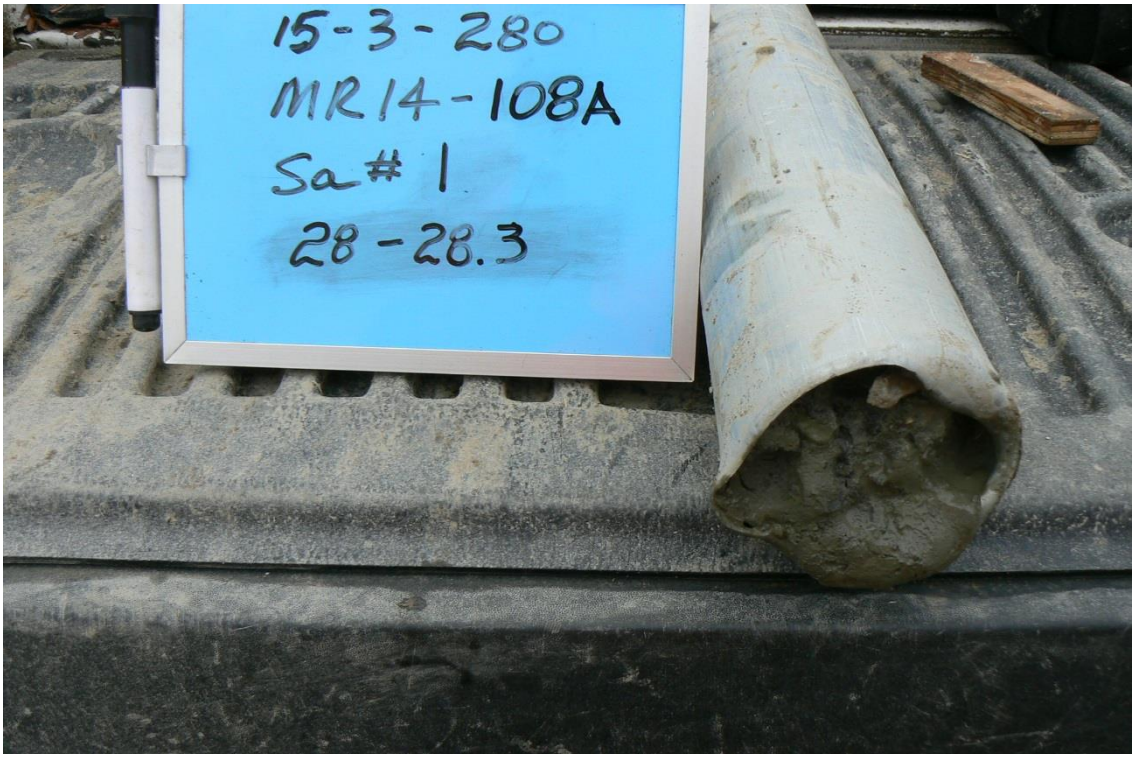
MR14-108 SAMPLE #4

MR14-108 SAMPLE #5

MR14-108 SAMPLE #6

MR14-108 SAMPLE #7

MR14-108A PHOTO SUMMARY



MR14-108A SAMPLE #1

MR14-108A SAMPLE #2

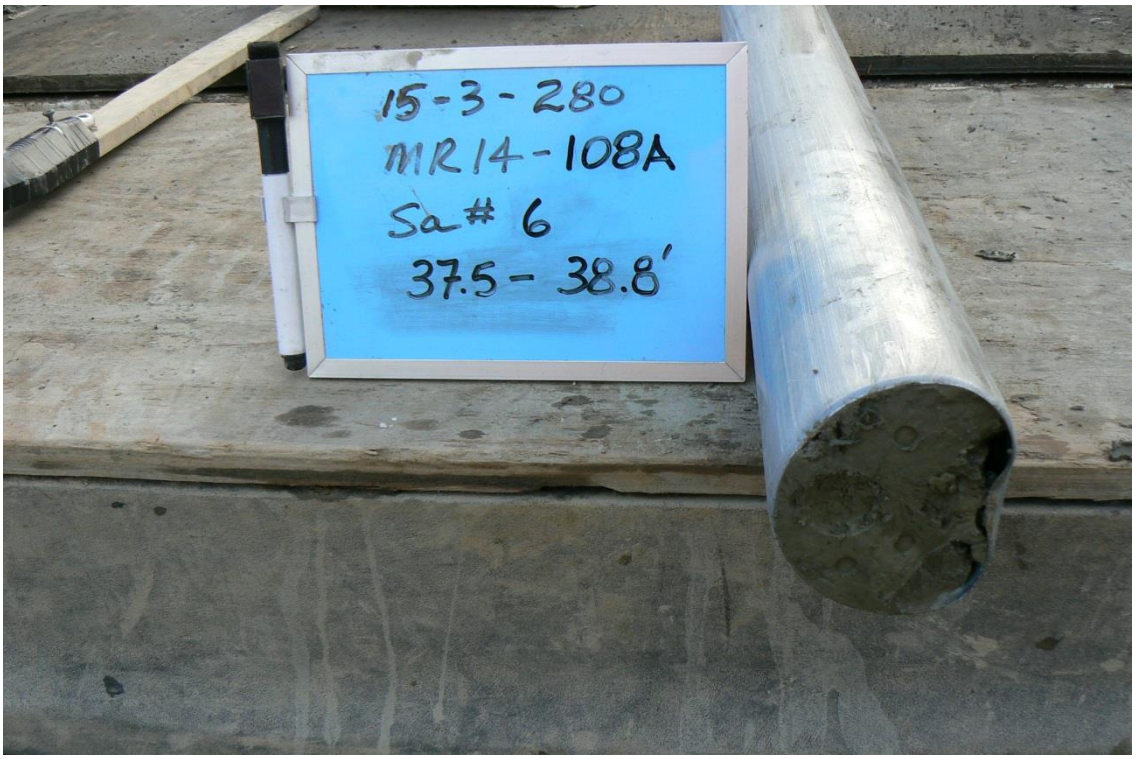
NO PHOTO TAKEN

MR14-108A SAMPLE #3

NO RECOVERY

MR14-108A SAMPLE #4

MR14-108A SAMPLE #5 – FIELD LABEL INCORRECT



MR14-108A SAMPLE #6

MR14-109 PHOTO SUMMARY

MR14-109 SAMPLE #1

MR14-109 SAMPLE #2

MR14-109 SAMPLE #3

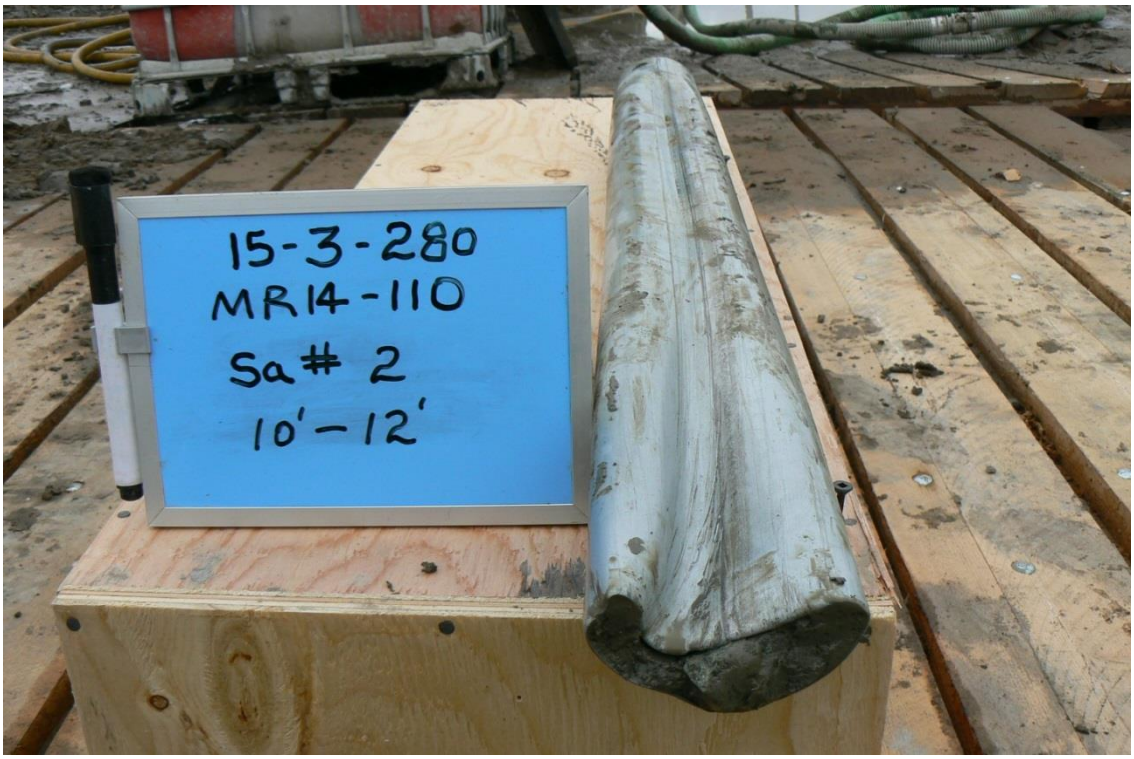
MR14-109 SAMPLE #4

MR14-109 SAMPLE #5

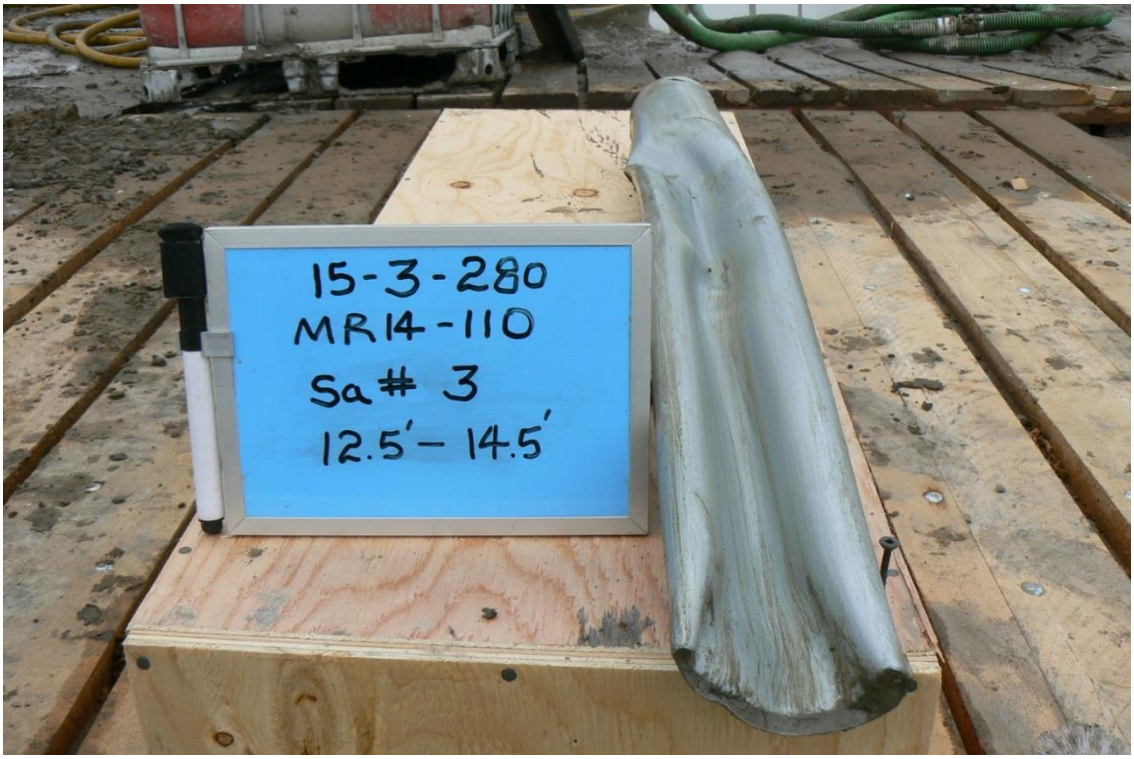
MR14-109 SAMPLE #6

MR14-110 PHOTO SUMMARY

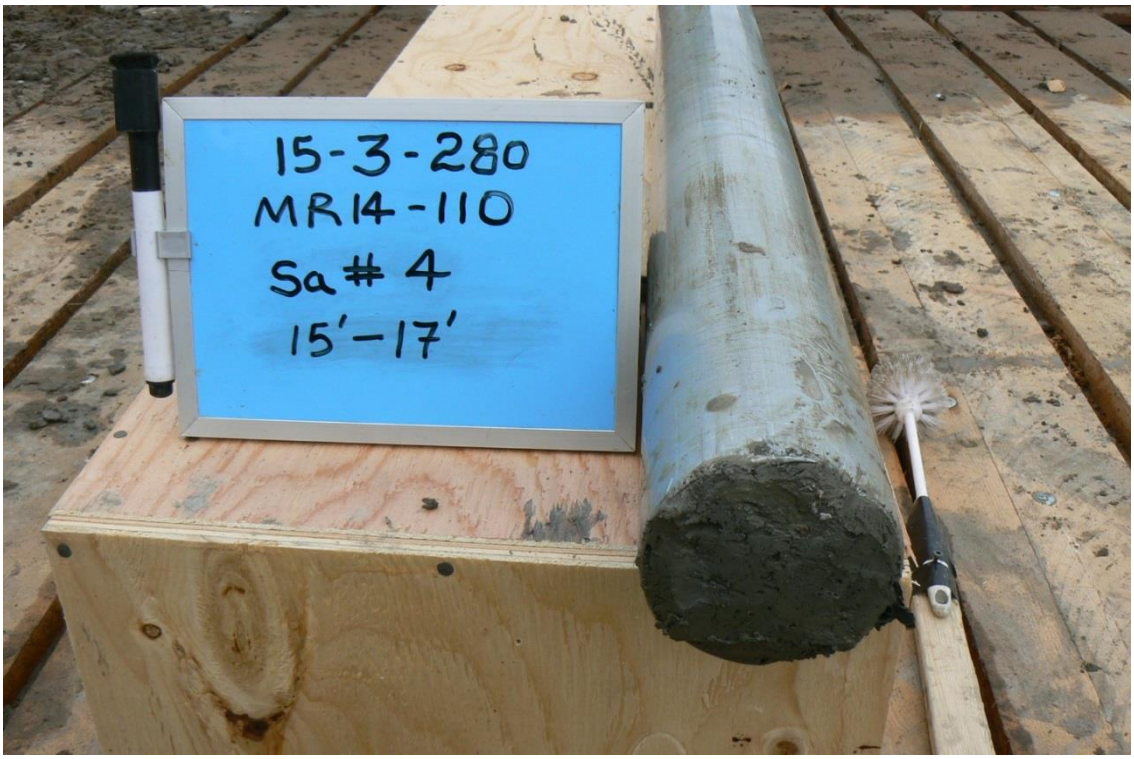
MR14-110 SAMPLE #1



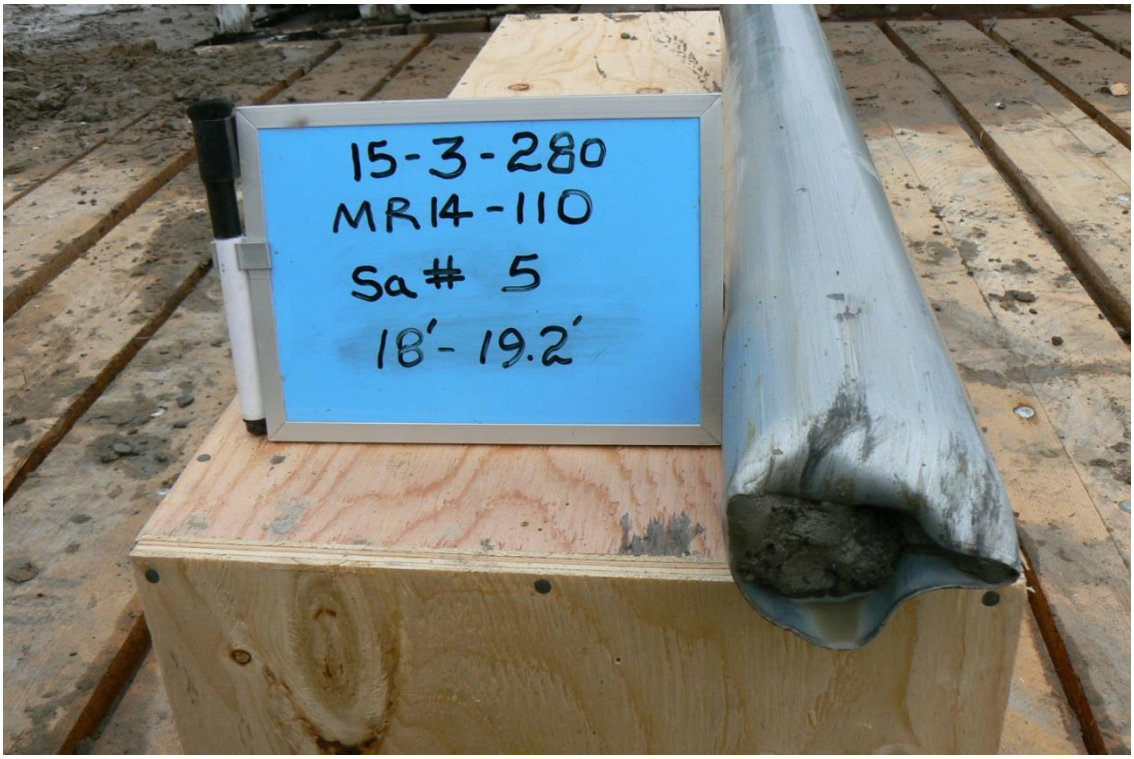
MR14-110 SAMPLE #2



MR14-110 SAMPLE #3



MR14-110 SAMPLE #4



MR14-110 SAMPLE #5

MR14-110 SAMPLE #6

MR14-111 PHOTO SUMMARY

MR14-111 SAMPLE #1

MR14-111 SAMPLE #2

MR14-111 SAMPLE #3

NO RECOVERY

MR14-111 SAMPLE #4

MR14-111 SAMPLE #5

MR14-111 SAMPLE #6

MR14-111 SAMPLE #7

MR14-112 PHOTO SUMMARY

MR14-112 SAMPLE #1

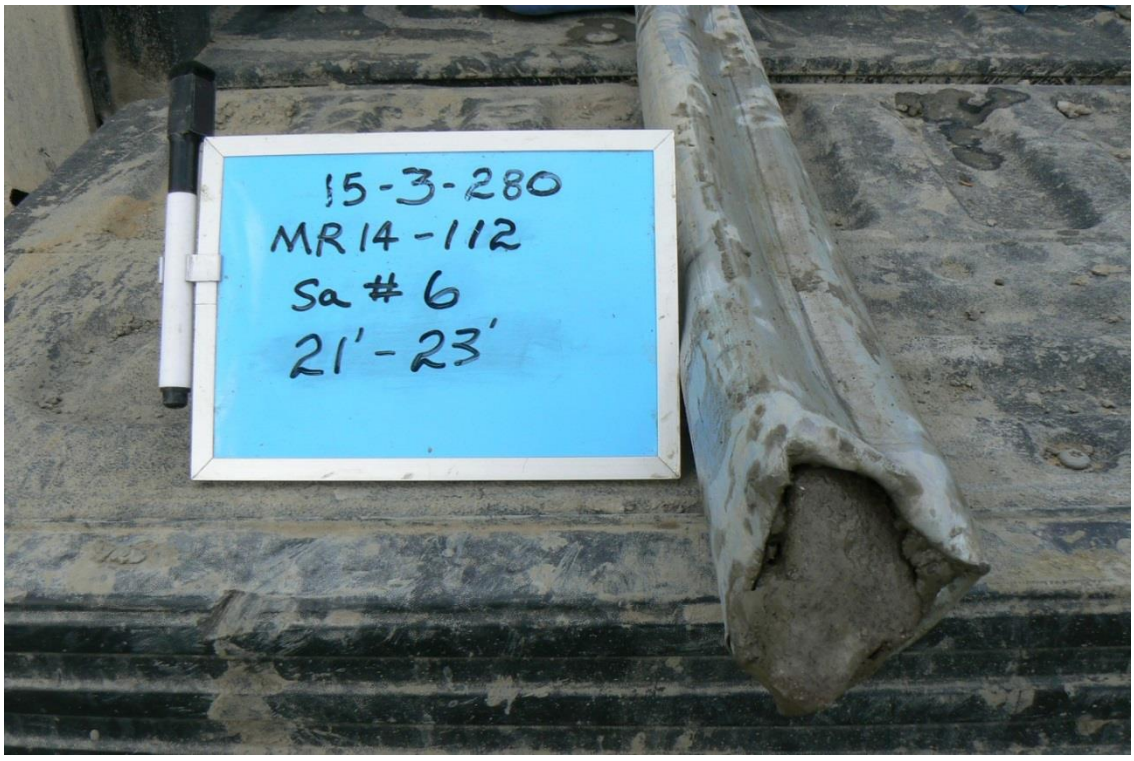
NO RECOVERY

MR14-112 SAMPLE #2

MR14-112 SAMPLE #3

MR14-112 SAMPLE #4

MR14-112 SAMPLE #5

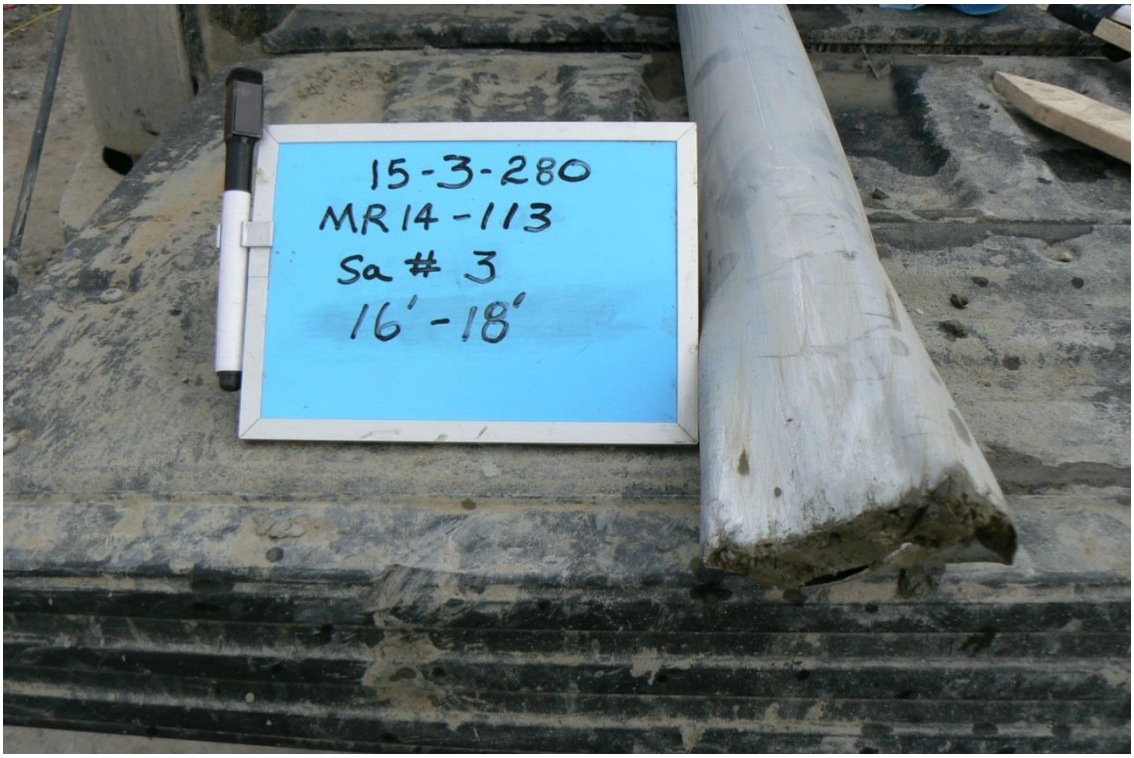


MR14-112 SAMPLE #6

MR14-113 PHOTO SUMMARY

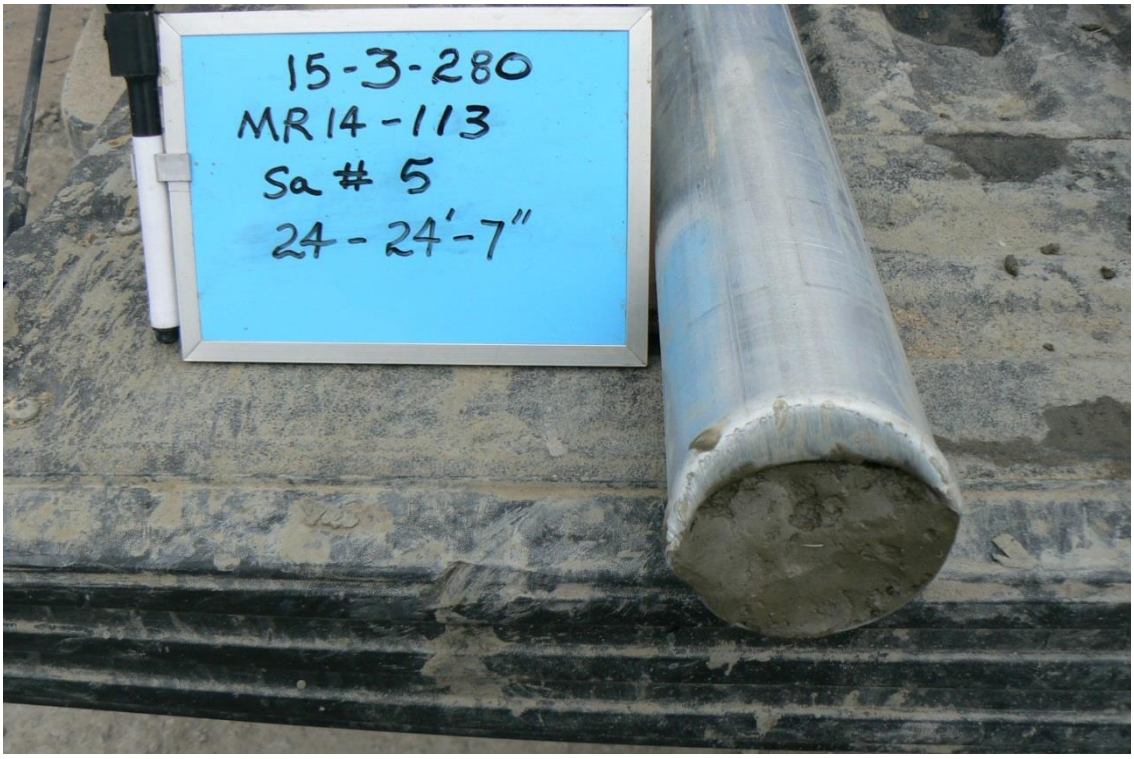
MR14-113 SAMPLE #1

MR14-113 SAMPLE #2



MR14-113 SAMPLE #3

MR14-113 SAMPLE #4



MR14-113 SAMPLE #5

MR14-113 SAMPLE #6

MR14-114 PHOTO SUMMARY

MR14-114 SAMPLE #1

MR14-114 SAMPLE #2

MR14-114 SAMPLE #3

NO RECOVERY

MR14-114 SAMPLE #4

MR14-114 SAMPLE #5

NO RECOVERY

MR14-114 SAMPLE #6

MR14-114 SAMPLE #7

MR14-115 PHOTO SUMMARY

MR14-115 SAMPLE #1

DISTURBED BAG SAMPLE – NO PHOTO

MR14-115 SAMPLE #2

MR14-115 SAMPLE #3

MR14-115 SAMPLE #4

NO RECOVERY

MR14-115 SAMPLE #5

NO RECOVERY

MR14-115 SAMPLE #6

RH14-117 PHOTO SUMMARY

RH14-117 SAMPLE #1 – FIELD LABEL INCORRECT

RH14-117 SAMPLE #2 – FIELD LABEL INCORRECT

RH14-117 SAMPLE #3 – FIELD LABEL INCORRECT

RH14-117A PHOTO SUMMARY

RH14-117A SAMPLE #1 – FIELD LABEL INCORRECT

RH14-117A SAMPLE #2 – FIELD LABEL INCORRECT

RH14-118 PHOTO SUMMARY

RH14-118 SAMPLE #1 – FIELD LABEL INCORRECT

DISTURBED BAG SAMPLE NO PHOTO

RH14-118 SAMPLE #2

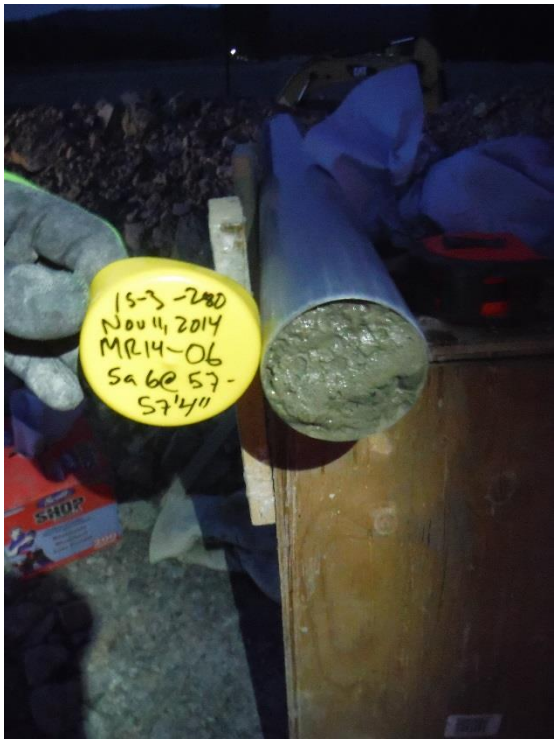
DISTURBED BAG SAMPLE NO PHOTO

NO RECOVERY

RH14-118 SAMPLE #3

RH14-118 SAMPLE #4

RH14-118 SAMPLE #5 – FIELD LABEL INCORRECT



RH14-118 SAMPLE #6 – FIELD LABEL INCORRECT