
APPENDIX F-1
Geotechnical Characterization

- **Part I – Laboratory Testing**
- **Part II – Seepage Analysis**
- **Part III – Field Investigations**



Part I
Laboratory Testing

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PART I - GEOTECHNICAL LABORATORY TESTS

1. GENERAL

This appendix presents test results obtained from our geotechnical laboratory in Vancouver for the following materials:

- Overburden soil samples retrieved from field investigations in the tailings impoundment areas including dam foundation and borrow materials;
- Tailings material;
- Waste rock material; and
- DMS float material.

Index property tests for these materials are covered in Section 2, while their engineering properties are described in Section 3. Section 4 presents laboratory test data sheets either in figures or tabular forms.

2. INDEX PROPERTY TESTS

Overburden soil samples retrieved from test holes and test pits during Phases 1 and 2 field investigations were visually classified, and their water content and gradation determined. The logs of test holes and test pits presented in Appendix II have incorporated these index properties. Similarly, gradation curves for damfill borrow, tailings, and DMS float materials were also obtained. The tailings sample was a mixture of four specimens: F11 and F12 (Zn, Rougher Scavenger Tail), F23 and F32 (Zn 1st Cleaner Scavenger Tail). Two specific gravity tests were also performed on the tailings sample. The waste rock material contains large rock pieces with matrix of finer materials. No gradation test was done for the waste rock, and its finer matrix was used to perform engineering property tests as described in Section 3.

3. ENGINEERING PROPERTY TESTS

Engineering property tests performed for each material are listed below:

- Damfill Borrow – standard Proctor compaction tests, triaxial permeameter tests, and consolidated-undrained triaxial shear tests with pore pressure measurement;

- Tailings – settling and consolidation tests, triaxial permeameter tests, and consolidated-undrained triaxial shear tests with pore pressure measurement;
- Waste Rock – standard Proctor compaction tests, triaxial permeameter tests, and consolidated-undrained triaxial shear tests with pore pressure measurement;
- DMS Float - standard Proctor compaction tests, constant head open-top permeameter tests, and direct shear tests.

For the damfill borrow, tailings and waste rock materials, consolidated-undrained triaxial shear tests were carried out with permeability measurement after consolidation and pore pressure measurement during shear. On the other hand, the permeability of the DMS float material was determined by constant head tests using an open-top permeameter due to its high permeability. The shear strength of the DMS float was determined by direct shear tests. The density values and consolidation stresses used in the laboratory were selected to represent field condition.

4. TEST DATA SHEETS

Test data sheets are presented in the following pages. They are grouped according to material type in the following order:

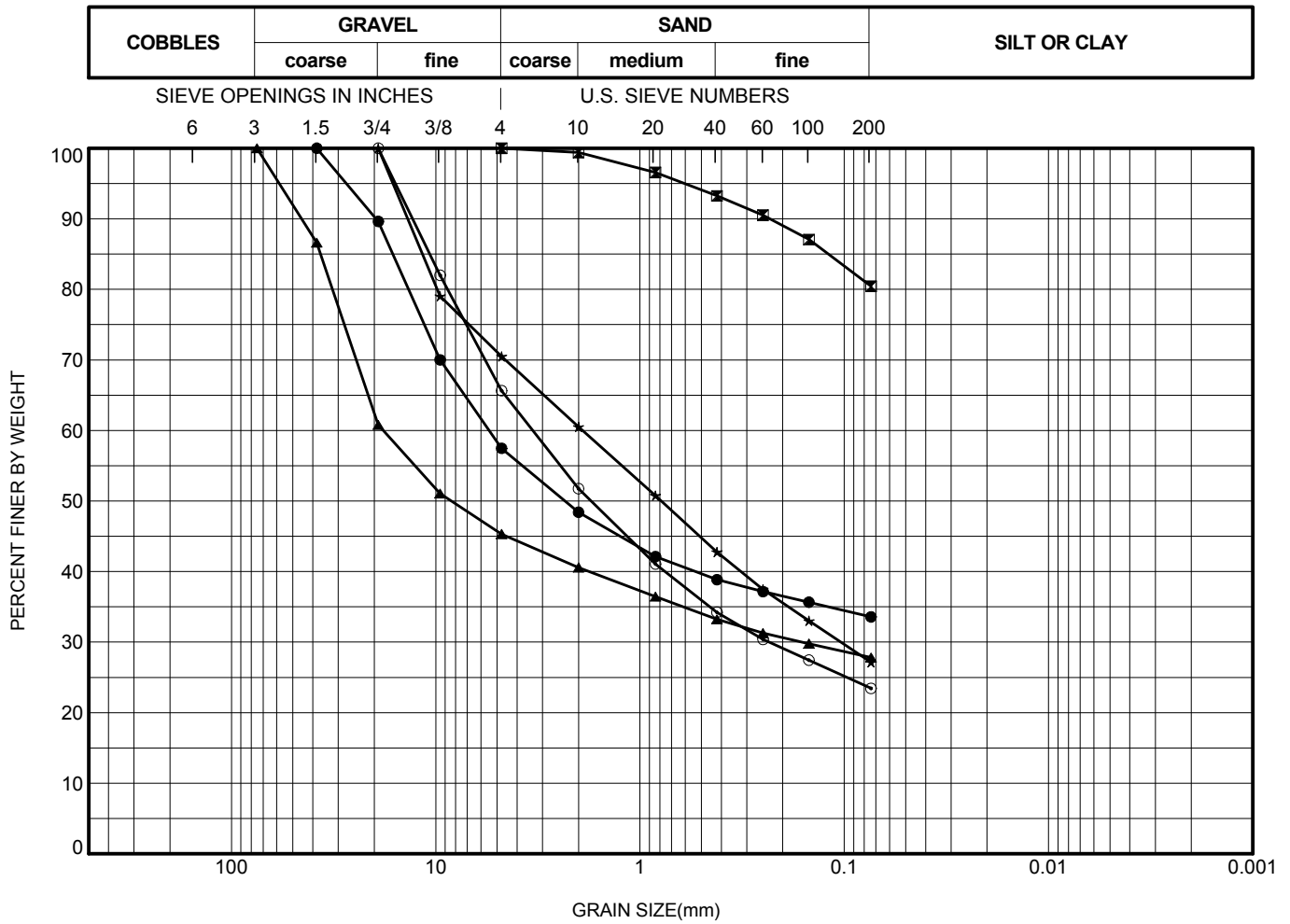
- Overburden in Tailings Impoundment Areas;
- Damfill Borrow;
- Tailings;
- Waste Rock; and
- DMS Float.

Results for the index property tests are presented first, followed by those from the engineering property tests, where applicable.



Overburden Materials

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05- 8	3.00	16.206	5.475	2.329				42.6	23.8	33.6
☒	TP05- 9	1.00	0.120						0.0	19.4	80.6
▲	TP05-12	1.00	36.578	18.043	8.379				54.7	17.5	27.9
★	TP05-14	1.00	11.607	1.914	0.786				29.5	43.2	27.3
⊙	TP05-15	2.00	10.691	3.349	1.735				34.4	42.1	23.5

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05- 8		3.00	10.8				
☒	TP05- 9		1.00	109.0				
▲	TP05-12		1.00	8.3				
★	TP05-14		1.00	12.1				
⊙	TP05-15		2.00	9.3				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

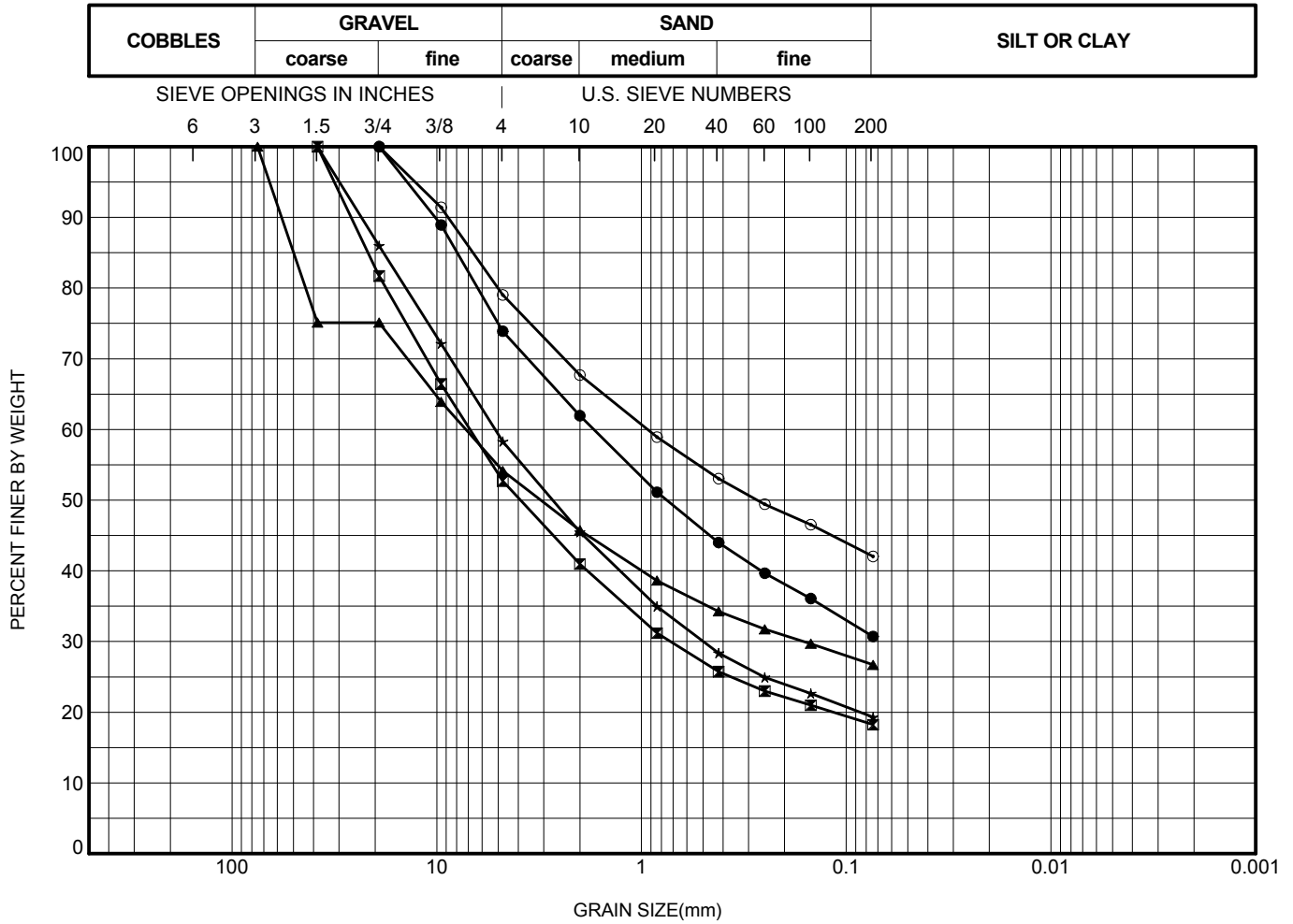
LOCATION: Yukon

FIGURE:

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-16	1.00	7.942	1.711	0.752				26.1	43.0	30.8
⊠	TP05-17	3.50	21.634	6.881	3.897				47.3	34.4	18.3
▲	TP05-18	1.50	49.939	7.213	3.104				45.9	27.4	26.8
★	TP05-19	1.50	18.172	5.184	2.716				41.7	38.9	19.4
⊙	TP05-20	2.00	6.647	0.934	0.272				21.0	36.9	42.1

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-16		1.00	9.1				
⊠	TP05-17		3.50	9.2				
▲	TP05-18		1.50	11.7				
★	TP05-19		1.50	22.0				
⊙	TP05-20		2.00	15.5				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

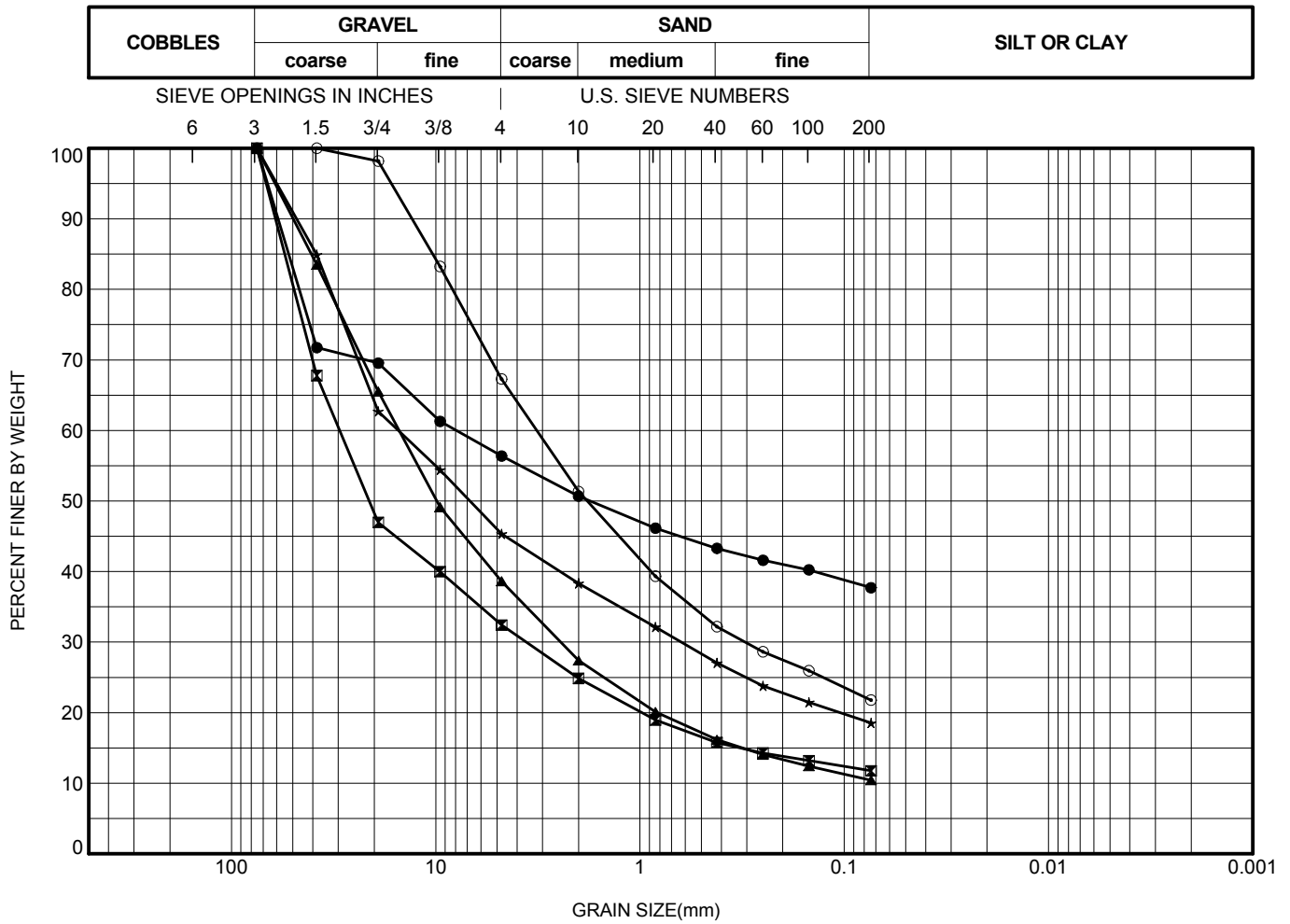
LOCATION: Yukon

FIGURE:

DRAWN BY: SE

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-22	1.00	52.419	7.936	1.753				43.6	18.6	37.8
⊠	TP05-22	3.00	54.782	29.479	21.131	0.321	0.031	943.614	67.6	20.6	11.8
▲	TP05-23	0.50	40.591	15.107	9.876	0.316			61.4	28.1	10.5
★	TP05-23	2.50	38.359	15.225	6.795				54.7	26.7	18.6
⊙	TP05-24	1.80	10.335	3.202	1.814				32.7	45.4	21.9

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-22		1.00	11.7				
⊠	TP05-22		3.00	9.7				
▲	TP05-23		0.50	10.5				
★	TP05-23		2.50	7.6				
⊙	TP05-24		1.80	10.6				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

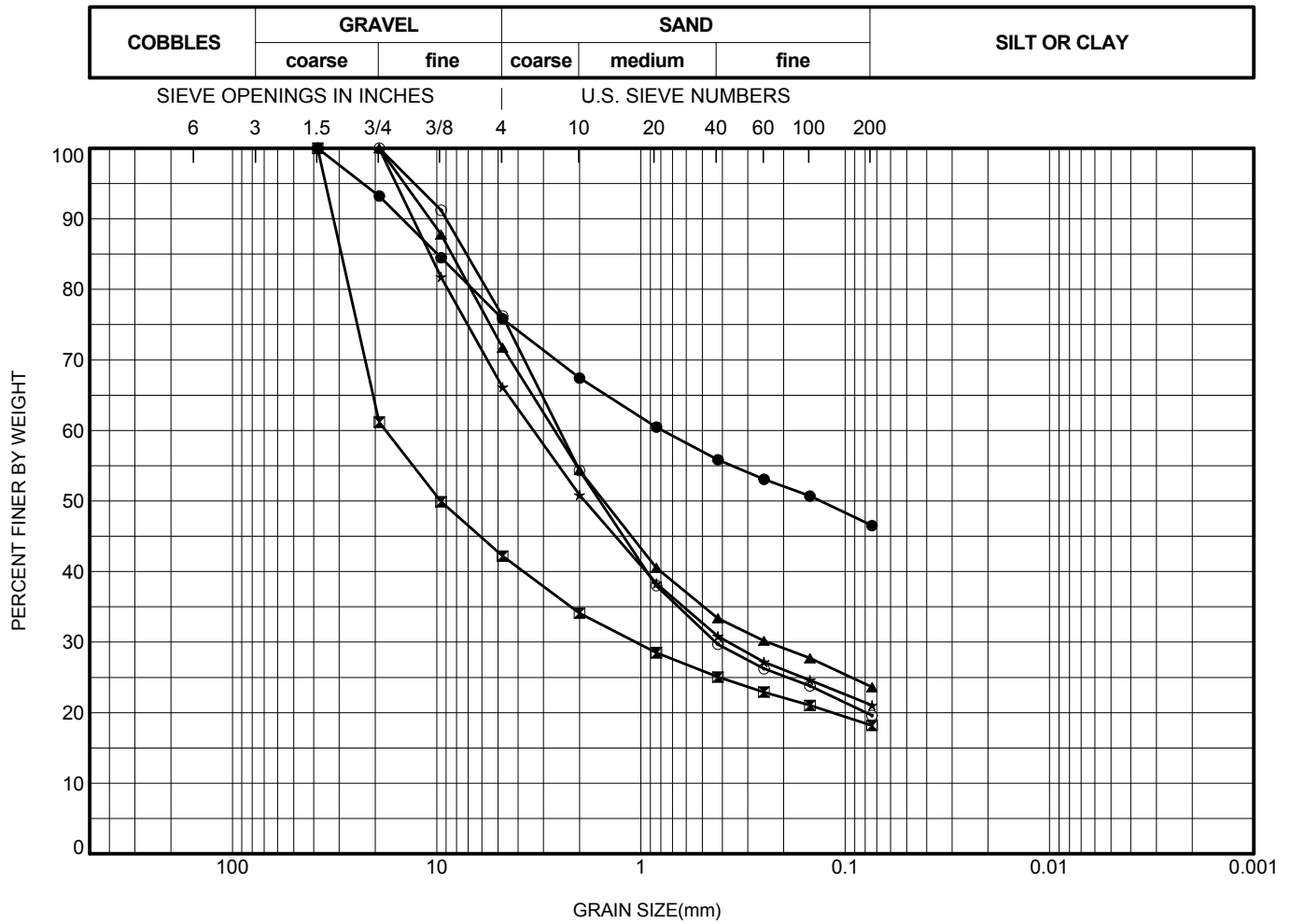
LOCATION: Yukon

FIGURE:

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CHECKED BY:

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-25	1.20	9.920	0.782	0.133				24.2	29.2	46.6
⊠	TP05-26	1.50	29.226	17.767	9.579				57.8	23.9	18.2
▲	TP05-27	1.00	8.437	2.648	1.520				28.3	48.0	23.7
★	TP05-28	1.00	10.777	3.362	1.887				33.9	45.0	21.1
⊙	TP05-29	1.00	7.142	2.504	1.590				23.8	56.5	19.7

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-25		1.20	10.6				
⊠	TP05-26		1.50	8.4				
▲	TP05-27		1.00	10.9				
★	TP05-28		1.00	16.1				
⊙	TP05-29		1.00	19.8				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

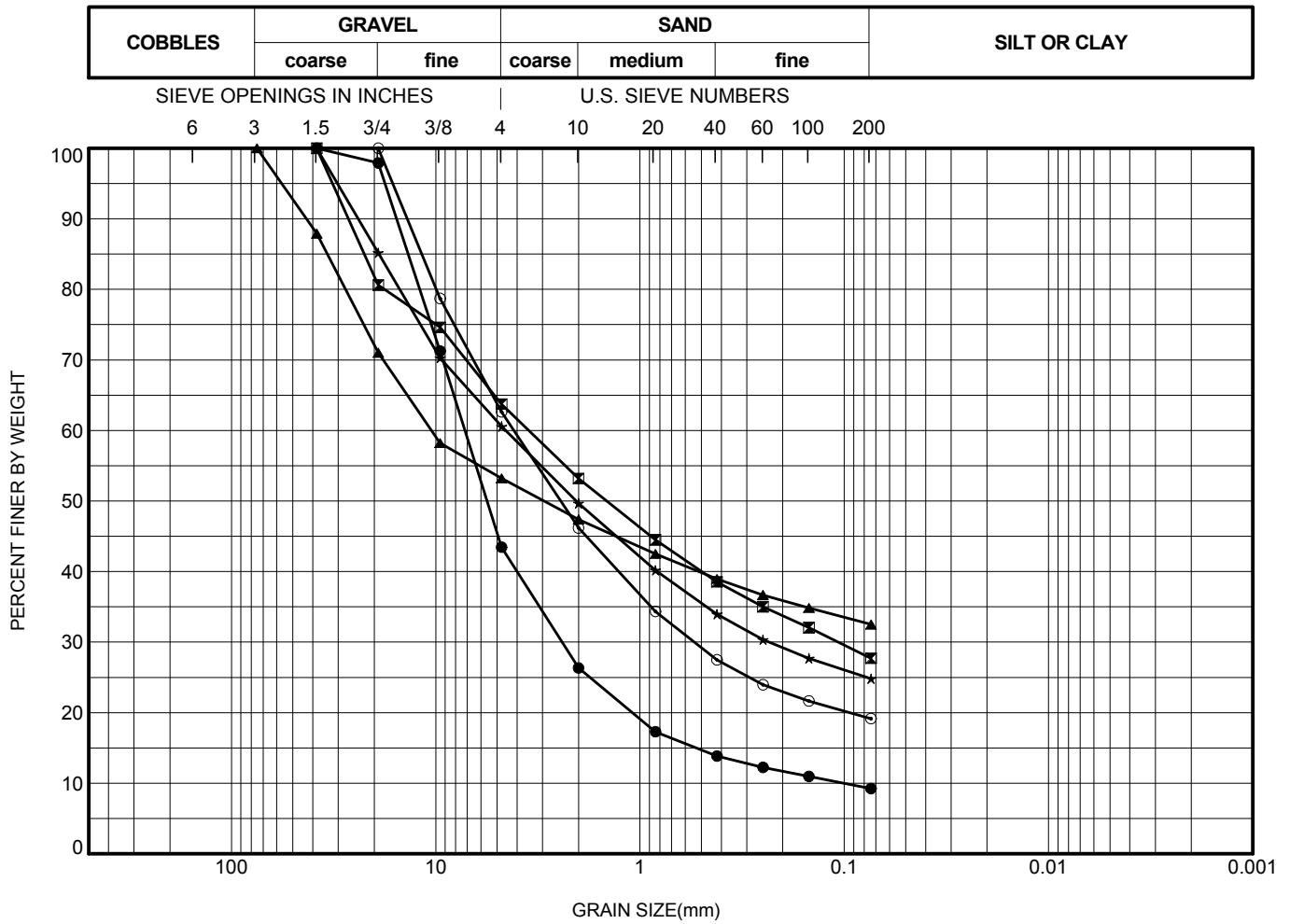
LOCATION: Yukon

FIGURE:

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-31	1.00	13.630	7.191	5.604	0.529	0.101	71.410	56.6	34.1	9.3
☒	TP05-43	2.00	22.347	3.501	1.454				36.3	35.9	27.8
▲	TP05-44	2.00	33.884	10.489	2.949				46.8	20.7	32.6
★	TP05-45	2.00	18.927	4.551	2.055				39.5	35.7	24.9
⊙	TP05-46	2.00	11.695	4.142	2.446				37.4	43.4	19.2

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-31		1.00	9.3				
☒	TP05-43		2.00	7.2				
▲	TP05-44		2.00	11.7				
★	TP05-45		2.00	9.5				
⊙	TP05-46		2.00	10.9				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

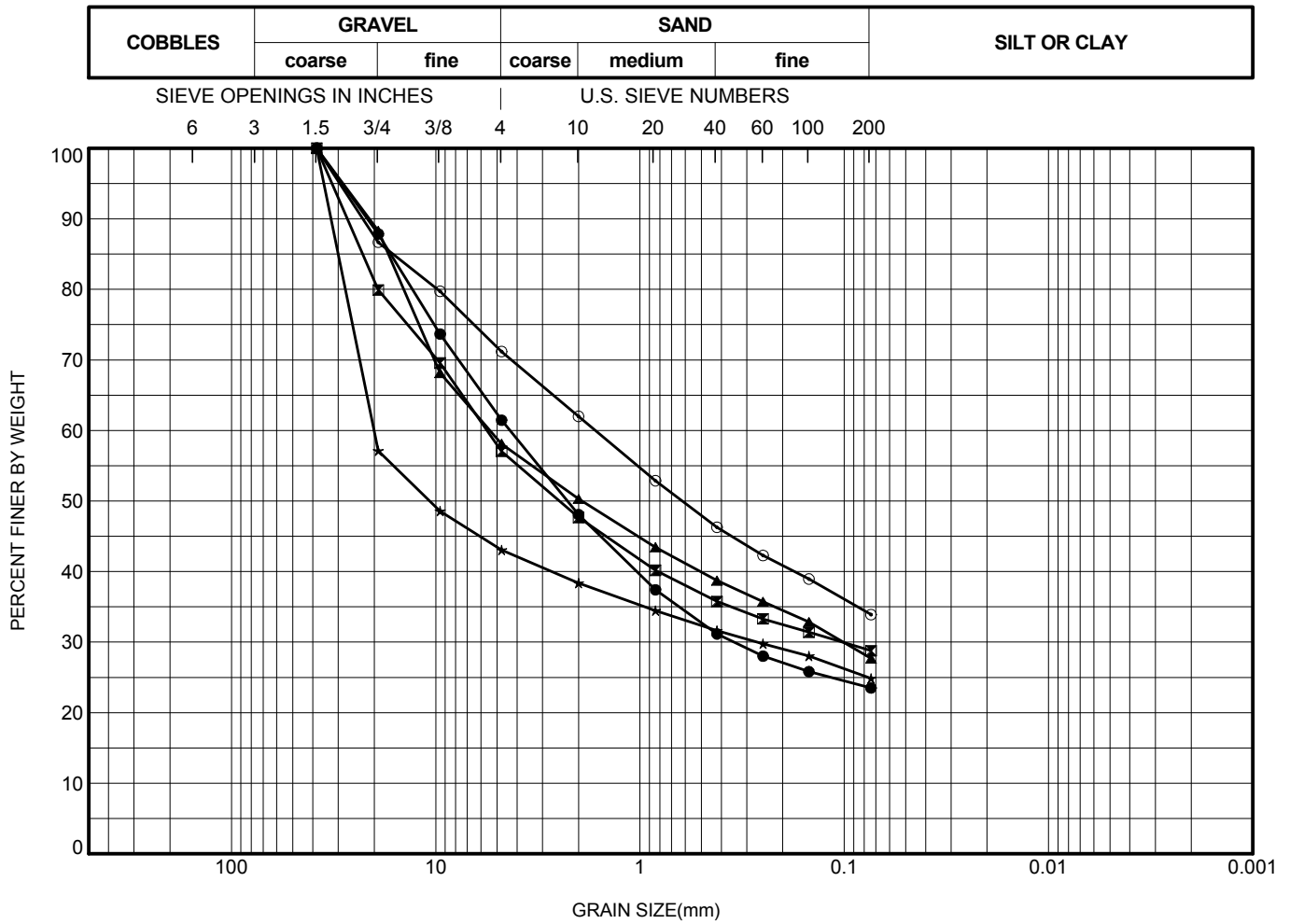
LOCATION: Yukon

FIGURE:

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-47	2.00	16.609	4.332	2.267				38.6	37.9	23.5
⊠	TP05-48	2.00	22.764	5.606	2.482				43.0	28.2	28.8
▲	TP05-72	2.50	17.039	5.427	1.926				41.9	30.3	27.8
★	TP05-74	1.50	29.973	20.007	10.698				57.0	18.1	24.9
⊙	TP05-75	1.50	16.153	1.655	0.621				28.8	37.2	34.0

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-47		2.00	11.8				
⊠	TP05-48		2.00	9.7				
▲	TP05-72		2.50	8.2				
★	TP05-74		1.50	7.7				
⊙	TP05-75		1.50	10.2				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

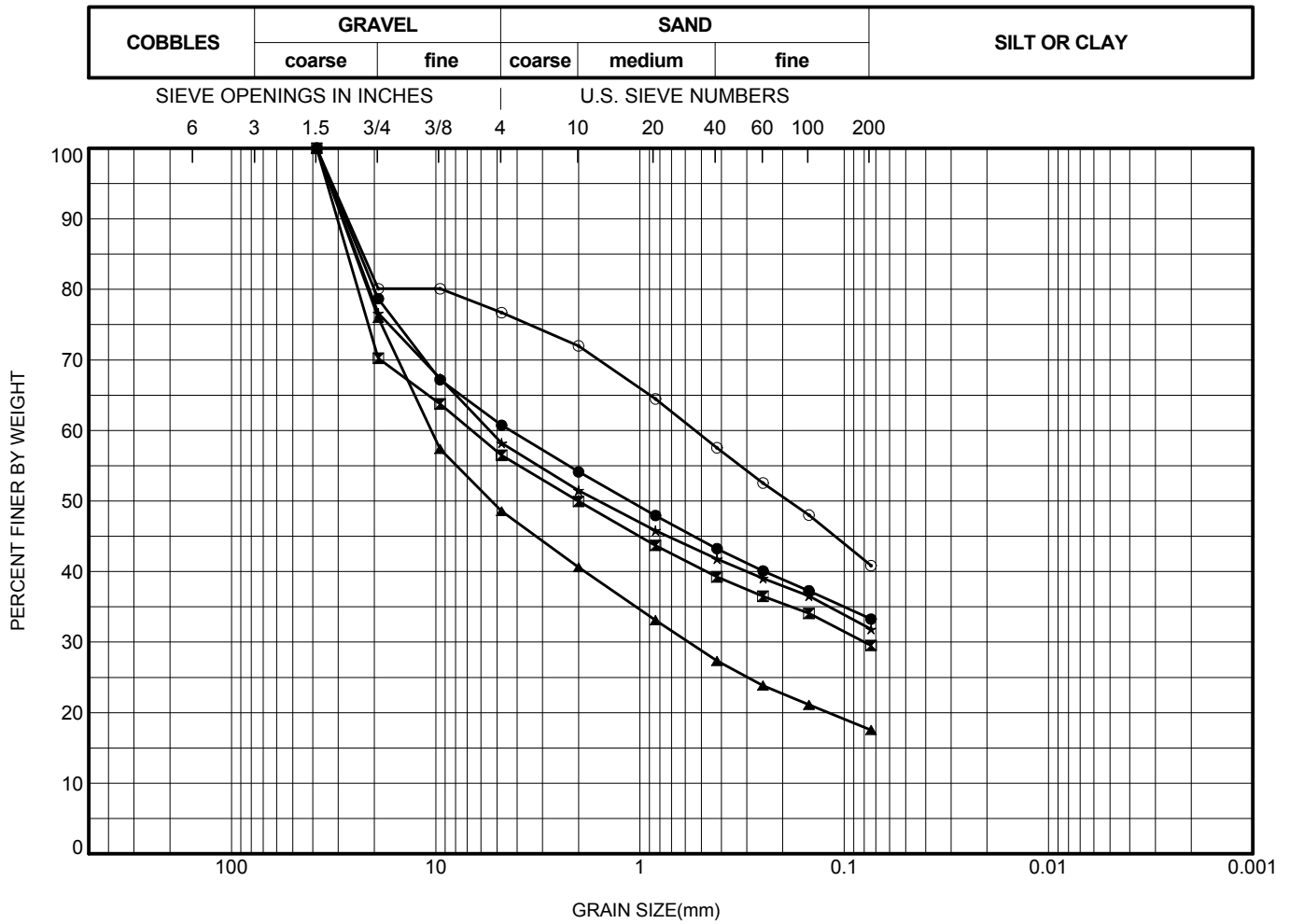
LOCATION: Yukon

FIGURE:

DRAWN BY: JG

CHECKED BY:

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-76	1.50	23.460	4.323	1.121				39.3	27.4	33.3
⊠	TP05-77	1.50	26.940	6.658	2.016				43.5	26.8	29.6
▲	TP05-83	1.80	24.775	10.503	5.330				51.5	30.9	17.6
★	TP05-84	1.50	24.488	5.453	1.595				41.8	26.3	31.9
⊙	TP05-85	1.50	22.662	0.537	0.187				23.3	35.7	41.0

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-76		1.50	10.3				
⊠	TP05-77		1.50	7.3				
▲	TP05-83		1.80	6.2				
★	TP05-84		1.50	10.6				
⊙	TP05-85		1.50	17.9				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

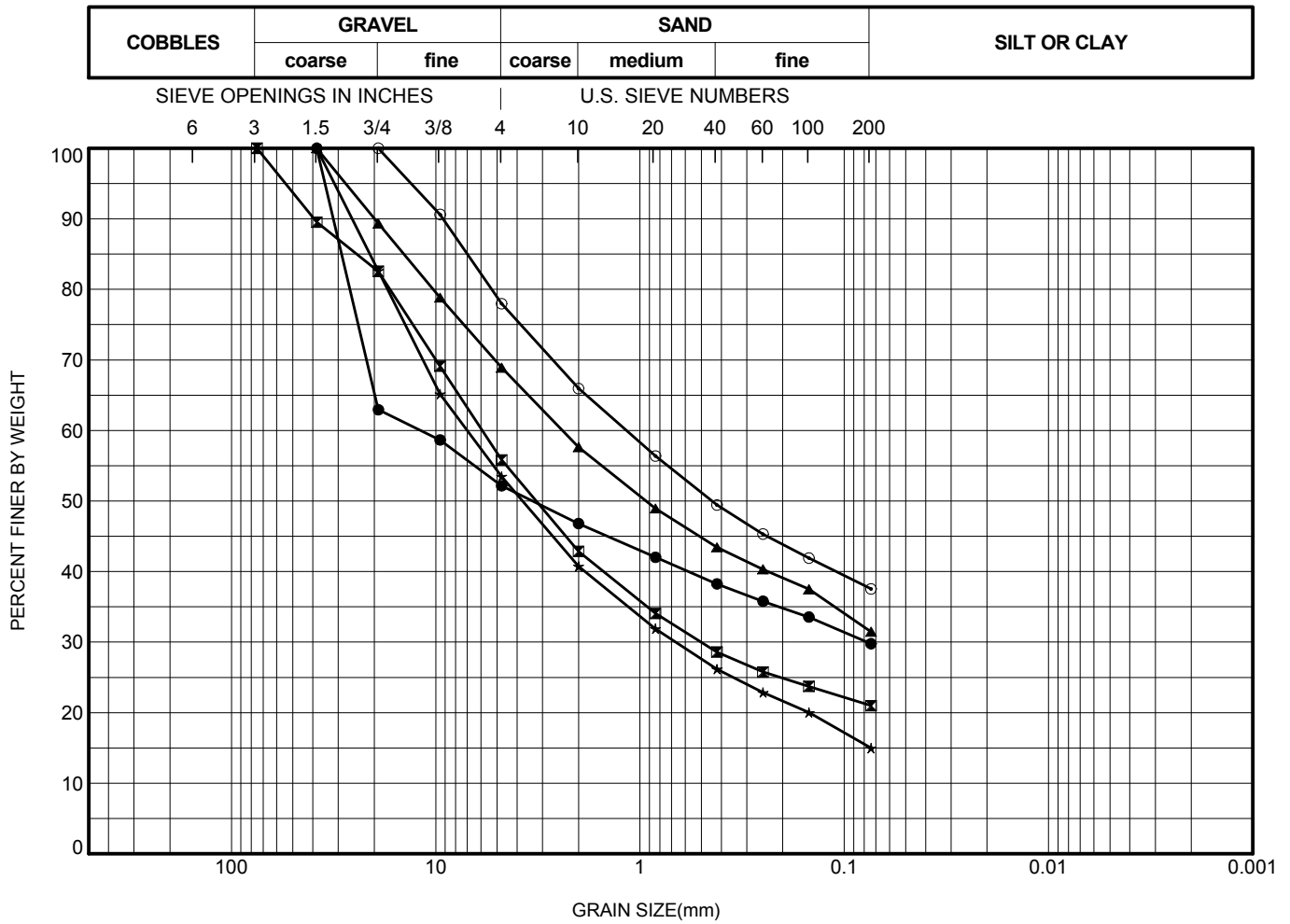
LOCATION: Yukon

FIGURE:

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-86	1.50	28.853	11.841	3.357				47.9	22.3	29.8
⊠	TP05-87	3.30	24.359	5.917	3.223				44.2	34.8	21.0
▲	TP05-89	1.50	14.318	2.400	0.934				31.1	37.3	31.6
★	TP05-89	3.00	20.991	7.008	3.758	0.074			46.6	38.4	15.1
⊙	TP05-91	1.00	7.000	1.167	0.444				22.1	40.3	37.6

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-86		1.50	8.8				
⊠	TP05-87		3.30	1.6				
▲	TP05-89		1.50	8.9				
★	TP05-89		3.00	3.0				
⊙	TP05-91		1.00	12.7				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

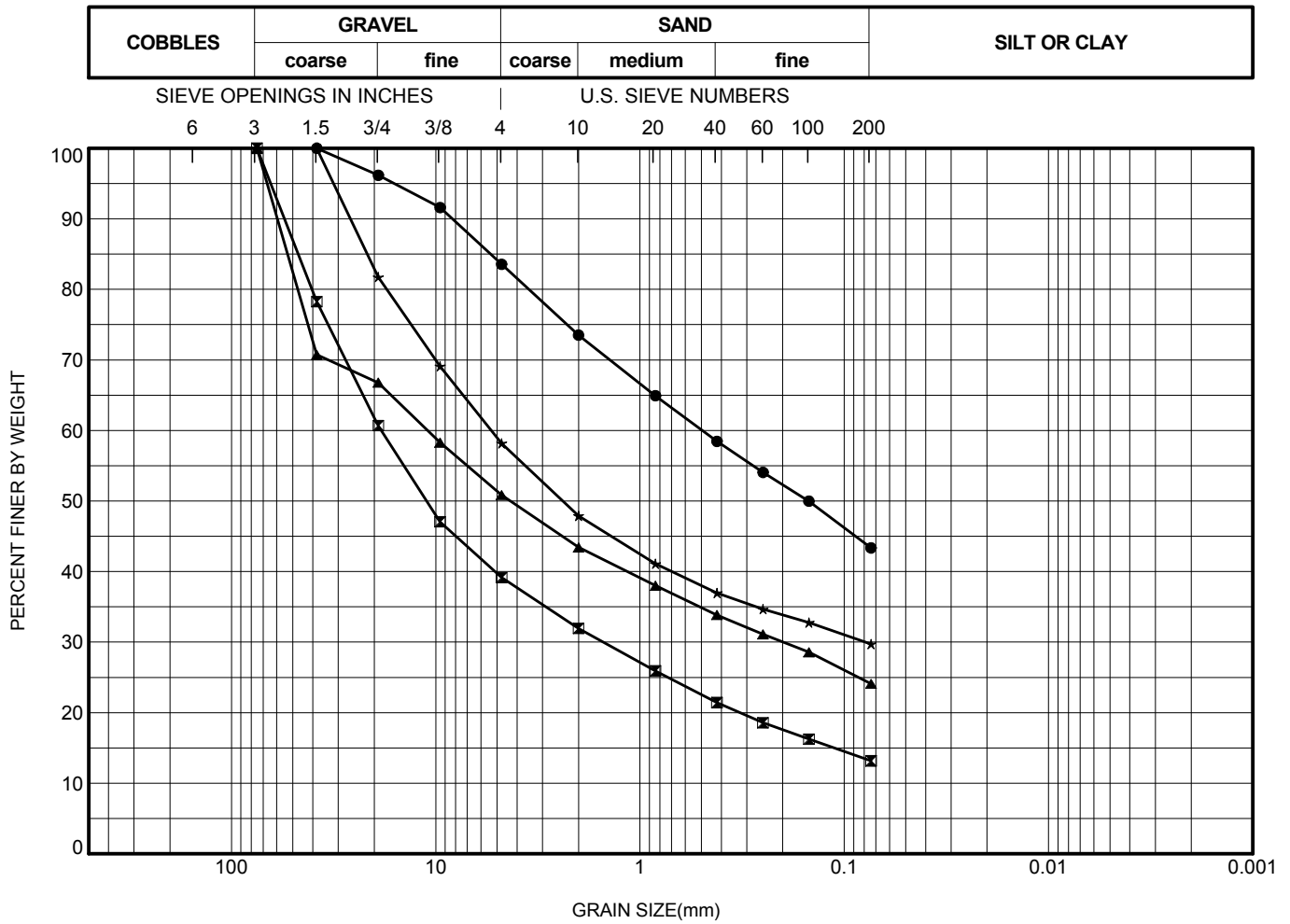
LOCATION: Yukon

FIGURE:

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GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-93	1.50	5.389	0.496	0.150				16.5	40.1	43.5
⊠	TP05-95	2.30	47.083	18.443	11.066	0.112			60.9	25.9	13.2
▲	TP05-96	1.50	53.074	10.953	4.311				49.2	26.7	24.2
★	TP05-97	1.50	21.618	5.340	2.389				41.8	28.4	29.8

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _p	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-93		1.50	13.0				
⊠	TP05-95		2.30	4.6				
▲	TP05-96		1.50	11.0				
★	TP05-97		1.50	7.7				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Pit Samples

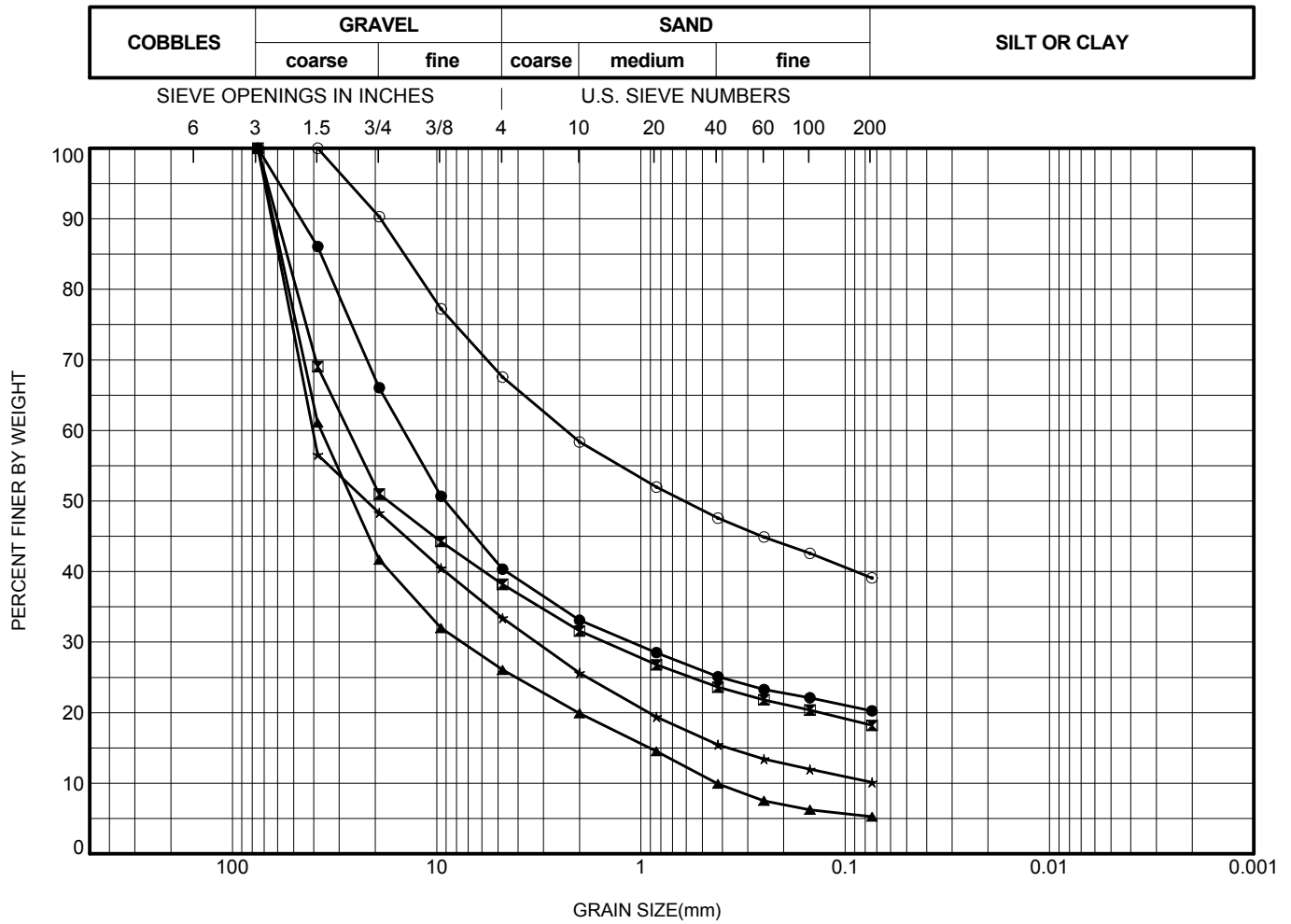
LOCATION: Yukon

FIGURE:

DRAWN BY: DL

CHECKED BY:

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	Borrow 1	0.00	36.810	14.520	9.100				59.7	20.0	20.3
⊠	Borrow 2	0.00	54.083	27.000	17.265				61.8	19.9	18.2
▲	Borrow 3	0.00	57.821	36.732	25.698	0.906	0.426	86.306	73.9	20.8	5.3
★	Go Creek Dam	0.00	59.415	40.298	22.024	0.373	0.071	569.587	66.6	23.2	10.2
⊙	MW05-6	0.00	14.399	2.332	0.615				32.5	28.4	39.2

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	Borrow 1	East	0.00	7.7				
⊠	Borrow 2	Central	0.00	9.0				
▲	Borrow 3	West	0.00	5.5				
★	Go Creek Dam		0.00	2.5				
⊙	MW05-6		0.00	11.4				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - General Borrow Materials

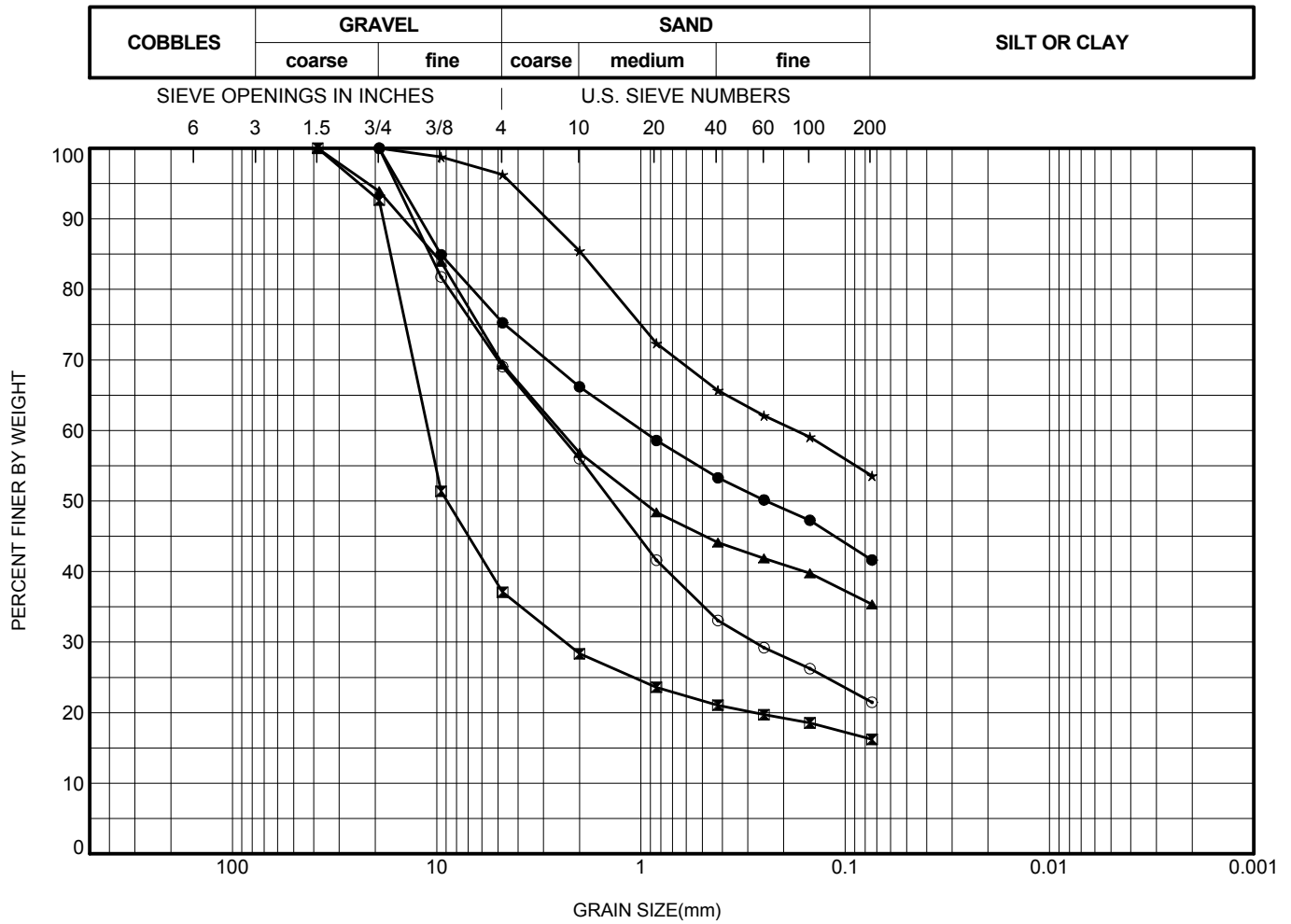
LOCATION: Yukon

FIGURE:

DRAWN BY: DL

CHECKED BY:

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TH05-1	11.45	9.557	0.988	0.244				24.8	33.5	41.7
⊠	TH05-3	1.00	16.788	11.010	8.902				62.9	20.8	16.3
▲	TH05-3	6.10	10.274	2.490	0.991				30.7	33.9	35.4
★	TH05-3	8.90	1.945	0.175					3.8	42.6	53.7
⊙	TH05-5	1.80	10.773	2.609	1.393				31.0	47.5	21.6

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	TH05-1		11.45	14.5				
⊠	TH05-3		1.00	11.5				
▲	TH05-3		6.10	12.3				
★	TH05-3		8.90	12.2				
⊙	TH05-5		1.80	13.7				

CU = COEFFICIENT OF UNIFORMITY = D60/D10

PARTICLE SIZES, e.g. D85, in mm

Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - Test Hole Samples

LOCATION: Yukon

FIGURE:

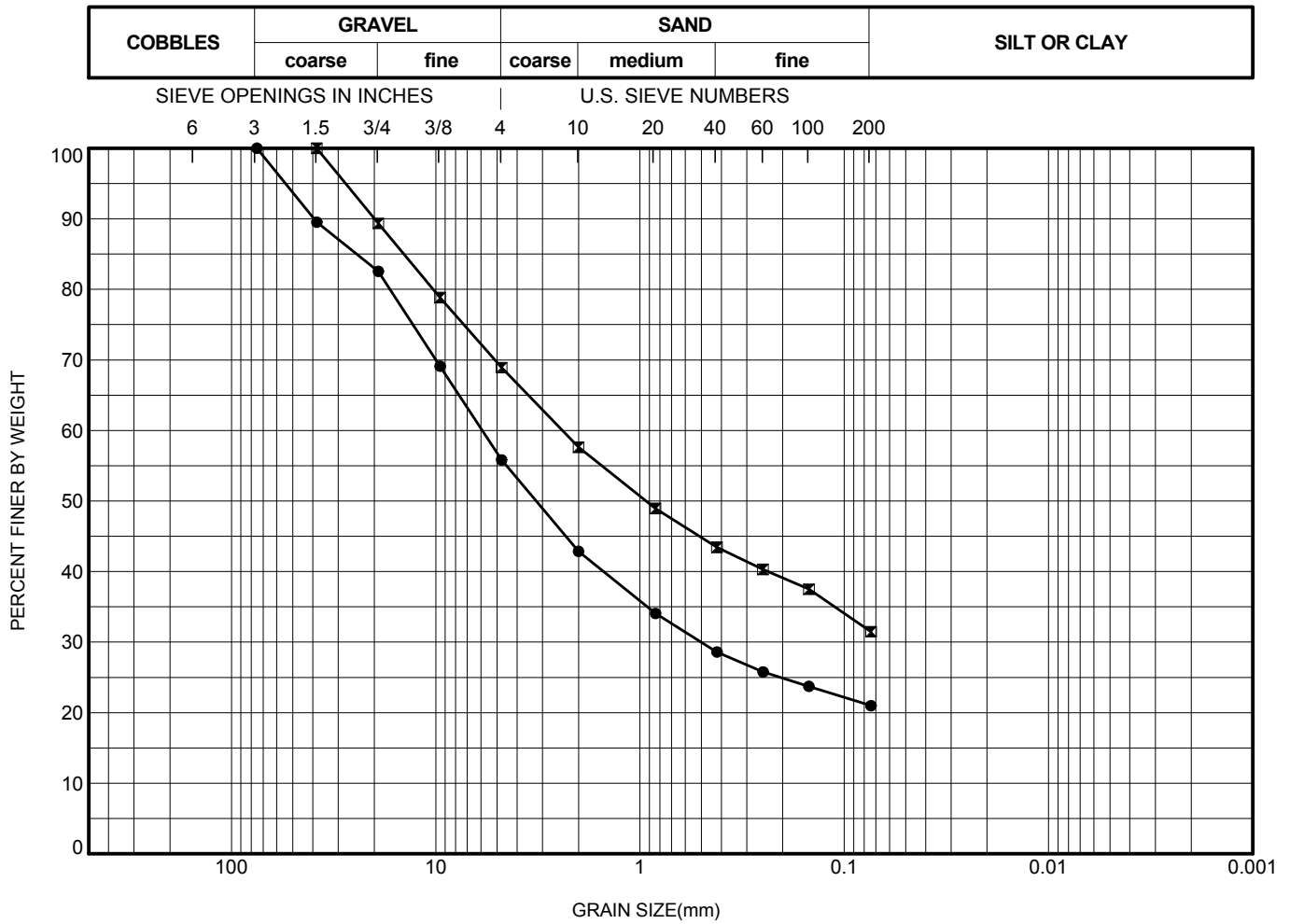
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Dam Fill

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	TP05-87	3.30	24.359	5.917	3.223				44.2	34.8	21.0
⊠	TP05-89	1.50	14.318	2.400	0.934				31.1	37.3	31.6

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	TP05-87		3.30					
⊠	TP05-89		1.50					

CU = COEFFICIENT OF UNIFORMITY = D60/D10 PARTICLE SIZES, e.g. D85, in mm Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02 01 01

PROJECT: Wolverine - DAM FILL

LOCATION: Yukon

FIGURE:

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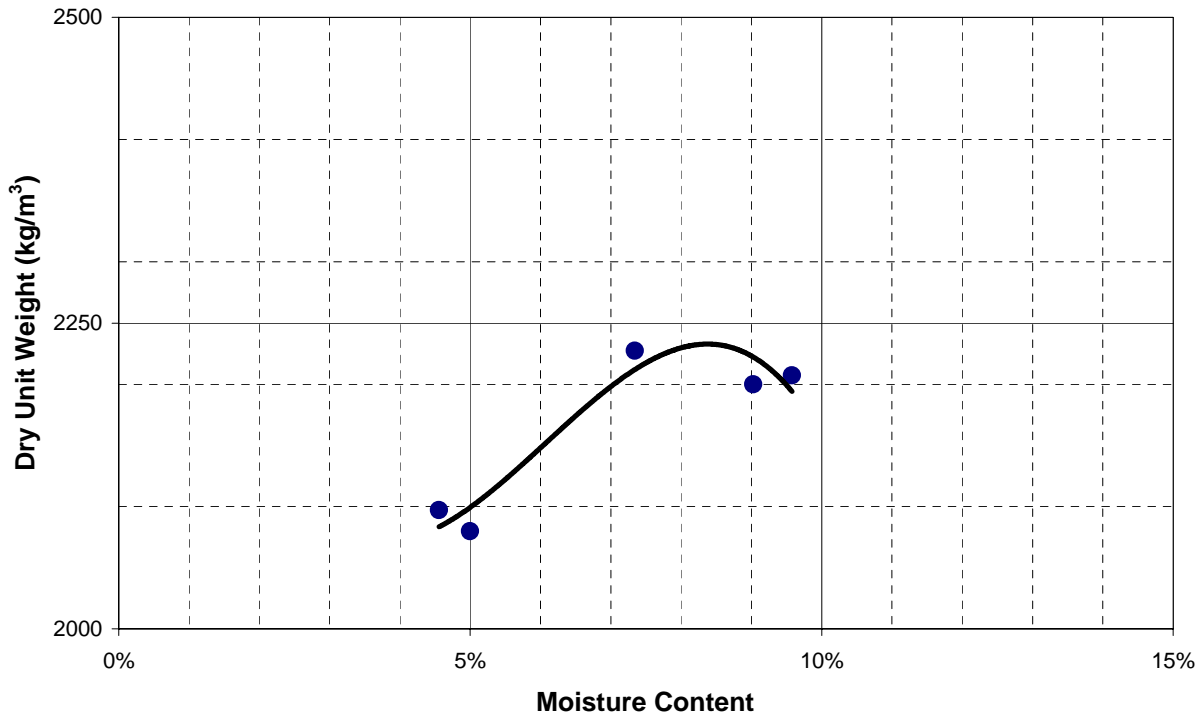
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COMPACTION TEST

Sample Description:

TRIAL NUMBER	1	2	3	4	5	6
Unit Weight Determination						
Wet Wt. Sample & Mold (g)	11592	11608	11651	11171	11152	
Weight of Mold (g)	6515	6515	6515	6515	6515	
Wet Wt. of Sample (g)	5077	5093	5136	4656	4637	
Volume of Mold (cm ³)	2123.48	2123.48	2123.48	2123.48	2123.48	
Wet Unit Wt. (kg/m ³)	2390.9	2398.4	2418.7	2192.6	2183.7	
Dry Unit Wt. (kg/m ³)	2227.3	2199.8	2207.2	2097.0	2079.7	
Moisture Content Determination						
Container No.	1	2	3	4	5	
Wet Wt. Sample & Tare (g)	627.42	392.24	552.74	464.31	105	
Dry Wt. Sample & Tare (g)	591.05	369.84	512.96	448.7	100	
Wt. of Water (g)	36.37	22.4	39.78	15.61	5	
Tare Container (g)	95.85	121.71	97.67	106.3	0	
Dry Wt. of Soil (g)	495.2	248.13	415.29	342.4	100	
Moisture Content (%)	7.3%	9.0%	9.6%	4.6%	5.0%	

Compaction Test



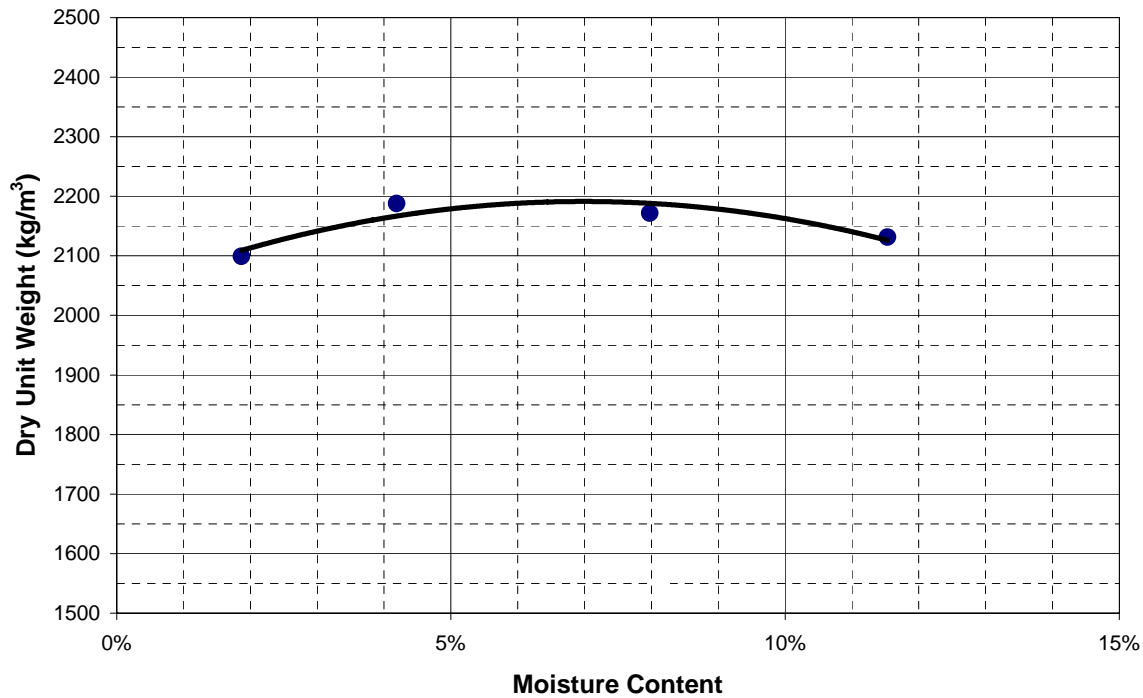
JOB NO.:	M09234A02
PROJECT:	Wolverine - DAM FILL (TP05-87)
LOCATION:	Yukon
DATE:	31-Aug-05
TESTED BY:	DL
CHECKED BY:	JG

COMPACTION TEST

Sample Description: **TP05 - 89** 1.5 m

TRIAL NUMBER	1	2				
Unit Weight Determination						
Wet Wt. Sample & Mold (g)	6350	6411	6441	6219		
Weight of Mold (g)	4231	4231	4231	4231		
Wet Wt. of Sample (g)	2119	2180	2210	1988		
Volume of Mold (cm ³)	929.623	929.623	929.623	929.623		
Wet Unit Wt. (kg/m ³)	2279.4	2345.0	2377.3	2138.5		
Dry Unit Wt. (kg/m ³)	2187.8	2171.8	2131.5	2099.3		
Moisture Content Determination						
Container No.						
Wet Wt. Sample & Tare (g)	959.93	809.79	1001.51	216.62		
Dry Wt. Sample & Tare (g)	926.21	770.17	927.86	212.95		
Wt. of Water (g)	33.72	39.62	73.65	3.67		
Tare Container (g)	121.38	273.37	289.29	16.35		
Dry Wt. of Soil (g)	804.83	496.8	638.57	196.6		
Moisture Content (%)	4.2%	8.0%	11.5%	1.9%		

Compaction Test



Kohn Crippen Berger

JOB NO.:	M09234A02	
PROJECT:	Wolverine - DAM FILL (TP05-89)	
LOCATION:	Yukon	
DATE:	19-Sep-05	
TESTED BY:	DL	CHECKED BY: JG



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER
 (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2 TRIAXIAL CELL: Test No.:
 PROJECT: Woverine Project PRESSURE PANEL: Tested by: Ganan
 SAMPLE INFORMATION: Tailings sample, prepared by moist tamping technique. Date: November 24, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
	t		Q _{in}		Q _{out}				h	i	k
11/24/05 11:45		64.05		46.10		205	200	300	68.9	5.4	
	13500		2.90		2.58						1E-06
11/24/05 15:30		63.80		47.10		205	200	300	67.6	5.3	
	6720		1.16		1.29						1E-06
11/24/05 17:22		63.70		47.60		205	200	300	67.0	5.3	
	56280		10.44		10.56						1E-06
11/25/05 9:00		62.80		51.70		205	200	300	62.0	4.9	
11/25/05 9:00		62.75		51.70		210	200	300	112.9	8.8	
	8100		2.90		2.58						1E-06
11/25/05 11:15		62.50		52.70		210	200	300	111.6	8.7	
	13500		4.64		4.38						1E-06
11/25/05 15:00		62.10		54.40		210	200	300	109.5	8.6	
11/25/05 15:00		62.10		40.50		210	200	300	123.4	9.7	
	8100		3.48		3.09						1E-06
11/25/05 17:15		61.80		41.70		210	200	300	121.9	9.6	
	148500		47.56		47.90						1E-06
11/27/05 10:30		57.70		60.30		210	200	300	99.2	7.8	

Base Burette Area: $A_{in} (cm^2) = 11.6$ Top Burette Area: $A_{out} (cm^2) = 2.575$ Sample Area: $A (cm^2) = 31.4873$ Sample Length: $L (cm) = 12.76$

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 100 kPa confining pressure.)



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2

TRIAxIAL CELL:

Test No.: TX271205

PROJECT: Woverine Project

PRESSURE PANEL:

Tested by: Ganan

SAMPLE INFORMATION: TP05-89 sample, prepared by moist tamping technique.

Date: November 19, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
		t	Q _{in}	Q _{out}							
12/19/05 11:50		63.50		45.90		310	300	750	119.4	9.4	
	5100		4.17		4.00						2.7E-06
12/19/05 13:15		63.15		47.45		310	300	750	117.5	9.3	
	6900		5.95		5.55						2.8E-06
12/19/05 15:10		62.65		49.60		310	300	750	114.9	9.1	
	8100		5.95		6.20						2.7E-06
12/19/05 17:25		62.15		52.00		310	300	750	112.0	8.8	
12/19/05 17:25		62.15		41.20		310	300	750	122.8	9.7	
	5100		4.17		4.39						2.8E-06
12/19/05 18:50		61.80		42.90		310	300	750	120.7	9.5	
12/19/05 19:35		61.75		43.45		305	300	750	69.2	5.5	
	50100		18.45		18.46						2.3E-06
12/20/05 9:30		60.20		50.60		305	300	750	60.5	4.8	
	9900		4.76		4.13						2.9E-06
12/20/05 12:15		59.80		52.20		305	300	750	58.5	4.6	
	11700		4.76		4.65						2.8E-06
12/20/05 15:30		59.40		54.00		305	300	750	56.3	4.4	
12/20/05 15:30		59.40		40.60		305	300	750	69.7	5.5	
	62700		26.18		27.11						2.7E-06
12/21/05 8:55		57.20		51.10		305	300	750	57.0	4.5	

Base Burette Area:

Top Burette Area:

Sample Area:

Sample Length:

A_{in} (cm²) = 11.9

A_{out} (cm²) = 2.582

A (cm²) = 31.4082

L (cm) = 12.68

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
(Back pressure saturation applied on the test specimen before consolidation)
(Permeability Test was performed after consolidation at 450 kPa confining pressure.)



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER
 (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2

TRIAxIAL CELL:

Test No.: TX271205

PROJECT: Woverine Project

PRESSURE PANEL:

Tested by: Ganan

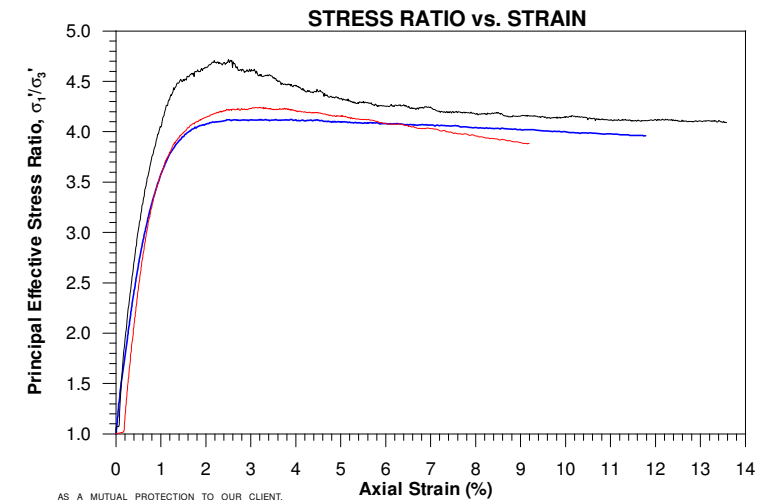
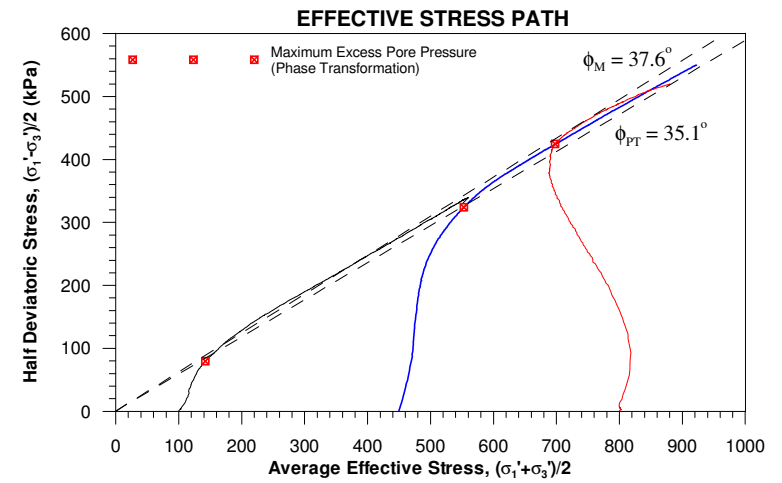
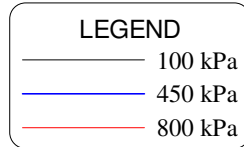
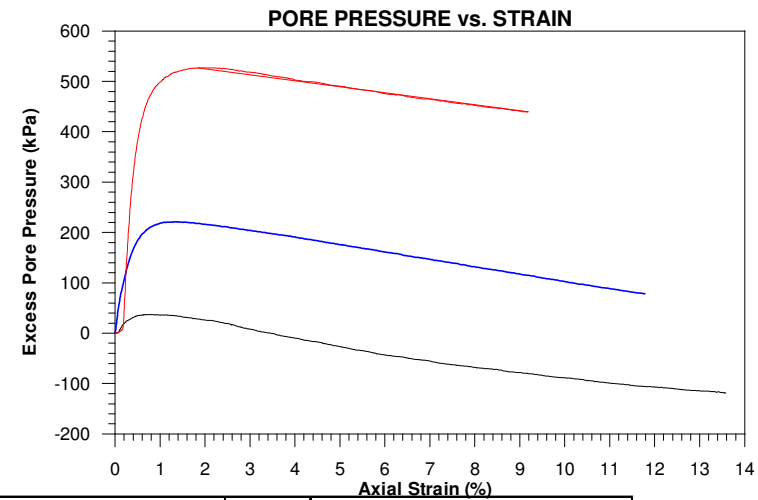
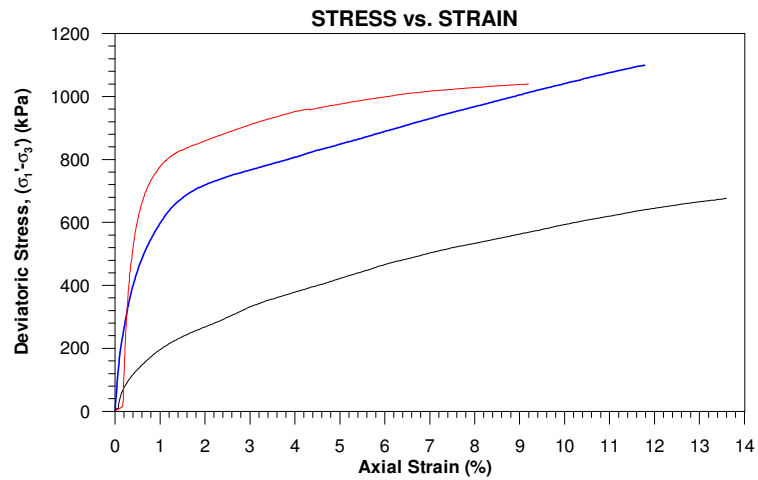
SAMPLE INFORMATION: TP05-89 sample, prepared by moist tamping technique.

Date: January 10, 2006

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
		t	Q _{in}	Q _{out}							
1/9/06 10:40		66.60		45.20		210	200	1000	123.2	9.7	
	4800		3.57		3.87						2.6E-06
1/9/06 12:00		66.30		46.70		210	200	1000	121.4	9.6	
	4800		4.16		4.00						2.8E-06
1/9/06 13:20		65.95		48.25		210	200	1000	119.5	9.4	
	4200		2.98		3.23						2.6E-06
1/9/06 14:30		65.70		49.50		210	200	1000	118.0	9.3	
	10200		8.33		8.00						2.8E-06
1/9/06 17:20		65.00		52.60		210	200	1000	114.2	9.0	
1/9/06 17:20		65.00		43.80		204.5	200	1000	67.0	5.3	
	4800		1.79		1.55						2.0E-06
1/9/06 18:40		64.85		44.40		204.5	200	1000	66.3	5.2	
	52200		19.63		19.37						2.5E-06
1/10/06 9:10		63.20		51.90		204.5	200	1000	57.1	4.5	

Base Burette Area: $A_{in} (cm^2) = 11.9$ Top Burette Area: $A_{out} (cm^2) = 2.582$ Sample Area: $A (cm^2) = 31.2181$ Sample Length: $L (cm) = 12.69$

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 800 kPa confining pressure.)



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

SPECIMEN INFORMATION	UNITS	DATA		
Dam Fill - TP05-89				
Initial Water Content	%	10.3	9.0	9.0
Initial Dry Density	kg/m ³	2130	2119	2109
Skempton's B Parameter		0.90	0.95	0.95
Back Pressure	kPa	200	300	200
Consolidation Stress (σ'_c)	kPa	100	450	800
(at start of shear)				
Dry Density	kg/m ³	2146	2149	2150
Specimen Height	mm	127.6	126.8	126.9
Specimen Area	mm ²	3148.7	3140.8	3121.8
Final Water Content	%	11.2	11.3	11.6

TO BE READ WITH KLOHN-CRIPPEN REPORT DATED _____

KLOHN-CRIPPEN		DATE
DESIGNED		
DRAWN		
CHECKED		
RECOMMENDED		
APPROVED		

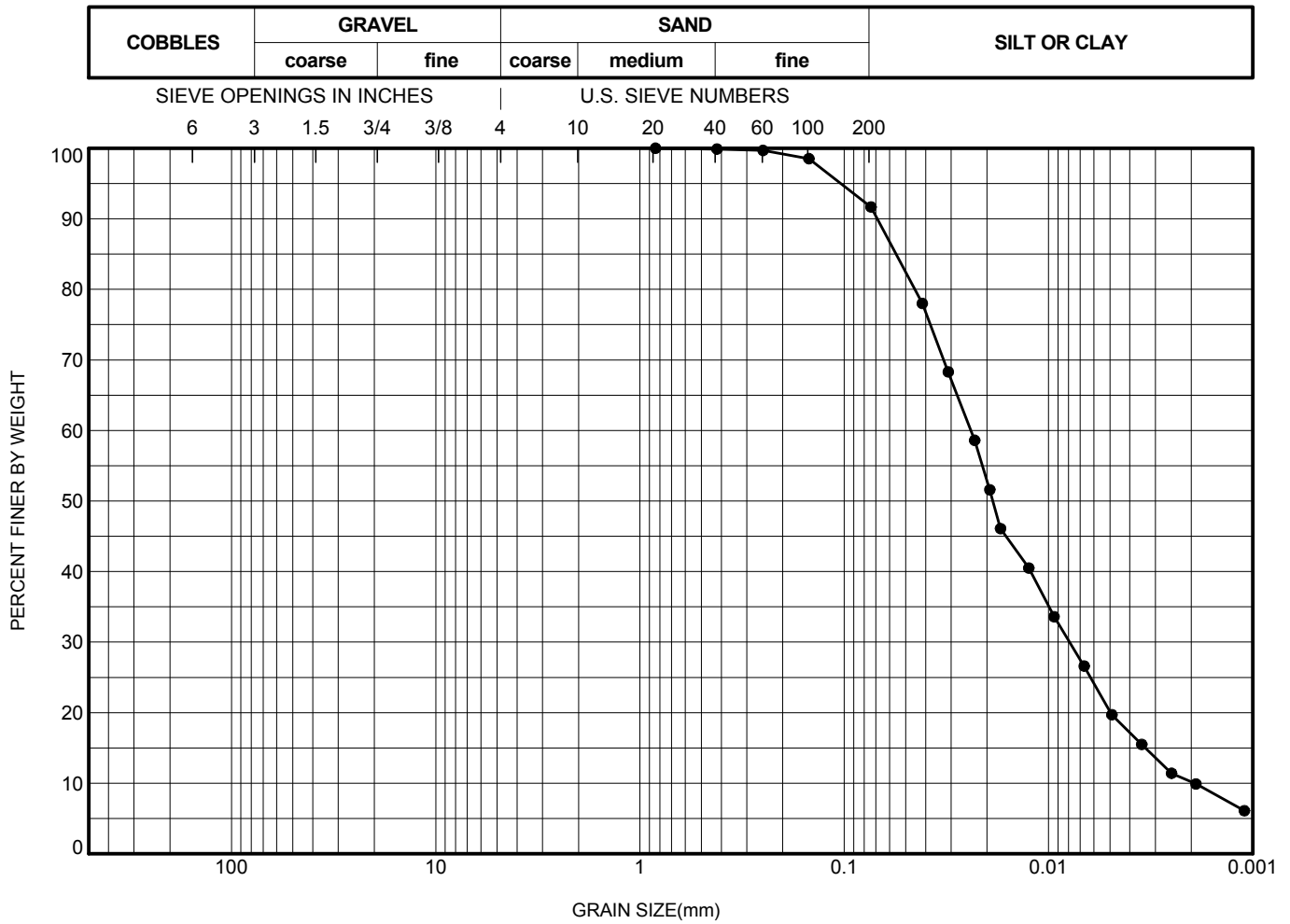
CLIENT

PROJECT WOLVERINE TAILINGS IMPOUNDMENT			
TITLE CIUC TRIAXIAL TEST RESULTS DAM FILL (TP05-89) SAMPLE			
DATE OF ISSUE December 2005	PROJECT No. M09234A02	DWG. No. FIG	REV.



Tailings

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	Tailings	0.00							0.0	8.2	91.8

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	Tailings		0.00					

CU = COEFFICIENT OF UNIFORMITY = D60/D10 PARTICLE SIZES, e.g. D85, in mm Tested by Wet Sieving Method (ASTM D1140 & D422)




PROJECT NO.: M09234A02 01 01
 PROJECT: Wolverine - Tailings Sample
 LOCATION: Yukon
 FIGURE:
 DRAWN BY: JG CHECKED BY:

SPECIFIC GRAVITY OF SOIL SOLIDS (ASTM-D854)

Sample No.	#1					
Flask No.	KL2	KL3				
Volume of Flask @ 20° C ml	500	500				
Method of Air removal	Boiling	Boiling				
De-airing Period hr	2	2				
Test temperature ° C	22.6	22.6				
Mass of Flask+Water (M _a) g	675.46	675.96				
Mass of Flask+Water+Soil (M _b) g	748.55	751.50				
Mass of Dish/Flask+Soil	277.13	281.12				
Mass of Dish/Flask	177.20	177.49				
Mass of Dry Soil (M _o) g	99.93	103.63				
Correction factor (K) @ Test Temperature	0.9998	0.9998				
Specific Gravity of Solids @ 20° C	3.72	3.69				
Average Specific Gravity of Solids @ 20° C	3.71					

Sample No.						
Flask No.						
Volume of Flask @ 20° C ml						
Method of Air removal						
De-airing Period hr						
Test temperature ° C						
Mass of Flask+Water (M _a) g						
Mass of Flask+Water+Soil (M _b) g						
Mass of Dish/Flask+Soil						
Mass of Dish/Flask						
Mass of Dry Soil (M _o) g						
Correction factor (K) @ Test Temperature						
Specific Gravity of Solids @ 20° C						
Average Specific Gravity of Solids @ 20° C						

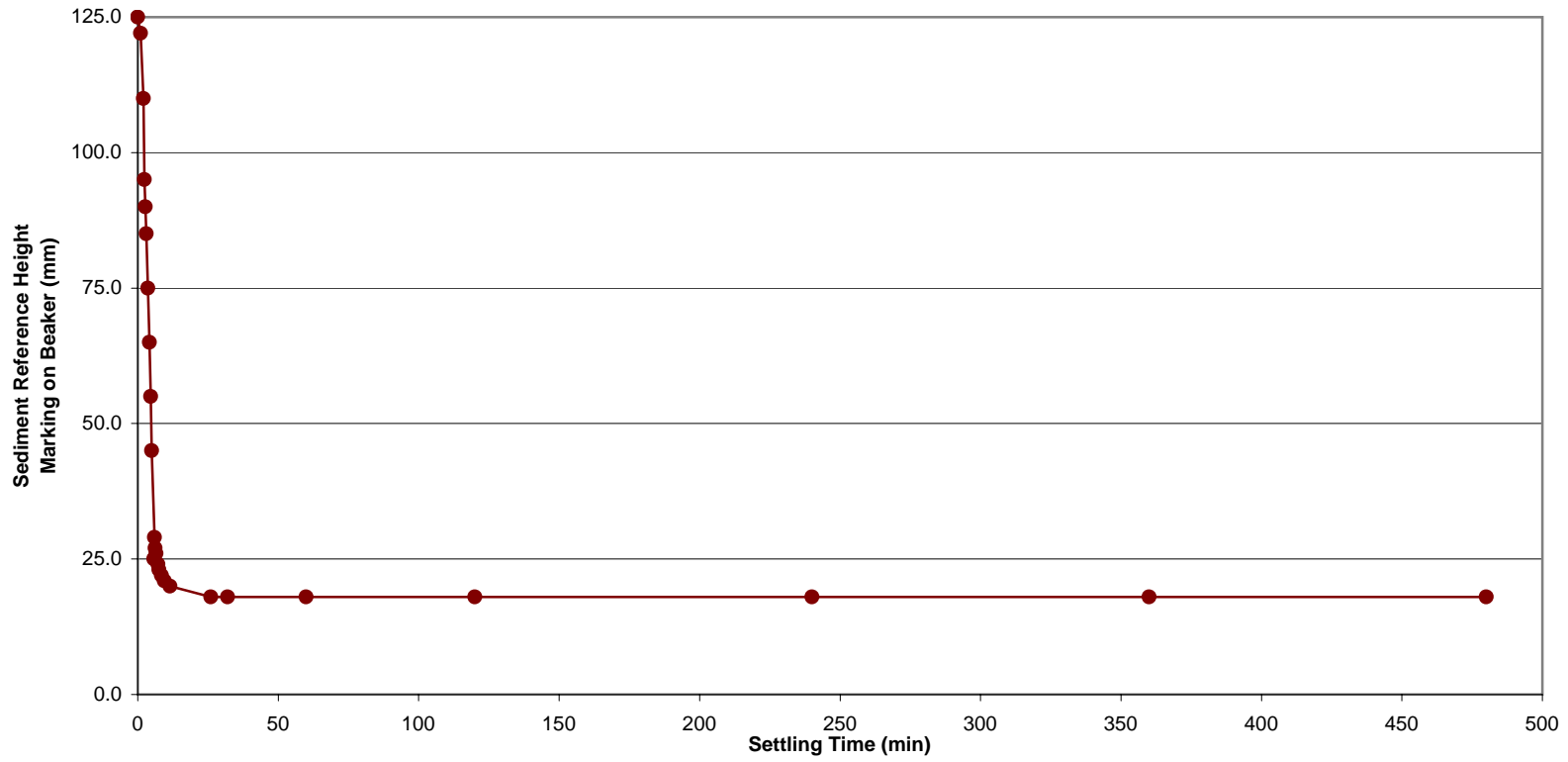
Specific Gravity of Solids @ 20° C = $(K \times M_o) / (M_o + M_a - M_b)$

 Klohn Crippen Berger	JOB NO.: M09234A02
	PROJECT: Wolverine - Tailings Sample
	LOCATION: Yukon
	DATE: December 13, 2005
	TESTED BY: JG CHECKED BY: GAN



Klohn Crippen Berger

Settling Test for Tailings Samples (14 % Initial Solid Content)



Note: Water Content at the end of
Settling Test is 54%

—●— Tailings



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER
 (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A02 TRIAXIAL CELL: Test No.:
 PROJECT: Woverine Project PRESSURE PANEL: Tested by: Ganan
 SAMPLE INFORMATION: Tailings sample, prepared by moist tamping technique. Date: 11/2/05

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
	t		Q _{in}		Q _{out}				h	i	k
11/2/05 11:00		66.00		45.40		260	250	350	122.4	9.6	
	900		22.04		22.40						9E-05
11/2/05 11:15		64.10		54.10		258	248	350	111.8	8.8	
	900		20.88		19.57						8E-05
11/2/05 11:30		62.30		61.70		258	248	500	102.4	8.1	
11/2/05 11:40		63.30		43.80		255	250	350	70.4	5.5	
	900		10.44		10.30						7E-05
11/2/05 11:55		62.40		47.80		255	250	350	65.5	5.2	
	900		9.86		9.27						7E-05
11/2/05 12:10		61.55		51.40		256	251	350	61.1	4.8	
11/2/05 13:10		61.50		42.00		255	250	350	70.4	5.5	
	900		9.86		10.30						7E-05
11/2/05 13:25		60.65		46.00		255	250	350	65.6	5.2	
	900		9.86		9.27						7E-05
11/2/05 13:40		59.80		49.60		256	251	350	61.1	4.8	

Base Burette Area: Top Burette Area: Sample Area: Sample Length:
 A_{in} (cm²) = 11.6 A_{out} (cm²) = 2.575 A (cm²) = 30.95 L (cm) = 12.69

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 100kPa confining pressure.)



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2 TRIAXIAL CELL: Test No.:
 PROJECT: Woverine Project PRESSURE PANEL: Tested by: Ganan
 SAMPLE INFORMATION: Tailings sample, prepared by moist tamping technique. Date: 11/2/05

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
		t	Q _{in}	Q _{out}							
11/7/05 14:00		67.50		41.00		205	200	475	77.4	6.3	
	1800		2.32		2.45						7E-06
11/7/05 14:30		67.30		41.95		205	200	475	76.3	6.2	
	1800		2.32		2.19						7E-06
11/7/05 15:00		67.10		42.80		205	200	475	75.2	6.1	
	3600		4.64		4.38						7E-06
11/7/05 16:00		66.70		44.50		205	200	475	73.1	5.9	
	3600		4.64		4.12						7E-06
11/7/05 17:00		66.30		46.10		205	200	475	71.1	5.8	
	5400		5.80		6.44						7E-06
11/7/05 18:30		65.80		48.60		205	200	475	68.1	5.5	
11/8/05 9:15		65.80		42.80		210	200	475	124.8	10.1	
	900		2.32		0.77						4E-06
11/8/05 9:30		65.60		43.10		210	200	475	124.3	10.1	
	1800		3.48		5.15						9E-06
11/8/05 10:00		65.30		45.10		210	200	475	122.0	9.9	
	1800		3.48		3.86						7E-06
11/8/05 10:30		65.00		46.60		210	200	475	120.2	9.7	
	3600		7.54		7.21						7E-06
11/8/05 11:30		64.35		49.40		210	200	475	116.8	9.5	
	5400		11.02		11.07						7E-06
11/8/05 13:00		63.40		53.70		210	200	475	111.5	9.0	

Base Burette Area: Top Burette Area: Sample Area: Sample Length:
 $A_{in} \text{ (cm}^2\text{)} = 11.6$ $A_{out} \text{ (cm}^2\text{)} = 2.575$ $A \text{ (cm}^2\text{)} = 29.782$ $L \text{ (cm)} = 12.34$

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 275kPa confining pressure.)



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2 TRIAXIAL CELL:
 PROJECT: Woverine Project PRESSURE PANEL:
 SAMPLE INFORMATION: Tailings sample, prepared by moist tamping technique.

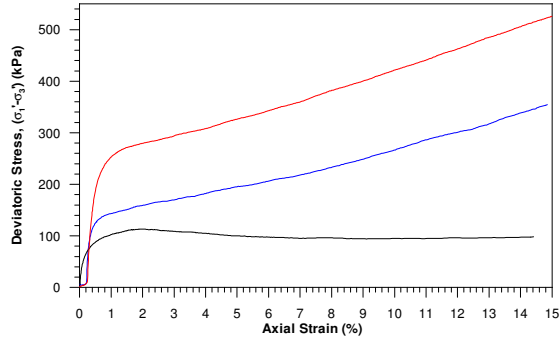
Test No.:
 Tested by: Ganan
 Date: Nov 17, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
	t		Q _{in}		Q _{out}				h	i	k
11/17/05 10:25		68.20		39.90		205	199	650	89.4	7.2	
	2100		2.90		3.09						7.1E-06
11/17/05 11:00		67.95		41.10		205	199	650	87.9	7.1	
	3600		5.22		5.15						7.1E-06
11/17/05 12:00		67.50		43.10		205	199	650	85.5	6.9	
	5400		7.54		7.98						7.5E-06
11/17/05 13:30		66.85		46.20		205	199	650	81.7	6.6	
	3600		4.64		4.63						6.9E-06
11/17/05 14:30		66.45		48.00		205	199	650	79.5	6.4	
	3600		4.64		4.89						7.4E-06
11/17/05 15:30		66.05		49.90		205	199	650	77.2	6.2	
11/17/05 15:30		66.00		49.95		210	199	650	128.0	10.3	
	2100		5.22		5.28						8.5E-06
11/17/05 16:05		65.55		52.00		210	199	650	125.5	10.1	
	5100		12.18		12.10						8.3E-06
11/17/05 17:30		64.50		56.70		210	199	650	119.8	9.6	

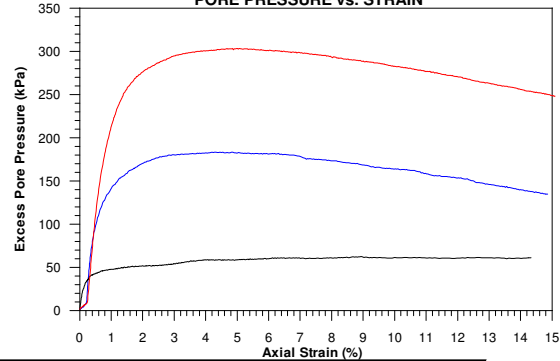
Base Burette Area: Top Burette Area: Sample Area: Sample Length:
 A_{in} (cm²) = 11.6 A_{out} (cm²) = 2.575 A (cm²) = 28.8882 L (cm) = 12.45

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 450kPa confining pressure.)

STRESS vs. STRAIN

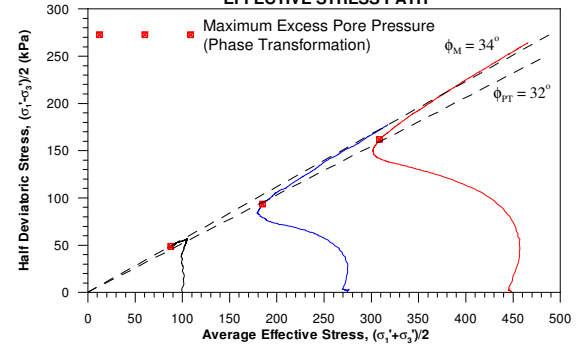


PORE PRESSURE vs. STRAIN

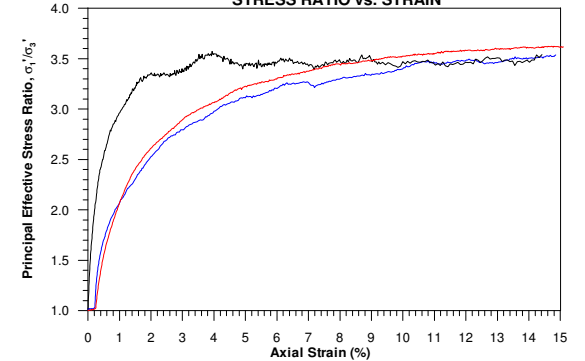


LEGEND
 — 100 kPa
 — 275 kPa
 — 450 kPa

EFFECTIVE STRESS PATH



STRESS RATIO vs. STRAIN



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SPECIMEN INFORMATION	UNITS	DATA		
Tailings Sample				
Initial Water Content	%	18.5	17.6	17.6
Initial Dry Density	kg/m ³	1848	1858	1842
Skempton's B Parameter		0.96	0.98	0.98
Back Pressure	kPa	250	200	200
Consolidation Stress (σ'_v) (at start of shear)	kPa	100	275	450
Dry Density	kg/m ³	1905	2036	2080
Specimen Height	mm	126.9	123.4	124.5
Specimen Area	mm ²	3095.2	2978.2	2888.8
Final Water Content	%	23.2	19.6	19.2

TO BE READ WITH KLOHN-CRIPPEN REPORT DATED _____

KLOHN-CRIPPEN	DATE
DESIGNED	
DRAWN	
CHECKED	
RECOMMENDED	
APPROVED	

PROJECT			
WOLVERINE TAILINGS IMPOUNDMENT			
FILE			
CIUC TRIAXIAL TEST RESULTS TAILINGS SAMPLE			
DATE OF ISSUE	PROJECT NO.	DRAW. NO.	REV.
November 2005	M09234A02	FIG.	



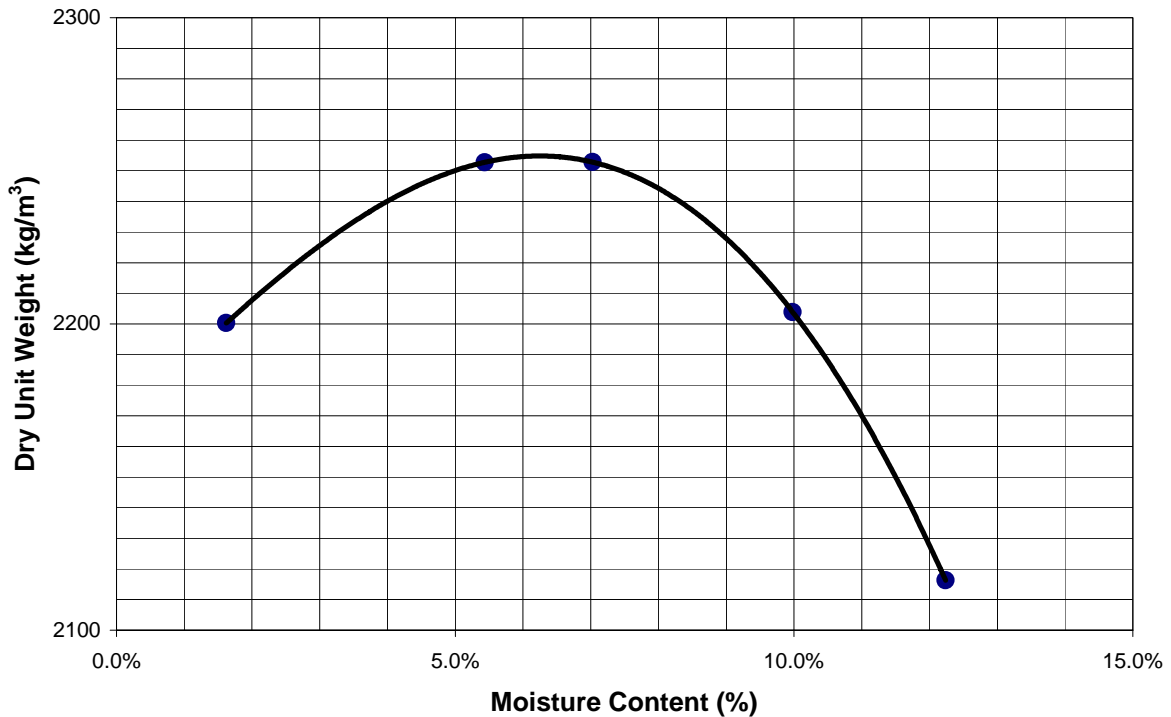
Waste Rock

STANDARD PROCTOR COMPACTION TEST (ASTM D698, Method B)

Sample Description: Waste Rock, 3/8" minus material

TRIAL NUMBER	1	2	3	4	5	6
Unit Weight Determination						
Wet Wt. Sample & Mold (g)	6348	6480	6514	6526	6480	
Weight of Mold (g)	4230	4230	4230	4230	4230	
Wet Wt. of Sample (g)	2118	2250	2284	2296	2250	
Volume of Mold (cm ³)	947.26	947.26	947.26	947.26	947.26	
Wet Unit Wt. (kg/m ³)	2235.9	2375.3	2411.2	2423.8	2375.3	
Dry Unit Wt. (kg/m ³)	2200.3	2252.8	2252.8	2203.9	2116.3	
Moisture Content Determination						
Container No.	2	4	3	4	4	
Wet Wt. Sample & Tare (g)	274.07	348.2	253.76	244.65	343.07	
Dry Wt. Sample & Tare (g)	271.56	335.7	243.32	232.05	316	
Wt. of Water (g)	2.51	12.5	10.44	12.6	27.07	
Tare Container (g)	116.61	105.77	94.78	105.79	94.77	
Dry Wt. of Soil (g)	154.95	229.93	148.54	126.26	221.23	
Moisture Content (%)	1.6%	5.4%	7.0%	10.0%	12.2%	

Proctor Compaction Test



Klohn Crippen Berger

JOB NO.:	M09234A02
PROJECT:	Wolverine - Waste Rock
LOCATION:	
DATE:	8-Dec-05
TESTED BY:	GG
CHECKED BY:	



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2

TRIAxIAL CELL:

Test No.:

PROJECT: Woverine Project

PRESSURE PANEL:

Tested by: Ganan

SAMPLE INFORMATION: Waste Rock sample, prepared by moist tamping technique.

Date: Dec 29, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
		t	Q _{in}	Q _{out}							
12/13/05 13:50		61.40		40.90		205	200	300	71.4	5.7	
	1800		3.57		3.86						1.3E-05
12/13/05 14:20		61.10		42.40		205	200	300	69.6	5.6	
	2400		5.95		5.67						1.5E-05
12/13/05 15:00		60.60		44.60		205	200	300	66.9	5.4	
	2100		4.76		4.89						1.5E-05
12/13/05 15:35		60.20		46.50		205	200	300	64.6	5.2	
12/13/05 15:35		60.20		46.50		210	200	300	115.5	9.2	
	1500		7.14		6.95						1.7E-05
12/13/05 16:00		59.60		49.20		210	200	300	112.2	9.0	
	1800		7.73		7.98						1.7E-05
12/13/05 16:30		58.95		52.30		310	300	750	108.5	8.7	
	1800		8.93		7.73						1.7E-05
12/13/05 17:00		58.20		55.30		310	300	750	104.7	8.4	

Base Burette Area:

Top Burette Area:

Sample Area:

Sample Length:

A_{in} (cm²) = 11.9

A_{out} (cm²) = 2.575

A (cm²) = 29.5709

L (cm) = 12.49

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
(Back pressure saturation applied on the test specimen before consolidation)
(Permeability Test was performed after consolidation at 100 kPa confining pressure.)



HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2 TRIAXIAL CELL: Test No.:
 PROJECT: Woverine Project PRESSURE PANEL: Tested by: Ganan
 SAMPLE INFORMATION: Waste Rock sample, prepared by moist tamping technique. Date: Dec 29, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
	t		Q _{in}		Q _{out}				h	i	k
12/29/05 15:00		62.60		39.50		205	200	475	74.0	5.9	
	2100		2.38		2.71						7.3E-06
12/29/05 15:35		62.40		40.55		205	200	475	72.8	5.8	
	1500		2.38		1.94						7.9E-06
12/29/05 16:00		62.20		41.30		205	200	475	71.8	5.7	
	1800		2.38		2.32						7.7E-06
12/29/05 16:30		62.00		42.20		205	200	475	70.7	5.7	
	2700		3.57		3.36						7.6E-06
12/29/05 17:15		61.70		43.50		205	200	475	69.1	5.5	
	12900		15.47		15.49						7.8E-06
12/29/05 20:50		60.40		49.50		205	200	475	61.8	4.9	
12/14/05 9:45		66.00		44.00		310	300	750	123.8	9.9	
	3600		4.16		4.39						4.2E-06
12/14/05 10:45		65.65		45.70		310	300	750	121.8	9.7	
	4500		5.95		6.20						4.8E-06
12/14/05 12:00		65.15		48.10		310	300	750	118.9	9.5	

Base Burette Area: A_{in} (cm²) = 11.9 Top Burette Area: A_{out} (cm²) = 2.582 Sample Area: A (cm²) = 29.5709 Sample Length: L (cm) = 12.49

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 275 kPa confining pressure.)



Klohn Crippen Berger

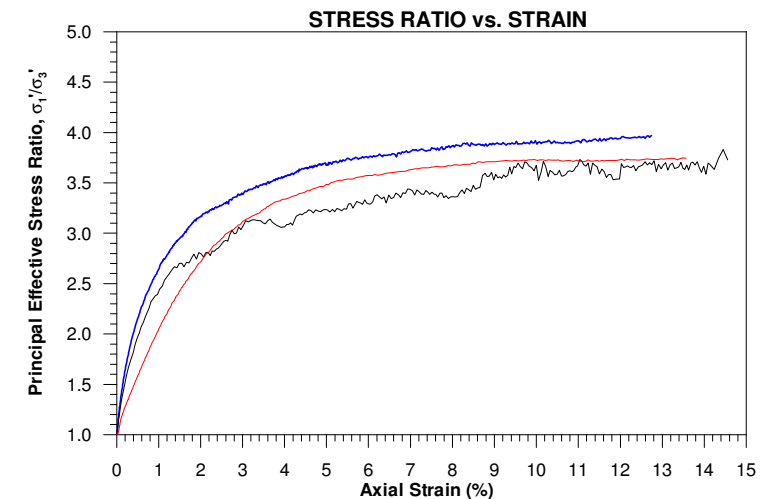
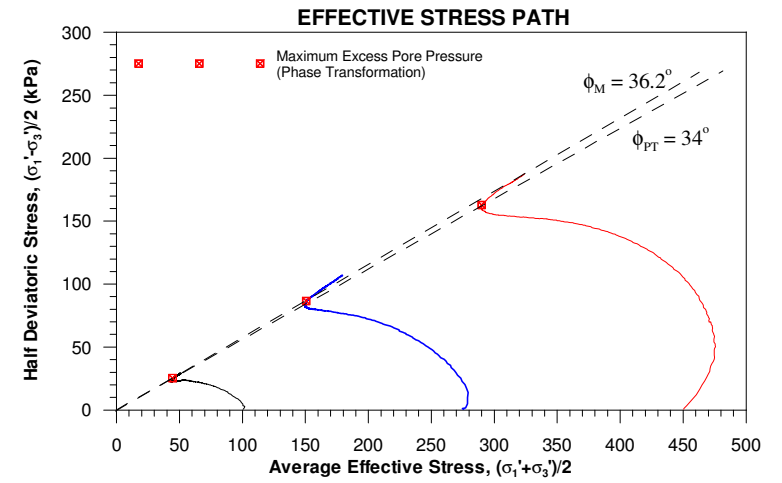
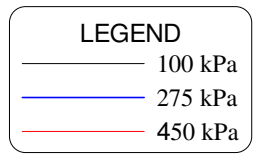
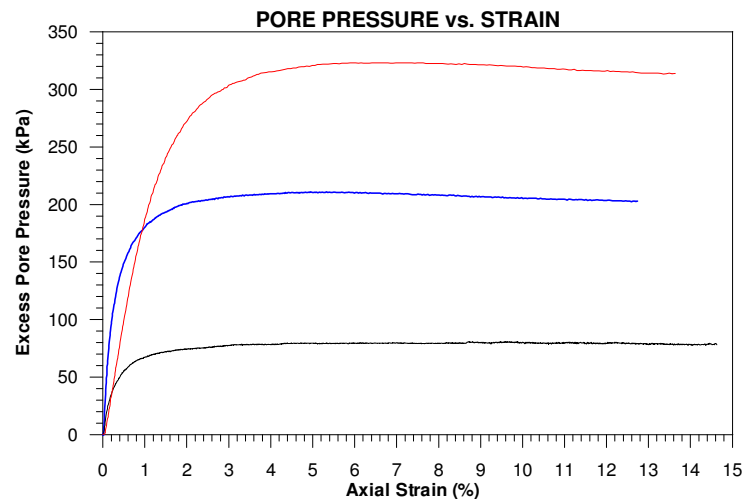
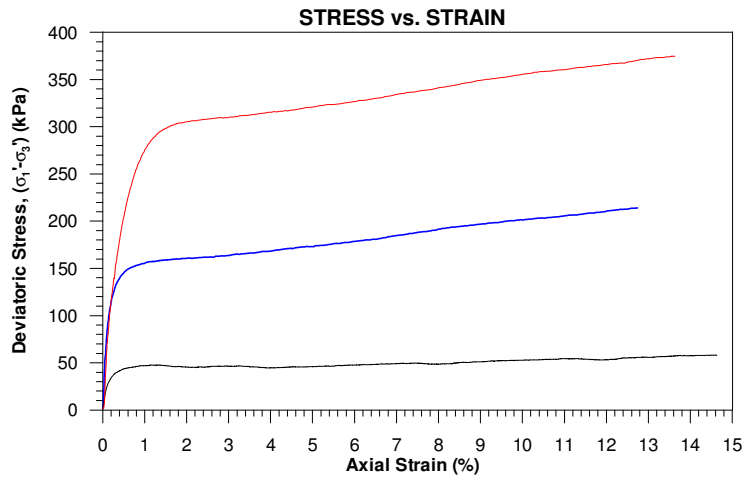
HYDRAULIC CONDUCTIVITY TEST USING A FLEXIBLE WALL PERMEAMETER (Triaxial Permeability Test) (ASTM D5084-00)

PROJECT NO: M09234A2	TRIAxIAL CELL:	Test No.:
PROJECT: Woverine Project	PRESSURE PANEL:	Tested by: Ganan
SAMPLE INFORMATION: Waste Rock sample, prepared by moist tamping technique.		Date: Dec 13, 2005

DATE / TIME	TIME INTERVAL (sec)	BASE BURETTE (IN FLOW)		TOP BURETTE (OUT FLOW)		BASE PRESSURE (kPa)	TOP PRESSURE (kPa)	CELL PRESSURE (kPa)	HEAD LOSS (cm)	GRADIENT i	COEF. OF PERMEABILITY (cm/sec) k
		READING (cm)	VOLUME (cm ³)	READING (cm)	VOLUME (cm ³)						
		t	Q _{in}	Q _{out}							
12/13/05 14:45		69.00		38.60		305	300	750	81.3	6.5	
	6300		4.16		3.87						3E-06
12/13/05 16:30		68.65		40.10		305	300	750	79.5	6.4	
	6840		2.98		2.58						2.1E-06
12/13/05 18:24		68.40		41.10		305	300	750	78.2	6.3	
	4260		3.57		3.87						5E-06
12/13/05 19:35		68.10		42.60		305	300	750	76.4	6.1	
	45900		23.80		22.98						3.0E-06
12/14/05 8:20		66.10		51.50		305	300	750	65.5	5.2	
	5100		1.19		1.81						2.2E-06
12/14/05 9:45		66.00		52.20		305	300	750	64.7	5.2	
12/14/05 9:45		66.00		44.00		310	300	750	123.8	9.9	
	3600		4.16		4.39						4E-06
12/14/05 10:45		65.65		45.70		310	300	750	121.8	9.7	
	4500		5.95		6.20						5E-06
12/14/05 12:00		65.15		48.10		310	300	750	118.9	9.5	
	5700		7.14		7.23						5E-06
12/14/05 13:35		64.55		50.90		310	300	750	115.5	9.2	

Base Burette Area:	Top Burette Area:	Sample Area:	Sample Length:
A _{in} (cm ²) = 11.9	A _{out} (cm ²) = 2.582	A (cm ²) = 29.5709	L (cm) = 12.49

Hydraulic Conductivity (Coef. of Permeability), $k = \ln(h_1/h_2) \times (A_{in} \times A_{out} \times L) / (A \times t \times (A_{in} + A_{out}))$ by ASTM D5084-00, method C
 (Back pressure saturation applied on the test specimen before consolidation)
 (Permeability Test was performed after consolidation at 450kPa confining pressure.)



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SPECIMEN INFORMATION	UNITS	DATA		
Waste Rock Sample				
Initial Water Content	%	3.9	5.3	5.4
Initial Dry Density	kg/m ³	2058	2034	2032
Skempton's B Parameter		0.98	0.98	0.95
Back Pressure	kPa	200	200	300
Consolidation Stress (σ'_3)	kPa	100	275	450
(at start of shear)				
Dry Density	kg/m ³	2098	2220	2225
Specimen Height	mm	127.1	125.4	124.9
Specimen Area	mm ²	3128.1	2939.0	2957.1
Final Water Content	%	13.1	11.8	11.6

TO BE READ WITH KLOHN-CRIPPEN REPORT DATED _____

KLOHN-CRIPPEN		DATE
DESIGNED		
DRAWN		
CHECKED		
RECOMMENDED		
APPROVED		

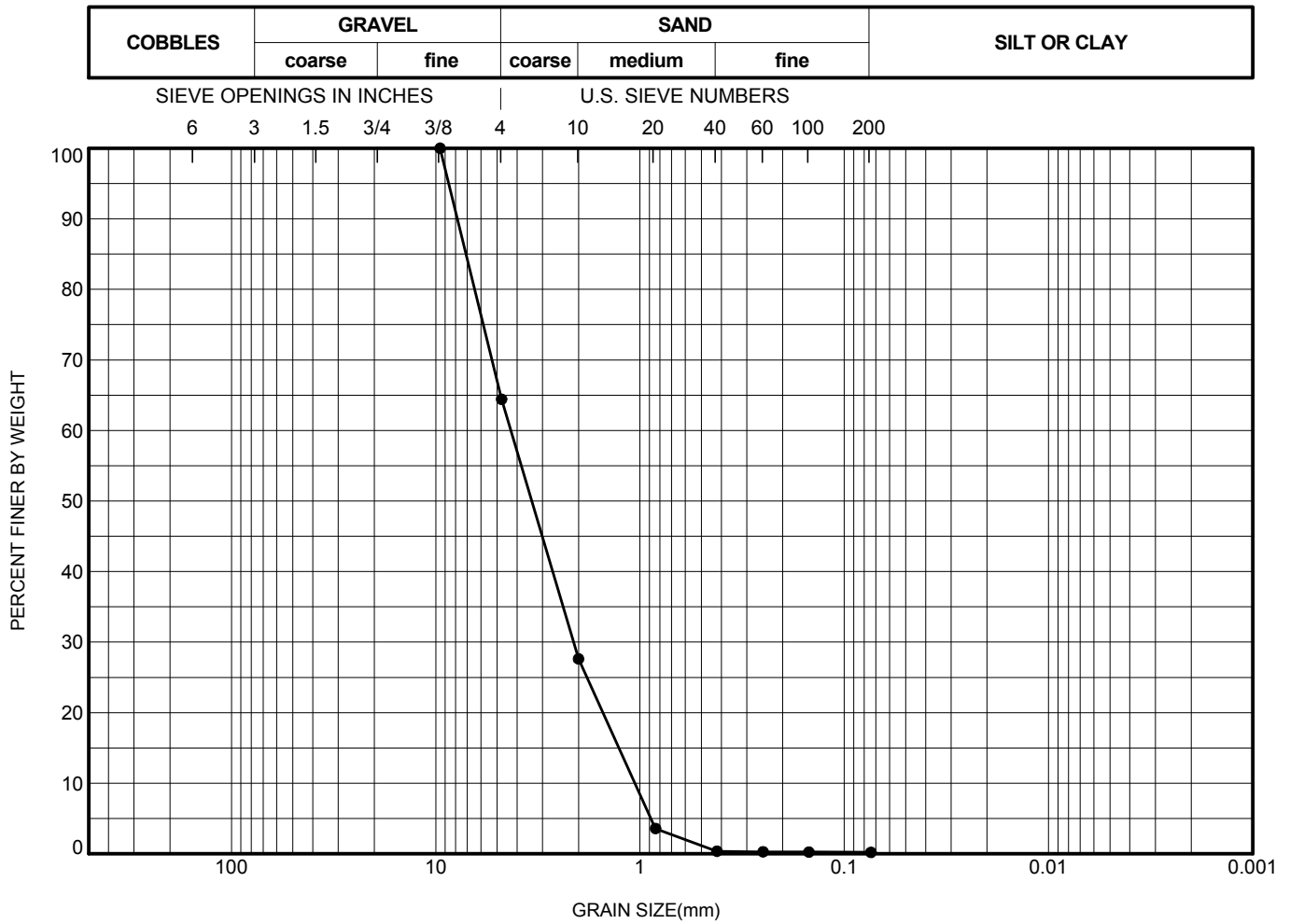
Yukon Zinc CORPORATION

PROJECT	WOLVERINE TAILINGS IMPOUNDMENT		
TITLE	CIUC TRIAXIAL TEST RESULTS WASTE ROCK SAMPLE		
DATE OF ISSUE	PROJECT No.	DWG. No.	REV.
December 2005	M09234A02	FIG.	



DMS Float

GRAIN SIZE DISTRIBUTION



	HOLE	DEPTH (m)	D85	D60	D50	D15	D10	CU	%GRAVEL	%SAND	%FINES
●	DMS Float	0.00	7.108	4.289	3.389	1.268	1.059	4.050	35.7	64.1	0.2

	HOLE	SAMPLE	DEPTH (m)	W%	W _L	W _P	PI	REMARKS / SAMPLE DESCRIPTION
●	DMS Float		0.00					

CU = COEFFICIENT OF UNIFORMITY = D60/D10 PARTICLE SIZES, e.g. D85, in mm Tested by Wet Sieving Method (ASTM D1140 & D422)



PROJECT NO.: M09234A02

PROJECT: Wolverine - DMS Float

LOCATION: Yukon

FIGURE:

DRAWN BY: GG

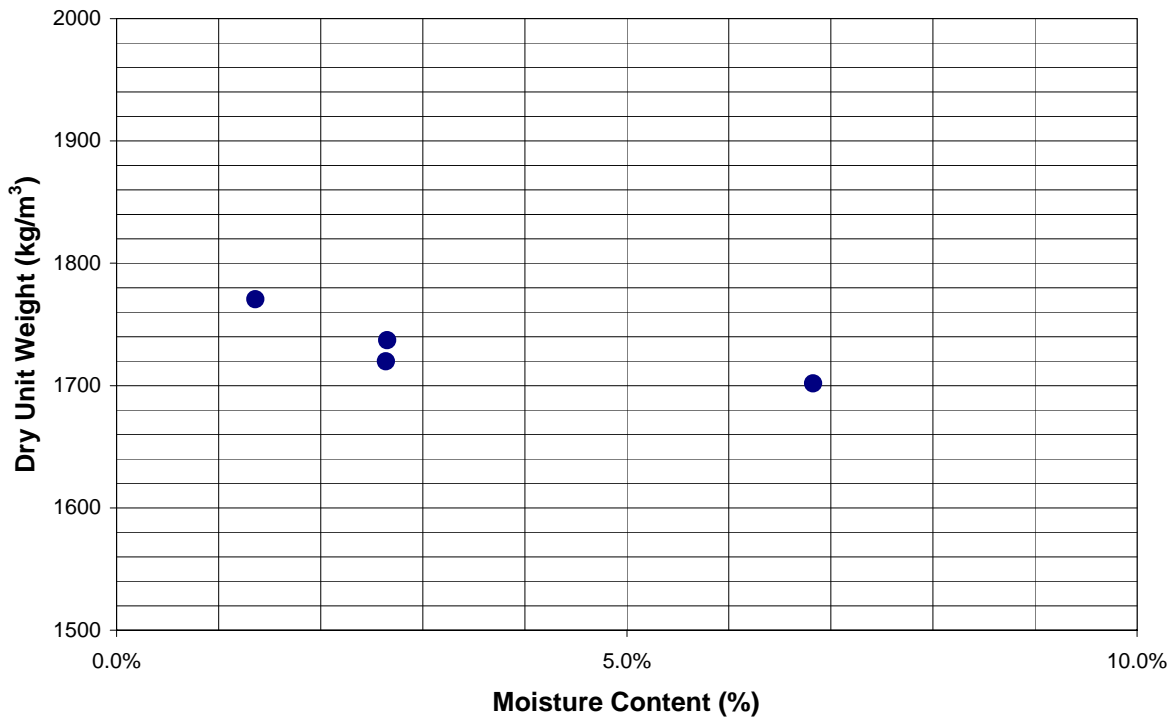
CHECKED BY:

STANDARD PROCTOR COMPACTION TEST (ASTM D698, Method B)

Sample Description: DMS Floats

TRIAL NUMBER	1	2	3	4	5	6
Unit Weight Determination						
Wet Wt. Sample & Mold (g)	5930	5902	5919	5952		
Weight of Mold (g)	4230	4230	4230	4230		
Wet Wt. of Sample (g)	1700	1672	1689	1722		
Volume of Mold (cm ³)	947.26	947.26	947.26	947.26		
Wet Unit Wt. (kg/m ³)	1794.6	1765.1	1783.0	1817.9		
Dry Unit Wt. (kg/m ³)	1770.5	1719.7	1737.0	1701.7		
Moisture Content Determination						
Container No.	4	2	4	3		
Wet Wt. Sample & Tare (g)	361.40	342.55	504.00	428.57		
Dry Wt. Sample & Tare (g)	358.10	336.18	493.71	408.54		
Wt. of Water (g)	3.3	6.37	10.29	20.03		
Tare Container (g)	115.84	94.78	105.78	115.15		
Dry Wt. of Soil (g)	242.26	241.4	387.93	293.39		
Moisture Content (%)	1.4%	2.6%	2.7%	6.8%		

Proctor Compaction Test



Klohn Crippen Berger

JOB NO.:	M09234A02
PROJECT:	Wolverine - DMS Float
LOCATION:	
DATE:	16-Dec-05
TESTED BY:	GG
CHECKED BY:	

Constant Head Permeability Test using Open Top Permeameter (ASTM D2434-68)

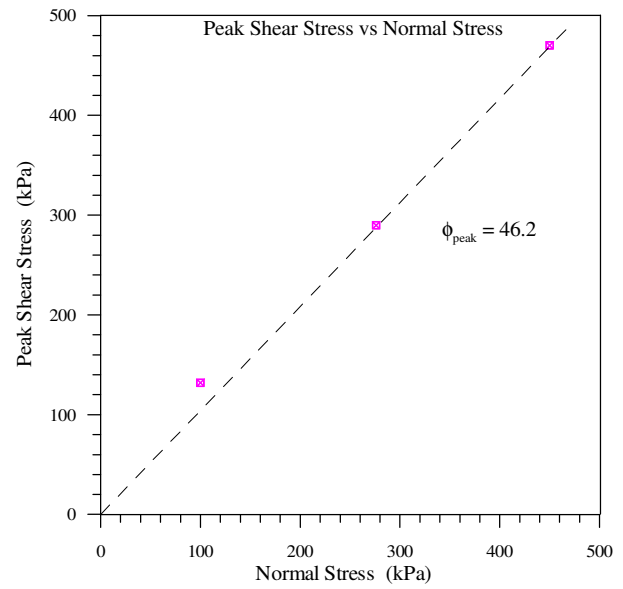
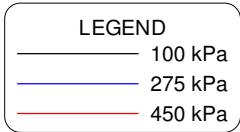
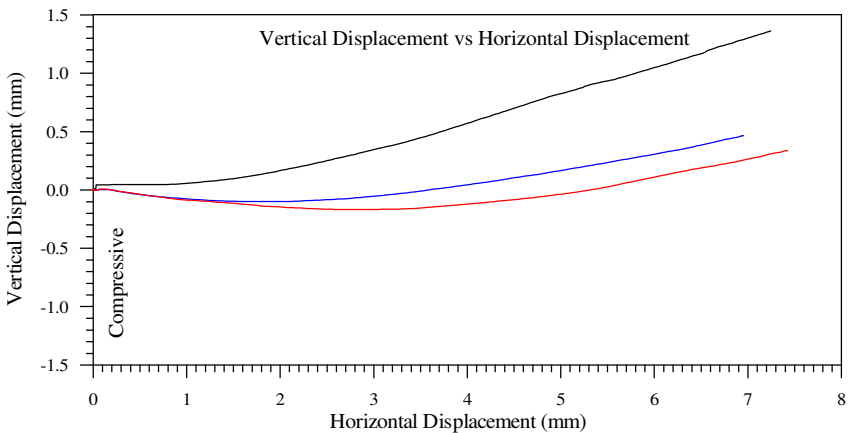
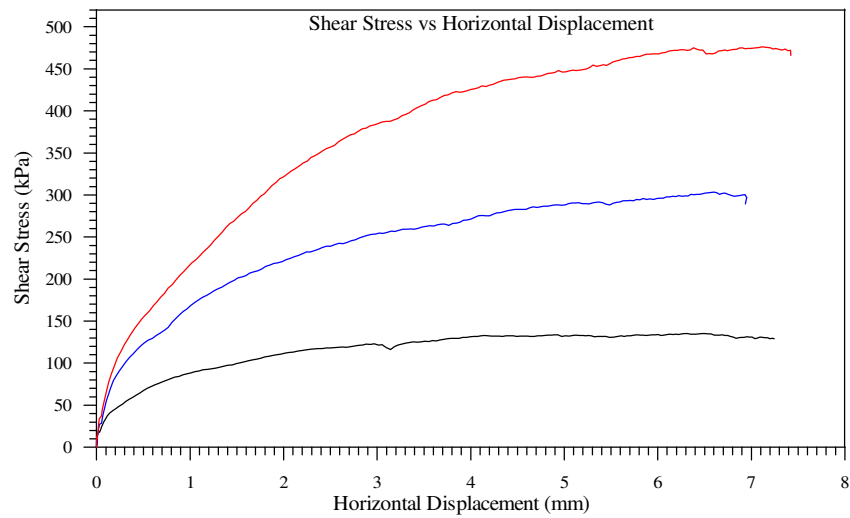
PROJECT NO. : M09234A02
 PROJECT : Wolverine Project
 SAMPLE : DMS Float
 DRY DENSITY: 1656 kg/m³ (hand tamping in 3 layers x 10 stokes)
 DATE : December 22, 2005
 TEST BY: Ganan Gananathan

1st HEAD			1	2	3	4	5	6	7
Determination No.:									
Elapsed Time		minutes							
Quantity of Discharge	Q	cm ³	1060	1079	1082	1071	1072	1080	
Specimen Full Length	L	cm	20	20	20	20	20	20	
Distance between Manometers	d	cm							
Area of Specimen *	A	cm ²	188.7	188.7	188.7	188.7	188.7	188.7	
Time of Discharge	t	sec	40.5	42	42.2	42.6	43.4	46	
Constant Head	H	cm	8	8	8	8	8	8	
Manometer Head Difference	h	cm							
Discharge Rate	Q/t	cm ³ /sec	26.2	25.7	25.6	25.1	24.7	23.5	
Turbidity			Cloudy	Clear	Clear	Clear	Clear	Clear	
Coef. of Permeability **	k=QL/AtH	cm/sec	3.5E-01	3.4E-01	3.4E-01	3.3E-01	3.3E-01	3.1E-01	

2nd HEAD			1	2	3	4	5	6	7
Determination No.:									
Elapsed Time		minutes							
Quantity of Discharge	Q	cm ³	1076	1037	1071	1074	1081		
Specimen Full Length	L	cm	20	20	20	20	20		
Distance between Manometers	d	cm							
Area of Specimen *	A	cm ²	188.7	188.7	188.7	188.7	188.7		
Time of Discharge	t	sec	52.7	50.9	52.9	54.0	54.9		
Constant Head	H	cm	7	7	7	8	8		
Manometer Head Difference	h	cm							
Discharge Rate	Q/t	cm ³ /sec	20.4	20.4	20.2	19.9	19.7		
Turbidity			Clear	Clear	Clear	Clear	Clear		
Coef. of Permeability **	k=QL/AtH	cm/sec	3.1E-01	3.1E-01	3.1E-01	2.6E-01	2.6E-01		

3rd HEAD			1	2	3	4	5	6	7
Determination No.:									
Elapsed Time		minutes							
Quantity of Discharge	Q	cm ³							
Specimen Full Length	L	cm							
Distance between Manometers	d	cm							
Area of Specimen *	A	cm ²							
Time of Discharge	t	sec							
Constant Head	H	cm							
Manometer Head Difference	h	cm							
Discharge Rate	Q/t	cm ³ /sec							
Turbidity									
Coef. of Permeability **	k=QL/AtH	cm/sec							

Remarks: Specimen diameter = 15.5 cm



Note 1.
Sample was prepared by hand compaction.

Test Procedure:
 - mixed a loose sample of DMS floats;
 - placed sample in shear box, in layers, by hand, firmly pressing the soil into the corners and along the edges;
 - consolidated sample at 14, 28, 56, 276 and 450 kPa normal loads,
 - conducted a single point shear test at 450 kPa normal load; shear rate at 0.08 mm/min.

SPECIMEN INFORMATION	UNITS	DATA		
TEST SAMPLE	-	DMS Floats		
INITIAL SPECIMEN HEIGHT	mm	45.0	44.5	45.5
SPECIMEN CROSS SECTION	mm-mm	100 x 100	100 x 100	100 x 100
STRAIN RATE	mm/min	0.08	0.08	0.08
INITIAL DRY DENSITY	kg/m ³	1584	1568	1587
CONSOLIDATION STRESS	kPa	100	276	450
- AFTER CONSOLIDATION	-	-	-	-
DRY DENSITY	kg/m ³	1598	1596	1722
PEAK SHEAR STRENGTH	kPa	132	290	470

TO BE READ WITH KLOHN-CRIPPEN REPORT DATED _____

KLOHN CRIPPEN		DATE
DESIGNED		
DRAWN	Ganan	Jan '06
TESTED	Ganan	Jan '06
CHECKED		
RECOMMENDED		
APPROVED		


 Klohn Crippen Berger

 Yukon Zinc
 CORPORATION

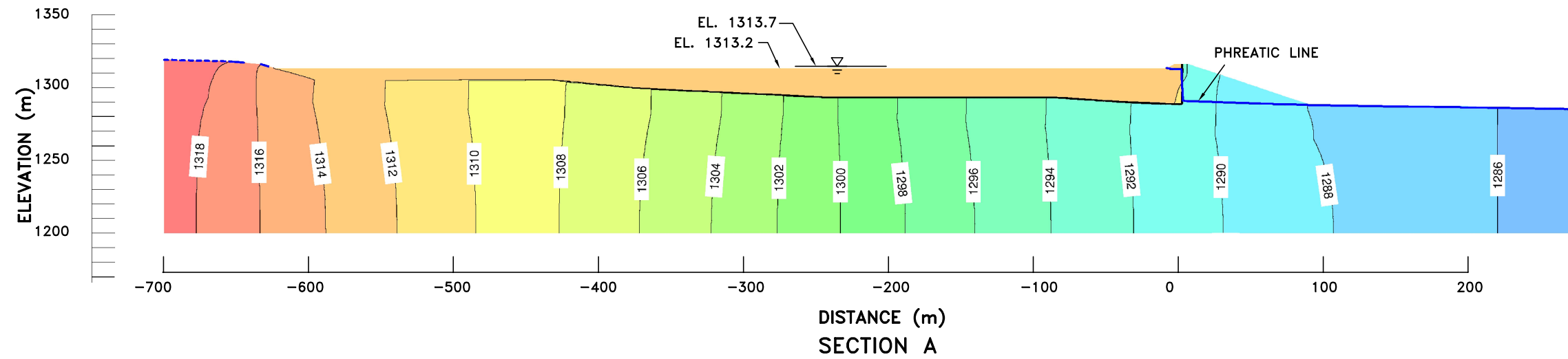
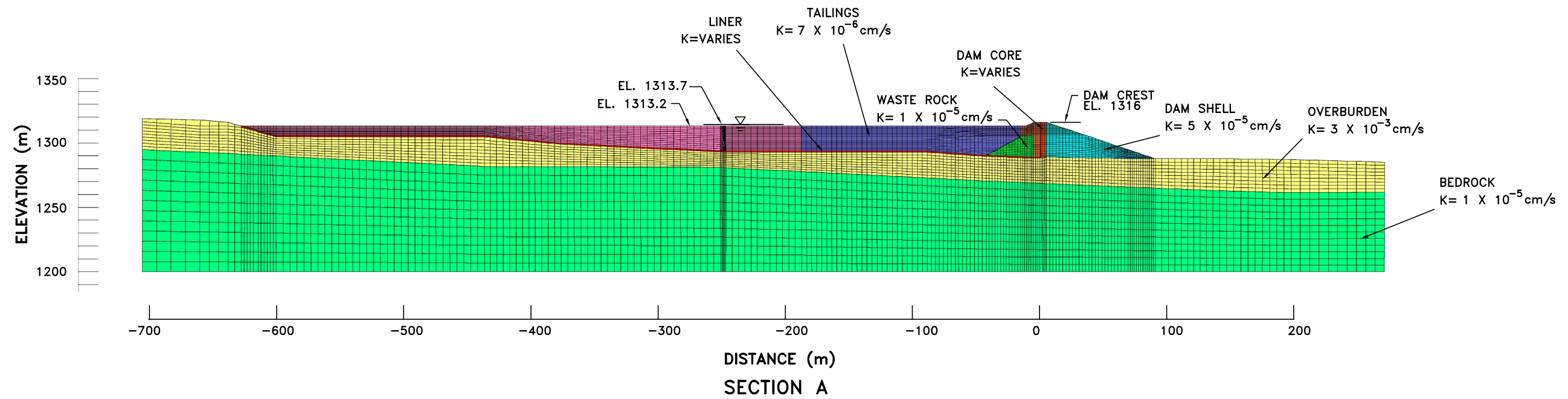
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PROJECT	WOLVERINE TAILINGS IMPOUNDMENT		
TITLE	Direct Shear Test on DMS Float		
DATE OF TEST	PROJECT NO.	FIG No.	REV.
January, 2006	M09234A02		

Part II

Seepage Analysis

- **Typical Seepage Analysis Section**



M:\0923402 - Wolverine Feasibility Design & Enviro. Assess\400 Design\410 Drawings\Feasibility-Study\Fig7.7.2.dwg (cwong)

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-----	M0923402	-----	A

WOLVERINE PROJECT
 ULTIMATE TAILINGS DAM -
 SEEPAGE ANALYSIS FOR



Part III
Field Investigations

PART III – FIELD INVESTIGATIONS

PHASE 1

Test Holes: - TH05-1 to TH05-4
- TH05-6

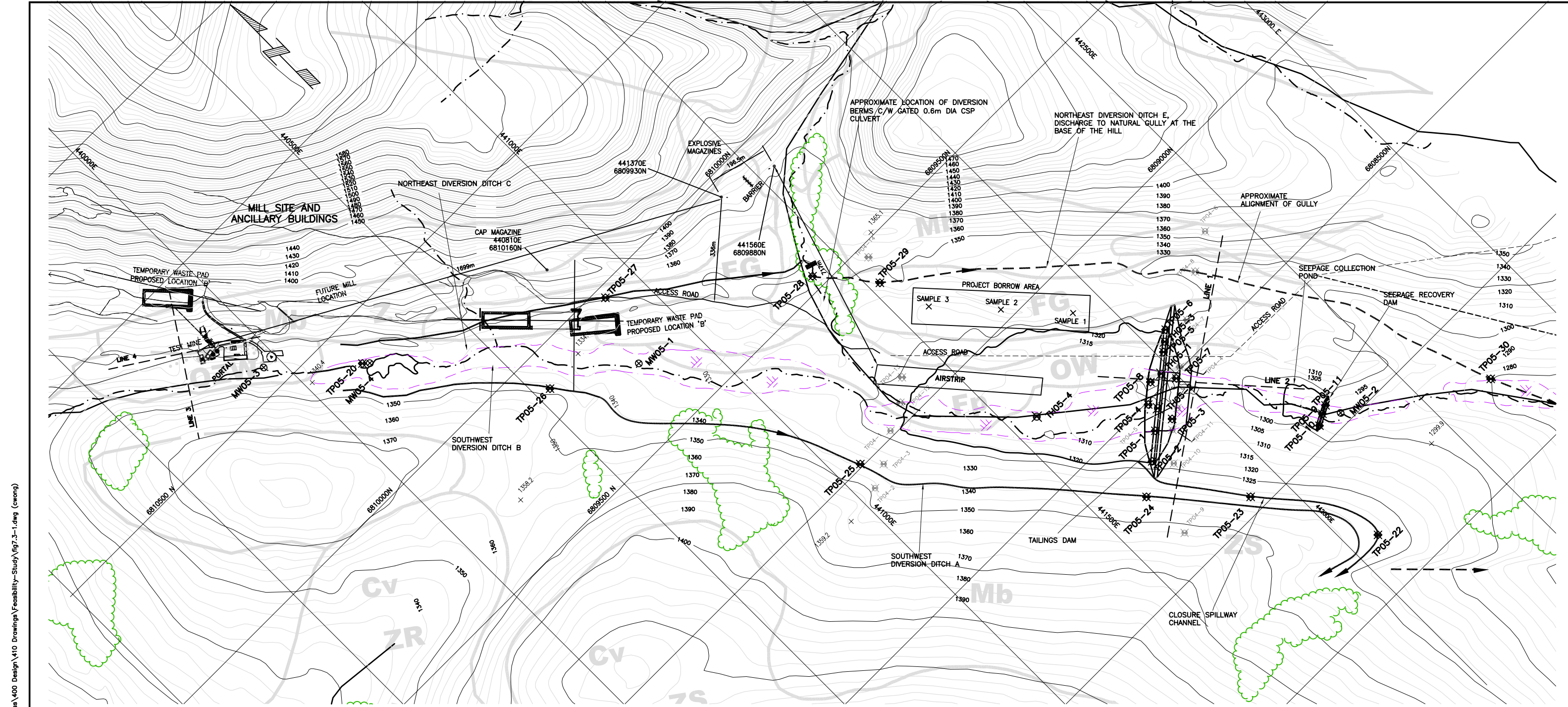
Test Pits: - TP05-1 to TP05-11
- TP05-22 to TP05-30

PHASE 2

Test Holes: - TH05-7 to TH05-12

Test Pits: - TP05-71 to TP05-86
- TP05-91 to TP05-97

MONITORING WELLS - MW05-1(A,B) to MW05-7(A,B)



LEGEND

TH05-1 TEST HOLE

TP05-1 TEST PIT

MW05-1 MONITORING HOLE

--- MULTI-ELECTRODE RESISTIVITY SURVEY LINE

DIVERSION DITCH

TP05-20	440179E	6810366N
TP05-22	442093E	6807676N
TP05-23	441890E	6808051N
TP05-24	441654E	6808287N
TP05-25	441080E	6809010N
TP05-26	440548E	6809884N
TP05-28	441397E	6809544N
TP05-29	441535E	6809376N
TP05-30	442702E	6807776N

SEEPAGE DAM

TP05-9	442241E	6808076N
TP05-11	442268E	6808088N
TP05-10	442208E	6808056N

TAILINGS DAM

TH05-1	441966E	6808534N
TH05-2	441881E	6808462N
TH05-3	442048E	6808597N
TH05-4	441587E	6808717N
TH05-5	442021E	6808577N
TH05-7	441990E	6808488N
TP05-1	441824E	6808417N
TP05-2	441748E	6808355N
TP05-3	441889E	6808406N
TP05-4	441867E	6808492N
TP05-6	442077E	6808622N
TP05-8	441923E	6808538N

MW05-1	440806E	6809740N
MW05-2	442285E	6808037N

NOTE

1. DAM OUTLINE SHOWN HAS BEEN SUPERCEDED.



Scale: 1=40FPS
Drawing File: M:\09234A02-Wolverine Feasibility Design & Enviro. Assess\400 Design\410 Drawings\Facility-Study\Fig7.3-1.dwg (c-wong)
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FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
	M09234A02		A
	FIG. 7.3.1		

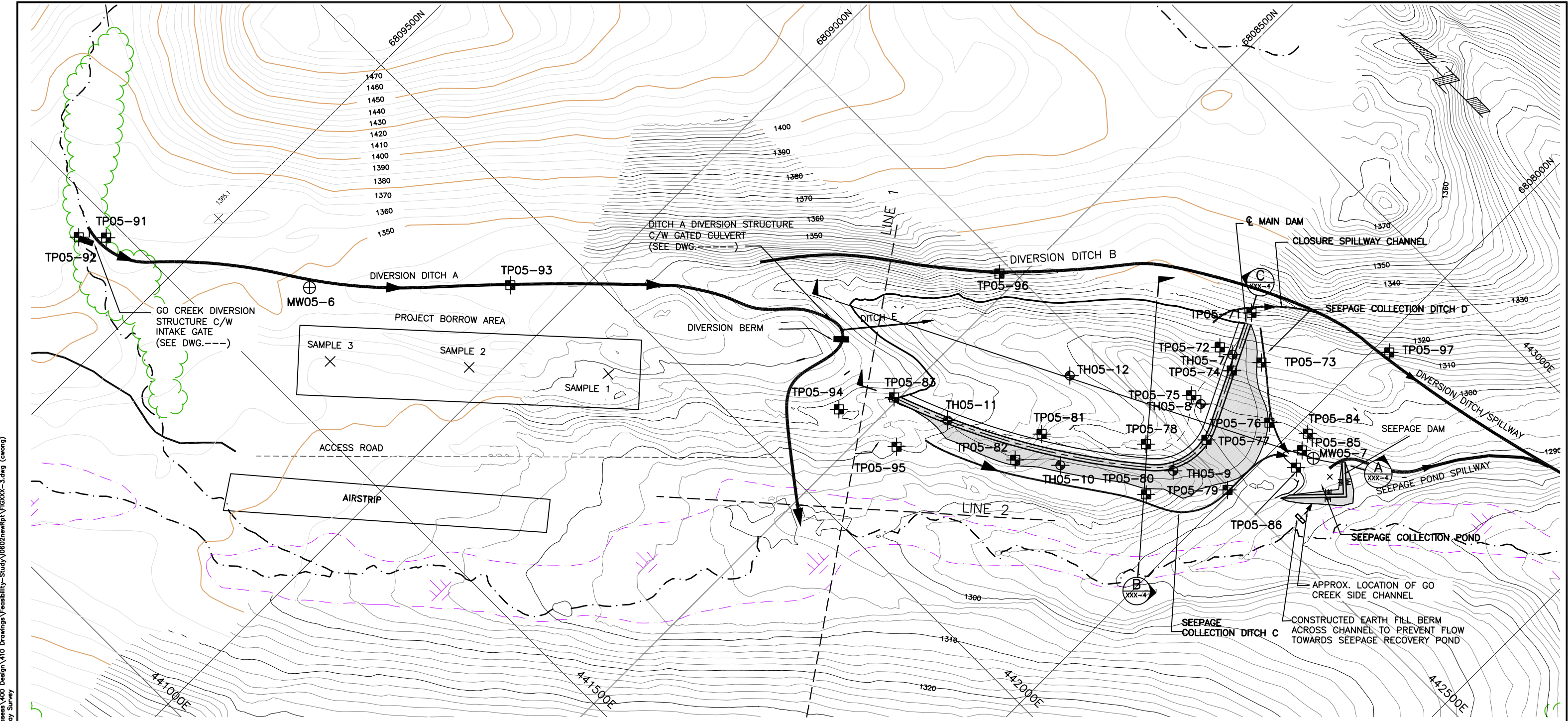
Yukon Zinc CORPORATION

WOLVERINE PROJECT

SITE INVESTIGATION PLAN - PHASE 1

FOR ALTERNATE TAILINGS IMPOUNDMENT SITE

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LEGEND

- ⊕ TH05-1 TEST HOLE
- ⊕ TP05-1 TEST PIT
- ⊕ MW05-1 MONITORING WELL
- MULTI-ELECTRODE RESISTIVITY SURVEY LINE

DIVERSION DITCHES			TAILINGS DAM					
TP05-91	-	441475E, 6809620N	TP05-71	-	442732E, 6808187N	TH05-7	-	442686E, 6808164N
TP05-92	-	441443E, 6809653N	TP05-72	-	442654E, 6808183N	TH05-8	-	442583E, 6808114N
TP05-93	-	441893E, 6809089N	TP05-73	-	442685E, 6808116N	TH05-9	-	442479E, 6808092N
TP05-94	-	442134E, 6808558N	TP05-74	-	442641E, 6808142N	TH05-10	-	442346E, 6808238N
TP05-95	-	442158E, 6808446N	TP05-75	-	442564E, 6808160N	TH05-11	-	442248E, 6808417N
TP05-96	-	442481E, 6808529N	TP05-76	-	442324E, 6808036N	TH05-12	-	442444E, 6808326N
TP05-97	-	442847E, 6807978N	TP05-77	-	442529E, 6808090N			
			TP05-78	-	442453E, 6808156N			
			TP05-79	-	442495E, 6808007N	MW05-6	-	441655E, 6809322N
			TP05-80	-	442395E, 6808097N	MW05-7	-	442643E, 6807941N
			TP05-81	-	442343E, 6808291N			
			TP05-82	-	442281E, 6808291N			
			TP05-83	-	442212E, 6808507N			

SEEPAGE DAM		
TP05-84	-	442656E, 6807979N
TP05-85	-	442629E, 6807966N
TP05-86	-	442602E, 6807952N



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.					SECTION:		FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
					SCALE:		DATE:	M09234A02	XXX-3	A
DWG. NO.			REFERENCE DRAWINGS			DESIGN BY: RLO	DATE: ---	 Yukon Zinc Corporation WOLVERINE PROJECT TAILINGS FACILITY SITE INVESTIGATION PLAN		
PROJECT			DESCRIPTION			DRAWN BY: CYW	DATE: ---			
NO			ISSUE/REVISIONS			CHECK BY: ---	DATE: ---			
NO			BY DATE			APP. BY: HM	DATE: ---			



Phase 1



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-1

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 5/17/2005 FINISHED: 5/18/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442284.6m N 6808037.2m	GROUND ELEVATION: 1304.9 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 32.61 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: MSR	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a) = axial; (d) = diametrical	TEMPERATURE	FIELD/LAB DATA							
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %					
					Dip Angle			30	60				CORE RECOVERY %	R.Q.D. %				
									0	6	12	25	50	75	5	10	15	
0.6			FILL consisting of sand, gravel and cobbles.															
0.804-3			TOPSOIL.															
1.304.1			- Peat, organics.															
2			SILT-SAND-GRAVEL-COBBLE, mostly low to medium plastic silt, sandy and gravelly, fine to coarse sand and gravel, silty/clayey sand matrix, occasional boulders, angular to subangular gravel, grey to green, moist (TILL-LIKE).															
3			- All gravel and cobbles are chloritic ryolite.															
4			- Very poor core recovery.															
5																		
6																		
7																		
8			- Brown clay and rock fragments between 7.45 m and 7.60 m depth.															
9																		
10																		
11																		
12			- Clay, greenish grey, medium plastic and rock fragments between 11.45 m and 11.73 m depth.															
12.2			ARGILLITE, siliceous, moderately weathered, foliated at 80 degrees from core axis.															
1.292.7			- Foliation was poorly bonded (break easily under finger pressure), with calcite veins throughout.															
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

KC: ROCK-S@4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 28/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK

CORE LOSS
 FRACTURED/BROKEN CORE
 DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-1

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (d)=diametrical	TEMPERATURE	FIELD/LAB DATA						
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N ● CORE RECOVERY %	WATER CONTENT % ○ R.Q.D. %				
					Dip Angle								0	6	12	25	50
			(continued from previous page)														
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	
31																	
32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
41																	
42																	
43																	
44																	
45																	

- Joints infilled with sand and rock fragments, with some shattered sections between 25.7 m and 26.1 m depth.
 - Fault gouge - silty sand and angular rock fragments between 26.2 m and 26.8 m depth.

32.6
1,272.3
End of Hole at: 32.6 m

Notes:

- Piezometer stickup lengths are as follows:
 - TH05-1A = 0.30 m;
 - TH05-1B = 1.72 m.
- Water levels measured in piezometers TH05-1A and B after installation were 31.85 m and 1.20 m, respectively.

KC_ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17, 2011 ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-2

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 6/1/2005 FINISHED: 6/5/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 441875m N 6808453m	GROUND ELEVATION: 1304.5 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 31.1 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a) = axial, (b) = diametrical	TEMPERATURE	FIELD/LAB DATA							
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %					
					Dip Angle			30	60		CORE RECOVERY %	R.Q.D. %						
									0	6	12	25	50	75	5	10	15	
1			TOPSOILS. - Peat and organics.															
2			- Peat, saturated, with coarse sand in clay matrix between 1.8 m and 2.4 m depth.															
3			2.4 1,302.1 SAND, coarse, some gravel, greenish grey.															
4			3.5 1,301.0 GRAVEL, fine to coarse, sandy, with clay/mud, very dense, green.															
5			4.4 1,300.1 5.0 1,299.5 - Encountered obstruction during drilling at about 3.5 m depth. Drilled with tricone bit from 3.5 m to 3.7 m depth.															
6			CLAY and COBBLES.															
7		1	SILT-SAND-GRAVEL-COBBLE, mostly fine to coarse gravel, some silt to silty, low plastic silt, trace to some sand, flat, angular to subrounded gravel, yellow to grey, moist.															
8			- Boulder sized clasts of light green metavolcanic rocks recovered.															
9																		
10		2																
11																		
12																		
13		3																
14																		
15																		
16		4																
17																		
18																		
19		5																
20																		

KC_ROCK-SI@4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK.LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

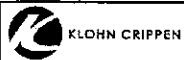


GEOLOGIC LOG OF DRILL HOLE NO.: TH05-2

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (d)=diametrical	TEMPERATURE	FIELD/LAB DATA		
					10-6	10-4	10-2				SPT/LPT N	WATER CONTENT %	R.Q.D. %
			(continued from previous page)										
							SEE BOTTOM OF FORM FOR CODES						
							Dip Angle						
							30 60						
										0 6 12		25 50 75	5 10 15
21													
22													
23													
24			23.5 1,281.0 ARGILLITE, moderately weathered, foliated, with three quartz veins 15 cm to 20 cm thick.										
25													
26													
27													
28												75	10
29													
30													
31			31.1 1,273.4 End of Hole at: 31.1 m										
32													
33			Notes:										
34			1. Piezometer stickup lengths are as follows:										
35			- TH05-2A = 0.66 m;										
36			- TH05-2B = 0.66 m.										
37			2. Water levels measured in piezometers TH05-2A and B after installation were artesian.										
38			3. Shelby tube sampling was conducted between the ground surface and 5.0 m depth.										
39													
40													
41													
42													
43													
44													
45													

KC ROCK-SIG WOLVERINE TEST HOLES - NOV 17 GPJ ROCK-LOG.GDT 2/6/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-3

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 5/18/2005 FINISHED: 5/23/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 441889.9m N 6808405.5m	GROUND ELEVATION: 1315 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 39.17 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HQ Core ROCK: HQ Core
LOGGED BY: MSR	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)-axial; (d)-diametrical	TEMPERATURE	FIELD/LAB DATA					
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %			
					Dip Angle		CORE RECOVERY %		R.Q.D. %							
										0 6 12	25 50 75	5 10 15				
1			SILT-SAND-GRAVEL-COBBLE, mostly fine to coarse gravel, some sand to sandy, some silt, low to medium plastic silt, silt-sand-gravel matrix, some cobbles, flat and elongated, angular to subrounded gravel, grey to light brown, moist (TILL-LIKE).													
2		1	- LPT N = 32 blows at 1.83 m depth.													
3																
4		2	- LPT N = 39 blows at 3.66 m depth.													
5																
6		3	- LPT N = 28 blows at 6.10 m depth.													
7		4														
8																
9		5	- LPT N = 58 blows at 8.23 m depth. Till-like overburden, silty fine sand matrix with gravel, cobbles and weather rock fragments, light brown.													
10			- Mostly silt and sand, medium to high plastic silt, fine to coarse sand, with trace gravel, grey at 8.86 m depth.													
11																
12		6	- LPT N = 17 blows at 11.28 m depth. Gravel and rock fragments (1 cm to 5 cm size) with trace silt and sand. Note: no soil matrix; 3 cm thick quartz veins, with black clay at end of SPT sampler.													
13																
14																
15		7	- Mostly fine to medium gravel with trace sand and silt at 14.33 m depth. - LPT N = 19 blows at 14.73 m depth.													
16																
17																
18		8	- Encountered fine to coarse sand with trace gravel and silt (till-like) between 17.37 m and 17.83 m depth. - LPT N = 24 blows at 17.37 m depth. Fine to coarse sand with trace gravel and silt (till-like).													
19																
20																

KC ROCK-SIG-4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 28/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISSY J: JOINT M: SCHISTY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-3

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA SEE BOTTOM OF FORM FOR CODES	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)-axial; (d)-diametrical	TEMPERATURE	FIELD/LAB DATA											
					10-6	10-4	10-2				Dip Angle 30 60		SPT/LPT N ● CORE RECOVERY %			WATER CONTENT % ○ R.Q.D. %						
(continued from previous page)																						
21		9	- Till-like overburden mostly gravel, with clayey/silty fine sand matrix, and fine to coarse gravel, light brown, between 20.42 m and 26.97 m depth. - LPT N = 62 blows over first 6.5" at 20.42 m depth. - LPT N = 75 blows over first 6.5" at 23.47 m depth. - LPT N > 100 blows at 26.52 m depth.																			
22		10																				
23																						
24																						
25																						
26																						
27																						
28																						
28.4																						
29			1,286.7 ARGILLITE, highly weathered, black.																			
30																						
31																						
32																						
33																						
34																						
35																						
36																						
37																						
38																						
39		11	39.2 1,275.8 - Mostly fine to coarse gravel at 38.71 m depth. End of Hole at: 39.2 m																			
40																						
41																						
42																						
43																						
44																						
45																						

Notes:

- The SPT/LPT N values indicated are the field measured LPT N values.
- Piezometer stickup length is as follows:
- TH05-3A = 0.05 m;
- Water levels measured in piezometer TH05-3A after installation was 30.51 m.

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC: ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17 GPJ ROCK-LOG.GDT 2/8/06



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-4

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 5/18/2005 FINISHED: 5/19/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 441867.4m N 6808492.4m	GROUND ELEVATION: 1312 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 23.49 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: MSR	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA SEE BOTTOM OF FORM FOR CODES	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)-axial; (c)-circular	TEMPERATURE	FIELD/LAB DATA											
					10-6	10-4	10-2				Dip Angle 30 60	SPT/LPT N ● CORE RECOVERY %	WATER CONTENT % ○ R.Q.D. %									
														0	6	12	25	50	75	5	10	15
1			SILT-SAND-GRAVEL-COBBLE, silty fine sand matrix with coarse gravel, cobbles and occasional boulders (TILL-LIKE). - Most soil matrix washed out during drilling.																			
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						
17																						
17.3																						
17.3-18			ARGILLITE, siliceous, moderately weathered, foliated at 80 degrees from core axis. - Foliation was poorly bonded (breaks easily under finger pressure), with calcite veins throughout.																			
18																						
19																						
20																						

KC: ROCK-SIG@A WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

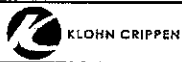


GEOLOGIC LOG OF DRILL HOLE NO.: TH05-4

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY (continued from previous page)	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONT- INUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a) =axial; (d) =diametrical</small>	TEMPERATURE	FIELD/LAB DATA		
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N ● CORE RECOVERY %	WATER CONTENT % ○ R.Q.D. %
					Dip Angle 30 60		0 6 12	25 50 75					
21													
22													
23													
24			23.5 1,288.5 End of Hole at: 23.5 m										
25			Notes:										
26			1. No piezometer installation in TH05-4.										
27			2. SPT or LPT testing was not conducted in TH05-4.										
28													
29													
30													
31													
32													
33													
34													
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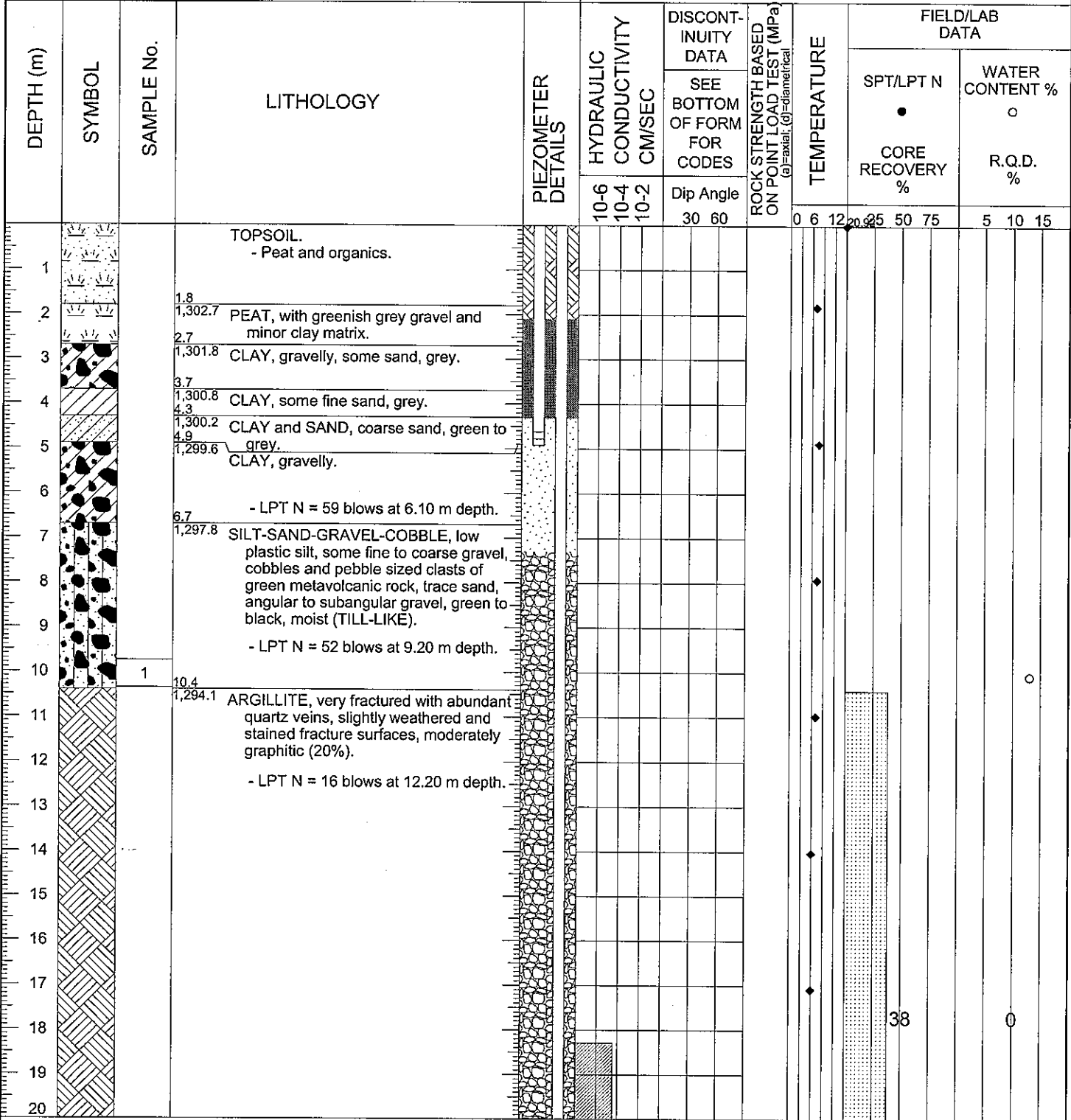
KC ROCK-9104 WOLVERINE TEST HOLES - NOV 17 GPJ ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-6

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 6/5/2005 FINISHED: 6/8/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 441882m N 6808396m	GROUND ELEVATION: 1304.5 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 31.1 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: EA	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:



KC:ROCK-SI@4 WOLVERINE TEST HOLES - NOV 17 09 1 ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHISTTY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-6

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)-axial; (d)-diametrical	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	Dip Angle 30 60	SPT/LPT N			WATER CONTENT %			
													CORE RECOVERY %			R.Q.D. %			
			(continued from previous page)																
21																			
22																			
23																			
24																			
25			25.0 1,279.5 QUARTZ, mostly quartz veins.																
26																			
27																			
28																			
29																			
30																			
31			31.1 1,273.4 End of Hole at: 31.1 m																
32																			
33																			
34																			
35																			
36																			
37																			
38																			
39																			
40																			
41																			
42																			
43																			
44																			
45																			

Notes:

- The SPT/LPT N values indicated are the field measured LPT N values.
- Piezometer stickup length is as follows:
 - TH05-6A = 0.67 m;
 - TH05-6B = 1.10 m;
- Water levels measured in piezometer TH05-6A and B after installation were 29.00 m and 5.79 m, respectively.
- Shelby tube sampling was conducted between the ground surface and 5.8 m depth.

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/06

TEST PIT LOG

				Su - kPa								
				20	60	100	140	180				
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005 FINISHED: 5/25/2005		VANE PEAK REMOLD		FIELD	LAB	▲ UC/2	△ P.PEN/2	
				EXCAVATOR TYPE: Hand Digging		◆	■					
				GROUND ELEV. (m): 1307.5		* % FINES						
				COORDINATES (m): N 6808416.8 E 441824		W _p %	W%	W _L %				
				DESCRIPTION OF MATERIALS		x	o	x				
		20	40	60	80							
0.5		Grab1	▨	0.10	Organics and moss, black, moist.							
			▨	1307.4	Clay, frozen.							
1.0		Grab2	▨	1307.3	Peat, black, moist.							
			▨	1.20	End of Hole at 1.20 m.							
1.5				1306.3	NOTES: a) Samples were taken at 0.10 m and 1.0 m depths. b) Water to top of hole.							
2.0												
2.5												
3.0												
3.5												
4.0												
4.5												
5.0												



KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 26/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02
PROJECT: Wolverine FD and EA
LOCATION: Wolverine Lake
LOGGED BY: MR/RB/EACHECKED BY:
SHEET 1 OF 1 HOLE NO.: TP05-01

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005		FINISHED: 5/25/2005			VANE PEAK		FIELD		LAB		UC/2		
				EXCAVATOR TYPE: Hand Digging						REMOLD		◇		□		▲ P.PEN/2	
				GROUND ELEV. (m): 1320.0						* % FINES							
				COORDINATES (m): N 6808354.7 E 441747.8						W _P %		W%		W _L %		X	
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS		X		O		X					
0.5		Grab1	 0.20 1319.8 0.30 1319.7	Organics and black organic-rich mud.													
			 0.75 1319.3	Sand and gravel.													
				Gravel, fine to medium, silty, medium plastic silt, some sand to sandy, fine to coarse sand, grey, moist, frozen.													
1.0				End of Hole at 0.75 m.													
1.5																	
2.0																	
2.5																	
3.0																	
3.5																	
4.0																	
4.5																	
5.0																	

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/08



KLOHN CRIPPEN

PROJECT NO.: M09234A02
 PROJECT: Wolverine FD and EA
 LOCATION: Wolverine Lake
 LOGGED BY: MR/RB/EACHECKED BY:
 SHEET 1 OF 1 HOLE NO.: TP05-02

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005		FINISHED: 5/25/2005			VANE PEAK		FIELD		LAB		UC/2		
				EXCAVATOR TYPE: Hand Digging		GROUND ELEV. (m): 1304.5		COORDINATES (m): N 6808405.5 E 441889.9		REMO		* % FINES		W _p %		W _L %	
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS											
0.5		Grab1	Organics.	0.30													
			1304.2	Peat, trace silt, soft, dark brown to black (swamp).													
1.0		Grab2	1.00	1303.5	End of Hole at 1.00 m.												
NOTES:																	
a) Water to top of pit.																	

KC_TEST_PIT-SI TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02
PROJECT: Wolverine FD and EA
LOCATION: Wolverine Lake
LOGGED BY: MR/RB/EACHECKED BY:
SHEET 1 OF 1 HOLE NO.: TP05-03

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005 FINISHED: 5/25/2005		INSTRUMENT	DETAILS	Su - kPa										
				EXCAVATOR TYPE: Hand Digging	GROUND ELEV. (m): 1304.5			20	60	100	140	180	VANE	FIELD	LAB	UC/2	P.PEN/2	
				COORDINATES (m): N 6808492.4 E 441867.4				* % FINES										
				DESCRIPTION OF MATERIALS				W _p %	W%	W _L %								
								x	o	x								
								20	40	60	80							
		Grab1			Peat and organics, black, moist.													
				0.15	Clay, frozen.													
				1304.4														
0.5				0.35	Peat.													
				1304.2														
1.0				1.00	Clay.													
				1303.5														
				1.10														
				1303.4														
					End of Hole at 1.10 m.													
1.5																		
2.0																		
2.5																		
3.0																		
3.5																		
4.0																		
4.5																		
5.0																		

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ_KC_DATA.GDT 26/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MR/RB/EACHECKED BY:

SHEET 1 OF 1 **HOLE NO.:** TP05-04

TEST PIT LOG

				Su - kPa					
				20	60	100	140	180	
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/20/2005		FINISHED: 5/20/2005			
				EXCAVATOR TYPE: 420D Cat Backhoe					
				GROUND ELEV. (m): 1321.0					
				COORDINATES (m): N 6808622.4 E 442076.6					
				DESCRIPTION OF MATERIALS					
				INSTRUMENT	DETAILS				
				VANE PEAK REMOLD		FIELD	LAB		▲ UC/2 △ P.PEN/2
				* % FINES					
				W _p %	W%	W _L %			
				x	o	x			
				20	40	60	80		
0.5			0.10	Peat, frozen.					
1.0			1320.9	Silt-Sand-Gravel-Cobble, mostly fine to coarse gravel, silty, some fine to medium sand, sandy silt/clay matrix, subrounded to subangular gravel, green to grey (TILL-LIKE).					
1.5		Grab1						o	
2.0									
2.5									
3.0									
3.5			3.30	End of Hole at 3.30 m.					
4.0			1317.7						
4.5									
5.0									

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ_KC_DATA.GDT_2606



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-06

TEST PIT LOG

				Su - kPa							
				20	60	100	140	180			
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/21/2005 FINISHED: 5/21/2005		VANE		FIELD	LAB	UC/2	
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK		◆	■	▲	P.PEN/2
				GROUND ELEV. (m): 1304.5		REMO		◇	□	△	P.PEN/2
				COORDINATES (m): N 6808487.6 E 441990.4		Wp%		W%		W_L%	
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS		* % FINES			
Fill consisting of gravel, cobbles and boulders.											
0.5			▬▬▬▬▬▬▬▬▬▬								
			▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾ ▾▾▾▾▾▾▾▾▾▾	0.60 1303.9	Peat, frozen from 0.6 m to 1.0 m depth.						
1.0			▬▬▬▬▬▬▬▬▬▬								
1.5			▬▬▬▬▬▬▬▬▬▬	1.50 1303.0	Silt-Sand-Gravel-Cobble, mostly fine to coarse gravel, silty, some fine to coarse sand, silty fine sand matrix, occasional boulders, medium dense, flat and elongated gravel, subrounded to subangular gravel and cobble, green, moist (TILL-LIKE).		○				
2.0	Grab1		●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●● ●●●●●●●●●●●●								
2.5			▬▬▬▬▬▬▬▬▬▬	2.50 1302.0	Gravel and Cobble, subangular to subrounded.						
3.0			▬▬▬▬▬▬▬▬▬▬	3.00 1301.5	End of Hole at 3.00 m.						
3.5			▬▬▬▬▬▬▬▬▬▬								
4.0			▬▬▬▬▬▬▬▬▬▬								
4.5			▬▬▬▬▬▬▬▬▬▬								
5.0			▬▬▬▬▬▬▬▬▬▬								

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ_KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-07

TEST PIT LOG

				Su - kPa									
				20	60	100	140	180					
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/21/2005 FINISHED: 5/21/2005		VANE PEAK		FIELD		LAB			
				EXCAVATOR TYPE: 420D Cat Backhoe		REMOLO		* % FINES		▲ UC/2		△ P.PEN/2	
				GROUND ELEV. (m): 1304.5		W _p %		W%		W _L %			
				COORDINATES (m): N 680853.8 E 441923.5		x		o		x			
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS							
			[Symbol: Horizontal dashes]	Fill consisting of gravel, cobbles and boulders.									
0.5			[Symbol: Downward arrows]	0.50	1304.0 Peat, some silt, brown, moist, frozen from 0.5 m to 1.0 m depth.								
1.0			[Symbol: Downward arrows]										
		Grab1	[Symbol: Downward arrows]										
1.5			[Symbol: Downward arrows]										
2.0			[Symbol: Downward arrows]	2.00	1302.5 Gravel, fine to coarse, silty, trace sand, subangular rock fragments, flat gravel, grey, moist.								
2.5			[Symbol: Downward arrows]										
3.0			[Symbol: Downward arrows]										
		Grab2	[Symbol: Downward arrows]										
3.5			[Symbol: Downward arrows]	3.50	1301.0 End of Hole at 3.50 m.								
4.0			[Symbol: Downward arrows]										
4.5			[Symbol: Downward arrows]										
5.0			[Symbol: Downward arrows]										

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake






LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-08

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005 FINISHED: 5/25/2005		Su - kPa					
				EXCAVATOR TYPE: Hand Digging		20	60	100	140	180	
				GROUND ELEV. (m): 1294.0		VANE PEAK	FIELD	LAB	▲ UC/2		
				COORDINATES (m): N 6808076.3 E 442241.3		REMOLD	◇	□	△ P.PEN/2		
				DESCRIPTION OF MATERIALS		* % FINES					
						W _p %	W%	W _L %			
						X	o	X			
						20	40	60			
		Grab1		Peat and organics, black, moist.							
0.5				0.25 1293.8 Clay (mud), frozen.							
				1293.7 Clay, peat, occasional boulders.							
1.0				0.90 1293.1 Clay.							
				1293.0 End of Hole at 1.00 m.							
1.5				NOTES: a) Organic debris throughout the pit. b) Water seeps from top.							
2.0											
2.5											
3.0											
3.5											
4.0											
4.5											
5.0											



KLOHN CRIPPEN

PROJECT NO.: M09234A02
PROJECT: Wolverine FD and EA
LOCATION: Wolverine Lake
LOGGED BY: MR/RB/EACHECKED BY:
SHEET 1 OF 1 HOLE NO.: TP05-09

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06

TEST PIT LOG

				Su - kPa								
				20	60	100	140	180				
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/25/2005 FINISHED: 5/25/2005		VANE FIELD LAB						
				EXCAVATOR TYPE: Hand Digging		PEAK ♦ ■			▲ UC/2			
				GROUND ELEV. (m): 1295.0		REMOLD ◇ □			△ P.PEN/2			
				COORDINATES (m): N 6808056.3		* % FINES						
DESCRIPTION OF MATERIALS				W _p %		W%		W _L %				
				x	o	x						
				20	40	60	80					
0.5		Grab1	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); margin-right: 5px;"></div> <div> <p>0.10 Organics.</p> <p>1294.9 Gravel, fine to coarse, some sand, some silt, occasional cobbles/boulders, flat and elongated, angular to subrounded clasts, yellow, moist, abundant organics.</p> <p>0.40</p> <p>1294.6</p> </div> </div>									
1.0			End of Hole at 0.40 m.									
NOTES:												
a) Heavy water seepage at 5 cm depth.												



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MR/RB/EACHECKED BY:	
SHEET 1 OF 1	HOLE NO.: TP05-10

KC_TEST_PIT-SI_TESTPITS20_JUN05 KC_DATA.GDT 2/6/06

TEST PIT LOG

				Su - kPa				
				20	60	100	140	180
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/20/2005 FINISHED: 5/20/2005		VANE FIELD LAB		
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK ◆ ■	▲ UC/2	
				GROUND ELEV. (m): 1294.5		REMO ◇ □	△ P.PEN/2	
				COORDINATES (m): N 6808088.5 E 442267.5		* % FINES		
DESCRIPTION OF MATERIALS				W _p %	W%	W _L %		
				x - - - - - o - - - - - x				
				20	40	60	80	
0.5			Peat, frozen.					
			0.25 1294.3	Sand and Gravel, fine to coarse, trace silt and clay, flat, angular to subangular, yellow to grey, moist.				
1.0		Grab1						
1.5								
2.0								
2.5								
3.0								
3.5			3.30 1291.2	End of Hole at 3.30 m.				
4.0								
4.5								
5.0								



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-11

TEST PIT LOG

				Su - kPa						
				20	60	100	140	180		
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/13/2005 FINISHED: 5/13/2005		VANE FIELD LAB				
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK ♦ ■	▲ UC/2			
				GROUND ELEV. (m): 1341.0		REMOULD ◇ □	△ P.PEN/2			
				COORDINATES (m): N 6810045.9 E 440622.5		* % FINES				
				DESCRIPTION OF MATERIALS		W _p %	W%	W _L %		
		x - - - - - o - - - - - x								
		20	40	60	80					
INSTRUMENT DETAILS										
0.5			0.35 1340.7	Peat, organics, saturated.						
1.0	Grab1		1.50 1339.5	Clay and Gravel, fine to coarse, subangular to subrounded gravel, occasional cobbles, medium dense, greenish grey, wet.		*				
1.5			2.50 1338.5	Argillite, completely weathered, black, wet. - Small water seepage at clay/argillite contact.						
2.0			3.00 1338.0	Silt-Sand-Gravel-Cobble, mostly fine to coarse, subangular gravel, some sand to sandy, some silt, approximately 50% gravel and cobbles.		*				
2.5	Grab2		End of Hole at 3.00 m.							
3.0										
3.5										
4.0										
4.5										
5.0										

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/08



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-22

TEST PIT LOG

				Su - kPa							
				20	60	100	140	180			
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/13/2005		FINISHED: 5/13/2005		VANE	FIELD	LAB	▲ UC/2
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK	◆	■	▲ P.PEN/2		
				GROUND ELEV. (m): 1348.0		REMOVED	◇	□			
				COORDINATES (m): N 6810040.4 E 440715		* % FINES					
DESCRIPTION OF MATERIALS				W _P %	W%	W _L %					
				x - - - - - x	o - - - - - x						
				20	40	60	80				
			Topsoil, organics.								
0.5		Grab1	0.25 1347.8	Gravel, fine to coarse, sandy, fine to coarse sand, some silt/clay, subrounded to subangular gravel and cobbles, brown, moist to wet.				*			
1.0			0.70 1347.3	Silt/Clay-Sand-Gravel, mostly fine to coarse gravel, sandy, fine to coarse sand, some medium plastic silt/clay, subrounded to subangular gravel, some cobbles, greenish brown, dry (TILL-LIKE).							
2.5		Grab2						*			
5.0			5.00								

INSTRUMENT DETAILS

Continued Next Page


KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 2	HOLE NO.: TP05-23

KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT_2/8/06

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/13/2005 FINISHED: 5/13/2005		INSTRUMENT	DETAILS	Su - kPa											
				EXCAVATOR TYPE: 420D Cat Backhoe				VANE PEAK	FIELD	LAB	▲ UC/2								
				GROUND ELEV. (m): 1348.0				REMOLD	◇	■	△ P.PEN/2								
				COORDINATES (m): N 6810040.4 E 440715				* % FINES											
				DESCRIPTION OF MATERIALS				W _p %	W%	W _L %									
				1343.0	End of Hole at 5.00 m.														
5.5																			
6.0																			
6.5																			
7.0																			
7.5																			
8.0																			
8.5																			
9.0																			
9.5																			
10.0																			

KC_TEST_PIT-SI TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 2 OF 2	HOLE NO.: TP05-23

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/13/2005		FINISHED: 5/13/2005		VANE PEAK		FIELD		LAB		UC/2			
				EXCAVATOR TYPE: 420D Cat Backhoe				REMOVED		◆		□		▲		△	
				GROUND ELEV. (m): 1347.0				* % FINES		W _p %		W%		W _L %			
				COORDINATES (m): N 6809997 E 440771				x - - - - - o - - - - - x									
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS											
			0.15	Topsoil, organics.													
			1346.9	Sand, fine, silty, some subangular to subrounded gravel, frozen.													
0.5			0.50	Silt/Clay-Sand-Gravel, mostly fine to coarse sand, gravelly, some medium to highly plastic silt/clay, subrounded to subangular gravel, dense, greenish brown, wet (TILL-LIKE).													
			1346.5														
1.0																	
1.5																	
2.0		Grab1		* (in soil column)													
2.5																	
3.0			2.70	End of Hole at 2.70 m. ▼													
			1344.3														
3.5																	
4.0																	
4.5																	
5.0																	

KC_TEST_PIT-SI_TESTPITS20_JUN05P1_KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-24

TEST PIT LOG

				Su - kPa											
				20	60	100	140	180							
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/15/2005		FINISHED: 5/15/2005		VANE		FIELD		LAB			
				EXCAVATOR TYPE: 420D Cat Backhoe				PEAK		◇		■		▲ UC/2	
				GROUND ELEV. (m): 1365.5				REMO		◇		□		▲ P.PEN/2	
				COORDINATES (m): N 6810629 E 440120				* % FINES							
DESCRIPTION OF MATERIALS				W _p %	W%	W _L %									
				x	o	x	20	40	60	80					
0.5			Peat, brown, organics.												
1.0			Silt/Clay-Sand-Gravel, mainly medium plastic silt/clay, some fine to coarse sand and gravel, subangular to subrounded gravel, occasional cobbles, dense, greenish brown, moist (TILL-LIKE). - Till is weathered from 0.15 m to 1.2 m depth; harder below 1.2 m depth.												
1.5		Grab1	* 0.15 1365.4												
2.0															
2.5															
3.0															
3.5			End of Hole at 3.20 m.	3.20 1362.3											
4.0															
4.5															
5.0															

KC_TEST_PIT-SI TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-25

TEST PIT LOG

				Su - kPa														
				20	60	100	140	180										
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/15/2005		FINISHED: 5/15/2005			INSTRUMENT DETAILS	VANE PEAK		FIELD		LAB		▲ UC/2		
				EXCAVATOR TYPE: 420D Cat Backhoe						REMOLD		◇		□		△ P.PEN/2		
				GROUND ELEV. (m): 1396.0						* % FINES								
				COORDINATES (m): N 6811409 E 439612						W _p %	W%	W _L %	x	o	x	x	x	
DESCRIPTION OF MATERIALS								20	40	60	80							
0.5			Peat, brown, organics.															
1.0			0.20 1395.8	Silt/Clay-Sand-Gravel, mostly fine to coarse gravel, sandy, some medium plastic silt/clay, subangular to subrounded gravel, some cobbles, dense, greenish brown, moist (TILL-LIKE). - Till is weathered from 0.2 m to 1.0 m depth; harder below 1.0 m depth.														
1.5		Grab1																
2.0																		
2.5																		
3.0																		
3.5			3.30 1392.7	End of Hole at 3.30 m.														
4.0																		
4.5																		
5.0																		

KC_TEST_PIT-SI_TESTPITS00_JUN.GPJ_KC_DATA.GDT_2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-26

TEST PIT LOG

				Su - kPa										
				20	60	100	140	180						
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/22/2005		FINISHED: 5/22/2005			INSTRUMENT DETAILS	VANE PEAK		FIELD	LAB	▲ UC/2
				EXCAVATOR TYPE: Hand Digging						REMOLD		◇	□	△ P.PEN/2
				GROUND ELEV. (m): 1340.0						* % FINES				
				COORDINATES (m): N 6809009.8 E 441080						W _p %	W%	W _L %	x	o
DESCRIPTION OF MATERIALS						20	40	60	80					
0.5			Peat, organics.	0.30										
			Clay, sandy, black, frozen.	1339.7										
1.0		Grab1	Silt-Sand-Gravel, mostly fine to coarse sand, gravelly, fine to coarse gravel, silty, flat and elongated gravel, angular to subangular gravel and cobbles, black, moist.	0.70 1339.3						o	*			
			End of Hole at 1.05 m.	1.05 1339.0										
1.5														
2.0														
2.5														
3.0														
3.5														
4.0														
4.5														
5.0														



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY:	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-28

TEST PIT LOG

				Su - kPa									
				20	60	100	140	180					
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/22/2005 FINISHED: 5/22/2005		VANE PEAK		FIELD		LAB		▲ UC/2	
				EXCAVATOR TYPE: Hand Digging		REMOULD		◇		□		△ P.PEN/2	
				GROUND ELEV. (m): 1338.0		* % FINES		W _p %		W%		W _L %	
				COORDINATES (m): N 6808286.9 E 441654.3		x - - - - - o - - - - - x		20		40		60	
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS							
0.5		Grab1	Peat, organics.	0.15									
			Silt/Clay and Gravel, dark brown, frozen.	1337.9									
			Sand, fine to coarse, gravelly, fine gravel, some silt, black, moist, frozen.	0.35 1337.7									
			End of Hole at 0.70 m.	0.70 1337.3									
1.0													
1.5													
2.0													
2.5													
3.0													
3.5													
4.0													
4.5													
5.0													


KC_TEST_PIT-SI_TESTPITS20_JUN.GPJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY:	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-29

TEST PIT LOG

				Su - kPa										
				20	60	100	140	180						
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/21/2005		FINISHED: 5/21/2005								
				EXCAVATOR TYPE: Hand Digging		INSTRUMENT	VANE PEAK		FIELD LAB					
				GROUND ELEV. (m): 1332.0			◆	■	▲ UC/2					
				COORDINATES (m): N 6808051 E 441890.5			◇	□	△ P.PEN/2					
DESCRIPTION OF MATERIALS				* % FINES										
				W _p %	W%		W _L %							
				x	o	x								
				20	40	60	80							
0.5		Grab1		Gravel, fine to medium, some silt and sand, angular to subangular gravel, with subrounded pebbles, cobbles and boulders, yellow to grey, moist. - photos 7, 8; - photo 9 looking North; - photo 10 looking South				o						
				0.35 1331.7 End of Hole at 0.35 m.										
1.0														
1.5														
2.0														
2.5														
3.0														
3.5														
4.0														
4.5														
5.0														

KC_TEST_PIT-SI TESTPITS20_JUN16PJ KC_DATA.GDT 2/6/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: RB/EA	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-30



Phase 2



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-7

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/6/2005 FINISHED: 8/8/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442660m N 6808160m	GROUND ELEVATION: 1305 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 31.4 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HQ Core ROCK: HQ Core
LOGGED BY: EA	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (d)=diametrical	TEMPERATURE	FIELD/LAB DATA						
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %				
					Dip Angle		CORE RECOVERY %	R.Q.D. %									
		30	60		0	6		12	25	50	75	5	10	15			
0.304.8			TOPSOIL - organics.														
1			SILT-SAND-GRAVEL-COBBLE, with occasional boulders.														
2		1	- LPT N = 101 blows at 1.52 m depth.														
3		2	- LPT N = 81 blows at 3.05 m depth.														
4																	
5		3	- LPT N = 29+ blows for first 6" at 4.57 m depth.														
6		4	- LPT N = 30+ blows for first 5" at 6.1 m depth.														
7																	
8																	
9																	
10		5	- LPT N = 35+ blows for first 6" at 9.14 m depth.														
11																	
12																	
13			- LPT N = 30+ blows for first 1" at 12.19 m depth.														
14																	
15																	
16			- LPT N = 32+ blows for first 4" at 15.24 m depth.														
17																	
18																	
19			- LPT N = 21+ blows for first 2" at 18.29 m depth.														
20																	

KC ROCK-81@4 - WOLVERINE TEST HOLES - NOV 17 09J1 ROCK-LOG.GDT 28/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-7

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE			FIELD/LAB DATA		
					10-6	10-4	10-2			SEE BOTTOM OF FORM FOR CODES	Dip Angle 30 60	0 6 12	25 50 75	SPT/LPT N ● CORE RECOVERY %	WATER CONTENT % ○ R.Q.D. %
(continued from previous page)															
21															
22			- LPT N = 37+ blows for first 3" at 21.34 m depth.												
23															
24															
25			24.4 1,280.6 - LPT N = 21+ blows for first 3" at 24.38 m depth. BEDROCK.												
26		ARMS	- Grey, laminated, strongly foliated, siliceous argillite, angular gravel, with quartz veins between 24.4 m and 27.4 m depth.									30		0	
27															
28		ARMS	- Same as above, with some black graphitic argillite.									21		0	
29															
30															
31				Piezometer 7A										0	
32			31.4 1,273.6 End of Hole at: 31.4 m												
33			Notes:												
34			1. The SPT/LPT N values indicated are the field measured LPT N values.												
35			2. Piezometer stickup length for TH05-07A is ___ m. Water level could not be measured in piezometer TH05-7A due to gasoline in piezometer.												
36															
37			3. Piezometer TH05-7B was not installed in overburden because the 70' casing could not be removed.												
38															
39			4. ARMS = massive argillite.												
40															
41															
42															
43															
44															
45															

KC: ROCK-S@4 WOLVERINE TEST HOLES - NOV 17.GPJ Rock-LOG.GDT 2/8/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-8

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/2/2005 FINISHED: 8/5/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442565m N 6808139m	GROUND ELEVATION: 1290 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 30.8 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HQ Core ROCK: HQ Core
LOGGED BY: EA	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial, (d)=diametrical	TEMPERATURE	FIELD/LAB DATA							
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %					
					Dip Angle			CORE RECOVERY %		R.Q.D. %								
0.2			TOPSOIL - organics.															
1			SILT-SAND-GRAVEL-COBBLE, low plastic silt, fine to coarse sand and gravel, occasional boulders, flat, subrounded to subangular gravel, grey to green, dry to moist (TILL-like).															
2			- LPT N = 20+ blows for first 6" at 1.52 m depth.															
3		1	- LPT N = 47 blows for 12" at 3.05 m depth.															
4																		
5		2	- LPT N = 48+ blows over first 12" at 4.57 m depth.															
6																		
7		3	- LPT N = 42+ blows over first 10" at 6.10 m depth.															
8																		
9																		
10		4	- LPT N = 50+ blows over first 12" at 9.14 m depth.															
11																		
12			- LPT N = 30+ blows over first 6" at 12.19 m depth.															
13																		
14																		
15																		
16		5	- LPT N = 60 blows over first 6" at 15.24 m depth.															
17																		
18																		
19		6	- LPT N = 80+ blows over first 9" at 18.29 m depth.															
20																		

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC: ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/06



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-8

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA SEE BOTTOM OF FORM FOR CODES Dip Angle 30 60	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (c)=diametrical	TEMPERATURE 0 6 12	FIELD/LAB DATA									
					10-6	10-4	10-2				SPT/LPT N CORE RECOVERY %			WATER CONTENT % R.Q.D. %						
			(continued from previous page)																	
21			1,270.2 BEDROCK. - Weak bedrock encountered at 19.8 m depth.																	
22																				
23																				
24					Piezometer 8B															
25																				
26		ARMS		- Black, well foliated, massive and highly fractured argillite encountered between 24.4 m and 27.4 m depth.																
27																				
28																				
29		ARMS/ QTVN		- Black, weakly foliated, massive argillite (mudstone) encountered between 27.4 m and 29.4 m depth. Note: last 30 cm of core run encountered milky white bull quartz vein.																
30					Piezometer 8A															
31			30.8 1,259.2 End of Hole at: 30.8 m																	
32			Notes:																	
33			1. The SPT/LPT N values indicated are the field measured LPT N values.																	
34			2. Piezometer stickup lengths are as follows:																	
35			- TH05-8A = 0.20 m;																	
36			- TH05-8B = 0.17 m.																	
37			3. Water levels measured in piezometers TH05-8A and B after installation were artesian.																	
38			4. ARMS = massive argillite; QTVN = quartz vein.																	
39																				
40																				
41																				
42																				
43																				
44																				
45																				

KC-ROCK-SIGMA WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-9

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/12/2005 FINISHED: 8/19/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442454m N 6808092m	GROUND ELEVATION: 1303 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 35.05 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: EA	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	CORE RECOVERY %	WATER CONTENT %						
					Dip Angle								R.Q.D. %						
				30 60						0	6	12	25	50	75	5	10	15	
0.3			TOPSOIL - organics.																
1			SILT-SAND-GRAVEL-COBBLE, low plastic silt, fine to coarse sand and gravel, occasional boulders, flat, subrounded to subangular gravel, grey to green, dry to moist (TILL-LIKE).																
2		1																	
3		2	- LPT N = 57 blows at 1.52 m depth. - LPT N = 51 blows at 3.05 m depth.																
4			Piezometer 9B																
5		3	- LPT N = 125 blows at 4.57 m depth.																
6			- LPT N = 20 blows over first 6" at 6.10 m depth.																
7																			
8																			
9																			
10			- LPT N = 26 blows over first 5" at 9.14 m depth.																
11																			
12			- LPT N = 23 blows over first 2" at 12.19 m depth.																
13																			
14																			
15																			
16		4	- LPT N = 23 blows over first 4" at 15.24 m depth.																
17																			
18																			
19		5	- LPT N = 23 blows over first 2" at 18.29 m depth.																
20																			

KC ROCK-SIG@ WOLVERINE TEST HOLES - NOV 17, 2005 ROCK-LOG.GDT 2/6/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'Y J: JOINT M: SCHIST'Y S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-9

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (c)=circumferential	TEMPERATURE	FIELD/LAB DATA						
					10-6	10-4	10-2	SEE BOTTOM OF FORM FOR CODES			SPT/LPT N			WATER CONTENT %			
								Dip Angle			CORE RECOVERY %			R.Q.D. %			
			30	60				0	6	12	25	50	75	5	10	15	
(continued from previous page)																	
21																	
22			- LPT N = 26 blows over first 2" at 21.34 m depth.														
23																	
24																	
25			- LPT N = 24 blows over first 3.5" at 24.38 m depth.														
26																	
27																	
28		6	- LPT N = 24 blows over first 2.5" at 27.43 m depth.														
29																	
30			Piezometer 9A														
30.1			1,272.9 BEDROCK.														
31			- LPT N = 25 blows over first 3" at 30.48 m depth.														
32		OVBD/ ARMS	- 5 cm of black carbonaceous argillite (minor pyrite) encountered between 30.5 m and 32.0 m depth.														
33		ARMS	- Dark grey siliceous argillite encountered between 32.0 m and 35.1 m depth.														
34																	
35			35.1 1,268.0 End of Hole at: 35.1 m														
36																	
37			Notes:														
38			1. The SPT/LPT N values indicated are the field measured SPT N values.														
39			2. Piezometer stickup lengths are as follows:														
40			- TH05-9A = 0.21 m;														
41			- TH05-9B = 0.31 m.														
42			3. Water levels measured in piezometers TH05-9A and B after installation were 10.72 m and 3.67 m, respectively.														
43			4. OVBN = overburden; ARMS = massive argillite.														
44			5. Two separate holes were drilled for the piezometer installation in overburden and bedrock.														
45																	

KC-ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17 GPJ ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-10

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/19/2005 FINISHED: 8/25/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442328m N 6808233m	GROUND ELEVATION: 1308 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 38.1 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA SEE BOTTOM OF FORM FOR CODES Dip Angle 30 60	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (σ_{Fmax}), (σ_c)=diametrical	TEMPERATURE	FIELD/LAB DATA							
					10-6	10-4	10-2				SPT/LPT N	WATER CONTENT %						
											CORE RECOVERY %	R.Q.D. %						
									0	6	12	25	50	75	5	10	15	
0-2			TOPSOIL - organics.															
2-307.8			OVERBURDEN consisting of SILT/CLAY, SAND, GRAVEL, COBBLE, with occasional boulders. - SPT N = 20+ blows over first 6" at 1.52 m depth. - SPT N = 20+ blows over first 6" at 3.05 m depth.															
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Piezometer 10B

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC. ROCK-SIG@ WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/05



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-10

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (c)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA									
					10-6	10-4	10-2	SEE BOTTOM OF FORM FOR CODES			SPT/LPT N ●	WATER CONTENT % ○	CORE RECOVERY %			R.Q.D. %				
					30	60	Dip Angle						25	50	75	5	10	15		
(continued from previous page)																				
21																				
22																				
23																				
24																				
25																				
26																				
27																				
28																				
29																				
30																				
31																				
32			32.0 1,276.0	BEDROCK.																
33				- Carbonaceous between 32.6 m and 35.1 m depth.																
34																				
35				- 80% of core run is gouge; carbonaceous between 35.1 m and 38.1 m depth.																
36																				
37																				
38			38.1 1,269.9	Piezometer 10A End of Hole at: 38.1 m																
39																				
40																				
41																				
42																				
43																				
44																				
45																				

KC: ROCK-SIG: WOLVERINE TEST HOLES - NOV 17 GPJ ROCK-LOG.GDT 2/0/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-11

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/26/2005 FINISHED: 8/31/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442248m N 6808417m	GROUND ELEVATION: 1312.5 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 46.3 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (σ _p =axial; (σ) _p =diametrical)	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N	WATER CONTENT %	CORE RECOVERY %	R.Q.D. %				
					Dip Angle		30 60		0 6 12	25 50 75						5 10 15			
0.3			TOPSOIL - organics.																
1.3			TILL-LIKE OVERBURDEN consisting of SILT/CLAY, SAND, GRAVEL, COBBLE, with occasional boulders.																
12.3				Piezometer 11B															

KC, ROCK-SIG@4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/6/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-11

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)-axial; (d)-diametrical	TEMPERATURE	FIELD/LAB DATA					
					10-6	10-4	10-2	SEE BOTTOM OF FORM FOR CODES			SPT/LPT N	WATER CONTENT %				
			(continued from previous page)					Dip Angle 30 60			CORE RECOVERY %			R.Q.D. %		
										0 6 12	25 50 75	5 10 15				
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40			39.6 1,272.9 BEDROCK.													
41			- Between 39.6 m and 42.7 m depth: upper one-third is subangular pebbles to cobbles, lower two-third is foliated rhyolite overlying tuffaceous argillite.													
42																
43				Piezometer 11A												
44																
45																

KC ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-11

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (d)=diametrical	TEMPERATURE	FIELD/LAB DATA									
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	Dip Angle 30 60	SPT/LPT N ● CORE RECOVERY %			WATER CONTENT % ○ R.Q.D. %				
			(continued from previous page)																	
46			46.3 1,266.2 End of Hole at: 46.3 m																	
47																				
48			Notes:																	
49			1. No SPT or LPT testing was carried out in TH05-11 due to abundance of cobbles and boulders.																	
50			2. Two separate holes were drilled for the overburden and bedrock piezometers to facilitate installation and increased reliability of piezometric data.																	
51			3. Piezometer stickup lengths are as follows:																	
52			- TH05-11A = 0.40 m;																	
53			- TH05-11B = 0.39 m.																	
54			4. Water levels measured in piezometers TH05-11A and B after installation were 9.37 m and 8.50 m, respectively.																	
55																				
56																				
57																				
58																				
59																				
60																				
61																				
62																				
63																				
64																				
65																				
66																				
67																				
68																				
69																				
70																				

KC ROCK-SIG-WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-12

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 8/9/2005 FINISHED: 8/12/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 422438m N 6808331m	GROUND ELEVATION: 1305.5 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 29.6 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: NQ Core ROCK: NQ Core
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA SEE BOTTOM OF FORM FOR CODES Dip Angle 30 60	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE			FIELD/LAB DATA					
					10-6	10-4	10-2			SPT/LPT N			WATER CONTENT %					
										CORE RECOVERY %			R.Q.D. %					
									0	6	12	25	50	75	5	10	15	
1	●		9.305.3 TOPSOIL - organics. OVERBURDEN.															
2	●																	
3	●																	
4	●																	
5	●																	
6	●																	
7	●																	
8	●																	
9	●																	
10	●																	
11	●																	
12	●																	
13	●																	
14	●																	
15	●																	
16	●																	
17	●																	
18	●																	
19	●																	
20	●																	

KC: ROCK-SIG/4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: TH05-12

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N			WATER CONTENT %				
					Dip Angle		CORE RECOVERY %					R.Q.D. %							
		30 60																	
			(continued from previous page)																
21																			
22																			
23																			
24			24.1 1,281.4 BEDROCK.																
25																			
26																			
27																			
28																			
29																			
30			29.6 1,275.9 End of Hole at: 29.6 m																
31																			
32																			
33																			
34																			
35																			
36																			
37																			
38																			
39																			
40																			
41																			
42																			
43																			
44																			
45																			

KC-ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/8/05

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005		FINISHED: 7/21/2005			VANE PEAK		FIELD		LAB		UC/2		
				EXCAVATOR TYPE: 420D Cat Backhoe						REMO		◇		□		▲ P.PEN/2	
				GROUND ELEV. (m): ~ 1317.5						* % FINES							
				COORDINATES (m): N 6808187 E 442732						W _p %		W%		W _L %			
				DESCRIPTION OF MATERIALS						x - - - - -		o - - - - -		x - - - - -			
				20 40 60 80													
0.5			0.20	TOPSOIL - organics and moss.													
1.0		1		GRAVEL and COBBLE, fine to coarse gravel, some silt and sand, with about 20% coarse sand, yellow, dry to moist.						o							
1.5																	
2.0			1.70	GRAVEL, fine to coarse, sandy silty matrix, trace clay, occasional cobbles and boulders up to 0.5 m size, dense, subrounded to subangular, green, dry to moist (TILL-LIKE).													
2.5		2								o							
3.0			3.00	End of Hole at 3.00 m.													
3.5																	
4.0																	
4.5																	
5.0																	

KC_TEST_PIT-SI TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-71

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005 FINISHED: 7/20/2005		INSTRUMENT	Su - kPa				
				EXCAVATOR TYPE: 420D Cat Backhoe	GROUND ELEV. (m): ~ 1304.5		20	60	100	140	180
				COORDINATES (m): N 6808183 E 442654		DETAILS	VANE PEAK	FIELD	LAB	▲ UC/2	
				DESCRIPTION OF MATERIALS			REMOLD	◇	□	△ P.PEN/2	
							* % FINES				
							W _p %	W%	W _L %		
							x	o	x		
							20	40	60	80	
0.15			TOPSOIL.								
			- organics and black organic rich mud.								
0.25			VOLCANIC ASH, white.								
0.5			GRAVEL and COBBLE, fine to coarse gravel, some fine to coarse sand, flat, subangular to subrounded gravel, brown, moist.								
1.0		1									
1.5			GRAVEL, fine to coarse, silty clayey matrix, medium dense to dense, angular to subangular, grey, moist (TILL).								
2.0											
2.5		2									
3.0			End of Hole at 3.00 m.								
3.5											
4.0											
4.5											
5.0											

KC_TEST_PIT-SI TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/9/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-72

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005 FINISHED: 7/20/2005		Su - kPa								
				EXCAVATOR TYPE: 420D Cat Backhoe		VANE PEAK	FIELD	LAB	UC/2	P.PEN/2	20	60	100	140
				GROUND ELEV. (m): ~ 1304		REMOLD	* % FINES							
				COORDINATES (m): N 6808116 E 442685			W _p %	W%	W _L %					
				DESCRIPTION OF MATERIALS			x	o	x					
							20	40	60	80				
0.15			TOPSOIL - peat and organics.											
			SILT and SAND, some gravel, medium dense, brown.											
1.50			GRAVEL, fine to coarse, sandy silty matrix, occasional cobbles and boulders, dense, angular to subangular, grey, moist (TILL-LIKE).											
3.00		1	End of Hole at 3.00 m.											

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake



LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-73

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005 FINISHED: 7/20/2005		Su - kPa								
				EXCAVATOR TYPE: 420D Cat Backhoe	GROUND ELEV. (m): ~1298	VANE PEAK	FIELD	LAB	UC/2	P.PEN/2	20	60	100	140
COORDINATES (m): N 6808142 E 442641				INSTRUMENT	DETAILS	* % FINES								
DESCRIPTION OF MATERIALS						W _p %	W%	W _L %	20	40	60	80		
0.5				0.15	TOPSOIL. - organics.									
1.0					SILT-SAND-GRAVEL, low to medium plastic silt, fine to coarse sand and gravel, clayey, occasional cobbles and boulders, dense, subrounded to subangular, green to grey, moist (TILL-LIKE).									
1.5		1												
2.0					- Encountered a 2.0 m size boulder at 2.0 m depth.									
2.5														
3.0				3.00	End of Hole at 3.00 m.									
3.5														
4.0														
4.5														
5.0														

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 10s.GPJ KC_DATA.GDT 2/2/08



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-74

TEST PIT LOG

				Su - kPa							
				20	60	100	140	180			
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005 FINISHED: 7/20/2005		INSTRUMENT DETAILS	VANE	FIELD	LAB	▲ UC/2 △ P.PEN/2	
				PEAK	◆		■				
				REMO	◇		□				
				* % FINES							
			W _p %	W%	W _L %						
			x	o	x						
			20	40	60	80					
DESCRIPTION OF MATERIALS											
			TOPSOIL - peat and organics.								
0.5			0.25 SILT-SAND-GRAVEL, medium plastic silt, fine to coarse sand and gravel, clayey, occasional cobbles, dense, subrounded to subangular, green to grey (TILL-LIKE).								
1.0			- Between 0.25 m and 1.0 m depth, approximately 20% gravel.								
1.5		1	- Between 1.0 m and 3.5 m depth, approximately 5% gravel.								
2.0											
2.5											
3.0											
3.5			3.50 End of Hole at 3.50 m.								
4.0											
4.5											
5.0											



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-75

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005		FINISHED: 7/20/2005			VANE PEAK		FIELD		LAB		▲ UC/2		
				EXCAVATOR TYPE: 420D Cat Backhoe						REMOLD		◇		□		△ P.PEN/2	
				GROUND ELEV. (m): ~1289						★ % FINES							
				COORDINATES (m): N 6808036 E 442624						W _p %		W%		W _L %			
				DESCRIPTION OF MATERIALS						x - - - - -		o - - - - -		x - - - - -			
				20 40 60 80													
0.5			0.20	TOPSOIL - peat and organics.													
			0.50	CLAY, silty, sandy, wet.													
1.0				SILT-SAND-GRAVEL, medium plastic silt, fine to coarse sand and gravel, clayey, occasional cobbles, dense, subrounded to subangular, green to grey (TILL-LIKE).													
1.5		1															
2.0																	
2.5																	
3.0			3.00	End of Hole at 3.00 m.													
3.5																	
4.0																	
4.5																	
5.0																	

INSTRUMENT DETAILS



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-76

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/20/2005 FINISHED: 7/20/2005		INSTRUMENT	Su - kPa						
				EXCAVATOR TYPE: 420D Cat Backhoe			VANE PEAK	FIELD	LAB	UC/2	PEN/2		
				GROUND ELEV. (m): ~ 1294									
				COORDINATES (m): N 6808090 E 442529									
				DESCRIPTION OF MATERIALS									
0.5			0.15	TOPSOIL, - organics.									
1.0				SILT-SAND-GRAVEL, medium plastic silt, fine to coarse sand and gravel, clayey, occasional cobbles, dense, subrounded to subangular, green to grey (TILL-LIKE).									
1.5		1											
2.0													
2.5													
3.0			2.80										
3.5				End of Hole at 3.00 m.									
4.0													
4.5													
5.0													



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-77

KC_TEST_PIT-SI TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/3/06

TEST PIT LOG

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		Su - kPa				
				EXCAVATOR TYPE: 420D Cat Backhoe	GROUND ELEV. (m): ~1300	20	60	100	140	180
				COORDINATES (m): N 6808156 E 442453		VANE PEAK	FIELD	LAB	UC/2	
				DESCRIPTION OF MATERIALS		REMOLD	* % FINES		P.PEN/2	
						W _p %	W%	W _L %		
						x	o	x		
						20	40	60	80	
0.0 - 0.20			TOPSOIL - organics.							
0.20 - 1.80			GRAVEL, fine to medium, sandy, silty, trace clay, occasional cobbles, angular to subangular, brown to grey.							
1.80 - 2.00		1	GRAVEL POCKET, coarse, subrounded, small water seep.							o
2.00 - 2.50			GRAVEL, fine to coarse, sandy silty matrix, trace clay, occasional cobbles, dense, subrounded to subangular, green, moist (TILL-LIKE).							
2.50 - 3.50			End of Hole at 3.50 m.							

KC_TEST_PIT-SI TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-78

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		INSTRUMENT	Su - kPa				
				EXCAVATOR TYPE: 420D Cat Backhoe			VANE PEAK	FIELD	LAB	UC/2	
				GROUND ELEV. (m): ~ 1295			REMOLD	◇	□	△	P.PEN/2
				COORDINATES (m): N 6808007 E 442495			* % FINES				
				DESCRIPTION OF MATERIALS			W _p %	W%	W _L %		
								×	○	×	
							20	40	60	80	
0.5			0.15	TOPSOIL. - organics.							
1.0				GRAVEL, fine to coarse, sandy silty matrix, trace clay, occasional cobbles and boulders up to 0.5 m size, dense, subrounded to subangular, green, moist (TILL-LIKE).							
1.5		1									
2.0											
2.5											
3.0			2.80	End of Hole at 2.80 m.							
3.5											
4.0											
4.5											
5.0											



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-79

KC_TEST_PIT(S)_TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/3/06

TEST PIT LOG

				Su - kPa				
				20	60	100	140	180
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		VANE FIELD LAB		
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK ♦ ■	▲ UC/2	
				GROUND ELEV. (m): ~ 1306		REMOULD ◇ □	▲ P.PEN/2	
				COORDINATES (m): N 6808097 E 442395		* % FINES		
DESCRIPTION OF MATERIALS				W _p %	W%	W ₁ %		
TOPSOIL. - peat and organics.				x - - - - - o - - - - - x	20	40	60	80
0.5		1	0.30 0.35	VOLCANIC ASH, white.				
1.0				GRAVEL, fine to coarse, sandy silty matrix, trace clay, occasional cobbles and boulders up to 0.5 m size, dense, subrounded to subangular, green, moist (TILL-LIKE).				
1.5								
2.0								
2.5								
3.0			3.00	End of Hole at 3.00 m.				
3.5								
4.0								
4.5								
5.0								



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-80

KC_TEST_PIT-SI TESTPITS TP05-81 TO 106.GPJ KC_DATA.GDT 2/3/06

TEST PIT LOG

				Su - kPa							
				20	60	100	140	180			
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		VANE		FIELD		LAB	
				EXCAVATOR TYPE: 420D Cat Backhoe		PEAK		◆	■	▲ UC/2	
				GROUND ELEV. (m): ~ 1305.5		REMOULD		◇	□	△ P.PEN/2	
				COORDINATES (m): N 6808291 E 442343		INSTRUMENT DETAILS		* % FINES			
				DESCRIPTION OF MATERIALS				W _p %	W%	W _L %	W _L %
x	o	x	x								
				20	40	60	80				
0.5			0.20 0.25	TOPSOIL. - peat and organics.							
1.0				VOLCANIC ASH, white.							
1.5		1		GRAVEL, fine to coarse, sandy silty matrix, trace clay, low to medium plastic silt/clay, occasional cobbles, medium dense, subrounded to subangular, yellow to green, moist (TILL-LIKE).							
2.0				- Dense to very dense between 1.0 m and 3.5 m depth.							
2.5											
3.0											
3.5			3.50	End of Hole at 3.50 m.							
4.0											
4.5											
5.0											



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-81

KC_TEST_PIT-SI TESTPITS TP05-81 TO 106.GPJ KC_DATA.GDT 2/2/06

TEST PIT LOG

				Su - kPa							
				20	60	100	140	180			
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		INSTRUMENT	DETAILS	VANE PEAK	FIELD	LAB	▲ UC/2
				EXCAVATOR TYPE: 420D Cat Backhoe				REMOULD	◇	■	△ P.PEN/2
				GROUND ELEV. (m): ~ 1310				* % FINES			
				COORDINATES (m): N 6808291 E 442281				W _p %	W%	W _L %	
				DESCRIPTION OF MATERIALS				x - - - - - o - - - - - x	20	40	60
0.5			0.10	TOPSOIL. - organics. GRAVEL, silty, brown.							
1.0			0.60	COBBLE, some boulders, trace to some sand (approximately 10% coarse sand).							
2.0			2.00	GRAVEL, fine to coarse, sandy silty matrix, trace clay, low to medium plastic silt/clay, occasional cobbles and boulders up to 1 m size, very dense, subrounded to subangular, yellow to green, moist (TILL-LIKE).							
3.0		1					o				
3.5			3.50	End of Hole at 3.50 m.							
4.0											
4.5											
5.0											



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-82

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 106.GPJ KC_DATA.GDT 2/2/06

TEST PIT LOG

				Su - kPa												
				20	60	100	140	180								
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005		FINISHED: 7/21/2005			VANE PEAK		FIELD		LAB		▲ UC/2	
				EXCAVATOR TYPE: 420D Cat Backhoe		REMOVED		◇		□		△ P.PEN/2				
				GROUND ELEV. (m): ~ 1317		* % FINES		W _p %		W%		W _L %				
				COORDINATES (m): N 6808507 E 442212		x - - - - - o - - - - - x		20		40		60		80		
				DESCRIPTION OF MATERIALS		INSTRUMENT		DETAILS								
0.5			0.25	TOPSOIL - peat and organics.												
			0.80	GRAVEL and COBBLE, coarse gravel, some sand, brown.												
1.0				GRAVEL and BOULDERS, fine to coarse, sandy, some silt, occasional cobbles, very dense, subrounded to angular gravel, boulders between 0.6 m and 1.0 m size, greenish grey, wet (TILL-LIKE).												
2.5		1														
3.0			2.90	End of Hole at 2.90 m.												
4.0																
4.5																
5.0																

KC_TEST_PIT-SI TESTPITS TP05-83 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-83

TEST PIT LOG

				Su - kPa													
				20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		VANE PEAK FIELD LAB											
				EXCAVATOR TYPE: 420D Cat Backhoe		◆	■	▲ UC/2									
				GROUND ELEV. (m): ~ 1320		◇	□	△ P.PEN/2									
				COORDINATES (m): N 6807979 E 442656		* % FINES											
				DESCRIPTION OF MATERIALS		W _p %	W%	W _L %									
		x	o	x													
		20	40	60	80												
		INSTRUMENT DETAILS															
0.5		1	0.10	TOPSOIL. - organics.													
				SAND and GRAVEL, silty.													
			0.30	GRAVEL, fine to coarse, silty/clayey and sandy, medium plastic silt/clay, dense, flat, subrounded to angular, yellow to grey, wet (TILL-LIKE). - Water encountered at 2.70 m depth.													
2.0																	
2.5																	
3.0				2.80	End of Hole at 2.80 m.												
3.5																	
4.0																	
4.5																	
5.0																	

KC_TEST_PIT-SI TESTPITS TP05-84 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-84

TEST PIT LOG

				Su - kPa											
				20	60	100	140	180							
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		VANE PEAK REMOLD		FIELD LAB		UC/2 P.PEN/2					
				EXCAVATOR TYPE: 420D Cat Backhoe				◆	■	▲	△				
				GROUND ELEV. (m): ~ 1288				* % FINES							
				COORDINATES (m): N 6807966 E 442629				W _p %	W%	W _L %					
				DESCRIPTION OF MATERIALS				x	o	x					
				20		40		60		80					
			TOPSOIL - peat and organics.	0.20											
0.5			COBBLE and BOULDER.												
1.0			SILT/CLAY, medium plastic, sandy and gravelly, fine to coarse sand and gravel, stiff, green to black.	1.00											
1.5		1													
2.0															
2.5			End of Hole at 2.30 m.	2.30											
3.0															
3.5															
4.0															
4.5															
5.0															

KC_TEST_PIT-SI TESTPITS TP05-81 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-85

TEST PIT LOG

				Su - kPa										
				20	60	100	140	180						
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005		FINISHED: 7/21/2005			INSTRUMENT DETAILS	VANE PEAK		FIELD	LAB	UC/2
				EXCAVATOR TYPE: 420D Cat Backhoe		REMOULD				P.PEN/2				
				GROUND ELEV. (m): ~ 1289		* % FINES		W _p %		W%	W _L %			
				COORDINATES (m): N 6807952 E 442602		X	---	---		---	X			
DESCRIPTION OF MATERIALS														
0.5			TOPSOIL. - organics.											
1.0			0.25	GRAVEL, fine to coarse, silty/clayey and sandy, medium plastic silt/clay, occasional cobbles and boulders up to 0.4 m size, dense, flat, subrounded to subangular, yellow to grey, moist to wet (TILL-LIKE).										
1.5		1				0								
2.0														
2.5														
3.0			2.90	End of Hole at 2.90 m.										
3.5														
4.0														
4.5														
5.0														

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 106.GPJ KC_DATA.GDT 2/2/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-86

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/21/2005 FINISHED: 7/21/2005		INSTRUMENT	DETAILS	Su - kPa				
				EXCAVATOR TYPE: 420D Cat Backhoe				VANE PEAK	FIELD	LAB	UC/2	
				GROUND ELEV. (m): ~ 1357.5				REMOLD	◊	■	▲ P.PEN/2	
				COORDINATES (m): N 6809620 E 441475				* % FINES				
DESCRIPTION OF MATERIALS						W _p %	W%	W _L %				
						×	○	×	20	40	60	80
			TOPSOIL. - peat and organics.									
0.5			0.30	SAND and SILT, fine to coarse sand, low to medium plastic silt, gravelly, trace to some clay, occasional cobbles, dense, yellow to green, moist to wet (TILL-LIKE). - Ground was frozen to 1.0 m depth.								
1.0		1					○					
1.5												
2.0			1.70	End of Hole at 1.70 m.								
2.5												
3.0												
3.5												
4.0												
4.5												
5.0												

KC_TEST_PIT-SI TESTPITS TP05-51 TO 105.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-91

TEST PIT LOG

				Su - kPa														
				20	60	100	140	180										
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/30/2005 FINISHED: 7/30/2005		VANE PEAK FIELD LAB												
				EXCAVATOR TYPE: Manual		REMOULD ◊ ◻	▲ UC/2	△ P.PEN/2										
				GROUND ELEV. (m):		* % FINES												
				COORDINATES (m):		W _p %	W%	W _L %										
				DESCRIPTION OF MATERIALS		x - - - - - o - - - - - x	20	40	60	80								
0.5			0.01	TOPSOIL. - organics. SAND, medium, some cream coloured patches of ash (20%), trace silt, grey.														
			0.37	TOPSOIL. - organics.														
			0.40	GRAVEL and COBBLE, fine to coarse gravel, some sand and silt, trace clay, occasional boulders, angular to subrounded, grey to brown, moist (TILL-LIKE).														
1.0			0.90	End of Hole at 0.90 m.														

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 105.GPJ KC_DATA.GDT 2/2/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: EA/RB	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-92

TEST PIT LOG

				Su - kPa									
				20	60	100	140	180					
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/15/2005 FINISHED: 5/15/2005		VANE PEAK		FIELD		LAB		UC/2	
				EXCAVATOR TYPE: 420D Cat Backhoe		REMOVED		◇	□	▲	P.PEN/2		
				GROUND ELEV. (m): ~ 1337.5		* % FINES		W _p %	W%	W _L %			
				COORDINATES (m): N 6809089 E 441893		x	o	x					
DESCRIPTION OF MATERIALS				INSTRUMENT		DETAILS							
			TOPSOIL - peat and organics.	0.20									
0.5		1	SILT/CLAY, medium plastic, some sand, grey to brown, moist.										
1.0			SAND and SILT, fine to coarse sand, low to medium plastic silt, some fine to coarse gravel, some clay, yellow, moist.	0.80			o						
1.5		2											
2.0							o						
2.5			End of Hole at 2.20 m.	2.20									
3.0													
3.5													
4.0													
4.5													
5.0													

KC_TEST_PIT-SI TESTPITS TP05-51 TO 105.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-93

TEST PIT LOG

				Su - kPa												
				20	60	100	140	180								
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/14/2005		FINISHED: 5/14/2005			VANE		FIELD		LAB			
				EXCAVATOR TYPE: 420D Cat Backhoe					PEAK		◆		■		▲ UC/2	
				GROUND ELEV. (m): ~ 1320					REMOLD		◇		□		△ P.PEN/2	
				COORDINATES (m): N 6808558 E 442134					* % FINES							
				DESCRIPTION OF MATERIALS					W _p %		W%		W _L %			
									x - - - - - x		o - - - - - o		x - - - - - x			
									20		40		60		80	
0.5			0.10	TOPSOIL. - peat and organics.												
1.0			0.10	GRAVEL, fine to coarse, sandy silty matrix, trace clay, occasional cobbles and boulders up to 0.6 m size, dense, subrounded to subangular, green, moist (TILL-LIKE).												
1.5			0.10													
2.0			0.10													
2.5		1	0.10						o							
3.0			2.80	End of Hole at 2.80 m.												
3.5																
4.0																
4.5																
5.0																

KC_TEST_PIT-SI TESTPITS TP05-51 TO 106.GPJ KC_DATA.GDT 2/5/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-94

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/14/2005 FINISHED: 5/14/2005		INSTRUMENT	Su - kPa												
				EXCAVATOR TYPE: 420D Cat Backhoe			VANE PEAK	FIELD	LAB	UC/2									
				GROUND ELEV. (m): ~ 1311			◆	◆	■	▲									
				COORDINATES (m): N 6808446 E 442158			◇	◇	□	△									
				DESCRIPTION OF MATERIALS			* % FINES												
		W _p %	W%	W _L %															
		x	o	x															
		20	40	60	80														
			▲	TOPSOIL. - peat and organics.															
			▲	0.20															
			▲	0.30	VOLCANIC ASH, white.														
0.5			●	GRAVEL, fine to coarse, sandy silty matrix, low plastic, trace clay, occasional cobbles, dense, subrounded to subangular, green, moist (TILL-LIKE).															
1.0																			
1.5																			
2.0																			
2.5		1				o													
3.0			●	3.00	End of Hole at 3.00 m.														
3.5																			
4.0																			
4.5																			
5.0																			

KC_TEST_PIT-SI TESTPITS TP05-95 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: MSR	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-95

TEST PIT LOG

						Su - kPa													
						20	60	100	140	180									
DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 7/30/2005 FINISHED: 7/30/2005		INSTRUMENT DETAILS	VANE PEAK		FIELD	LAB	▲ UC/2 △ P.PEN/2								
				EXCAVATOR TYPE: Manual			◆	■											
				GROUND ELEV. (m):			* % FINES		W _p %	W%	W _L %								
				COORDINATES (m):			x	o	x										
DESCRIPTION OF MATERIALS						20	40	60	80										
0.5			0.15	TOPSOIL. - organics.															
			0.80	GRAVEL and COBBLE, fine to coarse, sandy silty matrix, low plasticity, trace clay, angular to subrounded gravel, light brown, moist (TILL-LIKE).															
1.0				End of Hole at 0.80 m.															
1.5																			
2.0																			
2.5																			
3.0																			
3.5																			
4.0																			
4.5																			
5.0																			

KC_TEST_PIT-SI TESTPITS TP05-S1 TO 108.GPJ KC_DATA.GDT 2/2/08



KLOHN CRIPPEN

PROJECT NO.: M09234A02	
PROJECT: Wolverine FD and EA	
LOCATION: Wolverine Lake	
LOGGED BY: EA/RB	CHECKED BY:
SHEET 1 OF 1	HOLE NO.: TP05-96

TEST PIT LOG

Su - kPa

20 60 100 140 180

DEPTH (m)	SAMPLE TYPE	SAMPLE No.	SYMBOL	STARTED: 5/13/2005 FINISHED: 5/13/2005		INSTRUMENT	Su - kPa						
				EXCAVATOR TYPE: 420D Cat Backhoe			VANE PEAK	FIELD	LAB	UC/2			
				GROUND ELEV. (m): ~ 1312.5									
				COORDINATES (m): N 6807978 E 442847									
				DESCRIPTION OF MATERIALS		DETAILS	* % FINES						
							W _p %	W%	W _L %				
						x	o	x	x				
						20	40	60	80				
0.5			0.10	TOPSOIL. - organics.									
1.0				GRAVEL, fine to coarse, sandy silty matrix, low plasticity, trace clay, occasional cobbles and boulders, angular to subrounded, light greenish grey, dry to moist (TILL-LIKE).									
1.5		1											
2.0				End of Hole at 3.00 m.									
2.5													
3.0			3.00										
3.5													
4.0													
4.5													
5.0													

KC_TEST_PIT-SI TESTPITS TP05-97 TO 106.GPJ KC_DATA.GDT 2/3/06



KLOHN CRIPPEN

PROJECT NO.: M09234A02

PROJECT: Wolverine FD and EA

LOCATION: Wolverine Lake

LOGGED BY: MSR

CHECKED BY:

SHEET 1 OF 1

HOLE NO.: TP05-97



Photograph 1 TH05-1 (June, 2005).



Photograph 2 TH05-2 (June, 2005).



Photograph 3 TH05-3 (June, 2005).



Photograph 4 TH05-4 (June, 2005).



Photograph 5 TH05-6 (June, 2005).



Photograph 6 TH05-7 (August 20, 2005).



Photograph 7 TH05-7 (August 20, 2005).



Photograph 8 TH05-7 (August 20, 2005).



Photograph 9 TH05-7 (August 20, 2005).



Photograph 10 TH05-8 (July 27, 2005).



Photograph 11 TH05-8 (August 7, 2005).



Photograph 12 TH05-8 (August 7, 2005).



Photograph 13 TH05-8 (August 7, 2005).



Photograph 14 TH05-8 (August 7, 2005).



Photograph 15 TH05-8 (August 7, 2005).



Photograph 16 TH05-8 (August 7, 2005).



Photograph 17 TH05-9 (July 27, 2005).



Photograph 18 TH05-9 (August 21, 2005).



Photograph 19 TH05-9 (August 21, 2005).



Photograph 20 TH05-9 (August 21, 2005).



Photograph 21 TH05-9 (August 21, 2005).



Photograph 22 TH05-9 (August 21, 2005).



Photograph 23 TH05-9 (August 21, 2005).



Photograph 24 TH05-9 (August 21, 2005).



Photograph 25 TH05-9 (August 21, 2005).



Photograph 26 TH05-9 (August 21, 2005).



Photograph 27 TH05-10 (August 1, 2005).



Photograph 28 TH05-11 (July 27, 2005).



Photograph 29 TH05-12 (July 27, 2005).

Monitoring Wells



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-2A

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 5/31/2005 FINISHED: 6/1/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442284.6m N 6808037.2m	GROUND ELEVATION: 1292 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 22.86 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HW Casing ROCK: 100mm dia. Tricone
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial; (d)=diametrical	TEMPERATURE	FIELD/LAB DATA						
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N			WATER CONTENT %		
					Dip Angle		CORE RECOVERY %					R.Q.D. %					
1			Peat (drill cuttings)														
2																	
3																	
4			4.1 1,287.9 Overburden (drill cuttings)														
5																	
6			6.1 1,285.9 Sand, greyish brown (drill cuttings)														
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18			17.7 1,274.3 Argillite, dark grey (drill cuttings)														
19																	
20																	
21			NOTE: Hydraulic Conductivity from 18.29m to 22.86m is zero.														
22																	
23			22.9 1,269.1 End of Hole at: 22.9 m														
24																	
25																	
26																	
27																	
28																	
29																	
30																	

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC_ROCK-SIG-4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 23/05



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-3B

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 5/25/2005 FINISHED: 5/26/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 439946.6m N 6810580m	GROUND ELEVATION: 1338 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 5 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HW Casing ROCK: 100mm dia. Tricone
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	CORE RECOVERY %	SPT/LPT N			WATER CONTENT %			
					Dip Angle		30 60		0	6			12	25	50	75	5	10	15
1			Gravel, mainly angular, clayey, dark grey. Sand in drill cuttings.																
2																			
3																			
4																			
5			5.0 1,333.0 End of Hole at: 5.0 m																
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
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27																			
28																			
29																			
30																			

KC-ROCK-SI@4 WOLVERINE TEST HOLES - NOV 17, 05 PJ ROCK-LOG.GDT 23/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-4A

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial, (d)=diametrical	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N			WATER CONTENT %				
					Dip Angle			CORE RECOVERY %				R.Q.D. %							
			(continued from previous page)																
31			return.																
32																			
33																			
34																			
35																			
36																			
37																			
38																			
39																			
40																			
41																			
42																			
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64																			
65																			
66																			
67																			
68																			

KC_ROCK-SI@4 WOLVERINE TEST HOLES - NOV 17.0PJ ROCK-LOG.GDT 2/9/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-6B

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 7/25/2005 FINISHED: 7/29/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 441657m N 6809312m	GROUND ELEVATION: 1348 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 13.6 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HW Casing ROCK: 100mm dia. Tricone
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA		ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) (a)=axial, (d)=diametrical	TEMPERATURE	FIELD/LAB DATA							
					10-6	10-4	10-2	SEE BOTTOM OF FORM FOR CODES				SPT/LPT N ●	WATER CONTENT % ○						
								Dip Angle 30 60					CORE RECOVERY %			R.Q.D. %			
								25	50			75	5	10	15				
1			Overburden																
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14			13.6 1,334.4 End of Hole at: 13.6 m																
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29																			
30																			

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC-ROCK-SIG4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 23/06



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-7A

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (c)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA					
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N			WATER CONTENT %	
					Dip Angle			30				60	CORE RECOVERY %			R.Q.D. %
			(continued from previous page)							0 6 12	25 50 75	5 10 15				
31			End of Hole at: 30.2 m													
32																
33																
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KC-ROCKSI@4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/2/06

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK
 CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO



GEOLOGIC LOG OF DRILL HOLE NO.: MW05-7B

CLIENT: Yukon Zinc Corporation	PROJECT NO.: M09234A02
PROJECT: Wolverine Feasibility Design and Environmental Assessment	DATE HOLE STARTED: 7/30/2005 FINISHED: 8/1/2005
LOCATION:	DATUM: NAD27
DIRECTION AZIMUTH: DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 442633m N 6807943m	GROUND ELEVATION: 1286 m
MANUFACTURER'S DRILL DESIGNATION: BBS 25A	TOTAL DEPTH OF HOLE: 4.6 m
DRILLING CONTRACTOR: Advanced Drilling Ltd.	DRILLING METHOD SOIL: HW Casing ROCK: 100mm dia. Tricone
LOGGED BY: EA/RB	DRILLING FLUID: Water
CHECKED BY:	HOLE DIA.:

DEPTH (m)	SYMBOL	SAMPLE No.	LITHOLOGY	PIEZOMETER DETAILS	HYDRAULIC CONDUCTIVITY CM/SEC			DISCONTINUITY DATA	ROCK STRENGTH BASED ON POINT LOAD TEST (MPa) <small>(a)=axial; (d)=diametrical</small>	TEMPERATURE	FIELD/LAB DATA								
					10-6	10-4	10-2				SEE BOTTOM OF FORM FOR CODES	SPT/LPT N			WATER CONTENT %				
					Dip Angle			30				60	CORE RECOVERY %			R.Q.D. %			
					30	60					25		50	75	5	10	15		
1			Overburden																
2																			
3																			
4																			
4.6			End of Hole at: 4.6 m																
5																			
6																			
7																			
8																			
9																			
10																			
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12																			
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29																			
30																			

DISCONTINUITY CODES: B: BEDDING D: DRILL BRK F: FAULT G: GNEISS'TY J: JOINT M: SCHIST'TY S: SHEAR T: TENSION CRK

CORE LOSS FRACTURED/BROKEN CORE DIP ANGLES MEASURED WITH RESPECT TO

KC: ROCK-3@4 WOLVERINE TEST HOLES - NOV 17.GPJ ROCK-LOG.GDT 2/3/06