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Geothermal Service of Canada

Service géothermique du Canada

GEOTHERMAL GRADIENTS IN GRANITE BATHOLITHS OF NEW BRUNSWICK

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Abstract

Data pertinent to the assessment of the geothermal energy resources of the Atlantic Provinces have been compiled and collected. Warm water in sedimentary basins and hot dry rock within Palaeozoic intrusives are considered as potential geothermal resources and, therefore, constituted the principal study areas.

The study has delineated areas with perhaps some low-grade geothermal energy potential or, at least, some areas which require further consideration. Continuing investigations are recommended so that the potential of these areas may be fully evaluated.

Résumé

L'auteur a reassemblé et groupé des données pertinentes pour l'évaluation des ressources en énergie géothermique. L'eau chaude des bassins sédimentaires et la roche sèche chaude des intrusions du Paléozoique sont considérées comme des ressources possibles en énergie géothermique et, de ce fait, elles ont été les principaux d'objets d'étude.

L'étude a permis de délimiter des régions qui ont peut-être un potentiel en énergie géothermique basse température ou, du moins, certaines zones qui exigent un examen plus poussé. L'auteur recommende de poursuivre les travaux, de manière à évaluer pleinement le potentiel énergétique de ces régions.

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INTRODUCTION

A 768.3-metre diamond drill project was undertaken in December 1982 to obtain temperature and rock property data from the St. George and Pokiok granite batholiths in New Brunswick. The project was a continuation of the assessment of the low-grade geothermal potential of the Atlantic Provinces initiated in 1981. The drill hole to investigate the St. George batholith is located near the community of Welsford; the one to investigate the Pokiok batholith is located near the town of McAdam (Figure 1).

The project was undertaken for the Division of Gravity, Geothermics and Geodynamics, Earth Physics Branch, Energy, Mines and Resources Canada. Scientific direction was provided by Dr. M. J. Drury, Division of Gravity, Geothermics and Geodynamics. Contract management was provided by Mr. E. K. Fresque, P. Eng., Supply and Services Canada. Field management was performed by John A. Leslie & Associated Limited, geologists, Bedford, Nova Scotia, under contract number OSQ82-00134. Diamond

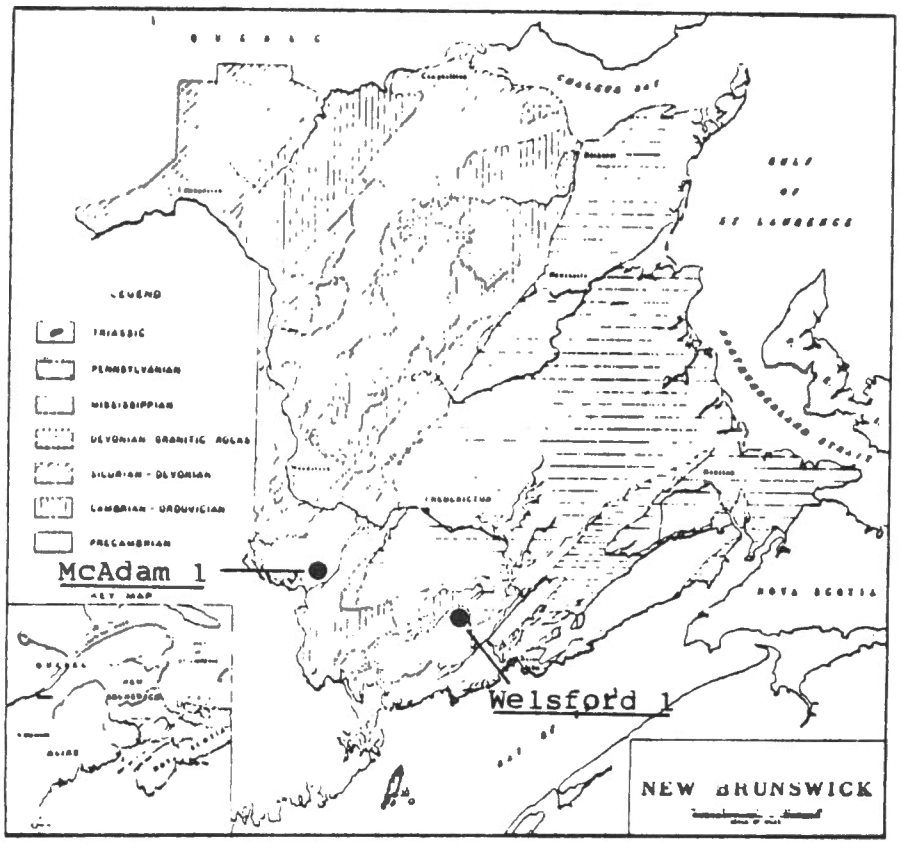


Figure 1
Drill Hole Locations

drilling services were provided by Hop-Mun Drilling Incorporated, Salisbury, New Brunswick, under contract number OGR82-00444.

Although both sedimentary basins and hot-dry rock environments were considered in earlier studies, this project involved only the latter. Hot-dry rocks within Paleozoic intrusives are the targets. They are young crystalline rocks such as granite. Higher than normal thermal gradients within these rocks may result from thermal anomalies caused by above background quantities of the radiogenic elements uranium, thorium and potassium. As the necessary reservoirs are generally lacking in crystalline rock, they may be created by hydrofracturing. The water to be heated is then introduced into the system. Experiments in this technique are being undertaken by the Los Alamos Scientific Laboratory, New Mexico, while field investigations are being undertaken in the Cornwall district, England.

ACKNOWLEDGEMENTS

The cooperation and assistance provided by personnel of Georgia-Pacific Corporation and the New Brunswick

departments of Natural Resources and Transport are gratefully acknowledged.

GEOLOGY OF INVESTIGATION SITES

The St. George and Pokiok batholiths intrude sedimentary and volcanic rocks of the Fredericton Trough. Each are comprised of a number of intrusive phases. The particular phases involved in this investigation were the Mount Douglas granite (McCutcheon, 1981) of the St. George complex and the Hawkshaw granite (McCutcheon et al, 1981) of the Pokiok complex.

The Mount Douglas intrusive, at the investigation site, may be described as a pink, megacrystic, equigranular granite. It is comprised of approximately 35 per cent quartz, 30 per cent pink potassic feldspar, 25 per cent plagioclase feldspar and 10 per cent biotite with accessory zircon and apatite. Alteration is evident throughout the drilled section with over 70 per cent of the section judged highly altered. The products of this alteration include sericitized potassic feldspar, kaolinized plagioclase feldspar and chloritized biotite.

A Rb/Sr total-rock age for this intrusive of 348 $\pm$ 8 Ma places it near the Devonian-Carboniferous boundary (L. R. Fyffe, pers. comm., 1983).

The portion of the Hawkshaw intrusive investigated is a grey, medium grained granite. It contains approximately 35 per cent quartz, 35 per cent potassic feldspar, 15 per cent plagioclase feldspar and 15 per cent biotite. Accessory minerals include pyrite and zircon. Some alteration is evidenced by sericitization of the feldspars and chloritization of biotite. Phenocrysts of both feldspars are common. Zoning of the plagioclase feldspars is often accentuated by biotite inclusions. McCutcheon et al (1981) suggest 390 Ma as the age of crystallization of the Pokiok batholith. The older Rb/Sr total-rock age of 431 $\pm$ 9 Ma is interpreted to result from the mixing of crustal and mantle strontium.

THE 1982 DRILLING PROJECT

The 1982 drilling project comprised three phases: pre-drilling, drilling and post drilling. These phases are discussed in detail below.

Pre-Drilling Phase

The pre-drilling phase concerned site selection, obtaining all necessary permissions and site visits with potential bidders for the drilling contract.

Site Selection

The drill sites were chosen on the basis of collected and compiled heat generation data. The sources of this data included Chandra (1980) Hassan (1982) and John A. Leslie & Associates Limited (1982). The latter included data compiled and collected under Supply and Services Canada, contract number OSQ81-00077 and published as Earth Physics Branch Open File Report No. 82-8.

The specific sites had to be accessible both in terms of transportation and surface and mineral rights ownership. Some primary sites were inaccessible, particularly for the Mount Douglas granite. However, those selected were thought suitable to meet the objectives of the project.

Permissions

Once drill sites were selected, entry permission of the surface rights owners was obtained. The McAdam drill

hole is located on lands owned by Georgia-Pacific Corporation. The Welsford site is located within the right-of-way of a secondary road administered by the New Brunswick Department of Transport.

Discussions were held with both the Forestry and Mines branches of the New Brunswick Department of Natural Resources with regard to what the project entailed, what permits may be necessary and to obtain all necessary permissions. To avoid possible legal complications and inconveniences caused by mineral exploration activity, the mineral rights were obtained for the immediate area of the drill sites. The investigation was then carried out under the provisions of the New Brunswick Mining Act. The acquired rights will be permitted to expire once all required data have been collected.

Site Visits

On November 9, 1982, five potential bidders for the drilling contract were shown the proposed sites. The drill contract was awarded on November 26, 1982. Drill

equipment was moved to the Pokiok site on November 30, 1982, and drilling commenced on December 1, 1982.

Drilling Phase

General

A total of 768.3 metres of BQ wireline diamond drilling was accomplished, 397.0 metres at McAdam and 371.3 metres at Welsford. Both holes collared in bedrock and were drilled at angles of minus 90 degrees. NW casing was emplaced to depths below severe surface weathering. Caps were placed on the casing to prevent articles from being thrown in the holes and causing blockages.

Appendix I contains the drill contractor's shift reports which indicate drilling rates, problems, etc. Drilling was carried out on a 24-hour basis as that is the most cost efficient procedure, particularly in sub-zero weather. Excellent drilling conditions resulted in 100 per cent core recovery at McAdam. Although some problems were created by altered and broken rock at Welsford, core recovery at that site

was generally good. Both holes remained open to their respective bottoms at the time of the last temperature log.

A site geologist checked the daily drilling progress and performed various site tasks such as lithologic logging, sampling and labelling core boxes. Lithologic logs are contained in Appendix II.

Bottomhole Temperatures

Temperatures were recorded at the bottom of each hole as drilling progressed (Appendix III). Readings were taken with temperature bridge Model number BGT-1 employing a single thermistor probe. Attempts were made to record these temperatures at the same time each day. The exact time usually depended on the completion of the particular drill run nearest to the time agreed to by the drill contractor and site-geologist. Although some instability of the readings is evident, they would have provided very useful data in the event the holes were completely lost at any time due to incompetent rock.

Post-Drilling Phase

The post-drilling activities included temperature logging, lithologic logging, radiometric and ultra-violet light logging, sampling, core storage and site inspection.

Temperature Logging

Four temperature logs were run on each hole. The time intervals were as close to zero, 24 and 72 hours and five months after cessation of drilling as field conditions would permit. Readings were taken utilizing temperature bridge Model BGT-1 employing a single thermistor probe. The station interval was five metres with the exception of the first log of the McAdam hole for which the interval averaged three metres. Field conditions necessitated the substitution of cable graduations and five-metre intervals for the depth counter employed for the three-metre interval. The collected temperatures and supporting data are tabled in Appendix IV.

Lithologic Logging

Brief lithologic logs describing major changes in rock type were undertaken by the site-geologist. As indicated earlier, these are contained in Appendix II.

Radiometric and Ultra-Violet Light Logging

All core was logged radiometrically with a Geometrics spectrometer, Model GR-310. Although differing degrees of alteration showed slight variation in total count, no obviously anomalous zones were detected. General comments on the total count radiometrics accompany the lithologic logs in Appendix II. Ultra-violet light logging was carried out using lamp Model MSL-48 manufactured by Ultra-Violet Products Incorporated. Some fluorescence was observed over a narrow section of the McAdam hole (see also lithologic log).

Core Sampling

Two adjacent core samples were collected at ten-metre intervals over the entire length of the core for heat generation determinations and thermal conductivity measurements. Samples for heat generation determinations

were taken of split core over a length of 20 centimetres. Pertinent data on these samples are outlined in appendices V and VI. Full and intact core samples, 15 centimetres long, were collected for thermal conductivity measurements. Although the results of these measurements were not available at the completion of the remaining phases of this investigation, pertinent data on these samples are outlined in appendices VII and VIII.

Surface Sampling

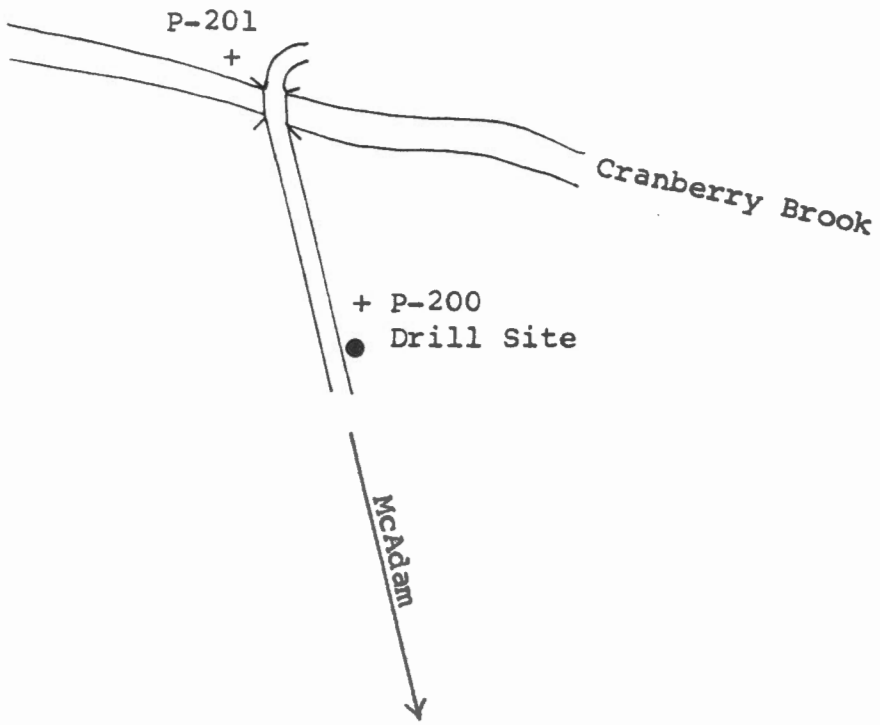
Samples of all surface outcrop near the drill sites were collected for heat generation determinations. (figures 2 and 3). The pertinent data on these samples are included in appendices V and VI.

Core Storage

All core boxes have been properly labelled and are stored at the New Brunswick Natural Resources core storage facility in Fredericton, New Brunswick.

Site Inspection

The two drill sites were inspected subsequent to the removal of the drilling equipment. Little ground



Scale: 1 cm = 50 metres

Figure 2

Surface Samples - McAdam

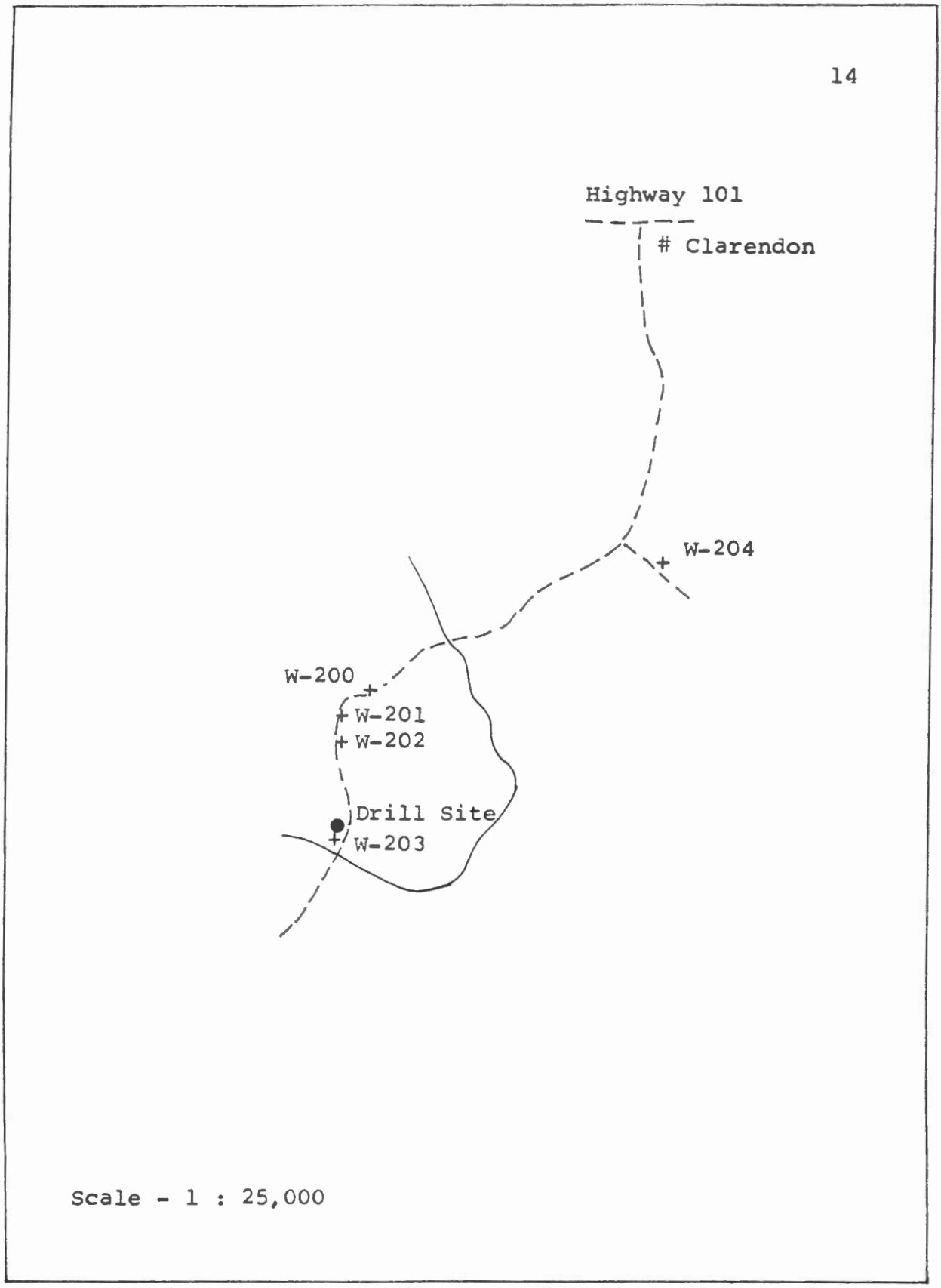


Figure 3

Surface Samples - Welsford

disturbance was evident. Both sites were left in as close to their pre-drilling condition as possible.

CONCLUSIONS AND RECOMMENDATIONS

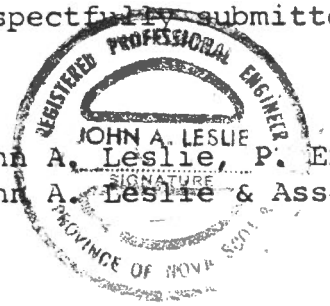
The collected temperature data indicate a thermal gradient of about 18 degrees centigrade per kilometre for both the McAdam and Welsford areas. Although the resulting gradients were quite constant, all logs except those five months after cessation of drilling indicated a slight decrease in temperature. The five-month logs indicated temperature increases of as much as one degree. This apparent increase may be due to instrumentation as a different temperature bridge was employed for those particular logs. A ten or twelve-month temperature log may be useful in establishing either the presence or absence of such a trend.

The lack of significant gradients is attributed, particularly at the Welsford site, to the altered nature of the country rock accompanied by leaching of the radiogenic elements. The validity of this observation can only be substantiated when chemical analyses of the cores are available for heat generation determinations.

Although the results were somewhat disappointing, one of the main objectives of the project was achieved. The thermal and rock property data obtained aided in assessing the low-grade geothermal potential of the sites. Unfortunately, neither the McAdam or Welsford site has any obvious potential. This does not, however, preclude the possibility of favorable sites elsewhere within the investigated geologic environments, particularly within the Mount Douglas granite. It should be noted that the approach taken was necessarily akin to "wildcatting" in petroleum exploration.

Further exploration of the Mount Douglas granite is recommended. A minimum of three 400-metre drill holes are thought necessary to more fully evaluate the low-grade geothermal energy potential of the intrusive. However, prior surface examinations should be undertaken in an attempt to differentiate between surface and hydrothermal alteration and to avoid highly altered rock from which the radiogenic elements may have been leached.

Respectfully submitted



John A. Leslie, P. Eng., for
John A. Leslie & Associates Limited

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APPENDIX I

DRILL SHIFT REPORTS

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION Mt Adams DATE Oct 29 19 82

HOLE SIZE _____ HOLE NO. _____ DRILL TYPE 38 SHIFT _____

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		
CASED OR DRILLED		
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Lima			8
M Lima			8
HELPERS			
D Lynch			8
T. Lima			8
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION		16	16	

REMARKS: Load Rig Travel to Fredericton

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION N/C Claim DATE Nov 30 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		
CASED OR DRILLED		
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
Lynch	8	4	8
M. Smith	8	4	8
HELPERS			
D. Lynch	8	4	8
Smith	8	4	8
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)	10	1	3
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN		8	8	
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION		8	8	

REMARKS: Travel to Col site & Landscape 4 hrs
set up 4 hrs

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY. CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION McAdam 11 DATE Dec 1 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT days

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED		
TRICONE BITS	CHOPPING BITS	
AUGER HEADS	AUGER TEETH	
BENTONITE	ADDITIVES	
CEMENT	1 bag cement	
CORE BOXES		
SHELBY TUBES		
SAMPLE JARS		
PENETRATION CONES		
OTHER (SPECIFY)		
ITEMS LEFT IN HOLE (SPECIFY)		
TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT	10	118
DEPTH START SHIFT	6	18
CASED OR DRILLED		118
CORE RECOVERED		118

MATERIAL	FROM	TO	FEET
OVERBURDEN NW	0	5	5
BEDROCK BQ	0	10	118

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Smith	8	8	12
M Smith	8	1	5
HELPERS			
D [illegible]	8	8	12
Jim [illegible]	8	1	5
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN		7	7	
DRILLING BEDROCK				
CASING (DEPTH 10 ft		8	8	
REAMING (FROM TO)				
WATERLINE (LENGTH)		2	2	
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Set up waterline & pump & run NW csg to 5 ft BW to 118 ft & run cement in NW csg.

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Meridian DATE Dec 1 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT Mid.

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		296
DEPTH START SHIFT		118
CASED OR DRILLED		178
CORE RECOVERED		178

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					
CORE BOXES	1½ EBC Rigid Ord.				
SHELBY TUBES					
SAMPLE JARS					
PENETRATION CONES					
OTHER (SPECIFY)					

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

ITEMS LEFT IN HOLE (SPECIFY)

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

LABOUR	FROM	TO	TOT. HRS
RUNNERS			
J M Smith	5	8	12
HELPERS			
J Smith	5	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE - LOGAN DRILLING LTD., CANARY - CLIENT'S REPRESENTATIVE, [illegible] - RUNNER/FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Vic Adam DATE Dec 2 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT Day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		424
DEPTH START SHIFT		296
CASED OR DRILLED		128
CORE RECOVERED		

OTHER SUPPLIES USED		
TRICONE BITS	CHOPPING BITS	
AUGER HEADS	AUGER TEETH	
BENTONITE	ADDITIVES	
CEMENT		
CORE BOXES		
SHELBY TUBES		
SAMPLE JARS		
PENETRATION CONES		
OTHER (SPECIFY)		
ITEMS LEFT IN HOLE (SPECIFY)		

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Lucas	8	8	12
HELPERS			
D Lucas	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: run out of Rustwell pull rods twice

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 2 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		492.
DEPTH START SHIFT		424
CASED OR DRILLED		68'
CORE RECOVERED		

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

OTHER (SPECIFY)

ITEMS LEFT IN HOLE (SPECIFY)

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Lunt	8	8	12
HELPERS			
J Lunt	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK			6	6	
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)			6	6	
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS: 10 days pump broke down

CLIENT'S REPRESENTATIVE	RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK, RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

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CONTRACT _____ LOCATION McAdam DATE Dec 3 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		492
CASED OR DRILLED		
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	
TESTING AND LOGGING	
CLINOMETER	TROPARI / OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Lusa	8	8	12
HELPERS			
D Lusa	8	8	12
OTHER			
EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE OR HOURS			
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS OR HOURS			
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)		R	12	
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Trip to mobilon to repair Hyd pump

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Mt Eldon DATE Dec 3 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nuti

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		632
DEPTH START SHIFT		492
CASED OR DRILLED		140
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M. Lewis	5	8	12
HELPERS			
J. Lewis	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE	RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

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CONTRACT _____ LOCATION McAdam DATE Dec 4 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		779
DEPTH START SHIFT		632
CASED OR DRILLED		147
CORE RECOVERED		

OTHER SUPPLIES USED			
TRICONE BITS		CHOPPING BITS	
AUGER HEADS		AUGER TEETH	
BENTONITE		ADDITIVES	
CEMENT			
CORE BOXES			
SHELBY TUBES			
SAMPLE JARS			
PENETRATION CONES			
OTHER (SPECIFY)			
ITEMS LEFT IN HOLE (SPECIFY)			
TESTING AND LOGGING			
CLINOMETER	TROPARI	OTHER	

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[signature]	8	8	12
HELPERS			
[signature]	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

[signature]
CLIENT'S REPRESENTATIVE

[signature]
RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 4 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		892
DEPTH START SHIFT		778
CASED OR DRILLED		114
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Lusk	8	8	12
HELPERS			
J Lusk	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK	1	12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 5 19 82

HOLE SIZE _____ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1042
DEPTH START SHIFT		892
CASED OR DRILLED		150
CORE RECOVERED		150

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

ITEMS LEFT IN HOLE (SPECIFY)

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Smith	8	5	12
HELPERS			
D Smith	8	5	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			

5 TON TRUCK MILEAGE	OR HOURS
1/2 TON TRUCK	
CAR	
CHAIN SAW DAYS	OR HOURS
BOAT	
MOTOR	
OTHER	

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK		12	12		
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS:

CLIENT'S REPRESENTATIVE	RUNNER/FOREMAN
	C Smith

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

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CONTRACT _____ LOCATION N/C Adam DATE Dec 5 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1126
DEPTH START SHIFT		1042
CASED OR DRILLED		84
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[illegible]	8	18	12
HELPERS			
[illegible]	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK			12	12	
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS:

[illegible]
CLIENT'S REPRESENTATIVE

[illegible]
RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 6 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		1222
DEPTH START SHIFT		1126
CASED OR DRILLED		96
CORE RECOVERED		

OTHER SUPPLIES USED			
TRICONE BITS		CHOPPING BITS	
AUGER HEADS		AUGER TEETH	
BENTONITE		ADDITIVES	
CEMENT			
CORE BOXES			
SHELBY TUBES			
SAMPLE JARS			
PENETRATION CONES			
OTHER (SPECIFY)			
ITEMS LEFT IN HOLE (SPECIFY)			
TESTING AND LOGGING			
CLINOMETER	TROPARI	OTHER	

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[signature]	8	8	12
HELPERS			
[signature]	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK		12	12		
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS:

[signature] CLIENT'S REPRESENTATIVE

[signature] RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 6 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nuts

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1270
DEPTH START SHIFT		1222
CASED OR DRILLED		48
CORE RECOVERED		

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					
CORE BOXES					
SHELBY TUBES					
SAMPLE JARS					
PENETRATION CONES					
OTHER (SPECIFY)					
ITEMS LEFT IN HOLE (SPECIFY)					
TESTING AND LOGGING					
CLINOMETER	TROPARI	OTHER			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Lucas	8	8	12
HELPERS			
J Lucas	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		6	6	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)		6	6	
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Hyd hose broke, walking joint broke

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION Whitecourt DATE Dec 7. 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT Day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED			
TRICONE BITS		CHOPPING BITS	
AUGER HEADS		AUGER TEETH	
BENTONITE		ADDITIVES	
CEMENT			
CORE BOXES			
SHELBY TUBES			
SAMPLE JARS			
PENETRATION CONES			
OTHER (SPECIFY)			
ITEMS LEFT IN HOLE (SPECIFY)			
TESTING AND LOGGING			
CLINOMETER	TROPARI	OTHER	

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1382
DEPTH START SHIFT		1270
CASED OR DRILLED		
CORE RECOVERED		32

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Lunn	8	5	9
HELPERS			
D Lunn	8	5	9
OTHER			

EQUIPMENT	
DRILL RIG (HOURS)	
TRACTOR (HOURS)	
5,TON TRUCK MILEAGE OR HOURS	
1/2 TON TRUCK	
CAR	
CHAIN SAW DAYS OR HOURS	
BOAT	
MOTOR	
OTHER	

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK			3	3
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)			6	6
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Repair w/c cost - Logan truck.

CLIENT'S REPRESENTATIVE

C Lunn
RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Windsor DATE Dec 7 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED		
TRICONE BITS		CHOPPING BITS
AUGER HEADS		AUGER TEETH
BENTONITE		ADDITIVES
CEMENT	1 NW 5' casing [illegible]	
CORE BOXES	1 NW [illegible]	
SHELBY TUBES	1 BW 30" [illegible]	
SAMPLE JARS	1 BW shoe [illegible]	
PENETRATION CONES		
OTHER (SPECIFY)		
ITEMS LEFT IN HOLE (SPECIFY)		
TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		
CASED OR DRILLED		
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
Jim Lucas			6
HELPERS			
J. Lucas			6
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN		8	8	
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Lunch 1 hr.

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION McAdam DATE Dec 8 19 82

HOLE SIZE BQ HOLE NO. 1 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		
CASED OR DRILLED		
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Smith	8	8	12
M Smith	8	8	12
HELPERS			
D Smith	8	8	12
J Smith	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: move to Wirral.

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION LD Trial DATE Dec 9 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED		
TRICONE BITS		CHOPPING BITS
AUGER HEADS		AUGER TEETH
BENTONITE		ADDITIVES
CEMENT		
CORE BOXES	1 bag cement	
SHELBY TUBES		
SAMPLE JARS		
PENETRATION CONES		
OTHER (SPECIFY)		

ITEMS LEFT IN HOLE (SPECIFY)

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT	20	146
DEPTH START SHIFT	0	20
CASED OR DRILLED		
CORE RECOVERED		146

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Smith	8	8	12
M Smith	8	12	4
HELPERS			
D Smith	8	8	12
J Smith	8	12	4
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN			2	2	
DRILLING BEDROCK			8	8	
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN			4	4	
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)			-		
OTHER (SPECIFY)			2	2	
MOBILIZATION					

REMARKS: 2 hrs pick up + supplies.

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wirral DATE Dec 9 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		146
DEPTH START SHIFT		176
CASED OR DRILLED		100
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Smith	8	8	12
HELPERS			
J Smith	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK		12	12		
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS: Tony Called.

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wind DATE Dec 10 19 83

HOLE SIZE B12 HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		261
DEPTH START SHIFT		246
CASED OR DRILLED		215
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[illegible]	8	8	12
HELPERS			
[illegible]	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wirral DATE Dec 10 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		628
DEPTH START SHIFT		461
CASED OR DRILLED		167
CORE RECOVERED		

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					
CORE BOXES					
SHELBY TUBES					
SAMPLE JARS					
PENETRATION CONES					
OTHER (SPECIFY)					

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

ITEMS LEFT IN HOLE (SPECIFY)

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Lewis	8	8	12
HELPERS			
J Lewis	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wirral DATE Dec 11 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		774
DEPTH START SHIFT		628
CASED OR DRILLED		146
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	
TESTING AND LOGGING	
CLINOMETER	TROPARI / OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Smith	8	5	12
HELPERS			
D Smith	5	5	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE	RUNNER/FOREMAN
	C Smith

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wind. DATE Dec 11 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT nts

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		855
DEPTH START SHIFT		774
CASED OR DRILLED		81
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	
TESTING AND LOGGING	
CLINOMETER / TROPARI / OTHER	

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
D. Smith	8	8	12
HELPERS			
J. Smith	8	8	12
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		12	12	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wind DATE Dec 12 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		920
DEPTH START SHIFT		855
CASED OR DRILLED		65
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	
TESTING AND LOGGING	
CLINOMETER	TROPARI / OTHER

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
C Lang	5	6	10
HELPERS			
D Lang	5	6	10
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK		10	10		
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS:

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION Wirral DATE Dec 13 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		942
DEPTH START SHIFT		920
CASED OR DRILLED		22
CORE RECOVERED		

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	
TESTING AND LOGGING	
CLINOMETER / TROPARI / OTHER	

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR

	FROM	TO	TOT. HRS
RUNNERS			
C Smith	8	5	9
M Smith	8	5	9
HELPERS			
D Smith	8	5	9
J Smith	8	5	9
OTHER			

EQUIPMENT

DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	HOURS SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		9	9	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)		9	9	
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Pull rods trouble with tube going down x mis cables. Thus repairs trash x obtaining supplies

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

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CONTRACT ______ LOCATION [illegible] DATE Dec 14 1982

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT ~~nite~~ day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1092
DEPTH START SHIFT		942
CASED OR DRILLED		
CORE RECOVERED		150

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	
CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	

ITEMS LEFT IN HOLE (SPECIFY)

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

TESTING AND LOGGING

CLINOMETER	TROPARI	OTHER

LABOUR	FROM	TO	TOT. HRS
RUNNERS			
[illegible signature]	8	9	13
[illegible signature]	5	12	7
HELPERS			
[illegible signature]	8	9	13
[illegible signature]	5	12	7
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK

WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK		17	17	
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS:

[illegible signature] CLIENT'S REPRESENTATIVE

[illegible signature] RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

CONTRACT _____ LOCATION Wind DATE Dec 14 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT	CASING	DRILLING
DEPTH END SHIFT		1088
DEPTH START SHIFT		1042
CASED OR DRILLED		46
CORE RECOVERED		

OTHER SUPPLIES USED		MATERIAL	FROM	TO	FEET
TRICONE BITS	CHOPPING BITS	OVERBURDEN			
AUGER HEADS	AUGER TEETH	BEDROCK			
BENTONITE	ADDITIVES				
CEMENT					

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CORE BOXES	
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[signature]	8	4	8
HELPERS			
[signature]	8	4	8
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK		8	8		
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS: broke down minor repairs

[signature]
CLIENT'S REPRESENTATIVE

[signature]
RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

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DAILY REPORT

CONTRACT _____ LOCATION Wunal DATE Dec 15 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT Day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		1165
DEPTH START SHIFT		1088
CASED OR DRILLED		77
CORE RECOVERED		

OTHER SUPPLIES USED			
TRICONE BITS		CHOPPING BITS	
AUGER HEADS		AUGER TEETH	
BENTONITE		ADDITIVES	
CEMENT			
CORE BOXES			
SHELBY TUBES			
SAMPLE JARS			
PENETRATION CONES			
OTHER (SPECIFY)			
ITEMS LEFT IN HOLE (SPECIFY)			
TESTING AND LOGGING			
CLINOMETER	TROPARI	OTHER	

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[signature]	8	10	14
HELPERS			
[signature]	8	10	14
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS				
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER	
DRILLING OVERBURDEN					
DRILLING BEDROCK			14	14	
CASING (DEPTH)					
REAMING (FROM TO)					
WATERLINE (LENGTH)					
CEMENT (AT FT.)					
SET UP OR TEAR DOWN					
MOVING (DISTANCE)					
WEDGING					
TESTING					
AWAITING ORDERS					
DELAYS (SPECIFY)					
REPAIRS (SPECIFY)					
OTHER (SPECIFY)					
MOBILIZATION					

REMARKS:

[signature] — CLIENT'S REPRESENTATIVE

[signature] — RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

47

CONTRACT _____ LOCATION Wuad DATE Dec 15 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT nite

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED			
TRICONE BITS		CHOPPING BITS	
AUGER HEADS		AUGER TEETH	
BENTONITE		ADDITIVES	
CEMENT			
CORE BOXES	5		
SHELBY TUBES			
SAMPLE JARS			
PENETRATION CONES			
OTHER (SPECIFY)			
ITEMS LEFT IN HOLE (SPECIFY)			
TESTING AND LOGGING			
CLINOMETER	TROPARI	OTHER	

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		1218
DEPTH START SHIFT		1165
CASED OR DRILLED		53
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE						
LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
M Lucas	8	4	8
HELPERS			
J Lucas	8	4	8
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE		OR HOURS	
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS		OR HOURS	
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK			8	8
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: machine broke down

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

LOGAN DRILLING LIMITED

DAILY REPORT

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CONTRACT _____ LOCATION Wirral DATE Dec 16 19 82

HOLE SIZE BQ HOLE NO. 2 DRILL TYPE 38 SHIFT day

DIAMOND ARTICLES				
TYPE	NUMBER	OVERBURDEN	BEDROCK	LEFT IN HOLE

OTHER SUPPLIES USED	
TRICONE BITS	CHOPPING BITS
AUGER HEADS	AUGER TEETH
BENTONITE	ADDITIVES
CEMENT	2-10' BW rods left in hole
CORE BOXES	1 WW ctn; 2 more
SHELBY TUBES	
SAMPLE JARS	
PENETRATION CONES	
OTHER (SPECIFY)	
ITEMS LEFT IN HOLE (SPECIFY)	

TESTING AND LOGGING		
CLINOMETER	TROPARI	OTHER

FOOTAGE REPORT		
	CASING	DRILLING
DEPTH END SHIFT		
DEPTH START SHIFT		
CASED OR DRILLED		
CORE RECOVERED		

MATERIAL	FROM	TO	FEET
OVERBURDEN			
BEDROCK			

CASING - IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

CASING - LEFT IN HOLE

LENGTH	AW	BW	NQ	NW	HW	OTHER
2 FT.						
5 FT.						
10 FT.						

LABOUR			
RUNNERS	FROM	TO	TOT. HRS
[illegible]	8	6	10
[illegible]			8
HELPERS			
[illegible]	8	6	10
[illegible]			5
OTHER			

EQUIPMENT			
DRILL RIG (HOURS)			
TRACTOR (HOURS)			
5 TON TRUCK MILEAGE	OR HOURS		
1/2 TON TRUCK			
CAR			
CHAIN SAW DAYS	OR HOURS		
BOAT			
MOTOR			
OTHER			

DESCRIPTION OF WORK	HOURS			
WORK DETAIL	SPVSR.	RUNNER	HELPER	OTHER
DRILLING OVERBURDEN				
DRILLING BEDROCK				
CASING (DEPTH)				
REAMING (FROM TO)				
WATERLINE (LENGTH)				
CEMENT (AT FT.)				
SET UP OR TEAR DOWN				
MOVING (DISTANCE)				
WEDGING				
TESTING				
AWAITING ORDERS				
DELAYS (SPECIFY)				
REPAIRS (SPECIFY)				
OTHER (SPECIFY)				
MOBILIZATION				

REMARKS: Rods finished [illegible]

CLIENT'S REPRESENTATIVE

RUNNER/FOREMAN

DESIGNATIONS: WHITE: LOGAN DRILLING LTD.; CANARY: CLIENT'S REPRESENTATIVE; PINK: RETAIN BY FOREMAN

APPENDIX II

LITHOLOGIC LOGS

LITHOLOGIC LOG

Hole No.: McAdam 1, EPB No. 319 Location: McAdam, N. B.

Latitude: 45°40.7' Longitude: 67°18.8'

Drilled by: Hop-Mun Drilling Drill Type: Longyear 38

Started: December 1, 1982 Completed: December 8, 1982

Dip: Vertical Final Depth: 397.0 metres

Logged by: G. Reid

---

0 - 1.5: NW CASING (Left in hole)

0 - 3.0: BW CASING (Left in hole, capped)

0 - 397.0: GRANITE

Medium to coarse grained, grey, biotite granite containing approximately 15 per cent biotite, 35 per cent quartz and 50 per cent potassic and plagioclase feldspar. Locally, porphyritic with phenocrysts of both feldspars. Biotite inclusions in plagioclase phenocrysts accentuate zoning. Potassic feldspar rimming plagioclase common. Local fracturing accompanied by alteration of the feldspars. Scattered biotite-rich xenoliths. Minor disseminated pyrite.

33.2: minor muscovite and pyrite along fractures.
47.3: xenoliths.
47.0 - 49.4: biotite altered to chlorite.
62.8 - 65.5: xenoliths.
88.4: xenoliths.
92.7: altered feldspar.
97.9 - 108.5: biotite-rich, altered feldspar.
129.3: broken core, sandy.
135.1 - 225.9: biotite inclusions in plagioclase.

146.6 - 147.6: quartz-feldspar veins up to 2.5 cm wide with minor pyrite.
149.4 - 155.5: strongly porphyritic.
160.7: xenoliths.
163.1: 5 cm quartz-feldspar vein.
169.2: disseminated pyrite.
189.3: xenoliths.
190.2 - 192.4: quartz-feldspar veins with altered feldspar.
200.9: narrow pyrite stringer.
218.0 - 222.3: fractured with clay minerals developed along fractures.
228.4 - 228.6: fine grained, buff colored dike.
235.7 - 245.1: scattered quartz-feldspar veins 3 to 5 cm wide.
243.9 - 249.4: numerous plagioclase phenocrysts.
247.8: xenolith.
257.3 and 265.5: narrow pyrite stringers.
267.4 - 268.0 and 271.0 - 274.7: fractures with reddish altered feldspar and biotite altered to chlorite.

276.5 - 281.4: minor disseminated pyrite.
283.2: xenolith.
288.7: quartz-feldspar-muscovite vein.
304.6 and 318.9: xenoliths.
321.6 and 327.4: minor pyrite.
323.8: 3 cm quartz-feldspar vein.
331.1 - 397.0: scattered fractures with altered feldspar and minor pyrite.

397.0 END OF HOLE

Core recovery - 100 per cent

Radiometry Measurements - the total count varied from 9 to 34 counts per second, averaging about 20 counts per second, with no obvious variation between rock types and phases.

Fluorescence - associated with fracture in fine grained dike rock from 228.4 to 228.6.

LITHOLOGIC LOG

Hole No: Welsford 1, EPB No. 320 Location: Welsford, N. B.

Latitude: 45°26.3' Longitude: 66°26.4'

Drilled by: Hop-Mun Drilling Drill Type: Longyear 38

Started: December 9, 1982 Completed: December 15, 1982

Dip: Vertical Final Depth: 371.3 metres

Logged by: G. Reid

---

0 - 6.1: BW CASING (Left in hole, capped)

0 - 226.5: ALTERED GRANITE

Generally coarse grained, reddish granite containing approximately 35 per cent quartz, 30 per cent pink potassic feldspar, 25 per cent plagioclase feldspar and less than 10 per cent mafics, mostly biotite. The plagioclase feldspar is strongly kaolinized and the biotite is altered to chlorite. Fracturing is present with accompanying more intense alteration; with broken and rubbly core resulting. Minor secondary muscovite and disseminated pyrite.

45.4 - 46.0: slightly brecciated.
46.0 - 46.6: medium grained phase with gradational margins.
50.9: potassic feldspar rimming plagioclase.
93.9 - 94.8: medium grained phase.
116.5 - 123.5 and 134.8 - 155.8: development of chlorite and muscovite.
179.9 - 184.4: fine grained reddish granite dike with hematitic stained fractures.
185.0 - 226.5: scattered hematite-rich veinlets with associated muscovite.
221.6: 20 cm wide fine grained dike.
223.2 - 223.5: hematite-rich zone.
223.5 - 226.5: silicified zone cut by narrow, vuggy quartz veins.

LITHOLOGIC LOG - WELSFORD 1 (cont'd.)

226.5 - 293.0 GRANITE

Generally coarse grained, reddish granite; the unaltered equivalent of the above section. Local silicified zones and narrow quartz veining with minor hematite.

230.5: grains of fluorite.
255.8 - 257.3: medium grained.
282.6 - 285.1: slightly altered.

293.0 - 320.1 ALTERED GRANITE

As from 0 - 226.5. Silicification and hematitic staining throughout. Locally slight brecciation.

320.1 - 355.2 GRANITE

As from 226.5 - 293.0. Some fracturing with hematitic staining.

342.4: plagioclase rimmed by potassic feldspar.
343.3: 10 cm wide fine grained zone.
350.6 - 352.1: scattered narrow quartz-feldspar veins with narrow, fine grained margins.

355.2 - 367.7 ALTERED GRANITE

As from 0 - 226.5 and 293.0 - 321.1. Plagioclase rimmed by potassic feldspar. Hematitic stained fractures with adjacent feldspar more intensely altered.

367.7 - 371.3 GRANITE

As in above sections 226.5 - 293.0 and 320.1 - 355.2.

LITHOLOGIC LOG - WELSFORD 1 (cont'd.)

371.3 END OF HOLE

Core Recovery - nearly 100 per cent, although often broken in the altered sections.

Radiometric Measurements - the total count values varied from 13 to 41 counts per second, averaging about 22 counts per second. Values of the altered phases were 2 to 4 counts per second less than those of the unaltered phases. Higher values, averaging 25 to 30 counts per second, were associated with hematitic stained fractures near bottom of hole.

Fluorescence - none observed.

APPENDIX III

Bottom Hole Temperatures

McAdam 1, EPB No. 319

Date	Time (p.m.)	Depth(m)	Temp. °C	Remarks
December 1, 1982	3:45	13.0	6.184	Drift noted in all readings.
December 2, 1982	2:39	113.0	11.298	
December 3, 1982	2:30	145.0	7.923	
December 4, 1982	3:26	218.0	10.342	
December 5, 1982	3:30	299.0	12.697	
December 6, 1982	2:33	360.0	14.357	
December 7, 1982	3:30	396.0	14.426	

Welsford 1, EPB No. 320

Date	Time (p.m.)	Depth(m)	Temp. °C	Remarks
December 10, 1982	2:45	110.0	8.498	
December 11, 1982	3:00	235.0	16.016	
December 12, 1982	2:10	275.0	14.522	
December 13, 1982				Drill down, hole inaccessible
December 14, 1982	3:05	309.0	13,366	
December 15, 1982	2:15	339.0	16.311	
December 16, 1982	2:30	370.0	11.620	Drill down for 11 hours - stable.

APPENDIX IV

TEMPERATURE LOGS

COLLECTED TEMPERATURE DATA

Hole: McAdam 1, EPB No. 319 Location: McAdam, N. B.

Latitude: 45°40.7' 10-Hour Log - December 8, 1982

Longitude: 67°18.8' Thermistor No. 5326

Total Depth: 397.0m Logged Depth: 395.5m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
0.0	274	13,044	4.812	Log began about 10
3.0		12,072	6.575	hours after removal
6.2		12,022	6.668	of drill rods.
9.5		12,258	6.224	
12.6		12,376	6.006	
15.7		12,420	5.925	Hole collared in
18.8		12,376	6.006	bedrock.
21.8	275	12,367	6.025	
24.9		12,268	6.206	Water at 0.0m.
27.9		12,241	6.255	
				0 - 397.0m: medium to
31.0		12,169	6.390	coarse grained, grey
34.2		12,135	6.491	biotite granite with
37.6	275	12,073	6.590	feldspar phenocrysts.
40.6		12,049	6.617	
43.7		12,009	6.693	0 - 1.5m: NW Casing.
46.8		11,975	6.757	
49.8		11,958	6.691	0 - 3.0m: BW Casing.
52.8		11,904	6.898	
55.9		11,888	6.924	
59.0		11,850	6.999	
62.1	276	11,816	7.065	
65.3		11,783	7.129	
68.5		11,746	7.201	
71.6		11,730	7.232	
74.7		11,704	7.283	
77.8		11,684	7.326	
80.8		11,687	7.317	
83.9		11,649	7.391	
87.0		11,616	7.457	
90.0		11,589	7.510	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
10-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
93.4	277	11,570	7.548	
96.8		11,547	7.594	
100.4		11,519	7.649	
103.1		11,488	7.711	
105.7		11,479	7.729	
108.7		11,455	7.778	
111.8		11,438	7.812	
114.8		11,398	7.892	
117.9		11,384	7.921	
120.9		11,354	7.982	
124.0	278	11,320	8.051	
127.0		11,315	8.061	
130.1		11,291	8.110	
133.3		11,258	8.177	
136.5		11,243	8.208	
139.6		11,216	8.264	
142.7		11,190	8.317	
145.8		11,182	8.334	
148.9		11,158	8.383	
151.9		11,133	8.436	
155.0	278	11,123	8.477	
158.1		11,108	8.485	
161.1		11,085	8.535	
164.1		11,047	8.614	
167.1		11,030	8.650	
170.1		10,994	8.726	
173.2		10,980	8.755	
176.4		10,947	8.825	
179.6		10,919	8.884	
182.6		10,891	8.944	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
10-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
185.5	277	10,870	8.989	
188.5		10,844	9.041	
191.5		10,825	9.085	
195.0		10,792	9.165	
198.3		10,760	9.225	
201.6		10,707	9.340	
205.8		10,670	9.420	
211.0		10,619	9,531	
214.5		10,607	9.558	
218.0		10,528	9.731	
221.5	276	10,473	9.853	
224.8		10,393	10.032	
228.1		10,338	10.156	
231.7		10,337	10.158	
235.3		10,392	10.034	
238.8		10,377	10.068	
243.3		10,330	10.174	
248.4		10,279	10.289	
251.4		10,244	10.369	
254.5		10,217	10.431	
257.5	275	10,180	10.516	
260.6		10,143	10.601	
263.8		10,100	10.700	
267.0		10,076	10.756	
270.2		10,030	10.863	
273.4		9,998	10.939	
276.7		10,057	10.800	
280.0		10,033	10.856	
283.3		10,005	10.921	
286.6		9,978	10.984	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
10-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
289.9	275	9,945	11.061	
292.9		9,918	11.125	
295.9		9,888	11.196	
298.8		9,860	11.263	
301.9		9,830	11.334	
305.1		9,802	11.401	
308.3		9,779	11.456	
311.4		9,748	11.531	
314.5		9,726	11.585	
317.7		9,699	11.649	
320.9	275	9,674	11.710	
323.9		9,651	11.767	
326.9		9,627	11.825	
329.9		9,607	11.874	
333.2		9,577	11.948	
336.4		9,550	12.014	
339.7		9,526	12.074	
342.9		9,507	12.121	
346.1		9,482	12.186	
349.3		9,458	12.243	
352.3	275	9,436	12.298	
355.4		9,409	12.365	
358.4		9,391	12.411	
361.5		9,374	12.453	
364.6		9,361	12.487	
368.8		9,343	12.532	
371.0		9,327	12.572	
374.1		9,318	12.595	
377.2		9,312	12.608	
380.3		9,308	12.620	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
10-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
383.4	275	9,315	12.603	
386.4		9,335	12.552	
389.5		9,340	12.539	
392.5		9,350	12.514	
395.5		9,380	12.433	End of log.

COLLECTED TEMPERATURE DATA

Hole: McAdam 1, EPB No. 319 Location: McAdam, N. B.

Latitude: 45°40.7' 34-Hour Log - December 9, 1982.

Longitude: 67°18.8' Thermistor No. 5326

Total Depth: 397.0m Logged Depth: 395.0m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
0.0	268	12,956	4.965	Log began about 34
5.0		12,124	6.856	hours after removal
10.0		12,266	6.210	of drill rods.
15.0		12,752	5.325	
20.0		12,528	5.728	Hole collared in
25.0		12,456	5.892	bedrock.
30.0		12,412	5.940	
35.0		12,252	6.235	Water at 0.0m.
40.0		12,206	6.321	
45.0		12,170	6.389	0 - 397.0m: medium to coarse grained,
50.0	268	12,106	6.509	grey biotite granite
55.0		12,015	6.683	with feldspar
60.0		12,023	6.667	phenocrysts.
65.0		11,936	6.835	
70.0		11,888	6.926	0 - 1.5m: NW Casing.
75.0		11,832	7.034	
80.0		11,805	7.086	0 - 3.0m: BW Casing.
85.0		11,791	7.113	
90.0		11,745	7.214	
95.9		11,707	7.277	
100.0	268	11,656	7.377	
105.0		11,610	7.468	
110.0		11,564	7.540	
115.0		11,521	7.645	
120.0		11,490	7.707	
125.0		11,447	7.794	
130.0		11,398	7.892	
135.0		11,364	7.961	
140.0		11,313	8.065	
145.0		11,280	8.130	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
34-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	268	11,241	8.212	
155.0		11,192	8.313	
160.0		11,149	8.402	
165.0		11,110	8.483	
170.0		11,063	8.581	
175.0		11,109	8.278	
180.0		11,995	8.724	
185.0		11,949	8.821	
190.0		10,908	8,908	
195.0		10,863	9.004	
200.0	269	10,827	9.081	
205.0		10,774	9.195	
210.0		10,728	9.293	
215.0		10,606	9.560	
220.0		10,573	9.632	
225.0		10,487	9.823	
230.0		10,377	10.068	
235.0		10,448	9.909	
240.0		10,435	9.938	
245.0		10,377	10.067	
250.0	270	10,323	10.190	
255.0		10,286	10.274	
260.0		10,240	10.378	
265.0		10,164	10.553	
270.0		10,135	10.619	
275.0		10,107	10.784	
280.0		10,112	10.675	
285.0		10,070	10.770	
290.0		10,030	10.863	
295.0		9,981	10.971	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1, (Cont'd.) Location:
34-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
300.0	272	9,941	11.071	
305.0		9,888	11.196	
310.0		9,852	11.282	
315.0		9,810	11.382	
320.0		9,773	11.471	
325.0		9,734	11.564	
330.0		9,700	11.647	
335.0		9,646	11.779	
340.0		9,622	11.837	
345.0		9,583	11.933	
350.0	273	9,551	12.012	
355.0		9,510	12.113	
360.0		9,483	12.180	
365.0		9,456	12.261	
370.0		9,427	12,320	
375.0		9,401	12.386	
380.0		9,387	12.421	
385.0		9,388	12.418	
390.0		9,384	12.428	
395.0		9,389	12.414	End of log.

COLLECTED TEMPERATURE DATA

Hole: McAdam 1, EPB No.319 Location: McAdam, N. B.

Latitude: 45°40.7' 82-Hour Log - December 11,1982

Longitude: 67°18.8' Thermistor No. 5326

Total Depth: 397.0m Logged Depth: 395.0m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
5.0	262	12,013	6.686	Log began about 82
10.0		12,159	6.410	hours after removal
15.0		12,482	5.811	of drill rods.
20.0		12,597	5.604	
25.0		12,535	5.715	Hole collared in
30.0		12,535	5.715	bedrock.
35.0		12,389	5.982	
40.0		12,324	6.102	Water at 0.0m.
45.0		12,308	6.132	
				0 - 397.0m: medium to
50.0	264	12,236	6.265	coarse grained, grey
55.0		12,156	6.416	biotite granite with
60.0		12,124	6.475	feldspar phenocrysts.
65.0		12,056	6.605	
70.0		11,995	6.720	0 - 1.5m: NW Casing.
75.0		11,961	6.785	
80.0		11,919	6.866	0 - 3.0m: BW Casing.
85.0		11,853	6.993	
95.0		11,823	7.051	
100.0	266	11,762	7.170	
105.0		11,716	7.260	
110.0		11,675	7.340	
115.0		11,642	7.405	
120.0		11,586	7.516	
125.0		11,542	7.603	
130.0		11,501	7.685	
135.0		11,457	7.774	
140.0		11,411	7.866	
145.0		11,369	7.951	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
82-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	269	11,313	8.065	
155.0		11,278	8.136	
160.0		11,222	8.252	
165.0		11,175	8.348	
170.0		11,118	8.466	
175.0		11,087	8.531	
180.0		11,060	8.587	
185.0		11,014	8.684	
190.0		10,969	8.779	
195.0		10,926	8.869	
200.0	271	10,867	8.995	
205.0		10,840	9.053	
210.0		10,777	9.188	
215.0		10,719	9.313	
220.0		10,643	9.477	
225.0		10,579	9.619	
230.0		10,428	9.954	
235.0		10,528	9.731	
240.0		10,510	9.771	
245.0		10,473	9.853	
250.0	273	10,410	9.994	
255.0		10,375	10.073	
260.0		10,316	10.206	
265.0		10,277	10.294	
270.0		10,221	10.422	
275.0		10,216	10.433	
280.0		10,195	10.482	
285.0		10,156	10.571	
290.0		10,111	10.674	
295.0		10,075	10.757	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (Cont'd.) Location:
82-Hour Log

Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
300.0	274	10,022	10.880	
305.0		9,985	10.967	
310.0		9,941	11.071	
315.0		9,922	11.115	
320.0		9,865	11.251	
325.0		9,830	11.334	
330.0		9,786	11.440	
335.0		9,755	11.514	
340.0		9,710	11.623	
345.0		9,682	11.691	
350.0	276	9,641	11.791	
355.0		9,606	11.873	
360.0		9,570	11.965	
365.0		9,543	12.031	
370.0		9,507	12.121	
375.0		9,483	12.180	
380.0		9,454	12.252	
385.0		9,440	12.288	
390.0		9,418	12.343	
395.0		9,401	12.386	End of log.

COLLECTED TEMPERATURE DATA

Hole: McAdam 1, EPB No. 319 Location: McAdam, N. B.

Latitude: 45°40.7' 5-Month Log - May 3, 1983

Longitude: 67°18.8' Thermistor No. 5326

Total Depth: 397.0m Logged Depth: 395.0m

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
0.0	288	12,129	6.466	Log run about 5
5.0		13,297	6.153	months after cessa-
10.0		12,329	6.093	tion of drilling
15.0		11,986	6.736	
20.0		11,980	6.749	Hole collared in
25.0		12,052	5.620	bedrock
30.0		12,048	5.612	
35.0		12,019	6.675	Water 0.0m
40.0		11,981	6.747	
45.0		11,931	6.843	0 - 397.0m: medium to coarse grained,
50.0	287	11,884	6.933	grey biotite granite
55.0		11,840	7.018	with feldspar pheno-
60.0		11,784	7.127	crysts
65.0		11,741	7.211	
70.0		11,693	7.305	0 - 1.5m: NW Casing
75.0		11,643	7.403	0 - 3.0m: BW Casing
80.0		11,599	7.490	
85.0		11,555	7.578	
90.0		11,511	7.665	
95.0		11,466	7.756	
100.0	287	11,425	7.838	
105.0		11,381	7.927	
110.0		11,328	8.034	
115.0		11,281	8.130	
120.0		11,232	8.231	
125.0		11,189	8.319	
130.0		11,138	8.425	
135.0		11,088	8.529	
140.0		11,046	8.616	
145.0		11,000	8.713	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (cont'd.) Location:
5-Month Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	287	10,949	8.821	
155.0		10,897	8.931	
160.0		10,848	9.035	
165.0		10,786	9.165	
170.0		10,743	9.261	
175.0		10,696	9.363	
180.0		10,654	9.455	
185.0		10,610	9.551	
190.0		10,559	9.663	
195.0		10,520	9.749	
200.0	286	10,465	9.871	
205.0		10,423	9.965	
210.0		10,379	10.063	
215.0		10,335	10.163	
220.0		10,285	10.276	
225.0		10,235	10.389	
230.0		10,185	10.503	
235.0		10,137	10.615	
240.0		10,102	10.695	
245.0		10,062	10.858	
250.0	286	10,017	10.894	
255.0		9,977	10.985	
260.0		9,932	11.092	
265.0		9,891	11.189	
270.0		9,854	11.277	
275.0		9,832	11.329	
280.0		9,784	11.444	
285.0		9,744	11.540	
290.0		9,701	11.645	
295.0		9,659	11.722	

COLLECTED TEMPERATURE DATA

Hole: McAdam 1 (cont'd.) Location:
5-Month Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
300.0	286	9,614	11.856	
305.0		9,573	11.958	
310.0		9,533	12.057	
315.0		9,490	12.163	
320.0		9,448	12.268	
325.0		9,412	12.358	
330.0		9,370	12.463	
335.0		9,332	12.560	
340.0		9,287	12.673	
345.0		9,250	12.768	
350.0	286	9,208	12.876	
355.0		9,171	12.971	
360.0		9,128	13.083	
365.0		9,087	13.191	
370.0		9,050	13.287	
375.0		0,021	13.363	
380.0		8,977	13.480	
385.0		8,937	13.586	
390.0		8,895	13.698	
395.0		8,864	13.781	End of log

COLLECTED TEMPERATURE DATA

Hole: Welsford 1, EPB No. 320 Location: Welsford, N. B.

Latitude: 45°26.3' 0-Hour Log - December 17, 1982

Longitude: 66°26.4' Thermistor No. 5326

Total Depth: 371.3m Logged Depth: 370.0m

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
0.0	275	13,805	3.535	Log began immediately
5.0		12,361	6.034	after removal of rods.
10.0		12,336	6.080	
15.0		12,364	6.028	Hole collared in
20.0		12,437	5.895	bedrock.
25.0		12,497	5.785	
30.0		12,537	5.676	0 - 6.1m: BW Casing.
35.0		12,595	5.607	
40.0		12,537	5.712	0 - 371.3m: coarse
45.0		12,479	5.817	grained reddish granite with repeating altered
50.0	274	12,402	5.958	and unaltered phases.
55.0		12,331	6.089	
60.0		12,259	6.223	
65.0		12,199	6.335	
70.0		12,138	6.449	
75.0		12,091	6.538	
80.0		12,039	6.637	
85.0		11,980	6.749	
90.0		11,926	6.843	
95.0		11,865	6.969	
100.0	274	11,803	7.090	
105.0		11,708	7.275	
110.0		11,670	7.350	
115.0		11,634	7.421	
120.0		11,574	7.540	
125.0		11,476	7.735	
130.0		11,331	8.028	
135.0		11,372	7.945	
140.0		11,329	8.032	
145.0		11,282	8.128	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd.) Location:
0-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
150.0	274	11,224	8.248	
155.0		11,179	8.340	
160.0		11,139	8.423	
165.0		11,101	8.502	
170.0		11,075	8.556	
175.0		11,027	8.656	
180.0		10,974	8.768	
185.0		10,954	8.811	
190.0		10,921	8.880	
195.0		10,887	8.952	
200.0	274	10,842	9.049	
205.0		10,800	9.139	
210.0		10,764	9.216	
215.0		10,718	9.315	
220.0		10,672	9.416	
225.0		10,637	9.492	
230.0		10,589	9.597	
235.0		10,563	9.654	
240.0		10,521	9.747	
245.0		10,487	9.823	
250.0	274	10,446	9.914	
255.0		10,412	9.990	
260.0		10,373	10.077	
265.0		10,332	10.169	
270.0		10,289	10.267	
275.0		10,253	10.349	
280.0		10,207	10.451	
285.0		10,176	10.525	
290.0		10,136	10.617	
295.0		10,087	10.730	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd.) Location:
0-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
300.0	275	10,036	10.848	
305.0		9,994	10.946	
310.0		9,954	11.040	
315.0		9,920	11.120	
320.0		9,883	11.208	
325.0		9,853	11.280	
330.0		9,839	11.312	
335.0		9,815	11.370	
340.0		9,801	11.404	
345.0		9,781	11.452	
350.0	275	9,758	11.507	
355.0		9,744	11.540	
360.0		9,730	11.575	
365.0		9,737	11.557	
370.0		9,766	11.488	End of log.

COLLECTED TEMPERATURE DATA

Hole: Welsford 1, EPB No. 320 Location: Welsford, N. B.

Latitude: 45°26.3' 24-Hour Log - December 12, 1982

Longitude: 66°26.4' Thermistor No. 5326

Total Depth: 371.3m Logged Depth: 370.0m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
0.0	259	15,037	1.628	Log began 24 hours
5.0		12,175	6.380	after removal of
10.0		12,212	6.310	drill rods.
15.0		12,208	6.318	
20.0		12,276	6.192	Hole collared in
25.0		12,324	6.101	bedrock.
30.0		12,371	6.015	
35.0		12,464	5.844	0 - 6.1m: BW Casing.
40.0		12,445	5.880	
45.0		12,420	5.925	0 - 371.3m: coarse grained reddish granite
50.0	262	12,364	6.028	with repeating altered
55.0		12,306	6.136	and unaltered phases.
60.0		12,257	6.227	
65.0		12,198	6.342	
70.0		12,151	6.425	
75.0		12,101	6.519	
80.0		12,046	6.624	
85.0		12,015	6.683	
90.0		11,950	6.721	
95.0		11,900	6.902	
100.0	263	11,847	7.005	
105.0		11,757	7.180	
110.0		11,722	7.248	
115.0		11,679	7.332	
120.0		11,633	7.423	
125.0		11,529	7.629	
130.0		11,402	7.884	
135.0		11,437	7.814	
140.0		11,395	7.898	
145.0		11,352	7.986	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd.) Location:
24-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	265	11,298	8.096	
155.0		11,243	8.208	
160.0		11,209	8.278	
165.0		11,171	8.357	
170.0		11,139	8.423	
175.0		11,096	8.512	
180.0		11,046	8.616	
185.0		11,018	8.675	
190.0		10,987	8.740	
195.0		10,944	8.832	
200.0	267	10,910	8.904	
205.0		10,863	9.004	
210.0		10,828	9.078	
215.0		10,789	9.162	
220.0		10,745	9.257	
225.0		10,700	9.355	
230.0		10,662	9.438	
235.0		10,626	9.516	
240.0		10,589	9.597	
245.0		10,549	9.685	
250.0	270	10,520	9.549	
255.0		10,477	9.845	
260.0		10,446	9.914	
265.0		10,403	10.009	
270.0		10,363	10.099	
275.0		10,323	10.167	
280.0		10,289	10.267	
285.0		10,247	10.363	
290.0		10,218	10.429	
295.0		10,168	10.544	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd.) Location:
24-Hour Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
300.0	272	10,124	10.645	
305.0		10,084	10.736	
310.0		10,042	10.833	
315.0		10,005	10.921	
320.0		9,971	11.001	
325.0		9,940	11.073	
330.0		9,923	11.113	
335.0		9,894	11.182	
340.0		9,877	11.223	
345.0		9,849	11.289	
350.0	274	9,827	11.344	
355.0		9,802	11.402	
360.0		9,778	11.458	
365.0		9,770	11.478	
370.0		9,773	11.470	End of log.

COLLECTED TEMPERATURE DATA

Hole: Welsford 1, EPB No. 320 Location: Welsford, N. B.

Latitude: 45°26.3' 72-Hour Log - December 20, 1982

Longitude: 66°26.4' Thermistor No. 5326

Total Depth: 371.3m Logged Depth: 370.0m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
0.0	271	14,994	1.691	Log began 72 hours
5.0		12,077	6.565	after removal of
10.0		12,055	6.607	drill rods.
15.0		12,119	6.485	
20.0		12,191	6.350	Hole collared in
25.0		12,262	6.217	bedrock.
30.0		12,302	6.143	
35.0		12,400	5,962	0 - 6.1m: BW Casing.
40.0		12,394	5.972	
45.0		12,384	5.991	0 - 371.3m: coarse grained reddish granite
50.0	270	12,352	6.050	with repeating altered
55.0		12,306	6.136	and unaltered phases.
60.0		12,262	6.217	
65.0		12,214	6.306	
70.0		12,168	6.393	
75.0		12,127	6.470	
80.0		12,087	6.546	
85.0		12,037	6.641	
90.0		11,995	6.720	
95.0		11,950	6.806	
100.0	271	11,895	6.912	
105.0		11,826	7.046	
110.0		11,788	7.119	
115.0		11,752	7.191	
120.0		11,689	7.313	
125.0		11,605	7.478	
130.0		11,502	7.683	
135.0		11,523	7.641	
140.0		11,484	7.719	
145.0		11,437	7.814	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd,) Location:
72-Hour log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	272	11,391	7.907	
155.0		11,346	7.998	
160.0		11,303	8.086	
165.0		11,264	8.165	
170.0		11,230	8.235	
175.0		11,188	8.321	
180.0		11,141	8.419	
185.0		11,111	8.481	
190.0		11,070	8.567	
195.0		11,036	8.637	
200.0	273	10,993	8.738	
205.0		10,953	8.813	
210.0		10,911	8.902	
215.0		10,868	8.991	
220.0		10,830	9.071	
225.0		10,784	9,173	
230.0		10,742	9,264	
235.0		10,705	9.344	
240.0		10,667	9.427	
245.0		10,629	9.509	
250.0	274	10,597	9.580	
255.0		10,557	9.668	
260.0		10,520	9.749	
265.0		10,482	9.834	
270.0		10,441	9.925	
275.0		10,403	10.009	
280.0		10,364	10.097	
285.0		10,328	10.178	
290.0		10,290	10.265	
295.0		10,247	10.363	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (Cont'd.) Location:
72-Hour log

Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
300.0	274	10,202	10.465	
305.0		10,166	10.547	
310.0		10,126	10.640	
315.0		10,102	10.695	
320.0		10,053	10.812	
325.0		10,022	10.881	
330.0		9,997	10.940	
335.0		9,965	11.014	
340.0		9,936	11.083	
345.0		9,905	11.156	
350.0	275	9,875	11.227	
355.0		9,847	11.294	
360.0		9,816	11.368	
365.0		9,795	11.418	
370.0		9,783	11.446	End of log

COLLECTED TEMPERATURE DATA

Hole: Welsford 1, EPB No. 320 Location: Welsford, N. B.

Latitude: 45°26.3' 5-Month Log - May 4, 1983

Longitude: 66°26.4' Thermistor No. 5326

Total Depth: 371.3m Logged Depth: 370.0m

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
0.0	294	12,112	6.497	Log run about 5
5.0		12,260	6.221	months after
10.0		12,405	5.953	cessation of
15.0		12,082	6.557	drilling
20.0		11,939	6.827	
25.0		11,894	6.914	Hole collared in
30.0		11,872	6.952	bedrock
35.0		11,863	6.973	
40.0		11,853	6.993	0 - 6.1m: BW casing
45.0		11,792	7.111	
				0 - 371.3m: coarse
50.0	294	11,774	7.146	grained reddest
55.0		11,745	7.203	granite with repeat-
60.0		11,734	7.224	ing altered and un-
65.0		11,706	7.278	altered phases
70.0		11,686	7.319	
75.0		11,652	7.385	
80.0		11,627	7.435	
85.0		11,591	7.506	
90.0		11,564	7.560	
95.0		11,506	7.671	
100.0	294	11,493	7.701	
105.0		11,449	7.790	
110.0		11,417	7.854	
115.0		11,375	7.939	
120.0		11,341	8.008	
125.0		11,299	8.094	
130.0		11,261	8.171	
135.0		11,218	8.260	
140.0		11,177	8.344	
145.0		11,134	8.434	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (cont'd.) Location:
5-month Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist.(ohms)	Corrected Resist.(ohms)	Temp.(°C)	Lithology/Remarks
150.0	293	11,096	8.513	
155.0		11,056	8.595	
160.0		11,017	8.677	
165.0		10,974	8.769	
170.0		10,932	8.857	
175.0		10,872	8.985	
180.0		10,852	9.027	
185.0		10,811	9.115	
190.0		10,769	9.205	
195.0		10,729	9.291	
200.0	293	10,692	9.372	
205.0		10,644	9.476	
210.0		10,604	9.565	
215.0		10,559	9.663	
220.0		10,519	9.751	
225.0		10,468	9.864	
230.0		10,437	9.934	
235.0		10,385	10.050	
240.0		10,346	10.138	
245.0		10,308	10.223	
250.0	293	10,268	10.315	
255.0		10,222	10.419	
260.0		10,188	10.498	
265.0		10,141	10.605	
270.0		10,104	10.690	
275.0		10,062	10.788	
280.0		10,020	10.885	
285.0		9,978	10.984	
290.0		9,940	11.085	
295.0		9,898	11.173	

COLLECTED TEMPERATURE DATA

Hole: Welsford 1 (cont'd.) Location:
5-Month Log
Latitude:

Longitude: Thermistor No.

Total Depth: Logged Depth:

Vertical Depth (m)	Cable Resist. (ohms)	Corrected Resist. (ohms)	Temp. (°C)	Lithology/Remarks
300.0	292	9,858	11.268	
305.0		9,818	11.363	
310.0		9,774	11.468	
315.0		9,733	11.567	
320.0		9,697	11.654	
325.0		9,652	11.764	
330.0		9,617	11.852	
335.0		9,575	11.953	
340.0		9,541	12.036	
345.0		9,497	12.145	
350.0	291	9,463	12.230	
355.0		9,425	12.325	
360.0		9,383	12.431	
365.0		9,344	12.529	
370.0		9,309	12.617	

APPENDIX V

Samples for Heat Generation Determinations - McAdam

Surface Samples

Sample No.	Location
P-200	30 metres north of drill site
P-201	175 metres north-northwest of drill site

Split Core Samples

Sample No.	Depth (m)	Sample No.	Depth (m)
P-100	10.13	P-120	210.25
P-101	20.27	P-121	220.24
P-102	30.20	P-122	230.20
P-103	39.99	P-123	240.38
P-104	50.20	P-124	250.20
P-105	60.20	P-125	260.20
P-106	70.20	P-126	270.00
P-107	80.20	P-127	280.30
P-108	90.27	P-128	290.20
P-109	100.20	P-129	300.40
P-110	110.18	P-130	310.25
P-111	120.23	P-131	320.26
P-112	130.30	P-132	330.26
P-113	140.26	P-133	340.22
P-114	150.24	P-134	350.15
P-115	160.17	P-135	360.26
P-116	170.17	P-136	370.20
P-117	180.22	P-137	380.25
P-118	190.29	P-138	390.35
P-119	200.15		

APPENDIX VI

Samples for Heat Generation Determinations - Welsford

Surface Samples

Sample No.	Location
W-200	1,050 metres north of drill site
W-201	750 metres north of drill site
W-202	600 metres north of drill site
W-203	25 metres south of drill site
W-204	1,900 metres northeast of drill site

Split Core Samples

Sample No.	Depth (m)	Sample No.	Depth (m)
W-100	10.66	W-120	209.95
W-101	21.27	W-121	220.26
W-102	30.55	W-122	230.20
W-103	40.20	W-123	240.17
W-104	50.63	W-124	250.20
W-105	60.24	W-125	260.10
W-106	70.20	W-126	270.45
W-107	81.96	W-127	280.37
W-108	90.35	W-128	290.07
W-109	100.46	W-129	299.63
W-110	110.23	W-130	310.37
W-111	120.72	W-131	320.35
W-112	130.20	W-132	330.05
W-113	141.23	W-133	339.58
W-114	150.20	W-134	350.02
W-115	160.22	W-135	360.16
W-116	170.37	W-136	369.92
W-117	181.55		
W-118	191.41		
W-119	200.20		

APPENDIX VII

Core Samples for Thermal Conductivity Measurements - McAdam

Sample No.	Depth (m)	Sample No.	Depth (m)
P-1	9.85	P-21	209.98
P-2	20.00	P-22	219.97
P-3	29.92	P-23	229.93
P-4	39.72	P-24	239.91
P-5	49.92	P-25	249.93
P-6	59.92	P-26	259.93
P-7	69.92	P-27	269.73
P-8	79.92	P-28	280.03
P-9	90.00	P-29	289.92
P-10	99.92	P-30	300.13
P-11	109.91	P-31	309.88
P-12	119.96	P-32	319.89
P-13	130.02	P-33	329.89
P-14	139.99	P-34	339.95
P-15	149.96	P-35	349.88
P-16	159.90	P-36	359.99
P-17	169.90	P-37	369.93
P-18	179.96	P-38	379.98
P-19	190.00	P-39	390.08
P-20	199.88		

APPENDIX VIII

Core Samples for Thermal Conductivity Measurements - Welsford

Sample No.	Depth (m)	Sample No.	Depth (m)
W-1	10.39	W-21	209.68
W-2	21.00	W-22	219.99
W-3	30.28	W-23	229.93
W-4	39.93	W-24	239.90
W-5	50.36	W-25	249.93
W-6	59.97	W-26	259.83
W-7	69.93	W-27	270.18
W-8	81.69	W-28	280.10
W-9	90.08	W-29	289.80
W-10	100.19	W-30	299.36
W-11	109.96	W-31	310.10
W-12	120.45	W-32	320.08
W-13	129.93	W-33	329.78
W-14	140.96	W-34	330.31
W-15	149.93	W-35	349.85
W-16	159.75	W-36	359.89
W-17	169.90	W-37	369,65
W-18	181.28		
W-19	191.14		
W-20	199.93		