

Report on
GEOTECHNICAL INVESTIGATIONS
MACKENZIE HIGHWAY
MILE 544 to MILE 635

Prepared for
DEPARTMENT OF PUBLIC WORKS OF CANADA

Volume 6



April 20, 1973



R.M. HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & TESTING



This report is in seven volumes. A Table of Contents is at the front of each volume.

<u>Volume Number</u>	<u>Contents</u>
1	Text
2	Text (continued)
3	Test Hole Logs and Test Data Test Holes 1 through 200
4	Test Hole Logs and Test Data Test Holes 201 through 400
5	Test Hole Logs and Test Data Test Holes 401 through 600
6	Test Hole Logs Test Holes 601 through 850
7	Test Hole Logs Test Holes 851 through 1103





APPENDIX D

Explanation Sheets



EXPLANATION OF TERMS AND SYMBOLS
USED ON TEST HOLE LOG SHEETS

Depth

This column refers to the depth below the ground surface in feet.

Sample Number

Tube and core samples were numbered consecutively from the surface. Grab samples were not numbered.

Sample Type

This column indicates the depth interval and condition of each sample attempted. Undisturbed samples in this program were obtained with Shelby tubes of 18 inches length and 3 inches diameter, manufactured from 11 gauge steel, or by core drilling. Cores were of 2.85 inch diameter and up to 36 inches long.

Disturbed samples were obtained from the returned cuttings.

T indicates tube sample

C indicates core sample

 indicates large grab sample

Note: Grab samples taken for water content and visual examination are not indicated in this column.

Percent Recovery

This column shows the length of sample recovered as a percentage of the length attempted. 100% recovery is not indicated and may be assumed where no value is shown.



Penetration Resistance

No standard penetration tests were performed during this program.

Soil Symbol

The soil symbols used are explained in full on page 5 of this appendix.

Soil Description

Soils of different engineering classification are grouped generically for ease of reference. The system used is the Modified Unified Classification System for Soils.

Frozen Ground

The depth intervals over which frozen and unfrozen ground were encountered are indicated by F and UF respectively. No attempt was made to differentiate between seasonal frost and permafrost.

Ice Description

The ice content of permafrost soils has been classified according to the National Research Council System for describing permafrost. A brief review of the NRC System is contained on page 9 of this appendix. Where no entry is made, the type was not recorded in the field.

The amount of ice contained in a soil sample was estimated in the field laboratory by inspection. The value arrived at by the laboratory technician has been left unchanged.



Water Content

The natural water content of the soil at the time of drilling is plotted against depth on the chart at the right hand side of the log. The water content, which is indicated by a circle, is expressed as a percentage of the dry weight of the soil. It will be observed that water contents in excess of 100% are indicated in the column at the right of the chart by figures.

Volume of Ice

The total volume of ice in undisturbed samples is indicated on the same chart as water contents. The value is indicated by a triangle. This volume is the total volume of ice in an undisturbed sample and includes interstitial ice, as well as excess ice, and is expressed as a percentage of the total volume of the sample.

Grain Size Analysis

The proportions of clay, silt, sand and gravel in a sample are summarized. Grain size curves for each sample so analyzed are on separate sheets.

Wet Density

The wet in situ density of undisturbed samples is the total weight of the sample in pounds (including ice and water) divided by the volume of the sample in cubic feet.



Dry Density

The dry in situ density of undisturbed samples is the weight of dry soil divided by the volume of the sample in cubic feet.

Atterberg Limits

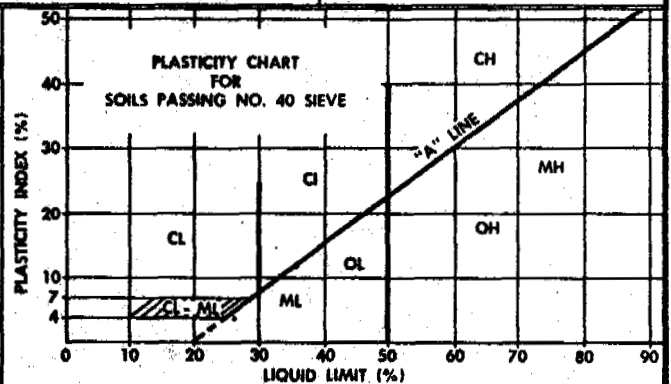
The plastic and liquid limits are shown on the water content chart by a horizontal bar. The Atterberg system is discussed in the following section.

NOTES ON ATTERBERG LIMITS

Soils which possess a significant fraction of clay can exist in liquid, plastic or solid states according to the water content. Where the water content is very high, so that the soil is in the form of a slurry, the soil behaves as a liquid. If the water content is reduced, for example through evaporation, the clay will enter into a plastic state. If the water content is reduced yet further, the clay will become a solid. The transition from one state to another occurs gradually over a range of water content. Atterberg, a Swedish agronomist, developed a method for delineating the boundaries between the three states. If his method is used, the water content which marks the dividing line between the plastic and liquid state is known as the Liquid Limit. These water contents are all expressed as percentages of the dry weight of soil. The range of water content between the plastic

MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

MAJOR DIVISION			GROUP SYMBOL	GRAPH SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 200 SIEVE)	GRAVELS MORE THAN HALF COARSE GRAINS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW		RED	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			GP		RED	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS	
		DIRTY GRAVELS (WITH SOME FINES)	GM		YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			GC		YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-(SILT) CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
	SANDS MORE THAN HALF FINE GRAINS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	SW		RED	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			SP		RED	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS	
		DIRTY SANDS (WITH SOME FINES)	SM		YELLOW	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			SC		YELLOW	CLAYEY SANDS, SAND-(SILT) CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES 200 SIEVE)	SILTS BELOW "A" LINE NEGLECTIBLE ORGANIC CONTENT	$W_L < 50\%$	ML		GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (see below)	
		$W_L > 50\%$	MH		BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS		
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART NEGLECTIBLE ORGANIC CONTENT	$W_L < 30\%$	CL		GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS		
		$30\% < W_L < 50\%$	CI		GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS		
		$W_L > 50\%$	CH		BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
	ORGANIC SILTS & CLAYS BELOW "A" LINE ON CHART	$W_L < 50\%$	OL		GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY	
		$W_L > 50\%$	OH		BLUE	ORGANIC CLAYS OF HIGH PLASTICITY		
	HIGHLY ORGANIC SOILS			Pt		ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE



1. ALL SIEVE SIZES MENTIONED ON THIS CHART ARE U.S. STANDARD, A.S.T.M. E.11.
2. BOUNDARY CLASSIFICATIONS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN COMBINED GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL SAND MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%.



and liquid limit is known as the plastic range and the numerical difference between the liquid and plastic limits is called the Plasticity Index.

It will be appreciated that where the natural water content is in excess of the liquid limit, the soil mass will be most unstable and will readily flow into excavations or trenches. Such considerations will not apply where the soil mass is kept frozen. However, in cases where the frozen soil is allowed to thaw, the relationship between the natural water content and liquid limit becomes critical.

On page 5 there is a chart showing the relationship between the Plasticity Index, the Liquid Limit and the group symbols of the Unified Classification System. The Atterberg Limit system is extremely useful for identifying and classifying soils.

NOTES ON THE RADFORTH SYSTEM

FOR CLASSIFYING PEAT

The Radforth classification system for describing muskeg (organic terrain) is a method for classifying the three elements of vegetation, topography and organic surface cover using letter and figure symbols. Height and type of vegetation is described by using capital letters (A through I). Topography is described by using lower case letters (a through p) Organic cover type if described by using figures (1 through 16).



Table I outlines these figure symbols and the peat structure and type represented by them. A complete description of the Radforth system is contained in "Guide to a Field Description of Muskeg" published by National Research Council, Ottawa, from which has been copied Table I.



TABLE I
SUBSURFACE CONSTITUTION

Predominant Characteristic	Category	Name
	1.	Amorphous-granular peat
	2.	Non-woody, fine-fibrous peat
	3.	Amorphous-granular peat containing woody fine fibres
	4.	Amorphous-granular peat containing woody fine fibres
	5.	Peat, predominantly amorphous-granular, containing non-woody fine fibres, held in a woody, fine fibrous framework.
	6.	Peat, predominantly amorphous-granular containing woody fine fibres, held in a woody, coarse-fibrous framework.
	7.	Alternate layering of non-woody, fine fibrous peat and amorphous-granular peat containing non-woody fine fibres.
	8.	Non-woody, fine-fibrous peat containing a mound of coarse fibres.
	9.	Wood, fine fibrous peat held in a woody, coarse-fibrous framework.
	10.	Woody particles held in a non-woody, fine-fibrous peat.
	11.	Woody and non-woody particles held in fine-fibrous peat.
	12.	Woody, coarse-fibrous peat.
	13.	Coarse fibres criss-crossing fine- fibrous peat.
	14.	Non-woody and woody fine-fibrous peat held in a coarse-fibrous framework.
	15.	Woody mesh of fibres and particles enclosing amorphous-granular peat containing fine fibres.
	16.	Woody, coarse-fibrous peat containing scattered woody chunks.



NOTES ON THE NATIONAL RESEARCH COUNCIL
SYSTEM FOR DESCRIBING PERMAFROST

Ground ice occurs in three conditions. Non-visible, visible (but less than one inch in thickness) and clear ice. Non-visible ice is designated N with an added suffix of one or two lower case letters. Visible ice is designated V with an added suffix of one lower case letter. Clear ice is designated ICE with notes on ice type.

TABLE IV

<u>Symbol</u>	<u>Description</u>
Nf	Non-visible ice, frozen soil in friable condition.
Nbn	Non-visible ice, frozen soil well bonded, no excess ice.
Nbe	Non-visible ice, frozen soil well bonded, excess ice revealed on melting sample.
Vx	Visible ice crystals.
Vc	Ice coatings on soil particles.
Vr	Ice formations irregularly orientated.
Vs	Stratified ice lenses.
ICE	Clear ice over one inch in thickness.
ICE + soil	Ice over one inch thick with soil inclusions.

A complete description of this system is contained in "Guide to a Field Description of Permafrost" published by National Research Council, Ottawa.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: 77		FIELD ENG: BG		DATE DRILLED: 7/2/77		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE						
EXP: ~~77~~		TECH: DLE 13		RIG: MANLEY 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE B,C,S NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %			
2						OH CLAY: ORGANIC, SILTY, BLACK C1 CLAY (FILL): SILTY SAND/ FINE GRAINED PEARLES BROWN		V ₅ 5	2	○								HEADLINE STRIKE MAY 5" 15-35" HIGH OCCASIONAL BIRCH
4								V ₅ 10	4	○								
6						SHANDY CL COBBLES COAL, RUST		Nb	6	○								
8									8	○								
10									10	○								
12						GREY BROWN			12	○								
14									14	○								
16									16	○								
18						CH HIGH PLASTIC GREY			18	○								
20						END OF HOLE			20									
22									22									
24									24									

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: RC		DATE DRILLED: 26/4/75		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~TC~~		TECH: MLE 16		RIG: MLE 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						CLAY: ORGANIC										
						CLAY (FILL):		Vx 20%								
2						SILTY SANDY STONES			2							
4						COAL & RUST SPOTS		Vx 5%	4							
6						MED PLASTIC BROWN			6							
8						COBBLES		Nbn	8							
10						GREY BROWN			10							
12									12							
14						CH HIGH PLASTIC GRAY			14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <i>TC</i>		FIELD ENG: <i>PC</i>		DATE DRILLED: <i>24/1/73</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE															
CKD: <i>1/1</i>		TECH: <i>1/1 E 19</i>		RIG: <i>HEVHEV 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE		B.C.S.		NUMBER													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						<i>PT PEAT: CATEGORY # 15</i>				O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
						<i>C1 CLAY (TILL):</i>		<i>V_i < 5%</i>		PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+																			
2						<i>SANDY SILTY STONES COBBLES MED PLASTIC BROWN SANDIER</i>			2							<i>DENSE SPRUCE 20' to 35' HIGH 5" MAX. Ø OCCASIONAL BIRCH</i>													
4									4																				
6	<i>1</i>								6																				
8									8																				
10						<i>LESS SANDY</i>			10																				
12									12																				
14						<i>SANDIER GREY</i>		<i>NF</i>	14																				
16	<i>2</i>								16																				
18									18																				
20						<i>LESS SANDY</i>			20																				
22						<i>END OF HOLE</i>			22																				
24									24																				

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN:	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:	ELEV:	TEST HOLE									
CXD:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:				MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			

DWN: TC FIELD ENG: R.P. DATE DRILLED: 27/6/75 AIRPHOTO NO: A22934-155 CHAINAGE: OFFSET: ELEV:

CXD: TECH: INT 16 RIG: MAYHEM 1000 SURFACE DRAINAGE: FAIR VEGETATION: SEE REMARKS

TEST HOLE

MILE	B,C,S	NUMBER
594	B-77	607

O = WATER CONTENT (% OF DRY WEIGHT)
Δ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT LIQUID LIMIT

20 40 60 80 100 100+

OH CLAY: ORGANIC 14
C1 CLAY (TILL):
SILTY SANDY STONES
MED PLASTIC BROWN
RUST & COAL SPOTS 5
SANDIER

LESS SANDY 11
GREY BROWN

SILTIER 13
SANDIER

CH LESS SILTY 17
LESS SANDY HIGH PLASTIC GREY

END OF HOLE 20

F V+ 5%

NF

GRAIN-SIZE ANALYSIS

CLAY	SILT	SAND	GRAVEL
%	%	%	%

REMARKS

MED PLASTIC SPRUCE 10'-25' HIGH 6" MAX Ø OCCASIONAL BRACH

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>RL</i>		DATE DRILLED: <i>27/6/73</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		TEST HOLE																	
CKD: <i>1111</i>		TECH: <i>NF 1G</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS												
										CLAY %	SILT %	SAND %	GRAVEL %																
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
2						OH CLAY: ORGANIC CI CLAY (TILL): SILTY SANDY STONES MED PLASTIC BROWN RUSTY COAL SPOTS		V ₊ 5%	2																				
4						SANDIER			4																				
6	1							NF	6																				
8									8																				
10									10																				
12						LESS SANDY GREY BROWN			12																				
14						SILTIER SANDIER			14																				
16									16																				
18									18																				
20						LESS SILTY LESS SANDY HIGH PLASTIC GREY			20																				
22									22																				
24						END OF HOLE			24																				

594 B-77 607
 REMARKS:
 1.5% PLASTIC
 SPHULE 10-25
 HIGH 6" MAX Ø
 OCCASIONAL
 BIRCH

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>TL</i>		FIELD ENG: <i>RL</i>		DATE DRILLED: <i>26/4/73</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: <i>RL</i>		TECH: <i>JVF IG</i>		RIG: <i>MAXVEL 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						MILE <i>5943-77</i> B.C.S. <i>603</i> NUMBER
2						<i>P1 PEAT: CATEGORY # 15</i> <i>C1 CLAY (TLL): VERY SATY</i> <i>SANDY</i> <i>STONES</i> <i>MED. PLASTIC</i> <i>LESS SILTY</i> <i>BROWN</i>		<i>Vt < 5%</i>	2							<i>MED. DENSE</i> <i>SPRUCE 10-25</i> <i>HIGH 5" MAX</i> <i>OCCASIONAL</i> <i>BIRCH</i>
4									4							
6									6							
8						<i>SANDIER</i>		<i>NF</i>	8							
10						<i>GRAVELLY</i>		<i>Nbn</i>	10							
12									12							
14									14							
16									16							
18									18							
20						<i>CH</i> <i>LESS GRAVEL</i> <i>LESS SANDY</i> <i>GREY</i> <i>HIGH PLASTIC</i>		<i>Nf</i>	20							
22						<i>END OF HOLE</i>			22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: G.N.		FIELD ENG: B.C.	DATE DRILLED: 22/2/73	AIRPHOTO NO: A22934-137	CHAINAGE:	OFFSET:	ELEV:		TEST HOLE							
CKD: ~~1~~		TECH: J.W.	RIG: FAIRING 1000	SURFACE DRAINAGE: POOR	VEGETATION: SEE REMARKS					MILE	B,C,S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
2						CH CLAY: organic		V _s 30%	2							Medium Dense Spruce 5'-25' High, Max 5" φ
4						CI CLAY (TILL) silty, sand, medium plastic stones cobbles		V _x 10%	4							
6								Nbr	6							
8									8							
10									10							
12									12							
14						CH high plastic gray			14							
16									16							
18									18							
20						END of HOLE			20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TD</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>23/6/72</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		TEST HOLE																	
CKD: <i>11</i>		TECH: <i>IN</i>		RIG: <i>FAIRBANKS 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE: <i>589</i> B.C.S. <i>611</i> NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN		Vs 35%								MED DENSE SILTY 10' MAX HIGH 4" MAX													
2						CI CLAY (FILL): SANDY SILTY STONES RUST SPECS MED PLASTIC BROWN		Nb	2																				
4									4																				
6									6																				
8									8																				
10									10																				
12						GRAVELLY			12																				
14									14																				
16						LESS GRAVEL HIGH PLASTIC GREY			16																				
18									18																				
20						END OF HOLE			20																				
22									22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>RC</i>		DATE DRILLED: <i>23/1/77</i>		AIRPHOTO NO: <i>A22934-157</i>		CHAINAGE:		OFFSET:		TEST HOLE																	
CKD: <i>TC</i>		TECH: <i>JW</i>		RIG: <i>FALLING 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										20	40	60	80	100	100+														
2	1	C	100			OH CLAY. ORGANIC HIGH PLASTIC DARK BROWN	1/4 F	Vs 30%	2																				
4						CI CLAY (TILL): SANDY SILTY STONES RUST LENSES MED. PLASTIC BROWN	2%	Vs 15%	4																				
6	2	C	89					Nbn	6																				
8						SP SAND (TILL): FINE GRAINED CLAYEY LOW PLASTIC GREY BROWN	7		8																				
10	3	C	100						10																				
12	4	C	89						12																				
14						CH CLAY (TILL) SMTH SANDY HIGH PLASTIC GREY BROWN	13		14																				
16	5	C	83						16																				
18						SP SAND (TILL): FINE GRAINED CLAYEY LOW PLASTIC GREY BROWN	15%		18																				
20	6	C	100						20																				
22									22																				
24						END OF HOLE	19%		24																				

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: G.N.		FIELD ENG: B.C.		DATE DRILLED: 23/2/73		AIRPHOTO NO: A 22934-157		CHAINAGE:		OFFSET:		TEST HOLE					
CKD: ~~XXXX~~		TECH: J.V.		RIG: FAIRING 1000		SURFACE DRAINAGE: Good		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %	SAND %	GRAVEL %				
						Pt ~~Peat~~ category #5 C1 CLAY(TILL): Sandy silty rust specs med plastic brown CH high plastic rust lenses coal specs grey END of HOLE		Vs 40% Non		O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
2									2								Medium Dense Spruce 15-35' High, Max 7" d
4									4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: C.N.

FIELD ENG: B.C.

DATE DRILLED: 22/2/53

AIRPHOTO NO: A22934-157

CHAINAGE:

CKD: ~~111~~

TECH: J.W.

RIG: FAIRING 1902

SURFACE DRAINAGE: 4000

VEGETATION: SEE REMARKS

OFFSET:

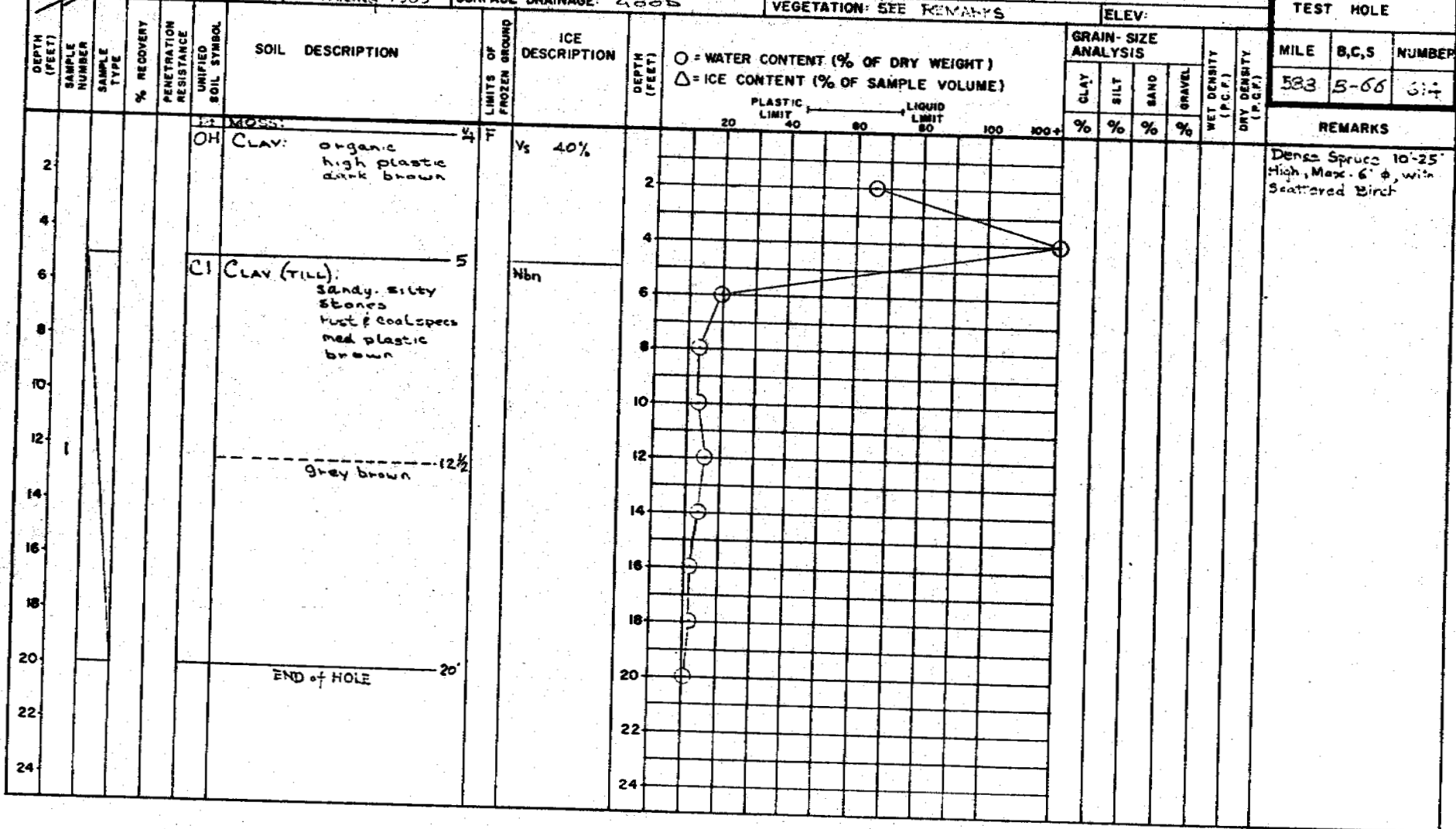
ELEV:

TEST HOLE

TEST HOLE	MILE	B.C.S	NUMBER
	583	5-66	6:4

REMARKS

Dense Spruce 10'-25'
High, Max. 6" ϕ , with
Scattered Birch



R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: TC			FIELD ENG: EC			DATE DRILLED: 26/1/75			AIRPHOTO NO: A 22934-155			CHAINAGE:			OFFSET:			TEST HOLE											
CKD: ~~HH~~			TECH: HH & EB			RIG: MAYHEM 1000			SURFACE DRAINAGE: POOR			VEGETATION: SEE FLEMMING'S			ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTICITY		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B.C.S	NUMBER									
										PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL														
						1.1 DEPT. CATEGORY "18"	15	Vs 30%			20																		
2						C1 CLAY (TILL): SANDY SILTY STONES MED. PLASTIC BROWN		Vs 15%	2																				
4	1	C	50						4																				
6						6 RUSTY COAL SPEC. COBBLES			6																				
8									8																				
10	2					9 GREY BROWN			10																				
12									12																				
14						14 CH GREY HIGH PLASTIC			14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

MED DENSE
SPRUCE 15' TO 40'
HIGH 10' MAX &
OCCASIONAL
WILLOW, BIRCH
& BLACK POPLAR

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: EC		DATE DRILLED: 26/4/75		AIRPHOTO NO: A22954-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~TC~~		TECH: HIL/EB		RIG: MCKEN 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						OH CLAY: ORGANIC HIGH PLASTIC 1'	F	Vx 20%								MED. DENSE SPRUCE 15 TO 25 HIGH 6' MAX. & OCCASIONAL BIRCH, POPLAR & WILLOW
2						CI CLAY (TILL): SANDY SILTY STONES COBBLES RUST & COAL SPOTS MED PLASTIC BROWN	UF		2							
4							F	Nbn	4							
6						----- 6			6							
8									8							
10						CH ----- 10			10							
12									12							
14									14							
16									16							
18									18							
20						----- 20			20							
22						END OF HOLE			22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: PC	DATE DRILLED: 26/2/72	AIRPHOTO NO: A22934-155	CHAINAGE:	WACKENZIE HIGHWAY	OFFSET:	TEST HOLE								
TECH: HH & EP		RIG: MAYHEV 1000	SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE	B.C.S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2						PT PEAT: CATEGORY #16		V _x 30%	2							POPLAR 15' to 35' HIGH 8" MAX Ø OCCASIONAL BIRCH, SPRUCE & WILLOW
4					C1 CLAY (TILL): SANDY SILTY STONES MED. PLASTIC BROWN COBBLES		V _s 15%	4								
6							N67	6								
8								8								
10								10								
12					CH	HIGH PLASTIC GREY		12								
14								14								
16								16								
18								18								
20						END OF HOLE		20								
22								22								
24								24								

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: TC		FIELD ENG: RC		DATE DRILLED: 26/1/73		AIRPHOTO NO: A 22934-155		CHAINAGE:		OFFSET:		TEST HOLE																	
CKD: ~~RC~~		TECH: HH FEB		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %																		
2						OH CLAY: ORGANIC 1		Vs 40%	2					DENSE SPRUCE 20' to 40' HIGH 10" MAX. Ø OCCASIONAL POPULAR & BIRCH															
4	1					CI CLAY (FILL): SANDY SILTY MED PLASTIC STONES BROWN RUST SPOTS COAL SPOTS CORBELS		N60	4																				
6									6																				
8						VERY SANDY 7			8																				
10	2								10																				
12						CH LESS SANDY GREY HIGH PLASTIC 10%			12																				
14									14																				
16									16																				
18									18																				
20									20																				
22									22																				
24						END OF HOLE 20			24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: BC	DATE DRILLED: 26/1/70	AIRPHOTO NO: A 22934-155	CHAINAGE:	OFFSET:	ELEV:	TEST HOLE								
CKD: <i>MA</i>		TECH: <i>HH E EB</i>	RIG: <i>MAYHEW 1000</i>	SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2	1					PI PEAT: CATEGORY "I"		V _h 40%	2							DENSE SURFACE 15' to 25' HIGH 6" MAX Ø OCCASIONAL BIRCH
4						CI CLAY (TILL): SANDY SILTY STONES MED. PLASTIC BROWN COBBLES	V _h 5%	4								
6						POCKETS OF SAND	N6m	6								
8	2							8								
10								10								
12						CH NO POCKETS OF SAND		12								
14						GREY HIGH PLASTIC		14								
16	3							16								
18								18								
20						END OF HOLE		20								
22								22								
24								24								

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TL</i>			FIELD ENG: <i>EC</i>			DATE DRILLED: <i>26/1/77</i>			AIRPHOTO NO: <i>A22934-155</i>			CHAINAGE:			OFFSET:			TEST HOLE											
CKD: <i>TL</i>			TECH: <i>HH & EB</i>			RIG: <i>MAYNEW 1000</i>			SURFACE DRAINAGE: <i>POOR</i>			VEGETATION: <i>SEE REMARKS</i>			ELEV:			MILE B.C.S. NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						PT PEAT: CATEGORY # 1		V _x 50%																					
2						CI CLAY: SILTY MED. PLASTIC LIGHT BROWN		V _x 30%	2																				
4								V _x 50%	4																				
6						CI CLAY (FILL): SANDY SILTY MED. PLASTIC STONES RUSTY COAL SPOTS LIGHT BROWN		V _x 25%	6																				
8									8																				
10						----- GREY BROWN COBBLES		Nbn	10																				
12									12																				
14									14																				
16						CH ----- HIGH PLASTIC GREY			16																				
18									18																				
20									20																				
22									22																				
24						END OF HOLE			24																				

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: TC		FIELD ENG: BC		DATE DRILLED: 26/2/73		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~TC~~		TECH: HLE EB		RIG: MAYHEW 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE: 59.3 B.C.S. NUMBER: 622				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PEAT: CATEGORY "1"	3/4	Vs 40%								MED. DENSE SPRUCE 15 TO 25' HIGH 5' MAX Ø OCCASIONAL BIRCH & TAMARAC
2						CI CLAY (TILL): SANDY SILTY STONES RUST & COAL SPOTS MED. PLASTIC BROWN	3	Vr 5%	2							
4						VERY SANDY		Nbn	4							
6						LESS SANDY	6 1/2		6							
8									8							
10									10							
12						CH BOULDERS GRAY HIGH PLASTIC	12		12							
14									14							
16									16							
18									18							
20						END OF HOLE	20		20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: TC		FIELD ENG: BC		DATE DRILLED: 26/1/73		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CND		TECH: HH F.E.B.		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOTEL		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						OH CLAY: ORGANIC 1		Vs 70%								
						SC SAND (FILL): MED GRAINED SILTY CLAY STONES, STONES		Nbn								
						SP NON CLAYEY COBBLES										
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: G.N.		FIELD ENG: B.C.		DATE DRILLED: 23/2/72		AIRPHOTO NO: A 22934-157		CHAINAGE:		OFFSET:		TEST HOLE		
CKD: ~~1111~~		TECH: J.W.		RIG: FAIRBANKS 1000		SURFACE DRAINAGE: 4000		VEGETATION: DENSE SPRUCE 15'-25'		ELEV:		MILE B.C.S. NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
						OH CLAY: organic high plastic		Vs 30%						
2					CI	CLAY (TILL) silty sandy, medium plastic pebbles cobbles brown rust & coal specs		Vs 20%	2					
4									4					
6									6					
8									8					
10									10					
12					CH	high plastic grey		Nf	12					
14									14					
16									16					
18									18					
20						END of HOLE			20					
22									22					
24									24					

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: G-4		FIELD ENG: B.C.	DATE DRILLED: 23/2/73	AIRPHOTO NO: A 22934-157	CHAINAGE:	OFFSET:	TEST HOLE		
TECH: J.W.		RIG: FAIRING 1000	SURFACE DRAINAGE: 4000		VEGETATION: DENSE SPRUCE 10' 30" HIGH	ELEV:	MILE	B,C,S	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	
								GRAIN-SIZE ANALYSIS	
								CLAY	SILT
								SAND	GRAVEL
								WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
								REMARKS	
0						OH CLAY: organic	1/4	Vs 40%	
2						CI CLAY (TILL) silty, sandy medium plastic pebbles cobbles	1	Vs 20%	
4						CH high plastic grey brown	4		
6									
8									
10									
12									
14									
16									
18									
20						END of HOLE	20'		

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN:	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:																										
CND	TECH: FPEIS	RIG: MAUIEN 1000	SURFACE DRAINAGE: POOR	VEGETATION: SEE REMARKS	ELEV:																										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	TEST HOLE															
																MILE	B,C,S	NUMBER													
																595	C	628													
																REMARKS															
PEAT CATEGORY #2 1/2 C1 CLAY (TILL): SANDY SATY STONES RUST & COAL MED PLASTIC BROWN SILTYER --- 12 END OF HOLE --- 14																Vx 20% N67			○ = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT LIQUID LIMIT										DENSE SPRUCE 15' HIGH 4" MAX Ø ODD BIRCH? WILLOW		

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: TC		FIELD ENG: RC		DATE DRILLED: 2/2/73		AIRPHOTO NO: A22934-155		CHAINAGE: 716 + 50		OFFSET:		TEST HOLE				
CKD: ~~TC~~		TECH: EP 16		RIG: NEWELL 122		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
2					OH	CLAY: ORGANIC HIGH PLASTIC DARK BROWN	F	1/2 30% N6m	2							SPRUCE & BIRCH 20' to 30' HIGH 6" MAX. & OCCASIONAL WILLOW & LARCH
4					C1	CLAY (FILL): SANDY SILTY STONES RUST & COAL SPOTS MED PLASTIC BROWN			4							
6									6							
8									8							
10						VERY SANDY			10							
12						LESS SANDY			12							
14						END OF HOLE			14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>12</i>		FIELD ENG: <i>B.C.</i>		DATE DRILLED: <i>2/27/73</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE: <i>725+13</i>		OFFSET:		TEST HOLE				
CKD: <i>12</i>		TECH: <i>LB & IG</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE <i>595</i> B,C,S <i>C</i> NUMBER <i>630</i>				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT. PART. CATEGORY "4", F		V _h 40%								MED. DENSE DWARF SPRUCE ODD WILLOWS
						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN		V _x 30%								
2									2							
4						CH CLAY (TILL): SILTY SANDY STONES FAST-F COAL SPOTS HIGH PLASTIC BROWN		N ₆₀	4							
6									6							
8						COBBLES			8							
10									10							
12									12							
14						GREY			14							
16						END OF HOLE			16							
18									18							
20									20							
22									22							
24									24							

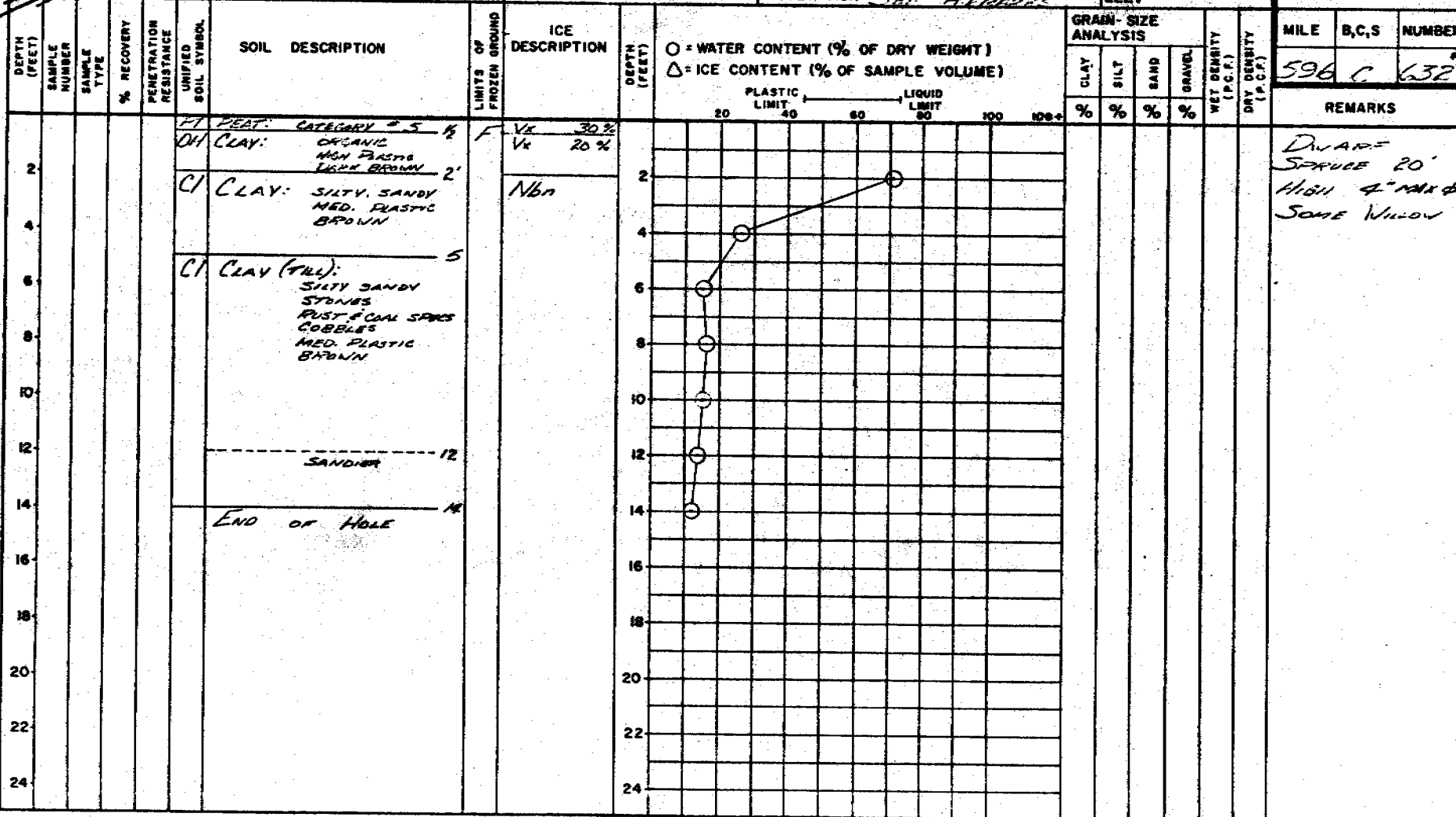
R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
OWN: <i>TD</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>24/1/72</i>		AIRPHOTO NO: <i>A 22934-155</i>		CHAINAGE: <i>740+32</i>		OFFSET:							
CKD: <i>BC</i>		TECH: <i>BE 16</i>		RIG: <i>MANNEN 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:							
										TEST HOLE							
										MILE	B,C,S	NUMBER					
										596	C	631					
										REMARKS							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %				
2						PT PEAT: CATEGORY #5		V _x 30%	2								MED DENSE SPRUCE OLD BIRCH & WILLOW
						OH CLAY: ORGANIC		V _x 20%									
4						CI CLAY (TILL):		Nb _n	4								
						SANDY SILTY											
6						STONES			6								
						RUST & COAL SPOTS											
8						MED. PLASTIC			8								
						BROWN											
10						COBBLES			10								
									12								
12						BOULDERS											
						GREY BROWN											
14						END OF HOLE			14								
						(HOLE ENDED ON BOULDER)											
16									16								
18									18								
20									20								
22									22								
24									24								

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC	FIELD ENG: BC	DATE DRILLED: 24/1/79	AIRPHOTO NO: A22934-153	CHAINAGE: 247+73	MACKENZIE HIGHWAY
CND: ~~TC~~	TECH: EBE/G	RIG: MANNING 1000	SURFACE DRAINAGE: POOR	VEGETATION: SEE REMARKS	TEST HOLE
				OFFSET:	
				ELEV:	

TEST HOLE



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
DWN: <i>TL</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>24/1/75</i>		AIRPHOTO NO: <i>A 22934-153</i>		CHAINAGE: <i>753+60</i>		OFFSET:					
CKD: <i>TL</i>		TECH: <i>EB F I G</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:					
TEST HOLE															
MILE		B.C.S		NUMBER		REMARKS									
596		C		633											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										CLAY	SILT	SAND	GRAVEL		
										%	%	%	%		
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)					
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 80 100 100+					
2						PT PEAT: CATEGORY #12 OH CLAY: ORGANIC HIGH PLASTIC BROWN	F	Vx 80%	2						
4						CI CLAY (FILL): SILTY SLIGHT SANDY STONES FIRST 1 CM SPARS MED. PLASTIC BROWN		Vx 60%	4						
6								Vx 20%	6						
8								Vx 10%	8						
10						SANDY COBBLES		Nbn	10						
12									12						
14									14						
16									16						
18									18						
20									20						
22									22						
24						END OF HOLE			24						

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY					
DWN: <i>TT</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>2/1/77</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE: <i>767+10</i>		OFFSET:			
CKD: <i>10/1/77</i>		TECH: <i>EP EIG</i>		RIG: <i>MILWEN 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:			
TEST HOLE													
MILE B.C.S NUMBER													
596 C 634													
REMARKS													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.G.F.)	DRY DENSITY (P.G.F.)
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)	CLAY SILT SAND GRAVEL		
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT	% % % %		
2						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN		Vx 20% Vx 90%	2				
4						CI CLAY (FILL): SILTY STONES MED. PLASTIC BROWN		Vx 60%	4				
6						SANDY FINE STONES COAL SPOTS COBBLES		Vx 20% Vx 5%	6				
8						SANDIER		Nbr	8				
10									10				
12									12				
14						END OF HOLE			14				
16									16				
18									18				
20									20				
22									22				
24									24				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

TEST HOLE

MILE	B,C,S	NUMBER
596	C	635

REMARKS

SPARSE DWARF
SPRUCE 15' HIGH
4" MAX Ø
OCCASIONAL
BIRCH & WILLOW
(DRUNKEN FOREST)

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: BC		DATE DRILLED: 27/6/73		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~1111~~		TECH: JVF IG		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
2					PT	PEAT. CATEGORY # 16	F	1/3 40%	2							LOW DENSITY SPRUCE 15 to 25 HIGH 5' MAX Ø
4					CI	CLAY (FILL): SANDY SILTY STONES COBBLES RUST & COAL SPOTS MED. PLASTIC BROWN		1/3 10%	4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DATE: 5H

FIELD ENG: PC

DATE DRILLED: 27/2/73

AIRPHOTO NO: A 22934-155

CHAINAGE:

OFFSET:

TEST HOLE

CKD

TECH: 1 E, 1 M

RIG: VAYVIEW

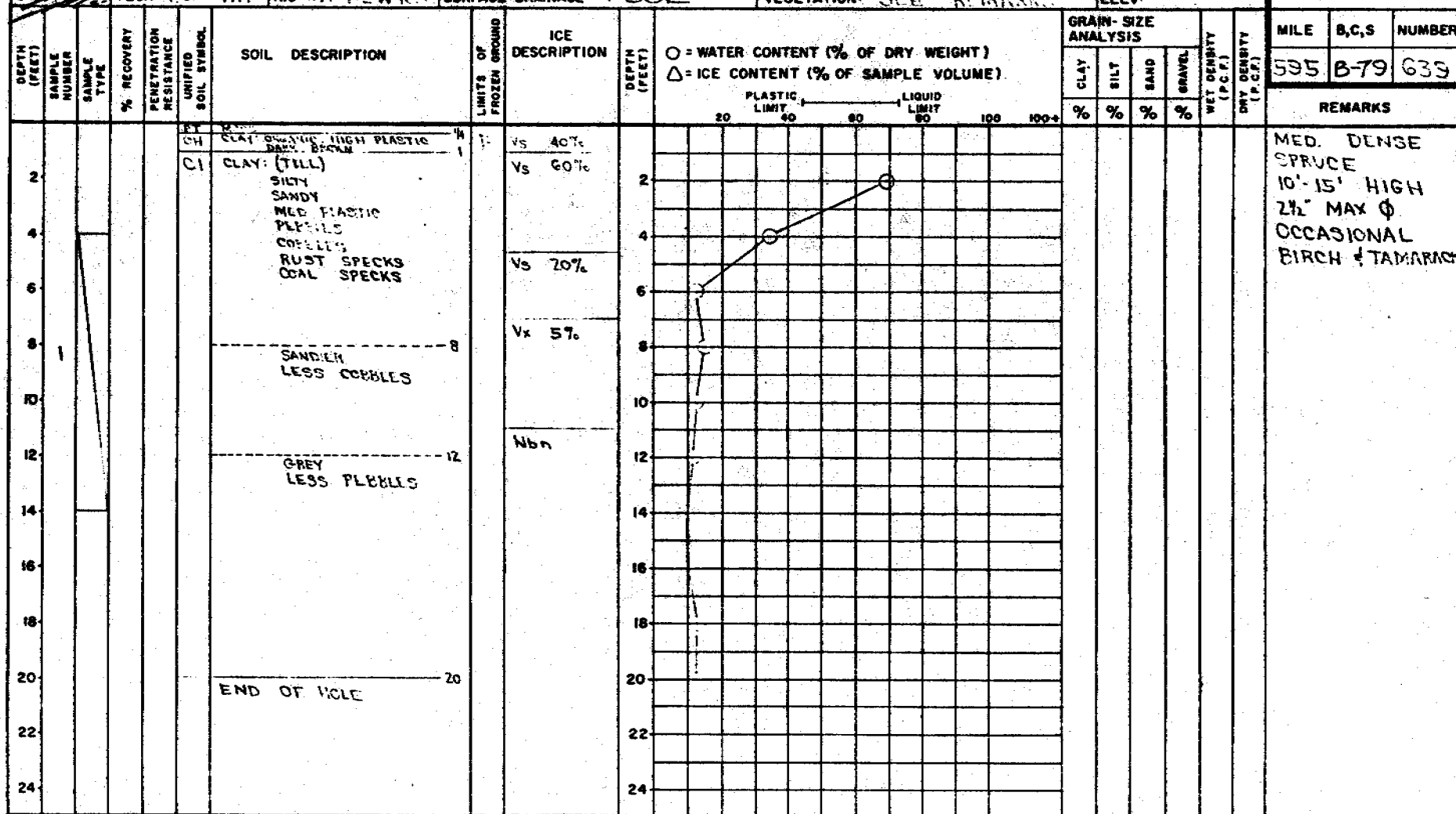
SURFACE DRAINAGE: FREE

VEGETATION: SEE REMARKS

ELEV:

MILE	B,C,S	NUMBER
595	B-79	639

REMARKS



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: EC		DATE DRILLED: 7/1/79		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~111~~		TECH: JLF IG		RIG: MANN 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PERT: CATEGORY "16"										
						CI CLAY (TILL):		V _e 50%								
2						SANDY SILTY STONES			2							
4						COBBLES MED. PLASTIC BROWN BOULDERS		Nb _n	4							
6	1								6							
8						GREY-BROWN	8		8							
10									10							
12								NP	12							
14						SILTIER	14		14							
16									16							
18						CH HIGH PLASTIC BOULDERS GREY	18		18							
20						END OF HOLE	20		20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>GL</i>		DATE DRILLED: <i>27/4/75</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:							
CHK: <i>GL</i>		TECH: <i>IN E 16</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>PCOE</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:							
TEST HOLE																	
MILE <i>594.873</i> B.C.S. <i>341</i> NUMBER <i>4</i>																	
REMARKS																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)		
										CLAY	SILT	SAND	GRAVEL				
										%	%	%	%				
										20 40 60 80 100 100+ PLASTIC LIMIT LIQUID LIMIT							
										20 40 60 80 100 100+ PLASTIC LIMIT LIQUID LIMIT							
2						PT PEAT: CATEGORY #3 OF CLAY: ORGANIC LIGHT PLASTIC DARK BROWN		ICE 75%	2								
4								Vs 40	4								
6						CI CLAY (FILL): SANDY SILTY STONES COBBLES ROOT & COAL SPECS MED. PLASTIC BROWN		Vs 35	6								
8	1							Nbn	8								
10									10								
12									12								
14						SANDIER			14								
16									16								
18						END OF HOLE (HOLE ENDED IN BOUNDER)			18								
20									20								
22									22								
24									24								

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TC</i>		FIELD ENG: <i>RC</i>		DATE DRILLED:		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>11/11/54</i>		TECH:		RIG:		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE <i>594</i> B.C.S. <i>B-7B</i> NUMBER <i>642</i>				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PEAT: CATEGORY "5" 1										
2						CI CLAY (MLL): SANDY SILTY STRAVES POST 5' QAL SPDS COBBLES MED PLASTIC BROWN		V _v 15%	2							
4									4							
6									6							
8									8							
10								N ₆	10							
12									12							
14						CH HIGH PLASTIC GREY		N _F	14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY					
DWN: <i>TC</i>		FIELD ENG: <i>EC</i>		DATE DRILLED: <i>8/1/78</i>		AIRPHOTO NO: <i>A 72934-155</i>		CHAINAGE:		OFFSET:			
~~CHS~~		TECH: <i>W/E LG</i>		RIG: <i>MAYHEW K20</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:			
TEST HOLE													
MILE		B,C,S		NUMBER									
<i>594</i>		<i>B-78</i>		<i>593</i>									
REMARKS													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 80 100 100+	CLAY % SILT % SAND % GRAVEL %		
2						PT PEAT: CATEGORY #3 CI CLAY: SILTY MED PLASTIC BROWN		Vs 50%	2				
4								Vs 10%	4				
6								Nb	6				
8	1					CI CLAY (TILL): SANDY SILTY SPINDS RUST & COAL SPKS COBBLES MED PLASTIC GRY			8				
10									10				
12									12				
14									14				
16									16				
18						VERY SANDY		Nf	18				
20						END OF HOLE			20				
22									22				
24									24				

DENSE SPRUCE
10' to 20' HBN
5" MAX. Ø
OCCASIONAL
BIRCH

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWNER: TC		FIELD ENG: BC		DATE DRILLED: 7/12/73		AIRPHOTO NO: 122934-155		CHAINAGE:		OFFSET:		TEST HOLE									
CND: 111-1		TECH: JNF 16		RIG: VALLEY RIG		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										CLAY	SILT	SAND	GRAVEL								
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)												
									PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+												
2					PT	PEAT: CATEGORY 15		Vs 30%	2						MED DENSE SPHERE 20-35' HIGH 6" MAX. Ø OCCASIONAL BIRCH						
4					CI	CLAY (FILL) SANDY SILTY MED. PLASTIC BROWN STONES		Vs 60%	4												
6						COBBLES BOULDERS			6												
8								Vr 10%	8												
10								Vr 1%	10												
12									12												
14									14												
16									16												
18						GREY BROWN			18												
20						END OF HOLE			20												
22									22												
24									24												

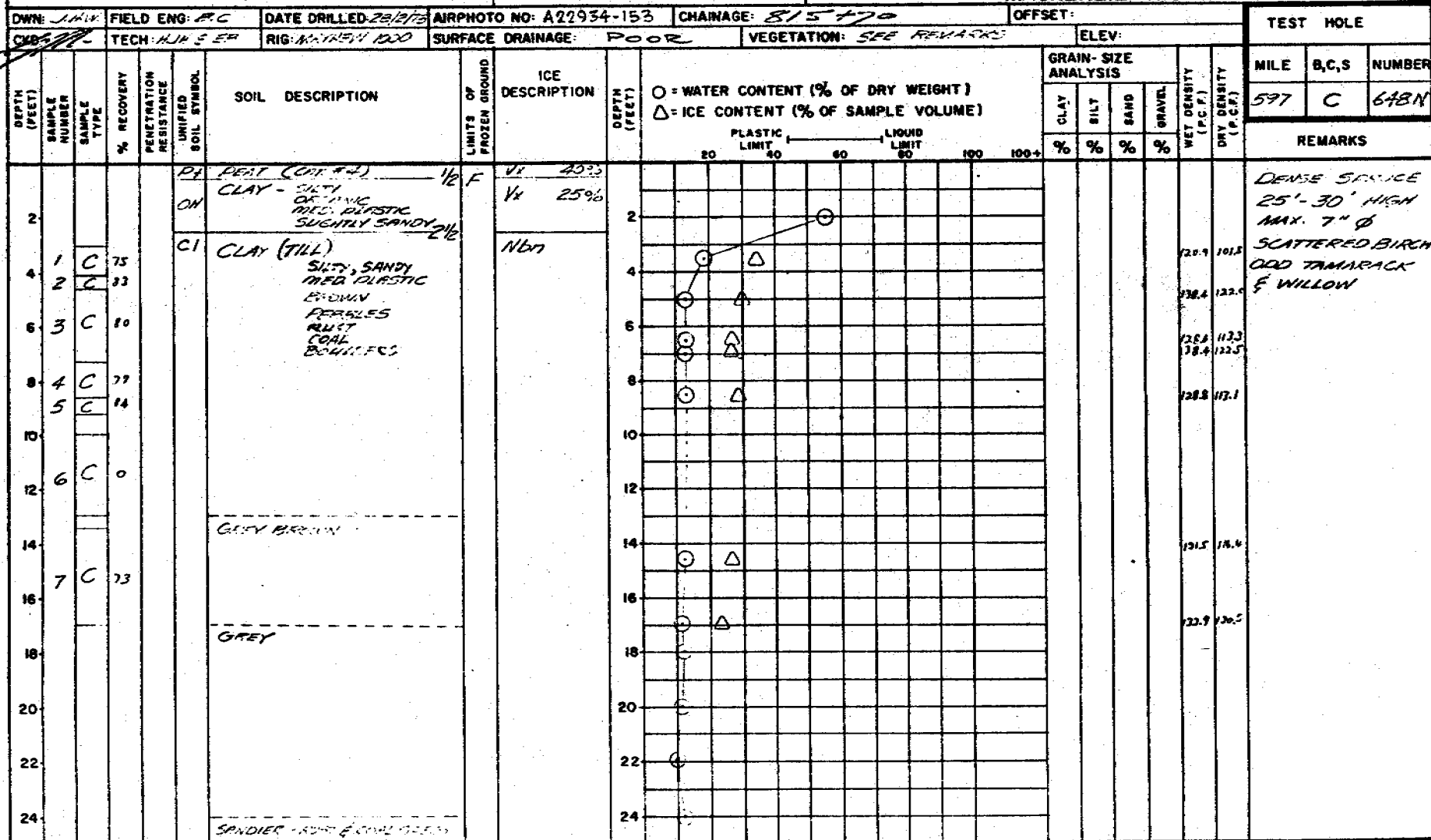
DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWNER		FIELD ENG.	DATE DRILLED	AIRPHOTO NO.	CHAINAGE	OFFSET	MACADAMIZED THROTTWAY						TEST HOLE			
CID	TECH	RIG	SURFACE DRAINAGE	VEGETATION	ELEV.								MILE	B,C,S	NUMBER	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2					CH	CLAY - SILTY HIGH PLASTIC GRAY BROWN	Vx 40%		2							
4					CI	CLAY - SILTY SANDY MED PLASTIC PEARLIES RUSTY COAL GRAY BROWN	VsVx 60% Nbn		4							
6									6							
8									8							
10					SM	SAND - SILTY MEDIUM GRAINED COAL SPECS BROWN			10							
12									12							
14						END OF HOLE			14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
DWN: <i>JK</i>		FIELD ENG: <i>B.C.</i>		DATE DRILLED: <i>2-2-73</i>		AIRPHOTO NO: <i>A 22934-153</i>		CHAINAGE: <i>205+16</i>		OFFSET:					
CD: <i>JK</i>		TECH: <i>LINE E.B.</i>		RIG: <i>HYPER 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SLE FERNIK</i>		ELEV:					
TEST HOLE															
MILE		B,C,S		NUMBER											
<i>571</i>		<i>C</i>		<i>647</i>											
REMARKS															
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										CLAY	SILT	SAND	GRAVEL		
										%	%	%	%		
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)					
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+					
2					<i>PH</i>	<i>PEAT (CAT #4)</i>	<i>F</i>	<i>1/2 60%</i>	2						
					<i>C1</i>	<i>CLAY-SILTY (FILL) MED PLASTIC BROWN</i>		<i>1/2 30%</i>	4						
4						<i>SANDY DEEP FS GRAY BROWN</i>		<i>1/2 5%</i>	6						
6						<i>BOULDERS 6 1/2'</i>		<i>Nbr</i>	8						
8									10						
10					<i>C1 SM</i>	<i>VERY SANDY</i>		<i>1/2 10%</i>	12						
12									14						
14								<i>Nbr</i>	16						
16						<i>END OF HOLE</i>			18						
18									20						
20									22						
22									24						
24															

*DENSE SPRUCE
15'-25' HIGH
MAX. 5" Ø
SCATTERED BIRCH
& TAMARACK*

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: J.M.W.		FIELD ENG. B.C.		DATE DRILLED 28/1/78		AIRPHOTO NO: A22934-153		CHAINAGE: 815+70		OFFSET:		TEST HOLE SHEET 2 of 2				
CYD: ~~1/2~~		TECH: K.H.S.E.B.		RIG: J.M.W. 10'S		SURFACE DRAINAGE: POOR		VEGETATION:		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
28					7	SANDY SILTY COAL & LUST SPEC. DEBELED		Nbn	28							
30									30							
32									32							
34									34							
36									36							
38									38							
40						END OF HOLE	40		40							
42									42							
44									44							
46									46							
48									48							
50									50							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWR: <i>TC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>11/2/72</i>		AIRPHOTO NO: <i>422934-153</i>		CHAINAGE: <i>825+17</i>		OFFSET:		TEST HOLE				
CDD: <i>11/2/72</i>		TECH: <i>JLE IG</i>		RIG: <i>4115-1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE	B,C,S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (p.c.f.)	DRY DENSITY (p.c.f.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						OH CLAY: ORGANIC CI CLAY (TILL): SANDY SILTY STONES RUST & COAL SPOTS COBBLES MED. PLASTIC BROWN		Vs 20% Nbn								MED. DENSE SPRUCE, BIRCH & TANARACK 40' HIGH 8" MAX Ø
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14						END OF HOLE	14		14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
OWNER: <u>CRA</u>		FIELD ENG: <u>EC</u>		DATE DRILLED: <u>1/3/73</u>		AIRPHOTO NO: <u>A22934-153</u>		CHAINAGE: <u>835+73</u>		OFFSET:								
CKD: <u>11/11/73</u>		TECH: <u>JWA-16</u>		RIG: <u>Winnipeg 1000</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE PLANTING</u>		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	TEST HOLE		
										CLAY	SILT	SAND	GRAVEL			WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE
2					CL	CLAY (TILL) SILTY, SANDY MED PLASTIC PEBBLES & COBBLES		Nbn	2								MED DENSE BLACK POPLAR & BIRCH 15-45' HIGH 10" ϕ MAX.	
4					GM	GRAVEL SILTY-CLAYEY	3 1/2 4 1/2		4									
6					CL	CLAY (TILL) SILTY-SANDY MED PLASTIC COBBLES, SMALL BOULDERS BROWN			6									
8									8									
10						BEDROCK (LIMESTONE) WEATHERED GREY	9 1/4		10									
12						END OF HOLE	12		12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: HH		FIELD ENG: BC		DATE DRILLED: 11/3/73		AIRPHOTO NO: A 22934-153		CHAINAGE: 8+6 ± 00		OFFSET:		TEST HOLE				
CKD: ~~HH~~		TECH: JW & IG		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+							
					PT	PEAT - category #1	1/2	Vx 5%								
					OH	CLAY - med plastic, black	1									
2					CI	CLAY (TILL): sandy silty pebbles med plastic brown		Nbn	2							
4									4							
6									6							
8						BEDROCK (LIMESTONE) WEATHERED grey	7		8							
10									10							
12						END OF HOLE	12		12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

BIRCH 20' TO 30'
HIGH
8" MAX Ø
OCCASIONAL
SPRUCE, WILLOW
& TAMARACK

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY															
OWN: HH		FIELD ENG: PC		DATE DRILLED: 1/3/73		AERPHOTO NO: A22934-153		CHANNAGE: 855+10		OFFSET:		TEST HOLE									
CKD: ~~HH~~		TECH: JW + IG		RIG: MATTHEW ROSS		SURFACE DRAINAGE: POOR		VEGETATION: SLI		REMARKS:		ELEV:									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B.C.S	NUMBER	
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %						
2					C1	CLAY (TILL): Silty Sandy pebbles med plastic brown	F	Vx 5%	2												
4								Non	4												
6						grey			6												
8									8												
10						BEDROCK (LIMESTONE) WEATHERED grey			10												
12						END OF HOLE			12												
14									14												
16									16												
18									18												
20									20												
22									22												
24									24												

BIRCH 35' HIGH
8" MAX Ø
OCCASIONAL
TAMARACK &
WILLOW & SPRUCE

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWH: 72		FIELD ENG: J.C.	DATE DRILLED: 1/2/73	AIRPHOTO NO: A 22934-153	CHAINAGE: 855 + 15	OFFSET:	MACKENZIE HIGHWAY											
CDD: ~~72~~		TECH: J. Wal. G.	RIG: WILHEW 1000	SURFACE DRAINAGE: FAIR		VEGETATION: SLT 241-755		ELEV:										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	TEST HOLE		
										CLAY	SILT	SAND	GRAVEL			MILE	B.C.S	NUMBER
										%	%	%	%					
					DL	1LT - ORGANIC	F	V _x < 5%										
2					ML	SILT SANDY - CLAYEY H.D. PLASTIC FILLING		Nbn	2									
4						BEDROCK (LIMESTONE) WEATHERED GRAY			4									
6									6									
8									8									
10						END OF HOLE			10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT LIQUID LIMIT

20 40 60 80 100 100+

MID DENSE
 SPRUCE
 5'-35' HIGH
 6"Ø MAX
 BIRCH
 5'-40' HIGH
 9"Ø MAX
 WILLOW
 & TAMARACK

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWR: <u>024</u>		FIELD ENG: <u>P.C.</u>		DATE DRILLED: <u>1/3/78</u>		AIRPHOTO NO: <u>A 22934-153</u>		CHAINAGE: <u>866+03</u>		MACKENZIE HIGHWAY		OFFSET:		ELEV:		TEST HOLE		
CKD: <u>---</u>		TECH: <u>J.M.A.R.</u>		RIG: <u>MB/H&W 1000</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE FLOWERS</u>								MILE <u>598</u> B.C.S. <u>C</u> NUMBER <u>654</u>		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
										CLAY %	SILT %	SAND %	GRAVEL %					
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)								
										20	40	60	80	100	100+			
2					SM	SILT CLAYEY - SANDY MED PLASTIC BECOMES SANDIER	F	Ndn	2									
4						BD ROCK (LIMESTONE) WEATHERED GREY			4									
6									6									
8						END OF HOLE			8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWH: 3.1		FIELD ENG: 3.1	DATE DRILLED: 1/3/75	AIRPHOTO NO: A22934-153	CHAINAGE: 587+06	OFFSET:	TEST HOLE										
CKD: 3.1	TECH: 3.1	RIG: WILHELM 1000	SURFACE DRAINAGE: POOR		VEGETATION: SET REMARKS	ELEV:	NILE	B,C,S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS	
										CLAY %	SILT %	SAND %	GRAVEL %				
						PT PEAT: CATEGORY #2		Vx < 5%								Med Dense SPRUCE 20-30' HIGH 7" φ MAX	
2						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN			2								
4						CI CLAY: MED. PLASTIC SILTY BROWN		Nf	4								
6						BEDROCK (LIMESTONE) WEATHERED GREY			6								
8									8								
10									10								
12									12								
14						END OF HOLE			14								
16									16								
18									18								
20									20								
22									22								
24									24								

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: 029		FIELD ENG: 2..		DATE DRILLED: 27/2/73		AIRPHOTO NO: A22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: 001		TECH: 5-4-H		RIG: MANHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: See P. 1000		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+							
2					CL	CLAY (TILL) SILTY SAND MED. PLASTIC PEBBLES, BROWN	4'	Vx 20%	2							RED DUNE SPRUCE 20-30' HIGH 5" φ MAX SCATTERED Willow & Birch
4					GM	SAND (TILL) GRAVELLY WELL GRADED BROWN	3'	Vx 15 % Nbn	4							
6									6							
8						SANDIER & FINER	8'	Nf	8							
10									10							
12									12							
14						LESS PEBBLES	15'		14							
16									16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: T ¹		FIELD ENG: B.	DATE DRILLED: 27-1-68	AIRPHOTO NO: A22934-155	CHAINAGE:	OFFSET:					TEST HOLE					
CMD	TECH: NHE FB	RIG: MERRY 1000	SURFACE DRAINAGE: POOR	VEGETATION: SEE AIRPHOTOS	ELEV:					MILE	B,C,S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAM-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)	CLAY %	SILT %	SAND %	GRAVEL %			
						PEAT: CATEGORY "1"		V _L 30%								DENSE SPRUCE
						CI CLAY (TLL) SILTY SANDY RUSTY COAL SPOTS STONES CASTLES MED PLASTIC BROWN BOWLDERS POCKETS OF SAND		N6n								20' TO 25' HIGH
2									2							6" MAX Ø
4									4							OCCASIONAL
6									6							BRN F LARCH
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>TC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>2/24/53</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: <i>111</i>		TECH: <i>W.H. S.E.</i>		RIG: <i>MILLEN 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See Form 111</i>								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>P1 FEAT: CATEGORY # 5</i>		<i>V_x 60%</i>								<i>MED DENSE SPRUCE 15' TO 20' HIGH 3" MAX. Ø OCCASIONAL BIRCH & LARCH</i>
2					<i>C1 CLAY (FILL): SILTY SANDY RUSTY COAL SPECS STONES MED. PLASTIC BROWN</i>		<i>V_x 50%</i>	2								
4							<i>V_x 30%</i>	4								
6							<i>V_x 25%</i>	6								
8						<i>VERY SANDY</i>	<i>V_r 10%</i>	8								
10							<i>V_x 5%</i>	10								
12							<i>Nbr</i>	12								
14								14								
16						<i>LESS SANDY HIGH PLASTIC GREY</i>		16								
18								18								
20						<i>END OF HOLE</i>		20								
22								22								
24								24								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: 02A		FIELD ENG: B.C.		DATE DRILLED: 27/2/73		AIRPHOTO NO: A22934-153		CHAINAGE:		OFFSET:		TEST HOLE				
CND: 572-		TECH: E3 & H.H.		RIG: MATHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: See Remarks		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
					OL	SILT <i>ORGANIC PART INCLUSIONS</i>		Vs 40%								<i>DECK SPRUCE 15-25' HIGH 5" φ MAX OCCASIONAL BIRCH</i>
2					CL	CLAY <i>SILTY-SANDY MED PLASTIC BROWN</i>		ICE Vx 80%	2							
4								Vx 70%	4							
6									6							
8					CL	CLAY (TILL) <i>VERY SANDY, SILTY LOW PLASTIC PEBBLES BROWN</i>		Vx 10%	8							
10								Vs 10%	10							
12					SM	SAND (TILL) <i>GRAVELLY, SILTY POORLY GRADED MED GRADED GREY-BROWN</i>		Nf	12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <u>TC</u>		FIELD ENG: <u>BC</u>		DATE DRILLED: <u>27/6/77</u>		AIRPHOTO NO: <u>A22934-153</u>		CHAINAGE:		OFFSET:		TEST HOLE				
CUT: <u>11-1</u>		TECH: <u>MH & EB</u>		RIS: <u>MAYHEW 100</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									○ = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+							
2						PT PEAT: CATEGORY #10 1		V _s 20%	2							DENSE SANDS 20' to 35' HIGH 10" MAX. Ø OCCASIONAL BIRCH
						OH (LAV. ORGANIC) 2		V _x 70%								
4						CI CLAY (TILL):										
						SANDY SILTY		V _x 15%	4							
						ROCKY COAL SPIN										
						STONES										
						MED. PLASTIC										
						BROWN										
						COBBLES										
						BOULDERS										
6									6							
8									8							
10									10							
12						SANDIER			12							
14									14							
16									16							
18						GREY			18							
20									20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <i>TP</i>		FIELD ENG: <i>B</i>		DATE DRILLED: <i>27/2/72</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE:		OFFSET:		TEST HOLE									
CND: <i>11/11/72</i>		TECH: <i>HALE EB</i>		RIG: <i>MAXIM 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE <i>59.6</i> S.C.S. <i>B-81</i> NUMBER <i>125</i>									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										CLAY %	SILT %	SAND %	GRAVEL %								
						PT FENT: CATEGORY #1, CI (CLAY (TILL): SANDY SILTY STONES FRST COAL SPECS MED. PLASTIC BROWN COBBLES BOULDERS		V_s 60% V_s 50%								DENSE SURFACE 15' TO 20' HIGH 5" MAX ϕ OCCASIONAL BIRCH					
2									2												
4									4												
6								V_s 15%	6												
8								V_s 5%	8												
10								V_s 20%	10												
12								N60	12												
14						GREY			14												
16									16												
18									18												
20						END OF HOLE			20												
22									22												
24									24												

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>CP-1</i>		FIELD ENG: <i>B.C.</i>		DATE DRILLED: <i>27/2/73</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>11/11/73</i>		TECH: <i>ER & H.H.</i>		RIG: <i>PLAYHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE <i>596</i> B.C.S. <i>B-81</i> NUMBER <i>663</i>				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
						PT PENT CAT #4		Vs 60%								DENSE STUPE 15'-25' HIGH 5" φ MAX OCCASIONAL BIRCH
2					CI CLAY	1'	F	Vx 60%	2							
4					SILTY BROWN MED PLASTIC	3'		Vx 50%	4							
6					SANDY	5'		Vx 10%	6							
8					CL CLAY (TILL)	7'		Nbn	8							
10					SILTY SANDY RUST & COAL SPOTS	9'			10							
12					SANDIER, SILTIER	10'			12							
14					PEBBLES	12'		Vx 10%	14							
16					SM SAND (TILL)	19'			16							
18					SILT, PEBBLES MED GRAINED, BROWN	20'			18							
20					LIGHT BROWN FEWER PEBBLES				20							
22					GRAY BROWN				22							
24					END OF HOLE				24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: <i>IC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>25/11/77</i>		AIRPHOTO NO: <i>422934-157</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>11/1/78</i>		TECH: <i>HL/EB</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>PT BEAD: EATON'S 1/2" CATENARY 3/12</i> OL SILT: <i>ORGANIC MEDIUM ELASTIC</i> CI CLAY (TILL) <i>SANDY, SILTY MEDIUM PLASTIC STONE'S ELST</i> CI SM <i>SAND & GRAVEL POCKETS</i> Boulders END OF HOLE		<i>V_x 40%</i> <i>V_x 50%</i> <i>N₆₀</i>								DENSE SPRUCE 25' TO 60' HIGH 6" TO 15" Ø OCCASIONAL TAMARACK
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

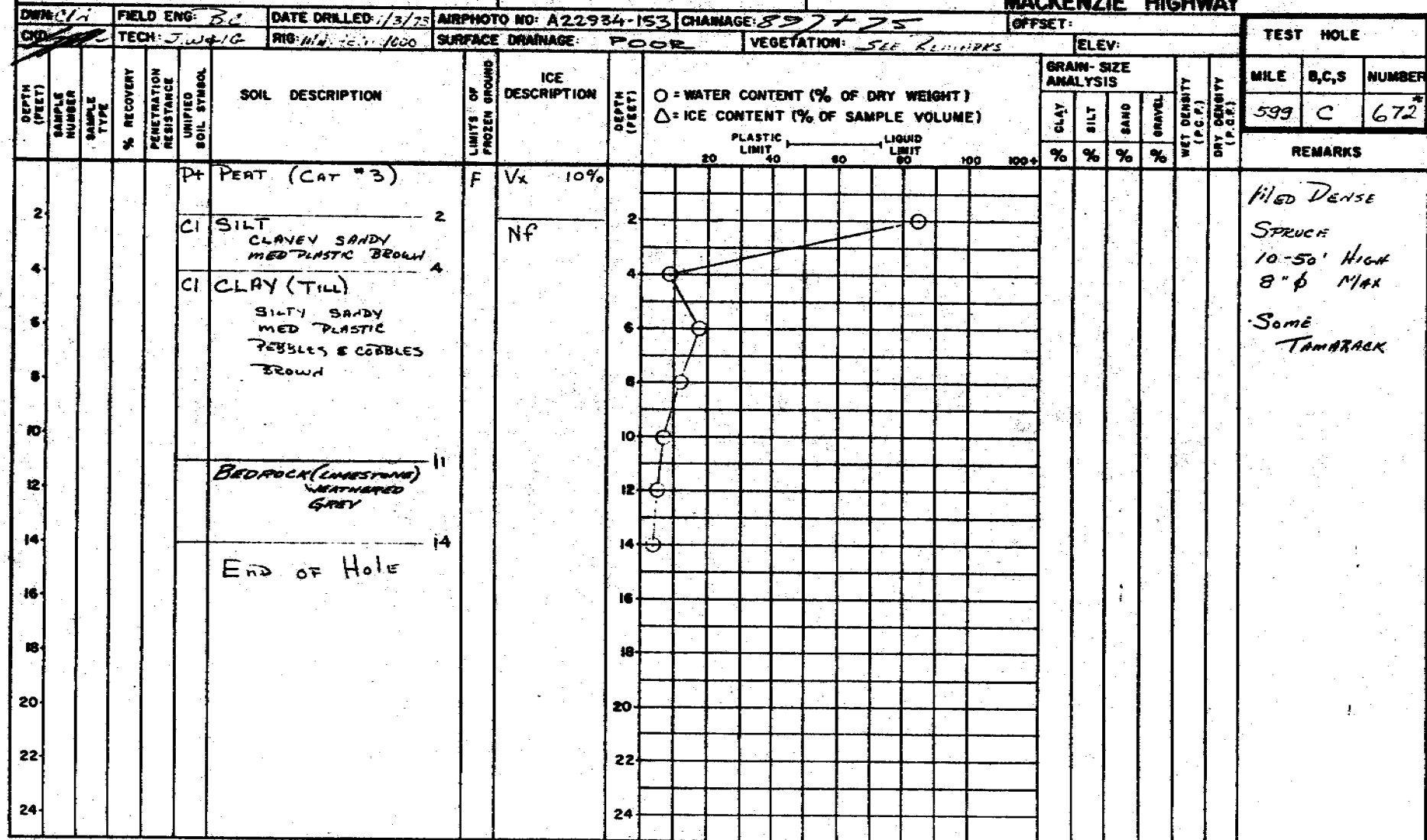
DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

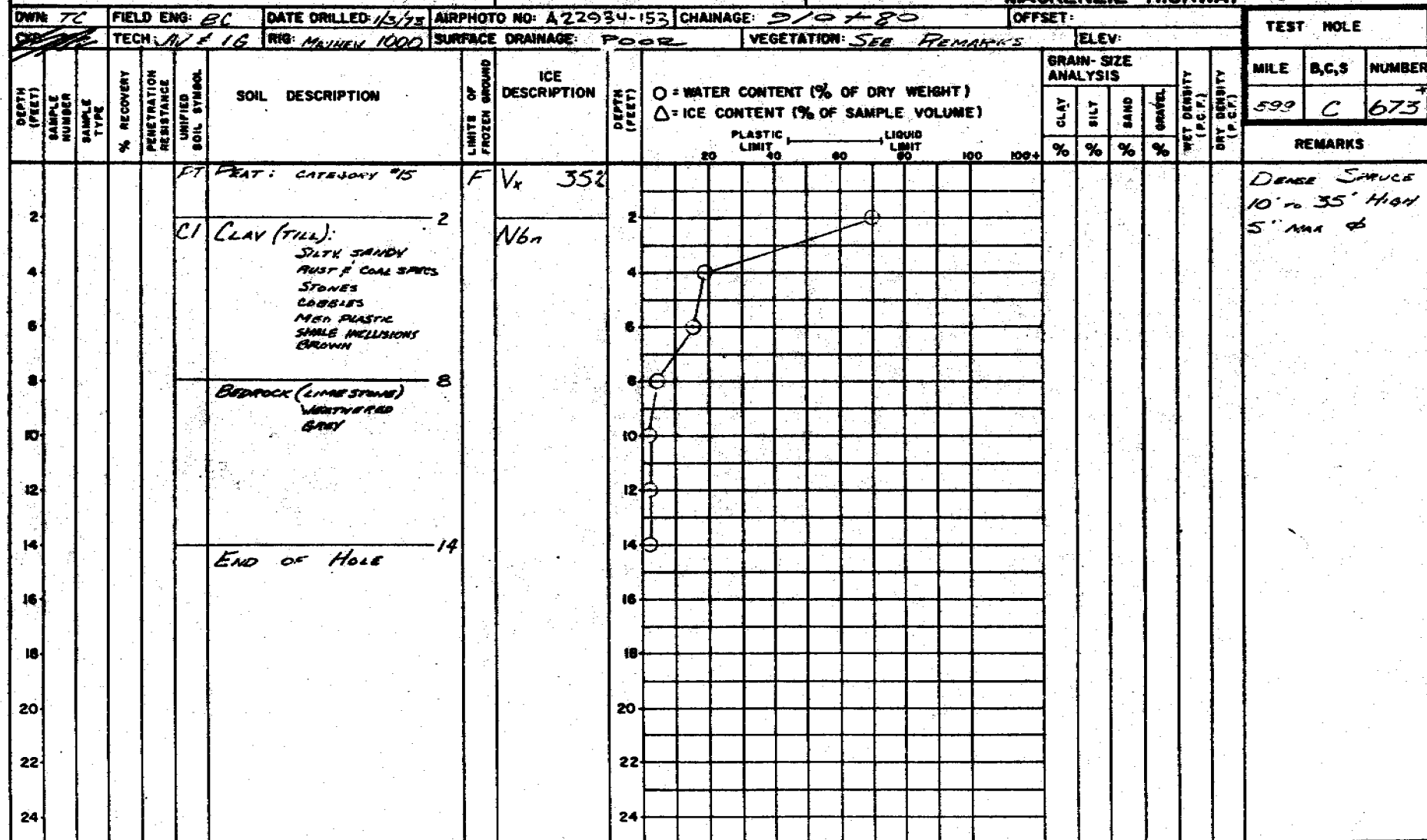
[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
OWNER: TC		FIELD ENG: RC		DATE DRILLED: 20/1/77		AIRPHOTO NO: A22934-157		CHAINAGE:		OFFSET:		TEST HOLE					
CHK: ~~RC~~		TECH: HH		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %	SAND %	GRAVEL %				
						PT PEAT: CATEGORY #14	F	V _x 20%								DENSE SPRUCE 15' to 30' HIGH 6" to 8" Ø OCCASIONAL BIRCH	
						CI CLAY (TILL): SANDY SILTY RUSTY COAL SPRES STONES MED. PLASTIC BROWN COBBLES		V _x 10%									
2									2								
4									4								
6						BEDROCK (LIMESTONE)			6								
8						BADLY WEATHERED			8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWNER: J.H.W.		FIELD ENG: B.C.		DATE DRILLED: 1/3/73		AIRPHOTO NO: A22934-153		CHAINAGE: 933+05		OFFSET:					
CD: ~~111~~		TECH: J.H.W.		RIG: MTH-100		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:					
										TEST HOLE					
										599	C	675			
										REMARKS					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										CLAY	SILT	SAND	GRAVEL		
										%	%	%	%		
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)					
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+					
2					CI	PEAT (CAT. R 15) CLAY - SILTY (TILL) SANDY MED PLASTIC BROWN	1/2 F	Vx 20%	2						
4								Vx 5%	4						
6						PEBBLES		Nb7	6						
8									8						
10					SM	SAND - SILTY (TILL) FINE GRAINED PEBBLES BROWN	9	Nf	10						
12									12						
14						END OF HOLE	14		14						
16									16						
18									18						
20									20						
22									22						
24									24						

LOW DENSITY
BIRCH TO
40' HIGH
TAMARACK &
WILLOW TO
10' HIGH
BIRCH MAX 10" Ø

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWR		FIELD ENG.	DATE DRILLED	AIRPHOTO NO.	CHAINAGE	OFFSET							TEST HOLE				
CMD	TECH	RIG	SURFACE DRAINAGE	VEGETATION	ELEV.									MILE	B,C,S	NUMBER	
	J.W.	B.C.	1/3/72	A 22934-153	942+15										539	C	676
DEPTH (FEET)		SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
											CLAY %	SILT %	SAND %	GRAVEL %			
							PEAT (CNF #3) OH CLAY - ORGANIC BLACK	1/2 F	1/4 30% 1/4 20%	2	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						DENSE SPRUCE 20'-40' HIGH MIN. 8" Ø SCATTERED B/RCH & THAWPACK
4						C1	CLAY - SILTY SANDY PERELES MED. PLASTIC		Nd7	4							
14							END OF HOLE			14							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWNER: J.M.W.		FIELD ENG: B.C.		DATE DRILLED: 1/5/74		AIRPHOTO NO: A22934-153		CHAINAGE: 952+05		OFFSET:						
CIP: ~~XXXX~~		TECH: J.M.E. A.B.		RIG: M.H. NEW 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:						
TEST HOLE																
MILE: 600 B.C.S: C NUMBER: 677																
REMARKS																
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
											CLAY	SILT	SAND	GRAVEL		
											%	%	%	%		
2					OM	SILT - ORGANIC CLAYEY	1'	Vs 5%	2							
4					AL	SILT - SANDY LOW PLASTIC BROWN	3 1/2'	Nbn	4							
6					CI	CLAY - SILTY SANDY PEBBLES COBBLES MED. PLASTIC BROWN	8'		6							
8					CH	CLAY (SHALE) HIGH PLASTIC GREY	14'		8							
10						GREY @ 14'			10							
12						END OF HOLE			12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
DWG: H-11		FIELD ENG:		DATE DRILLED: 1/3/73		AIRPHOTO NO: A22934-153		CHAINAGE: 270 + 21		OFFSET:				
CD: ~~111~~		TECH: HH & EB		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:				
TEST HOLE														
MILE 600 B.C.S. C NUMBER 679 *														
REMARKS														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.G.P.)	
											CLAY %	SILT %	SAND %	GRAVEL %
2					PT	PEAT: CATEGORY #1	F	Vx 70%	2					
4					SM	SAND (TILL) SILTY MED GRAINED BROWN		Vx 40%	4					
6						SILTIER FINE GRAINED		Nbn	6					
8						STONES PEBBLES GREY BROWN			8					
10					CI	CLAY (TILL) SILTY SANDY PEBBLES MED PLASTIC RUSTY COAL BROWN			10					
12					CH	CLAY (SHALE) HIGH PLASTIC GREY			12					
14						END OF HOLE			14					
16									16					
18									18					
20									20					
22									22					
24									24					

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: H.J.H.			FIELD ENG: BC			DATE DRILLED: 1/3/73			AIRPHOTO NO: A22934-153			CHAINAGE: 580425			OFFSET:			ELEV:			TEST HOLE								
CRD: ~~XXXX~~			TECH: HH & EB			RIG: MAYHEW 1000			SURFACE DRAINAGE: POOR			VEGETATION: SEE REMARKS																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
					PT	PEAT: CATEGORY #4	1/2	Vs 50%																					
2					CI	CLAY: SILTY MED. PLASTIC BROWN		Vx 10%	2							MED DENSE SPRUCE 15'-25' HIGH 5" MAX Ø OCCASIONAL BIRCH & TAMARACK													
4					CI	CLAY TILL: SILTY SANDY PEBBLES COAL SPECKS RUST SPECKS MED PLASTIC BROWN	3	Vx 3%	4																				
6									6																				
8						GREY BROWN	7		8																				
10									10																				
12					CH	CLAY (SHALE) HIGH PLASTIC GREY	11	Nbn	12																				
14						END OF HOLE	14		14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWR: TC		FIELD ENG: R.C.		DATE DRILLED: 1/3/75		AIRPHOTO NO: A22934-153		CHAINAGE: 1000+20		OFFSET:		TEST HOLE				
CD: ~~TC~~		TECH: HH FEB		RIG: MANNEN 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PEAT: CATEGORY # 2	1/2	Vx 20%								DENSE SPACES 25' to 35' HIGH 8" MAX. ϕ OCCASIONAL BIRCH & LARCH
						OL CLAY: ORGANIC SILTY MED. PLASTIC	2	Vx 30%								
2						CI CLAY (TILL): SILTY SANDY SPONGE MED. PLASTIC BROWN SANDIER RUST & COAL SPRES		Nbn	2							
4									4							
6								Vx 5%	6							
8								Vx 10%	8							
10								Nbn	10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWE: TC		FIELD ENG: BC	DATE DRILLED: 1/5/73	AIRPHOTO NO: A22934-153	CHAINAGE: 1911 + 20	OFFSET:	ELEV:	TEST HOLE									
GND: ~~1911~~		TECH: H/H F.E.R.	RIG: MANNEN 1000	SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY	SILT	SAND	GRAVEL				
										%	%	%	%				
					PT	PEAT: CATEGORY "6"	F	Vx 30%									DENSE SPRUCE 15' to 25' HIGH 2" MAX. Ø OCCASIONAL BIRCH & LARCH
2					CI	CLAY (FILL): SILTY SANDY STONES RUSTY COAL SPARKS MED. PLASTIC BROWN		N6n	2								
4									4								
6								Vx 5%	6								
8								N6n	8								
10									10								
12									12								
14					CN	HIGH PLASTIC BROWN			14								
16									16								
18									18								
20									20								
22									22								
24						END OF HOLE			24								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

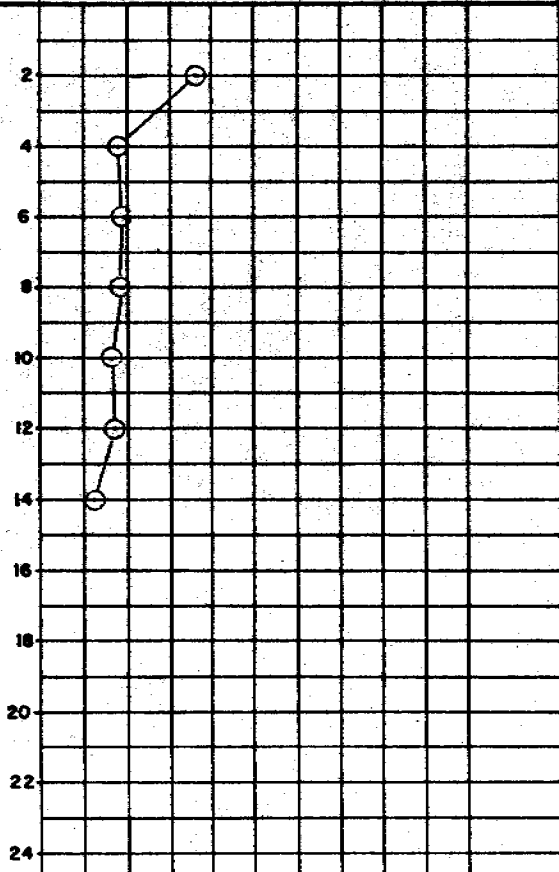
[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWG: TC		FIELD ENG: BC		DATE DRILLED: 1/5/73		AIRPHOTO NO: A22934-151		CHAINAGE: 1031+75		OFFSET:		TEST HOLE			
CND: 22		TECH: HIL & EB		RIG: MANNEN 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %				
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)					
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+					
						PT PEAT: CATEGORY #5		V _x 70%						MED DENSE SHRUBS 15' to 20' HIGH 4" MAX φ OCCASIONAL BIRCH	
2					C1 CLAY (TILL): SANDY SATY STONE FIST & COAL SPKS MED. PLASTIC BROWN COBBLES		V _x 10%		2						
4							V _s 20%		4						
6							V _x 10%		6						
8									8						
10									10						
12									12						
14									14						
16									16						
18									18						
20									20						
22									22						
24						END OF HOLE		V _x < 5%							
								N ₆₀							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: TC		FIELD ENG: BC		DATE DRILLED: 1/5/75		AIRPHOTO NO: A22934-151		CHAINAGE: 1050+35		OFFSET:		TEST HOLE				
CD: ~~1050+35~~		TECH: HH & EB		RIG: MAYHEM 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PEAT: CATEGORY "1"		Vx 60%								MED DENSE SPRUCE 10'x15' HIGH 3" MAX Ø OCCASIONAL BIRCH
2						CH CLAY: SILTY HIGH PLASTIC BROWN		Nbn	2							
4						CI CLAY (FILL): SILTY SANDY STONES RUSTY COAL SPARKS MED PLASTIC BROWN			4							
6									6							
8									8							
10									10							
12						SANDIER GREY BROWN			12							
14						END OF HOLE			14							
16									16							
18									18							
20									20							
22									22							
24									24							

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ——— LIQUID LIMIT
 20 40 60 80 100 100+



DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>TK</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>11/1/77</i>		AIRPHOTO NO: <i>A 22934-153</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CND: <i>11/1/77</i>		TECH: <i>15 E JK</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE S.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						ON CLAY: <i>ORGANIC</i>		<i>V_x 20%</i>								<i>MED DENSE SPRINGS 20' HIGH 4" MAX Ø</i>
						<i>C1 CLAY (FILL):</i>		<i>V_x 10%</i>								
2						<i>SILTY SANDY PEBBLES COBBLES MED PLASTIC BEDDING</i>			2							
4						<i>SILTIER REST F COAL SPKS</i>			4							
6									6							
8	<i>1</i>							<i>V_x 45%</i>	8							
10								<i>Nbn</i>	10							
12									12							
14									14							
16									16							
18						<i>GRAY</i>			18							
20						<i>END OF HOLE</i>			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: HJH		FIELD ENG: BC		DATE DRILLED: 7/2/73		AIRPHOTO NO: A 22934-153		CHAINAGE:		OFFSET:		TEST HOLE				
CKD		TECH: EB & HH		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
					PT	PEAT: category # 12		Vx 50%								DENSE SPRUCE 25' TO 30' HIGH 8" MAX Ø OCCASIONAL BIRCH & TAMARACK
2					CH	CLAY: silty high plastic brown		ICE 80%	2							
4									4							
6					CI	CLAY (TILL) silty sandy pebbles med plastic brown		Vx 40%	6							
8						----- pockets of silt-sand		Vx 5%	8							
10								Nbn	10							
12									12							
14									14							
16					CH	gray high plastic			16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>RC</i>		DATE DRILLED: <i>6/3/73</i>		AIRPHOTO NO: <i>422934-155</i>		CHAINAGE: <i>663+27</i>		OFFSET:		ELEV:		TEST HOLE			
CND: <i>100</i>		TECH: <i>MR. MD. RA</i>		RIG: <i>FALLING 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>				MILE		B,C,S			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %	SAND %	GRAVEL %				
2						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN	F	V _x 20%	2								SERVICE 5 to 10' HIGH 5" MAX. Ø OCCASIONAL BIRCH
4						CI CLAY (FAL): SANDY SILTY SPONGE RUSTY COAL SPRES MED. PLASTIC GREY		V _x < 5%	4								
6									6								
8									8								
10	1	T	44			SANDIER BROWN			10								
12									12								
14	2	T	100						14								
16						CH CLAY (SHALE): DARK GREY END OF HOLE			16								
18									18								
20									20								
22									22								
24									24								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <u>CRH</u>		FIELD ENG: <u>B.C.</u>		DATE DRILLED: <u>28/3/73</u>		AIRPHOTO NO: <u>A 22934-153</u>		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2						
CKD: <u> </u>		TECH: <u>I.C. & J.W.</u>		RIG: <u>WANY HEW 1000</u>		SURFACE DRAINAGE: <u>FOOR</u>		VEGETATION:		ELEV:		MILE B.C.S. NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
										CLAY %	SILT %	SAND %	GRAVEL %					
					CI	CLAY (TILL) SANDY SILTY MED PLASTIC PEBBLES & BOULDERS GRAY	F	Nd _n		○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT LIQUID LIMIT								
28									28									
30									30									
32									32									
34									34									
36									36									
38									38									
40									40									
42									42									
44									44									
46									46									
48									48									
50									50									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWN: J.M.V.		FIELD ENG: B.C.		DATE DRILLED: 22-7-75		AIRPHOTO NO: A 22934-153		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE				
CKD: ~~100~~		TECH: HUN & EB		RIG: MARYEN 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS						MILE B,C,S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER & ICE CONTENT		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)		CLAY	SILT	SAND	GRAVEL			
						1-4 MOSS												
						0-6 SILT: ORGANIC	1/4	1/4 30 %										
2					CI	CLAY (HILL) SANDY, SILTY MED PLASTIC BROWN		1/4 60 %	2								DENSE SPRUCE 35'-40' HIGH MAX. 9" Ø 000 BIRCH	
4									4									
6						PEBBLES		1/4 5 %	6									
8									8									
10						VERY SANDY @ 8 1/2'			10									
12						BOULDERS			12									
14					CH	CLAY (SHALE) GREY HIGH PLASTIC	14'		14									
16									16									
18									18									
20						END OF HOLE	18'		20									
22									22									
24									24									

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

✱

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: BC		DATE DRILLED: 28/3/77		AIRPHOTO NO: R 22934-153		CHAINAGE:		OFFSET:		TEST HOLE				
TECH: HMF EB		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE		B,C,S				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAM-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
					PT	DEPT: CATEGORY # 5 1/2		V _x 70%								
					CI	CLAY: SILTY MED. PLASTIC BROWN		V _x 10%								
2									2							
4						CI CLAY (FILL): SANDY, SILTY STONES RUST & COAL SPOTS MED. PLASTIC BROWN COBBLES		V _x 15%								
6								V _x 5%								
8								V _x < 5%								
10								Nb								
12								V _x < 5%								
14						END OF HOLE			14							
16									16							
18									18							
20									20							
22									22							
24									24							

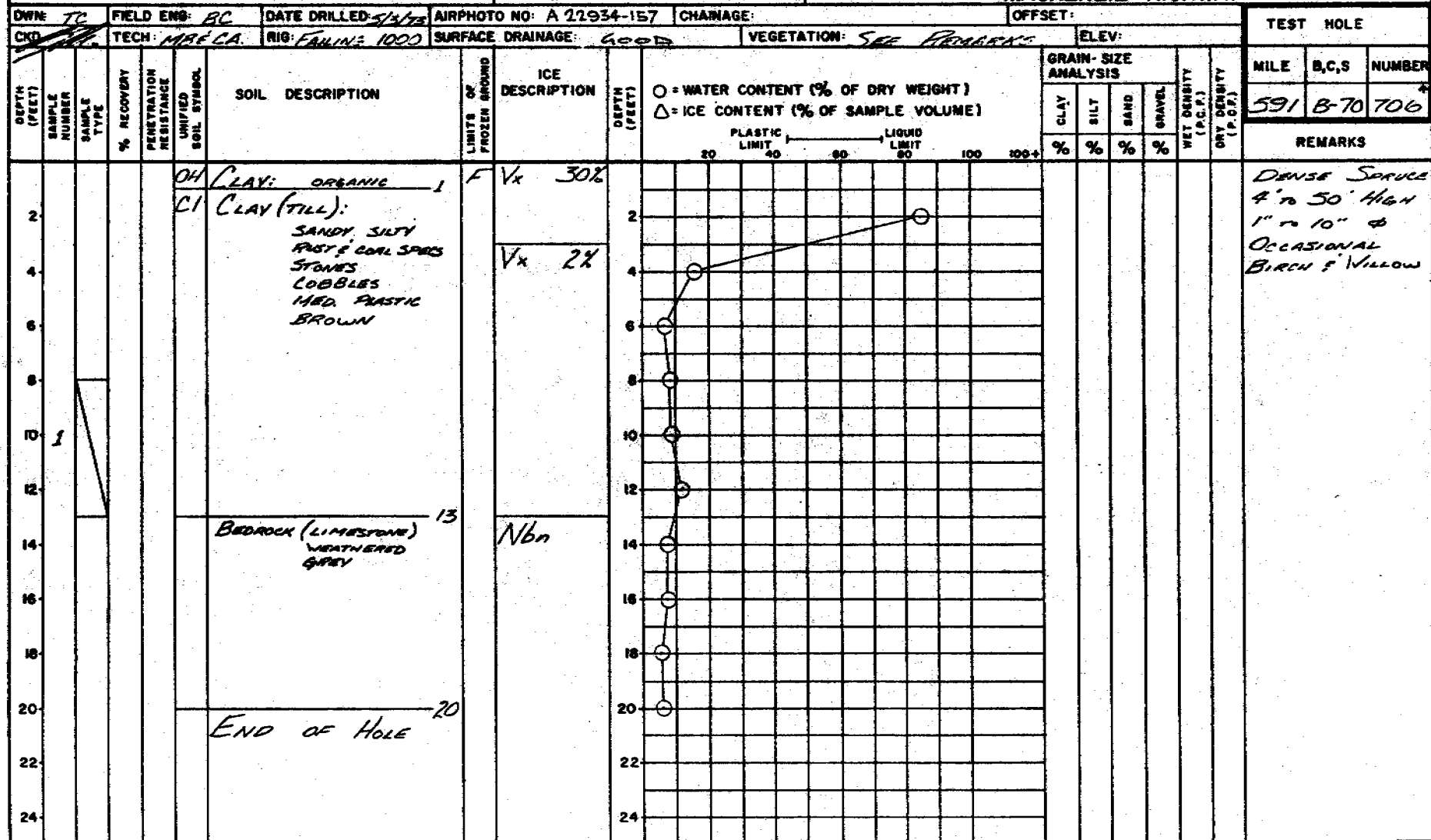
DENSE SPRUCE
40' to 45' HIGH
10" MAX. Ø
OCCASIONAL
BIRCH

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWNER: TC		FIELD ENG: BC		DATE DRILLED: 20/1/15		AIRPHOTO NO: A 22934-153		CHAINAGE:		OFFSET:		TEST HOLE				
CNO: ~~111~~		TECH: HLE EB		RIG: MATHEN 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
						LT MASS										
						OH CLAY: ORGANIC HIGH PLASTIC	14	Vx 20%								
2						CI CLAY (FILL): SILTY, SANDY		Vx 70%	2							
4						ROST & COAL SPRES		Vr 5%	4							
6						STRAITS			6							
8						COBBLES			8							
10						MED PLASTIC BROWN			10							
12									12							
14						END OF HOLE	14	Nbn	14							
16									16							
18									18							
20									20							
22									22							
24									24							

597 B-84 705

DENSE SPALLS 25' TO 35' HIGH 8" MAX. Ø OCCASIONAL BIRCH

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: TC		FIELD ENG: BC		DATE DRILLED: 5/4/73		AIRPHOTO NO: Q22934-157		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE															
CER: ~~XXXX~~		TECH: MRE CA		RIG: FALLING ROCK		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS																					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						OH CLAY: ORGANIC	F	V _L 20%								DENSE SPRUCE 10' to 50' HIGH 10" MAX. Ø OCCASIONAL BIRCH 5' to 30' HIGH 8" MAX. Ø													
2						CI CLAY (TILL): SILTY SANDY RICH F COAL SPRES STONES BOULDERS MED. PLASTIC BROWN		V _L 5%	2																				
4									4																				
6									6																				
8								V _S 30%	8																				
10									10																				
12						BEDROCK (LIMESTONE) 12		N ₆₀	12																				
14						WEATHERED			14																				
16									16																				
18									18																				
20						END OF HOLE 20			20																				
22									22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWR: HH		FIELD ENG: BC		DATE DRILLED: 2/3/73		AIRPHOTO NO: A 22934-151		CHAINAGE: 1052+30		OFFSET:								
CHD: ~~HH~~		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	TEST HOLE SHEET 1 OF 2		
										CLAY %	SILT %	SAND %	GRAVEL %			MILE	B,C,S	NUMBER
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)								
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+								
2					OL	SILT organic sandy brown	F	Nbn	2									DENSE SPRUCE SPRUCE 10' TO 30' HIGH 5" MAX Ø
4					CH	CLAY (TILL) silty sandy pebbles cobbles high plastic rust specks coal specks brown		Vr 20%	4									
6								Nbn	6									
8									8									
10						more cobbles grey brown			10									
12								Vx 2%	12									
14						grey			14									
16									16									
18								Nbn	18									
20									20									
22									22									
24									24									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWNER: HH		FIELD ENG: BC		DATE DRILLED:		AIRPHOTO NO: A 22934-151		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2 OF 2				
QID: ~~HH~~		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B,C,S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
					CH	CLAY (TILL) silty sandy pebbles cobbles high plastic rust specks coal specks grey	F	Nb								
28									28							
30									30							
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50						END OF HOLE			50							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>SM</i>			FIELD ENG: <i>30</i>			DATE DRILLED: <i>5/3/73</i>			AIRPHOTO NO: <i>R 22934-1S1</i>			CHAINAGE: <i>1060405</i>			OFFSET:			TEST HOLE SHEET 1 OF 2											
~~CNE~~			TECH: <i>J.W.</i>			RIG: <i>4" 1000</i>			SURFACE DRAINAGE: <i>POOR</i>			VEGETATION: <i>See Remarks</i>			ELEV:			MILE			B,C,S			NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						OH CLAY - ORGANIC BLACK		Vr 40%																					
						CI CLAY (TILL)		Vx 10%																					
						Silty, sandy medium plastic rust, coal stones cobles grey																							
2									2																				
4									4																				
6									6																				
8									8																				
10								Vx < 5%	10																				
12									12																				
14									14																				
16									16																				
18									18																				
20									20																				
22									22																				
24								Nbn	24																				

Low Density
Spruce
20-45' HIGH
6" ϕ MAX

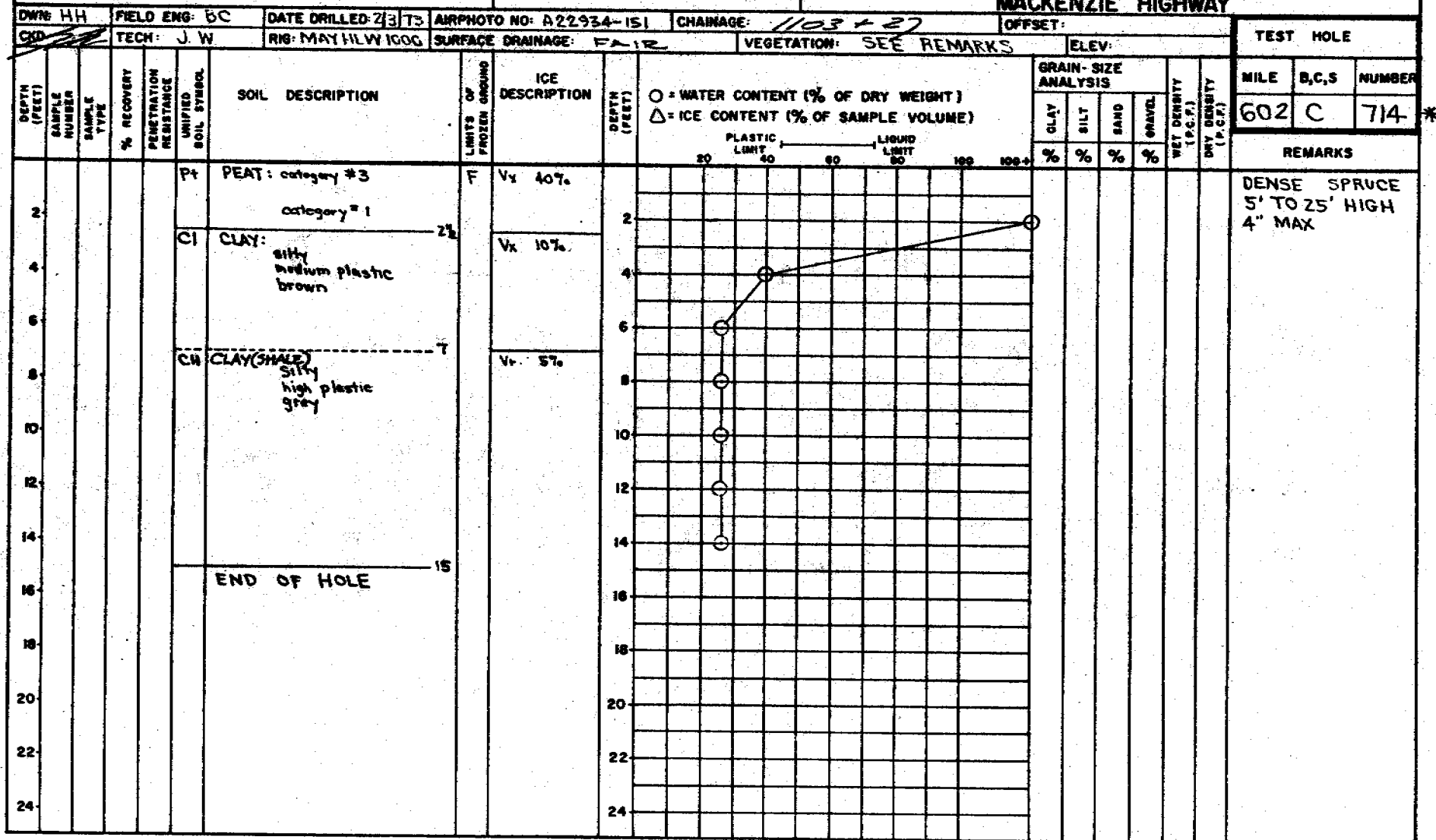
R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>CE</i>		FIELD ENG: <i>SC</i>		DATE DRILLED		AIRPHOTO NO: <i>A 22954-151</i>		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2 OF 2				
CND: <i>CE</i>		TECH: <i>T.W</i>		RIG: <i>MATHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE SHEET #1</i>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>C1 CLAY (TILL)</i>		<i>Nbn</i>		○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT LIQUID LIMIT						
						<i>28' LESS COBBLES</i>		<i>Vx < 5%</i>								
28									28							
30									30							
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50						<i>END OF HOLE</i>			50							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: C-1		FIELD ENG: B.C.		DATE DRILLED: 2/3/73		AIRPHOTO NO: A22934-151		CHAINAGE: 1067+00		OFFSET:		TEST HOLE				
CRO		TECH: J.W.		RIG: HILL & NEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SP. BERRIES		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
2					OH	CLAY: ORGANIC HIGH PLASTIC BLACK	F	Vs 40%	2							MED DE KE SPRUCE 15-35' HIGH 6" MAX
4					C1	NO ORGANICS MEDIUM PLASTIC BROWN SILTY, SANDY		Vx < 5%	4							
6									6							
8									8							
10									10							
12									12							
14						GRAVELLY			14							
16									16							
18									18							
20									20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: HH			FIELD ENG: BC			DATE DRILLED: 2/3/73			AIRPHOTO NO: A22934-151			CHAINAGE: 1075+10			OFFSET:			TEST HOLE											
GEO: ~~HH~~			TECH: JW			RIG: MAYHEW 1000			SURFACE DRAINAGE: FAIR			VEGETATION: SEE REMARKS			ELEV:			MILE B.C.S. NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %																		
						PEAT: category #3		Vx 45%																					
2						category #15		Vx 70%	2					MED DENSE SPRUCE 15-45' HIGH 9" φ MAX															
4					CH CLAY: ORGANIC HIGH PLASTIC		Vx 40%	4																					
6					NO ORGANICS SET, SANDY BROWN		Vx 10%	6																					
8								8																					
10					GREY			10																					
12								12																					
14								14																					
16								16																					
18								18																					
20								20																					
22								22																					
24						END OF HOLE			24																				

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: TC		FIELD ENG: EC		DATE DRILLED: 8/3/72		AIRPHOTO NO: A22834-151		CHAINAGE: 1084+28		OFFSET:		ELEV:		TEST HOLE															
CKD: JH		TECH: JH		RIG: MANDEL 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS																					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS											
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %														
2					OH	CLAY: ORGANIC HIGH PLASTIC	F	1/2 35%	2									DENSE SPRUCE 15' to 25' HIGH 5" MAX Ø											
4					C1	CLAY VERY SMTY SANDY MED PLASTIC BROWN		1/5 15%	4																				
6						SANDIER			6																				
8									8																				
10									10																				
12									12																				
14					CH	HIGH PLASTIC GREY		1/4 10%	14																				
16						END OF HOLE			16																				
18									18																				
20									20																				
22									22																				
24									24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWNER: HH		FIELD ENG: BC		DATE DRILLED:		AIRPHOTO NO: A22934-151		CHAINAGE: <u>1111 + 33</u>		OFFSET:		TEST HOLE				
CND: <u>1111</u>		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: <u>FAIR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE: <u>603</u> S.C.S: <u>C</u> NUMBER: <u>715</u> *				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
2					OH	CLAY: organic silty high plastic black	F	Vx 30%	2							DENSE SPRUCE 5'-20' HIGH 4" MAX Ø
4					CH	silty high plastic brown no organics		Vx 5%	4							
6									6							
8						CLAY(SHALE) high plastic grey		Vs 1%	8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWR: HH		FIELD ENG: BC		DATE DRILLED: 2/5/75		AIRPHOTO NO: R22934-151		CHAINAGE: 1122+25		OFFSET:		TEST HOLE				
CDR: ~~HH~~		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2					OH	CLAY - organic dark brown	F	Vx 40%	2							DENSE SPRUCE 5' TO 25' HIGH 4" MAX Ø
4					CI	CLAY (TILL) silty sandy med. plastic brown		Vs 30%	4							
6								Vx 15%	6							
8								Nbn	8							
10						sandier		Vx 5%	10							
12								Nbn	12							
14					CH	CLAY (SHALE) high plastic			14							
16						END OF HOLE			16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <u>TL</u>		FIELD ENG: <u>RL</u>		DATE DRILLED: <u>2/5/73</u>		AIRPHOTO NO: <u>A 22934-151</u>		CHAINAGE: <u>1131+65</u>		OFFSET:		TEST HOLE																	
CER: <u>700</u>		TECH: <u>EB</u>		RIG: <u>MANUEL DND</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE <u>603</u> B.C.S. <u>C</u> NUMBER <u>717</u>																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS											
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %														
2						PT PEAT: CATEGORY "12"		V _s 60%	2								MED DENSE SANDS 5" to 20" HIGH 8" MAX φ OCCASIONAL B-PLAK.												
						CI CLAY: SANDY SILTY MED. PLASTIC BROWN		V _s 10%	4																				
4						CI CLAY (TILL) SILTY, SANDY MED. PLASTIC RUST, COAL PERCLES		V _s 15%	6																				
8						CH CLAY (SHALE) HIGH PLASTIC GREY		N ₆₇	8																				
14						END OF HOLE			14																				

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWY: <i>77</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>2/1/78</i>		AIRPHOTO NO: <i>A22954-149</i>		CHAINAGE: <i>1140+20</i>		OFFSET:		TEST HOLE									
CKD: <i>77</i>		TECH: <i>EB</i>		RIG: <i>MAYHEW 100</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS			
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %						
2						OH CLAY: ORGANIC		Vs 20%	2									MED. DENSE SPINDLES 5" to 10" HIGH 4" MAX. & "DRUNKEN FOREST"			
						CI CLAY: SILTY SANDY MED PLASTIC BROWN															
4						CI CLAY (FILL): SILTY SANDY RUSTY COAL SPOTS STONES MED PLASTIC BROWN GREY		Nbn	4												
6						GREY BOULDERS			6												
8									8												
10						OH CLAY (SHALE) HIGH PLASTIC GREY			10												
12									12												
14						END OF HOLE			14												
16									16												
18									18												
20									20												
22									22												
24									24												

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
OWN: TC		FIELD ENG: BC		DATE DRILLED: 2/3/73		AIRPHOTO NO: A 22334-149		CHAINAGE: 1150+40		OFFSET:		TEST HOLE		
CND: ~~TC~~		TECH: ER		RIG: MARYON 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)				
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+				
2						PT ~~PEAT~~ : CATEGORY #4 C1 CLAY: SILTY SANDY MED PLASTIC BROWN		V _x 10% V _x 5%	2					MED. DENSE SURFACE 10' to 20' HIGH 6" MAX @
4						C1 CLAY(SH): SILTY SANDY STONES MED. PLASTIC BROWN			4					
6						----- VERY SILTY MED. PLASTIC	Nbn		6					
8						-----	V _x 10%		8					
10						----- GREY			10					
12						CLAY(SHALE) HIGH PLASTIC GREY	Nbn		12					
14						----- END OF HOLE			14					
16									16					
18									18					
20									20					
22									22					
24									24					

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <u>TC</u>		FIELD ENG: <u>RC</u>		DATE DRILLED: <u>2/3/79</u>		AIRPHOTO NO: <u>R22534-149</u>		CHAINAGE: <u>1152+65</u>		OFFSET:		TEST HOLE									
CIR: <u>1111</u>		TECH: <u>EB</u>		RIG: <u>HANNA 1000</u>		SURFACE DRAINAGE: <u>FAIR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE B.C.S. NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	% LIMITS FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAM-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										CLAY %	SILT %	SAND %	GRAVEL %								
						OH CLAY: ORGANIC CI CLAY: (TILL) SILTY, SANDY MEDIUM PLASTIC RUST, COAL BROWN		V _x 50% V _s 10% V _s 5% V _b 20% V _s 10% N ₆₀		○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)											
2									2												
4									4												
6									6												
8									8												
10									10												
12						Gray			12												
14									14												
16									16												
18									18												
20									20												
22									22												
24									24												

MED DENSE
SPRUCE 10" to 20"
HIGH 4 to 6" φ

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: TC		FIELD ENG: BC		DATE DRILLED: 1/5/73		AIRPHOTO NO: A22934-149		CHAINAGE: 1168+38		OFFSET:		TEST HOLE				
CND: ~~XXXX~~		TECH: EB		RIG: MAXWELL RD		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE S.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
2	1	T	100			PT PRAT. CATEGORY = 3 1/2 F OH CLAY: ORGANIC HIGH PLASTIC		V _L 50% V _S 20%	2							DUMP SPUR 5' TO 10' HIGH 4" MAX. Ø OCCASIONAL PEGLAR
4						CI CLAY (TILL): SANDY, SILTY RUSTY COAL SPARS STONES MED PLASTIC GRAY BROWN		V _L 5%	4							
6						CH ——— HIGH PLASTIC GRAY		V _S 10%	6							
8								V _S 5%	8							
10									10							
12						VERY SANDY COBBLES		V _S 3%	12							
14						END OF HOLE		Nb	14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWNER: <i>TC</i>		FIELD ENG: <i>RC</i>		DATE DRILLED: <i>2/5/75</i>		AIRPHOTO NO: <i>A22334-149</i>		CHAINAGE: <i>1176+00</i>		OFFSET:		TEST HOLE																	
CNO: <i>1176</i>		TECH: <i>EB</i>		RIS: <i>MAINTEN 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>See Remarks</i>		ELEV:		MILE B.C.S. NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.P.)	DRY DENSITY (P.C.P.)	REMARKS															
										CLAY %	SILT %																		
						OH CLAY: <i>ORGANIC</i>	<i>1/2</i>	<i>Vx 60%</i>						<i>DWAVE SPALLS 10' to 15' HIGH 3' to 4" Ø</i>															
2						CH CLAY: <i>SILTY HIGH PLASTIC BROWN</i>		<i>Vx 10%</i>																					
4								<i>Vx 40%</i>																					
6								<i>Vx 25%</i>																					
8						CI CLAY (FILL): <i>SILTY SANDY RUSTY & COARSE JONES MED. PLASTIC BROWN</i>	<i>6</i>	<i>Vx 10%</i>																					
10								<i>N60</i>																					
12						CH CLAY (SNAIL): <i>HIGH PLASTIC GREY</i>	<i>10</i>																						
14																													
16																													
18																													
20																													
22																													
24																													
						END OF HOLE	<i>14</i>																						

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: HH		FIELD ENG: BC		DATE DRILLED: 11/3/73		AIRPHOTO NO: A22934-151		CHAINAGE:		OFFSET:		TEST HOLE				
CKD		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
										% % % % CLAY SILT SAND GRAVEL						
2					11	MOSS			2							MED. DENSE STIFF 5' TO 10' HIGH 3" MAX φ
					11	CLAY: black		Vs 60%								
4					C1	CLAY: silty sandy med plastic brown		N6n	4							
6									6							
8									8							
10					CH	CLAY (SHALE) high plastic grey		Vs 10%	10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: 44		FIELD ENG: BC		DATE DRILLED: 1/3/73		AIRPHOTO NO: A22934-151		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE																
CKD: ~~44~~		TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS						MILE B.C.S NUMBER																
DEPTH (FEET)		SAMPLE NUMBER		SAMPLE TYPE		% RECOVERY		PENETRATION RESISTANCE		UNIFIED SOIL SYMBOL		SOIL DESCRIPTION		LIMITS OF FROZEN GROUND		ICE DESCRIPTION		DEPTH (FEET)		GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)		DRY DENSITY (P.C.F.)		REMARKS				
																				CLAY		SILT		SAND		GRAVEL				
																				%		%		%		%				
2		T1		T5								PEAT cat-bog #15		W		F		Y ₂ 40%		2								MED. DENSE		
2		T2		100								CLAY: organic high plastic		17 1/2		F		V _s 70%		2								CLAY		
4												CLAY: silty high plastic brown				F		V _r 10%		4								5' TO 20' HIGH		
6																F		V _s 50%		6								3" MAX Ø		
8												gray		8 1/2		F				8										
10																F				10										
12																F				12										
14																F				14										
16																F				16										
18												CLAY (TILL): cobbles pebbles high plastic gray		18		F		Nbn		18										
20												END OF HOLE		20		F				20										
22																F				22										
24																F				24										

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DATE DRILLED: 1/2/73		AIRPHOTO NO: A22934-151		CHAINAGE:		OFFSET:		TEST HOLE								
TECH: JW		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2						PT PEAT: Category #3	3/4	V _s 40%	2							MED DENCE SPRUCE 5' TO 20' HIGH 4" MAX Ø
4						CI CLAY: silty, sandy med plastic brown		V _s 50%	4							
6								V _r 30%	6							
8								Nbn	8							
10						CH CLAY: (SHALE) high plastic gray	9'		10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE	20'		20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: HJH		FIELD ENG: EC		DATE DRILLED: 1/3/73		AIRPHOTO NO: A22534-153		CHAINAGE:		OFFSET:		TEST HOLE				
CKD		TECH: HJH & EB		RIG: MARYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2					OH	CLAY: organic, high plastic sandy silty dark brown	T	Vs 40	2							DENSE SPRUCE 15' TO 30' HIGH 8" MAX Ø OCCASIONAL BIRCH
4					CI	CLAY (TILL): sandy silty pebbles med plastic rust & coal specks brown		Vx 20 Vs 30	4							
6						sandier siltier		Vs 20	6							
8								Vs 10	8							
10									10							
12						grey		Vx 5	12							
14									14							
16						cobbles less sandy		Nbn	16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: TC			FIELD ENG: RC			DATE DRILLED: 1/5/72			AIRPHOTO NO: A22934-153			CHAINAGE:			OFFSET:			TEST HOLE											
CKD: 22			TECH: MUEER			RIG: MAXWELL 1000			SURFACE DRAINAGE: POOL			VEGETATION: ST. PINE			ELEV:			MILE B.C.S. NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %																		
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT																			
2						VI PEAT: CATEGORY #4		V _x 30%	2					DENSE SAND 15" TO 30" IN SIZE 6" MAX. Ø OCCASIONAL BIRCH															
3					CH CLAY: ORGANIC HIGH PLASTIC DARK BROWN		V _x 60%	3																					
4					CI CLAY (FILL): SANDY SILTY STONES RUST & COAL SPECS MED PLASTIC BROWN		V _x 10%	4																					
6								6																					
7					LESS SAND COBBLES			7																					
10								10																					
12					CH CLAY: GRAY HIGH PLASTIC			12																					
14								14																					
16								16																					
18					CH CLAY (SNAIL): HIGH PLASTIC GRAY			18																					
20					END OF HOLE			20																					
22								22																					
24								24																					

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: 414		FIELD ENG: BC		DATE DRILLED: 5/1/73		AIRPHOTO NO: A22934-153		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: ~~414~~		TECH: EF - HH		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER
										CLAY %	SILT %					
2					OH	CLAY: ORGANIC HIGH PLASTIC DARK BROWN	F	Vx 40%	2							
4					CH	CLAY: SILTY HIGH PLASTIC BROWN		Vs 60%	4							
6					CI	CLAY (TILL): SILTY SANDY PEBBLES MED. PLASTIC GREY BROWN BOULDERS CORBELS		Vx 5%	6							
8								Vs 20%	8							
10						SANDIER SILTIER		Nbn	10							
12									12							
14									14							
16									16							
18						MORE PEBBLES			18							
20						END OF HOLE			20							
22									22							
24									24							

MED DENSE
SPRUCE 15' TO 20'
HIGH
6" MAX Ø
OCCASIONAL
BIRCH
TAMARACK

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>T</i>		FIELD ENG: <i>SC</i>		DATE DRILLED: <i>1/5/73</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>100</i>		TECH: <i>JH FLS</i>		RIG: <i>NATHAN 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE PREVIOUS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>HI PEAT: CATEGORY #3 1/2</i> <i>C1 (CLAY (TILL))</i> SANDY SILTY SANDS FINE & COAL SPOTS MED. PLASTIC SILTY COBBLES	<i>Vs 90%</i> <i>Vs 70%</i> <i>Vs 30%</i> <i>Vs 10%</i> <i>N6n</i>	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)								
2									2							<i>NEAR DRIVE</i> <i>SANDY SILTY</i> <i>HIGH 5' MAX</i> <i>OCCASIONAL</i> <i>BIRCH</i>
4									4							
6									6							
8	<i>1</i>								8							
10									10							
12						POCKETS OF SAND AND GRAVEL			12							
14						LESS SAND AND GRAVEL			14							
16									16							
18									18							
20									20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: —		FIELD ENG: <i>PC</i>		DATE DRILLED: <i>1/17/75</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE: —		OFFSET: —		TEST HOLE				
CKO: <i>772</i>		TECH: <i>11.5 16</i>		RIG: <i>MANUEL 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>See Notes</i>		ELEV: —		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+							
									% % % % CLAY SILT SAND GRAVEL							
1						1' <i>Light Greenish #16</i>		<i>V_s 40%</i>	1							<i>Bore 10' to 20'</i> <i>High 9" max φ</i> <i>Occasional</i> <i>Spalls 30" H.</i> <i>6" max. φ</i>
2					<i>OH CLAY: ORGANIC</i>		<i>V_s 60%</i>	2								
3					<i>CLAY (FILL):</i>		<i>V_s 30%</i>	3								
4					<i>Silty SANDY</i>		<i>V_s 5%</i>	4								
5					<i>Med PLASTIC</i>		<i>Nbn</i>	5								
6					<i>VERY SANDY</i>			6								
7					<i>Med PLASTIC</i>			7								
8					<i>VERY SANDY</i>			8								
9					<i>Med PLASTIC</i>			9								
10					<i>VERY SANDY</i>			10								
11					<i>Med PLASTIC</i>			11								
12					<i>VERY SANDY</i>			12								
13					<i>Med PLASTIC</i>			13								
14					<i>VERY SANDY</i>			14								
15					<i>Med PLASTIC</i>			15								
16					<i>VERY SANDY</i>			16								
17					<i>Med PLASTIC</i>			17								
18					<i>VERY SANDY</i>			18								
19					<i>Med PLASTIC</i>			19								
20					<i>VERY SANDY</i>			20								
21					<i>Med PLASTIC</i>			21								
22					<i>VERY SANDY</i>			22								
23					<i>Med PLASTIC</i>			23								
24					<i>VERY SANDY</i>			24								

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
OWN:		FIELD ENG:		DATE DRILLED: 7/75		AIRPHOTO NO: A 22934-153		CHAINAGE:		OFFSET:		TEST HOLE		
CKD:		TECH:		RIG:		SURFACE DRAINAGE: FAIR		VEGETATION: See		ELEV:		MILE B.C.S. NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
2					CI	CLAY: silty, sandy medium plastic brown			2					Low Plasticity 5-55 HIGH 8 φ 100 Scattered 5-20' HIGH 6" φ 100
4								4						
6						sandier			6					
8					CH	CLAY SHALE - SANDSTONE: high plastic clay shale interbedded with fine grained sandstone, brownish, silty, layers 1/4" sandstone layers 1/4"		Nbn	8					
10									10					
12									12					
14								Nf	14					
16									16					
18									18					
20						END of HOLE			20					
22									22					
24									24					

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: ---		FIELD ENG: <u>RE</u>	DATE DRILLED: <u>3/2/75</u>	AIRPHOTO NO: <u>B2097-1-152</u>	CHAINAGE: ---	MACKENZIE HIGHWAY				TEST HOLE						
CKD: <u>1</u>	TECH: <u>1/16</u>	RIG: <u>1000</u>	SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE COMMENTS</u>		ELEV: ---		OFFSET: ---		MILE B,C,S NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 20 40 60 80 100 100+						
2						U4 CLAY: <u>ORGANIC</u>		V _s 20%	2							100' FROM SURFACE 20' IN 10' IN 8" DIA ORGANIC SILT
4					C1 CLAY (TILL): SANDY SILTY STONES JUST E COAL SPKS MED. PLASTIC BROWN COBBLES		V _s 70%	4								
6							V _s 25%	6								
8							V _s 5%	8								
10							N/A	10								
12								12								
14								14								
16								16								
18								18								
20								20								
22								22								
24								24								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

CKD	TECH	RIG	AIRPHOTO NO: H 22954-1D5	CHAINAGE:	OFFSET:	TEST HOLE
2	2	1000	SURFACE DRAINAGE: FAIR	VEGETATION:	FLW	

[illegible]

597 8-85 735

REMARKS

[illegible]

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT					DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: HA		FIELD ENG: EC		DATE DRILLED: 22/7/78		AIRPHOTO NO: B22934-153		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE										
CKD: 22		TECH: JVV - 12		RIG: FAIRVIEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS																
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS								
										CLAY %	SILT %	SAND %	GRAVEL %											
						MOSS CLAY: organic black silty plastic	Y3	Vs 40%																
2					CI	CLAY (TILL): silty sandy med plastic petioles caliche brown		Vs 20%	2															
4									4															
6								Vs 5%	6															
8						boulders	8	Nbn	8															
10									10															
12									12															
14									14															
16									16															
18						grey	17 1/2		18															
20						END OF HOLE			20															
22									22															
24									24															

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <i>RD</i>		FIELD ENG: <i>RC</i>		DATE DRILLED: <i>22/2/74</i>		AIRPHOTO NO: <i>A22934-153</i>		CHAINAGE: <i>777+16</i>		OFFSET:		ELEV:		TEST HOLE															
CKD: <i>RD</i>		TECH: <i>ICU</i>		RIG: <i>HIMMEL 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See 8/4</i>																					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B.C.S	NUMBER											
										CLAY %	SILT %	SAND %	GRAVEL %																
						CLAY <i>ORGANIC HIGH PLASTIC</i>		<i>20%</i>																					
						CLAY (TILL)																							
2						SAND SILTY			2					117.8	95.5														
4	1	C	100			MED PLASTIC			4					127.1	105.5														
6						RUST & COAL SPECKS			6					126.2	104.1														
8	2	C	53			DARK BROWN			8																				
10						PEBBLES			10																				
12	3	C	83						12					137.1	120.0														
14	4	C	100						14					134.7	118.1														
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

MED DUNE
SPURSE
20-25 HIGH
5" & MAX
OCCASIONAL
BIRCH

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: H J H		FIELD ENG: EC		DATE DRILLED: 11/3/72		AIRPHOTO NO: R 22934-153		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~11/3/72~~		TECH: EB & HH		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						FT PEAT: CATEGORY #6		V _s 20%								MED. DENSE SPRUCE 20' TO 30' HIGH 5" MAX Ø OCCASIONAL BIRCH & TAMARACK
2					CI	CLAY: SILTY MED. PLASTIC BROWN		V _s 80%	2							
4								V _r 40%	4							
6					CH	CLAY (TILL) SILTY SANDY HIGH PLASTIC PEBBLES RUST SPECKS COAL SPLICKS GREY BROWN	4 1/2	V _r 20%	6							
8								V _s 5%	8							
10								Nb	10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN:		FIELD ENG:		DATE DRILLED:		AIRPHOTO NO:		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE							
CKD:		TECH:		RIG:		SURFACE DRAINAGE:		VEGETATION:		ELEV:		MILE		B,C,S		NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										CLAY %	SILT %	SAND %	GRAVEL %								
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT ——— LIQUID LIMIT ——— 20 40 60 80 100 100+											
2						CLAY: CHANCE		V _x 50%	2							Red Brown Sand 15' to 35' High 6' to 10' to Occasional Brown & Lamin					
4						CLAY: SILTY HIGH PLASTIC BROWN		V _s 40%	4												
6						CLAY (FILL): SANDY SILTY STONES RUSTY COAL SPOTS MED PLASTIC BROWN		V _x 10%	6												
8								Nb	8												
10	1					SILTIER		V _x < 5%	10												
12								Nb	12												
14						GREY			14												
16								V _x 5%	16												
18	2								18												
20						END OF HOLE			20												
22									22												
24									24												

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
OWN: <i>TD</i>		FIELD ENG: <i>CC</i>		DATE DRILLED: <i>1/13/74</i>		AIRPHOTO NO: <i>A22934-151</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE				
CKD: <i>1/13/74</i>		TECH: <i>EP</i>		RIG: <i>1.5 IN. TDD</i>		SURFACE DRAINAGE: <i>P003</i>		VEGETATION: <i>See Remarks</i>										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %	SAND %	GRAVEL %					
						<i>PT PEAT: CATEGORY "6" 13</i> <i>CH CLAY: ORGANIC HIGH PLASTIC 1</i> <i>CI CLAY (TILL): SILTY SANDY STONES MED. PLASTIC RUSTY COAL SPOTS BROWN 26</i> <i>GREY BROWN 8</i> <i>HIGH PLASTIC GREY 13</i> <i>END OF HOLE 20</i>		<i>Vx 25%</i> <i>Vx 60%</i> <i>Vx 35%</i> <i>Vx 5%</i>										<i>MED. DENSE SPRUCE 25% 35% HIGH 8" MAX. Ø OCCASIONAL BROWN & BLACK</i>
2									2									
4									4									
6									6									
8									8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TH</i>		FIELD ENG: <i>RC</i>		DATE DRILLED: <i>11/3/72</i>		AERIAL PHOTO NO: <i>A22934-151</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>TH</i>		TECH: <i>HLS-EB</i>		RIG: <i>1 1/2" NEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See Remarks</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT <i>PEAT: CATEGORY #6</i>		<i>Vx 60%</i>								<i>RED BENSE SURFACE 20' to 45' HIGH ORGANIC BIRCH, POPLAR & TRIMARK</i>
2					CI	CLAY (TILL) SILTY SANDY W/ST. COAL SPRES STONER MED PLASTIC BROWN		<i>Vx 40%</i>	2							
4									4							
6						GREY BROWN		<i>Vx 30%</i>	6							
8								<i>Vx 20%</i>	8							
10								<i>N6n</i>	10							
12					CH	HIGH PLASTIC GREY BROWN			12							
14						GREY			14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: <i>TC</i>		FIELD ENG: <i>HC</i>	DATE DRILLED: <i>1/3/78</i>	AIRPHOTO NO: <i>A22934-151</i>	CHAINAGE:	OFFSET:	ELEV:		TEST HOLE							
COR: <i>30</i>	TECH: <i>100</i>	RIG: <i>Miller D-10</i>	SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See Notes</i>	ELEV:		MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
2						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN.		V _x 70%	2						MED. DENSE SANDS 10-12" HIGH 3' MAX. F. DISPERSED COBBLES	
4						CH CLAY: SILTY SANDY HIGH PLASTIC BROWN.		V _x 60%	4							
6						CI CLAY (FILL): SILTY SANDY STONE, FINE GRAIN SANDS MED. PLASTIC BROWN.		V _s 50%	6							
8								V _x 10%	8							
10								V _x 5%	10							
12								N60	12							
14									14							
16						GREY			16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

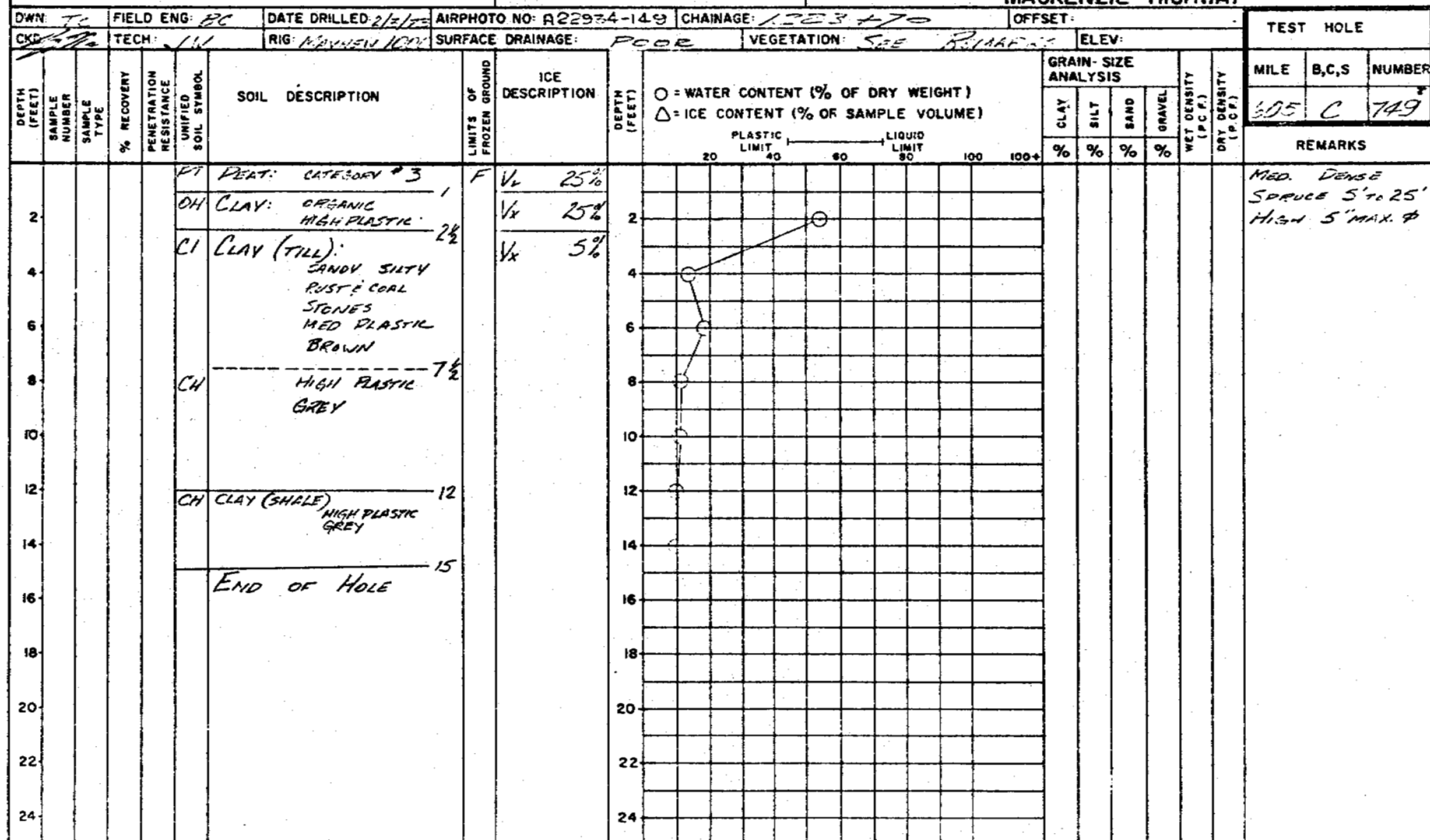
DWN:	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE	OFFSET:	ELEV:	TEST HOLE									
CKD:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:				MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT						
										20	40	60	80	100	100+	
										%	%	%	%			
2						PT PEAT: CATEGORY #5	F	V _x 60%	2							MED Dense & STRUCT 10' to 15' HIGH 3" to 5" Ø Occasional Thin Crack
4						C1 CLAY (FILL): Silty SANDY RUSTY ORAL SPOTS STONES MED PLASTIC BROWN		V _x 5%	4							
6						CN CLAY (SHALE):		N/A	6							
8						HIGH PLASTIC GREY BROWN			8							
10									10							
12									12							
14						END OF Hole			14							
16									16							
18									18							
20									20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: <i>TL</i>		FIELD ENG: <i>RC</i>	DATE DRILLED: <i>2/3/72</i>	AIRPHOTO NO: <i>922034-149</i>	CHAINAGE: <i>11564+75</i>	OFFSET:	TEST HOLE									
CNO: <i>76</i>		TECH: <i>ER</i>	RIG: <i>MAULEY 1000</i>	SURFACE DRAINAGE: <i>POOR</i>	VEGETATION: <i>SEE REMARKS</i>	ELEV:	MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
2						OH CLAY. ORGANIC HIGH PLASTIC 1 1/2	F	Vx 70%								SPARSE DWARF SPRUCE OCCASIONAL POPLAR
4						LI CLAY (FILL) SANDY SILTY RUSS COAL DEFS STONES MED. PLASTIC BROWN		Vx 50%	2							
6						----- 6 GREY		Vs 10%	4							
8								Vs 40%	6							
10						CH CLAY (SHALE) HIGH PLASTIC GREY	Nbn		8							
12									10							
14						END OF HOLE 14			12							
16									14							
18									16							
20									18							
22									20							
24									22							
									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: TC		FIELD ENG: EC		DATE DRILLED: 2/3/74		AIRPHOTO NO: A22934-149		CHAINAGE: 1215+20		OFFSET:		TEST HOLE			
CND: ~~TC~~		TECH: JV		RIG: NAWLEY 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY %	SILT %				
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+					
2					OH	CLAY: ORGANIC	1'	Vs 60%	2					MED. DENSE SPRINGS 10' to 20' HIGH 5' MAX. Ø DRAINAGE FORMER	
4					SP	SAND: SILTY NON PLASTIC BROWN	3'	NH	4						
6					CI	CLAY (TILL): SILTY SANDY STONES, RUST & COAL SPOTS MED PLASTIC BROWN		Vs 40%	6						
8								Vx 5%	8						
10						GREY.	9		10						
12									12						
14									14						
16									16						
18									18						
20									20						
22									22						
24						END OF HOLE	15		24						

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

WELL DENSE
SPRUCE 5 to 20'
Height 4' max. d

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TL</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>3/3/72</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE: <i>1237+90</i>		OFFSET:		TEST HOLE				
CND: <i>11</i>		TECH: <i>11</i>		RIG: <i>MANUEL 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>WILLOWS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>1237+90</i> BEDROCK (SHALESTONE) BADLY WEATHERED INGRESS OF SAND & SILT IN FISSURES										
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>5/3/73</i>		AIRPHOTO NO: <i>A22934-155</i>		CHAINAGE:		OFFSET:		TEST HOLE																	
CIR: <i>591</i>		TECH: <i>MR. CA</i>		RIG: <i>FALLING BLOCK</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE		B,C,S		NUMBER													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY	SILT	SAND	GRAVEL																
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																				
									PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																				
									%				%																
2						CI CLAY (TILL): SANDY SILTY STONES RUSTY COAL SPECS MED. PLASTIC BROWN		Vx 5%	2								BIRCH 40' → 50' HIGH 6" MAX. φ OCCASIONAL SPRUCE 10' HIGH 12" MAX. φ												
4									4																				
6									6																				
8						SP SAND (TILL): SILTY NON PLASTIC STONES BROWN		Nf	8																				
10									10																				
12						LESS STONES			12																				
14									14																				
16									16																				
18						CI CLAY (TILL): SANDY SILTY RUSTY COAL SPECS STONES MED. PLASTIC BROWN		Nbn	18																				
20									20																				
22						END OF HOLE			22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: TC		FIELD ENG: BC		DATE DRILLED: 8/3/73		AIRPHOTO NO: A 22934-155		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: ~~TC~~		TECH: MRF CA		RIG: FAIRING 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						PT PEAT: CATEGORY # 2		V _s 20%								MED DENSE SPRUCE 10" to 30" HIGH 2" to 6" Ø OCCASIONAL POPULAR
						CATEGORY # 3		V _x 5%								
2						CI CLAY: SILTY SANDY MED. PLASTIC BROWN			2							
4									4							
6									6							
8						CI CLAY (TILL): SILTY SANDY RUST & COAL SPOTS STONES MED PLASTIC COBBLES BROWN			8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22						END OF HOLE			22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

REMARKS

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWE		FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:	ELEV:	TEST HOLE										
CND	TECH	RIG	SURFACE DRAINAGE:	VEGETATION:				MILE	B.C.S.	NUMBER								
								591	B-72	755								
								REMARKS										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTIC LIMIT	LIQUID LIMIT	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	
													CLAY %	SILT %	SAND %	GRAVEL %		
													%	%	%	%		
2						SAND (TILL): COARSE GRAINED STONES SILTY TRACE OF CLAY NON PLASTIC BLOWN MED GRAINED			2									
4							4			4								
6							6			6								
8							8			8								
10							10			10								
12							12			12								
14						END OF HOLE			14									
16									16									
18									18									
20									20									
22									22									
24									24									

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

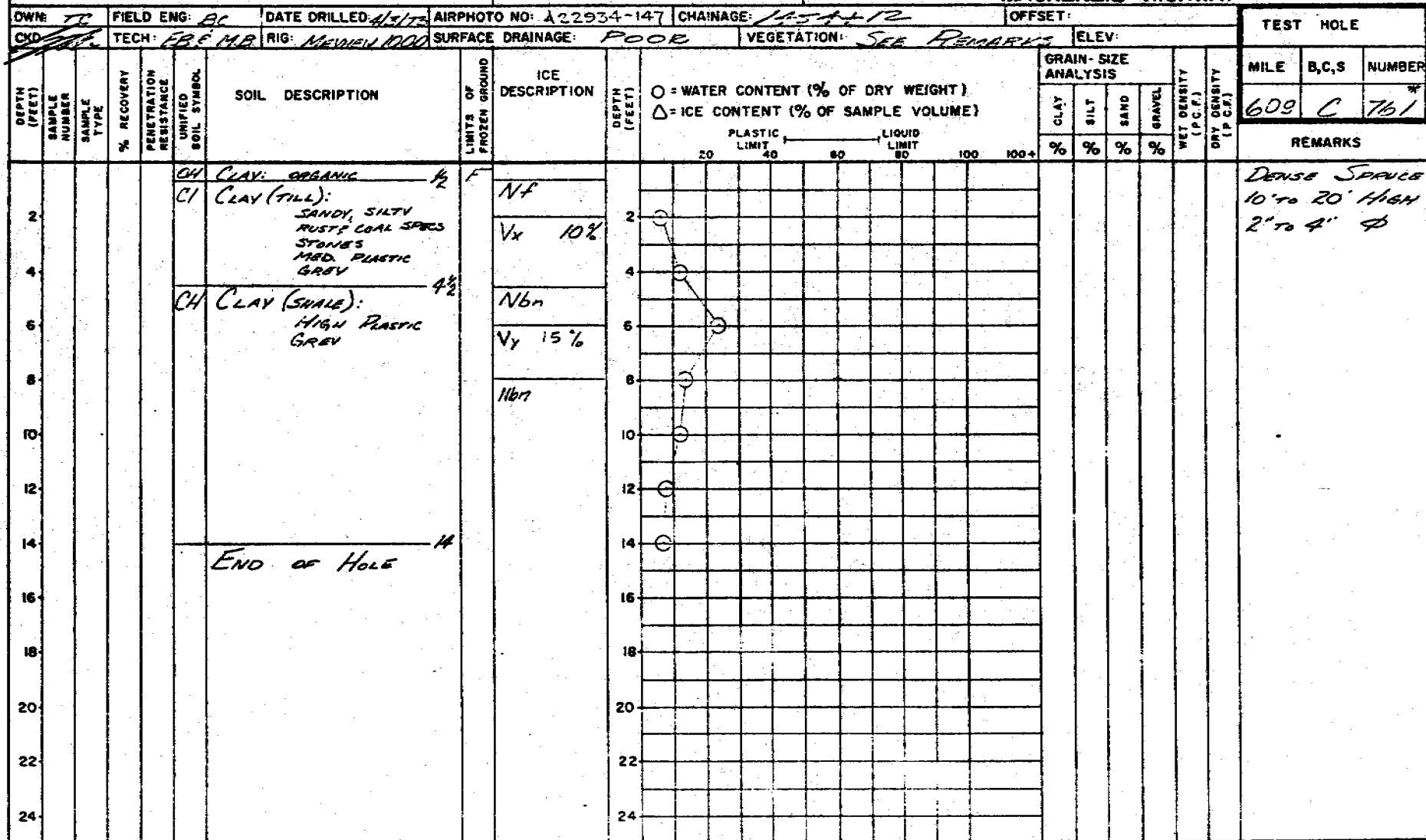
DUNE TC		FIELD ENG: <i>BC</i>	DATE DRILLED: <i>5/3/72</i>	AIRPHOTO NO: <i>A22934-155</i>	CHAINAGE:	MACKENZIE HIGHWAY	OFFSET:	ELEV:	TEST HOLE							
CYD	TECH: <i>MB & CA</i>	RIG: <i>FAIRING 1000</i>	SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>					MILE	B,C,S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT 40 60 LIQUID LIMIT 80 100 100+						
2	1	C	42			(1) CLAY (TILL): SANDY SILTY RUST & COAL SPECS STONES MED. PLASTIC BROWN	F	V _s 10%	2							
4								V _s 5%	4							
6	2	C	71			SANDIER COBBLES BOULDERS		Nbn	6							
8								V _c 2%	8							
10								V _x 1%	10							
12								Nbn	12							
14									14							
16									16							
18									18							
20						GREY		Nbn	20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: BC		DATE DRILLED: 2/5/75		AIRPHOTO NO: A 22934-149		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: ~~MA~~		TECH: EB		RIG: MAXWELL 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	100+	
										PLASTIC LIMIT				LIQUID LIMIT		
2					PT	PEAT: CATEGORY # 4		V _i 80%	2							
					OH	CLAY: ORGANIC		ICE 60%								
4					CH	CLAY: SILTY HIGH PLASTIC BROWN		V _s 50%	4							
6					SP	SAND: MED GRAINED GRAVELLY SILTY, GRAY-BROWN		V _s 40%	6							
8					SM	FINER LESS STAINS		NF	8							
10					CI	CLAY (TILL): SILTY, SANDY FAST & COAL MED PLASTIC BROWN		Nb ₁	10							
12									12							
14					CH	CLAY (SHALE) HIGH PLASTIC GREY			14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
DWN: TC		FIELD ENG: BC		DATE DRILLED: 2/4/75		AIRPHOTO NO: A22934-149		CHAINAGE:		OFFSET:		TEST HOLE			
CKD: ~~BC~~		TECH: EB		RIG: HAVEN 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE B,C,S NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				REMARKS	
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										%	%	%	%		
2	1	T	0			PT PEAT. CATEGORY #1 CLAY (TILL) SANDY SILTY STONES RUST & COAL SPARS MED PLASTIC BROWN	1/2 60% 1/3 30% 1/4 40%		2						
4									4						
6									6						
8									8						
10	2	T	92			CH CLAY (SHALE) HIGH PLASTIC GREY	10	N60	10					1261	1045
12	3	T	0						12						
14									14						
16									16						
18									18						
20						END OF HOLE	20		20						
22									22						
24									24						

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <u>TC</u>		FIELD ENG: <u>EC</u>		DATE DRILLED: <u>2/4/73</u>		AIRPHOTO NO: <u>R22934-149</u>		CHAINAGE:		OFFSET:		TEST HOLE		
CXB: <u>MA</u>		TECH: <u>EB</u>		RIG: <u>MANUEL 1000</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE B.C.S NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
						OH CLAY: ORGANIC		V _x 30%						
2						CH CLAY: SILTY HIGH PLASTIC BROWN		V _x 5%	2					
4								V _s 30%	4					
6						CI CLAY (TILL)		V _x 60%	6					
8						SILTY SANDY STONES RUST & COAL MED PLASTIC BROWN		V _s 20%	8					
10								V _s 5%	10					
12									12					
14						CH CLAY (SHALE)		Nbn.	14					
16						HIGH PLASTIC GREY			16					
18									18					
20						END OF HOLE			20					
22									22					
24									24					

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

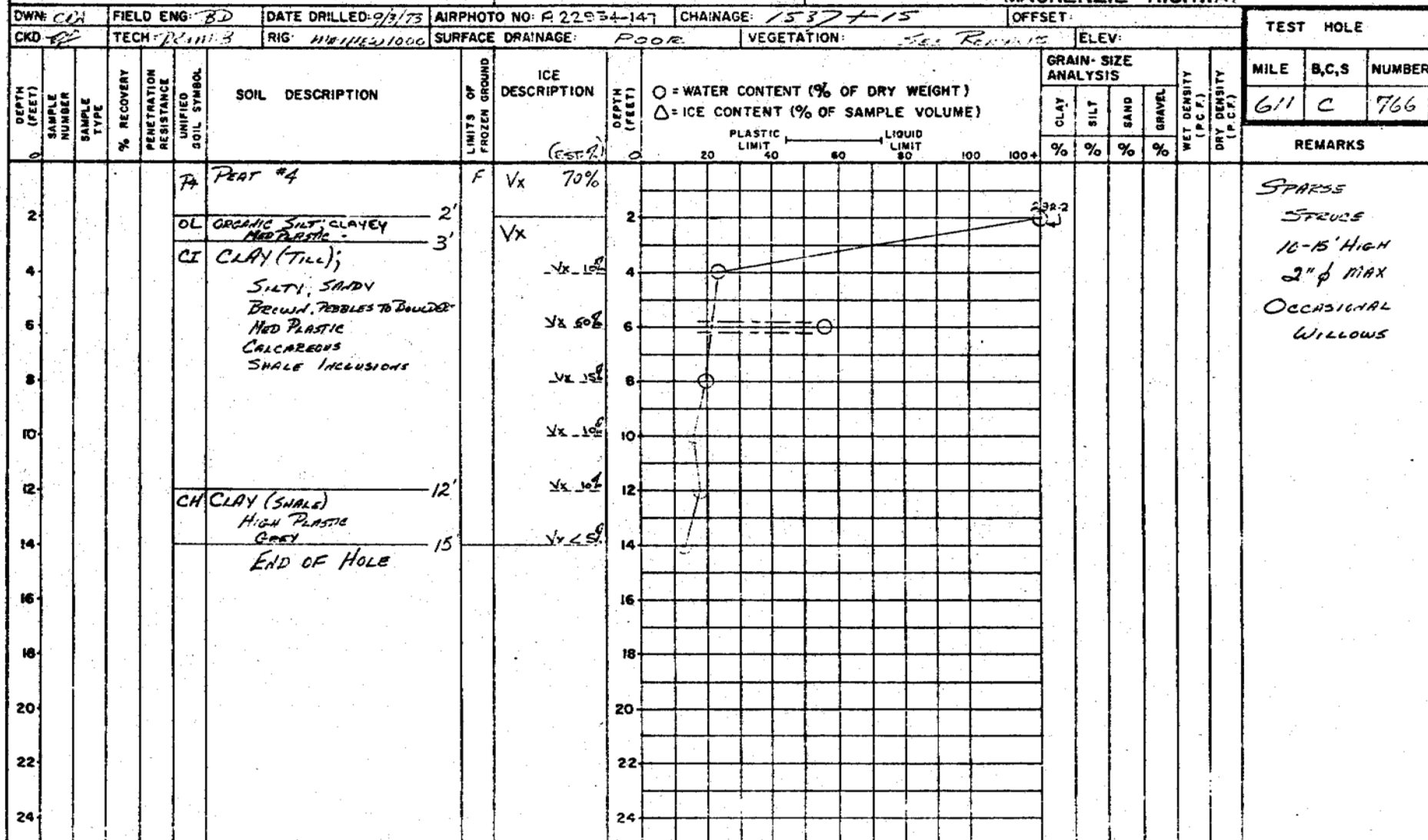
DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWR:	FIELD ENG:	DATE DRILLED	AIRPHOTO NO:	CHAINAGE:	OFFSET:	ELEV:	TEST HOLE		
CKD:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:			MILE	B,C,S	NUMBER
							609	C	763
								REMARKS	
								DENSE SPRUCE 15' TO 25' HIGH 4" to 6" Ø OCCASIONAL BIRCH	

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
OWN: TC		FIELD ENG: RC		DATE DRILLED: 4/3/72		AIRPHOTO NO: A22934-147		CHAINAGE: 1435+45		OFFSET:		TEST HOLE						
CND: ~~XXXX~~		TECH: EBE MB		RIG: MINIHEN 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										○	△	CLAY	SILT	SAND	GRAVEL			
									PLASTIC LIMIT 40		LIQUID LIMIT 80							
									20 40 60 80 100 100+									
2						OH CLAY: ORGANIC SN SAND: GRAVELLY BROWN		VI 70%	2	○								DENSE SPAULS 15' TO 20' HIGH 2" to 4" Ø
4						C1 CLAY (TILL): SILTY, SANDY ROST COAL SPRES STONES MED. PLASTIC BROWN		Non	4	○								
6									6	○								
8									8	○								
10						GRAY SHALE INCLUSIONS			10	○								
12						CH CLAY (SHALE) HIGH PLASTIC GREY			12	○								
14						END OF HOLE			14	○								
16									16									
18									18									
20									20									
22									22									
24									24									

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CH</i>			FIELD ENG: <i>PC</i>			DATE DRILLED: <i>4/3/73</i>			AIRPHOTO NO: <i>A 22934-147</i>			CHAINAGE: <i>1523+40</i>			OFFSET:			ELEV:			TEST HOLE								
CKD: <i>4/</i>			TECH: <i>JH W 4 H 3</i>			RIG: <i>DAVIDSON 1000</i>			SURFACE DRAINAGE: <i>4000</i>			VEGETATION:						MILE			B.C.S			NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %				SAND %	GRAVEL %													
0						<i>CI</i> <i>CLAY; ORG. SANDY, SILTY MED PLAS-C BROWN</i>	<i>F</i>	<i>65%</i>	0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)					SPARSELY POPULATED SPRUCE 10-25' HIGH 3"φ MAX														
2									2																				
4									4																				
6						<i>PEBBLES TO BOULDERS</i>			6																				
8									8																				
10						<i>CI</i> <i>CLAY (TILL); SANDY SILTY MED PLASTIC PEBBLES & SHALY INCLUSIONS GREY</i>			10																				
12									12																				
14						<i>END OF HOLE</i>			14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: C.R.H.			FIELD ENG: S.D.			DATE DRILLED: 9/3/73			AIRPHOTO NO: A22934-147			CHAINAGE: 1572+50			OFFSET:			TEST HOLE											
CKD: 34			TECH: D.H. 11.2			RIG: M125W1150			SURFACE DRAINAGE: POOR			VEGETATION: See Remarks			ELEV:			MILE			B.C.S			NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %																		
0						PEAT #4		(EST. 2) Vx 35%	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
2					PA	BLACK			2																				
4					CL	CLAY (TILL)	2 1/2	Vx 25%	4																				
6						SILTY SANDY, BEDDED			6																				
8						MED LOW PLASTIC CALCAREOUS BOULDERS		Vs 10%	8																				
10								clbn	10																				
12						SHALE INCLUSIONS	12'		12																				
14						GREEN	14'		14																				
16						END OF HOLE			16																				
18									18																				
20									20																				
22									22																				
24									24																				

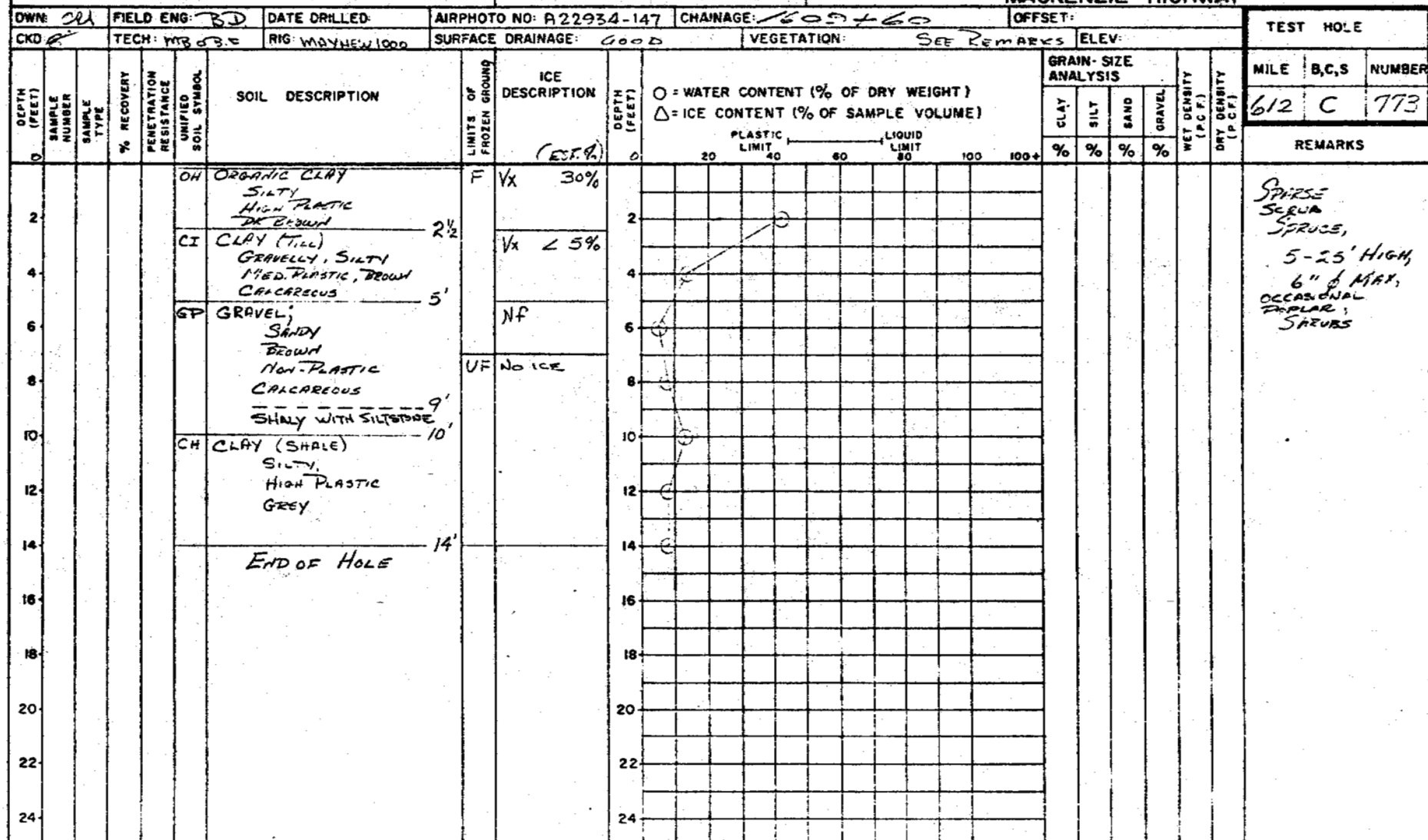
R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CRA		FIELD ENG: RD		DATE DRILLED: 9/3/75		AIRPHOTO NO: A22934-147		CHAINAGE: 1560423		OFFSET:		TEST HOLE					
CKD: 16		TECH: RAN 12		RIG: FIVE HILL 200		SURFACE DRAINAGE: POOR		VEGETATION: SP. BUSHES		ELEV:		MILE B.C.S. NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY	SILT	SAND	GRAVEL				
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
										PLASTIC LIMIT LIQUID LIMIT 40 80							
						CLAY (TILL); SANDY, SILTY HIGH PLASTIC BROWN FEWER CALCREOUS	1 1/2	Vx 40% Vx 10%	0								MODERATELY DENSE SPRUCE 15' HIGH 5" φ
2									2								
4									4								
6									6								
8						CLAY (SHALE) HIGH PLASTIC SANDY BROWN LAMINATED	7 1/2	NDn	8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24						END OF HOLE	14		24								

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>CL-1</i>		FIELD ENG: <i>R.D.</i>		DATE DRILLED: <i>7/3/73</i>		AIRPHOTO NO: <i>A 22934-147</i>		CHAINAGE: <i>1578 + 30</i>		OFFSET:		TEST HOLE				
CKD: <i>2</i>		TECH: <i>DE-113</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See Remarks</i>		ELEV:		MILE B,C,S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	100+	
0						<i>Pt PERT #10</i>		<i>F Vx 45%</i>	0							
2						<i>SM SAND; SILTY. 2 1/2'</i>		<i>Vx < 5%</i>	2							
4						<i>CI CLAY (TILL) 4'</i>		<i>non</i>	4							
6						<i>SANDY, SILTY MED PLASTIC BROWN PEBBLES, CALCAREOUS</i>			6							
8									8							
10									10							
12						<i>CH CLAY (SHALE) 11'</i>			12							
14						<i>SILTY, HIGH PLASTIC GREY, LAMINATED</i>			14							
16						<i>END OF HOLE 14'</i>		<i>WATER</i>	16							
18									18							
20									20							
22									22							
24									24							

MODERATELY
 DENSE
 SPRUCE
 10' HIGH
 5" d MAY

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CBA			FIELD ENG: BD			DATE DRILLED: 9/15/74			AIRPHOTO NO: A22934-147			CHAINAGE: 15864+00			OFFSET:			TEST HOLE											
CKD: 10			TECH: J.P. H. 7			RIG: NAYASA 100			SURFACE DRAINAGE: P002			VEGETATION: T-2			ELEV:			MILE B.C.S. NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
0								EST. 7	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
2					OH	ORGANIC CLAY HIGH PLASTIC BLACK	F	Vx 20%	2							SPARSE SCRUB SPRUCE To 20' HIGH 4" MAX													
4					CI CH	CLAY; SILTY, SANDY SLIGHTLY ORGANIC MED TO HIGH PLASTIC BROWN CALCAREOUS		Vx 40%	4																				
6								Vx 15%	6																				
8					CI	CLAY (TILL); SILTY, SANDY MED PLASTIC, BROWN PEBBLES, CALCAREOUS		115%	8																				
10					CN	CLAY (SHALE); HIGH PLASTIC GREY TRACE OF CALCAREOUS		Vs 10%	10																				
12									12																				
14						END OF HOLE			14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
OWN: <i>DPW</i>		FIELD ENG: <i>BD</i>		DATE DRILLED: <i>9/3/77</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE: <i>1528+27</i>		OFFSET:			
CKD: <i>DPW</i>		TECH: <i>DPW</i>		RIG: <i>11/2 INCH 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION:		ELEV:			
										TEST HOLE SHEET 2 of 2			
										MILE	B,C,S	NUMBER	
										612	C	774	
										REMARKS			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)			
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+			
24						EXTREMELY HARD SHALE		Nbn	24				
26						FRACURED			26				
28									28				
30									30				
32									32				
34									34				
36									36				
38									38				
40									40				
42									42				
44						SHALESTONE 44'		Nbn	44				
46									46				
48									48				
50						END OF HOLE 50'			50				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: <u>USA</u>		FIELD ENG: <u>RD</u>	DATE DRILLED: <u>9/3/73</u>	AIRPHOTO NO: <u>A22034-147</u>	CHAINAGE: <u>1532+27</u>	OFFSET:	TEST HOLE <u>SHEET 1 of 2</u>							
CKD: <u>11</u>	TECH: <u>DR-113</u>	RIG: <u>Wipac 400</u>	SURFACE DRAINAGE: <u>POOR</u>	VEGETATION: <u>Scrub</u>	ELEV:	MILE B.C.S NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST %)	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
											CLAY % SILT % SAND % GRAVEL %			
0						CH		F	0					
2						CH		Vx 70%	2					
4						SD	2 1/2'		4					
6						CL	4'		6					
8						CL		Vx 5%	8					
10						CH			10					
12						CH			12					
14						CH			14					
16						CH			16					
18						CH			18					
20						CH			20					
22						CH			22					
24						CH			24					

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>ORA</i>			FIELD ENG: <i>B.D.</i>			DATE DRILLED: <i>11/3/73</i>			AIRPHOTO NO: <i>A22934-147</i>			CHAINAGE: <i>1601+00</i>			OFFSET:			TEST HOLE											
CKD: <i>1/2</i>			TECH: <i>ORA</i>			RIG: <i>TRILING</i>			SURFACE DRAINAGE: <i>GOOD</i>			VEGETATION: <i>See Remarks</i>			ELEV:			MILE <i>612</i> B.C.S. <i>SN</i> NUMBER <i>775</i>											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
0										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
2					CI	CLAY (TILL); SILTY SANDY, MED PLASTIC BROWN, PEBBLES, RUSTY COAL SPECKS CALCAREOUS, SHALE INCLUSIONS BOULDERS	F	Vx 20%	2																				
4					CH	CLAY (SHALE); HIGH PLASTIC BROWN CALCAREOUS.		Vr 2%	4																				
6	1	C	N/R						6																				
8									8																				
10									10																				
12	2	C	N/R						12																				
14									14																				
16	3	C	N/R			GREY		Nbn	16																				
18									18																				
20									20																				
22									22																				
24									24																				

MODERATELY
DENSE
SPRUCE
5-70' HIGH
10" MAX
WILLOWS
" OCCASIONAL
BIRCH

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <u>CT-1</u>		FIELD ENG: <u>BD</u>		DATE DRILLED: <u>11/3/73</u>		AIRPHOTO NO: <u>A22934-147</u>		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2				
<u>CKD</u>		TECH: <u>GA</u>		RIG: <u>FAILING</u>		SURFACE DRAINAGE: <u>GOOD</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE: <u>613</u> B.C.S. <u>SN</u> NUMBER: <u>775</u>				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
26					CH	CLAY (SHALE) GREY HIGH PLASTIC CALCAREOUS	71	Nbn	26							
28									28							
30									30							
32									32							
34									34							
36									36							
38									38							
40									40							
42						END OF HOLE	42'	Water	42							
44									44							
46									46							
48									48							
50									50							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: CRA		FIELD ENG: BD.		DATE DRILLED: 10/3/73		AIRPHOTO NO: A 22934-147		CHAINAGE: 1604+10		OFFSET:		TEST HOLE																	
CKD: 11		TECH: W.B.E.		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
0						OL ORGANIC SILT; CLAYEY, TRACE OF SAND LOW PLASTIC DK BROWN	F	Vx 10%	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
2						SHALE STONE; HARD		Nf	2							MODERATELY DENSE SPRUCE 20-50' HIGH 6" φ MAX WILLOWS OCCASIONAL POPLAR													
4						GRAVEL INCLUSIONS CLEAN			4																				
6						GR. SHALY GRAVEL; SILTY			6																				
8						SILTIER, TRACE OF CLAY			8																				
10						WATER SILTY CLAYEY	UF	No ICE.	10																				
12									12																				
14						LESS GRAVELLY			14																				
16						END OF HOLE			16																				
18									18																				
20									20																				
22									22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>21</i>		FIELD ENG: <i>ED</i>		DATE DRILLED: <i>11/3/73</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE: <i>167+50</i>		OFFSET:		TEST HOLE SHEET 1 OF 2				
CKD: <i>1</i>		TECH: <i>W3-B.F</i>		RIG: <i>HP-1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE	B,C,S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										PLASTIC LIMIT	LIQUID LIMIT	%	%	%	%	
1					SP	SAND; COARSE GRAVELLY	F	12	2							SPARSE SCRUB SPRUCE 5'-20' HIGH 6" MAX SHRUBS WILLOWS
2																
3																
4					SW	FINE GRAVELLY			4							
5																
6					CI	CLAY (TILL)		Vx 15%	6							
7						SILTY, SANDY, GRAVELLY MED PLASTIC BROWN CALCAREOUS		Vs 20%	7							
8									8							
9									9							
10							UF	NO ICE	10							
11									11							
12									12							
13									13							
14						GREY			14							
15									15							
16									16							
17									17							
18					CH	CLAY (SHALE)			18							
19						HIGH PLASTIC GREY			19							
20									20							
21									21							
22									22							
23									23							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: CDT		FIELD ENG: B.D.		DATE DRILLED: 10/3/73		AIRPHOTO NO: A22934-145		CHAINAGE: 16294.05		OFFSET:		TEST HOLE				
CKD: 114		TECH: 12.2F		RIG: M.M. HEWIDG		SURFACE DRAINAGE: POOR		VEGETATION: SET 200000		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
0									0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						612 C 778
										PLASTIC LIMIT 40 60 80 100 100+ LIQUID LIMIT						
2					OH	ORGANIC SILT; MED PLASTIC CLAYEY, MED PLASTIC YELLOW-BROWN CLOR.	2	Nbn	2							MODERATELY DENSE SPRUCE 15-30' HIGH OCCASIONAL BIRCH & WILLOWS
4					GP	GRAVEL; SLIGHTLY SANDY, BOULDERS.	4	Vx < 5%	4							
6					CI	CLAY (TILL)			6							
8					CL	SILTY, SANDY, GENEALLY LOW-MEDIUM PLASTIC, BROWN RUST & COAL SPECKS CHLOROCUS			8							
10					CH	CLAY (SHALE) SILTY HIGH PLASTIC BROWN	10	Vx 10%	10							
12						GREY	13'		12							
14						END OF HOLE	14'		14							
16									16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: BC		DATE DRILLED: 11/1/79		AIRPHOTO NO: A 22934-149		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: H		TECH: EB		RIG: MANHOLE 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	100+	
2					CI	CLAY: SILTY MED. PLASTIC BROWN	14	Nbn	2							DENSE SPRUCE 20' to 30' HIGH 6" to 12" Ø OCCASIONAL POPLAR & BIRCH
4					CI	CLAY (TAL): SILTY SANDY MED. PLASTIC RUSTY COAL SPERS STONE BROWN POCKETS OF SAND	4	Nbn	4							
6								NF	6							
8								Nbn	8							
10						SANDY INCLUSIONS SILT STONE INCLUSIONS	10	NF	10							
12									12							
14					CH	CLAY (SHALE): SILTY HIGH PLASTIC GREY	14		14							
16									16							
18									18							
20						END OF HOLE	20		20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: BL		DATE DRILLED: 2/3/75		AIRPHOTO NO: A22934-149		CHAINAGE:		MACKENZIE HIGHWAY		TEST HOLE				
CKD: 10		TECH: JLV		RIG: MAX HEN 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+							
0						Mass SH CLAY (SHALE)	14	F	0							
2						silty high plastic interbedded with sandstone brown hard		Nbn	2							
4						rust stains	4'		4							
6									6							
8									8							
10									10							
12									12							
14									14							
16						gray	16		16							
18									18							
20						END OF HOLE	20		20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <u>TC</u>			FIELD ENG: <u>BC</u>			DATE DRILLED: <u>2/5/72</u>			AIRPHOTO NO: <u>A 22954-149</u>			CHAINAGE:			OFFSET:			TEST HOLE											
CKD: <u>100</u>			TECH: <u>III</u>			RIG: <u>MAYHEW 100</u>			SURFACE DRAINAGE: <u>POOR</u>			VEGETATION: <u>SEE REMARKS</u>			ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	S.C.S	NUMBER													
										CLAY %	SILT %						SAND %	GRAVEL %											
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
0						OH CLAY: ORGANIC	F	V _x 30%	0																				
2						CI CLAY (TILL): SILTY SANDY RUSTY COAL SPOTS STONES MED PLASTIC POCKETS OF GRAVEL		V _x 10%	2																				
4								V _x 5%	4																				
6									6																				
8	1							V _x 10%	8																				
10						CH No GRAVEL HIGH PLASTIC	8 1/2	V _x 5%	10																				
12								Nbn	12																				
14						CH CLAY (SHALE) HIGH PLASTIC GREY	14		14																				
16									16																				
18									18																				
20						END OF HOLE	20		20																				
22									22																				
24									24																				

DENSE SPRUCE
 10' to 30' HIGH
 7" MAX Ø

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CKA</i>			FIELD ENG: <i>RD</i>			DATE DRILLED: <i>9/3/73</i>			AIRPHOTO NO: <i>A 22934-149</i>			CHAINAGE:			OFFSET:			ELEV:			TEST HOLE								
CKD: <i>2</i>			TECH: <i>RA</i>			RIG: <i>FRILING</i>			SURFACE DRAINAGE: <i>POOR</i>			VEGETATION: <i>SEE REMARKS</i>																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.P.)	DRY DENSITY (P.C.P.)	MILE	B,C,S	NUMBER													
										CLAY %	SILT %						SAND %	GRAVEL %											
0								(EST)	0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
2					CH	ORGANIC CLAY; SILTY HIGH PLASTIC DK BROWN	1/4'	Vs 90%	2																				
4					CI	CLAY (TILL) SILTY-SANDY MED PLASTIC BROWN, PEBBLES CALCAREOUS	4'	Vs 75%	4																				
6									6																				
8									8																				
10								Vx 5%	10																				
12									12																				
14									14																				
16									16																				
18									18																				
20						GREEN SHALE INCLUSIONS	16'		20																				
22									22																				
24						END OF HOLE	20'		24																				

604 B-94 793

REMARKS

DENSE
 SPRUCE
 5-25' HIGH
 4" MAY

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: <u>TL</u>		FIELD ENG: <u>BC</u>		DATE DRILLED: <u>2/3/73</u>		AIRPHOTO NO: <u>A 22934-149</u>		CHAINAGE:		OFFSET:		TEST HOLE				
CNO: <u>22</u>		TECH: <u>IV</u>		RIG: <u>JOHN 1000</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2						PT PEAT: CATEGORY #5		V _x 30%	2							DENSE SAND 5' to 25' HIGH 5' MAX. Ø
4					SL SAND: CLAYEY SILTY BROWN		V _x 5%	4								
6					CH (CLAY (TILL): SILTY SANDY STONES FAST & COAL SPKS HIGH PLASTIC GREY COBBLES		V _L 50%	6								
8						V _S 80%	8									
10						V _S 50%	10									
12						V _S 20%	12									
14						Nbn			14							
16									16							
18									18							
20									20							
22									22							
24						END OF HOLE			24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWNER: <u>TC</u>		FIELD ENG: <u>BC</u>		DATE DRILLED: <u>5/9/84</u>		AIRPHOTO NO: <u>A22934-149</u>		CHAINAGE:		OFFSET:		TEST HOLE				
CNO: <u>11111</u>		TECH: <u>EB & MB</u>		RIS: <u>MACKEN 1000</u>		SURFACE DRAINAGE: <u>GOOD</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0						PT PEAT: CATEGORY #2			0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
2						CI CLAY (TILL): SANDY SILTY STRAIES RUST & COAL SPOTS MED. PLASTIC BROWN		Vs 10%	2							MED. DENS & SPRICE 15' to 25' HIGH 6' MAX & Occasional WILLOW & BIRCH
4								Vs 20%	4							
6								Vs 30%	6							
8								Vs 10%	8							
10						CH HIGH PLASTIC GREY BOULDERS			10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>TC</i>		FIELD ENG: <i>EC</i>		DATE DRILLED: <i>3/5/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: <i>MB</i>		TECH: <i>EBE MB</i>		RIG: <i>MAXIM 1000</i>		SURFACE DRAINAGE: <i>Good</i>		VEGETATION:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						<i>OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN</i>		<i>(EST.) Vs 20%</i>								
2									2							
4									4							
6									6							
8						<i>CI CLAY (TILL): SANDY, SILTY RUSTY COAL SPOTS STONES MED. PLASTIC BROWN</i>		<i>Vs 25%</i>	8							
10								<i>Vs 45%</i>	10							
12								<i>Vx 60%</i>	12							
14								<i>Vs 50%</i>	14							
16								<i>Vx 10%</i>	16							
18								<i>Vx 5%</i>	18							
20						<i>END OF HOLE</i>			20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN:	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:	ELEV:	TEST HOLE									
CID:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:	REMARKS:		MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %	
										20	40	60	80	100	100+	
												%	%	%	%	
0						PT PEAT: CATEGORY #5	F	V _x 40%	0							
2						OH CLAY: ORGANIC HIGH PLASTIC PEAT INCLUSIONS		V _y 20%	2							
4								V _y 30%	4							
6						CI CLAY (TILL) SILTY, SANDY MEDIUM PLASTIC STONES COAL, RUST COBBLES		V _x 5%	6							
8								V _y 1%	8							
10						CH HIGH PLASTIC GREY			10							
12						SHALE INCLUSIONS			12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: T.C.		FIELD ENG: B.C.		DATE DRILLED 3/3/73		AIRPHOTO NO: A22934-149		CHAINAGE		OFFSET								
CKD: ~~TECH E.B. & M.B.~~		RIG: MAYHEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE SHEET #1		ELEV:		TEST HOLE SHEET 2 of 2								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS		
										CLAY %	SILT %	SAND %	GRAVEL %					
						CH CLAY (TILL) CONTINUES	F	Nbr		20 40 60 80 100 100+ PLASTIC LIMIT LIQUID LIMIT								
28									28									
30						END of HOLE			30									
32									32									
34									34									
36									36									
38									38									
40									40									
42									42									
44									44									
46									46									
48									48									
50									50									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TC</i>		FIELD ENG: <i>BL</i>		DATE DRILLED: <i>3/3/75</i>		AIRPHOTO NO: <i>822934-149</i>		CHAINAGE: <i>1255+75</i>		OFFSET:		TEST HOLE				
CND: <i>BL</i>		TECH: <i>SP FMR</i>		RIG: <i>MANUEL 1000</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
BY FEET: CATEGORY <i>23</i> $\frac{1}{4}$ F <i>VR</i> <i>75%</i> <i>CI</i> CLAY (TILL): SILTY SANDY RUST & COAL SPOTS MED. PLASTIC STONES POCKETS OF SAND BROWN <i>Nf</i> <i>Nbn</i> END OF HOLE ¹⁴																
2									2							MED DENSE SPRUCES 15 to 20' HIGH 4" MAX ϕ
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CEA</i>			FIELD ENG: <i>BC</i>			DATE DRILLED: <i>7/2/73</i>			AIRPHOTO NO: <i>A22934-149</i>			CHAINAGE: <i>1269+85</i>			OFFSET:			TEST HOLE											
CKD: <i>1269+85</i>			TECH: <i>T.W.</i>			RIG: <i>1171-E-1000</i>			SURFACE DRAINAGE: <i>POOR</i>			VEGETATION: <i>SEE COMMENTS</i>			ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						<i>PI MOSS:</i> <i>OH CLAY' ORGANIC HIGH PLASTIC</i> <i>CI CLAY (TILL)</i> <i>OL SILTY SANDY MEDIUM PLASTIC</i> <i>COAL DUST</i> <i>Pebbles</i> <i>Organics</i>		○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																					
										20	40	60	80	100	100+														
2								<i>Vr 60%</i>	2							<i>MED DENSE</i> <i>STRUCTURE</i> <i>10-25' HIGH</i> <i>9" Ø MAX</i>													
4								<i>Vr 55%</i>	4																				
6								<i>Vx 30%</i>	6																				
8									8																				
10								<i>Vr 45%</i>	10																				
12								<i>Vr 20%</i>	12																				
14									14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CBI		FIELD ENG: RC		DATE DRILLED: 3/3/73		AIRPHOTO NO: A22934-149		CHAINAGE: 1277+30		OFFSET:		TEST HOLE									
CKD: ~~RC~~		TECH: ~~SW~~		RIG: R/FINE/1000		SURFACE DRAINAGE: POOR		VEGETATION: ~~See Notes~~		ELEV:		MILE B,C,S NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										CLAY %	SILT %	SAND %	GRAVEL %								
						OH CLAY:		Vr 65%													
2						ORGANIC HIGH PLASTIC BLACK			2							Med Dense Sand 5-35 P.C.F. 10" Ø VERT					
4						CI CLAY (TILL)		Vr 40%	4												
6						SILTY, SANDY MEDIUM PLASTIC RUSTY COAL PEBBLES BROWN		Nf	6												
8									8												
10						CH CLAY (SHALE)			10												
12						HIGH PLASTIC BROWN		Nbn	12												
14						GREY			14												
16									16												
18									18												
20									20												
22									22												
24						END OF HOLE			24												

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: HH		FIELD ENG: BC		DATE DRILLED: 3/4/73		AIRPHOTO NO: A22934-149		CHAINAGE: 12.86 + 30		OFFSET:		TEST HOLE				
CKD: ~~HH~~		TECH: JW		RIG: MAYHEW 1003		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (F.T. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
									O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)							
									PLASTIC LIMIT ——— LIQUID LIMIT 40 ——— 60 ——— 80 ——— 100 ——— 100+							
									%							
2						PT PEAT: category #3	F	Vr 60%	2							DENSE SPRUCE 10' TO 30' HIGH 9" MAX ∅
						category #1		Vs 20%								
4						CI CLAY (TILL): silty sandy med plastic pebbles gravelly boulders brown		Vx 10%	4							
								Vr 1%								
6									6							
8								Vr 5%	8							
10								Vr 1%	10							
12									12							
						grey										
14									14							
16						END OF HOLE			16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

MACKENZIE HIGHWAY

FIELD ENG: BC

DATE DRILLED: 3/4/73

AIRPHOTO NO: A 22934-140

CHAINAGE: 1293480

OFFSET:

ELEV:

TEST HOLE

MILE	B,C,S	NUMBER
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

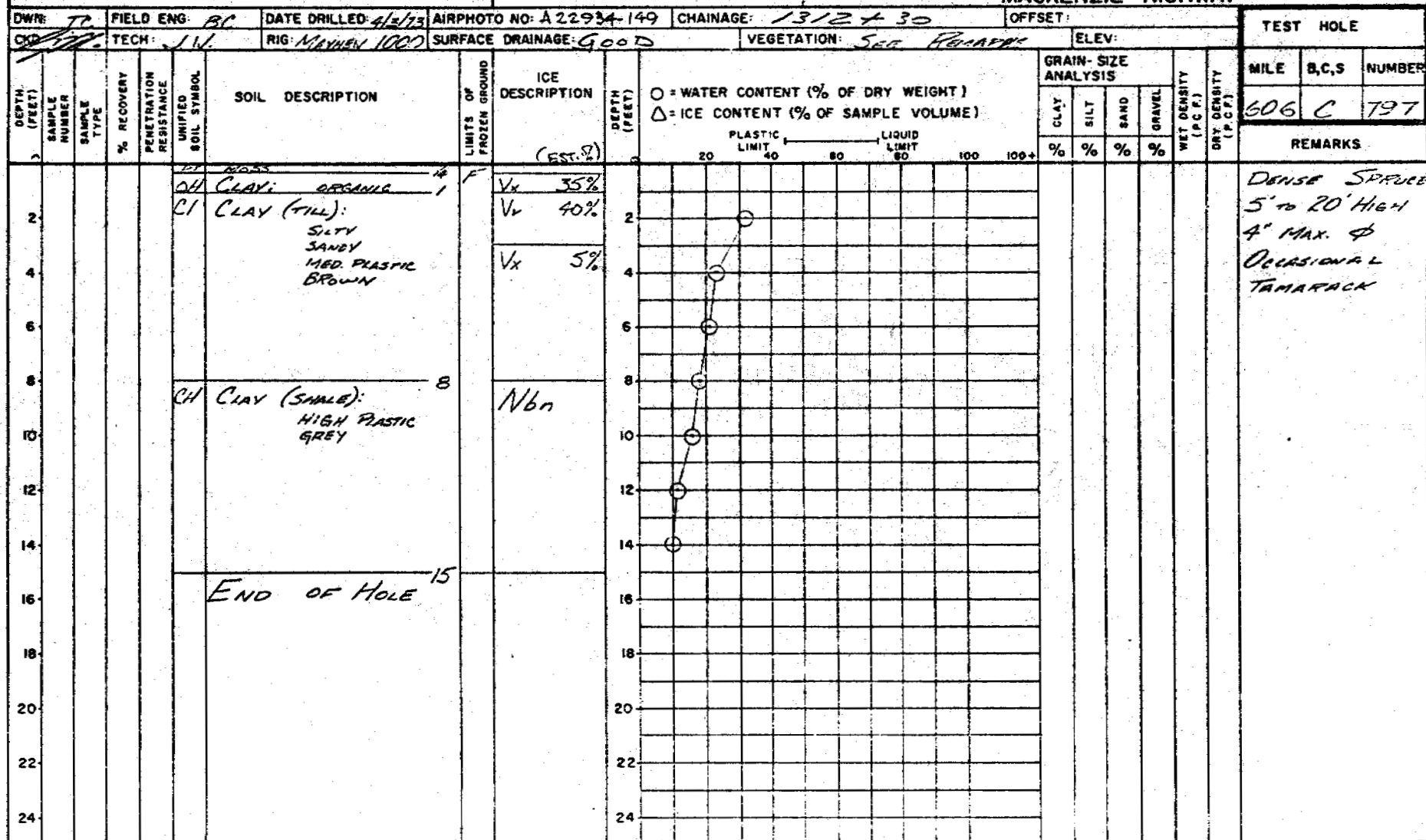
606	C	795*
-----	---	------

REMARKS

MED DENSE
SPRUCE
10' TO 25'
4" MAX Ø
OCCASIONAL
LARCH

[illegible]

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TL</i>		FIELD ENG: <i>BL</i>		DATE DRILLED: <i>4/5/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE: <i>1520+70</i>		OFFSET:						
<i>CS 322</i>		TECH: <i>JN</i>		RIG: <i>MAYHEM 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:						
										TEST HOLE						
										MILE	B,C,S	NUMBER				
										607	C	798				
										REMARKS						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 20 40 60 80 100 100+	CLAY	SILT	SAND	GRAVEL		
										%	%	%	%			
2					<i>OH</i>	<i>CLAY: ORGANIC</i>	<i>1/8</i>	<i>V_x 35%</i>	2	○						
4					<i>CI</i>	<i>CLAY (FILL):</i> <i>SILTY SANDY</i> <i>PUST & COAL SPECKS</i> <i>MED. PLASTIC</i> <i>BROWN</i> <i>STONES</i>		<i>Nbn</i>	4	○						
6									6	○						
8									8	○						
10									10	○						
12					<i>CH</i>	<i>CLAY (SHALE)</i>	<i>12</i>		12	○						
14						<i>HIGH PLASTIC</i> <i>GREY</i>			14	○						
16						<i>END OF HOLE</i>	<i>15</i>		16							
18									18							
20									20							
22									22							
24									24							

MED. DENSE
SPRUE 5" to 35"
HIGH 6" MAX Ø

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>TC</i>		FIELD ENG: <i>B.C.</i>		DATE DRILLED: <i>4/5/73</i>		AIRPHOTO NO: <i>A229E4-143</i>		CHAINAGE: <i>1337+00</i>		OFFSET:		TEST HOLE				
CKD: <i>1/1</i>		TECH: <i>IN</i>		RIG: <i>NAVVIEW 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	100+	
2						CH CLAY: ORGANIC		V _x 35%	2							Dense Spring 10' to 40' High 3" max φ
4						CLAY (TILL) VERY SANDY SILTY RUSTY COAL SPOTS STONES COBBLES MED. PLASTIC BROWN		V _L 60%	4							
6								V _x 10%	6							
8						LESS SANDY		N ₆₀	8							
10								V _x 5%	10							
12						CH CLAY (SHALE) HIGH PLASTIC GREY		N ₆₀	12							
14									14							
16						END OF HOLE			16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <i>TC</i>			FIELD ENG: <i>BC</i>			DATE DRILLED: <i>4/3/75</i>			AIRPHOTO NO: <i>A22934-149</i>			CHAINAGE: <i>1345+27</i>			OFFSET:			ELEV:			TEST HOLE								
CKD: <i>TC</i>			TECH: <i>JK</i>			RIG: <i>MANNING 1000</i>			SURFACE DRAINAGE: <i>FAIR</i>			VEGETATION: <i>SEE REMARKS</i>																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER											
										CLAY %	SILT %	SAND %	GRAVEL %																
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME) PLASTIC LIMIT LIQUID LIMIT 40 60 80 100 100+																			
0								(EST.)	0																				
2						OH CLAY: ORGANIC HIGH PLASTIC DARK BROWN		V _h 70%	2																				
4						C1 CLAY (TILL): SILTY SANDY STONES COBBLES RUSTY COAL SPOTS MED PLASTIC BROWN		V _x 25%	4																				
6								V _x 10%	6																				
8								V _h 2%	8																				
10									10																				
12						CH CLAY (SHALE) HIGH PLASTIC GREY			12																				
14									14																				
16						END OF HOLE			16																				
18									18																				
20									20																				
22									22																				
24									24																				

DENSE SPRUCE
10' to 25' HIGH
5" MAX. Ø

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: <i>TC</i>		FIELD ENG: <i>SL</i>	DATE DRILLED: <i>4/2/73</i>	AIRPHOTO NO: <i>A 22934-149</i>	CHAINAGE: <i>1353+50</i>	OFFSET:	MACKENZIE HIGHWAY		TEST HOLE								
CKD: <i>MC</i>	TECH: <i>JK</i>	RIG: <i>MAXWELL 1000</i>	SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY	SILT	SAND	GRAVEL				
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)							
										PLASTIC LIMIT 20 40 60 80 100 100+							
2						<i>CI CLAY (TILL):</i> <i>SANDY SILTY</i> <i>MED. PLASTIC</i> <i>RUSTY COAL SPKS</i> <i>STONES</i> <i>COBBLES</i> <i>BROWN</i>		<i>V₁ 15%</i> <i>V₁ 25%</i> <i>V_x 15%</i>	2								<i>MED. DENSE</i> <i>SPRINGS 10' to 35'</i> <i>HIGH 7" MAX. Φ</i> <i>OCCASIONAL</i> <i>BIRCH</i>
4									4								
6									6								
8									8								
10						<i>CH CLAY (SHALE)</i> <i>HIGH PLASTIC</i> <i>GREY</i>		<i>Nbn</i>	10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24						<i>END OF HOLE</i>			24								

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY					
DWN: <i>TC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>4/3/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE: <i>1363+07</i>		OFFSET:			
CKD: <i>JK</i>		TECH: <i>JN</i>		RIG: <i>MILWEN 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:			
										TEST HOLE			
										MILE	B,C,S	NUMBER	
										<i>607</i>	<i>C</i>	<i>803</i>	
										REMARKS			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)			
										PLASTIC LIMIT	LIQUID LIMIT		
										20	40	80	100
0						<i>OH CLAY: ORGANIC</i>	<i>1/4</i>	<i>Vx 30%</i>	0				
2						<i>CI (CLAY (TILL))</i>		<i>Vx 5%</i>	2				
4						<i>SILTY SANDY GRAVELLY</i>			4				
6						<i>RUSTY COAL SPOTS</i>			6				
8						<i>MED PLASTIC</i>		<i>Vx 10%</i>	8				
10						<i>LESS GRAVEL</i>			10				
12								<i>Nbn</i>	12				
14									14				
16						<i>SHALE INCLUSIONS</i>			16				
18						<i>GRAY</i>			18				
20									20				
22									22				
24									24				
						<i>END OF HOLE</i>	<i>5</i>						

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
DWN: <i>TC</i>		FIELD ENG: <i>EC</i>		DATE DRILLED: <i>4/3/78</i>		AIRPHOTO NO: <i>A 22943-129</i>		CHAINAGE: <i>1323+30</i>		OFFSET:		TEST HOLE		
CKD: <i>MC</i>		TECH: <i>JN</i>		RIG: <i>MANLEY 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
0						<i>OH CLAY: ORGANIC</i>	<i>1/4</i>	<i>10%</i>	0					<i>Med Dense</i> <i>SPRUE 10'-25'</i> <i>HIGH 5' MAX. Ø</i>
2					<i>CH CLAY (TILL)</i>	<i>1/4</i>	<i>5%</i>	2						
4					<i>SANDY SILTY GRAVELLY</i>			4						
6					<i>RUSTY COAL SPOTS</i>			6						
8					<i>MED. PLASTIC BROWN</i>			8						
10					<i>LESS GRAVEL</i>			10						
12					<i>CH CLAY (SHALE):</i>	<i>1/4</i>	<i>5%</i>	12						
14					<i>HIGH PLASTIC GREY</i>	<i>None</i>		14						
16								16						
18								18						
20								20						
22								22						
24								24						
						<i>END OF HOLE</i>								

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN:	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:			
TZ	BC	8/5/73	R 22934-147	138.3+80				
CND:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:	ELEV:			
MH	JW	MAYHEW 1000	F.A.I.R.	SEA REMAINS				
						TEST HOLE		
						MILE	B,C,S	NUMBER
						608	C	805*
						REMARKS		
						MED. DENSE SPRUCE 20' TO 40' HIGH 10" MAX. φ		

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <i>TC</i>		FIELD ENG: <i>EC</i>		DATE DRILLED: <i>4/5/75</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE: <i>1330+70</i>		OFFSET:		TEST HOLE		MILE		B.C.S		NUMBER											
CKD: <i>TC</i>		TECH: <i>JV</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		REMARKS		MILE		B.C.S		NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST.%)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
						PT PEAT: CATEGORY "5"		Vx 60%		O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
						CI CLAY (TILL): SILTY SANDY STONES MED PLASTIC BROWN		Vx 30%		PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+																			
						CH CLAY (SHALE): HIGH PLASTIC BROWN		Nbn																					
						END OF HOLE																							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: <i>RL</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>4/3/78</i>		AIRPHOTO NO: <i>A 2293A-147</i>		CHAINAGE: <i>1400+70</i>		OFFSET:		TEST HOLE				
CKD: <i>RL</i>		TECH: <i>LV</i>		RIG: <i>MAYHEW 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
						<i>PT MOSS</i>		<i>(see 8)</i>	0							
						<i>OH CLAY: ORGANIC</i>	<i>1/4</i>	<i>V_x 30%</i>	2							<i>DENSE SPHULF</i> <i>10' to 40' HIGH</i> <i>8" MAX. Ø</i> <i>OCCASIONAL</i> <i>BIRCH</i>
						<i>GV GRAVEL: VERY CLEAN BROWN</i>	<i>1</i>	<i>NP</i>	4							
						<i>C1 CLAY (TILL)</i>	<i>3</i>	<i>V_r 20%</i>	6							
						<i>SILTY SANDY GRAVELLY LOBBLES MED. PLASTIC BROWN</i>			8							
									10							
									12							
									14							
									16							
									18							
									20							
									22							
									24							
						<i>LESS GRAVEL SHALE INCLUSIONS GREY</i>	<i>11</i>	<i>V_r < 5%</i>	10							
						<i>END OF HOLE</i>	<i>14</i>		14							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: RC		DATE DRILLED: 4/3/73		AIRPHOTO NO: A 22934-147		CHAINAGE: 1406+50		OFFSET:		MACKENZIE HIGHWAY				
CKD: ~~RA~~		TECH: JV		RIG: MAYHEM 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		TEST HOLE				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
0									0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+						
2						OH CLAY: ORGANIC GP GRAVEL (FILL): SILTY CLAYEY BROWN CLEAN	1/4 F	Vx 35% Vx 15%	2							LOW DENSITY SPRUCE 10' to 25' HIGH 4" MAX Ø
4									4							
6									6							
8									8							
10						OH CLAY (SMALL TILL) STONES COBBLES HIGH PLASTIC GREY	9	Nbn	10							
12									12							
14									14							
16						END OF HOLE	15		16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TL</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>4/3/12</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE: <i>1426+15</i>		OFFSET:		TEST HOLE				
CKD: <i>1426</i>		TECH: <i>JK</i>		RIG: <i>MARSH 1000</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0						OH CLAY: <i>ORGANIC</i>		<i>(EST. 8%)</i>	0							
2						CI CLAY (TILL) <i>SILTY, SANDY MEDIUM PLASTIC POGGIES RUST</i>		<i>Vx 40% Vx 15% Vr 5%</i>	2							<i>Low to MED DENSITY SPRINGS 5' to 20' HIGH 4" MAX. ϕ</i>
4									4							
6						SI SANDIER		<i>Vx 1%</i>	6							
8									8							
10						CH CLAY (SHALE) <i>HIGH PLASTIC GREY</i>			10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24						END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>TC</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>4/5/73</i>		AIRPHOTO NO: <i>A 22934-147</i>		CHAINAGE: <i>1435+03</i>		OFFSET:		TEST HOLE		MILE		B.C.S		NUMBER											
CKD: <i>BC</i>		TECH: <i>EB</i>		RIG: <i>MARLEN 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		REMARKS		MILE		B.C.S		NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
0									0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										20	40	60	80	100	100+														
2						OH CLAY: ORGANIC HIGH PLASTIC	F	Vx 30%	2							MED. DENSE SPRUCE 15' to 25' HIGH, 3' to 8" & OCCASIONAL WILLOWS													
4					CI CLAY (TILL): SANDY, SILTY RUST & COAL SPKS STONES MED. PLASTIC BROWN COBBLES		Vx 15%	4																					
6					LESS SAND		Vr 3%	6																					
8							Vr 1%	8																					
10					SHALE INCLUSIONS		Nbn	10																					
12								12																					
14								14																					
16								16																					
18								18																					
20								20																					
22								22																					
24						END OF HOLE			24																				

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DOWN: TC		FIELD ENG: BC	DATE DRILLED: 4/3/75	AIRPHOTO NO: A 22934-147	CHAINAGE: 1445+10	OFFSET:	WAGKENZIE HIGHWAY		TEST HOLE							
CND: ~~TC~~	TECH: EBE MB	RIG: MARYHEV 1000	SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0						PT PEAT: CATEGORY "A"		(EST.) Vx 20%	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
2					SP	SAND (TILL): SILTY GRAVELLY	1 1/2	NF	2							MED. DENSE SPRUCE 20" to 40" 6" to 10" #
4					CI	CLAY (TILL) SANDY, SILTY RUSTY COAL SPOTS STONES MED PLASTIC BROWN	3	Nbn	4							
6									6							
8									8							
10					CH	CLAY (SHALE) HIGH PLASTIC GREY	9'		10							
12									12							
14						END OF HOLE	14		14							
16									16							
18									18							
20									20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: TC	FIELD ENG: RC	DATE DRILLED: 4/3/73	AIRPHOTO NO: A22934-149	CHAINAGE: 1277+00	OFFSET: 950' RT	TEST HOLE										
CXD: ~~RC~~	TECH: EBE MB	RIG: MARIEN 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SEE REMARKS	ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST.)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	80	100	100+		
2						PT PEAT: CATEGORY #1 C1 CLAY (FILL): SANDY SILTY STONES RUST & COAL SPECKS MED. PLASTIC BROWN		V _w 30.0 V _x 5%	2							SPRUCE 15' to 25' HIGH 4" to 6" φ OCCASIONAL POPLAR
4	1								4							
6									6							
8						SHALE INCLUDING GREY		N6n	8							
10						CH CLAY (SHALE): HIGH PLASTIC GREY			10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT					DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: <u>HH</u>		FIELD ENG: <u>BC</u>		DATE DRILLED: <u>3/2/73</u>		AIRPHOTO NO: <u>D22934-149</u>		CHAINAGE:		OFFSET:		TEST HOLE												
<u>CKD</u>		TECH: <u>JW</u>		RIG: <u>MAYHEW 1000</u>		SURFACE DRAINAGE: <u>GOOD</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:		MILE		B.C.S		NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS										
										CLAY %	SILT %													
0								(EST. 9)	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)														
										20	40	60	80	100	100+									
2					OH	MOSS CLAY: ORGANIC HIGH PLASTIC DARK BROWN	1/4 F	Vx 30%	2															
4					CI	CLAY (MILL) SILTY MED. PLASTIC BROWN PEDDLES COAR, RUSS	2 1/2 F	Vr 5%	4															
6								Vr 2%	6															
8								Vx 5%	8															
10									10															
12								Vr 2%	12															
14					CH	CLAY (SHALE): HIGH PLASTIC GREY	13 F		14															
16								Vr 1%	16															
18									18															
20						END OF HOLE	20'		20															
22									22															
24									24															

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>TL</i>		FIELD ENG: <i>B.C.</i>		DATE DRILLED: <i>5/5/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>TL</i>		TECH: <i>JV</i>		RIG: <i>MANHEIM 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	160+	
2						CI CLAY (TILL) SILTY SANDY MEDIUM PLASTIC PEDDLES RUST, COAL BROWN	14	30%	2							
4								2%	4							
6								5%	6							
8									8							
10						CH CLAY (SHALE) HIGH PLASTIC GREY	10	2%	10							
12									12							
14						END OF HOLE	14		14							
16									16							
18									18							
20									20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: <i>TM</i>		FIELD ENG: <i>BC</i>	DATE DRILLED: <i>4/3/72</i>	AIRPHOTO NO: <i>A22934-149</i>	CHAINAGE: <i>1320+40</i>	OFFSET: <i>1600' RT</i>	TEST HOLE											
CKD: <i>77</i>	TECH: <i>FR.F.M.B.</i>	RIG: <i>MAYHEW 1000</i>	SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	S,C,S	NUMBER
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)								
										0	20	40	60	80	100	100+		
										PLASTIC LIMIT		LIQUID LIMIT						
										CLAY	SILT	SAND	GRAVEL					
										%	%	%	%					
						<i>CLAY (TILL):</i>	<i>14</i>	<i>F</i>	<i>10%</i>									
						<i>SILTY, SANDY</i>												
						<i>RUSTY COAL SPECS</i>												
						<i>STONES</i>												
						<i>MED PLASTIC</i>												
						<i>BROWN</i>												
						<i>GREY BROWN</i>	<i>5</i>		<i>V_x < 5%</i>									
						<i>CH CLAY (SHALE)</i>	<i>8'</i>		<i>N₆₀</i>									
						<i>HIGH PLASTIC</i>												
						<i>GREY</i>												
						<i>END OF HOLE</i>	<i>20</i>											

REMARKS

DENSE SPRUCE

30' HIGH

4" to 10" φ

OCCASIONAL

BIRCH & WILLOW

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DOWN: <i>TL</i>		FIELD ENG: <i>BC</i>	DATE DRILLED: <i>4/3/75</i>	AIRPHOTO NO: <i>A22934-149</i>	CHAINAGE:	OFFSET:	ELEV:		TEST HOLE							
CKD: <i>201</i>		TECH: <i>EREMB</i>	RIG: <i>MAYHEM 1000</i>	SURFACE DRAINAGE: <i>GOOD</i>	VEGETATION: <i>SEE REMARKS</i>					MILE	B,C,S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 40 60 80 100 100+						
										%	%	%	%			
0									0							
2						<i>CI CLAY (TILL):</i> <i>SILTY SANDY</i> <i>RUSTY COAL SPECS</i> <i>STONES</i> <i>MED. PLASTIC</i> <i>BROWN</i>		<i>V_x < 5%</i>	2							
4								<i>N6n</i>	4							
6						<i>GREY BROWN</i>			6							
8						<i>LESS SAND</i>			8							
10									10							
12									12							
14									14							
16						<i>CH CLAY (SHALE):</i> <i>HIGH PLASTIC</i> <i>GRY</i>			16							
18									18							
20						<i>END OF HOLE</i>			20							
22									22							
24									24							

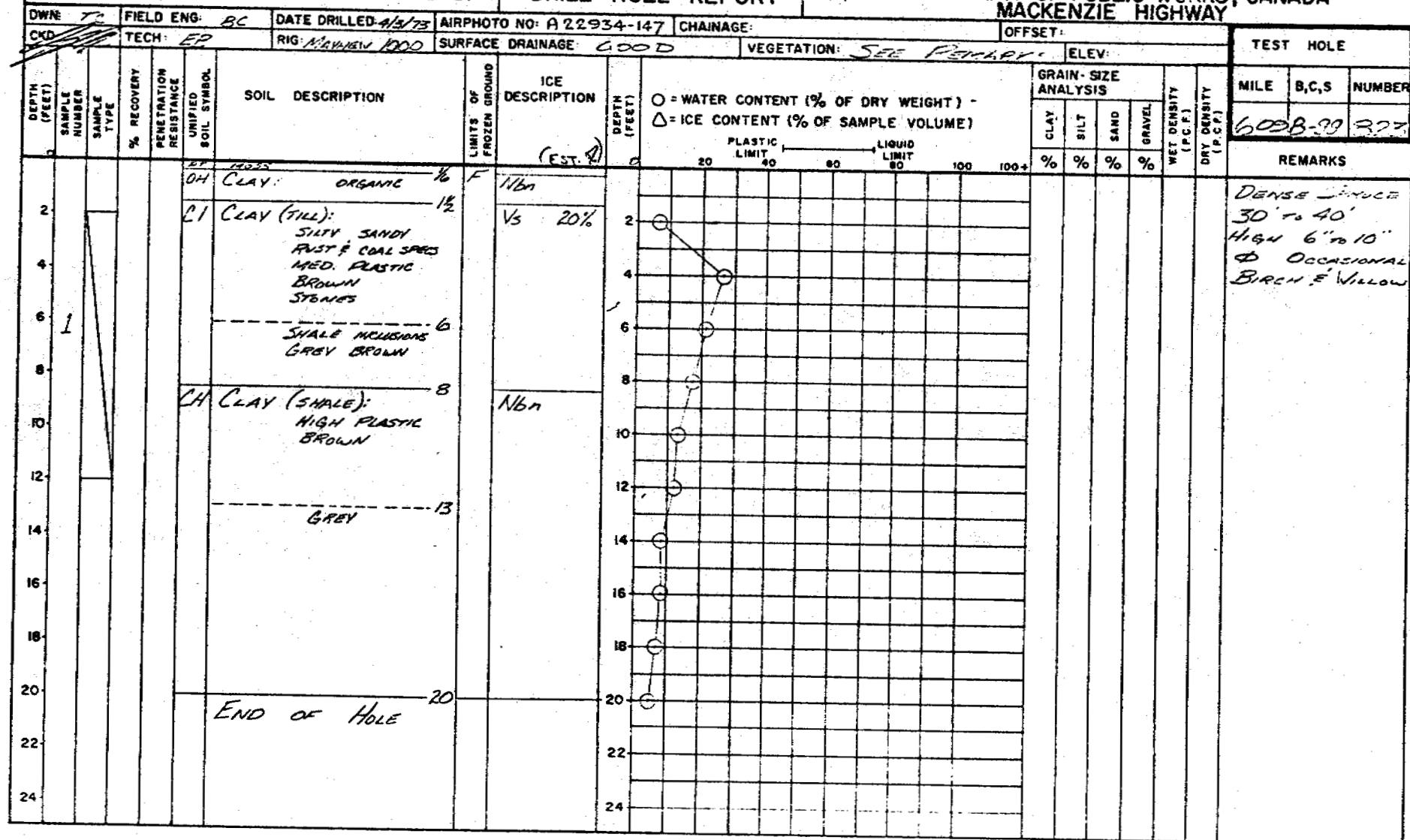
R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
OWN: <i>TE</i>		FIELD ENG: <i>BC</i>		DATE DRILLED: <i>4/2/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>TE</i>		TECH: <i>EBE MB</i>		RIG: <i>MAHON 1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 40 ——— 60 ——— 80 ——— 100 ——— 100+						
0								<i>(EST.)</i>	0							<i>DENSE SPRUCE 15' to 20' HIGH 2" to 8" Φ</i>
2					<i>OH</i>	CLAY: ORGANIC HIGH PLASTIC	<i>14</i>	<i>Vx</i> 10%	2							
4					<i>CI</i>	CLAY (TILL): SANDY, SILTY RUST & COAL SPECS STONES MED. PLASTIC BROWN	<i>2</i>	<i>Nbn</i>	4							
6								<i>Vx</i> 5%	6							
8								<i>Nbn</i>	8							
10								<i>Vx</i> < 5%	10							
12					<i>CH</i>	CLAY (SHALE): HIGH PLASTIC GREY	<i>11</i>		12							
14								<i>Nbn</i>	14							
16									16							
18									18							
20									20							
22									22							
24									24							
						END OF HOLE	<i>17</i>									

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

[illegible]

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: B	DATE DRILLED: 4/3/72	AIRPHOTO NO: A 22934-147	CHAINAGE:	OFFSET:	MACKENZIE HIGHWAY										
CKD: ~~1000~~	TECH: ED E.M.R.	RIG: HAVEN 1000	SURFACE DRAINAGE: FAIR	VEGETATION: S.E. PINE	ELEV:	TEST HOLE											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER		
										CLAY		SILT	SAND	GRAVEL			
										%	%	%	%				
0						CI CLAY (TILL):		ICE 80% Vx 40%	0								
2						SANDY SILTY STONES			2								
4						RUSTY COAL SPERS			4								
6						MED. PLASTIC BROWN		Vx 10-6	6								
8								Nbn	8								
10									10								
12									12								
14									14								
16						CH CLAY (SHALE):			16								
18						HIGH PLASTIC LIGHT GREY			18								
20						END OF HOLE			20								
22									22								
24									24								

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: <i>CMA</i>		FIELD ENG: <i>ED</i>		DATE DRILLED: <i>7/3/75</i>		AIRPHOTO NO: <i>R 22934-148</i>		CHAINAGE:		OFFSET:		TEST HOLE													
CKD: <i>1</i>		TECH: <i>CON</i>		RIG: <i>FLING</i>		SURFACE DRAINAGE: <i>FAIR</i>		VEGETATION: <i>See Remarks</i>		ELEV:		MILE B.C.S. NUMBER													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)				GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										PLASTIC LIMIT 40 LIQUID LIMIT 80 100 100+ 20 40 60 80 100 100+				CLAY	SILT	SAND	GRAVEL				%	%	%	%	
0						CLAY (TILL); SILEX, SAND, MED PLASTIC, BROWN PEBBLES, RUST STAINS CALCAREOUS	F	15%	0																
2									2																
4									4																
6						SILT STONE; HORIZONTAL STRATIFICATION, FIGURED, RUSTED BROWN COLOR			6																
8									8																
10									10																
12									12																
14						SHALE BEDDINGS.			14																
16						GREY			16																
18									18																
20									20																
22									22																
24						END OF HOLE			24																

MODERATELY
DENSE
SPRUCE & BIRCH
5-60' HIGH
12" MAX

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
DWN: CRA		FIELD ENG: ED		DATE DRILLED: 9/3/73		AIRPHOTO NO: A22934-149		CHAINAGE:		OFFSET:		TEST HOLE		
CKD: C		TECH: CRA		RIG: FILING		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %			
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)				
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+				
2					CI	CLAY (SHALE); WEATHERED MED PLASTIC RUSTED CALCAREOUS, BROWN	F	Vr 2%	2					SPRUCE & BIRCH 5-60' HIGH 8" φ MAX
4					CI	CLAY (SHALE) BROWN SAND STRIPE INCLUSIONS		Nbn	4					
6									6					
8									8					
10									10					
12	(1) C	N/R							12					
14						END OF HOLE			14					
16									16					
18									18					
20									20					
22									22					
24									24					

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: TC		FIELD ENG: BL		DATE DRILLED: 4/3/73		AIRPHOTO NO: 222934-147		CHAINAGE: 1433+21		OFFSET:		TEST HOLE				
CND: ~~TC~~		TECH: F.R.E.M.B.		RIG: MAYHEW 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S. NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
						OH CLAY: ORGANIC 1/2		(EST.) Vx 5%								
2						CI CLAY (TILL) VERY SANDY SATY STONES RUSTY COAL SPKS MED. PLASTIC BROWN		NF	2							DENSE SANDS 20' to 30' HIGH 5" to 10" Ø
4								Vx 10%	4							
6								Vx 5%	6							
8						CH CLAY (SHALE): 6		Vs 15%	8							
10								Nbn	10							
12									12							
14									14							
16						END OF HOLE 14			16							
18									18							
20									20							
22									22							
24									24							

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY																															
DWN: <u>TE</u>		FIELD ENG: <u>RC</u>		DATE DRILLED: <u>4/3/73</u>		AIRPHOTO NO: <u>A22934-147</u>		CHAINAGE: <u>1508+73</u>		OFFSET:																					
CKD: <u>1111</u>		TECH: <u>EVA MB</u>		RIG: <u>MANHEIM 100</u>		SURFACE DRAINAGE: <u>POOR</u>		VEGETATION: <u>SEE REMARKS</u>		ELEV:																					
DEPTH (FEET)		SAMPLE NUMBER		SAMPLE TYPE		% RECOVERY		PENETRATION RESISTANCE		UNIFIED SOIL SYMBOL		SOIL DESCRIPTION		LIMITS OF FROZEN GROUND		ICE DESCRIPTION		DEPTH (FEET)		O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)		DRY DENSITY (P.C.F.)		TEST HOLE	

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: TC		FIELD ENG: RC		DATE DRILLED: 4/5/73		AIRPHOTO NO: A22934-147		CHAINAGE: 15124+00		OFFSET:		TEST HOLE				
CXD: ~~TC~~		TECH: ER & MB		RIG: MACKENZIE 1000		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B,C,S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
0						CLAY: ORGANIC 1/2	F	Vx 20%	0							
2						CLAY (TILL):		Vx 5%	2							
4						SANDY SILTY		Nbn	4							
6						STONES			6							
8						RUST & COAL SPOTS			8							
10						MED. PLASTIC			10							
12						BROWN			12							
14						CH HIGH PLASTIC			14							
16						GREY SHALE INCLUSIONS			16							
18						CH CLAY (SHALE):			18							
20						HIGH PLASTIC			20							
22						GREY			22							
24						END OF HOLE			24							

DENSE SPRUCE
30' to 40'
HIGH. 6" to 12" Ø
COLLISIONAL
BIRCH

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

REMARKS

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWE: 061		FIELD ENG: 82		DATE DRILLED: 9/3/73		AIRPHOTO NO: A22934-149		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: 12		TECH: 06		RIG: TRILING		SURFACE DRAINAGE: POOR		VEGETATION: SEA BENTHOS						MILE	B,C,S	NUMBER
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
0					OH	ORGANIC CLAY; SILTY, HIGH PLASTIC DK BROWN	14'	Vs 40% (EST. 2)	0							
2									2							
4					CI	CLAY (TILL) SILTY, SANDY, GRAVELLY MED PLASTIC BROWN, PEBBLES, RUST SPOTS	4'	Vr 80% Vx 10%	4							
6									6							
8									8							
10									10							
12					CH	CLAY (SHALE); HIGH PLASTIC GREY	12'	Vx 2%	12							
14									14							
16									16							
18									18							
20						END OF HOLE	20'		20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CD</i>			FIELD ENG: <i>BD</i>			DATE DRILLED: <i>9/3/73</i>			AIRPHOTO NO: <i>A 22934-149</i>			CHAINAGE:			OFFSET:			ELEV:			TEST HOLE								
CKD: <i>R</i>			TECH: <i>CD</i>			RIG: <i>FALLING</i>			SURFACE DRAINAGE: <i>POOR</i>			VEGETATION: <i>SEE REMARKS</i>																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS															
										CLAY %	SILT %																		
0									0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT	LIQUID LIMIT																		
										20	40	60	80	100															
2					OH	ORGANIC CLAY; SILTY HIGH PLASTIC DK BROWN	1/4'	VS 45%	2																				
4					CI	CLAY (TILL) SILTY, SANDY, MED PLASTIC BROWN PEBBLES, CALCAREOUS RUST SPECKS	4'	VS 30% VX 5%	4																				
6									6																				
8									8																				
10									10																				
12					CH	CLAY (SHALE) HIGH PLASTIC GRAY RUST STAINS	11'	Nbn	12																				
14									14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: CPA		FIELD ENG: B.D.		DATE DRILLED: 9/3/73		AIRPHOTO NO: A 22934-149		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: B		TECH: CEA		RIG: TAILING		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS						MILE	B,C,S	NUMBER
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
										CLAY %	SILT %					
0					CH	ORGANIC CLAY; SILTY HIGH PLASTIC DK BROWN		Vs 30%	0							
2					CH	CLAY; SILTY, SANDY MED TO HIGH PLASTIC BROWN		Vr 30%	2							
4	(1)	T	75					Vr 15%	4							
6	(1)				CI	CLAY(TILL); SILTY, SANDY, MED PLASTIC BROWN, PEBBLES CALCAREOUS RUST STAINS SILTSTONE INCLUSIONS		Vr 5%	6							
8	(1)								8							
10									10							
12	(1)	C	45			GREY			12							
14	(1)					SHALESTONE INCLUSIONS			14							
16									16							
18									18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWN: <i>CL</i>		FIELD ENG: <i>B.D</i>		DATE DRILLED: <i>10/3/78</i>		AIRPHOTO NO: <i>A22934-149</i>		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: <i>U</i>		TECH: <i>CA</i>		RIG: <i>TRILING</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>		ELEV:		MILE B,C,S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST. %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										20	40	60	80	100	100+	
0					OH	ORGANIC CLAY; SILTY, HIGH PLASTIC DK BROWN	1/4"	Vs 40%	0							
2					CI	CLAY (TILL); SILTY, SANDY, MED PLASTIC, BROWN PEBBLES, CALCAREOUS	2 1/2"	Vx 5%	2							
4					CH	CLAY (SHALE); HIGH PLASTIC BROWN SILT STONE & SHALE STONE	6'	Ndn	4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20						END OF HOLE	20'		20							
22									22							
24									24							

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: TC		FIELD ENG: BC	DATE DRILLED: 6/3/73	AIRPHOTO NO: A 22934-153	CHAINAGE:	OFFSET:	TEST HOLE									
CND: ~~BC~~	TECH: CA EMB	RIG: FALLING 1000	SURFACE DRAINAGE: GOOD		VEGETATION: SEE REMARKS	ELEV:	MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0								(EST. %)	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT LIQUID LIMIT 40 80 100 100+						
2								V _x 40%	2							SPURGE & PEAR 5' to 30' HIGH 5" MAX Ø
4									4							
6									6							
8								V _x 10%	8							
10						GREY		V _x 3%	10							
12	1	C	100			BEDROCK: (LIMESTONE) WEATHERED GREY FRACTURED		ND	12							
14						END OF HOLE			14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CPA</i>		FIELD ENG: <i>BD</i>		DATE DRILLED: <i>10/3/73</i>		AIRPHOTO NO: <i>A 22934-149</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE			
CKD: <i>CP</i>		TECH: <i>CPA</i>		RIG: <i>ENILING</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>See RUNNERS</i>									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B.C.S	NUMBER	
										CLAY %	SILT %						SAND %
0						OH <i>ORGANIC CLAY;</i> <i>SILTY HIGH PLASTIC</i> <i>DK BROWN</i>		<i>(EST. 2)</i> Vs 45%	0								
2									2								
4						CI <i>CLAY (TILL);</i> <i>SILTY, SANDY, MED</i> <i>PLASTIC, BROWN, PEBBLES</i> <i>CALCAREOUS</i>		Vr 15%	4								
6	(1)	T	N/R			<i>BOULDERS</i> — 7'		Vr 5%	6								
8									8								
10									10								
12	(1)								12								
14									14								
16						CH <i>CLAY (SHALE);</i> <i>HIGH PLASTIC</i> <i>FISSURED</i> <i>GRAY, HARD.</i>		Ndn	16								
18									18								
20						END OF HOLE			20								
22									22								
24									24								

SPRUCE
5-35' HIGH
4" Ø MAX
OCCASIONAL
BIRCH

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>CH</i>		FIELD ENG: <i>SD</i>		DATE DRILLED: <i>10/5/73</i>		AIRPHOTO NO: <i>A 22934-147</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE		
CKD: <i>M</i>		TECH: <i>CI</i>		RIG: <i>TRILING</i>		SURFACE DRAINAGE: <i>POOR</i>		VEGETATION: <i>SEE REMARKS</i>								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
0								(EST. 9)	0	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+						
2						CH <i>ORGANIC CLAY, MED. PLASTIC</i>		<i>VS 40%</i>	2							MODERATELY DENSE SPRUCE 5-25' HIGH 3" MAX
4						CI <i>CLAY (TILL);</i>		<i>Vr 25%</i>	4							
6						<i>SHADY, SILTY,</i>			6							
8						<i>MED. PLASTIC</i>			8							
10						<i>BROWN, PEBBLES</i>			10							
12						<i>CALCAREOUS</i>			12							
14						CH <i>CLAY (SHALE)</i>		<i>Vr 5%</i>	14							
16						<i>SILTY, HIGH PLASTIC</i>		<i>ntbn</i>	16							
18						<i>GREY</i>		<i>Vr 5%</i>	18							
20						END OF HOLE			20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DWN: <i>CH</i>		FIELD ENG: <i>ED</i>		DATE DRILLED: <i>10/3/73</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE:		OFFSET:		ELEV:		TEST HOLE					
CKD: <i>CH</i>		TECH: <i>CH</i>		RIG: <i>TAILING</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE REMARKS</i>											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER	
										CLAY %	SILT %	SAND %	GRAVEL %						
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)									
										20	40	80	100	100+					
0																			
2					CI	CLAY (TILL) SANDY SILTY MED PLASTIC, BROWN, FINEST SANDS, PEBBLES TO BOULDERS, CARCAREOUS, BOULDERS		Vx 30%	2										
4						BOULDERS			4										
6						BOULDERS		Vx 5%	6										
8									8										
10						SILTIER			10										
12									12										
14									14										
16					CH	CLAY (SHALE); HIGH PLASTIC GREY		16N	16										
18									18										
20						END OF HOLE			20										
22									22										
24									24										

DENSE
 SPRUCE
 5-40' HIGH
 6" MAX
 OCCASIONAL
 BIRCH

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CA		FIELD ENG: EJD		DATE DRILLED: 11/3/73		AIRPHOTO NO: A22934-147		CHAINAGE:		OFFSET:		TEST HOLE					
CKD: 66		TECH: CA		RIG: FAILING		SURFACE DRAINAGE: POOR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										CLAY	SILT	SAND	GRAVEL				
										○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)							
										PLASTIC LIMIT ——— LIQUID LIMIT 20 40 60 80 100 100+							
2						ON ORG. CLAY, DR. BRN 1/4" HIGH PLASTIC, SILTY 1'	F	Vs 50%	2							MODERATELY DENSE SPRUCE 5'-40' HIGH 5" d MAX	
4					CL CLAY (Till) - SILTY SANDY LOW PLASTIC BROWN PEBBLES & ROCKS CALCAREOUS		Vr 30%	4									
6							Nf		6								
8							Vr 20%		8								
10					CH CLAY (SHALE) FISSURED 8' BROWN - HIGH PLASTIC CALCAREOUS ----- 10' GREY		Vs 5%		10								
12									12								
14									14								
16									16								
18									18								
20						END OF HOLE 20'			20								
22									22								
24									24								

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT					DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: CEA		FIELD ENG: B.D.		DATE DRILLED: 10/3/73		AIRPHOTO NO: A22934-147		CHAINAGE:		OFFSET:		TEST HOLE												
CKD: /		TECH: CEA		RIG: FAILING		SURFACE DRAINAGE: FAIR		VEGETATION: SEE REMARKS		ELEV:		MILE B.C.S NUMBER												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS										
										CLAY %	SILT %													
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)														
										PLASTIC LIMIT	LIQUID LIMIT													
										20	40	60	80	100										
2						CLAY (TILL) SILTY, SANDY MED PLASTIC BROWN, PEBBLES CALCAREOUS SHALE INCLUSIONS	1/4'	Vx 40%	2															
4									4															
6	(1)	T	100						6															
8									8															
10						CLAY (SHALE) BROWN, HIGH PLASTIC	9'	Vr 30%	10															
12									12															
14						GREY	14'	Vr 10%	14															
16									16															
18									18															
20						END OF HOLE	20'		20															
22									22															
24									24															

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: <i>CLH</i>		FIELD ENG: <i>P.D.</i>		DATE DRILLED: <i>9/5/73</i>		AIRPHOTO NO: <i>A22934-147</i>		CHAINAGE:		OFFSET:								
CKD: <i>1</i>		TECH: <i>DRM-3</i>		RIG: <i>PHYHEW/1000</i>		SURFACE DRAINAGE: <i>GOOD</i>		VEGETATION: <i>SEE RUNNERS</i>		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	TEST HOLE		
										CLAY %	SILT %	SAND %	GRAVEL %			MILE	B,C,S	NUMBER
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)								
										20	40	60	80	100	100+			
2						CLAY (TILL); SILTY, SANDY MED PLASTIC BROWN, CALcareous PEBBLES COBBLES = PEBBLES PEBBLY		Vx 25% NDA	2									
4									4									
6									6									
8									8									
10									10									
12									12									
14						CLAY (SHALE); HIGH PLASTIC, LIGHT BROWN			14									
16									16									
18						GREY			18									
20						END OF HOLE			20									
22									22									
24									24									

SPARSE
SCRUB.
SPRUCE
10-15' HIGH
4" φ

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CRA			FIELD ENG: B.D.			DATE DRILLED: 10/3/73			AIRPHOTO NO: A22934-147			CHAINAGE:			OFFSET:			TEST HOLE											
CKD: 46			TECH: CRA			RIG: FAIRING			SURFACE DRAINAGE: FAIR			VEGETATION: SEE RUNNERS			ELEV:			MILE B,C,S NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS													
										CLAY %	SILT %	SAND %	GRAVEL %																
0								(EST. %)	0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
										PLASTIC LIMIT LIQUID LIMIT 20 40 60 80 100 100+																			
2					CI	CLAY (TILL) SILTY, SANDY MED PLASTIC, BROWN. PEBBLES, RUST + COAL SPALLS, CHALKY	1/4	Vx 20%	2																				
4	(1)				CH	CLAY (SHALE) BROWN, HIGH PLASTIC FISSED SILT & FINE SANDSTONE PARTINGS.	4 1/2	Vr 5%	4																				
6	(1)	T	100						6																				
8									8																				
10									10																				
12									12																				
14									14																				
16									16																				
18									18																				
20									20																				
22									22																				
24									24																				

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OFFSET:

ELEV:

TEST HOLE

MILE	B,C,S	NUMBER
------	-------	--------

6103-100	844
----------	-----

REMARKS

MED. DENSE
SPRUCE
15'-20' HIGH
5" Ø MAX

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

FIELD DATA										TEST HOLE									
DWN: C&D		FIELD ENG: R.D.		DATE DRILLED: 9/5/73		AIRPHOTO NO: A22934-147		CHAINAGE:		OFFSET:		ELEV:		MILE		B,C,S		NUMBER	
CKD: R		TECH: DP & M.B.		RIG: MAYNEW 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE RUNNERS						610		B-100		845	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS			
										CLAY	SILT	SAND	GRAVEL						
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)									
										PLASTIC LIMIT — LIQUID LIMIT 20 40 60 80 100 100+									
0									0										
2					CH	ORGANIC CLAY, SILTY, MED PLASTIC, BLACK	14	10%	2										
4					CI	CLAY (TILL) MED TO HIGH PLASTIC BROWN SILTY SHALE INCLUSIONS	2		4										
6									6										
8									8										
10						SILTSTONE PIECES			10										
12									12										
14					CH	CLAY (SHALE) MED TO HIGH PLASTIC GREY INTERBEDDED WITH SILTSTONE	14	Ndn	14										
16									16										
18									18										
20						END OF HOLE	20	13 2%	20										
22									22										
24									24										

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OFFSET

ELEV:

TEST HOLE

MILE	B,C,S	NUMBER
611	B101	846

REMARKS

MODERATELY
DENSE
SPRUCE
10-15' HIGH
4" MAX

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: <i>CD</i>			FIELD ENG: <i>B.D.</i>			DATE DRILLED: <i>10/3/73</i>			AIRPHOTO NO: <i>A22934-147</i>			CHAINAGE:			OFFSET:			ELEV:			TEST HOLE								
CKD: <i>B</i>			TECH: <i>CD</i>			RIG: <i>FAILING</i>			SURFACE DRAINAGE: <i>GOOD</i>			VEGETATION: <i>SEE REMARKS</i>																	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST %)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS												
										CLAY %	SILT %	SAND %	GRAVEL %																
0									0	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																			
									20	PLASTIC LIMIT 40 LIQUID LIMIT 80																			
2					CI	CLAY (TILL-LIKE) SILT, SANDY MED PLASTIC, BROWN PEBBLES, RUST & COAL STOCKS, CALCAREOUS	F	V _x 45%	2																				
4					CI	CLAY SILT, TRACE OF SAND MED PLASTIC, BROWN SILT-SAND PARTING.		V _s 70% V _r 20%	4																				
6	(1)	T			CH	CLAY (SHALE) SILT, HIGH PLASTIC, BROWN RUST STAINING. — 9'			6																				
8	(1)								8																				
10								ndn	10																				
12									12																				
14									14																				
16									16																				
18									18																				
20									20																				
22						END OF HOLE			22																				
24									24																				

R.M. HARDY AND ASSOCIATES LTD.										DRILL HOLE REPORT										DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: CDA			FIELD ENG: BD			DATE DRILLED: 9/3/73			AIRPHOTO NO: A22934-147			CHAINAGE:			OFFSET:			VEGETATION: SEE REMARKS			ELEV:			TEST HOLE					
CKD: ~~100~~			TECH: DR-M.B.			RIG: PLAYHEW 1000			SURFACE DRAINAGE: F.N.R.																				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT)		ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER							
										○	△	PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %												
0									0																				
2					CH	ORGANIC CLAY, SILTY MED PLASTIC, BLACK	1/4'	Vs 30%	2																				
4					CI	CLAY (TILL)	1 1/2'	Vs 20%	4																				
6						SILTY, SANDY MED PLASTIC BROWN, PEBBLES CALCAREOUS			6																				
8									8																				
10					CH	CLAY (SHALE)	10'	Nbn	10																				
12						BROWN, HIGH PLASTIC FISSURED			12																				
14									14																				
16									16																				
18						GREY	18'		18																				
20						LAMINATED	20'		20																				
22						END OF HOLE			22																				
24									24																				

SCRUB
SPRUCE
15-20' HIGH
3" φ MAX

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT		DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: 014		FIELD ENG: ED		DATE DRILLED: 9/3/73		AIRPHOTO NO: 222934-147		CHAINAGE:		OFFSET:		TEST HOLE				
CKD: H		TECH: DEAN B		RIG: 11-6125W 1650		SURFACE DRAINAGE: POOR		VEGETATION: See Remarks		ELEV:		MILE B.C.S NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY %	SILT %	SAND %	GRAVEL %			
										O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)						
										PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 80 100 100+						
0									0							
2						MOSS PEAT #4 BLACK-BROWN		1/2 20%	2							SPARSE SCRUB 16-15' HIGH 3" MAX
4						CI CLAY (TILL); SILTY, SANDY, BROWN MED. PLASTIC, CALCAREOUS PEBBLES, SHALE INCLUSIONS		1HBN	4							
6						SANDIER			6							
8									8							
10									10							
12									12							
14						MORE SHALE INCLUSIONS			14							
16									16							
18						CH CLAY (SHALE) GREY HIGH PLASTIC, LAM. NOTED GREYER			18							
20						END OF HOLE			20							
22									22							
24									24							